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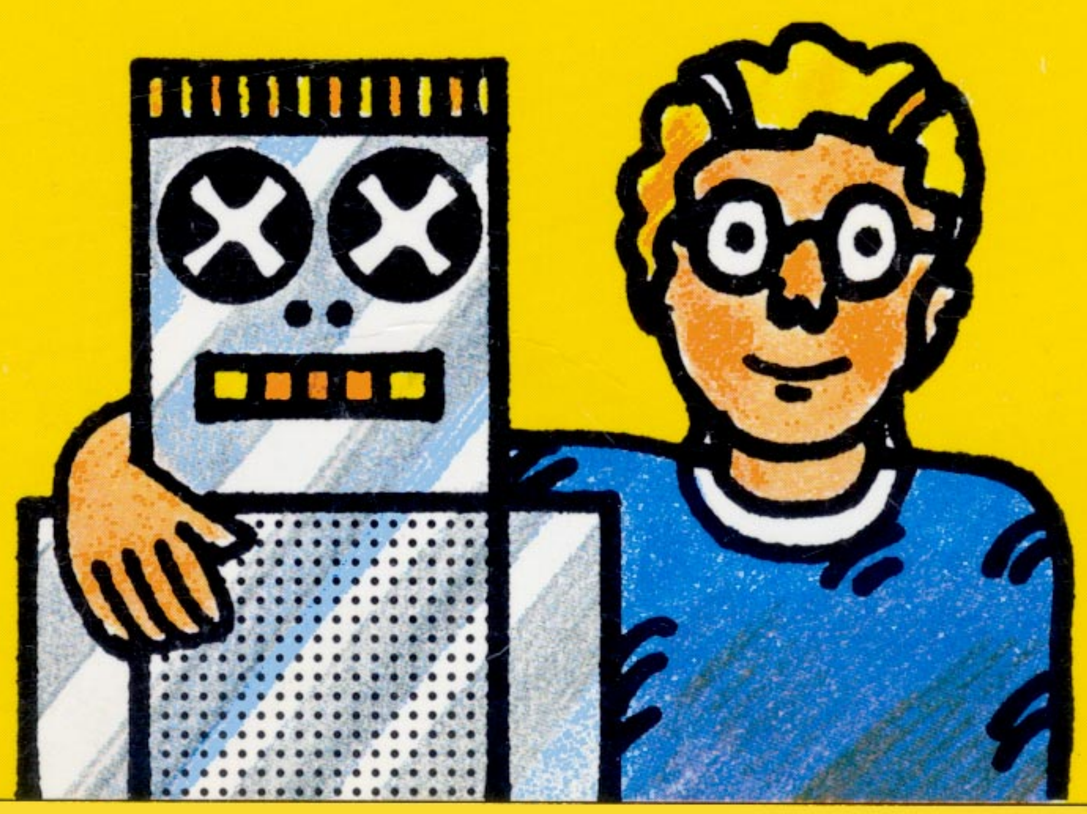
BASIC

COMPUTER

MICROCOMPUTER EDITION

GAMES

101 Great Games to Play on Your Home Computer.
By yourself or with others. Each complete with
programming and sample run. Edited by David H. Ahl



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Edited by David H. Ahl
Program Conversion by Steve North
Illustrations by George Beker

Workman Publishing
New York

All of the programs listed here run, without error, in Microsoft Basic Version 3 0 or higher While most users will encounter no problems in entering and running the games, some microcomputer Basics may require program conversion If you are a newcomer to personal computing, do not attempt to enter the longest program first This will only result in frustration and confusion You must become familiar with your Basic's capabilities and limitations before attempting one of the longer programs

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To Derek, the game player ....

THE AUTHOR

David H. Ahl is a computer hacker from way back. He learned to program in 1956 on a Burroughs B-200 in Algol and CAL (Cornell Assembly Language) and has worked with such diverse beasts as the Bendix G-15 and G-20, IBM 650, 704, 7090, 1401, 1130, 360/40 and 360/50, CDC 3200 and 3600, GE 115, 235, and 635, HP 2000, NCR Century 50 and 100, DEC PDP-8, 10, 11, 12 and 15 as well as virtually every microcomputer made to the present day.

He wrote his first computer game about a week after learning to program and has been involved ever since in both serious games (Carnegie-Mellon management game, U.S. energy simulation) as well as games for fun.
His career has been intertwined with computers in market research and new product forecasting, educational research, marketing of computers to schools and colleges, teaching, and lecturing. Now, as Publisher of *Creative Computing* magazine he is continuing to pioneer new computer applications for fun and fortune.

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Bob Albrecht. For his continuing contribution to the world of computer games and for setting me straight as to who wrote what.

Dartmouth College. For recognizing games as a legitimate educational tool and allowing them to be written and played on the Dartmouth timesharing system.

Microcomputer Manufacturers. For putting computer games within the reach of every American in the comfort of their own home.

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Introduction

You're seated in a heavily padded chair which is vibrating ever so slightly. All of a sudden you feel a jolt and your viewscreen, which has previously been black, shows the receding form of the lunar command module. It will continue to orbit around the moon two hundred miles up while you land your LEM and explore the moon. Your viewscreen now shows that you are beginning to tumble, so you hit the button on your right joystick to give a short burst on the starboard stabilization rockets. A few more short bursts right, left, then right again and your viewscreen shows that you've stabilized your craft and that you're headed smoothly, if rather rapidly, toward the lunar surface. In panic you realize that you've taken a long time with your stabilizing maneuvers so you jab the retro rocket firing control on full. Your viewscreen is now obscured by the flames so you switch to a computer display which shows your spacecraft and its position as you approach the moon. You manage to slow your craft, however, you see that you're heading for the side of a crater and you don't have enough time for positional maneuvers. You switch your viewscreen back on and hope for the best. Unfortunately, the crater walls are steep and one leg of your LEM makes contact before the others. It buckles and the craft topples over. At this, Mission Control in Houston sends you a radio message, "Ground telemetry records severe craft damage. You have 13.2 days of oxygen. Information on rescue attempt to follow. Don't panic."

You punch another button on your console and your screen lights up, "Lunar Landing Simulation complete. Try again?" You lean back in your easychair, palms moist with perspiration and type, "No. Get Football." A moment later a referee and the hulking shape of Roger Staubach appears on the screen. The ref turns and asks you, "Heads or tails?"

Far-fetched? Not at all. Technologically this is all possible today. From an economic standpoint it will take a few more years before systems with these capabilities are within reach of the average consumer. But even today some amazing games are possible with the current breed of home computers. That's what this book is all about: games for home microcomputers, minis, timesharing systems and even large mainframes—in short, any computer that speaks Basic.

Computer games are not a new phenomenon. Back in 1952 shortly after the first commercial computers were introduced, A. L. Samuel at IBM wrote a checkers program for the IBM 701. It was written with the idea that a great deal could be learned about the human thought process if one could simulate it on a computer. This also was the reason that Newell, Shaw, and Simon a few years later at Rand Corporation wrote the first computer chess program. But even to those uninitiated in the field of artificial intelligence research, these programs were great fun as games even if they didn't play outstanding chess or checkers.

But while these programs were being written as part of research projects, a much larger group of people were furtively writing and playing games at lunchtime and before and after work on their employers' computers. There were at least two or three of these fanatical game players, sometimes more, at each computer installation of any size. The advent of the minicomputer and timesharing networks in the early 1960's expanded this community of computer

hackers and by 1966 they were meeting at various professional society meetings and laying out plans for a computer chess tournament.

The hard core of the hackers, the real cultists, were those that were into Spacewar. Originally written by some hackers at the MIT EE Department back in 1961-62 for a DEC PDP-1, the first minicomputer, Spacewar spawned a fanatical community of hackers who played, modified, improved and experimented with it.

"Ah, Spacewar. Reliably at any nighttime moment, hundreds of computer technicians are effectively out of their bodies, computer-projected onto CRT display screens, locked in life-or-death space combat for hours at a time, ruining their eyes, numbing their fingers in frenzied mashing of control buttons, joyously slaying their friends and wasting their employers' valuable computer time. Something basic is going on." (Stewart Brand in *II Cybernetic Frontiers*.)*

Item: October 10, 1972. The PDP-10 at the Stanford AI Laboratory is reserved from 8:00 p.m. on for the "Intergalactic Spacewar Olympics."

Item: October 1976. Cromemco announces Spacewar for the 8080 and TV Dazzler. Paper tape $15.00.

In layman's terms what those two items mean is that in the short span of four years Spacewar went from a game that required the use of a multi-million dollar computer to a game that could be played on a $1,000 home computer.

What happens to a fanatical cult when you open the temple doors and let everyone take its source into their own homes? Obviously, we don't know since the temple hasn't been open that long, but it seems obvious that this same generation of kids that can't do manual math or use a slide rule because of the pocket calculator may learn that a TV set can throw some actively challenging things their way instead of just a passive picture.

About this Book

Basic Computer Games: Microcomputer Edition is a major revision of my first book, *101 Basic Computer Games* published in 1973 by Digital Equipment Corporation. The programs in the original book represented six different versions of Basic. The programs in this book all run in Microsoft Basic (more about that later on page XII). There were several programs that couldn't be converted or weren't worth converting to Microsoft Basic. These were deleted and replaced with new programs.

Program listings were done on a Teletype Model 43 terminal. Its 7 × 9 dot matrix printer coupled with its 13.2 characters per inch spacing gives it exceptionally high legibility, even when reduced to 64% as it has been done in here. I salute those of you with the first book who patiently, magnifying glass in hand, deciphered nearly illegible listings and got those programs up and running. This book should make that task considerably easier.

David H. Ahl
September, 1978

*Steward Brand, II Cybernetic Frontiers, New York, Random House, 1974.

The Basic Language

Be sure to read this section before entering any of the games in this book on your computer. It will save you time and minimize potential problems.

The games in this book were written by a wide cross section of people on a variety of computers over a ten-year period. Most of the games were originally written for time-sharing systems such as the DEC Timeshared 8 and RSTS-11, HP 2000, and CDC 3600.

The first edition of this book was originally published in the early 70's. All the programs were printed in their original dialect of Basic. One of the major functions of the book was to give computer users an opportunity to learn more about their own and other versions of Basic. For example, a dimensioned string variable such as A$(I) had an entirely different meaning in DEC and HP Basics. The designers of each version of Basic had good reasons for doing what they did and it was (and is) very instructive to understand how different approaches work and their respective rationales.

In 1975, a small company in the telemetry business, M.I.T.S., introduced the first computer for hobbyists, the Altair 8800. This signaled the start of an immense new industry: personal computers. Ed Roberts, president of M.I.T.S., contracted with a small consulting company started by two bright young programmers to write a version of Basic for the Altair.

The name of the consulting company was Microsoft, and the Basic that Bill Gates and Paul Allen devised soon came to be known, appropriately enough, as Microsoft Basic. It was modeled on Basic-Plus, originally a creation of Nathan Teichholtz at Digital Equipment Corporation. Nathan is an unsung hero in the history of the Basic language and deserves a great deal of credit for this vastly improved version of the language. And in the kudos department, we must always remember to bow low to John Kemeny and Tom Kurtz of Dartmouth, the creators of the original Basic.

In any event, in 1977 it appeared that Microsoft Basic was fast becoming the standard Basic for microcomputers, and the programs in this book were all converted to Microsoft Basic, Revision 4.0. For about three years, this Basic truly was the standard.

However, three things conspired against it becoming the all-time standard. First, it was written for the 8080 (and Z80) microprocessor, and later mpu's had capabilities (and idiosyncrasies) that the 8080 did not have, hence, slight differences started creeping into Microsoft Basic on later computers.

Second, not all computer manufacturers wanted to contract with Microsoft to write Basic for their computers and so some wrote their own. This has led to some particularly interesting (and confusing) dialects of Basic.

Third, as computer hardware became more powerful with 16-bit mpu's, special chips for graphics and sound, Winchester disk drives, modems, and other peripherals, various extensions and changes had to be made to the software. Some of these changes are in the operating system and are transparent to the user, but others affect the Basic language.

So, what you are holding is a book of thoroughly debugged programs that can be entered directly and will run perfectly on some computers, while on other computers they will not run at all. What can you do about it if you have a computer on which the programs will not run?

First, do not call or write us. You have paid less than a dime per program and, after everyone has taken his share, we have made less than 1 cent per program; for that, we can't afford to act as personal consultants.

Second, please keep in mind that every program runs perfectly in Microsoft Basic 4.0. The sample runs are not faked; they came off a real computer exactly as they appear. There are no typographical errors in the programs — misspellings maybe — but the functional code is absolutely correct.

Third, the early versions of the books had programs in 15 or 20 vastly different dialects of Basic, yet hundreds of thousands of purchasers managed to convert the programs to their machines and get them going.

The key to converting the programs is to understand how Microsoft Basic works compared with your Basic. While we cannot present an entire manual on Microsoft Basic, we have included in the next section information on the key elements of the language and those likely to be different in other implementations.

If direct conversion doesn't work, do some "reverse engineering," (as it known in the computer industry). This means taking apart a program and drawing a flowchart of the logic. With a flowchart in hand, you can then write your own program to do the same thing, but often faster and better.

Since many of the programs were originally written in what today would be considered a primitive version of Basic, there are many ways of substantially shortening and improving some of these programs.

You should also keep in mind that all of these programs were written on computers which used an ASR-33 Teletype terminal. These are massive clunkers with 72 (or 80) columns of output, upper case only, and no graphics capability whatsoever. Naturally, you will have to do a fair amount of reformatting if your computer has only 40 columns (Apple, etc.), 32 columns (Sinclair), 28 columns (TI), or 20 columns (Epson HX-20). It can be done; for another book, I converted Hammurabi, Lunar Lander, and Gunner, all of which use 72 columns, to all the computers mentioned above.

The programs in this book use the following statements and functions in Microsoft Basic:

Statements		
DATA	Holds numeric or string data for a READ statement	20 DATA 4,6,"AHL"
DEF FNA(X)	Defines any function of X	20 DEF FNA(X)=3*X-2 20 DEF FNA(X)=SIN(X/57.3)
DIM	Declares maximum size of string or numeric array. Array subscripting begins at 0 although many programs do not use the zero subscript.	20 DIM A(50) 20 DIM A$(25),B1$(50)
END	Last statement in program	9999 END
FOR..TO..(STEP)	Executes a loop. The test for ending the loop is made after the loop has been executed. Upon exiting, the counter value equals the upper limit plus the step. For example, 10 FOR J=1 TO 3 20 PRINT "HI" 30 NEXT J will print "HI" three times, and J will equal 4 when the loop is finished.	20 FOR I=1 TO 30 20 FOR J=2 TO N STEP 3
GOSUB n	Branch to subroutine n	20 GOSUB 200
GOTO n	Branch to statement n	20 GOTO 50
IF..THEN n	Branch to statement n if condition is true	20 IF A>1 THEN 50
IF..THEN stmts	Executes statements if condition is true. Drops to next numbered line if false.	20 IF Z<5 THEN A=1:PRINT B
IF..THEN n ELSE m	Branch to n if true or to m if not true	20 IF X=Y THEN 50 ELSE 90
IF..THEN stmts ELSE stmts	Does statements after THEN if true, stmts after ELSE if false	20 IF Z>R THEN X=1 ELSE X=2
INPUT	Requests data from keyboard. The prompt string is optional	20 INPUT N 20 INPUT "YES OR NO";Z$
LET	Assigns value of expression to variable. The word LET is optional	20 LET A=1 20 Z$="DRY"
NEXT	Marks end of FOR loop	20 NEXT J
ON m GOSUB...	Branch to mth subroutine	20 ON X GOSUB 100,200
ON m GOTO...	Branch to mth line no. In these statements, m must be an integer starting at 1 and increasing by 1	20 ON Y GOTO 50,80,120
PRINT	Displays strings, constants and variables. Calculations can be done within a PRINT statement	20 PRINT "A=";A 20 PRINT Z$,10*A+B
READ	Moves values of DATA into variables	20 READ N,X1,A$
REM	Remark. Does not execute	20 REMARKABLE PROGRAM
RESTORE	Resets DATA pointer to first item in list	20 RESTORE
RETURN	Go to statement following last GOSUB	20 RETURN
STOP	Terminate program	20 STOP

Functions

ABS (X)	Absolute value.
ASC(X$)	Returns the ASCII value of the first character in the string argument. ASC("A") is 65,ASC("B") is 66, etc.
ATN(X)	Arctangent
CHR$(X)	Converts ASCII value to a character string. CHR$(65) is "A", etc. CHR$(7) is a bell ring.
COS(X)	Cosine
EXP(X)	Value of e raised to the X power
INT(X)	Integer function
LEFT$(X$,Y)	The leftmost Y characters in X$
LEN(X$)	Number of characters in X$
LOG(X)	Log of x to the base e
MID$(X$,Y,Z)	Takes Z characters from X$ starting at position Y
RND(1)	Returns a random number between 0 and 1.
RIGHT$(X$,Y)	The rightmost Y characters in X$
SGN(X)	Sign function. Returns -1 if X is negative, 0 if x is zero, 1 if x is positive.
SIN(X)	Sine
SQR(X)	Square root
STR$(X)	Converts X to a string of decimal digits, for example if X was 8.45 it would be converted to the string "8.45".
TAB(X)	Spaces over to position X on the terminal.
TAN(X)	Tangent
VAL(X$)	Returns the numerical value of the string of digits in X$. Opposite of STR$(X).

In Microsoft (Altair) BASIC, any expression may be evaluated as either true or false. A true condition will return a value of -1, and a false condition 0. Thus, if we say LET Q= -(X=Y), Q=1 if X=Y and Q=0 if X=Y. This logical evaluation of expressions is only used in the Hexapawn game in the user-defined function and with a little ingenuity could be replaced with a look-up table. A few other games use the logical AND and OR operators, which work in a straightforward manner.

The programs in this book were printed on a printer that uses a caret (∧) to indicate exponentiation. This is equivalent to an up arrow. Incidentally, exponentiation and taking roots are among the least accurate functions on small computers. For example, try this program.

```
10 INPUT N
20 I=SQR(SQR(N))
30 J=(I↑2)↑2
40 PRINT N,J
50 GOTO 10
```

Chances are good that N and J will not be the same 25% or more of the time. You can improve the accuracy by substituting J*J for J squared or J*J*J for J cubed.

Microsoft Basic permits more than one statement on a line when the statements are separated by a colon (:). As noted above, in an IF..THEN statement, if the condition is false, control drops to the next numbered line, not to the next statement on the same line.

This means that for TI and other computers that do not permit multiple statements on one line, you will have to insert additional lines. This may be difficult when line numbers are close together. One easy solution is to add a zero to all line numbers, but you must remember to do this in IF..THEN, GOTO and GOSUB statements as well as changing all the numbered lines.

The random function can be especially irksome as it is one that differs widely on different versions of Basic. In Microsoft Basic, RND(1) returns a value between 0 and 0.999999. This is the convention used in all programs in this book. On some computers, you may have to use RND(0), and on others just RND.

Conversion to other Basics

Radio Shack BASIC: Approximately 25 of the games which do not use strings will run under Level 1 BASIC; another 20 or so may be converted relatively easily by converting to all numeric input (1 instead of YES, 0 for NO, etc.). In Level 2, change RND (1) to RND (0). Also function definitions, when used, must be expanded.

Apple II BASIC: All programs will run directly in Applesoft Basic with little or no modification. In integer Basic, strings are similar to HF Basic. Also, multiple statements on one line work differently than with Microsoft Basic.

DEC BASIC PLUS: Programs written in Altair BASIC should be completely compatible with DEC BASIC PLUS.

HP BASIC: Some conversion will be required to get certain programs to run in HP BASIC. First, HP BASIC does not have a zero subscript for arrays. So if, in a program, the zero subscript is used, HP BASIC will report a subscript out of bounds error. The solution is to add one to all the array subscripts if it is determined that the program does use the zero subscript.

Second, HP BASIC character strings differ from Altair BASIC. There are no string arrays. So if string arrays are used in some program, a conversion must be made. Possibly the string array could be converted into a single string, or a numeric array, or a series of data statements, or possibly a data file. Also, HP BASIC does not have RIGHT$, LEFT$ or MID$ functions. Instead substitute the normal HP string subscripting conventions [for instance, RIGHTS$(X$,2) becomes X$(LEN(X$)-1, LEN(X$)].

Third, HP BASIC does not have multiple statements on one line. Convert multiple statement lines to several separate lines.

SWTPC 6800 BASIC: Versions 2.0 and above of this BASIC should be nearly compatible. Like HP BASIC, SWTPC BASIC does not allow the zero subscript. Also, character strings may not contain more than 32 characters. Note that in Altair BASIC, RND(1) is used to get random numbers, rather than RND(0) as in SWTPC BASIC. These comments also apply to **MSI Disk BASIC.**

TDL ZAPPLE 8K and 12K BASIC: All the programs are executable in both TDL BASICs. However TDL ZAPPLE BASIC has a RANDOMIZE verb which should be inserted at the beginning of a program to get true pseudorandom numbers.

Sol BASIC: The programs will work directly in Sol Extended Basic. Many programs will run in 5K Basic but the majority will require considerable conversion.

PET BASIC: Commodore PET BASIC is identical to the BASIC used in this book. Thus, all the games will run without any conversion.

Cromemco 16K Extended BASIC: Cromemco BASIC allows multiple statements, but certain statements must be the last statement on a line, so some rearrangement may be necessary. Two-dimensional arrays must be dimensioned explicitly (there is no default to a 10 by 10 dimension). Also, strings in Cromemco BASIC are implemented like HP BASIC, not Altair BASIC.

Ohio Scientific BASIC: Most programs will run directly on Challenger 2P and larger systems. The 32-characters per line display of the Challenger 1P and Superboard will require conversion of the program output routines.

IMSAI 8K BASIC: Programs are executable with little or no modification.

North Star Disk BASIC: North Star BASIC has character strings like HP BASIC, so some conversion will be required. Also note that the function SQRT is used in place of SQR.

PolyMorphic 11K BASIC: The multiple statement separator is a backslash (/), not the colon. Like North Star BASIC, SQRT is used instead of SQR. In Poly BASIC, you're not allowed to exit a FOR loop prematurely, except by using the EXIT verb. So whenever you see an IF...THEN out of a FOR loop, use the EXIT verb. Also note that in order to get random numbers, RND must be used with a "seed" value between 0 and 1, which determines at what point in the sequence of random numbers the RND function starts. This seed value is usually based on the time of day. After initializing the RND function, use RND(0) to get random numbers.

BASIC-E (runs under CP/M Disk Operating System): All arrays must be dimensioned (there is no default). The RANDOMIZE verb should be used, at the beginning of the program, to get random numbers. Also, multiple statements are not allowed, so conversion to several single statement lines will be necessary.

The Games 

Acey Ducey

This is a simulation of the Acey Ducey card game. In the game, the dealer (the computer) deals two cards face up. You have an option to bet or not to bet depending on whether or not you feel the next card dealt will have a value between the first two.

Your initial money (Q) is set to $100; you may alter Statement 110 if you want to start with more or less than $100. The game keeps going on until you lose all your money or interrupt the program.

The original program author was Bill Palmby of Prairie View, Illinois.

```
          ACEY DUCEY CARD GAME
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


ACEY-DUCEY IS PLAYED IN THE FOLLOWING MANNER
THE DEALER (COMPUTER) DEALS TWO CARDS FACE UP
YOU HAVE AN OPTION TO BET OR NOT BET DEPENDING
ON WHETHER OR NOT YOU FEEL THE CARD WILL HAVE
A VALUE BETWEEN THE FIRST TWO.
IF YOU DO NOT WANT TO BET, INPUT A 0
YOU NOW HAVE  100  DOLLARS

HERE ARE YOUR NEXT TWO CARDS
 2
 9

WHAT IS YOUR BET? 25
QUEEN
SORRY, YOU LOSE
YOU NOW HAVE  75  DOLLARS


HERE ARE YOUR NEXT TWO CARDS
 4
 10

WHAT IS YOUR BET? 25
 10
SORRY, YOU LOSE
YOU NOW HAVE  50  DOLLARS

HERE ARE YOUR NEXT TWO CARDS
 8
QUEEN

WHAT IS YOUR BET? 0
CHICKEN!!

HERE ARE YOUR NEXT TWO CARDS
 6
 10

WHAT IS YOUR BET? 20
 10
SORRY, YOU LOSE
YOU NOW HAVE  30  DOLLARS

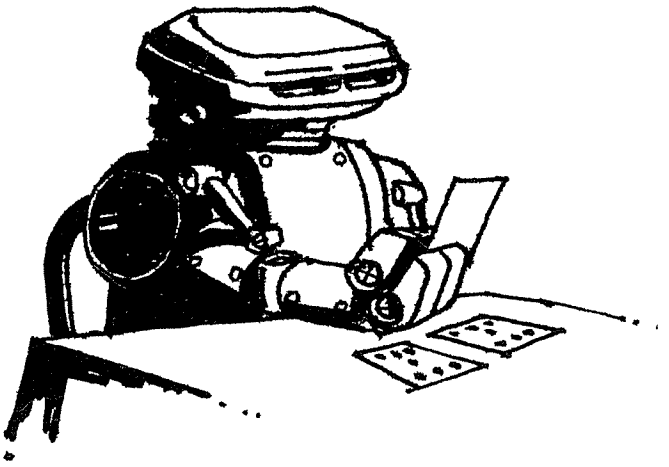
HERE ARE YOUR NEXT TWO CARDS
 9
JACK

WHAT IS YOUR BET? 0
CHICKEN!!

HERE ARE YOUR NEXT TWO CARDS
JACK
QUEEN

WHAT IS YOUR BET? 0
CHICKEN!!
```

```
10 PRINT TAB(26);"ACEY DUCEY CARD GAME"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
21 PRINT
22 PRINT
23 PRINT
30 PRINT"ACEY-DUCEY IS PLAYED IN THE FOLLOWING MANNER "
40 PRINT"THE DEALER (COMPUTER) DEALS TWO CARDS FACE UP"
50 PRINT"YOU HAVE AN OPTION TO BET OR NOT BET DEPENDING"
60 PRINT"ON WHETHER OR NOR YOU FEEL THE CARD WILL HAVE"
70 PRINT"A VALUE BETWEEN THE FIRST TWO."
80 PRINT"IF YOU DO NOT WANT TO BET, INPUT A 0"
100 N=100
110 Q=100
120 PRINT"YOU NOW HAVE ";Q;" DOLLARS"
130 PRINT
140 GOTO 260
210 Q=Q+M
220 GOTO 120
240 Q=Q-M
250 GOTO 120
260 PRINT"HERE ARE YOUR NEXT TWO CARDS "
270 A=INT(14*RND(1))+2
280 IF A<2 THEN 270
290 IF A>14 THEN 270
300 B=INT(14*RND(1))+2
310 IF B<2 THEN 300
320 IF B>14 THEN 300
330 IF A>=B THEN 270
350 IF A<11 THEN 400
360 IF A=11 THEN 420
370 IF A=12 THEN 440
380 IF A=13 THEN 460
390 IF A=14 THEN 480
400 PRINT A
410 GOTO 500
420 PRINT"JACK"
430 GOTO 500
440 PRINT"QUEEN"
450 GOTO 500
460 PRINT"KING"
470 GOTO 500
480 PRINT"ACE"
500 IF B<11 THEN 550
510 IF B=11 THEN 570
520 IF B=12 THEN 590
530 IF B=13 THEN 610
540 IF B=14 THEN 630
550 PRINT B
560 GOTO 650
570 PRINT"JACK"
580 GOTO 650
590 PRINT"QUEEN"
600 GOTO 650
610 PRINT"KING"
620 GOTO 650
630 PRINT"ACE"
640 PRINT
650 PRINT
660 INPUT"WHAT IS YOUR BET";M
670 IF M<>0 THEN 680
675 PRINT"CHICKEN!!!"
676 PRINT
677 GOTO 260
680 IF M<=Q THEN 730
690 PRINT"SORRY, MY FRIEND BUT YOU BET TOO MUCH"
700 PRINT"YOU HAVE ONLY ";Q;" DOLLARS TO BET"
710 GOTO 650
730 C=INT(14*RND(1))+2
740 IF C<2 THEN 730
750 IF C>14 THEN 730
760 IF C<11 THEN 810
770 IF C=11 THEN 830
780 IF C=12 THEN 850
790 IF C=13 THEN 870
800 IF C=14 THEN 890
810 PRINT C
820 GOTO 910
830 PRINT"JACK"
840 GOTO 910
850 PRINT"QUEEN"
860 GOTO 910
870 PRINT"KING"
880 GOTO 910
890 PRINT "ACE"
900 PRINT
910 IF C>A THEN 930
920 GOTO 970
930 IF C>=B THEN 970
950 PRINT"YOU WIN!!!"
960 GOTO 210
970 PRINT"SORRY, YOU LOSE"
980 IF M<Q THEN 240
990 PRINT
1000 PRINT
1010 PRINT"SORRY, FRIEND BUT YOU BLEW YOUR WAD"
1020 INPUT"TRY AGAIN (YES OR NO)";A$
1030 IF A$="YES" THEN 110
1040 PRINT"OK HOPE YOU HAD FUN"
1050 END
```



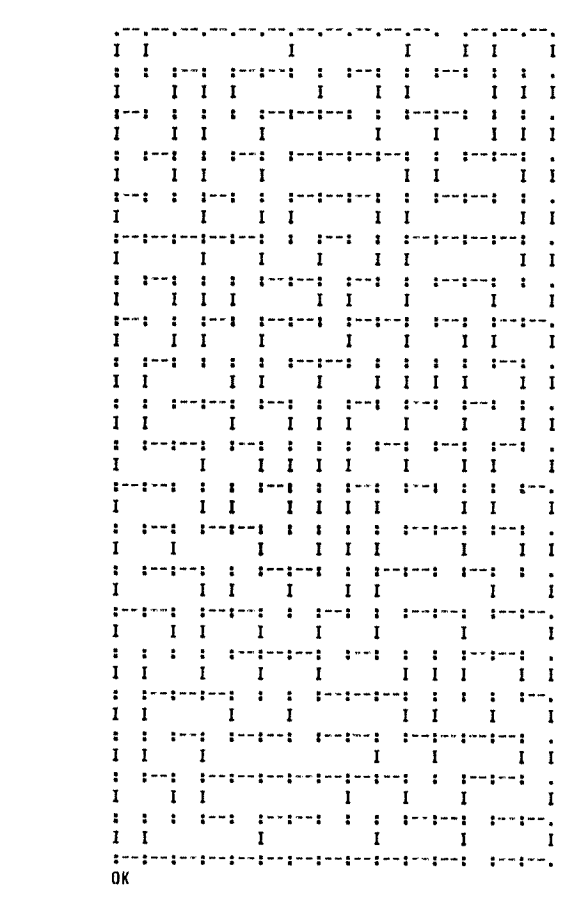
Amazing

This program will print out a different maze every time it is run and guarantees only one path through. You can choose the dimensions of the maze — i.e. the number of squares wide and long.

The original program author was Jack Hauber of Windsor, Connecticut.

```
                AMAZING PROGRAM
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


WHAT ARE YOUR WIDTH AND LENGTH? 15,20
```



```
OK
```

```
10 PRINT TAB(28);"AMAZING PROGRAM"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT:PRINT
100 INPUT "WHAT ARE YOUR WIDTH AND LENGTH";H,V
102 IF H<>1 AND V<>1 THEN 110
104 PRINT "MEANINGLESS DIMENSIONS.  TRY AGAIN.":GOTO 100
110 DIM W(H,V),V(H,V)
120 PRINT
130 PRINT
140 PRINT
150 PRINT
160 Q=0:Z=0:X=INT(RND(1)*H+1)
165 FOR I=1 TO H
170 IF I=X THEN 173
171 PRINT ".--";:GOTO 180
173 PRINT ".  ";
180 NEXT I
190 PRINT "."
195 C=1:W(X,1)=C:C=C+1
200 R=X:S=1:GOTO 260
210 IF R<>H THEN 240
215 IF S<>V THEN 230
220 R=1:S=1:GOTO 250
230 R=1:S=S+1:GOTO 250
240 R=R+1
250 IF W(R,S)=0 THEN 210
260 IF R-1=0 THEN 530
265 IF W(R-1,S)<>0 THEN 530
270 IF S-1=0 THEN 390
280 IF W(R,S-1)<>0 THEN 390
290 IF R=H THEN 330
300 IF W(R+1,S)<>0 THEN 330
310 X=INT(RND(1)*3+1)
320 ON X GOTO 790,820,860
330 IF S<>V THEN 340
334 IF Z=1 THEN 370
338 Q=1:GOTO 350
340 IF W(R,S+1)<>0 THEN 370
350 X=INT(RND(1)*3+1)
360 ON X GOTO 790,820,910
370 X=INT(RND(1)*2+1)
380 ON X GOTO 790,820
390 IF R=H THEN 470
400 IF W(R+1,S)<>0 THEN 470
405 IF S<>V THEN 420
410 IF Z=1 THEN 450
415 Q=1:GOTO 430
420 IF W(R,S+1)<>0 THEN 450
430 X=INT(RND(1)*3+1)
440 ON X GOTO 790,860,910
450 X=INT(RND(1)*2+1)
460 ON X GOTO 790,860
470 IF S<>V THEN 490
480 IF Z=1 THEN 520
485 Q=1:GOTO 500
490 IF W(R,S+1)<>0 THEN 520
500 X=INT(RND(1)*2+1)
510 ON X GOTO 790,910
520 GOTO 790
530 IF S-1=0 THEN 670
540 IF W(R,S-1)<>0 THEN 670
545 IF R=H THEN 610
547 IF W(R+1,S)<>0 THEN 610
550 IF S<>V THEN 560
552 IF Z=1 THEN 590
554 Q=1:GOTO 570
560 IF W(R,S+1)<>0 THEN 590
570 X=INT(RND(1)*3+1)
580 ON X GOTO 820,860,910
590 X=INT(RND(1)*2+1)
600 ON X GOTO 820,860
610 IF S<>V THEN 630
620 IF Z=1 THEN 660
625 Q=1:GOTO 640
630 IF W(R,S+1)<>0 THEN 660
640 X=INT(RND(1)*2+1)
650 ON X GOTO 820,910
660 GOTO 820
670 IF R=H THEN 740
680 IF W(R+1,S)<>0 THEN 740
685 IF S<>V THEN 700
690 IF Z=1 THEN 730
695 Q=1:GOTO 830
700 IF W(R,S+1)<>0 THEN 730
710 X=INT(RND(1)*2+1)
720 ON X GOTO 860,910
730 GOTO 860
740 IF S<>V THEN 760
750 IF Z=1 THEN 780
755 Q=1:GOTO 770
760 IF W(R,S+1)<>0 THEN 780
770 GOTO 910
780 GOTO 1000
790 W(R-1,S)=C
800 C=C+1:V(R-1,S)=2:R=R-1
810 IF C=H*V+1 THEN 1010
815 Q=0:GOTO 260
820 W(R,S-1)=C
830 C=C+1
840 V(R,S-1)=1:S=S-1:IFC=H*V+1 THEN 1010
850 Q=0:GOTO 260
860 W(R+1,S)=C
870 C=C+1:IF V(R,S)=0 THEN 880
875 V(R,S)=3:GOTO 890
880 V(R,S)=2
890 R=R+1
900 IF C=H*V+1 THEN 1010
905 GOTO 530
910 IF Q=1 THEN 960
920 W(R,S+1)=C:C=C+1:IF V(R,S)=0 THEN 940
930 V(R,S)=3:GOTO 950
940 V(R,S)=1
950 S=S+1:IF C=H*V+1 THEN 1010
955 GOTO 260
960 Z=1
970 IF V(R,S)=0 THEN 980
975 V(R,S)=3:Q=0:GOTO 1000
980 V(R,S)=1:Q=0:R=1:S=1:GOTO 250
1000 GOTO 210
1010 FOR J=1 TO V
1011 PRINT "I";
1012 FOR I=1 TO H
1013 IF V(I,J)<2 THEN 1030
1020 PRINT "   ";
1021 GOTO 1040
1030 PRINT "  I";
1040 NEXT I
1041 PRINT
1043 FOR I=1 TO H
1045 IF V(I,J)=0 THEN 1060
1050 IF V(I,J)=2 THEN 1060
1051 PRINT ":  ";
1052 GOTO 1070
1060 PRINT ":--";
1070 NEXT I
1071 PRINT "."
1072 NEXT J
1073 END
```

Animal

Unlike other computer games in which the computer picks a number or letter and you must guess what it is, in this game *you* think of an animal and the *computer* asks you questions and tries to guess the name of your animal. If the computer guesses incorrectly, it will ask you for a question that differentiates the animal it guessed from the one you were thinking of. In this way the computer "learns" new animals. Questions to differentiate new animals should be input without a question mark.

This version of the game does not have a SAVE feature. If your system allows, you may modify the program to save array A$, then reload the array when you want to play the game again. This way you can save what the computer learns over a series of games.

At any time if you reply "LIST" to the question "ARE YOU THINKING OF AN ANIMAL," the computer will tell you all the animals it knows so far.

The program starts originally by knowing only FISH and BIRD. As you build up a file of animals you should use broad, general questions first and then narrow down to more specific ones with later animals. For example, if an elephant was to be your first animal, the computer would ask for a question to distinguish an elephant from a bird. Naturally there are hundreds of possibilities, however, if you plan to build a large file of animals a good question would be "IS IT A MAMMAL."

This program can be easily modified to deal with categories of things other than animals by simply modifying the initial data in Line 530 and the dialogue references to animal in Lines 10, 40, 50, 130, 230, 240, and 600. In an educational environment, this would be a valuable program to teach the distinguishing characteristics of many classes of objects — rock formations, geography, marine life, cell structures, etc.

Originally developed by Arthur Luehrmann at Dartmouth College, Animal was subsequently shortened and modified by Nathan Teichholtz at DEC and Steve North at Creative Computing.

```
                ANIMAL
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


PLAY 'GUESS THE ANIMAL'
THINK OF AN ANIMAL AND THE COMPUTER WILL TRY TO GUESS IT.

ARE YOU THINKING OF AN ANIMAL? Y
DOES IT SWIM? NO
IS IT A BIRD? NO
THE ANIMAL YOU WERE THINKING OF WAS A ? ELEPHANT
PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A
ELEPHANT FROM A BIRD
? DOES IT LIKE PEANUTS
FOR A ELEPHANT THE ANSWER WOULD BE ? YES
ARE YOU THINKING OF AN ANIMAL? YES
DOES IT SWIM? YES
IS IT A FISH? NO
THE ANIMAL YOU WERE THINKING OF WAS A ? SEAL
PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A
SEAL FROM A FISH
? DOES IT HAVE SCALES
FOR A SEAL THE ANSWER WOULD BE ? NO
ARE YOU THINKING OF AN ANIMAL? YES
DOES IT SWIM? NO
DOES IT LIKE PEANUTS? NO
IS IT A BIRD? NO
THE ANIMAL YOU WERE THINKING OF WAS A ? LION
PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A
LION FROM A BIRD
? DOES IT ROAR
FOR A LION THE ANSWER WOULD BE ? YES
ARE YOU THINKING OF AN ANIMAL? YES
DOES IT SWIM? YES
DOES IT HAVE SCALES? NO
IS IT A SEAL? NO
THE ANIMAL YOU WERE THINKING OF WAS A ? OCTOPUS
PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A
OCTOPUS FROM A SEAL
? DOES IT HAVE EIGHT TENTACLES
FOR A OCTOPUS THE ANSWER WOULD BE ? YES
ARE YOU THINKING OF AN ANIMAL? YES
DOES IT SWIM? NO
DOES IT LIKE PEANUTS? YES
IS IT A ELEPHANT? YES
WHY NOT TRY ANOTHER ANIMAL?
ARE YOU THINKING OF AN ANIMAL? YES
DOES IT SWIM? NO
DOES IT LIKE PEANUTS? NO
DOES IT ROAR? NO
IS IT A BIRD? NO
THE ANIMAL YOU WERE THINKING OF WAS A ? WUMPUS
PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A
WUMPUS FROM A BIRD
? IS ITS LAST NAME YOB
FOR A WUMPUS THE ANSWER WOULD BE ? YES
ARE YOU THINKING OF AN ANIMAL? LIST

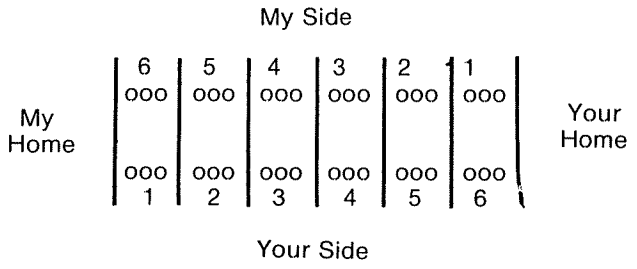
ANIMALS I ALREADY KNOW ARE:
ELEPHANT    FISH        LION        SEAL        OCTOPUS     BIRD
WUMPUS

ARE YOU THINKING OF AN ANIMAL? NO
ARE YOU THINKING OF AN ANIMAL?

BREAK IN 130
OK
```

```
10 PRINT TAB(32);"ANIMAL"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
40 PRINT "PLAY 'GUESS THE ANIMAL'"
50 PRINT "THINK OF AN ANIMAL AND THE COMPUTER WILL TRY TO GUESS IT."
60 PRINT
70 DIM A$(200)
80 FOR I=0 TO 3
90 READ A$(I)
100 NEXT I
110 N=VAL(A$(0))
120 REM          MAIN CONTROL SECTION
130 INPUT "ARE YOU THINKING OF AN ANIMAL";A$
140 IF A$="LIST" THEN 600
150 IF LEFT$(A$,1)<>"Y" THEN 120
160 K=1
170 GOSUB 390
180 IF LEN(A$(K))=0 THEN 999
190 IF LEFT$(A$(K),2)="\Q" THEN 170
200 PRINT "IS IT A ";RIGHT$(A$(K),LEN(A$(K))-2);
210 INPUT A$
220 A$=LEFT$(A$,1)
230 IF A$="Y" THEN PRINT "WHY NOT TRY ANOTHER ANIMAL?": GOTO 120
240 INPUT "THE ANIMAL YOU WERE THINKING OF WAS A ";V$
250 PRINT "PLEASE TYPE IN A QUESTION THAT WOULD DISTINGUISH A"
260 PRINT V$;" FROM A ";RIGHT$(A$(K),LEN(A$(K))-2)
270 INPUT X$
280 PRINT "FOR A ";V$;" THE ANSWER WOULD BE ";
290 INPUT A$
300 A$=LEFT$(A$,1): IF A$<>"Y" AND A$<>"N" THEN 280
310 IF A$="Y" THEN B$="N"
320 IF A$="N" THEN B$="Y"
330 Z1=VAL(A$(0))
340 A$(0)=STR$(Z1+2)
350 A$(Z1)=A$(K)
360 A$(Z1+1)="\A"+V$
370 A$(K)="\Q"+X$+"\"+A$+STR$(Z1+1)+"\"+B$+STR$(Z1)+"\"
380 GOTO 120
390 REM     SUBROUTINE TO PRINT QUESTIONS
400 Q$=A$(K)
410 FOR Z=3 TO LEN(Q$)
415 IF MID$(Q$,Z,1)<>"\" THEN PRINT MID$(Q$,Z,1);: NEXT Z
420 INPUT C$
430 C$=LEFT$(C$,1)
440 IF C$<>"Y" AND C$<>"N" THEN 410
450 T$="\"+C$
455 FOR X=3 TO LEN(Q$)-1
460 IF MID$(Q$,X,2)=T$ THEN 480
470 NEXT X
475 STOP
480 FOR Y=X+1 TO LEN(Q$)
490 IF MID$(Q$,Y,1)="\" THEN 510
500 NEXT Y
505 STOP
510 K=VAL(MID$(Q$,X+2,Y-X-2))
520 RETURN
530 DATA "4","\QDOES IT SWIM\Y2\N3\","\AFISH","\ABIRD"
600 PRINT: PRINT "ANIMALS I ALREADY KNOW ARE:"
605 X=0
610 FOR I=1 TO 200
620 IF LEFT$(A$(I),2)<>"\A" THEN 650
624 PRINT TAB(12*X);
630 FOR Z=3 TO LEN(A$(I))
640 IF MID$(A$(I),Z,1)<>"\" THEN PRINT MID$(A$(I),Z,1);: NEXT Z
645 X=X+1: IF X>5 THEN X=0: PRINT
650 NEXT I
660 PRINT
670 PRINT
680 GOTO 120
999 END
```

Awari



Awari is an ancient African game played with seven sticks and thirty-six stones or beans laid out as shown above. The board is divided into six compartments or pits on each side. In addition, there are two special home pits at the ends.

A move is made by taking all of the beans from any (non-empty) pit on your own side. Starting from the pit to the right of this one, these beans are 'sown' one in each pit working around the board anticlockwise.

A turn consists of one or two moves. If the last bean of your move is sown in your own home you may take a second move.

If the last bean sown in a move lands in an empty pit, provided that the opposite pit is not empty, all the beans in the opposite pit, together with the last bean sown are 'captured' and moved to the player's home.

When either side is empty, the game is finished. The player with most beans in his home has won.

In the computer version, the board is printed as 14 numbers representing the 14 pits.

```
      3  3  3  3  3  3
   0                     0
      3  3  3  3  3  3
```

The pits on your (lower) side are numbered 1-6 from left to right. The pits on my (the computer's) side are numbered from my left (your right).

To make a move you type in the number of a pit. If the last bean lands in your home, the computer types 'AGAIN?' and you then type in your second move.

The computer's move is typed, followed by a diagram of the board in its new state. The computer always offers you the first move. This is considered to be a slight advantage.

There is a learning mechanism in the program that causes the play of the computer to improve as it plays more games.

This version of Awari is adopted from one originally written by Geoff Wyvill of Bradford, Yorkshire, England.

```
                AWARI
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

      3  3  3  3  3  3
   0                     0
      3  3  3  3  3  3

YOUR MOVE? 5

      3  3  3  3  3  4
   0                     1
      3  3  3  3  0  4

MY MOVE IS 2
      3  4  4  4  0  4
   0                     1
      3  3  3  3  0  4

YOUR MOVE? 4

      3  4  4  4  0  4
   0                     2
      3  3  3  0  1  5

AGAIN? 1

      3  4  4  0  0  4
   0                     7
      0  4  4  0  1  5

MY MOVE IS 4
      0  5  0  0  0  4
   6                     7
      0  4  4  0  1  5

YOUR MOVE? 3

      0  5  0  0  0  4
   6                     8
      0  4  0  1  2  6

AGAIN? 5

      0  5  0  0  0  4
   6                     9
      0  4  0  1  0  7

MY MOVE IS 5
      1  0  0  0  0  4
   7                     9
      1  5  1  1  0  7

YOUR MOVE? 2

      1  0  0  0  0  4
   7                    10
      1  0  2  2  1  8

AGAIN? 3

      1  0  0  0  0  4
   7                    10
      1  0  0  3  2  8

MY MOVE IS 6,1
      0  1  1  1  1  0
   8                    10
      1  0  0  3  2  8

YOUR MOVE? 5

      0  1  1  1  1  0
   8                    11
      1  0  0  3  0  9

AGAIN? 4

      0  1  1  1  1  0
   8                    12
      1  0  0  0  1 10

MY MOVE IS 5
      0  0  1  1  1  0
  10                    12
      0  0  0  0  1 10

YOUR MOVE? 6

      1  0  2  2  2  1
  11                    15
      1  0  0  0  1  0

MY MOVE IS 6,4
      0  1  0  2  2  1
  14                    15
      0  0  0  0  1  0

YOUR MOVE? 5

      0  1  0  2  2  0
  14                    17
      0  0  0  0  0  0

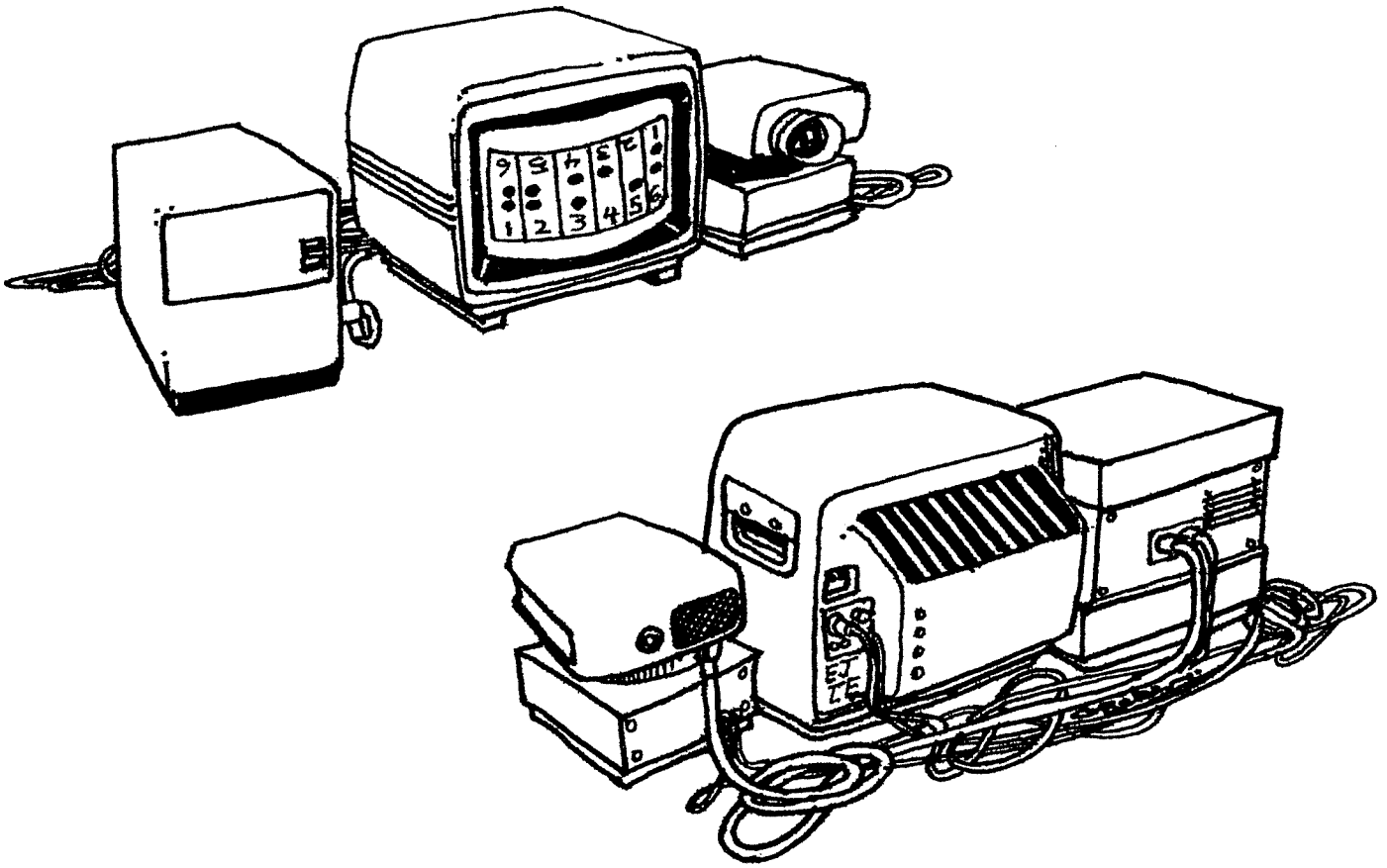
GAME OVER
YOU WIN BY 3 POINTS

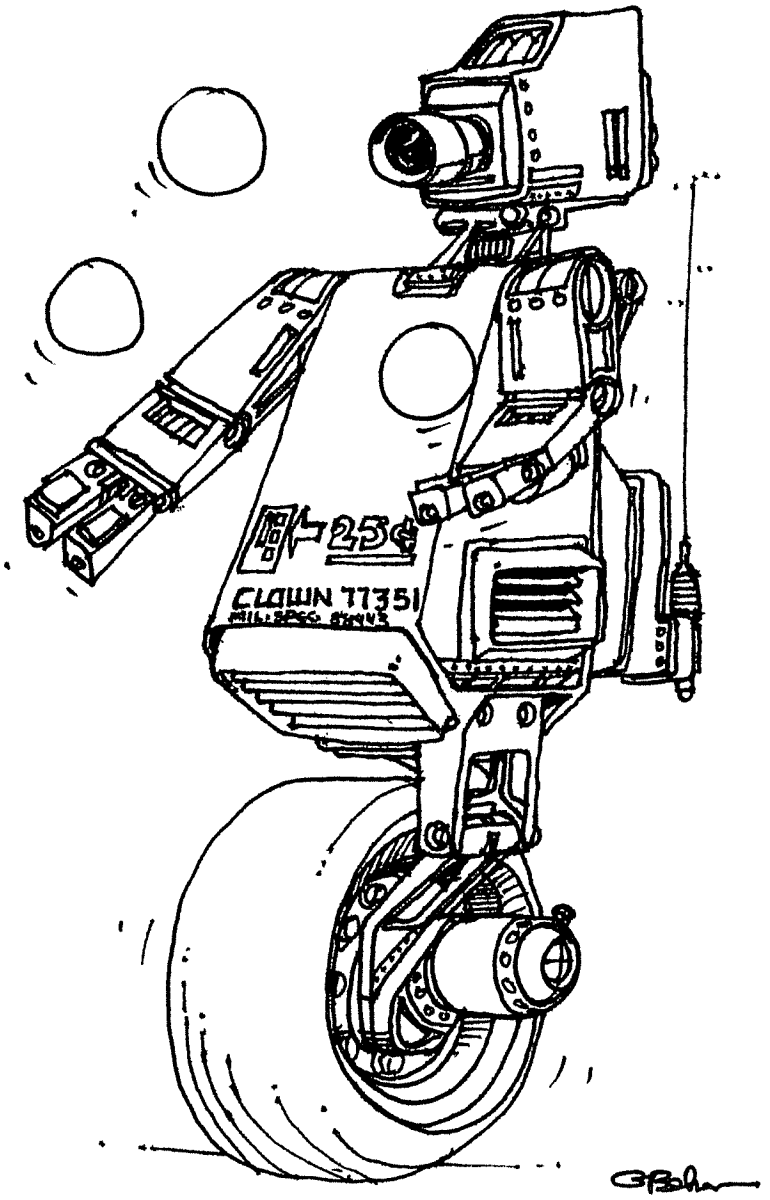
      3  3  3  3  3  3
   0                     0
      3  3  3  3  3  3

YOUR MOVE?

BREAK IN 110
```

```
5 PRINT TAB(34);"AWARI"
7 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
10 DATA 0
15 DIM B(13),G(13),F(50):READ N
20 PRINT:PRINT:E=0
25 FORI=0 TO 12:B(I)=3:NEXT I
30 C=0:F(N)=0:B(13)=0:B(6)=0
35 GOSUB 500
40 PRINT "YOUR MOVE";:GOSUB 110
45 IF E=0 THEN 80
50 IF M=H THEN GOSUB 100
55 IF E=0 THEN 80
60 PRINT "MY MOVE IS ";:GOSUB 800
65 IF E=0 THEN 80
70 IF M=H THEN PRINT ",";:GOSUB 800
75 IF E>0 THEN 35
80 PRINT:PRINT"GAME OVER"
85 D=B(6)-B(13):IF D<0 THEN PRINT "I WIN BY";-D;"POINTS":GOTO 20
90 N=N+1:IF D=0 THEN PRINT "DRAWN GAME":GOTO 20
95 PRINT "YOU WIN BY";D;"POINTS":GOTO 20
100 PRINT "AGAIN";
110 INPUT M:IF M<7 THEN IF M>0 THEN M=M-1:GOTO 130
120 PRINT "ILLEGAL MOVE":GOTO 100
130 IF B(M)=0 THEN 120
140 H=6:GOSUB 200
150 GOTO 500
200 K=M:GOSUB 600
205 E=0:IF K>6 THEN K=K-7
210 C=C+1:IF C<9 THEN F(N)=F(N)*6+K
215 FOR I=0 TO 5:IF B(I)<>0 THEN 230
220 NEXT I
225 RETURN
230 FOR I=7 TO 12:IF B(I)<>0 THEN E=1:RETURN
235 GOTO 220
500 PRINT:PRINT"   ";
505 FOR I=12 TO 7 STEP -1:GOSUB 580
510 NEXT I
515 PRINT:I=13:GOSUB 580
520 PRINT "                    ";:PRINT B(6):PRINT "   ";
525 FOR I=0 TO 5:GOSUB 580
530 NEXT I
535 PRINT:PRINT:RETURN
580 IF B(I)<10 THEN PRINT " ";
585 PRINT B(I);:RETURN
600 P=B(M):B(M)=0
605 FOR P=P TO 1 STEP -1:M=M+1:IF M>13 THEN M=M-14
610 B(M)=B(M)+1:NEXT P
615 IF B(M)=1 THEN IF M<>6 THEN IF M<>13 THEN IF B(12-M)<>0 THEN 625
620 RETURN
625 B(H)=B(H)+B(12-M)+1:B(M)=0:B(12-M)=0:RETURN
800 D=-99:H=13
805 FOR I=0 TO 13:G(I)=B(I):NEXT I
810 FOR J=7 TO 12:IF B(J)=0 THEN 885
815 G=0:M=J:GOSUB 600
820 FOR I=0 TO 5:IF B(I)=0 THEN 845
825 L=B(I)+I:R=0
830 IF L>13 THEN L=L-14:R=1:GOTO 830
835 IF B(L)=0 THEN IF L<>6 THEN IF L<>13 THEN R=B(12-L)+R
840 IF R>Q THEN Q=R
845 NEXT I
850 Q=B(13)-B(6)-Q:IF C>8 THEN 875
855 K=J:IF K>6 THEN K=K-7
860 FOR I=0 TO N-1:IF F(N)*6+K=INT(F(I)/6^(7-C)+.1) THEN Q=Q-2
870 NEXT I
875 FOR I=0 TO 13:B(I)=G(I):NEXT I
880 IF Q>=D THEN A=J:D=Q
885 NEXT J
890 M=A:PRINT CHR$(42+M);:GOTO 200
900 FOR I=0 TO N-1:PRINTB(I):NEXT I
999 END
```




CLOWN 77351

Bagels

In this game, the computer picks a 3-digit secret number using the digits 0 to 9 and you attempt to guess what it is. You are allowed up to twenty guesses. No digit is repeated. After each guess the computer will give you clues about your guess as follows:

PICO	One digit is correct, but in the wrong place
FERMI	One digit is in the correct place
BAGELS	No digit is correct

You will learn to draw inferences from the clues and, with practice, you'll learn to improve your score. There are several good strategies for playing Bagels. After you have found a good strategy, see if you can improve it. Or try a different strategy altogether and see if it is any better. While the program allows up to twenty guesses, if you use a good strategy it should not take more than eight guesses to get any number.

The original authors of this program are D. Resek and P. Rowe of the Lawrence Hall of Science, Berkeley, California.

```
                  BAGELS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

WOULD YOU LIKE THE RULES (YES OR NO)? YES

I AM THINKING OF A THREE-DIGIT NUMBER.  TRY TO GUESS
MY NUMBER AND I WILL GIVE YOU CLUES AS FOLLOWS:
   PICO   - ONE DIGIT CORRECT BUT IN THE WRONG POSITION
   FERMI  - ONE DIGIT CORRECT AND IN THE RIGHT POSITION
   BAGELS - NO DIGITS CORRECT

O.K.  I HAVE A NUMBER IN MIND.
GUESS # 1     ? 123
FERMI
GUESS # 2     ? 724
PICO FERMI
GUESS # 3     ? 827
FERMI FERMI
GUESS # 4     ? 927
FERMI FERMI
GUESS # 5     ? 627
YOU GOT IT!!!

PLAY AGAIN (YES OR NO)? YES

O.K.  I HAVE A NUMBER IN MIND.
GUESS # 1     ? 987
BAGELS
GUESS # 2     ? 654
PICO
GUESS # 3     ? 236
PICO PICO
GUESS # 4     ? 613
PICO
GUESS # 5     ? 327
FERMI FERMI
GUESS # 6     ? 328
FERMI FERMI
GUESS # 7     ? 329
FERMI FERMI
GUESS # 8     ? 325
YOU GOT IT!!!

PLAY AGAIN (YES OR NO)? YES

O.K.  I HAVE A NUMBER IN MIND.
GUESS # 1     ? 456
PICO
GUESS # 2     ? 123
FERMI
GUESS # 3     ? 167
YOU GOT IT!!!

PLAY AGAIN (YES OR NO)? YES

O.K.  I HAVE A NUMBER IN MIND.
GUESS # 1     ? 159
BAGELS
GUESS # 2     ? 247
PICO
GUESS # 3     ? 328
BAGELS
GUESS # 4     ? 476
PICO FERMI
GUESS # 5     ? 407
PICO FERMI
GUESS # 6     ? 740
PICO FERMI
GUESS # 7     ? 704
PICO PICO
GUESS # 8     ? 406
PICO PICO FERMI
GUESS # 9     ? 604
PICO PICO PICO
GUESS # 10    ? 460
YOU GOT IT!!!

PLAY AGAIN (YES OR NO)? NO

A 4 POINT BAGELS BUFF!!
HOPE YOU HAD FUN.  BYE.
```

```
5 PRINT TAB(33);"BAGELS"
10 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
15 REM *** BAGLES NUMBER GUESSING GAME
20 REM *** ORIGINAL SOURCE UNKNOWN BUT SUSPECTED TO BE
25 REM *** LAWRENCE HALL OF SCIENCE, U.C. BERKELY
30 DIM A1(6),A(3),B(3)
40 Y=0:T=255
50 PRINT:PRINT:PRINT
70 INPUT "WOULD YOU LIKE THE RULES (YES OR NO)";A$
90 IF LEFT$(A$,1)="N" THEN 150
100 PRINT:PRINT "I AM THINKING OF A THREE-DIGIT NUMBER.  TRY TO GUESS"
110 PRINT "MY NUMBER AND I WILL GIVE YOU CLUES AS FOLLOWS:"
120 PRINT "   PICO   - ONE DIGIT CORRECT BUT IN THE WRONG POSITION"
130 PRINT "   FERMI  - ONE DIGIT CORRECT AND IN THE RIGHT POSITION"
140 PRINT "   BAGELS - NO DIGITS CORRECT"
150 FOR I=1 TO 3
160 A(I)=INT(10*RND(1))
165 IF I-1=0 THEN 200
170 FOR J=1 TO I-1
180 IF A(I)=A(J) THEN 160
190 NEXT J
200 NEXT I
210 PRINT:PRINT "O.K.  I HAVE A NUMBER IN MIND."
220 FOR I=1 TO 20
230 PRINT "GUESS #";I,
240 INPUT A$
245 IF LEN(A$)<>3 THEN 630
250 FOR Z=1 TO 3:A1(Z)=ASC(MID$(A$,Z,1)):NEXT Z
260 FOR J=1 TO 3
270 IF A1(J)<48 THEN 300
280 IF A1(J)>57 THEN 300
285 B(J)=A1(J)-48
290 NEXT J
295 GOTO 320
300 PRINT "WHAT?"
310 GOTO 230
320 IF B(1)=B(2) THEN 650
330 IF B(2)=B(3) THEN 650
340 IF B(3)=B(1) THEN 650
350 C=0:D=0
360 FOR J=1 TO 2
370 IF A(J)<>B(J+1) THEN 390
380 C=C+1
390 IF A(J+1)<>B(J) THEN 410
400 C=C+1
410 NEXT J
420 IF A(1)<>B(3) THEN 440
430 C=C+1
440 IF A(3)<>B(1) THEN 460
450 C=C+1
460 FOR J=1 TO 3
470 IF A(J)<>B(J) THEN 490
480 D=D+1
490 NEXT J
500 IF D=3 THEN 680
505 IF C=0 THEN 545
520 FOR J=1 TO C
530 PRINT "PICO ";
540 NEXT J
545 IF D=0 THEN 580
550 FOR J=1 TO D
560 PRINT "FERMI ";
570 NEXT J
580 IF C+D<>0 THEN 600
590 PRINT "BAGELS";
600 PRINT
605 NEXT I
610 PRINT "OH WELL"
615 PRINT "THAT'S TWENTY GUESSES.  MY NUMBER WAS";100*A(1)+10*A(2)+A(3)
620 GOTO 700
630 PRINT "TRY GUESSING A THREE-DIGIT NUMBER.":GOTO 230
650 PRINT "OH, I FORGOT TO TELL YOU THAT THE NUMBER I HAVE IN MIND"
660 PRINT "HAS NO TWO DIGITS THE SAME.":GOTO 230
680 PRINT "YOU GOT IT!!!":PRINT
690 Y=Y+1
700 INPUT "PLAY AGAIN (YES OR NO)";A$
720 IF A$="YES" THEN 150
730 IF Y=0 THEN 750
740 PRINT:PRINT "A";Y;"POINT BAGELS BUFF!!"
750 PRINT "HOPE YOU HAD FUN.  BYE."
999 END
```

Banner

This program creates a large banner on a terminal of any message you input. The length of the message may be as long as a string variable permits in your version of BASIC. The letters may be any dimension you wish although the letter height plus distance from left-hand side should not exceed 6 inches. Experiment with the height and width until you get a pleasing effect on whatever terminal you are using. The permissable letters and characters are defined in the data statements 899 through 940.

Many people seem to have trouble getting this program to work, however, after thorough checking we guarantee that the version presented have runs correctly. We suspect the problem is dependent upon the Basic itself and the way it reads and restores data files.

This program was written by Leonard Rosendust of Brooklyn, New York.

```
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

10 INPUT "HORIZONTAL";X
20 INPUT "VERTICAL";Y
21 INPUT "CENTEED";L$
22 G1=0: IF L$>"P" THEN G1=1
23 INPUT "CHARACTER (TYPE 'ALL' IF YOU WANT CHARACTER BEING PRINTED)";M$
29 PRINT "STATEMENT";
30 INPUT A$
35 INPUT "SET PAGE";O$
40 A=ASC(LEFT$(A$,1))
50 REM
60 REM
70 FOR T=1 TO LEN(A$)
80 P$=MID$(A$,T,1)
90 FOR O=1 TO 50
95 READ S$,S(1),S(2),S(3),S(4),S(5),S(6),S(7)
96 IF P$=" " THEN 812
100 IF P$=S$ THEN 200
120 NEXT O
200 RESTORE
201 X$=M$
202 IF M$="ALL" THEN X$=S$
205 FOR U=1 TO 7
210 FOR K=8 TO 0 STEP -1
230 IF 2^K<S(U) THEN 270
240 J(9-K)=0
250 GOTO 280
270 J(9-K)=1: S(U)=S(U)-2^K
272 IF S(U)=1 THEN 815
280 NEXT K
445 FOR T1=1 TO X
447 PRINT TAB((63-4.5*Y)*G1/(LEN(X$))+1);
450 FOR B=1 TO F(U)
460 IF J(B)=0 THEN 500
465 FOR I=1 TO Y: PRINT X$;: NEXT I
470 GOTO 600
500 FOR I=1 TO Y
510 FOR I1=1 TO LEN(X$)
520 PRINT " ";: NEXT I1
530 NEXT I
600 NEXT B
620 PRINT
630 NEXT T1
700 NEXT U
750 FOR H=1 TO 2*X: PRINT: NEXT H
800 NEXT T
806 FOR H=1 TO 75: PRINT: NEXT H
810 END
812 FOR H=1 TO 7*X: PRINT: NEXT H
813 GOTO 800
815 F(U)=9-K: GOTO 445
899 DATA " ",0,0,0,0,0,0,0
900 DATA "A",505,37,35,34,35,37,505
901 DATA "G",125,131,258,258,290,163,101
902 DATA "E",512,274,274,274,274,258,258
903 DATA "I",2,2,2,512,2,2,2
904 DATA "W",256,257,129,65,129,257,256
905 DATA "L",512,257,257,257,257,257,257
906 DATA "S",69,139,274,274,274,163,69
907 DATA "O",125,131,258,258,258,131,125
908 DATA "N",512,7,9,17,33,193,512
909 DATA "F",512,18,18,18,18,18,2,2
910 DATA "K",512,17,17,41,69,131,258
911 DATA "B",512,274,274,274,274,274,239
912 DATA "D",512,258,258,258,258,131,125
913 DATA "H",512,17,17,17,17,17,17,512
914 DATA "M",512,7,13,25,13,7,512
915 DATA "?",5,3,2,354,18,11,5
916 DATA "U",128,129,257,257,257,129,128
917 DATA "R",512,18,18,50,82,146,271
918 DATA "P",512,18,18,18,18,18,15
919 DATA "Q",125,131,258,258,322,131,381
920 DATA "Y",8,9,17,481,17,9,8
921 DATA "V",64,65,129,257,129,65,64
922 DATA "X",388,69,41,17,41,69,388
923 DATA "Z",386,322,290,274,266,262,260
924 DATA "I",258,258,258,512,258,258,258
925 DATA "C",125,131,258,258,258,131,69
926 DATA "J",65,129,257,257,257,129,128
927 DATA "1",0,0,261,259,512,257,257
928 DATA "2",261,387,322,290,274,267,261
929 DATA "*",69,41,17,512,17,41,69
930 DATA "3",66,130,258,274,266,150,100
931 DATA "4",33,49,41,37,35,512,33
932 DATA "5",160,274,274,274,274,274,226
933 DATA "6",194,291,293,297,305,289,193
934 DATA "7",258,130,66,34,18,10,8
935 DATA "8",69,171,274,274,274,171,69
936 DATA "9",263,138,74,42,26,10,7
937 DATA "=",41,41,41,41,41,41,41
938 DATA "!",1,1,1,384,1,1,1
939 DATA "0",57,69,131,258,131,69,57
940 DATA ".",1,1,129,449,129,1,1
1000 STOP
1002 END
```

```
HORIZONTAL? 3
VERTICAL? 5
CENTERED? N
CHARACTER (TYPE 'ALL' IF YOU WANT CHARACTER BEING PRINTED? ALL
STATEMENT? CREATIVE
SET PAGE?
```

Basketball

This program simulates a game of basketball between Dartmouth College and an opponent of your choice. You are the Dartmouth captain and control the type of shot and defense during the course of the game.

There are four types of shots: 1. Long Jump Shot (30 ft.), 2. Short Jump Shot (15 ft.), 3. Lay Up, and 4. Set Shot. Both teams use the same defense, but you may call it: Press (6), Man-to-man (6.5), Zone (7), or None (7.5). To change defense, type "0" as your next shot.

Note: The game is biased slightly in favor of Dartmouth. The average probability of a Dartmouth shot being good is 62.95% compared to a probability of 61.85% for their opponent. (This makes the sample run slightly remarkable in that Cornell won by a score of 45 to 42. Hooray for the Big Red!)

Charles Bacheller of Dartmouth College was the original author of this game.

```
                BASKETBALL
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS IS DARTMOUTH COLLEGE BASKETBALL.  YOU WILL BE DARTMOUTH
  CAPTAIN AND PLAYMAKER.  CALL SHOTS AS FOLLOWS:  1. LONG
  (30 FT.) JUMP SHOT; 2. SHORT (15 FT.) JUMP SHOT; 3. LAY
  UP; 4. SET SHOT.
BOTH TEAMS WILL USE THE SAME DEFENSE.  CALL DEFENSE AS
FOLLOWS:  6. PRESS; 6.5 MAN-TO MAN; 7. ZONE; 7.5 NONE.
  TO CHANGE DEFENSE, JUST TYPE  0  AS YOUR NEXT SHOT.
YOUR STARTING DEFENSE WILL BE? 7

CHOOSE YOUR OPPONENT? CORNELL
CENTER JUMP
CORNELL CONTROLS THE TAP.

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 2
JUMP SHOT
SHOOTER IS FOULED.  TWO SHOTS.
SHOOTER MAKES BOTH SHOTS.
SCORE:  2 TO 0

SET SHOT.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 2
JUMP SHOT
SHOT IS OFF TARGET.
REBOUND TO CORNELL

JUMP SHOT.
PLAYER FOULED.  TWO SHOTS.
SHOOTER MAKES ONE SHOT AND MISSES ONE.
SCORE:  2 TO 1

YOUR SHOT? 1
JUMP SHOT
CHARGING FOUL.  DARTMOUTH LOSES BALL.

LAY UP.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 3
LAY UP.
SHOT IS GOOD.  TWO POINTS.
SCORE:  4 TO 1

LAY UP.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

LAY UP.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 4
SET SHOT.
SHOT IS OFF THE RIM.
CORNELL CONTROLS THE REBOUND.

SET SHOT.
SHOT IS MISSED.
CORNELL CONTROLS THE REBOUND.
PASS BACK TO CORNELL GUARD.

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 2
JUMP SHOT
SHOT IS GOOD.
SCORE:  6 TO 1

SET SHOT.
SHOT IS MISSED.
CORNELL CONTROLS THE REBOUND.
PASS BACK TO CORNELL GUARD.

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 4
SET SHOT.
SHOOTER FOULED.  TWO SHOTS.
SHOOTER MAKES BOTH SHOTS.
SCORE:  8 TO 1

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 2
JUMP SHOT
SHOT IS OFF TARGET.
REBOUND TO CORNELL

LAY UP.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 3
LAY UP.
SHOOTER FOULED.  TWO SHOTS.
SHOOTER MAKES BOTH SHOTS.
SCORE:  10 TO 1

SET SHOT.
SHOT IS MISSED.
CORNELL CONTROLS THE REBOUND.
SET SHOT.
SHOT IS GOOD.
SCORE:  10 TO 3

YOUR SHOT? 1
JUMP SHOT
SHOT IS GOOD.
SCORE:  12 TO 3
```

Later in the game ....

```
YOUR SHOT? 4
SET SHOT.
SHOT IS GOOD.  TWO POINTS.
SCORE:  37 TO 39

JUMP SHOT.
SHOT IS GOOD.
SCORE:  37 TO 41

YOUR SHOT? 2
JUMP SHOT
SHOT IS OFF TARGET.
DARTMOUTH CONTROLS THE REBOUND.
BALL PASSED BACK TO YOU.  YOUR SHOT? 1

JUMP SHOT
SHOT IS BLOCKED.  BALL CONTROLLED BY DARTMOUTH.
YOUR SHOT? 2
JUMP SHOT
SHOOTER IS FOULED.  TWO SHOTS.
SHOOTER MAKES ONE SHOT AND MISSES ONE.
SCORE:  38 TO 41

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 3
LAY UP.
SHOT BLOCKED.  CORNELL'S BALL.

JUMP SHOT.
SHOT IS OFF RIM.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT?
LAY UP.
SHOT IS GOOD.  TWO POINTS.
SCORE:  40 TO 41

JUMP SHOT.
PLAYER FOULED.  TWO SHOTS.
BOTH SHOTS MISSED.
SCORE:  40 TO 41

YOUR SHOT? 3
LAY UP.
SHOT BLOCKED.  CORNELL'S BALL.

JUMP SHOT.
SHOT IS GOOD.
SCORE:  40 TO 43

YOUR SHOT? 2
JUMP SHOT
SHOT IS OFF TARGET.
REBOUND TO CORNELL

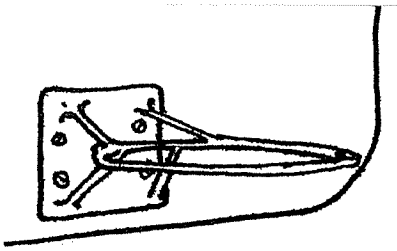
SET SHOT.
SHOT IS GOOD.
SCORE:  40 TO 45

YOUR SHOT? 2
JUMP SHOT
SHOT IS OFF TARGET.
DARTMOUTH CONTROLS THE REBOUND.
BALL PASSED BACK TO YOU.  YOUR SHOT? 4
SET SHOT.
SHOT IS GOOD.  TWO POINTS.
SCORE:  42 TO 45

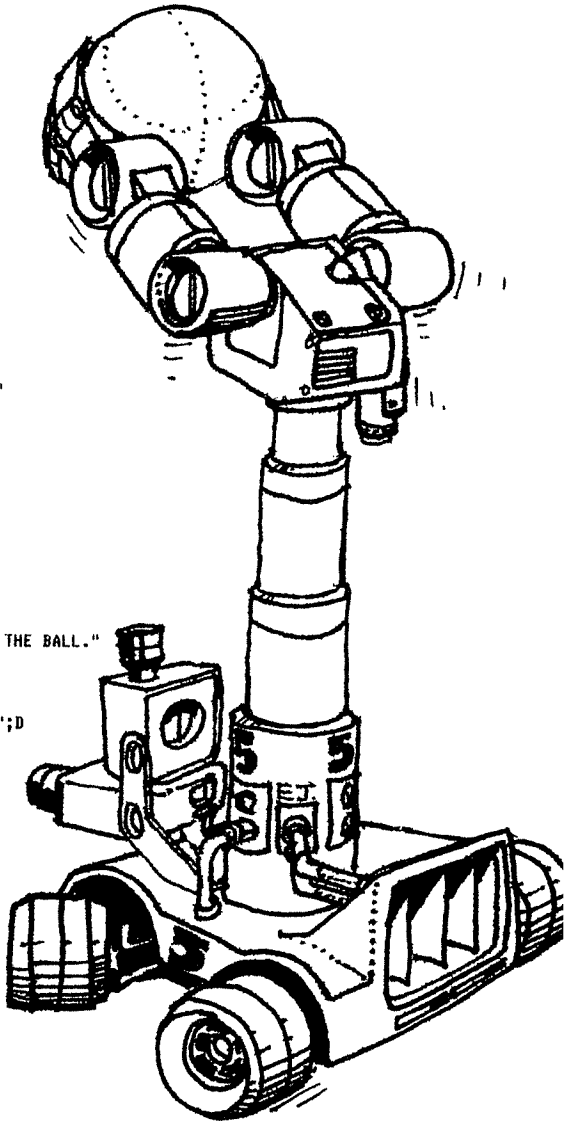
LAY UP.
SHOT IS MISSED.
DARTMOUTH CONTROLS THE REBOUND.

YOUR SHOT? 3

   ***** END OF GAME *****
FINAL SCORE: DARTMOUTH 42 CORNELL 45
```



```
5 PRINT TAB(31);"BASKETBALL"
7 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
8 PRINT:PRINT:PRINT
10 PRINT "THIS IS DARTMOUTH COLLEGE BASKETBALL.  YOU WILL BE DARTMOUTH"
20 PRINT "  CAPTAIN AND PLAYMAKER.  CALL SHOTS AS FOLLOWS:  1. LONG"
30 PRINT "  (30 FT.) JUMP SHOT; 2. SHORT (15 FT.) JUMP SHOT; 3. LAY"
40 PRINT "  UP; 4. SET SHOT."
60 PRINT "BOTH TEAMS WILL USE THE SAME DEFENSE.  CALL DEFENSE AS"
70 PRINT "FOLLOWS:  6. PRESS; 6.5 MAN-TO MAN; 7. ZONE; 7.5 NONE."
72 PRINT "  TO CHANGE DEFENSE, JUST TYPE  0  AS YOUR NEXT SHOT."
76 INPUT "YOUR STARTING DEFENSE WILL BE";D:IF D<6 THEN 2010
79 PRINT
80 INPUT "CHOOSE YOUR OPPONENT";O$
370 PRINT "CENTER JUMP"
390 IF RND(1)> 3/5 THEN 420
400 PRINT O$;" CONTROLS THE TAP."
410 GOTO 3000
420 PRINT "DARTMOUTH CONTROLS THE TAP."
425 PRINT
430 INPUT "YOUR SHOT";Z
440 P=0
445 IF Z<>INT(Z) THEN 455
446 IF Z<0 OR Z>4 THEN 455
447 GOTO 460
455 PRINT "INCORRECT ANSWER.  RETYPE IT. ";:GOTO 430
460 IF RND(1)<.5 THEN 1000
480 IF T<100 THEN 1000
490 PRINT
491 IF S(1)<>S(0) THEN 510
492 PRINT "   ***** END OF SECOND HALF *****"
493 PRINT "SCORE AT END OF REGULATION TIME:"
494 PRINT "        DARTMOUTH";S(1);O$;S(0)
495 PRINT
496 PRINT "BEGIN TWO MINUTE OVERTIME PERIOD"
499 T=93
500 GOTO 370
510 PRINT "   ***** END OF GAME *****"
515 PRINT "FINAL SCORE: DARTMOUTH";S(1);O$;S(0)
520 STOP
600 PRINT
610 PRINT "   *** TWO MINUTES LEFT IN THE GAME ***"
620 PRINT
630 RETURN
1000 ON Z GOTO 1040,1040
1030 GOTO 1300
1040 T=T+1
1041 IF T=50 THEN 8000
1042 IF T=92 THEN 1046
1043 GOTO 1050
1046 GOSUB 600
1050 PRINT "JUMP SHOT"
1060 IF RND(1)>.341*D/8 THEN 1090
1070 PRINT "SHOT IS GOOD."
1075 GOSUB 7000
1085 GOTO 3000
1090 IF RND(1)>.682*D/8 THEN 1200
1100 PRINT "SHOT IS OFF TARGET."
1105 IF D/6*RND(1)>.45 THEN 1130
1110 PRINT "DARTMOUTH CONTROLS THE REBOUND."
1120 GOTO 1145
1130 PRINT "REBOUND TO ";O$
1140 GOTO 3000
1145 IF RND(1)>.40 THEN 1158
1150 GOTO 1300
1158 IF D=6 THEN 5100
1160 PRINT "BALL PASSED BACK TO YOU. ";
1170 GOTO 430
1180 IF RND(1)>.9 THEN 1190
1185 PRINT "PLAYER FOULED, TWO SHOTS."
1187 GOSUB 4000
1188 GOTO 3000
1190 PRINT "BALL STOLEN. ";O$;"'S BALL."
1195 GOTO 3000
1200 IF RND(1)>.782*D/8 THEN 1250
1210 PRINT "SHOT IS BLOCKED.  BALL CONTROLLED BY ";
1230 IF RND(1)>.5 THEN 1242
1235 PRINT "DARTMOUTH."
1240 GOTO 430
1242 PRINT O$;"."
1245 GOTO 3000
1250 IF RND(1)>.843*D/8 THEN 1270
1255 PRINT "SHOOTER IS FOULED.  TWO SHOTS."
1260 GOSUB 4000
1265 GOTO 3000
1270 PRINT "CHARGING FOUL.  DARTMOUTH LOSES BALL."
1280 GOTO 3000
1300 T=T+1
1301 IF T=50 THEN 8000
1302 IF T=92 THEN 1304
1303 GOTO 1305
1304 GOSUB 600
1305 IF Z=0 THEN 2010
1310 IF Z>3 THEN 1700
1320 PRINT "LAY UP."
1330 IF 7/D*RND(1)>.4 THEN 1360
1340 PRINT "SHOT IS GOOD.  TWO POINTS."
1345 GOSUB 7000
1355 GOTO 3000
1360 IF 7/D*RND(1)>.7 THEN 1500
1370 PRINT "SHOT IS OFF THE RIM."
1380 IF RND(1)>2/3 THEN 1415
1390 PRINT O$;" CONTROLS THE REBOUND."
1400 GOTO 3000
1415 PRINT "DARTMOUTH CONTROLS THE REBOUND."
1420 IF RND(1)>.4 THEN 1440
1430 GOTO 1300
1440 PRINT "BALL PASSED BACK TO YOU.";
1450 GOTO 430
1500 IF 7/D*RND(1)>.875 THEN 1600
1510 PRINT "SHOOTER FOULED.  TWO SHOTS."
1520 GOSUB 4000
1530 GOTO 3000
1600 IF 7/D*RND(1)>.925 THEN 1630
1610 PRINT "SHOT BLOCKED. ";O$;"'S BALL."
1620 GOTO 3000
1630 PRINT "CHARGING FOUL.  DARTMOUTH LOSES THE BALL."
1640 GOTO 3000
1700 PRINT "SET SHOT."
1710 GOTO 1330
2010 INPUT "YOUR NEW DEFENSIVE ALIGNMENT IS";D
2030 IF D<6 THEN 2010
2040 GOTO 425
3000 P=1
3005 T=T+1
3008 IF T=50 THEN 8000
3012 GOTO 3018
3015 GOSUB 600
3018 PRINT
3020 Z1=10/4*RND(1)+1
3030 IF Z1>2 THEN 3500
3040 PRINT "JUMP SHOT."
3050 IF 8/D*RND(1)>.35 THEN 3100
3060 PRINT "SHOT IS GOOD."
3080 GOSUB 6000
3090 GOTO 425
3100 IF 8/D*RND(1)>.75 THEN 3200
3105 PRINT "SHOT IS OFF RIM."
3110 IF D/6*RND(1)>.5 THEN 3150
3120 PRINT "DARTMOUTH CONTROLS THE REBOUND."
3130 GOTO 425
3150 PRINT O$;" CONTROLS THE REBOUND."
3160 IF D=6 THEN 5000
3165 IF RND(1)>.5 THEN 3175
3168 PRINT "PASS BACK TO ";O$;" GUARD."
3170 GOTO 3000
3175 GOTO 3500
3200 IF 8/D*RND(1)>.9 THEN 3310
3210 PRINT "PLAYER FOULED.  TWO SHOTS."
3220 GOSUB 4000
3230 GOTO 425
3310 PRINT "OFFENSIVE FOUL.  DARTMOUTH'S BALL."
3320 GOTO 425
3500 IF Z1>3 THEN 3800
3510 PRINT "LAY UP."
3520 IF 7/D*RND(1)>.413 THEN 3600
3530 PRINT "SHOT IS GOOD."
3540 GOSUB 6000
3550 GOTO 425
3600 PRINT "SHOT IS MISSED."
3610 GOTO 3110
3800 PRINT "SET SHOT."
3810 GOTO 3520
4000 REM FOUL SHOOTING
4010 IF RND(1)>.49 THEN 4050
4020 PRINT "SHOOTER MAKES BOTH SHOTS."
4030 S(1-P)=S(1-P)+2
4040 GOSUB 6010
4041 RETURN
4050 IF RND(1)>.75 THEN 4100
4060 PRINT "SHOOTER MAKES ONE SHOT AND MISSES ONE."
4070 S(1-P)=S(1-P)+1
4080 GOTO 4040
4100 PRINT "BOTH SHOTS MISSED."
4110 GOTO 4040
5000 IF RND(1)>.75 THEN 5010
5005 GOTO 3165
5010 PRINT "BALL STOLEN.  EASY LAY UP FOR DARTMOUTH."
5015 GOSUB 7000
5030 GOTO 3000
5100 IF RND(1)>.6 THEN 5120
5110 GOTO 1160
5120 PRINT "PASS STOLEN BY ";O$;" EASY LAYUP."
5130 GOSUB 6000
5140 GOTO 425
6000 S(0)=S(0)+2
6010 PRINT "SCORE: ";S(1);"TO";S(0)
6020 RETURN
7000 S(1)=S(1)+2
7010 GOSUB 6010
7020 RETURN
8000 PRINT "   ***** END OF FIRST HALF *****"
8010 PRINT "SCORE: DARTMOUTH";S(1);O$;S(0)
8015 PRINT
8016 PRINT
8020 GOTO 370
9999 END
```



Batnum

The game starts with an imaginary pile of objects, coins for example. You and your opponent (the computer) alternately remove objects from the pile. You specify in advance the minimum and maximum number of objects that can be taken on each turn. You also specify in advance how winning is defined: 1. To take the last object or 2. To avoid taking the last object. You may also determine whether you or the computer go first.

The strategy of this game is based on modulo arithmetic. If the maximum number of objects a player may remove in a turn is M, then to gain a winning position a player at the end of his turn must leave a stack of 1 modulo (M+1) coins. If you don't understand this, play the game 23 Matches first, then BATNUM, and have fun!

BATNUM is a generalized version of a great number of manual remove-the-object games. The original computer version was written by one of the two originators of the BASIC language, John Kemeny of Dartmouth College.

```
                BATNUM
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS PROGRAM IS A 'BATTLE OF NUMBERS'
GAME, WHERE THE COMPUTER IS YOUR OPPONENT

THE GAME STARTS WITH AN ASSUMED PILE OF OBJECTS.
YOU AND YOUR OPPONENT ALTERNATELY REMOVE OBJECTS FROM
THE PILE.  WINNING IS DEFINED IN ADVANCE AS TAKING THE
LAST OBJECT OR NOT.  YOU CAN ALSO SPECIFY SOME OTHER
BEGINNING CONDITIONS.  DON'T USE ZERO, HOWEVER, IN
PLAYING THE GAME.

ENTER PILE SIZE? 23
ENTER WIN OPTION - 1 TO TAKE LAST, 2 TO AVOID LAST: ? 2
ENTER MIN AND MAX ? 1,3
ENTER START OPTION - 1 COMPUTER FIRST, 2 YOU FIRST ? 2
YOUR MOVE ? 2
COMPUTER TAKES 1 AND LEAVES 20
YOUR MOVE ? 3
COMPUTER TAKES 1 AND LEAVES 16
YOUR MOVE ? 3
COMPUTER TAKES 1 AND LEAVES 12
YOUR MOVE ? 3
COMPUTER TAKES 1 AND LEAVES 8
YOUR MOVE ? 3
COMPUTER TAKES 1 AND LEAVES 4
YOUR MOVE ? 3
COMPUTER TAKES 1 AND LOSES.
```

```
10 PRINT TAB(33);"BATNUM"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
110 PRINT "THIS PROGRAM IS A 'BATTLE OF NUMBERS'"
120 PRINT "GAME, WHERE THE COMPUTER IS YOUR OPPONENT"
130 PRINT
140 PRINT "THE GAME STARTS WITH AN ASSUMED PILE OF OBJECTS."
150 PRINT "YOU AND YOUR OPPONENT ALTERNATELY REMOVE OBJECTS FROM"
160 PRINT "THE PILE.  WINNING IS DEFINED IN ADVANCE AS TAKING THE"
170 PRINT "LAST OBJECT OR NOT.  YOU CAN ALSO SPECIFY SOME OTHER"
180 PRINT "BEGINNING CONDITIONS.  DON'T USE ZERO, HOWEVER, IN"
190 PRINT "PLAYING THE GAME."
200 PRINT
210 GOTO 330
220 FOR I=1 TO 10
230 PRINT
240 NEXT I
330 INPUT "ENTER PILE SIZE";N
350 IF N<>0 THEN 370
360 GOTO 330
370 IF N<>INT(N) THEN 220
380 IF N<1 THEN 220
390 INPUT "ENTER WIN OPTION - 1 TO TAKE LAST, 2 TO AVOID LAST: ";M
410 IF M=1 THEN 430
420 IF M<>2 THEN 390
430 INPUT "ENTER MIN AND MAX ";A,B
450 IF A>B THEN 430
460 IF A<1 THEN 430
470 IF A<>INT(A) THEN 430
480 IF B<>INT(B) THEN 430
490 INPUT "ENTER START OPTION - 1 COMPUTER FIRST, 2 YOU FIRST ";S
510 IF S=1 THEN 530
520 IF S<>2 THEN 490
530 C=A+B
540 IF S=2 THEN 570
550 GOSUB 600
560 IF W=1 THEN 220
570 GOSUB 810
580 IF W=1 THEN 220
590 GOTO 550
600 Q=N
610 IF M=1 THEN 630
620 Q=Q-1
630 IF M=1 THEN 680
640 IF N>A THEN 720
650 W=1
660 PRINT "COMPUTER TAKES";N;"AND LOSES."
670 RETURN
680 IF N>B THEN 720
690 W=1
700 PRINT "COMPUTER TAKES";N;"AND WINS."
710 RETURN
720 P=Q-C*INT(Q/C)
730 IF P>=A THEN 750
740 P=A
750 IF P<=B THEN 770
760 P=B
770 N=N-P
780 PRINT "COMPUTER TAKES";P;"AND LEAVES";N
790 W=0
800 RETURN
810 PRINT "YOUR MOVE ";
820 INPUT P
830 IF P<>0 THEN 870
840 PRINT "I TOLD YOU NOT TO USE ZERO! COMPUTER WINS BY FORFEIT."
850 W=1
860 RETURN
870 IF P<>INT(P) THEN 920
880 IF P>=A THEN 910
890 IF P=N THEN 960
900 GOTO 920
910 IF P<=B THEN 940
920 PRINT "ILLEGAL MOVE, REENTER IT ";
930 GOTO 820
940 N=N-P
950 IF N<>0 THEN 1030
960 IF M=1 THEN 1000
970 PRINT "TOUGH LUCK, YOU LOSE."
980 W=1
990 RETURN
1000 PRINT "CONGRATULATIONS, YOU WIN."
1010 W=1
1020 RETURN
1030 IF N>=0 THEN 1060
1040 N=N+P
1050 GOTO 920
1060 W=0
1070 RETURN
1080 END
```

Battle

BATTLE is based on the popular game Battleship which is primarily played to familiarize people with the location and designation of points on a coordinate plane.

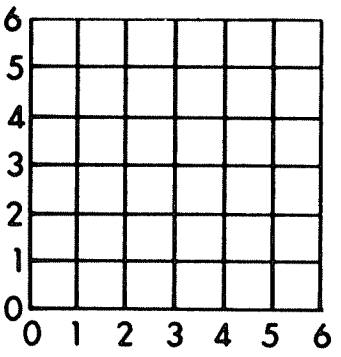
BATTLE first randomly sets up the bad guys' fleet disposition on a 6 by 6 matrix or grid. The fleet consists of six ships: Two destroyers (ships number 1 and 2) which are two units long, two cruisers (ships number 3 and 4) which are three units long and two aircraft carriers (ships number 5 and 6) which are four units long. The program then prints out this fleet disposition in a coded or disguised format (see the sample computer print-out). You then proceed to sink the various ships by typing in the coordinates (two digits, each from 1 to 6, separated by a comma) of the place where you want to drop a bomb, if you'll excuse the expression. The computer gives the appropriate responses (splash, hit, etc.) which you should record on a 6 by 6 matrix. You are thus building a representation of the actual fleet disposition which you will hopefully use to decode the coded fleet disposition printed out by the computer. Each time a ship is sunk, the computer prints out which ships have been sunk so far and also gives you a "SPLASH/HIT RATIO."

The first thing you should learn is how to locate and designate positions on the matrix, and specifically the difference between "3,4" and "4,3." Our method corresponds to the location of points on the coordinate plane rather than the location of numbers in a standard algebraic matrix: the first number gives the column counting from left to right and the second number gives the row counting from bottom to top.

The second thing you should learn about is the splash/hit ratio. "What is a ratio?" A good reply is "It's a fraction or quotient." Specifically, the splash/hit ratio is the number of splashes divided by the number of hits. If you had 9 splashes and 15 hits, the ratio would be 9/15 or 3/5, both of which are correct. The computer would give this splash/hit ratio as .6.

The main objective and primary educational benefit of BATTLE comes from attempting to decode the bad guys' fleet disposition code. To do this, you must make a comparison between the coded matrix and the actual matrix which you construct as you play the game.

The original author of both the program and these descriptive notes is Ray Westergard of the Lawrence Hall of Science, Berkeley, California.




```
                  BATTLE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THE FOLLOWING CODE OF THE BAD GUYS' FLEET DISPOSITION
HAS BEEN CAPTURED BUT NOT DECODED:

 0  0  0  2  2  6
 0  4  4  4  6  0
 5  0  0  6  0  0
 5  0  6  0  0  3
 5  1  0  0  0  3
 5  0  1  0  0  3

DE-CODE IT AND USE IT IF YOU CAN
BUT KEEP THE DE-CODING METHOD A SECRET.

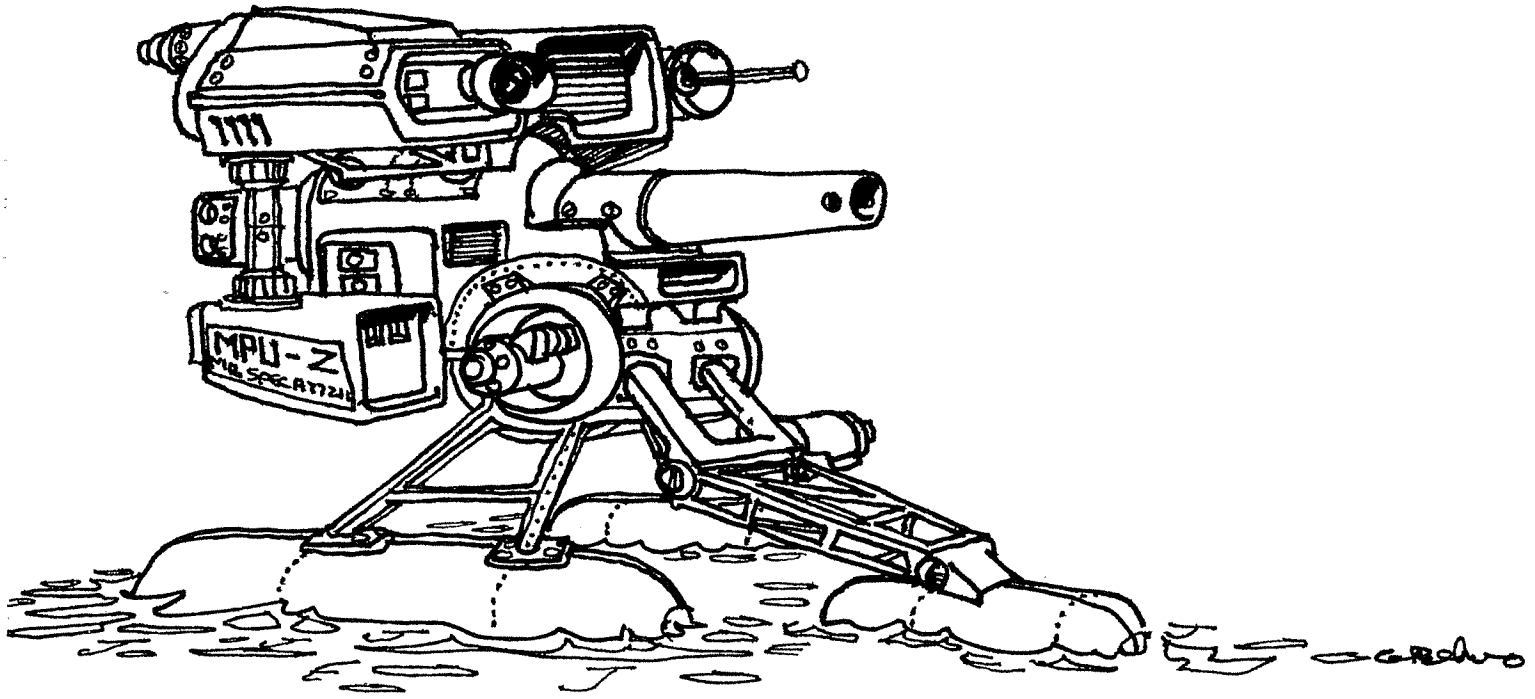
START GAME
? 1,1
A DIRECT HIT ON SHIP NUMBER  6
TRY AGAIN.
? 4,1
A DIRECT HIT ON SHIP NUMBER  3
TRY AGAIN.
? 5,1
A DIRECT HIT ON SHIP NUMBER  3
```

```
TRY AGAIN.
? 6,1
A DIRECT HIT ON SHIP NUMBER  3
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 0 DESTROYER(S),    1 CRUISER(S), AND   0 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS 0
? 2,1
SPLASH!  TRY AGAIN.
? 1,2
A DIRECT HIT ON SHIP NUMBER  2
TRY AGAIN.
? 1,3
A DIRECT HIT ON SHIP NUMBER  2
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 1 DESTROYER(S),    1 CRUISER(S), AND   0 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS .166667
? 3,7
INVALID INPUT.  TRY AGAIN.
? 3,6
A DIRECT HIT ON SHIP NUMBER  5
TRY AGAIN.
? 4,6
A DIRECT HIT ON SHIP NUMBER  5
TRY AGAIN.
? 5,6
A DIRECT HIT ON SHIP NUMBER  5
TRY AGAIN.
? 6,4
A DIRECT HIT ON SHIP NUMBER  1
TRY AGAIN.
? 6,6
A DIRECT HIT ON SHIP NUMBER  5
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 1 DESTROYER(S),    1 CRUISER(S), AND   1 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS .0909091
? 3,4
SPLASH!  TRY AGAIN.
? 2,2
A DIRECT HIT ON SHIP NUMBER  6
TRY AGAIN.
? 3,3
A DIRECT HIT ON SHIP NUMBER  6
TRY AGAIN.
? 4,4
A DIRECT HIT ON SHIP NUMBER  6
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 1 DESTROYER(S),    1 CRUISER(S), AND   2 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS .142857
? 6,4
YOU ALREADY PUT A HOLE IN SHIP NUMBER 1 AT THAT POINT.
SPLASH!  TRY AGAIN.
? 5,5
A DIRECT HIT ON SHIP NUMBER  1
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 2 DESTROYER(S),    1 CRUISER(S), AND   2 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS .2
? 2,3
A DIRECT HIT ON SHIP NUMBER  4
TRY AGAIN.
? 2,4
A DIRECT HIT ON SHIP NUMBER  4
TRY AGAIN.
? 2,5
A DIRECT HIT ON SHIP NUMBER  4
AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS.
SO FAR, THE BAD GUYS HAVE LOST
 2 DESTROYER(S),    2 CRUISER(S), AND   2 AIRCRAFT CARRIER(S).
YOUR CURRENT SPLASH/HIT RATIO IS .166667

YOU HAVE TOTALLY WIPED OUT THE BAD GUYS' FLEET
WITH A FINAL SPLASH/HIT RATIO OF .166667

**************************
```

```
5 PRINT TAB(33);"BATTLE"
7 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
10 REM -- BATTLE WRITTEN BY RAY WESTERGARD  10/70
20 REM COPYRIGHT 1971 BY THE REGENTS OF THE UNIV. OF CALIF.
30 REM PRODUCED AT THE LAWRENCE HALL OF SCIENCE, BERKELEY
40 REM DIM F(6,6),H(6,6),A(4)<B(4),C(6),L(3)
50 FOR X=1 TO 6
51 FOR Y=1 TO 6
52 F(X,Y)=0
53 NEXT Y
54 NEXT X
60 FOR I=1 TO 3
70 N=4-I
80 FOR J=1 TO 2
90 A=INT(6*RND(1)+1)
100 B=INT(6*RND(1)+1)
110 D=INT(4*RND(1)+1)
120 IF F(A,B)>0 THEN 90
130 M=0
140 ON D GOTO 150,340,550,740
150 B(1)=B
160 B(2)=7:B(3)=7
170 FOR K=1 TO N
180 IF M>1 THEN 240
190 IF B(K)=6 THEN 230
200 IF F(A,B(K)+1)>0 THEN 230
210 B(K+1)=B(K)+1
220 GOTO 280
230 M=2
240 IF B(1)<B(2) AND B(1)<B(3) THEN Z=B(1)
242 IF B(2)<B(1) AND B(2)<B(3) THEN Z=B(2)
244 IF B(3)<B(1) AND B(3)<B(2) THEN Z=B(3)
250 IF Z=1 THEN 90
260 IF F(A,Z-1)>0 THEN 90
270 B(K+1)=Z-1
280 NEXT K
290 F(A,B)=9-2*I-J
300 FOR K=1 TO N
310 F(A,B(K+1))=F(A,B)
320 NEXT K
330 GOTO 990
340 A(1)=A
350 B(1)=B
360 A(2)=0:A(3)=0:B(2)=0:B(3)=0
370 FOR K=1 TO N
380 IF M>1 THEN 460
390 IF A(K)=1 OR B(K)=1 THEN 450
400 IF F(A(K)-1,B(K)-1)>0 THEN 450
410 IF F(A(K)-1,B(K))>0 AND F(A(K)-1,B(K))=F(A(K),B(K)-1) THEN 450
420 A(K+1)=A(K)-1
430 B(K+1)=B(K)-1
440 GOTO 530
450 M=2
460 IF A(1)>A(2) AND A(1)>A(3) THEN Z1=A(1)
462 IF A(2)>A(1) AND A(2)>A(3) THEN Z1=A(2)
464 IF A(3)>A(1) AND A(3)>A(2) THEN Z1=A(3)
470 IF B(1)>B(2) AND B(1)>B(3) THEN Z2=B(1)
474 IF B(2)>B(1) AND B(2)>B(3) THEN Z2=B(2)
476 IF B(3)>B(1) AND B(3)>B(2) THEN Z2=B(3)
480 IF Z1=6 OR Z2=6 THEN 90
490 IF F(Z1+1,Z2+1)>0 THEN 90
500 IF F(Z1,Z2+1)>0 AND F(Z1,Z2+1)=F(Z1+1,Z2) THEN 90
510 A(K+1)=Z1+1
520 B(K+1)=Z2+1
530 NEXT K
540 GOTO 950
550 A(1)=A
560 A(2)=7:A(3)=7
570 FOR K=1 TO N
580 IF M>1 THEN 640
590 IF A(K)=6 THEN 630
600 IF F(A(K)+1,B)>0 THEN 630
610 A(K+1)=A(K)+1
620 GOTO 680
630 M=2
640 IF A(1)<A(2) AND A(1)<A(3) THEN Z=A(1)
642 IF A(2)<A(1) AND A(2)<A(3) THEN Z=A(2)
644 IF A(3)<A(1) AND A(3)<A(2) THEN Z=A(3)
```




```
650 IF Z=1 THEN 90
660 IF F(Z-1,B)>0 THEN 90
670 A(K+1)=Z-1
680 NEXT K
690 F(A,B)=9-2*I-J
700 FOR K=1 TO N
710 F(A(K+1),B)=F(A,B)
720 NEXT K
730 GOTO 990
740 A(1)=A
750 B(1)=B
760 A(2)=7:A(3)=7
770 B(2)=0:B(3)=0
780 FOR K=1 TO N
790 IF M>1 THEN 870
800 IF A(K)=6 OR B(K)=1 THEN 860
810 IF F(A(K)+1,B(K)-1)>0 THEN 860
820 IF F(A(K)+1,B(K))>0 AND F(A(K)+1,B(K))=F(A(K),B(K)-1) THEN 860
830 A(K+1)=A(K)+1
840 B(K+1)=B(K)-1
850 GOTO 940
860 M=2
870 IF A(1)<A(2) AND A(1)<A(3) THEN Z1=A(1)
872 IF A(2)<A(1) AND A(2)<A(3) THEN Z1=A(2)
874 IF A(3)<A(1) AND A(3)<A(2) THEN Z1=A(3)
880 IF B(1)>B(2) AND B(1)>B(3) THEN Z2=B(1)
882 IF B(2)>B(1) AND B(2)>B(3) THEN Z2=B(2)
884 IF B(3)>B(1) AND B(3)>B(2) THEN Z2=B(3)
890 IF Z1=1 OR Z2=6 THEN 90
900 IF F(Z1-1,Z2+1)>0 THEN 90
910 IF F(Z1,Z2+1)>0 AND F(Z1,Z2+1)=F(Z1-1,Z2) THEN 90
920 A(K+1)=Z1-1
930 B(K+1)=Z2+1
940 NEXT K
950 F(A,B)=9-2*I-J
960 FOR K=1 TO N
970 F(A(K+1),B(K+1))=F(A,B)
980 NEXT K
990 NEXT J
1000 NEXT I
1010 PRINT
1020 PRINT "THE FOLLOWING CODE OF THE BAD GUYS' FLEET DISPOSITION"
1030 PRINT "HAS BEEN CAPTURED BUT NOT DECODED:"
1040 PRINT
1050 FOR I=1 TO 6
1051 FOR J=1 TO 6
1052 H(I,J)=F(J,I)
1053 NEXT J
1054 NEXT I
1060 FOR I=1 TO 6
1061 FOR J=1 TO 6
1062 PRINT H(I,J);
1063 NEXT J
1064 PRINT
1065 NEXT I
1070 PRINT
1080 PRINT "DE-CODE IT AND USE IT IF YOU CAN"
1090 PRINT "BUT KEEP THE DE-CODING METHOD A SECRET."
1100 PRINT
1110 FOR I=1 TO 6
1111 FOR J=1 TO 6
1112 H(I,J)=0
1113 NEXT J
1114 NEXT I
1120 FOR I=1 TO 3
1121 L(I)=0
1122 NEXT I
1130 C(1)=2:C(2)=2
1140 C(3)=1:C(4)=1
1150 C(5)=0:C(6)=0
1160 S=0:H=0
1170 PRINT "START GAME"
1180 INPUT X,Y
1190 IF X<1 OR X>6 OR INT(X)<>ABS(X) THEN 1210
1200 IF Y>0 AND Y<7 AND INT(Y)=ABS(Y) THEN 1230
1210 PRINT "INVALID INPUT.  TRY AGAIN."
1220 GOTO 1180
1230 R=7-Y
1240 C=X
1250 IF F(R,C)>0 THEN 1290
1260 S=S+1
1270 PRINT "SPLASH!  TRY AGAIN."
1280 GOTO 1180
1290 IF C(F(R,C))<4 THEN 1340
1300 PRINT "THERE USED TO BE A SHIP AT THAT POINT, BUT YOU SUNK IT."
1310 PRINT "SPLASH!  TRY AGAIN."
1320 S=S+1
1330 GOTO 1180
1340 IF H(R,C)>0 THEN 1420
1350 H=H+1
1360 H(R,C)=F(R,C)
1370 PRINT "A DIRECT HIT ON SHIP NUMBER ";F(R,C)
1380 C(F(R,C))=C(F(R,C))+1
1390 IF C(F(R,C))>=4 THEN 1470
1400 PRINT "TRY AGAIN."
1410 GOTO 1180
1420 PRINT "YOU ALREADY PUT A HOLE IN SHIP NUMBER";F(R,C);
1430 PRINT "AT THAT POINT."
1440 PRINT "SPLASH!  TRY AGAIN."
1450 S=S+1
1460 GOTO 1180
1470 L(INT(F(R,C)-1)/2)+1)=L(INT(F(R,C)-1)/2)+1)+1
1480 PRINT "AND YOU SUNK IT.  HURRAH FOR THE GOOD GUYS."
1490 PRINT "SO FAR, THE BAD GUYS HAVE LOST"
1500 PRINT L(1);"DESTROYER(S),   ";L(2);"CRUISER(S), AND  ";
1510 PRINT L(3);"AIRCRAFT CARRIER(S)."
1520 PRINT "YOUR CURRENT SPLASH/HIT RATIO IS";S/H
1530 IF (L(1)+L(2)+L(3))<6 THEN 1180
1540 PRINT
1550 PRINT "YOU HAVE TOTALLY WIPED OUT THE BAD GUYS' FLEET"
1560 PRINT "WITH A FINAL SPLASH/HIT RATIO OF";S/H
1570 IF S/H>0 THEN 1590
1580 PRINT "CONGRATULATIONS -- A DIRECT HIT EVERY TIME."
1590 PRINT
1600 PRINT "****************************"
1610 PRINT
1620 GOTO 50
1630 END
```

Blackjack

This is a simulation of the card game of Blackjack or 21, Las Vegas style. This rather comprehensive version allows for up to seven players. On each hand each player may get another card (a hit), stand, split a hand in the event two identical cards were received or double down. Also, the dealer will ask for an insurance bet if he has an exposed ace.

Cards are automatically reshuffled as the 51st card is reached. For greater realism, you may wish to change this to the 41st card in Line 110. Actually, fanatical purists will want to modify the program so it uses three decks of cards instead of just one.

This program originally surfaced at Digital Equipment Corp.; the author is unknown.

```
                BLACKJACK
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

DO YOU WANT INSTRUCTIONS? YES
THIS IS THE GAME OF 21.  AS MANY AS 7 PLAYERS MAY PLAY THE
GAME.  ON EACH DEAL, BETS WILL BE ASKED FOR, AND THE
PLAYERS' BETS SHOULD BE TYPED IN.  THE CARDS WILL THEN BE
DEALT, AND EACH PLAYER IN TURN PLAYS HIS HAND.  THE
FIRST RESPONSE SHOULD BE EITHER 'D', INDICATING THAT THE
PLAYER IS DOUBLING DOWN, 'S', INDICATING THAT HE IS
STANDING, 'H', INDICATING HE WANTS ANOTHER CARD, OR '/',
INDICATING THAT HE WANTS TO SPLIT HIS CARDS.  AFTER THE
INITIAL RESPONSE, ALL FURTHER RESPONSES SHOULD BE 'S' OR
'H', UNLESS THE CARDS WERE SPLIT, IN WHICH CASE DOUBLING
DOWN IS AGAIN PERMITTED.  IN ORDER TO COLLECT FOR
BLACKJACK, THE INITIAL RESPONSE SHOULD BE 'S'.
NUMBER OF PLAYERS? 2
RESHUFFLING
BETS
# 1 ? 200
# 2 ? 150
PLAYER 1     2    DEALER
       9     6     9
       8     J
PLAYER 1 ? S
TOTAL IS 17
PLAYER 2 ? S
TOTAL IS 16
DEALER HAS A  3 CONCEALED FOR A TOTAL OF 12
DRAWS  Q   ...BUSTED
PLAYER 1  WINS   200 TOTAL= 200
PLAYER 2  WINS   150 TOTAL= 150
DEALER'S TOTAL=-350
BETS
# 1 ? 300
# 2 ? 200
PLAYER 1     2    DEALER
       K     Q     2
       2     4
PLAYER 1 ? H
RECEIVED A  3  HIT? S
TOTAL IS 15
PLAYER 2 ? H
RECEIVED A  3  HIT? S
TOTAL IS 17
DEALER HAS A  J CONCEALED FOR A TOTAL OF 12
DRAWS  Q   ...BUSTED
PLAYER 1  WINS   300 TOTAL= 500
PLAYER 2  WINS   200 TOTAL= 350
DEALER'S TOTAL=-850
BETS
# 1 ? 500
# 2 ? 500
PLAYER 1     2    DEALER
       K     5     4
       6     9
PLAYER 1 ? H
RECEIVED A  J  ...BUSTED
PLAYER 2 ? H
RECEIVED AN A  HIT? H
RECEIVED A  7  ...BUSTED
DEALER HAD A  2   CONCEALED.
PLAYER 1 LOSES   500 TOTAL= 0
PLAYER 2 LOSES   500 TOTAL=-150
DEALER'S TOTAL= 150
BETS
# 1 ? 500
# 2 ? 50
PLAYER 1     2    DEALER
       6     7     7
      10     J
PLAYER 1 ? S
TOTAL IS 16
PLAYER 2 ? S
TOTAL IS 17
DEALER HAS A  5 CONCEALED FOR A TOTAL OF 12
DRAWS  9   ---TOTAL IS 21

PLAYER 1 LOSES   500 TOTAL=-500
PLAYER 2 LOSES   50 TOTAL=-200
DEALER'S TOTAL= 700
BETS
# 1 ? 100
# 2 ? 100
PLAYER 1     2    DEALER
       A     8    10
       8     Q
NO DEALER BLACKJACK.
PLAYER 1 ? S
TOTAL IS 19
PLAYER 2 ? S
TOTAL IS 18
DEALER HAS A 10 CONCEALED FOR A TOTAL OF 20

PLAYER 1 LOSES   100 TOTAL=-600
PLAYER 2 LOSES   100 TOTAL=-300
DEALER'S TOTAL= 900
BETS
# 1 ? 500
# 2 ? 500
PLAYER 1     2    DEALER
       5     4     3
       2     8
PLAYER 1 ? H
RECEIVED A  4  HIT? H
RECEIVED AN A  HIT? H
RECEIVED AN A  HIT? S
TOTAL IS 13
PLAYER 2 ? H
RECEIVED A 10  ...BUSTED
DEALER HAS A  K CONCEALED FOR A TOTAL OF 13
DRAWS  7   ---TOTAL IS 20

PLAYER 1 LOSES   500 TOTAL=-1100
PLAYER 2 LOSES   500 TOTAL=-800
DEALER'S TOTAL= 1900
RESHUFFLING
BETS
# 1 ? 500
# 2 ? 500
```

```
PLAYER 1     2    DEALER
       3     5     7
       6     3
PLAYER 1 ? H
RECEIVED A 10  HIT? S
TOTAL IS 19
PLAYER 2 ? D
RECEIVED A  J
TOTAL IS 18
DEALER HAS A  6 CONCEALED FOR A TOTAL OF 13
DRAWS  2     7   ...BUSTED
PLAYER 1  WINS   500 TOTAL=-1100
PLAYER 2  WINS   1000 TOTAL= 700
DEALER'S TOTAL= 400
BETS
# 1 ? 400
# 2 ? 320
PLAYER 1     2    DEALER
       Q     8    10
       6     4
NO DEALER BLACKJACK.
PLAYER 1 ? S
TOTAL IS 16
PLAYER 2 ? D
RECEIVED A  7
TOTAL IS 19
DEALER HAS A  2 CONCEALED FOR A TOTAL OF 12
DRAWS  4     K   ...BUSTED
PLAYER 1  WINS   400 TOTAL=-700
PLAYER 2  WINS   640 TOTAL= 1340
DEALER'S TOTAL=-640
BETS
# 1 ? 500
# 2 ? 500
PLAYER 1     2    DEALER
       4     6     J
       2     Q
NO DEALER BLACKJACK.
PLAYER 1 ? H
RECEIVED A  9  HIT? H
RECEIVED AN 8  ...BUSTED
PLAYER 2 ? H
RECEIVED AN A  HIT? S
TOTAL IS 17
DEALER HAS A  7 CONCEALED FOR A TOTAL OF 17

PLAYER 1 LOSES   500 TOTAL=-1200
PLAYER 2 PUSHES       TOTAL= 1340
DEALER'S TOTAL=-140
```

```
2 PRINT TAB(31);"BLACK JACK"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
20 DIM P(15,12),Q(15),C(52),D(52),T(8),S(7),B(15)
30 DIM R(15)
40 REM--P(I,J) IS THE JTH CARD IN HAND I, Q(I) IS TOTAL OF HAND I
50 REM--C IS THE DECK BEING DEALT FROM, D IS THE DISCARD PILE,
60 REM--T(I) IS THE TOTAL FOR PLAYER I, S(I) IS THE TOTAL THIS HAND
70 REM--FOR PLAYER I, B(I) IS TH BET FOR HAND I
80 REM--R(I) IS THE LENGTH OF P(I,*)
90 GOTO 1500
100 REM--SUBROUTINE TO GET A CARD.  RESULT IS PUT IN X.
110 IF C<51 THEN 230
120 PRINT "RESHUFFLING"
130 FOR D=D TO 1 STEP -1
140 C=C-1
150 C(C)=D(D)
160 NEXT D
170 FOR C1=52 TO C STEP -1
180 C2=INT(RND(1)*(C1-C+1))+C
190 C3=C(C2)
200 C(C2)=C(C1)
210 C(C1)=C3
220 NEXT C1
230 X=C(C)
240 C=C+1
250 RETURN
300 REM--SUBROUTINE TO EVALUATE HAND I.  TOTAL IS PUT INTO
310 REM--Q(I). TOTALS HAVE THE FOLLOWING MEANING:
320 REM--  2-10...HARD 2-10
330 REM-- 11-21...SOFT 11-21
340 REM-- 22-32...HARD 11-21
350 REM--  33+....BUSTED
360 Q=0
370 FOR Q2=1 TO R(I)
380 X=P(I,Q2)
390 GOSUB 500
400 NEXT Q2
410 Q(I)=Q
420 RETURN
500 REM--SUBROUTINE TO ADD CARD X TO TOTAL Q.
510 X1=X: IF X1>10 THEN X1=10:  REM  SAME AS X1=10 MIN X
520 Q1=Q+X1
530 IF Q>=11 THEN 590
540 IF X>1 THEN 570
550 Q=Q+11
560 RETURN
570 Q=Q1-11*(Q1>=11)
580 RETURN
590 Q=Q1-(Q<=21 AND Q1>21)
600 IF Q<33 THEN 620
610 Q=-1
620 RETURN
700 REM--CARD PRINTING SUBROUTINE
710 REM  D$ DEFINED ELSEWHERE
720 PRINT MID$(D$,3*X-2,3);
730 PRINT "  ";
740 RETURN
750 REM--ALTERNATIVE PRINTING ROUTINE
760 PRINT " ";MID$(D$,3*X-1,2);
770 PRINT "   ";
780 RETURN
800 REM--SUBROUTINE TO PLAY OUT A HAND.
810 REM--NO SPLITTING OR BLACKJACKS ALLOWED
820 H1=5
830 GOSUB 1410
840 H1=3
850 ON H GOTO 950,930
860 GOSUB 100
870 B(I)=B(I)*2
880 PRINT "RECEIVED A";
890 GOSUB 700
900 GOSUB 1100
910 IF Q>0 THEN GOSUB 1300
920 RETURN
930 GOSUB 1320
940 RETURN
950 GOSUB 100
960 PRINT "RECEIVED A";
970 GOSUB 700
980 GOSUB 1100
990 IF Q<0 THEN 940
1000 PRINT "HIT";
1010 GOTO 830
1100 REM--SUBROUTINE TO ADD A CARD TO ROW I
1110 R(I)=R(I)+1
1120 P(I,R(I))=X
1130 Q=Q(I)
1140 GOSUB 500
1150 Q(I)=Q
1160 IF Q>=0 THEN 1190
1170 PRINT "...BUSTED"
1180 GOSUB 1200
1190 RETURN
1200 REM--SUBROUTINE TO DISCARD ROW I
1210 IF R(I)<>0 THEN 1230
1220 RETURN
1230 D=D+1
1240 D(D)=P(I,R(I))
1250 R(I)=R(I)-1
1260 GOTO 1210
1300 REM--PRINTS TOTAL OF HAND I
1310 PRINT
1320 AA=Q(I): GOSUB 3400
1325 PRINT "TOTAL IS";AA
1330 RETURN
1400 REM--SUBROUTINE TO READ REPLY
1410 REM  I$ DEFINED ELSEWHERE
1420 INPUT H$: H$=LEFT$(H$,1)
1430 FOR H=1 TO H1 STEP 2
1440 IF H$=MID$(I$,H,1) THEN 1480
1450 NEXT H
1460 PRINT "TYPE ";MID$(I$,1,H1-1);" OR ";MID$(I$,H1,2);" PLEASE";
1470 GOTO 1420
1480 H=(H+1)/2
1490 RETURN
1500 REM--PROGRAM STARTS HERE
1510 REM--INITIALIZE
1520 D$="N A  2  3  4  5  6  7N 8  9 10  J  Q  K"
1530 I$="H,S,D,/,"
1540 FOR I=1 TO 13
1550 FOR J=4*I-3 TO 4*I
1560 D(J)=I
1570 NEXT J
1580 NEXT I
1590 D=52
1600 C=53
1610 PRINT "DO YOU WANT INSTRUCTIONS";
1620 INPUT H$
1630 IF LEFT$(H$,1)="N" THEN 1760
1640 PRINT "THIS IS THE GAME OF 21.  AS MANY AS 7 PLAYERS MAY PLAY THE"
1650 PRINT "GAME.  ON EACH DEAL, BETS WILL BE ASKED FOR, AND THE"
1660 PRINT "PLAYERS' BETS SHOULD BE TYPED IN.  THE CARDS WILL THEN BE"
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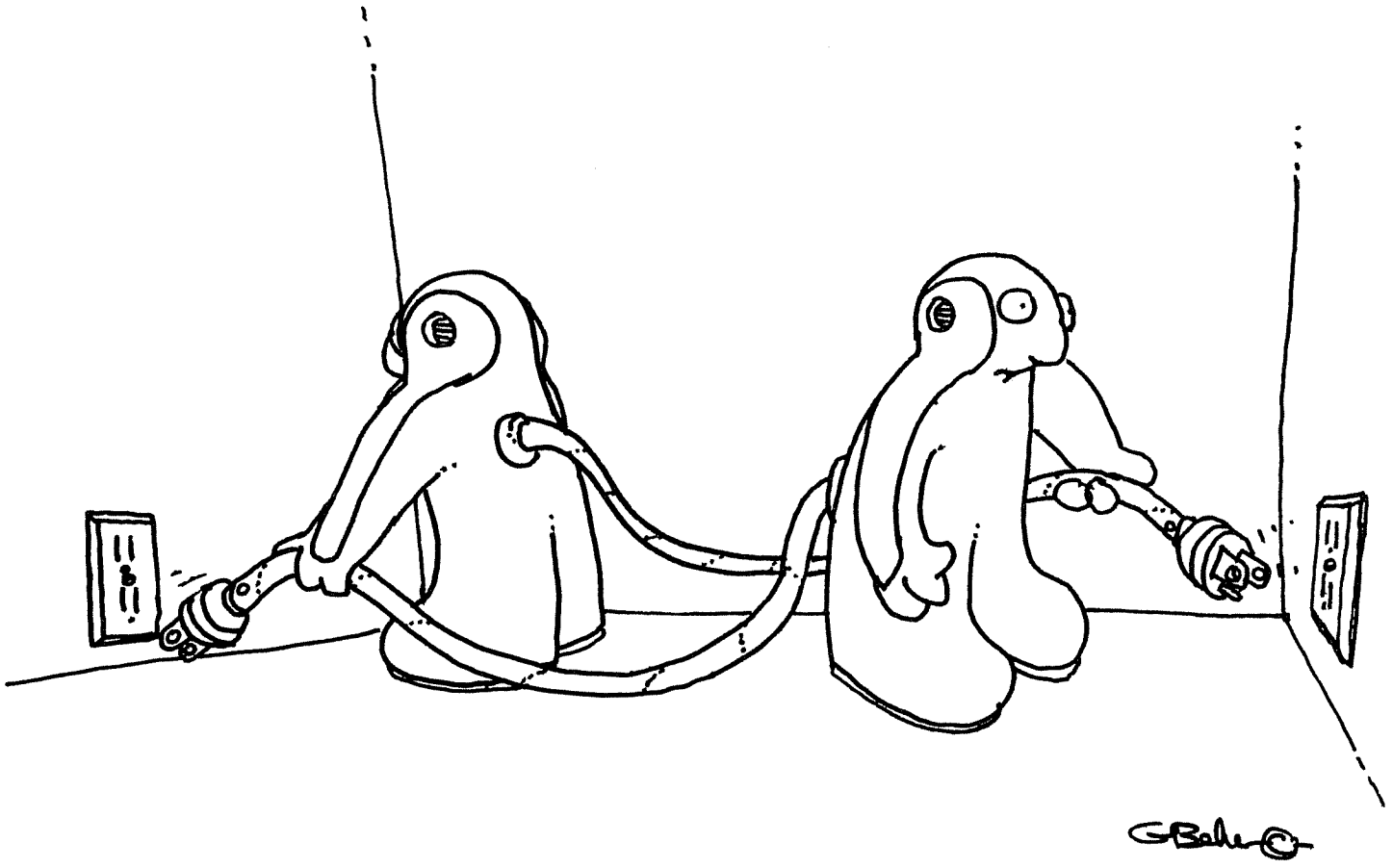
1670 PRINT "DEALT, AND EACH PLAYER IN TURN PLAYS HIS HAND.  THE"
1680 PRINT "FIRST RESPONSE SHOULD BE EITHER 'D', INDICATING THAT THE"
1690 PRINT "PLAYER IS DOUBLING DOWN, 'S', INDICATING THAT HE IS"
1700 PRINT "STANDING, 'H', INDICATING HE WANTS ANOTHER CARD, OR '/',"
1710 PRINT "INDICATING THAT HE WANTS TO SPLIT HIS CARDS.  AFTER THE "
1720 PRINT "INITIAL RESPONSE, ALL FURTHER RESPONSES SHOULD BE 'S' OR"
1730 PRINT "'H', UNLESS THE CARDS WERE SPLIT, IN WHICH CASE DOUBLING"
1740 PRINT "DOWN IS AGAIN PERMITTED.  IN ORDER TO COLLECT FOR"
1750 PRINT "BLACKJACK, THE INITIAL RESPONSE SHOULD BE 'S'."
1760 PRINT "NUMBER OF PLAYERS";
1770 INPUT N
1780 IF N<1 OR N>7 OR N>INT(N) THEN 1760
1790 FOR I=1 TO 8: T(I)=0: NEXT I
1800 D1=N+1
1810 IF 2*D1+C>=52 THEN GOSUB 120
1820 IF C=2 THEN C=C-1
1830 FOR I=1 TO N: Z(I)=0: NEXT I
1840 FOR I=1 TO 15: B(I)=0: NEXT I
1850 FOR I=1 TO 15: Q(I)=0: NEXT I
1860 FOR I=1 TO 7: S(I)=0: NEXT I
1870 FOR I=1 TO 15: R(I)=0: NEXT I
1880 PRINT "BETS"
1890 FOR I=1 TO N: PRINT "#";I;: INPUT Z(I): NEXT I
1900 FOR I=1 TO N
1910 IF Z(I)<=0 OR Z(I)>500 THEN 1880
1920 B(I)=Z(I)
1930 NEXT I
1940 PRINT "PLAYER";
1950 FOR I=1 TO N
1960 PRINT I;"   ";
1970 NEXT I
1980 PRINT "DEALER"
1990 FOR J=1 TO 2
2000 PRINT TAB(5);
2010 FOR I=1 TO D1
2020 GOSUB 100
2030 P(I,J)=X
2040 IF J=1 OR I<=N THEN GOSUB 750
2050 NEXT I
2060 PRINT
2070 NEXT J
2080 FOR I=1 TO D1
2090 R(I)=2
2100 NEXT I
2110 REM--TEST FOR INSURANCE
2120 IF P(D1,1)>1 THEN 2240
2130 PRINT "ANY INSURANCE";
2140 INPUT H$
2150 IF LEFT$(H$,1)<>"Y" THEN 2240
2160 PRINT "INSURANCE BETS"
2170 FOR I=1 TO N: PRINT "#";I;: INPUT Z(I): NEXT I
2180 FOR I=1 TO N
2190 IF Z(I)<0 OR Z(I)>B(I)/2 THEN 2160
2200 NEXT I
2210 FOR I=1 TO N
2220 S(I)=Z(I)*(3*(-(P(D1,2)>=10))-1)
2230 NEXT I
2240 REM--TEST FOR DEALER BLACKJACK
2250 L1=1: L2=1
2252 IF P(D1,1)=1 AND P(D1,2)>9 THEN L1=0: L2=0
2253 IF P(D1,2)=1 AND P(D1,1)>9 THEN L1=0: L2=0
2254 IF L1<>0 OR L2<>0 THEN 2320
2260 PRINT "DEALER HAS A";MID$(D$,3*P(D1,2)-2,3);" IN THE HOLE ";
2270 PRINT "FOR BLACKJACK"
2280 FOR I=1 TO D1
2290 GOSUB 300
2300 NEXT I
2310 GOTO 3140
2320 REM--NO DEALER BLACKJACK
2330 IF P(D1,1)>1 AND P(D1,1)<10 THEN 2350
2340 PRINT "NO DEALER BLACKJACK."
2350 REM--NOW PLAY THE HANDS
2360 FOR I=1 TO N
2370 PRINT "PLAYER";I;
2380 H1=7
2390 GOSUB 1410
2400 ON H GOTO 2550,2410,2510,2600
2410 REM--PLAYER WANTS TO STAND
2420 GOSUB 300
2430 IF Q(I)<>21 THEN 2490
2440 PRINT "BLACKJACK"
2450 S(I)=S(I)+1.5*B(I)
2460 B(I)=0
2470 GOSUB 1200
2480 GOTO 2900
2490 GOSUB 1320
2500 GOTO 2900
2510 REM--PLAYER WANTS TO DOUBLE DOWN
2520 GOSUB 300
2530 GOSUB 860
2540 GOTO 2900
2550 REM--PLAYER WANTS TO BE HIT
2560 GOSUB 300
2570 H1=3
2580 GOSUB 950
2590 GOTO 2900
2600 REM--PLAYER WANTS TO SPLIT
2610 L1=P(I,1): IF P(I,1)>10 THEN L1=10
2612 L2=P(I,2): IF P(I,2)>10 THEN L2=10
2614 IF L1=L2 THEN 2640
2620 PRINT "SPLITTING NOT ALLOWED."
2630 GOTO 2370
2640 REM--PLAY OUT SPLIT
2650 I1=I+D1
2660 R(I1)=2
2670 P(I1,1)=P(I,2)
2680 B(I+D1)=B(I)
2690 GOSUB 100
2700 PRINT "FIRST HAND RECEIVES A";
2710 GOSUB 700
2720 P(I,2)=X
2730 GOSUB 300
2740 PRINT
2750 GOSUB 100
2760 PRINT "SECOND HAND RECEIVES A";
2770 I=I1
2780 GOSUB 700
2790 P(I,2)=X
2800 GOSUB 300
2810 PRINT
2820 I=I1-D1
2830 IF P(I,1)=1 THEN 2900
2840 REM--NOW PLAY THE TWO HANDS
2850 PRINT "HAND";1-(I>D1);
2860 GOSUB 800
2870 I=I+D1
2880 IF I=I1 THEN 2850
2890 I=I1-D1
2900 NEXT I
2910 GOSUB 300
2920 REM--TEST FOR PLAYING DEALER'S HAND
2930 FOR I=1 TO N
2940 IF R(I)>0 OR R(I+D1)>0 THEN 3010
2950 NEXT I
2960 PRINT "DEALER HAD A";
2970 X=P(D1,2)
2980 GOSUB 700
2990 PRINT " CONCEALED."
3000 GOTO 3140
3010 PRINT "DEALER HAS A";MID$(D$,3*P(D1,2)-2,3);" CONCEALED ";
3020 I=D1
3030 AA=Q(I): GOSUB 3400
3035 PRINT "FOR A TOTAL OF";AA
3040 IF AA>16 THEN 3130
3050 PRINT "DRAWS";
3060 GOSUB 100
3070 GOSUB 750
3080 GOSUB 1100
3090 AA=Q: GOSUB 3400
3095 IF Q>0 AND AA<17 THEN 3060
3100 Q(I)=Q-(Q<0)/2
3110 IF Q<0 THEN 3140
3120 AA=Q: GOSUB 3400
3125 PRINT "---TOTAL IS";AA
3130 PRINT
3140 REM--TALLY THE RESULT
3150 REM
3160 Z$="LOSES PUSHES WINS "
3170 FOR I=1 TO N
3180 AA=Q(I): GOSUB 3400
3182 AB=Q(I+D1): GOSUB 3410
3184 AC=Q(D1): GOSUB 3420
3186 S(I)=S(I)+B(I)*SGN(AA-AC)+B(I+D1)*SGN(AB-AC)
3188 B(I+D1)=0
3200 PRINT "PLAYER";I;
3210 PRINT MID$(Z$,SGN(S(I))*6+7,6);" ";
3220 IF S(I)<>0 THEN 3250
3230 PRINT "      ";
3240 GOTO 3260
3250 PRINT ABS(S(I));
3260 T(I)=T(I)+S(I)
3270 PRINT "TOTAL=";T(I)
3280 GOSUB 1200
3290 T(D1)=T(D1)-S(I)
3300 I=I+D1
3310 GOSUB 1200
3320 I=I-D1
3330 NEXT I
3340 PRINT "DEALER'S TOTAL=";T(D1)
3350 GOSUB 1200
3360 GOTO 1810
3400 AA=AA+11*(AA>=22): RETURN
3410 AB=AB+11*(AB>=22): RETURN
3420 AC=AC+11*(AC>=22): RETURN
```



Bombardment

BOMBARDMENT is played on two, 5x5 grids or boards with 25 outpost locations numbered 1 to 25. Both you and the computer have four platoons of troops that can be located at any four outposts on your respective grids.

At the start of the game, you locate (or hide) your four platoons on your grid. The computer does the same on its grid. You then take turns firing missiles or bombs at each other's outposts trying to destroy all four platoons. The one who finds all four opponents' platoons first, wins.

This program was slightly modified from the original written by Martin Burdash of Parlin, New Jersey.

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                BOMBARDMENT
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


YOU ARE ON A BATTLEFIELD WITH 4 PLATOONS AND YOU
HAVE 25 OUTPOSTS AVAILABLE WHERE THEY MAY BE PLACED.
YOU CAN ONLY PLACE ONE PLATOON AT ANY ONE OUTPOST.
THE COMPUTER DOES THE SAME WITH ITS FOUR PLATOONS.

THE OBJECT OF THE GAME IS TO FIRE MISSILES AT THE
OUTPOSTS OF THE COMPUTER.  IT WILL DO THE SAME TO YOU.
THE ONE WHO DESTROYS ALL FOUR OF THE ENEMY'S PLATOONS
FIRST IS THE WINNER.

GOOD LUCK... AND TELL US WHERE YOU WANT THE BODIES SENT!

TEAR OFF MATRIX AND USE IT TO CHECK OFF THE NUMBERS.

 1     2     3     4     5
 6     7     8     9    10
11    12    13    14    15
16    17    18    19    20
21    22    23    24    25

WHAT ARE YOUR FOUR POSITIONS? 10,9,16,24

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 3
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 21 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 3
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 23 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 13
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 22 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 11
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 13 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 9
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 15 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 25
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 12 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 5
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 1 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 20
 HA, HA YOU MISSED.  MY TURN NOW

I GOT YOU.  IT WON'T BE LONG NOW.  POST 16 WAS HIT.
YOU HAVE ONLY THREE OUTPOSTS LEFT.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 21
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 20 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 23
YOU GOT ONE OF MY OUTPOSTS.
ONE DOWN, THREE TO GO

I MISSED YOU, YOU DIRTY RAT.  I PICKED 8 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 16
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 4 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 15
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 6 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 14
YOU GOT ONE OF MY OUTPOSTS.
TWO DOWN, TWO TO GO

I GOT YOU.  IT WON'T BE LONG NOW.  POST 10 WAS HIT.
YOU HAVE ONLY TWO OUTPOSTS LEFT.
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WHERE DO YOU WISH TO FIRE YOUR MISSILE? 13
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 19 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 12
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 7 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 11
 HA, HA YOU MISSED.  MY TURN NOW

I GOT YOU.  IT WON'T BE LONG NOW.  POST 24 WAS HIT.
YOU HAVE ONLY ONE OUTPOST LEFT.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 1
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 2 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 2
YOU GOT ONE OF MY OUTPOSTS.
THREE DOWN, ONE TO GO

I MISSED YOU, YOU DIRTY RAT.  I PICKED 18 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 3
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 3 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 4
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 14 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 22
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 25 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 12
 HA, HA YOU MISSED.  MY TURN NOW

I MISSED YOU, YOU DIRTY RAT.  I PICKED 11 .  YOUR TURN.

WHERE DO YOU WISH TO FIRE YOUR MISSILE? 9
 HA, HA YOU MISSED.  MY TURN NOW

YOU'RE DEAD. YOUR LAST OUTPOST WAS AT 9 . HA, HA, HA.
BETTER LUCK NEXT TIME.
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10 PRINT TAB(28);"BOMBARDMENT"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "YOU ARE ON A BATTLEFIELD WITH 4 PLATOONS AND YOU"
110 PRINT "HAVE 25 OUTPOSTS AVAILABLE WHERE THEY MAY BE PLACED."
120 PRINT "YOU CAN ONLY PLACE ONE PLATOON AT ANY ONE OUTPOST."
130 PRINT "THE COMPUTER DOES THE SAME WITH ITS FOUR PLATOONS."
135 PRINT
140 PRINT "THE OBJECT OF THE GAME IS TO FIRE MISSLES AT THE"
150 PRINT "OUTPOSTS OF THE COMPUTER.  IT WILL DO THE SAME TO YOU."
160 PRINT "THE ONE WHO DESTROYS ALL FOUR OF THE ENEMY'S PLATOONS"
170 PRINT "FIRST IS THE WINNER."
180 PRINT
190 PRINT "GOOD LUCK... AND TELL US WHERE YOU WANT THE BODIES SENT!"
200 PRINT
210 PRINT "TEAR OFF MATRIX AND USE IT TO CHECK OFF THE NUMBERS."
220 FOR R=1 TO 5: PRINT: NEXT R
260 DIM M(100)
270 FOR R=1 TO 5
280 I=(R-1)*5+1
290 PRINT I,I+1,I+2,I+3,I+4
300 NEXT R
350 FOR R=1 TO 10: PRINT: NEXT R
380 C=INT(RND(1)*25)+1
390 D=INT(RND(1)*25)+1
400 E=INT(RND(1)*25)+1
410 F=INT(RND(1)*25)+1
420 IF C=D THEN 390
430 IF C=E THEN 400
440 IF C=F THEN 410
450 IF D=E THEN 400
460 IF D=F THEN 410
470 IF E=F THEN 410
480 PRINT "WHAT ARE YOUR FOUR POSITIONS";
490 INPUT G,H,K,L
495 PRINT
500 PRINT "WHERE DO YOU WISH TO FIRE YOUR MISSLE";
510 INPUT Y
520 IF Y=C THEN 710
530 IF Y=D THEN 710
540 IF Y=E THEN 710
550 IF Y=F THEN 710
560 GOTO 630
570 M=INT(RND(1)*25)+1
575 GOTO 1160
580 IF X=G THEN 920
590 IF X=H THEN 920
600 IF X=L THEN 920
610 IF X=K THEN 920
620 GOTO 670
630 PRINT " HA, HA YOU MISSED.  MY TURN NOW"
640 PRINT: PRINT: GOTO 570
670 PRINT "I MISSED YOU, YOU DIRTY RAT.  I PICKED";M;".  YOUR TURN."
680 PRINT: PRINT: GOTO 500
710 Q=Q+1
720 IF Q=4 THEN 890
730 PRINT "YOU GOT ONE OF MY OUTPOSTS."
740 IF Q=1 THEN 770
750 IF Q=2 THEN 810
760 IF Q=3 THEN 850
770 PRINT "ONE DOWN, THREE TO GO"
780 PRINT: PRINT: GOTO 570
810 PRINT "TWO DOWN, TWO TO GO"
820 PRINT: PRINT: GOTO 570
850 PRINT "THREE DOWN, ONE TO GO"
860 PRINT: PRINT: GOTO 570
890 PRINT "YOU GOT ME, I'M GOING FAST.  BUT I'LL GET YOU WHEN"
900 PRINT " Y TRANSISTORS SECUPERA E"
910 GOTO 1235
920 Z=Z+1
930 IF Z=4 THEN 1110
940 PRINT "I GOT YOU.  IT WON'T BE LONG NOW.  POST";X;"WAS HIT."
950 IF Z=1 THEN 990
960 IF Z=2 THEN 1030
970 IF Z=3 THEN 1070
990 PRINT "YOU HAVE ONLY THREE OUTPOSTS LEFT."
1000 PRINT: PRINT: GOTO 500
1030 PRINT "YOU HAVE ONLY TWO OUTPOSTS LEFT."
1040 PRINT: PRINT: GOTO 500
1070 PRINT "YOU HAVE ONLY ONE OUTPOST LEFT."
1080 PRINT: PRINT: GOTO 500
1110 PRINT "YOU'RE DEAD. YOUR LAST OUTPOST WAS AT";X;". HA, HA, HA."
1120 PRINT "BETTER LUCK NEXT TIME."
1150 GOTO 1235
1160 P=P+1
1170 N=P-1
1180 FOR T=1 TO N
1190 IF M=M(T) THEN 570
1200 NEXT T
1210 X=M
1220 M(P)=M
1230 GOTO 580
1235 END
```

Bombs Away

In this program, you fly a World War II bomber for one of the four protagonists of the war. You then pick your target or the type of plane you are flying. Depending upon your flying experience and the quality of the enemy defenders, you then may accomplish your mission, get shot down, or make it back through enemy fire. In any case, you get a chance to fly again.

David Ahl modified the original program which was created by David Sherman while a student at Curtis Jr. High School, Sudbury, Massachusetts.

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          BOMBS AWAY
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


YOU ARE A PILOT IN A WORLD WAR II BOMBER.
WHAT SIDE -- ITALY(1), ALLIES(2), JAPAN(3), GERMANY(4)? 2
AIRCRAFT -- LIBERATOR(1), B-29(2), B-17(3), LANCASTER(4)? 4

YOU'RE BUSTING A GERMAN HEAVY WATER PLANT IN THE RUHR.

HOW MANY MISSIONS HAVE YOU FLOWN? 25


DIRECT HIT!!!!  43 KILLED.
MISSION SUCCESSFUL.



ANOTHER MISSION (Y OR N)? Y
YOU ARE A PILOT IN A WORLD WAR II BOMBER.
WHAT SIDE -- ITALY(1), ALLIES(2), JAPAN(3), GERMANY(4)? 3
YOU'RE FLYING A KAMIKAZE MISSION OVER THE USS LEXINGTON.
YOUR FIRST KAMIKAZE MISSION(Y OR N)? Y

* * * * BOOM * * * *
YOU HAVE BEEN SHOT DOWN.....
DEARLY BELOVED, WE ARE GATHERED HERE TODAY TO PAY OUR
LAST TRIBUTE...



ANOTHER MISSION (Y OR N)? Y
YOU ARE A PILOT IN A WORLD WAR II BOMBER.
WHAT SIDE -- ITALY(1), ALLIES(2), JAPAN(3), GERMANY(4)? 1
YOUR TARGET -- ALBANIA(1), GREECE(2), NORTH AFRICA(3)? 1

SHOULD BE EASY -- YOU'RE FLYING A NAZI-MADE PLANE.

HOW MANY MISSIONS HAVE YOU FLOWN? 200
MISSIONS, NOT MILES...
150 MISSIONS IS HIGH EVEN FOR OLD-TIMERS.
NOW THEN, HOW MANY MISSIONS HAVE YOU FLOWN? 20
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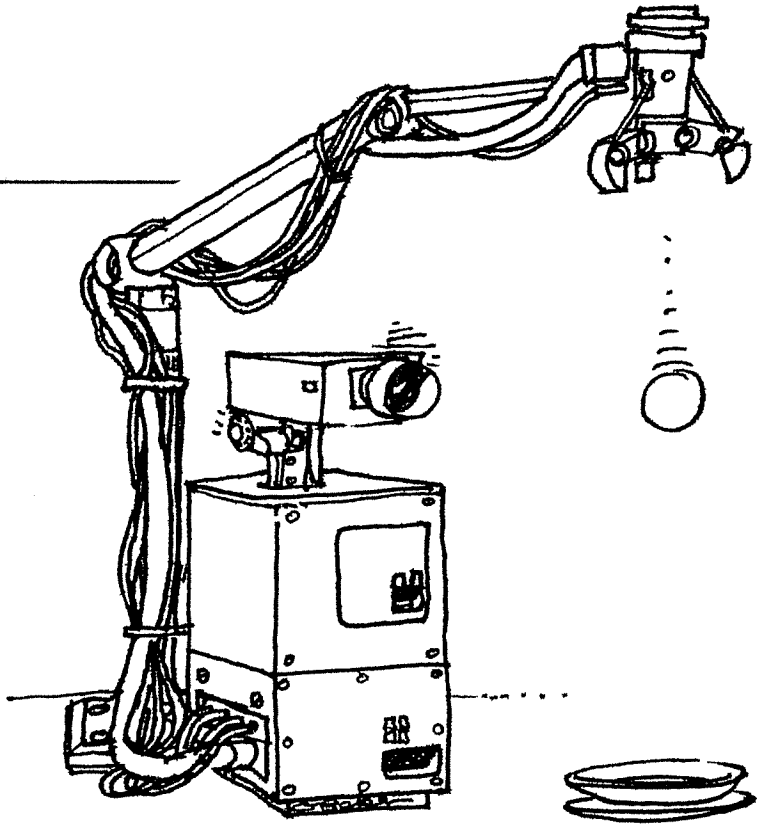
```
8 PRINT "YOU ARE A PILOT IN A WORLD WAR II BOMBER."
10 INPUT "WHAT SIDE -- ITALY(1), ALLIES(2), JAPAN(3), GERMANY(4)";A
20 IF A>0 AND A<5 THEN 25
22 PRINT "TRY AGAIN..." : GOTO 10
25 ON A GOTO 30, 110, 200, 220
30 INPUT "YOUR TARGET -- ALBANIA(1), GREECE(2), NORTH AFRICA(3)";B
40 IF B>0 AND B<4 THEN 45
42 PRINT "TRY AGAIN..." : GOTO 30
45 PRINT : ON B GOTO 50, 80,90
50 PRINT "SHOULD BE EASY -- YOU'RE FLYING A NAZI-MADE PLANE."
60 GOTO 280
80 PRINT "BE CAREFUL!!!" : GOTO 280
90 PRINT "YOU'RE GOING FOR THE OIL, EH?" : GOTO 280
110 INPUT "AIRCRAFT -- LIBERATOR(1), B-29(2), B-17(3), LANCASTER(4)";G
120 IF G>0 AND G<5 THEN 125
122 PRINT "TRY AGAIN..." : GOTO 110
125 PRINT : ON G GOTO 130, 150, 170, 190
130 PRINT "YOU'VE GOT 2 TONS OF BOMBS FLYING FOR PLOESTI." : GOTO 280
150 PRINT "YOU'RE DUMPING THE A-BOMB ON HIROSHIMA." : GOTO 280
170 PRINT "YOU'RE CHASING THE BISMARK IN THE NORTH SEA." : GOTO 280
190 PRINT "YOU'RE BUSTING A GERMAN HEAVY WATER PLANT IN THE RUHR."
195 GOTO 280
200 PRINT "YOU'RE FLYING A KAMIKAZE MISSION OVER THE USS LEXINGTON."
205 INPUT "YOUR FIRST KAMIKAZE MISSION(Y OR N)";F$
207 IF F$="N" THEN S=0 : GOTO 358
210 PRINT : IF RND(1)>.65 THEN 325
215 GOTO 380
220 PRINT "A NAZI, EH?  OH WELL.  ARE YOU GOING FOR RUSSIA(1),"
230 INPUT "ENGLAND(2), OR FRANCE(3)";M : IF M>0 AND M<4 THEN 235
232 PRINT "TRY AGAIN..." : GOTO 220
235 PRINT : ON M GOTO 250, 260, 270
250 PRINT "YOU'RE NEARING STALINGRAD." : GOTO 280
260 PRINT "NEARING LONDON.  BE CAREFUL, THEY'VE GOT RADAR." : GOTO 280
270 PRINT "NEARING VERSAILLES.  DUCK SOUP.  THEY'RE NEARLY DEFENSELESS.
280 PRINT
285 INPUT "HOW MANY MISSIONS HAVE YOU FLOWN";D
290 IF D<160 THEN 300
292 PRINT "MISSIONS, NOT MILES..."
295 PRINT "150 MISSIONS IS HIGH EVEN FOR OLD-TIMERS."
297 PRINT "NOW THEN, "; : GOTO 285
300 PRINT:IF D<100 THEN 310
305 PRINT "THAT'S PUSHING THE ODDS!" : GOTO 320
310 IF D<25 THEN PRINT "FRESH OUT OF TRAINING, EH?"
320 PRINT : IF D<160*RND(1) THEN 330
325 PRINT "DIRECT HIT!!!! "INT(100*RND(1))"KILLED."
327 PRINT "MISSION SUCCESSFUL." : GOTO 390
330 PRINT "MISSED TARGET BY"INT(2+30*RND(1))"MILES!"
335 PRINT "NOW YOU'RE REALLY IN FOR IT !!" : PRINT
340 INPUT "DOES THE ENEMY HAVE GUNS(1), MISSILES(2), OR BOTH(3)";R
345 IF R>0 AND R<4 THEN 350
347 PRINT "TRY AGAIN..." : GOTO 340
350 PRINT : T=0 : IF R=2 THEN 360
355 INPUT "WHAT'S THE PERCENT HIT RATE OF ENEMY GUNNERS (10 TO 50)";S
357 IF S<10 THEN PRINT "YOU LIE, BUT YOU'LL PAY...": GOTO 380
360 PRINT : IF R>1 THEN T=35
365 IF S+T>100*RND(1) THEN 380
370 PRINT "YOU MADE IT THROUGH TREMENDOUS FLAK!!" : GOTO 390
380 PRINT "* * * * BOOM * * * *"
384 PRINT "YOU HAVE BEEN SHOT DOWN....."
386 PRINT "DEARLY BELOVED, WE ARE GATHERED HERE TODAY TO PAY OUR"
387 PRINT "LAST TRIBUTE..."
390 PRINT:PRINT:PRINT:INPUT "ANOTHER MISSION (Y OR N)";U$
395 IF U$="Y" THEN 8
400 PRINT "CHICKEN !!!" : PRINT : END
```

Bounce



This program plots a bouncing ball. Most computer plots run along the paper in the terminal (top to bottom); however, this plot is drawn horizontally on the paper (left to right).

You may specify the initial velocity of the ball and the coefficient of elasticity of the ball (a superball is about 0.85 — other balls are much less). You also specify the time increment to be used in "strobing" the flight of the ball. In other words, it is as though the ball is thrown up in a darkened room and you flash a light at fixed time intervals and photograph the progress of the ball.

The program was originally written by Val Skalabrin while he was at DEC.

```
                    BOUNCE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS SIMULATION LETS YOU SPECIFY THE INITIAL VELOCITY
OF A BALL THROWN STRAIGHT UP, AND THE COEFFICIENT OF
ELASTICITY OF THE BALL.  PLEASE USE A DECIMAL FRACTION
COEFFICIENCY (LESS THAN 1).

YOU ALSO SPECIFY THE TIME INCREMENT TO BE USED IN
'STROBING' THE BALL'S FLIGHT (TRY .1 INITIALLY).

TIME INCREMENT (SEC)? .1

VELOCITY (FPS)? 30

COEFFICIENT? .9

FEET

 14      000
            0
 13     0    0

 12    0      0
                         00
 11   0                  0  0
              0         0    0
 10
     0                 0      0
 9             0                        0000
                                            0
 8                    0        0        0
    0                                        0
 7              0                    0
                      0         0
 6                                  0        0
   0
 5                0   0
                                0              0
 4                                  0
 3 0
                    0              0            0
 2                 0              0
 1
                                                 0
 0 0                0              0
.........................................................
 0        1        2        3        4        5        6
                          SECONDS
```

```
10 PRINT TAB(33);"BOUNCE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
90 DIM T(20)
100 PRINT "THIS SIMULATION LETS YOU SPECIFY THE INITIAL VELOCITY"
110 PRINT "OF A BALL THROWN STRAIGHT UP, AND THE COEFFICIENT OF"
120 PRINT "ELASTICITY OF THE BALL.  PLEASE USE A DECIMAL FRACTION"
130 PRINT "COEFFICIENCY (LESS THAN 1)."
131 PRINT
132 PRINT "YOU ALSO SPECIFY THE TIME INCREMENT TO BE USED IN"
133 PRINT "'STROBING' THE BALL'S FLIGHT (TRY .1 INITIALLY)."
134 PRINT
135 INPUT "TIME INCREMENT (SEC)";S2
140 PRINT
150 INPUT "VELOCITY (FPS)";V
160 PRINT
170 INPUT "COEFFICIENT";C
180 PRINT
182 PRINT "FEET"
184 PRINT
186 S1=INT(70/(V/(16*S2)))
190 FOR I=1 TO S1
200 T(I)=V*C^(I-1)/16
210 NEXT I
220 FOR H=INT(-16*(V/32)^2+V^2/32+.5) TO 0 STEP -.5
221 IF INT(H)<>H THEN 225
222 PRINT H;
225 L=0
230 FOR I=1 TO S1
240 FOR T=0 TO T(I) STEP S2
245 L=L+S2
250 IF ABS(H-(.5*(-32)*T^2+V*C^(I-1)*T))>.25 THEN 270
260 PRINT TAB(L/S2);"0";
270 NEXT T
275 T=T(I+1)/2
276 IF -16*T^2+V*C^(I-1)*T<H THEN 290
280 NEXT I
290 PRINT
300 NEXT H
310 PRINT TAB(1);
320 FOR I=1 TO INT(L+1)/S2+1
330 PRINT ".";
340 NEXT I
350 PRINT
355 PRINT " 0";
360 FOR I=1 TO INT(L+.9995)
380 PRINT TAB(INT(I/S2));I;
390 NEXT I
400 PRINT
410 PRINT TAB(INT(L+1)/(2*S2)-2);"SECONDS"
420 PRINT
430 GOTO 135
440 END
```

Bowling

This is a simulated bowling game for up to four players. You play 10 frames. To roll the ball, you simply type "ROLL." After each roll, the computer will show you a diagram of the remaining pins ("0" means the pin is down, "+" means it is still standing), and it will give you a roll analysis:

GUTTER
STRIKE
SPARE
ERROR (on second ball if pins still standing)

Bowling was written by Paul Peraino while a student at Woodrow Wilson High School, San Francisco, California.

```
                  BOWL
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


WELCOME TO THE ALLEY
BRING YOUR FRIENDS
OKAY LET'S FIRST GET ACQUAINTED

THE INSTRUCTIONS (Y/N)
? Y
THE GAME OF BOWLING TAKES SKILL.DURING THE GAME
THE COMPUTER WILL KEEP SCORE.YOU MAY COMPETE WITH
OTHER PLAYERS(UP TO FOUR).YOU WILL BE PLAYING TEN FRAMES
ON THE PIN DIAGRAM '0' MEANS THE PIN IS DOWN...'+' MEANS T
PIN IS STANDING.AFTER THE GAME THE COMPUTER WILL SHOW YOUR
SCORES .
FIRST OF ALL...HOW MANY ARE PLAYING? 2

VERY GOOD...
TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 1 BALL: 1

0 0 0 +
 0 + 0
  0 0
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 1 BALL: 2

0 0 0 0
 0 + 0
  0 0
   0
ERROR!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 1 BALL: 1

0 0 0 0
 + 0 0
  0 +
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 1 BALL: 2

0 0 0 0
 + 0 0
  0 +
   0
GUTTER!!
ERROR!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 2 BALL: 1

0 0 + 0
 + 0 0
  0 0
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 2 BALL: 2

0 0 + 0
 + 0 0
  0 0
   0
GUTTER!!
ERROR!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 2 BALL: 1

0 0 0 +
 0 + 0
  + 0
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 2 BALL: 2

0 0 0 0
 0 0 0
  + 0
   0
ERROR!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 3 BALL: 1

+ 0 0 0
 0 0 0
  0 +
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 3 BALL: 2

+ 0 0 0
 0 0 0
  0 0
   0
ERROR!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 3 BALL: 1

0 + 0 +
 0 0 +
  + +
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 3 BALL: 2

0 0 0 0
 0 0 0
  0 0
   0
SPARE!!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 4 BALL: 1

+ + 0 0
 0 0 0
  0 0
   0

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 4 BALL: 2

0 0 0 0
 0 0 0
  0 0
   0
SPARE!!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 4 BALL: 1

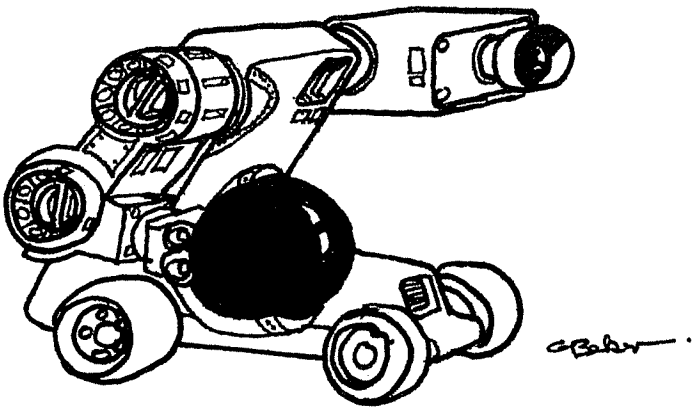
0 0 + +
 0 0 +
  0 0
   +

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 2 FRAME: 4 BALL: 2

0 0 0 0
 0 0 0
  0 0
   0
SPARE!!!!

TYPE ROLL TO GET THE BALL GOING.
? ROLL
PLAYER: 1 FRAME: 5 BALL: 1

0 0 0 +
 0 + 0
  0 0
   0
```



```
10 PRINT TAB(34);"BOWL"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
270 DIM C(15),A(100,6)
360 PRINT "WELCOME TO THE ALLEY"
450 PRINT "BRING YOUR FRIENDS"
540 PRINT "OKAY LET'S FIRST GET ACQUAINTED"
630 PRINT ""
720 PRINT "THE INSTRUCTIONS (Y/N)"
810 INPUT Z$
900 IF Z$="Y" THEN 990
960 IF Z$="N" THEN 1530
990 PRINT "THE GAME OF BOWLING TAKES MIND AND SKILL.DURING THE GAME"
1080 PRINT "THE COMPUTER WILL KEEP SCORE.YOU MAY COMPETE WITH"
1170 PRINT "OTHER PLAYERS(UP TO FOUR).YOU WILL BE PLAYING TEN FRAMES"
1260 PRINT "ON THE PIN DIAGRAM '0' MEANS THE PIN IS DOWN...'+' MEANS THE"
1350 PRINT "PIN IS STANDING.AFTER THE GAME THE COMPUTER WILL SHOW YOUR"
1440 PRINT "SCORES ."
1530 PRINT "FIRST OF ALL...HOW MANY ARE PLAYING";
1620 INPUT R
1710 PRINT
1800 PRINT "VERY GOOD..."
1890 FOR I=1 TO 100: FOR J=1 TO 6: A(I,J)=0: NEXT J: NEXT I
1980 F=1
2070 FOR P=1 TO R
2160 M=0
2250 B=1
2340 M=0: Q=0
2430 FOR I=1 TO 15: C(I)=0: NEXT I
2520 REMARK BALL GENERATOR USING MOD '15' SYSTEM
2610 PRINT "TYPE ROLL TO GET THE BALL GOING."
2700 INPUT N$
2790 K=0: D=0
2880 FOR I=1 TO 20
2970 X=INT(RND(1)*100)
3060 FOR J=1 TO 10
3150 IF X<15*J THEN 3330
3240 NEXT J
3330 C(15*J-X)=1
3420 NEXT I
3510 REMARK PIN DIAGRAM
3600 PRINT "PLAYER:"P;"FRAME:";F"BALL:"B
3690 FOR I=0 TO 3
3780 PRINT
3870 FOR J=1 TO 4-I
3960 K=K+1
4050 IF C(K)=1 THEN 4320
4140 PRINT TAB(I);"+ ";
4230 GOTO 4410
4320 PRINT TAB(I);"0 ";
4410 NEXT J
4500 NEXT I
4590 PRINT ""
4680 REMARK ROLL ANALYSIS
4770 FOR I=1 TO 10
4860 D=D+C(I)
4950 NEXT I
5040 IF D-M <> 0 THEN 5220
5130 PRINT "GUTTER!!"
5220 IF B<>1 OR D<>10 THEN 5490
5310 PRINT "STRIKE!!!!!"
5400 Q=3
5490 IF B<>2 OR D<>10 THEN 5760
5580 PRINT "SPARE!!!!"
5670 Q=2
5760 IF B<>2 OR D>=10 THEN 6030
5850 PRINT "ERROR!!!"
5940 Q=1
6030 IF B<>1 OR D>=10 THEN 6210
6120 PRINT "ROLL YOUR 2ND BALL"
6210 REMARK STORAGE OF THE SCORES
6300 PRINT
6390 A(F*P,B)=D
6480 IF B=2 THEN 7020
6570 B=2
6660 M=D
6750 IF Q=3 THEN 6210
6840 A(F*P,B)=D-M
6930 IF Q=0 THEN 2520
7020 A(F*P,3)=Q
7110 NEXT P
7200 F=F+1
7290 IF F<11 THEN 2070
7295 PRINT "FRAMES"
7380 FOR I=1 TO 10
7470 PRINT I;
7560 NEXT I
7650 PRINT
7740 FOR P=1 TO R
7830 FOR I=1 TO 3
7920 FOR J=1 TO 10
8010 PRINT A(J*P,I);
8100 NEXT J
8105 PRINT
8190 NEXT I
8280 PRINT
8370 NEXT P
8460 PRINT "DO YOU WANT ANOTHER GAME"
8550 INPUT A$
8640 IF LEFT$(A$,1)="Y" THEN 2610
8730 END
```

Boxing

This program simulates a three-round Olympic boxing match. The computer coaches one of the boxers and determines his punches and defenses, while you do the same for your boxer. At the start of the match, you may specify your man's best punch and his vulnerability.

There are approximately seven major punches per round, although this may be varied in Statement 185. The best two out of three rounds wins.

Jesse Lynch of St. Paul, Minnesota created this program.

```
                    BOXING
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


BOXING OLYMPIC STYLE (3 ROUNDS -- 2 OUT OF 3 WINS)
WHAT IS YOUR OPPONENT'S NAME? MEATHEAD
INPUT YOUR MAN'S NAME? SUPERMAN
DIFFERENT PUNCHES ARE 1 FULL SWING 2 HOOK 3 UPPERCUT 4 JAB
WHAT IS YOUR MANS BEST? 3
WHAT IS HIS VULNERABILITY? 2
MEATHEAD'S ADVANTAGE IS 2 AND VULNERABILITY IS SECRET.
ROUND 1 BEGINS...

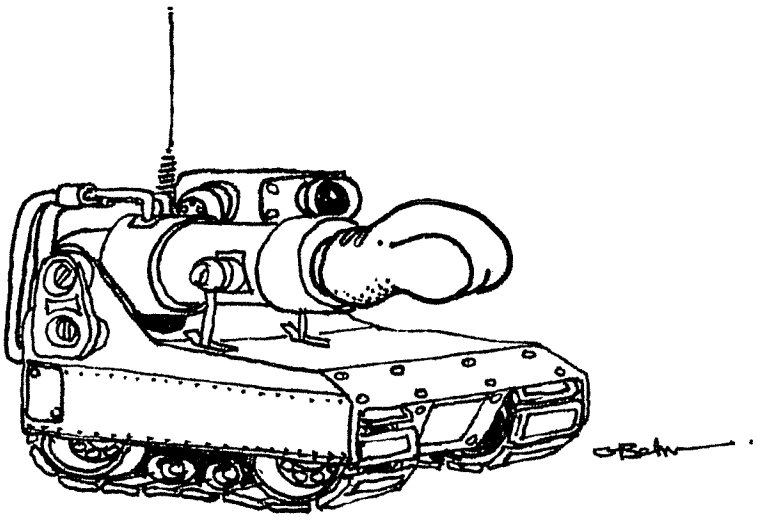
SUPERMAN'S PUNCH? 1
SUPERMAN SWINGS AND HE CONNECTS!
SUPERMAN IS ATTACKED BY AN UPPERCUT (OH,OH)...
 AND MEATHEAD CONNECTS...
SUPERMAN'S PUNCH? 4
SUPERMAN JABS AT MEATHEAD'S HEAD SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT    AND IT'S BLOCKED (LUCKY BLOCK!)
SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT   AND HE CONNECTS!
SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT    AND IT'S BLOCKED (LUCKY BLOCK!)
SUPERMAN'S PUNCH? 2
SUPERMAN GIVES THE HOOK... BUT IT'S BLOCKED!!!!!!!!!!!!!
SUPERMAN WINS ROUND  1
ROUND 2 BEGINS...

MEATHEAD  TAKES A FULL SWING AND POW!!!!! HE HITS HIM RIGHT IN THE FACE!
MEATHEAD  TAKES A FULL SWING AND BUT IT'S BLOCKED !
MEATHEAD JABS AND  BLOOD SPILLS !!!
SUPERMAN'S PUNCH? 1
SUPERMAN SWINGS AND HE CONNECTS!
MEATHEAD JABS AND  IT'S BLOCKED !
SUPERMAN IS ATTACKED BY AN UPPERCUT (OH,OH)...
 BLOCKS AND HITS MEATHEAD WITH A HOOK.
MEATHEAD  TAKES A FULL SWING AND BUT IT'S BLOCKED !
MEATHEAD WINS ROUND 2
ROUND 3 BEGINS...

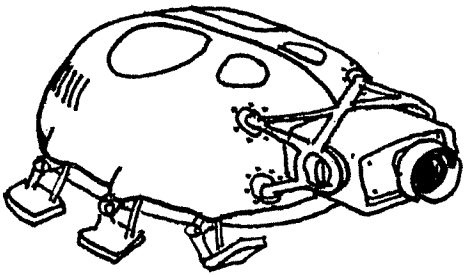
SUPERMAN'S PUNCH? 4
SUPERMAN JABS AT MEATHEAD'S HEAD SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT   AND HE CONNECTS!
SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT    AND IT'S BLOCKED (LUCKY BLOCK!)
MEATHEAD  TAKES A FULL SWING AND POW!!!!! HE HITS HIM RIGHT IN THE FACE!
SUPERMAN'S PUNCH? 1
SUPERMAN SWINGS AND HE CONNECTS!
SUPERMAN'S PUNCH? 1
SUPERMAN SWINGS AND HE CONNECTS!
SUPERMAN'S PUNCH? 3
SUPERMAN  TRIES AN UPPERCUT    AND IT'S BLOCKED (LUCKY BLOCK!)
SUPERMAN WINS ROUND  3
SUPERMAN AMAZINGLY WINS


AND NOW GOODBYE FROM THE OLYMPIC ARENA.
```

```
1 PRINT TAB(33);"BOXING"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "BOXING OLYMPIC STYLE (3 ROUNDS -- 2 OUT OF 3 WINS)"
5 J=0
6 L=0
10 PRINT "WHAT IS YOUR OPPONENT'S NAME";
20 INPUT J$
30 PRINT "INPUT YOUR MAN'S NAME";
40 INPUT L$
50 PRINT "DIFFERENT PUNCHES ARE 1 FULL SWING 2 HOOK 3 UPPERCUT 4 JAB"
60 PRINT "WHAT IS YOUR MANS BEST";
64 INPUT B
70 PRINT "WHAT IS HIS VULNERABILITY";
80 INPUT D
90 B1=INT(4*RND(1)+1)
100 D1=INT(4*RND(1)+1)
110 IF B1=D1 THEN 90
120 PRINT J$;"'S ADVANTAGE IS";B1;"AND VULNERABILITY IS SECRET."
130 FOR R=1 TO 3
140 IF J>= 2 THEN 1040
150 IF L>=2 THEN 1060
160 X=0
170 Y=0
180 PRINT "ROUND";R;"BEGINS..."
181 PRINT ""
185 FOR R1= 1 TO 7
190 I=INT(10*RND(1)+1)
200 IF I>5 THEN 600
210 PRINT L$;"'S PUNCH";
220 INPUT P
221 IF P=B THEN 225
222 GOTO 230
225 X=X+2
230 IF P=1 THEN 340
240 IF P=2 THEN 450
250 IF P=3 THEN 520
270 PRINT L$;" JABS AT ";J$"'S HEAD ";
271 IF D1=4 THEN 290
275 C=INT(8*RND(1)+1)
280 IF C<4 THEN 310
290 X=X+3
300 GOTO 950
310 PRINT "IT'S BLOCKED"
330 GOTO 950
340 PRINT L$ " SWINGS AND ";
341 IF D1=4 THEN 410
345 X3=INT(30*RND(1)+1)
350 IF X3<10 THEN 410
360 PRINT " HE MISSES ";
370 PRINT
375 IF X=1 THEN 950
380 PRINT
390 PRINT
400 GOTO 300
410 PRINT "HE CONNECTS!"
420 IF X>35 THEN 980
425 X=X+15
440 GOTO 300
450 PRINT L$;" GIVES THE HOOK... ";
455 IF D1=2 THEN 480
460 H1=INT(2*RND(1)+1)
470 IF H1=1 THEN 500
475 PRINT "CONNECTS..."
480 X=X+7
490 GOTO 300
500 PRINT "BUT IT'S BLOCKED!!!!!!!!!!!!!"
510 GOTO 300
520 PRINT L$ "  TRIES AN UPPERCUT   ";
530 IF D1=3 THEN 570
540 D5=INT(100*RND(1)+1)
550 IF D5<51 THEN 570
560 PRINT " AND IT'S BLOCKED (LUCKY BLOCK!)"
565 GOTO 300
570 PRINT "AND HE CONNECTS!"
580 X=X+4
590 GOTO 300
600 J7=INT(4*RND(1)+1)
601 IF J7 =B1 THEN 605
602 GOTO 610
605 Y=Y+2
610 IF J7=1 THEN 720
620 IF J7=2 THEN 810
630 IF J7 =3 THEN 860
640 PRINT J$;" JABS AND ";
645 IF D=4 THEN 700
650 Z4=INT(7*RND(1)+1)
655 IF Z4>4 THEN 690
660 PRINT " IT'S BLOCKED !"
670 GOTO 300
690 PRINT " BLOOD SPILLS !!!"
700 Y=Y+5
710 GOTO 300
720 PRINT J$"  TAKES A FULL SWING AND";
730 IF D=1 THEN 770
740 R6=INT(60*RND(1)+1)
745 IF R6 <30 THEN 770
750 PRINT " BUT IT'S BLOCKED !"
760 GOTO 300
770 PRINT " POW!!!!! HE HITS HIM RIGHT IN THE FACE!"
780 IF Y>35 THEN 1010
790 Y=Y+15
800 GOTO 300
810 PRINT J$;" GETS ";L$;" IN THE JAW (OUCH!)"
820 Y=Y+7
830 PRINT "....AND AGAIN!"
835 Y=Y+5
840 IF Y>35 THEN 1010
850 PRINT
860 PRINT L$;" IS ATTACKED BY AN UPPERCUT (OH,OH)..."
865 IF D=3 THEN 890
870 Q4=INT(200*RND(1)+1)
880 IF Q4>75 THEN 920
890 PRINT " AND ";J$;" CONNECTS..."
900 Y=Y+8
910 GOTO 300
920 PRINT " BLOCKS AND HITS ";J$;" WITH A HOOK."
930 X=X+5
940 GOTO 300
950 NEXT R1
951 IF X>Y THEN 955
952 PRINT J$" WINS ROUND" R
953 J=J+1
954 GOTO 960
955 PRINT L$" WINS ROUND "R
956 L=L+1
960 NEXT R
961 IF J>= 2 THEN 1040
962 IF L>=2 THEN 1060
980 PRINT J$ "  IS KNOCKED COLD AND " L$" IS THE WINNER AND CHAMP ";
1000 GOTO 1080
1010 PRINT L$ " IS KNOCKED COLD AND " J$" IS THE WINNER AND CHAMP ";
1030 GOTO 1000
1040 PRINT J$ "  WINS (NICE GOING )" J$
1050 GOTO 1000
1060 PRINT L$ " AMAZINGLY WINS  "
1070 GOTO 1000
1080 PRINT
1085 PRINT
1090 PRINT "AND NOW GOODBYE FROM THE OLYMPIC ARENA."
1100 PRINT
1110 END
```



Bug



The object of this game is to finish your drawing of a bug before the computer finishes.

You and the computer roll a die alternately with each number standing for a part of the bug. You must add the parts in the right order; in other words, you cannot have a neck until you have a body, you cannot have a head until you have a neck, and so on. After each new part has been added, you have the option of seeing pictures of the two bugs.

If you elect to see all the pictures, this program has the ability of consuming well over six feet of terminal paper per run. We can only suggest recycling the paper by using the other side.

Brian Leibowitz wrote this program while in the 7th grade at Harrison Jr-Sr High School in Harrison, New York.

```
                BUG
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THE GAME BUG
I HOPE YOU ENJOY THIS GAME.

DO YOU WANT INSTRUCTIONS? YES
THE OBJECT OF BUG IS TO FINISH YOUR BUG BEFORE I FINISH
MINE.  EACH NUMBER STANDS FOR A PART OF THE BUG BODY.
I WILL ROLL THE DIE FOR YOU, TELL YOU WHAT I ROLLED FOR YOU
WHAT THE NUMBER STANDS FOR, AND IF YOU CAN GET THE PART.
IF YOU CAN GET THE PART I WILL GIVE IT TO YOU.
THE SAME WILL HAPPEN ON MY TURN.
IF THERE IS A CHANGE IN EITHER BUG I WILL GIVE YOU THE
OPTION OF SEEING THE PICTURES OF THE BUGS.
THE NUMBERS STAND FOR PARTS AS FOLLOWS:
NUMBER        PART          NUMBER OF PART NEEDED
1             BODY          1
2             NECK          1
3             HEAD          1
4             FEELERS       2
5             TAIL          1
6             LEGS          6


YOU ROLLED A  1
1=BODY
YOU NOW HAVE A BODY.
I ROLLED A 4
4=FEELERS
I DO NOT HAVE A HEAD.
DO YOU WANT THE PICTURES? YES
*****YOUR BUG*****


     BBBBBBBBBBB
     B         B
     B         B
     BBBBBBBBBBB
I ROLLED A 6
6=LEGS
I NOW HAVE 4 LEGS.
DO YOU WANT THE PICTURES? NO
YOU ROLLED A  1
1=BODY
YOU DO NOT NEED A BODY.
I ROLLED A 3
3=HEAD
I DO NOT NEED A HEAD.
YOU ROLLED A  1
1=BODY
YOU DO NOT NEED A BODY.
I ROLLED A 1
1=BODY
I DO NOT NEED A BODY.
YOU ROLLED A  5
5=TAIL
YOU ALREADY HAVE A TAIL.
I ROLLED A 1
1=BODY
I DO NOT NEED A BODY.
YOU ROLLED A  5
5=TAIL
YOU ALREADY HAVE A TAIL.
I ROLLED A 6
6=LEGS
I NOW HAVE 5 LEGS.
DO YOU WANT THE PICTURES? NO
YOU ROLLED A  5
5=TAIL
YOU ALREADY HAVE A TAIL.
I ROLLED A 4
4=FEELERS
I GET A FEELER.
DO YOU WANT THE PICTURES? NO
YOU ROLLED A  2
2=NECK
YOU DO NOT NEED A NECK.
I ROLLED A 2
2=NECK
I DO NOT NEED A NECK.
YOU ROLLED A  4
4=FEELERS
YOU DO NOT HAVE A HEAD.
I ROLLED A 1
1=BODY
I DO NOT NEED A BODY.
YOU ROLLED A  2
2=NECK
YOU DO NOT NEED A NECK.
I ROLLED A 3
3=HEAD
I DO NOT NEED A HEAD.
YOU ROLLED A  5
5=TAIL
YOU ALREADY HAVE A TAIL.
I ROLLED A 5
5=TAIL
I DO NOT NEED A TAIL.
YOU ROLLED A  6
6=LEG
YOU NOW HAVE  3  LEGS.
I ROLLED A 2
2=NECK
I DO NOT NEED A NECK.
3=HEAD
YOU NEEDED A HEAD.
I ROLLED A 3
3=HEAD
I DO NOT NEED A HEAD.
DO YOU WANT THE PICTURES? NO
YOU ROLLED A  5
5=TAIL
YOU ALREADY HAVE A TAIL.
I ROLLED A 5
5=TAIL
I DO NOT NEED A TAIL.
YOU ROLLED A  2
2=NECK
YOU DO NOT NEED A NECK.
I ROLLED A 6
6=LEGS
I NOW HAVE 6 LEGS.
MY BUG IS FINISHED.
DO YOU WANT THE PICTURES? YES
*****YOUR BUG*****


         HHHHHHH
         H     H
         H O O H
         H     H
         H  V  H
         HHHHHHH
           N N
           N N
      BBBBBBBBBBB
      B         B
      B         B
TTTTTB          B
      BBBBBBBBBBB
       L L L
       L L L



******MY BUG******


           F F
           F F
           F F
           F F
         HHHHHHH
         H     H
         H O O H
         H     H
         H  V  H
         HHHHHHH
           N N
           N N
      BBBBBBBBBBB
      B         B
      B         B
TTTTTB          B
      BBBBBBBBBBB
       L L L L L L
       L L L L L L
I HOPE YOU ENJOYED THE GAME, PLAY IT AGAIN SOON!!
```

```
10 PRINT TAB(34);"BUG"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
40 REM
50 A=0: B=0: H=0: L=0: N=0: P=0: Q=0: R=0: S=0: T=0: U=0: V=0: Y=0
60 PRINT "THE GAME BUG
70 PRINT "I HOPE YOU ENJOY THIS GAME."
80 PRINT
90 PRINT "DO YOU WANT INSTRUCTIONS";
100 INPUT Z$
110 IF Z$="NO" THEN 300
120 PRINT "THE OBJECT OF BUG IS TO FINISH YOUR BUG BEFORE I FINISH"
130 PRINT "MINE.  EACH NUMBER STANDS FOR A PART OF THE BUG BODY."
140 PRINT "I WILL ROLL THE DIE FOR YOU, TELL YOU WHAT I ROLLED FOR YOU"
150 PRINT "WHAT THE NUMBER STANDS FOR, AND IF YOU CAN GET THE PART."
160 PRINT "IF YOU CAN GET THE PART I WILL GIVE IT TO YOU."
170 PRINT "THE SAME WILL HAPPEN ON MY TURN."
180 PRINT "IF THERE IS A CHANGE IN EITHER BUG I WILL GIVE YOU THE"
190 PRINT "OPTION OF SEEING THE PICTURES OF THE BUGS."
200 PRINT "THE NUMBERS STAND FOR PARTS AS FOLLOWS:"
210 PRINT "NUMBER","PART","NUMBER OF PART NEEDED"
220 PRINT "1","BODY","1"
230 PRINT "2","NECK","1"
240 PRINT "3","HEAD","1"
250 PRINT "4","FEELERS","2"
260 PRINT "5","TAIL","1"
270 PRINT "6","LEGS","6"
280 PRINT
290 PRINT
300 IF Y>0 THEN 2480
310 Z=INT(6*RND(1)+1)
320 C=1
330 PRINT "YOU ROLLED A ";Z
340 ON Z GOTO 350,430,540,650,760,870
350 PRINT "1=BODY"
360 IF B=1 THEN 410
370 PRINT "YOU NOW HAVE A BODY."
380 B=1
390 C=0
400 GOTO 970
410 PRINT "YOU DO NOT NEED A BODY."
420 GOTO 970
430 PRINT "2=NECK"
440 IF N=1 THEN 500
450 IF B=0 THEN 520
460 PRINT "YOU NOW HAVE A NECK."
470 N=1
480 C=0
490 GOTO 970
500 PRINT "YOU DO NOT NEED A NECK."
510 GOTO 970
520 PRINT "YOU DO NOT HAVE A BODY."
530 GOTO 970
540 PRINT "3=HEAD"
550 IF N=0 THEN 610
560 IF H=1 THEN 630
570 PRINT "YOU NEEDED A HEAD."
580 H=1
590 C=0
600 GOTO 970
610 PRINT "YOU DO NOT HAVE A NECK."
620 GOTO 970
630 PRINT "YOU HAVE A HEAD."
640 GOTO 970
650 PRINT "4=FEELERS"
660 IF H=0 THEN 740
670 IF A=2 THEN 720
680 PRINT "I NOW GIVE YOU A FEELER"
690 A=A+1
700 C=0
710 GOTO 970
720 PRINT "YOU HAVE TWO FEELERS ALREADY."
730 GOTO 970
740 PRINT "YOU DO NOT HAVE A HEAD."
750 GOTO 970
760 PRINT "5=TAIL"
770 IF B=0 THEN 830
780 IF T=1 THEN 850
790 PRINT "I NOW GIVE YOU A TAIL."
800 T=T+1
810 C=0
820 GOTO 970
830 PRINT "YOU DO NOT HAVE A BODY."
840 GOTO 970
850 PRINT "YOU ALREADY HAVE A TAIL."
860 GOTO 970
870 PRINT "6=LEG"
880 IF L=6 THEN 940
890 IF B=0 THEN 960
900 L=L+1
910 C=0
920 PRINT "YOU NOW HAVE ";L;" LEGS."
930 GOTO 970
940 PRINT "YOU HAVE 6 FEET ALREADY."
950 GOTO 970
960 PRINT "YOU DO NOT HAVE A BODY."
970 X=INT(6*RND(1)+1)
980 PRINT "I ROLLED A";X
990 ON X GOTO 1000,1080,1190,1300,1410,1520
1000 PRINT "1=BODY"
1010 IF P=1 THEN 1060
1020 PRINT "I NOW HAVE A BODY."
1030 C=0
1040 P=1
1050 GOTO 1630
1060 PRINT "I DO NOT NEED A BODY."
1070 GOTO 1630
1080 PRINT "2=NECK"
1090 IF Q=1 THEN 1150
1100 IF P=0 THEN 1170
1110 PRINT "I NOW HAVE A NECK."
1120 Q=1
1130 C=0
1140 GOTO 1630
1150 PRINT "I DO NOT NEED A NECK."
1160 GOTO 1630
1170 PRINT "I DO NOT HAVE A BODY."
1180 GOTO 1630
1190 PRINT "3=HEAD"
1200 IF Q=0 THEN 1260
1210 IF R=1 THEN 1280
1220 PRINT "I NEEDED A HEAD."
1230 R=1
1240 C=0
1250 GOTO 1630
1260 PRINT "I DO NOT HAVE A NECK."
1270 GOTO 1630
1280 PRINT "I DO NOT NEED A HEAD."
1290 GOTO 1630
1300 PRINT "4=FEELERS"
1310 IF R=0 THEN 1390
1320 IF S=2 THEN 1370
1330 PRINT "I GET A FEELER."
1340 S=S+1
1350 C=0
1360 GOTO 1630
1370 PRINT "I HAVE 2 FEELERS ALREADY."
1380 GOTO 1630
1390 PRINT "I DO NOT HAVE A HEAD."
1400 GOTO 1630
1410 PRINT "5=TAIL"
1420 IF P=0 THEN 1480
1430 IF U=1 THEN 1500
1440 PRINT "I NOW HAVE A TAIL."
1450 U=1
1460 C=0
1470 GOTO 1630
1480 PRINT "I DO NOT HAVE A BODY."
1490 GOTO 1630
1500 PRINT "I DO NOT NEED A TAIL."
1510 GOTO 1630
1520 PRINT "6=LEGS"
1530 IF V=6 THEN 1590
1540 IF P=0 THEN 1610
1550 V=V+1
1560 C=0
1570 PRINT "I NOW HAVE";V;"LEGS."
1580 GOTO 1630
1590 PRINT,"I HAVE 6 FEET."
1600 GOTO 1630
1610 PRINT "I DO NOT HAVE A BODY."
1620 GOTO 1630
1630 IF A=2 AND T=1 AND L=6 THEN 1650
1640 GOTO 1670
1650 PRINT "YOUR BUG IS FINISHED."
1660 Y=Y+1
1670 IF S=2 AND P=1 AND V=6 THEN 1690
1680 GOTO 1710
1690 PRINT "MY BUG IS FINISHED."
1700 Y=Y+2
1710 IF C=1 THEN 300
1720 PRINT "DO YOU WANT THE PICTURES";
1730 INPUT Z$
1740 IF Z$="NO" THEN 300
1750 PRINT "*****YOUR BUG*****"
1760 PRINT
1770 PRINT
1780 IF A=0 THEN 1860
1790 FOR Z=1 TO 4
1800 FOR X=1 TO A
1810 PRINT TAB(10);
1820 PRINT "A ";
1830 NEXT X
1840 PRINT
1850 NEXT Z
1860 IF H=0 THEN 1880
1870 GOSUB 2470
1880 IF N=0 THEN 1920
1890 FOR Z=1 TO 2
1900 PRINT "          N N"
1910 NEXT Z
1920 IF B=0 THEN 2000
1930 PRINT "     BBBBBBBBBBBB"
1940 FOR Z=1 TO 2
1950 PRINT "     B           B"
1960 NEXT Z
1970 IF T<>1 THEN 1990
1980 PRINT "TTTTTB           B"
1990 PRINT "     BBBBBBBBBBBB"
2000 IF L=0 THEN 2080
2010 FOR Z=1 TO 2
2020 PRINT TAB(5);
2030 FOR X=1 TO L
2040 PRINT " L";
2050 NEXT X
2060 PRINT
2070 NEXT Z
2080 FOR Z=1 TO 4
2090 PRINT
2100 NEXT Z
2110 PRINT "******MY BUG******"
2120 PRINT
2130 PRINT
2140 PRINT
2150 IF S=0 THEN 2230
2160 FOR Z=1 TO 4
2170 PRINT TAB(10);
2180 FOR X=1 TO S
2190 PRINT "F ";
2200 NEXT X
2210 PRINT
2220 NEXT Z
2230 IF R<>1 THEN 2250
2240 GOSUB 2470
2250 IF Q=0 THEN 2280
2260 PRINT "          N N"
2270 PRINT "          N N"
2280 IF P=0 THEN 2360
2290 PRINT "     BBBBBBBBBBBB"
2300 FOR Z=1 TO 2
2310 PRINT "     B           B"
2320 NEXT Z
2330 IF U<>1 THEN 2350
2340 PRINT "TTTTTB           B"
2350 PRINT "     BBBBBBBBBBBB"
2360 IF V=0 THEN 2450
2370 FOR Z=1 TO 2
2380 PRINT TAB(5);
2390 FOR X=1 TO V
2400 PRINT " L";
2410 NEXT X
2420 PRINT
2430 NEXT Z
2450 IF Y<>0 THEN 2540
2460 GOTO 300
2470 PRINT "        HHHHHHH"
2480 PRINT "        H     H"
2490 PRINT "        H O O H"
2500 PRINT "        H     H"
2510 PRINT "        H  V  H"
2520 PRINT "        HHHHHHH"
2530 RETURN
2540 PRINT "I HOPE YOU ENJOYED THE GAME,
2550 END                    PLAY IT AGAIN SOON!!"
```

Bullfight

In this simulated bullfight, you are the matador — i.e., the one with the principal role and the one who must kill the bull or be killed (or run from the ring).

On each pass of the bull, you may try:

0 Veronica (dangerous inside move of the cape)
1 Less dangerous outside move of the cape
2 Ordinary swirl of the cape

Or you may try to kill the bull:

4 Over the horns
5 In the chest

The crowd will determine what award you deserve, posthumously if necessary. The braver you are, the better the award you receive. It's nice to stay alive too. The better the job the picadores and toreadores do, the better your chances.

David Sweet of Dartmouth wrote the original version of this program. It was then modified by students at Lexington High School and finally by Steve North of Creative Computing.

```
                  BULL
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES
HELLO, ALL YOU BLOODLOVERS AND AFICIONADOS
HERE IS YOUR BIG CHANCE TO KILL A BULL

ON EACH PASS OF THE BULL, YOU MAY TRY
0 - VERONICA (DANGEROUS INSIDE MOVE OF THE CAPE)
1 - LESS DANGEROUS OUTSIDE MOVE OF THE CAPE
2 - ORDINARY SWIRL OF THE CAPE

INSTEAD OF THE ABOVE, YOU MAY TRY TO KILL THE BULL
ON ANY TURN: 4 (OVER THE HORNS), 5 (IN THE CHEST)
BUT IF I WERE YOU,
I WOULDN'T TRY IT BEFORE THE SEVENTH PASS.

THE CROWD WILL DETERMINE WHAT AWARD YOU DESERVE
POSTHUMOUSLY IF NECESSARY
THE BRAVER YOU ARE, THE BETTER THE AWARD YOU RECEIVE

THE BETTER A JOB THE PICADORES AND TOREADORES DO,
THE BETTER YOUR CHANCES ARE


YOU HAVE DRAWN A POOR BULL.

THE PICADORES DID A AWFUL JOB.
 2 OF THE HORSES OF THE PICADORES KILLED.
 1 OF THE PICADORES KILLED.

THE TOREADORES DID A AWFUL JOB.
 2 OF THE TOREADORES KILLED.


PASS NUMBER 1
THE BULL IS CHARGING AT YOU!  YOU ARE THE MATADOR--
DO YOU WANT TO KILL THE BULL? NO
WHAT MOVE DO YOU MAKE WITH THE CAPE? 0


PASS NUMBER 2
THE BULL IS CHARGING AT YOU!  YOU ARE THE MATADOR--
DO YOU WANT TO KILL THE BULL? NO
WHAT MOVE DO YOU MAKE WITH THE CAPE? 1


PASS NUMBER 3
HERE COMES THE BULL.  TRY FOR A KILL? NO
CAPE MOVE? 1


PASS NUMBER 4
HERE COMES THE BULL.  TRY FOR A KILL? NO
CAPE MOVE? 0


PASS NUMBER 5
HERE COMES THE BULL.  TRY FOR A KILL? NO
CAPE MOVE? 2


PASS NUMBER 6
HERE COMES THE BULL.  TRY FOR A KILL? NO
CAPE MOVE? 1


PASS NUMBER 7
HERE COMES THE BULL.  TRY FOR A KILL? NO
CAPE MOVE? 0


PASS NUMBER 8
HERE COMES THE BULL.  TRY FOR A KILL? YES
IT IS THE MOMENT OF TRUTH.
HOW DO YOU TRY TO KILL THE BULL? 5
THE BULL HAS GORED YOU
YOU ARE DEAD


THE CROWD AWARDS YOU
ONE EAR OF THE BULL

ADIOS


DO YOU WANT INSTRUCTIONS? NO


YOU HAVE DRAWN A SUPERB BULL.
GOOD LUCK.  YOU'LL NEED IT.


THE PICADORES DID A SUPERB JOB.

THE TOREADORES DID A SUPERB JOB.


PASS NUMBER 1
THE BULL IS CHARGING AT YOU!  YOU ARE THE MATADOR--
DO YOU WANT TO KILL THE BULL? NO
WHAT MOVE DO YOU MAKE WITH THE CAPE? 2
THE BULL HAS GORED YOU
YOU ARE DEAD


THE CROWD AWARDS YOU
ONE EAR OF THE BULL

ADIOS
```

```
10 PRINT TAB(34);"BULL"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 DEF FNA(K)=INT(RND(1)*2+1)
200 PRINT:PRINT:PRINT
202 L=1
205 PRINT "DO YOU WANT INSTRUCTIONS";
206 INPUT Z$
207 IF Z$="NO" THEN 400
210 PRINT "HELLO, ALL YOU BLOODLOVERS AND AFICIONADOS"
220 PRINT "HERE IS YOUR BIG CHANCE TO KILL A BULL"
230 PRINT
240 PRINT "ON EACH PASS OF THE BULL, YOU MAY TRY"
250 PRINT "0 - VERONICA (DANGEROUS INSIDE MOVE OF THE CAPE)"
260 PRINT "1 - LESS DANGEROUS OUTSIDE MOVE OF THE CAPE"
270 PRINT "2 - ORDINARY SWIRL OF THE CAPE"
280 PRINT
290 PRINT "INSTEAD OF THE ABOVE, YOU MAY TRY TO KILL THE BULL"
300 PRINT "ON ANY TURN: 4 (OVER THE HORNS), 5 (IN THE CHEST)"
310 PRINT "BUT IF I WERE YOU,"
320 PRINT "I WOULDN'T TRY IT BEFORE THE SEVENTH PASS."
330 PRINT
340 PRINT "THE CROWD WILL DETERMINE WHAT AWARD YOU DESERVE"
350 PRINT "POSTHUMOUSLY IF NECESSARY"
360 PRINT "THE BRAVER YOU ARE, THE BETTER THE AWARD YOU RECEIVE"
370 PRINT
380 PRINT "THE BETTER A JOB THE PICADORES AND TOREADORES DO,"
390 PRINT "THE BETTER YOUR CHANCES ARE"
400 PRINT
410 PRINT
420 D(5)=1
430 D(4)=1
450 DIM L$(5)
455 A=INT(RND(1)*5+1)
460 FOR I=1 TO 5
463 READ L$(I)
467 NEXT I
470 DATA "SUPERB","GOOD","FAIR","POOR","AWFUL"
490 PRINT "YOU HAVE DRAWN A ";L$(A);" BULL."
500 IF A>4 THEN 530
510 IF A<2 THEN 550
520 GOTO 570
530 PRINT "YOU'RE LUCKY."
540 GOTO 570
550 PRINT "GOOD LUCK.  YOU'LL NEED IT."
560 PRINT
570 PRINT
590 A$="PICADO"
595 B$="RES"
600 GOSUB 1610
610 D(1)=C
630 A$="TOREAD"
635 B$="ORES"
640 GOSUB 1610
650 D(2)=C
660 PRINT
670 PRINT
680 IF Z=1 THEN 1310
690 D(3)=D(3)+1
700 PRINT "PASS NUMBER";D(3)
710 IF D(3)<3 THEN 760
720 PRINT "HERE COMES THE BULL.  TRY FOR A KILL";
730 GOSUB 1930
735 IF Z1=1 THEN 1130
740 PRINT "CAPE MOVE";
750 GOTO 800
760 PRINT "THE BULL IS CHARGING AT YOU!  YOU ARE THE MATADOR--"
770 PRINT "DO YOU WANT TO KILL THE BULL";
780 GOSUB 1930
785 IF Z1=1 THEN 1130
790 PRINT "WHAT MOVE DO YOU MAKE WITH THE CAPE";
800 INPUT E
810 IF E<>INT(ABS(E)) THEN 830
820 IF E<3 THEN 850
830 PRINT "DON'T PANIC, YOU IDIOT!  PUT DOWN A CORRECT NUMBER"
840 GOTO 800
850 REM
860 IF E=0 THEN 920
870 IF E=1 THEN 900
880 M=.5
890 GOTO 930
900 M=2
910 GOTO 930
920 M=3
930 L=L+M
940 F=(6-A+M/10)*RND(1)/((D(1)+D(2)+D(3)/10)*5)
950 IF F<.51 THEN 660
960 PRINT "THE BULL HAS GORED YOU"
970 ON FNA(0) GOTO 980,1010
980 PRINT "YOU ARE DEAD"
990 D(4)=1.5
1000 GOTO 1310
1010 PRINT "YOU ARE STILL ALIVE"
1020 PRINT "DO YOU RUN FROM THE RING";
1030 GOSUB 1930
1035 IF Z1=2 THEN 1070
1040 PRINT "COWARD"
1050 D(4)=0
1060 GOTO 1310
1070 PRINT "YOU ARE BRAVE.  STUPID, BUT BRAVE."
1080 ON FNA(0) GOTO 1090,1110
1090 D(4)=2
1100 GOTO 660
1110 PRINT "YOU ARE GORED AGAIN"
1120 GOTO 970
1130 REM
1140 Z=1
1150 PRINT "IT IS THE MOMENT OF TRUTH."
1155 PRINT "HOW DO YOU TRY TO KILL THE BULL";
1160 INPUT H
1170 IF H=4 THEN 1230
1180 IF H=5 THEN 1230
1190 PRINT "YOU PANICKED.  THE BULL GORED YOU."
1220 GOTO 970
1230 K=(6-A)*10*RND(1)/((D(1)+D(2))*5*D(3))
1240 IF J=4 THEN 1290
1250 IF K>.2 THEN 960
1260 PRINT "YOU KILLED THE BULL"
1270 D(5)=2
1280 GOTO 1320
1290 IF K>.8 THEN 960
1300 GOTO 1260
1310 PRINT
1320 PRINT
1330 PRINT
1340 IF D(4)<>0 THEN 1390
1350 PRINT "THE CROWD BOOS FOR TEN MINUTES.  IF YOU EVER DARE TO SHOW"
1360 PRINT "YOUR FACE IN A RING AGAIN, THEY SWEAR THEY WILL KILL YOU--"
1370 PRINT "UNLES THE BULL DOES FIRST."
1380 GOTO 1580
1390 DEF FNC(Q)=FND(Q)*RND(1)
1395 DEF FND(Q)=(4.5+L/6-(D(1)+D(2))*2.5+4*D(4)+2*D(5)-D(3)^2/120-A)
1400 IF D(4)<>2 THEN 1430
1410 PRINT "THE CROWD CHEERS WILDLY"
1420 GOTO 1450
1430 IF D(5)<>2 THEN 1450
1440 PRINT "THE CROWD CHEERS"
1450 PRINT "THE CROWD AWARDS YOU"
1460 IF FNC(Q)<2.4 THEN 1570
1470 IF FNC(Q)<4.9 THEN 1550
1480 IF FNC(Q)<7.4 THEN 1520
1500 PRINT "OLE!  YOU ARE 'MUY HOMBRE'!! OLE!  OLE!"
1510 GOTO 1580
1520 PRINT "BOTH EARS OF THE BULL"
1530 PRINT "OLE!"
1540 GOTO 1580
1550 PRINT "ONE EAR OF THE BULL"
1560 GOTO 1580
1570 PRINT "NOTHING AT ALL"
1580 PRINT
1590 PRINT "ADIOS"
1600 GOTO 2030
1610 B=3/A*RND(1)
1620 IF B<.37 THEN 1740
1630 IF B<.5 THEN 1720
1640 IF B<.63 THEN 1700   1920 REM
1650 IF B<.87 THEN 1680   1930 INPUT A$
1660 C=.1                 1940 IF A$="YES" THEN 1990
1670 GOTO 1750            1950 IF A$="NO" THEN 2010
1680 C=.2                 1970 PRINT "INCORRECT ANSWER - - PLEASE TYPE 'YES' OR 'NO'."
1690 GOTO 1750            1980 GOTO 1930
1700 C=.3                 1990 Z1=1
1710 GOTO 1750            2000 GOTO 2020
1720 C=.4                 2010 Z1=2
1730 GOTO 1750            2020 RETURN
1740 C=.5                 2030 END
1750 T=INT(10*C+.2)
1760 PRINT "THE ";A$;B$;" DID A ";L$(T);" JOB."
1770 IF 4>T THEN 1900
1780 IF 5=T THEN 1870
1790 ON FNA(K) GOTO 1830,1850
1800 IF A$="TOREAD" THEN 1820
1810 PRINT "ONE OF THE HORSES OF THE ";A$;B$;" WAS KILLED."
1820 OF FNA(K) GOTO 1830,1850
1830 PRINT "ONE OF THE ";A$;B$;" WAS KILLED."
1840 GOTO 1900
1850 PRINT "NO ";A$;B$;" WERE KILLED."
1860 GOTO 1900
1870 IF A$="TOREAD" THEN 1890
1880 PRINT FNA(K);"OF THE HORSES OF THE ";A$;B$;" KILLED."
1890 PRINT FNA(K);"OF THE ";A$;B$;" KILLED."
1900 PRINT
1910 RETURN
```

Bullseye

In this game, up to 20 players throw darts at a target with 10-, 20-, 30-, and 40-point zones. The objective is to get 200 points.

You have a choice of three methods of throwing:

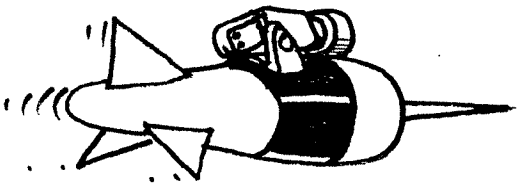
Throw	Description	Probable Score
1	Fast overarm	Bullseye or complete miss
2	Controlled overarm	10, 20, or 30 points
3	Underarm	Anything

You will find after playing a while that different players will swear by different strategies. However, consider the expected score per throw by always using Throw 3 (program line 220):

Score (S)	Probability (P)	S x P
40	1.00-.95 = .05	2
30	.95-.75 = .20	6
30	.75-.45 = .30	6
10	.45-.05 = .40	4
0	.05-.00 = .05	0
Expected score per throw =		18

Calculate the expected scores for the other throws and you may be surprised!

The program was written by David Ahl of Creative Computing.



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                BULLSEYE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

IN THIS GAME, UP TO 20 PLAYERS THROW DARTS AT A TARGET
WITH 10, 20, 30, AND 40 POINT ZONES.  THE OBJECTIVE IS
TO GET 200 POINTS.

THROW           DESCRIPTION             PROBABLE SCORE
 1              FAST OVERARM            BULLSEYE OR COMPLETE MISS
 2              CONTROLLED OVERARM      10, 20 OR 30 POINTS
 3              UNDERARM                ANYTHING

HOW MANY PLAYERS? 2

NAME OF PLAYER # 1 ? STEVE
NAME OF PLAYER # 2 ? DARTH

ROUND 1

STEVE'S THROW? 1
30-POINT ZONE!
TOTAL SCORE = 30

DARTH'S THROW? 2
WHEW!  10 POINTS.
TOTAL SCORE = 10

ROUND 2

STEVE'S THROW? 3
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 30

DARTH'S THROW? 1
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 10

ROUND 3

STEVE'S THROW? 1
20-POINT ZONE
TOTAL SCORE = 50

DARTH'S THROW? 1
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 10

ROUND 4

STEVE'S THROW? 2
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 50

DARTH'S THROW? 2
20-POINT ZONE
TOTAL SCORE = 30

ROUND 5

STEVE'S THROW? 1
BULLSEYE!!  40 POINTS!
TOTAL SCORE = 90

DARTH'S THROW? 1
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 30

ROUND 6

STEVE'S THROW? 1
30-POINT ZONE!
TOTAL SCORE = 120

DARTH'S THROW? 2
WHEW!  10 POINTS.
TOTAL SCORE = 40

ROUND 7

STEVE'S THROW? 2
WHEW!  10 POINTS.
TOTAL SCORE = 130

DARTH'S THROW? 3
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 40

ROUND 8

STEVE'S THROW? 1
BULLSEYE!!  40 POINTS!
TOTAL SCORE = 170

DARTH'S THROW? 2
WHEW!  10 POINTS.
TOTAL SCORE = 50

ROUND 9

STEVE'S THROW? 2
20-POINT ZONE
TOTAL SCORE = 190

DARTH'S THROW? 1
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 50

ROUND 10

STEVE'S THROW? 2
20-POINT ZONE
TOTAL SCORE = 210

DARTH'S THROW? 1
MISSED THE TARGET!  TOO BAD.
TOTAL SCORE = 50

WE HAVE A WINNER!!

STEVE SCORED 210 POINTS.

THANKS FOR THE GAME.
```

```
5 PRINT TAB(32);"BULLSEYE"
10 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
20 PRINT:PRINT:PRINT
30 PRINT "IN THIS GAME, UP TO 20 PLAYERS THROW DARTS AT A TARGET"
40 PRINT "WITH 10, 20, 30, AND 40 POINT ZONES.  THE OBJECTIVE IS"
50 PRINT "TO GET 200 POINTS.": PRINT
60 PRINT "THROW",TAB(20);"DESCRIPTION";TAB(45);"PROBABLE SCORE"
70 PRINT" 1";TAB(20);"FAST OVERARM";TAB(45);"BULLSEYE OR COMPLETE MISS"
80 PRINT" 2";TAB(20);"CONTROLLED OVERARM";TAB(45);"10, 20 OR 30 POINTS"
90 PRINT" 3";TAB(20);"UNDERARM";TAB(45);"ANYTHING":PRINT
100 DIM A$(20),S(20),W(10): M=0: R=0: FOR I=1 TO 20: S(I)=0: NEXT I
110 INPUT "HOW MANY PLAYERS";N: PRINT
120 FOR I=1 TO N
130 PRINT "NAME OF PLAYER #";I;:INPUT A$(I)
140 NEXT I
150 R=R+1: PRINT: PRINT "ROUND";R
160 FOR I=1 TO N
170 PRINT: PRINT A$(I)"'S THROW";: INPUT T
180 IF T<0 OR T>3 THEN PRINT "INPUT 1, 2, OR 3!": GOTO 170
190 ON T GOTO 200, 210, 200
200 P1=.65: P2=.55: P3=.5: P4=.5: GOTO 230
210 P1=.99: P2=.77: P3=.43: P4=.01: GOTO 230
220 P1=.95: P2=.75: P3=.45: P4=.05
230 U=RND(1)
240 IF U>=P1 THEN PRINT "BULLSEYE!!  40 POINTS!":B=40: GOTO 290
250 IF U>=P2 THEN PRINT "30-POINT ZONE!":B=30: GOTO 290
260 IF U>=P3 THEN PRINT "20-POINT ZONE":B=20: GOTO 290
270 IF U>=P4 THEN PRINT "WHEW!  10 POINTS.":B=10: GOTO 290
280 PRINT "MISSED THE TARGET!  TOO BAD.": B=0
290 S(I)=S(I)+B: PRINT "TOTAL SCORE =";S(I): NEXT I
300 FOR I=1 TO N
310 IF S(I)>=200 THEN M=M+1: W(M)=I
320 NEXT I
330 IF M=0 THEN 150
340 PRINT: PRINT "WE HAVE A WINNER!!": PRINT
350 FOR I=1 TO M: PRINT A$(W(I));" SCORED";S(W(I));"POINTS.": NEXT I
360 PRINT: PRINT "THANKS FOR THE GAME.": END
```

Bunny

```
                  BUNNY
    CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


 UN
BUN                                                BUNNYB
BUNNYB                                           NYBUNNYBUN
BUNNYBUN                                       UNNYBUNNYBUN
 UNNYBUNNY                                   NNYBUNNYBUNNYB
  NNYBUNNYBU                                 UNNYBUNNYBUNNYB
   NYBUNNYBUNN                             YBUNNYBUNNYBUNNY
    YBUNNYBUNNY                          NNYBUNNYBUNNYBUNN
     BUNNYBUNNYB                        UNNYBUNNYBUNNYBUN
      UNNYBUNNYBU                     BUNNYBUNNYBUNNYB
       NNYBUNNYBUN                  YBUNNYBUNNYBUNNY
        NYBUNNYBUNNY              NYBUNNYBUNNYBUNN
         YBUNNYBUNNYB          NNYBUNNYBUNNYBU
          BUNNYBUNNYBU       UNNYBUNNYBUNNYB
           UNNYBUNNYBUN   BUNNYBUNNYBUNN
            NNYBUNNYBUN YBUNNYBUNNYBU
              NYBUNNYBUNNYBUNNYBUNNY
               YBUNNYBUNNYBUNNYBUNN
                BUNNYBUNNYBUNNYBU
                  NNYBUNNYBUNNY .
                    NYBUNNYBUN
                     YBUNNYBU
                  UNNYBUNNYBUNN
              NYBUNNYBUNNYBUNNYB
            UNNYBUNNYBUNNYBUNNYBU
           BUNNYBUNNYBUNNYBUNNYBUN
        NYBUNNYBUNNYBUNNYBUNNYBUNN
       NNYBUNNYBUNNYBUNNYBUNNYBUNNY
     UNNYBUNN  UNNYBUNNYBUNNYBUNNY
    BUNNYBUN   UNNYBUNNYBUNNYBUNNYB
   YBUNNYBUN   UNNYBUNNYBUNNYBUNNYB
  NYBUNNYBUN  BUNNYBUNNYBUNNYBUNNYB
 NNYBUNNYBUNNYBUNNYBUNNYBUNNYBUNNYB
UNNYBUNNYBUNNYBUNNYBUNNYBUNNYBUNNYB
 NNYBUNNYBUNNYBUNNYBUNNYBUNNYBUNNY
  NYBUNNYBUNNYBUNNYBUNNYBUNNYBUNNY
   YBUNNYBUNNYBUNNYBUNNYBUNNYBUNN
    UNNYBUNNYBUNNYBUNNYBUNNYBUNN
        BUNNYBUNNYBUNNYBUNNYBUN Y
            YBUN YBUNNYB  NYBU   B
              BUNNY   NYBUNNYB     U
             YBUNN  U  YBUNNYB      N
            NYBUNN    NYBUNNY   NYBUNN
          NNYBUNNYBUNNYBUNNY UNN
         UNN   N Y  N YBUNNYBU
        BU     NN   N Y    Y
                  NN  UNNY
                      NNY
                       NY
```

```
10 PRINT TAB(33);"BUNNY"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
100 REM  "BUNNY" FROM AHL'S 'BASIC COMPUTER GAMES'
110 REM
120 FOR I=0 TO 4: READ B(I): NEXT I
130 GOSUB 260
140 L=64: REM  ASCII LETTER CODE...
150 REM
160 PRINT
170 READ X: IF X<0 THEN 160
175 IF X>128 THEN 240
180 PRINT TAB(X);: READ Y
190 FOR I=X TO Y: J=I-5*INT(I/5)
200 PRINT CHR$(L+B(J));
210 NEXT I
220 GOTO 170
230 REM
240 GOSUB 260: GOTO 450
250 REM
260 FOR I=1 TO 6: PRINT CHR$(10);: NEXT I
270 RETURN
280 REM
290 DATA 2,21,14,14,25
300 DATA 1,2,-1,0,2,45,50,-1,0,5,43,52,-1,0,7,41,52,-1
310 DATA 1,9,37,50,-1,2,11,36,50,-1,3,13,34,49,-1,4,14,32,48,-1
320 DATA 5,15,31,47,-1,6,16,30,45,-1,7,17,29,44,-1,8,19,28,43,-1
330 DATA 9,20,27,41,-1,10,21,26,40,-1,11,22,25,38,-1,12,22,24,36,-1
340 DATA 13,34,-1,14,33,-1,15,31,-1,17,29,-1,18,27,-1
350 DATA 19,26,-1,16,28,-1,13,30,-1,11,31,-1,10,32,-1
360 DATA 8,33,-1,7,34,-1,6,13,16,34,-1,5,12,16,35,-1
370 DATA 4,12,16,35,-1,3,12,15,35,-1,2,35,-1,1,35,-1
380 DATA 2,34,-1,3,34,-1,4,33,-1,6,33,-1,10,32,34,34,-1
390 DATA 14,17,19,25,28,31,35,35,-1,15,19,23,30,36,36,-1
400 DATA 14,18,21,21,24,30,37,37,-1,13,18,23,29,33,38,-1
410 DATA 12,29,31,33,-1,11,13,17,17,19,19,22,22,24,31,-1
420 DATA 10,11,17,18,22,22,24,24,29,29,-1
430 DATA 22,23,26,29,-1,27,29,-1,28,29,-1,4096
440 REM
450 END
```

Buzzword

This program is an invaluable aid for preparing speeches and briefings about educational technology. This buzzword generator provides sets of three highly-acceptable words to work into your material. Your audience will never know that the phrases don't really mean much of anything because they sound so great! Full instructions for running are given in the program.

This version of Buzzword was written by David Ahl.

```
          BUZZWORD GENERATOR
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS PROGRAM PRINTS HIGHLY ACCEPTABLE PHRASES IN
'EDUCATOR-SPEAK'THAT YOU CAN WORK INTO REPORTS
AND SPEECHES.  WHENEVER A QUESTION MARK IS PRINTED,
TYPE A 'Y' FOR ANOTHER PHRASE OR 'N' TO QUIT.


HERE'S THE FIRST PHRASE:
ABILITY VERTICAL AGE PERFORMANCE

? Y
DIFFERENTIATED CREATIVE FACILITY

? Y
MANIPULATIVE LEARNING ENVIRONMENT

? Y
ABILITY CREATIVE GROUPING

? Y
TAVISTOCK NON-GRADED REINFORCEMENT

? Y
MODULAR MOTIVATIONAL FACILITY

? Y
TAVISTOCK HUMANISTIC REINFORCEMENT

? Y
DISCOVERY MOTIVATIONAL GROUPING

? Y
HETEROGENEOUS VERTICAL AGE PROCESS

? Y
ABILITY LEARNING PROCESS

? Y
FLEXIBLE TRAINING CORE CURRICULUM

? N
COME BACK WHEN YOU NEED HELP WITH ANOTHER REPORT!
```

```
10 PRINT TAB(26);"BUZZWORD GENERATOR"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
40 PRINT "THIS PROGRAM PRINTS HIGHLY ACCEPTABLE PHRASES IN"
50 PRINT "'EDUCATOR-SPEAK'THAT YOU CAN WORK INTO REPORTS"
60 PRINT "AND SPEECHES.  WHENEVER A QUESTION MARK IS PRINTED,"
70 PRINT "TYPE A 'Y' FOR ANOTHER PHRASE OR 'N' TO QUIT."
80 PRINT:PRINT:PRINT "HERE'S THE FIRST PHRASE:"
90 DIM A$(40)
100 FOR I=1 TO 39 : READ A$(I) : NEXT I
110 PRINT A$(INT(13*RND(1)+1));" ";
120 PRINT A$(INT(13*RND(1)+14));" ";
130 PRINT A$(INT(13*RND(1)+27)) : PRINT
150 INPUT Y$ : IF Y$="Y" THEN 110 ELSE GOTO 999
200 DATA "ABILITY","BASAL","BEHAVIORAL","CHILD-CENTERED"
210 DATA "DIFFERENTIATED","DISCOVERY","FLEXIBLE","HETEROGENEOUS"
220 DATA "HOMOGENEOUS","MANIPULATIVE","MODULAR","TAVISTOCK"
230 DATA "INDIVIDUALIZED","LEARNING","EVALUATIVE","OBJECTIVE"
240 DATA "COGNITIVE","ENRICHMENT","SCHEDULING","HUMANISTIC"
250 DATA "INTEGRATED","NON-GRADED","TRAINING","VERTICAL AGE"
260 DATA "MOTIVATIONAL","CREATIVE","GROUPING","MODIFICATION"
270 DATA "ACCOUNTABILITY","PROCESS","CORE CURRICULUM","ALGORITHM"
280 DATA "PERFORMANCE","REINFORCEMENT","OPEN CLASSROOM","RESOURCE"
290 DATA "STRUCTURE","FACILITY","ENVIRONMENT"
999 PRINT "COME BACK WHEN YOU NEED HELP WITH ANOTHER REPORT!":END
```

Calendar

This program prints out a calendar for any year. You must specify the starting day of the week of the year in Statement 130. (Sunday (0), Monday (-1), Tuesday (-2), etc.). You can determine this by using the program WEEKDAY. You must also make two changes for leap years in Statements 360 and 620. The program listing describes the necessary changes. Running the program produces a nice 12-month calendar.

The program was written by Geoffrey Chase of the Abbey, Portsmouth, Rhode Island.

```
                    CALENDAR
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

** 0   ****************** JANUARY ****************** 365 **
     S       M       T       W       T       F       S
*************************************************************
     1       2       3       4       5       6       7
     8       9      10      11      12      13      14
    15      16      17      18      19      20      21
    22      23      24      25      26      27      28
    29      30      31

** 31  ****************** FEBRUARY****************** 334 **
     S       M       T       W       T       F       S
*************************************************************
                            1       2       3       4
     5       6       7       8       9      10      11
    12      13      14      15      16      17      18
    19      20      21      22      23      24      25
    26      27      28

** 59  ****************** MARCH ****************** 306 **
     S       M       T       W       T       F       S
*************************************************************
                            1       2       3       4
     5       6       7       8       9      10      11
    12      13      14      15      16      17      18
    19      20      21      22      23      24      25
    26      27      28      29      30      31

** 90  ****************** APRIL ****************** 275 **
     S       M       T       W       T       F       S
*************************************************************
                                                    1
     2       3       4       5       6       7       8
     9      10      11      12      13      14      15
    16      17      18      19      20      21      22
    23      24      25      26      27      28      29
    30

** 120 ****************** MAY ****************** 245 **
     S       M       T       W       T       F       S
*************************************************************
            1       2       3       4       5       6
     7       8       9      10      11      12      13
    14      15      16      17      18      19      20
    21      22      23      24      25      26      27
    28      29      30      31

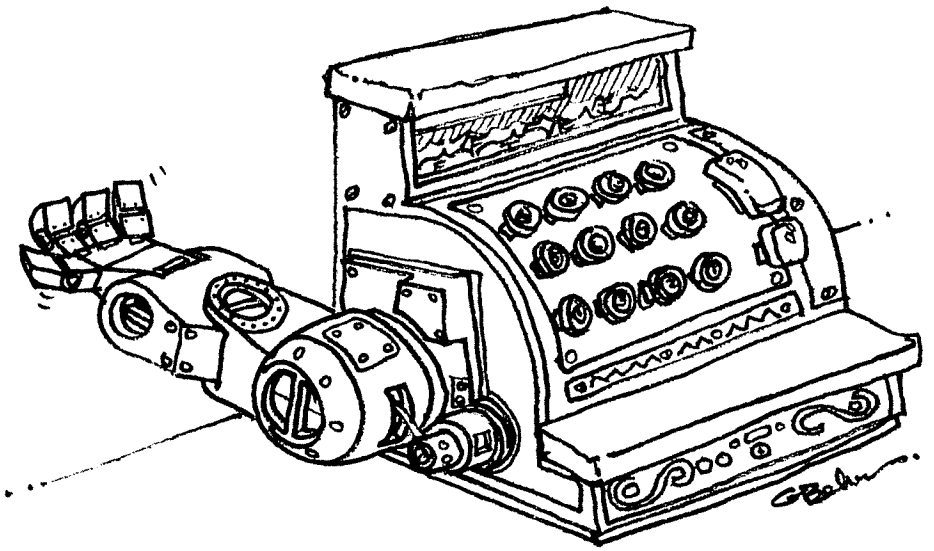
** 151 ****************** JUNE ****************** 214 **
     S       M       T       W       T       F       S
*************************************************************
                                    1       2       3
     4       5       6       7       8       9      10
    11      12      13      14      15      16      17
    18      19      20      21      22      23      24
    25      26      27      28      29      30
```

```
** 181 ******************   JULY   ****************** 184 **
    S       M       T       W       T       F       S
************************************************************
                                                    1
    2       3       4       5       6       7       8
    9       10      11      12      13      14      15
    16      17      18      19      20      21      22
    23      24      25      26      27      28      29
    30      31
** 212 ******************  AUGUST  ****************** 153 **
    S       M       T       W       T       F       S
************************************************************
                    1       2       3       4       5
    6       7       8       9       10      11      12
    13      14      15      16      17      18      19
    20      21      22      23      24      25      26
    27      28      29      30      31
** 243 ******************SEPTEMBER****************** 122 **
    S       M       T       W       T       F       S
************************************************************
                                            1       2
    3       4       5       6       7       8       9
    10      11      12      13      14      15      16
    17      18      19      20      21      22      23
    24      25      26      27      28      29      30
** 273 ****************** OCTOBER ****************** 92 **
    S       M       T       W       T       F       S
************************************************************
    1       2       3       4       5       6       7
    8       9       10      11      12      13      14
    15      16      17      18      19      20      21
    22      23      24      25      26      27      28
    29      30      31
** 304 ****************** NOVEMBER****************** 61 **
    S       M       T       W       T       F       S
************************************************************
                        1       2       3       4
    5       6       7       8       9       10      11
    12      13      14      15      16      17      18
    19      20      21      22      23      24      25
    26      27      28      29      30
```

```
** 334 ****************** DECEMBER****************** 31 **
    S       M       T       W       T       F       S
************************************************************
                                            1       2
    3       4       5       6       7       8       9
    10      11      12      13      14      15      16
    17      18      19      20      21      22      23
    24      25      26      27      28      29      30
    31
```

```
10 PRINT TAB(32);"CALENDAR"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 REM     VALUES FOR 1978 - SEE NOTES
110 DIM M(12)
120 FOR I=1 TO 6: PRINT CHR$(10);: NEXT I
130 D=0: REM 1978 STARTS ON SUNDAY (0=SUN, -1=MON, -2=TUES...)
140 S=0
150 REM     READ DAYS OF EACH MONTH
160 FOR N=0 TO 12: READ M(N): NEXT N
170 REM
180 FOR N=1 TO 12
190 PRINT: PRINT: S=S+M(N-1)
200 PRINT "**";S;TAB(7);
210 FOR I=1 TO 18: PRINT "*";: NEXT I
220 ON N GOTO 230,240,250,260,270,280,290,300,310,320,330,340
230 PRINT " JANUARY ";: GOTO 350
240 PRINT " FEBRUARY";: GOTO 350
250 PRINT "  MARCH  ";: GOTO 350
260 PRINT "  APRIL  ";: GOTO 350
270 PRINT "   MAY   ";: GOTO 350
280 PRINT "   JUNE  ";: GOTO 350
290 PRINT "   JULY  ";: GOTO 350
300 PRINT "  AUGUST ";: GOTO 350
310 PRINT "SEPTEMBER";: GOTO 350
320 PRINT " OCTOBER ";: GOTO 350
330 PRINT " NOVEMBER";: GOTO 350
340 PRINT " DECEMBER";
350 FOR I=1 TO 18: PRINT "*";: NEXT I
360 PRINT 365-S;"**";
370 REM   366-S;     ON LEAP YEARS
380 PRINT CHR$(10): PRINT "     S       M       T       W";
390 PRINT "       T       F       S"
400 PRINT
410 FOR I=1 TO 59: PRINT "*";: NEXT I
420 REM
430 FOR W=1 TO 6
440 PRINT CHR$(10)
450 PRINT TAB(4)
460 REM
470 FOR G=1 TO 7
480 D=D+1
490 D2=D-S
500 IF D2>M(N) THEN 580
510 IF D2>0 THEN PRINT D2;
520 PRINT TAB(4+8*G);
530 NEXT G
540 REM
550 IF D2=M(N) THEN 590
560 NEXT W
570 REM
580 D=D-G
590 NEXT N
600 REM
610 FOR I=1 TO 6: PRINT CHR$(10);: NEXT I
620 DATA 0,31,28,31,30,31,30,31,31,30,31,30,31
630 REM  0,31,29,  ..., ON LEAP YEARS
640 END
```

Change



In this program, the computer pretends it is the cashier at your friendly neighborhood candy store. You tell it the cost of the item(s) you are buying, the amount of your payment, and it will automatically (!) determine your correct change. Aren't machines wonderful? Dennis Lunder of People's Computer Company wrote this program.

```
                CHANGE
  CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


I, YOUR FRIENDLY MICROCOMPUTER, WILL DETERMINE
THE CORRECT CHANGE FOR ITEMS COSTING UP TO $100.

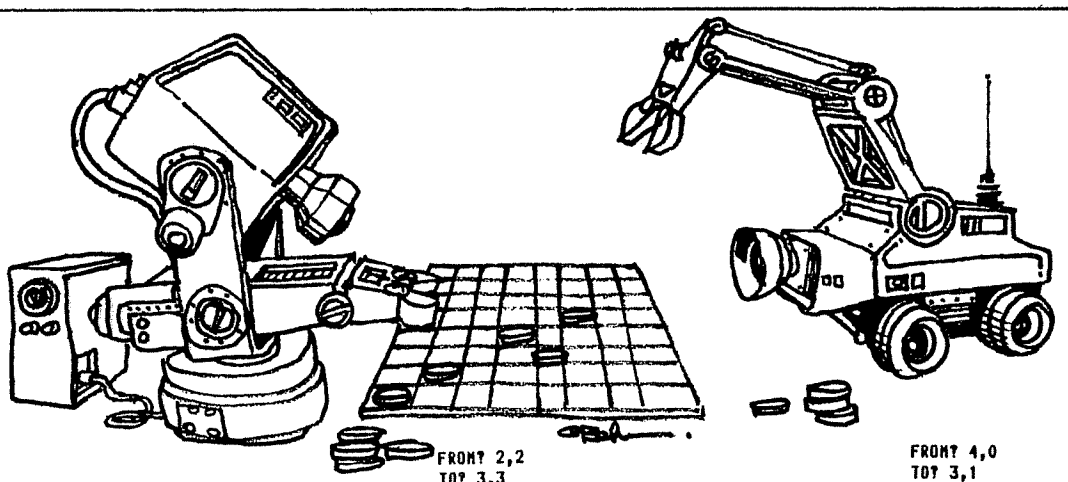

COST OF ITEM? 80.80
AMOUNT OF PAYMENT? 100
YOUR CHANGE, $ 19.20
 1 TEN DOLLAR BILL(S)
 1 FIVE DOLLARS BILL(S)
 4 ONE DOLLAR BILL(S)
 1 DIME(S)
 1 NICKEL(S)
 5 PENNY(S)
THANK YOU, COME AGAIN.


COST OF ITEM? .19
AMOUNT OF PAYMENT? 1.00
YOUR CHANGE, $ .81
 1 ONE HALF DOLLAR(S)
 1 QUARTER(S)
 1 NICKEL(S)
 1 PENNY(S)
THANK YOU, COME AGAIN.


COST OF ITEM? 1.01
AMOUNT OF PAYMENT? 5
YOUR CHANGE, $ 3.99
 3 ONE DOLLAR BILL(S)
 1 ONE HALF DOLLAR(S)
 1 QUARTER(S)
 2 DIME(S)
 4 PENNY(S)
```

```
2 PRINT TAB(33);"CHANGE"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
5 PRINT:PRINT:PRINT
6 PRINT "I, YOUR FRIENDLY MICROCOMPUTER, WILL DETERMINE"
8 PRINT "THE CORRECT CHANGE FOR ITEMS COSTING UP TO $100."
9 PRINT:PRINT
10 PRINT "COST OF ITEM";:INPUT A:PRINT "AMOUNT OF PAYMENT";:INPUT P
20 C=P-A:M=C:IF C<>0 THEN 90
25 PRINT "CORRECT AMOUNT, THANK YOU."
30 GOTO 10
90 IF C>0 THEN 120
95 PRINT "SORRY, YOU HAVE SHORT-CHANGED ME $";A-P
100 GOTO 10
120 PRINT "YOUR CHANGE, $";C
130 D=INT(C/10)
140 IF D=0 THEN 155
150 PRINT D;"TEN DOLLAR BILL(S)"
155 C=M-(D*10)
160 E=INT(C/5)
170 IF E=0 THEN 185
180 PRINT E;"FIVE DOLLARS BILL(S)"
185 C=M-(D*10+E*5)
190 F=INT(C)
200 IF F=0 THEN 215
210 PRINT F;"ONE DOLLAR BILL(S)"
215 C=M-(D*10+E*5+F)
220 C=C*100
225 M=C
230 G=INT(C/50)
240 IF G=0 THEN 255
250 PRINT G;"ONE HALF DOLLAR(S)"
255 C=M-(G*50)
260 H=INT(C/25)
270 IF H=0 THEN 285
280 PRINT H;"QUARTER(S)"
285 C=M-(G*50+H*25)
290 I=INT(C/10)
300 IF I=0 THEN 315
310 PRINT I;"DIME(S)"
315 C=M-(G*50+H*25+I*10)
320 J=INT(C/5)
330 IF J=0 THEN 345
340 PRINT J;"NICKEL(S)"
345 C=M-(G*50+H*25+I*10+J*5)
350 K=INT(C+.5)
360 IF K=0 THEN 380
370 PRINT K;"PENNY(S)"
380 PRINT "THANK YOU, COME AGAIN."
390 PRINT:PRINT
400 GOTO 10
410 END
```

Checkers



This program plays checkers. The pieces played by the computer are marked with an "X", yours are marked "O". A move is made by specifying the coordinates of the piece to be moved (X, Y). Home (O,O) is in the bottom left and X specifies distance to the right of home (i.e., column) and Y specifies distance above home (i.e., row). You then specify where you wish to move to.

The original version of the program by Alan Segal was not able to recognize (or permit) a double or triple jump. If you tried one, it was likely that your piece would disappear altogether!

Steve North of Creative Computing rectified this problem and Lawrence Neal contributed modifications to allow the program to tell which player has won the game. The computer does not play a particularly good game but we leave it to *you* to improve that.

```
                CHECKERS
  CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS IS THE GAME OF CHECKERS.  THE COMPUTER IS X,
AND YOU ARE O.  THE COMPUTER WILL MOVE FIRST.
SQUARES ARE REFERRED TO BY A COORDINATE SYSTEM.
(0,0) IS THE LOWER LEFT CORNER
(0,7) IS THE UPPER LEFT CORNER
(7,0) IS THE LOWER RIGHT CORNER
(7,7) IS THE UPPER RIGHT CORNER
THE COMPUTER WILL TYPE '+TO' WHEN YOU HAVE ANOTHER
JUMP.  TYPE TWO NEGATIVE NUMBERS IF YOU CANNOT JUMP.

     FROM 1  5 TO 0  4

     . X . X . X . X
     X . X . X . X .
     . . . X . X . X
     X . . . . . . .
     . . . . . . . .
     O . O . O . O .
     . O . O . O . O
     O . O . O . O .

FROM? 2,2
TO? 3,3
FROM 0  6 TO 1  5

. X . X . X . X
. . X . X . X .
. X . X . X . X
X . . . . . . .
. . . O . . . .
O . . . O . O .
. O . O . O . O
O . O . O . O .

FROM? 0,2
TO? 1,3
FROM 0  4 TO 2  2

. X . X . X . X
. . X . X . X .
. X . X . X . X
. . . . . . . .
. . . O . . . .
. . X . O . O .
. O . O . O . O
O . O . O . O .

FROM? 3,1
TO? 1,3
+TO? -1,-1
FROM 1  5 TO 0  4

. X . X . X . X
. . X . X . X .
. . . X . X . X
X . . . . . . .
. O . O . . . .
. . . . O . O .
. O . . . O . O
O . O . O . O .

FROM? 4,0
TO? 3,1
FROM 0  4 TO 2  2 TO 4  0

. X . X . X . X
. . X . X . X .
. . . X . X . X
. . . . . . . .
. . . O . . . .
. . . . O . O .
. O . . . O . O
O . O . X* . O .

FROM? 6,2
TO? 5,3
FROM 4  0 TO 6  2 TO 4  4 TO 2  2

. X . X . X . X
. . X . X . X .
. . . X . X . X
. . . . . . . .
. . . . . . . .
. . X* . O . . .
. O . . . . . O
O . O . . . O .

FROM? 1,1
TO? 3,3
+TO? -1,-1
FROM 2  6 TO 1  5

. X . X . X . X
. . . . X . X .
. X . X . X . X
. . . . . . . .
. . . O . . . .
. . . . O . . .
. . . . . . . O
O . O . . . O .
```

```
FROM? 0,0
TO? 1,1
FROM 1  5 TO 0  4


.   X   .   X   .   X   .   X

.   .   .   .   X   .   X   .

.   .   .   X   .   X   .   X

X   .   .   .   .   .   .   .

.   .   .   0   .   .   .   .

.   .   .   .   0   .   .   .

.   0   .   .   .   .   .   0

.   .   0   .   .   .   0   .


FROM? 1,1
TO? 2,2
FROM 3  5 TO 4  4


.   0   .   .   .   0   .   .

0   .   .   .   .   .   .   .

.   .   .   0   .   0   .   .

.   .   .   .   0   .   .   .

.   .   .   X   .   .   .   X

X   .   X   .   .   .   .   .

.   X   .   X   .   .   .   .

X   .   X   .   X   .   X   .


FROM? 3,3
TO? 2,4
FROM 5  5 TO 6  4


.   X   .   X   .   X   .   X

.   .   .   .   X   .   X   .

.   .   .   .   .   .   .   X

X   .   0   .   X   .   X   .

.   .   .   .   .   .   .   .

.   .   0   .   0   .   .   .

.   .   .   .   .   .   .   0

.   .   0   .   .   .   0   .


FROM? 0,2
FROM? 2,0
TO? 3,1
FROM 4  6 TO 5  5


.   X   .   X   .   X   .   X

.   .   .   .   .   .   X   .

.   .   .   .   .   X   .   X

X   .   0   .   X   .   X   .

.   .   .   .   .   .   .   .

.   .   0   .   0   .   .   .

.   .   .   0   .   .   .   0

.   .   .   .   .   .   0   .
```

```
5 PRINT TAB(32);"CHECKERS"
10 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
15 PRINT:PRINT:PRINT
20 PRINT "THIS IS THE GAME OF CHECKERS.  THE COMPUTER IS X,"
25 PRINT "AND YOU ARE O.  THE COMPUTER WILL MOVE FIRST."
30 PRINT "SQUARES ARE REFERRED TO BY A COORDINATE SYSTEM."
35 PRINT "(0,0) IS THE LOWER LEFT CORNER"
40 PRINT "(0,7) IS THE UPPER LEFT CORNER"
45 PRINT "(7,0) IS THE LOWER RIGHT CORNER"
50 PRINT "(7,7) IS THE UPPER RIGHT CORNER"
55 PRINT "THE COMPUTER WILL TYPE '+TO' WHEN YOU HAVE ANOTHER"
60 PRINT "JUMP.  TYPE TWO NEGATIVE NUMBERS IF YOU CANNOT JUMP."
65 PRINT:PRINT:PRINT
80 DIM R(4),S(7,7):G=-1:R(0)=-99
90 DATA 1,0,1,0,0,0,-1,0,0,1,0,0,0,-1,0,-1,15
120 FORX=0TO7:FORY=0TO7:READJ:IFJ=15THEN180
160 S(X,Y)=J:GOTO200
180 RESTORE:READS(X,Y)
200 NEXTY,X
230 FORX=0TO7:FORY=0TO7:IFS(X,Y)>-1THEN350
310 IFS(X,Y)=-1THENFORA=-1TO1STEP2:B=G:GOSUB650:NEXTA
330 IFS(X,Y)=-2THENFORA=-1TO1STEP2:FORB=-1TO1STEP2:GOSUB650:NEXTB,A
350 NEXTY,X:GOTO1140
650 U=X+A:V=Y+B:IFU<00RU>7ORV<00RV>7THEN870
740 IFS(U,V)=0THENGOSUB910:GOTO870
770 IFS(U,V)<0THEN870
790 U=U+A:V=V+B:IFU<00RV<00RU>7ORV>7THEN870
850 IFS(U,V)=0THENGOSUB910
870 RETURN
910 IFV=0ANDS(X,Y)=-1THENQ=Q+2
920 IFABS(Y-V)=2THENQ=Q+5
960 IFY=7THENQ=Q-2
980 IFU=00RU=7 THENQ=Q+1
1030 FORC=-1TO1STEP2:IFU+C<00RU+C>7ORV+G<0THEN1080
1035 IFS(U+C,V+G)<0THENQ=Q+1:GOTO1080
1040 IFU-C<00RU-C>7ORV-G>7THEN1080
1045 IFS(U+C,V+G)>0ANDS(S(U-C,V-G)=00R(U-C=XANDV-G=Y))THENQ=Q-2
1080 NEXTC:IFQ>R(0)THENR(0)=Q:R(1)=X:R(2)=Y:R(3)=U:R(4)=V
1100 Q=0:RETURN
1140 IF R(0)=-99 THEN 1880
1230 PRINTCHR$(30)"FROM"R(1);R(2)"TO"R(3);R(4);:R(0)=-99
1240 IFR(4)=0THENS(R(3),R(4))=-2:GOTO1420
1250 S(R(3),R(4))=S(R(1),R(2))
1310 S(R(1),R(2))=0:IFABS(R(1)-R(3))<>2THEN1420
1330 S((R(1)+R(3))/2,(R(2)+R(4))/2)=0
1340 X=R(3):Y=R(4):IFS(X,Y)=-1THENB=-2:FORA=-2TO2STEP4:GOSUB1370
1350 IFS(X,Y)=-2THENFORA=-2TO2STEP4:FORB=-2TO2STEP4:GOSUB1370:NEXTB
1360 NEXTA:IFR(0)<>-99THENPRINT"TO"R(3);R(4);:R(0)=-99:GOTO1240
1365 GOTO1420
1370 U=X+A:V=Y+B:IFU<00RU>7ORV<00RV>7THEN1400
1380 IFS(U,V)=0ANDS(X+A/2,Y+B/2)>0THENGOSUB910
1400 RETURN
1420 PRINT:PRINT:PRINT:FORY=7TO0STEP-1:FORX=0TO7:I=5*X:PRINTTAB(I);
1430 IFS(X,Y)=0THENPRINT".";
1470 IFS(X,Y)=1THENPRINT"0";
1490 IFS(X,Y)=-1THENPRINT"X";
1510 IFS(X,Y)=-2THENPRINT"X*";
1530 IFS(X,Y)=2THENPRINT"0*";
1550 NEXTX:PRINT" ":PRINT:NEXTY:PRINT
1552 FORL=0TO7
1554 FORM=0TO7
1556 IFS(L,M)=1ORS(L,M)=2THENZ=1
1558 IFS(L,M)=-1ORS(L,M)=-2THENT=1
1560 NEXTM
1562 NEXTL
1564 IF Z<>1 THEN 1880
1566 IF T<>1 THEN 1885
1570 T=0: Z=0
1590 INPUT "FROM";E,H:X=E:Y=H:IFS(X,Y)<=0THEN 1590
1670 INPUT "TO";A,B:X=A:Y=B
1680 IFS(X,Y)=0ANDABS(A-E)<=2ANDABS(A-E)=ABS(B-H)THEN1700
1690 PRINTCHR$(7)CHR$(11);:GOTO1670
1700 I=46
1750 S(A,B)=S(E,H):S(E,H)=0:IFABS(E-A)<>2THEN1810
1800 S((E+A)/2,(H+B)/2)=0
1802 INPUT "+TO";A1,B1:IF A1<0 THEN 1810
1804 IFS(A1,B1)<>00RABS(A1-A)<>2ORABS(B1-B)<>2THEN1802
1806 E=A:H=B:A=A1:B=B1:I=I+15:GOTO1750
1810 IFB=7THENS(A,B)=2
1830 GOTO230
1880 PRINT: PRINT "I WIN.": END
1885 PRINT: PRINT "YOU WIN.": END
```

Chemist

The fictitious chemical, kryptocyanic acid, can only be diluted by the ratio of 7 parts water to 3 parts acid. Any other ratio causes an unstable compound which soon explodes. Given an amount of acid, you must determine how much water to add for dilution. If you're more than 5% off, you lose one of your nine lives. The program continues to play until you lose all nine lives or until it is interrupted.

It was originally written by Wayne Teeter of Ridgecrest, California.

```
                CHEMIST
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THE FICTITIOUS  CHEMICAL KRYPTOCYANIC ACID CAN ONLY BE
DILUTED BY THE RATIO OF 7 PARTS WATER TO 3 PARTS ACID.
IF ANY OTHER RATIO IS ATTEMPTED, THE ACID BECOMES UNSTABLE
AND SOON EXPLODES.  GIVEN THE AMOUNT OF ACID, YOU MUST
DECIDE HOW MUCH WATER TO ADD FOR DILUTION.  IF YOU MISS
YOU FACE THE CONSEQUENCES.
 32 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 77
GOOD JOB! YOU MAY BREATHE NOW, BUT DON'T INHALE THE FUMES!

 11 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 27
SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB
OF QUIVERING PROTOPLASM!
HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE.
 26 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 28
SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB
OF QUIVERING PROTOPLASM!
HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE.
 47 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 82
SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB
OF QUIVERING PROTOPLASM!
HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE.
 27 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 63
GOOD JOB! YOU MAY BREATHE NOW, BUT DON'T INHALE THE FUMES!

 5 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 9
SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB
OF QUIVERING PROTOPLASM!
HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE.
 11 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER? 28
SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB
OF QUIVERING PROTOPLASM!
HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE.
 48 LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER?

BREAK IN 130
```

```
3 PRINT TAB(33);"CHEMIST"
6 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
8 PRINT:PRINT:PRINT
10 PRINT "THE FICTITIOUS CHECMICAL KRYPTOCYANIC ACID CAN ONLY BE"
20 PRINT "DILUTED BY THE RATIO OF 7 PARTS WATER TO 3 PARTS ACID."
30 PRINT "IF ANY OTHER RATIO IS ATTEMPTED, THE ACID BECOMES UNSTABLE"
40 PRINT "AND SOON EXPLODES.  GIVEN THE AMOUNT OF ACID, YOU MUST"
50 PRINT "DECIDE WHO MUCH WATER TO ADD FOR DILUTION.  IF YOU MISS"
60 PRINT "YOU FACE THE CONSEQUENCES."
100 A=INT(RND(1)*50)
110 W=7*A/3
120 PRINT A;"LITERS OF KRYPTOCYANIC ACID.  HOW MUCH WATER";
130 INPUT R
140 D=ABS(W-R)
150 IF D>W/20 THEN 200
160 PRINT "GOOD JOB! YOU MAY BREATHE NOW, BUT DON'T INHALE THE FUMES!"
170 PRINT
180 GOTO 100
200 PRINT "SIZZLE!  YOU HAVE JUST BEEN DESALINATED INTO A BLOB"
210 PRINT "OF QUIVERING PROTOPLASM!"
220 T=T+1
230 IF T=9 THEN 260
240 PRINT "HOWEVER, YOU MAY TRY AGAIN WITH ANOTHER LIFE."
250 GOTO 100
260 PRINT "YOUR 9 LIVES ARE USED, BUT YOU WILL BE LONG REMEMBERED FOR"
270 PRINT "YOUR CONTRIBUTIONS TO THE FIELD OF COMIC BOOK CHEMISTRY."
280 END
```

Chief

In the words of the program author, John Graham, "CHIEF is designed to give people (mostly kids) practice in the four operations (addition, multiplication, subtraction, and division).

It does this while giving people some fun. And then, if the people are wrong, it shows them how they should have done it.

CHIEF was written by John Graham of Upper Brookville, New York.

```
              CHIEF
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


 I AM CHIEF NUMBERS FREEK, THE GREAT INDIAN MATH GOD.
ARE YOU READY TO TAKE THE TEST YOU CALLED ME OUT FOR? YES
 TAKE A NUMBER AND ADD 3. DIVIDE THIS NUMBER BY 5 AND
MULTIPLY BY 8. DIVIDE BY 5 AND ADD THE SAME. SUBTRACT 1.
  WHAT DO YOU HAVE? 12
I BET YOUR NUMBER WAS  22  WAS I RIGHT? NO
WHAT WAS YOUR ORIGINAL NUMBER? 32
SO YOU THINK YOU'RE SO SMART, EH?
NOW WATCH.
 32 PLUS 3 EQUALS 35 .  THIS DIVIDED BY 5 EQUALS 7 ;
THIS TIMES 8 EQUALS 56 .  IF WE DIVIDE BY 5 AND ADD 5,
WE GET 16.2 , WHICH, MINUS 1 EQUALS 15.2 .
NOW DO YOU BELIEVE ME? NO
YOU HAVE MADE ME MAD!!!
THERE MUST BE A GREAT LIGHTNING BOLT!

                          X X
                         X X
                        X X
                       X X
                      X X
                     X X
                    X X
                   X X
                  X XXX
                 X   X
                XXX X
                 X X
                X X
               X X
              X X
             X X
            X X
           X X
          XX
         X
        *

##############################

I HOPE YOU BELIEVE ME NOW, FOR YOUR SAKE!!
```

```
2 PRINT TAB(30) "CHIEF"
4 PRINT TAB(15) "CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
10 PRINT " I AM CHIEF NUMBERS FREEK, THE GREAT INDIAN MATH GOD."
20 PRINT "ARE YOU READY TO TAKE THE TEST YOU CALLED ME OUT FOR";
30 INPUT A$
40 IF A$= "YES" THEN 60
50 PRINT "SHUTUP PALE FACE WITH WISE TONGUE."
60 PRINT " TAKE A NUMBER AND ADD 3. DIVIDE THIS NUMBER BY 5 AND"
70 PRINT "MULTIPLY BY 8. DIVIDE BY 5 AND ADD THE SAME. SUBTRACT 1."
80 PRINT "  WHAT DO YOU HAVE";
90 INPUT B
100 LET C = (B+1-5)*5/8*5-3
110 PRINT "I BET YOUR NUMBER WAS " C" WAS I RIGHT";
120 INPUT D$
130 IF D$="YES" THEN 510
140 PRINT "WHAT WAS YOUR ORIGINAL NUMBER";
150 INPUT K
155 LET F=K+3
160 LET G=F/5
170 LET H=G*8
180 LET I=H/5+5
190 LET J=I-1
200 PRINT "SO YOU THINK YOU'RE SO SMART, EH?"
210 PRINT "NOW WATCH."
230 PRINT K"PLUS 3 EQUALS"F".  THIS DIVIDED BY 5 EQUALS"G";"
240 PRINT "THIS TIMES 8 EQUALS"H".  IF WE DIVIDE BY 5 AND ADD 5,"
250 PRINT "WE GET"I", WHICH, MINUS 1 EQUALS"J"."
260 PRINT "NOW DO YOU BELIEVE ME";
270 INPUT Z$
290 IF Z$ ="YES" THEN 510
295 PRINT "YOU HAVE MADE ME MAD!!!"
300 PRINT "THERE MUST BE A GREAT LIGHTNING BOLT!"
310 PRINT:PRINT
330 FOR X=30 TO 22 STEP -1
340 PRINT TAB(X) "X X"
350 NEXT X
360 PRINT TAB(21) "X XXX"
370 PRINT TAB(20) "X   X"
380 PRINT TAB(19) "XXX X"
390 FOR Y=20 TO 13 STEP -1
400 PRINT TAB(Y) "X X"
410 NEXT Y
420 PRINT TAB(12) "XX"
430 PRINT TAB(11) "X"
440 PRINT TAB(10) "*"
450 PRINT:PRINT"##############################":PRINT
470 PRINT "I HOPE YOU BELIEVE ME NOW, FOR YOUR SAKE!!"
480 GOTO 520
510 PRINT "BYE!!!!!"
520 END
```

Chomp

This program is an adaptation of a mathematical game originally described by Martin Gardner in the January 1973 issue of *Scientific American*. Up to a 9x9 grid is set up by you with the upper left square a poison square. This grid is the cookie. Players alternately chomp away at the cookie from the lower right. To take a chomp, input a row and column number of one of the squares remaining on the cookie. All of the squares below and to the right of that square, including that square, disappear.

Any number of people can play — the computer is only the moderator; it is not a player. Two-person strategies are interesting to work out but strategies when three or more people are playing are a real challenge.

The computer version of the game was written by Peter Sessions of People's Computer Company.

```
                 CHOMP
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS IS THE GAME OF CHOMP (SCIENTIFIC AMERICAN, JAN 1973)
WANT THE RULES (1=YES, 0=NO!)? 1
CHOMP IS FOR 1 OR MORE PLAYERS (HUMANS ONLY).

HERE'S HOW A BOARD LOOKS (THIS ONE IS 5 BY 7):

      1 2 3 4 5 6 7 8 9
 1    P * * * * * * *
 2    * * * * * * * *
 3    * * * * * * * *
 4    * * * * * * * *
 5    * * * * * * * *


THE BOARD IS A BIG COOKIE - R ROWS HIGH AND C COLUMNS
WIDE. YOU INPUT R AND C AT THE START. IN THE UPPER LEFT
CORNER OF THE COOKIE IS A POISON SQUARE (P). THE ONE WHO
CHOMPS THE POISON SQUARE LOSES. TO TAKE A CHOMP, TYPE THE
ROW AND COLUMN OF ONE OF THE SQUARES ON THE COOKIE.
ALL OF THE SQUARES BELOW AND TO THE RIGHT OF THAT SQUARE
(INCLUDING THAT SQUARE, TOO) DISAPPEAR -- CHOMP!!
NO FAIR CHOMPING SQUARES THAT HAVE ALREADY BEEN CHOMPED,
OR THAT ARE OUTSIDE THE ORIGINAL DIMENSIONS OF THE COOKIE.

HERE WE GO...

HOW MANY PLAYERS? 2
HOW MANY ROWS? 8
HOW MANY COLUMNS? 7


      1 2 3 4 5 6 7 8 9
 1    P * * * * * * *
 2    * * * * * * * *
 3    * * * * * * * *
 4    * * * * * * * *
 5    * * * * * * * *
 6    * * * * * * * *
 7    * * * * * * * *
 8    * * * * * * * *

PLAYER  1
COORDINATES OF CHOMP (ROW,COLUMN)? 5,6

      1 2 3 4 5 6 7 8 9
 1    P * * * * * * *
 2    * * * * * * * *
 3    * * * * * * * *
 4    * * * * * * * *
 5    * * * * * *
 6    * * * * * *
 7    * * * * * *
 8    * * * * * *

PLAYER  2
COORDINATES OF CHOMP (ROW,COLUMN)? 3,2

      1 2 3 4 5 6 7 8 9
 1    P * * * * * * *
 2    * * * * * * * *
 3    *
 4    *
 5    *
 6    *
 7    *
 8    *

PLAYER  1
COORDINATES OF CHOMP (ROW,COLUMN)? 4,4
NO FAIR. YOU'RE TRYING TO CHOMP ON EMPTY SPACE!
PLAYER  1
COORDINATES OF CHOMP (ROW,COLUMN)? 2,2

      1 2 3 4 5 6 7 8 9
 1    P * * * * * * *
 2    *
 3    *
 4    *
 5    *
 6    *
 7    *
 8    *

PLAYER  2
COORDINATES OF CHOMP (ROW,COLUMN)? 1,2

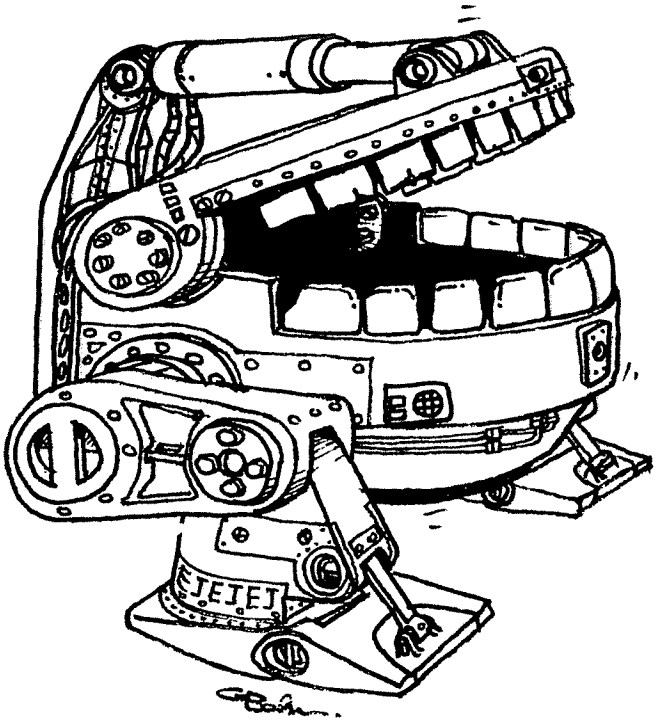
      1 2 3 4 5 6 7 8 9
 1    P
 2    *
 3    *
 4    *
 5    *
 6    *
 7    *
 8    *

PLAYER  1
COORDINATES OF CHOMP (ROW,COLUMN)? 2,1

      1 2 3 4 5 6 7 8 9
 1    P
 2
 3
 4
 5
 6
 7
 8

PLAYER  2
COORDINATES OF CHOMP (ROW,COLUMN)? 1,1
YOU LOSE, PLAYER  2

AGAIN (1=YES; 0=NO!)? 0
```



```
10 PRINT TAB(33);"CHOMP"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
40 DIM A(10,10)
100 REM *** THE GAME OF CHOMP *** COPYRIGHT PCC 1973 ***
110 PRINT
120 PRINT "THIS IS THE GAME OF CHOMP (SCIENTIFIC AMERICAN, JAN 1973)"
130 PRINT "WANT THE RULES (1=YES, 0=NO!)";
140 INPUT R
150 IF R=0 THEN 340
160 F=1
170 R=5
180 C=7
190 PRINT "CHOMP IS FOR 1 OR MORE PLAYERS (HUMANS ONLY)."
200 PRINT
210 PRINT "HERE'S HOW A BOARD LOOKS (THIS ONE IS 5 BY 7):"
220 GOSUB 540
230 PRINT
240 PRINT "THE BOARD IS A BIG COOKIE - R ROWS HIGH AND C COLUMNS"
250 PRINT "WIDE. YOU INPUT R AND C AT THE START. IN THE UPPER LEFT"
260 PRINT "CORNER OF THE COOKIE IS A POISON SQUARE (P). THE ONE WHO"
270 PRINT "CHOMPS THE POISON SQUARE LOSES. TO TAKE A CHOMP, TYPE THE"
280 PRINT "ROW AND COLUMN OF ONE OF THE SQUARES ON THE COOKIE."
290 PRINT "ALL OF THE SQUARES BELOW AND TO THE RIGHT OF THAT SQUARE"
300 PRINT "(INCLUDING THAT SQUARE, TOO) DISAPPEAR -- CHOMP!!"
310 PRINT "NO FAIR CHOMPING SQUARES THAT HAVE ALREADY BEEN CHOMPED,"
320 PRINT "OR THAT ARE OUTSIDE THE ORIGINAL DIMENSIONS OF THE COOKIE."
330 PRINT
340 PRINT "HERE WE GO..."
350 REM
360 F=0
370 FOR I=1 TO 10
372 FOR J=1 TO 10
375 A(I,J)=0
377 NEXT J
379 NEXT I
380 PRINT
390 PRINT "HOW MANY PLAYERS";
400 INPUT P
410 I1=0
420 PRINT "HOW MANY ROWS";
430 INPUT R
440 IF R <= 9 THEN 470
450 PRINT "TOO MANY ROWS (9 IS MAXIMUM). NOW, ";
460 GOTO 420
470 PRINT "HOW MANY COLUMNS";
480 INPUT C
490 IF C <= 9 THEN 530
500 PRINT "TOO MANY COLUMNS (9 IS MAXIMUM). NOW, ";
510 GOTO 470
530 PRINT
540 FOR I=1 TO R
550 FOR J=1 TO C
560 A(I,J)=1
570 NEXT J
580 NEXT I
590 A(1,1)=-1
600 REM PRINT THE BOARD
610 PRINT
620 PRINT TAB(7);"1 2 3 4 5 6 7 8 9"
630 FOR I=1 TO R
640 PRINT I;TAB(7);
650 FOR J=1 TO C
660 IF A(I,J)=-1 THEN 700
670 IF A(I,J)=0 THEN 720
680 PRINT "* ";
690 GOTO 710
700 PRINT "P ";
710 NEXT J
720 PRINT
730 NEXT I
740 PRINT
750 IF F=0 THEN 770
760 RETURN
770 REM GET CHOMPS FOR EACH PLAYER IN TURN
780 LET I1=I1+1
790 LET P1=I1-INT(I1/P)*P
800 IF P1 <> 0 THEN 820
810 P1=P
820 PRINT "PLAYER ";P1
830 PRINT "COORDINATES OF CHOMP (ROW,COLUMN)";
840 INPUT R1,C1
850 IF R1<1 THEN 920
860 IF R1>R THEN 920
870 IF C1<1 THEN 920
880 IF C1>C THEN 920
890 IF A(R1,C1)=0 THEN 920
900 IF A(R1,C1)=-1 THEN 1010
910 GOTO 940
920 PRINT "NO FAIR. YOU'RE TRYING TO CHOMP ON EMPTY SPACE!"
930 GOTO 820
940 FOR I=R1 TO R
950 FOR J=C1 TO C
960 A(I,J)=0
970 NEXT J
980 NEXT I
990 GOTO 610
1000 REM END OF GAME DETECTED IN LINE 900
1010 PRINT "YOU LOSE, PLAYER ";P1
1020 PRINT
1030 PRINT "AGAIN (1=YES; 0=NO!)";
1040 INPUT R
1050 IF R=1 THEN 340
1060 END
```

Civil War

This simulation is based on 14 battles in the Civil War. Facts and figures used are based on the actual occurrence. If you follow the same strategy used in the actual battle, the results will be the same. Generally, this is a good strategy since the generals in the Civil War were fairly good military strategists. However, you can frequently outperform the Civil War generals, particularly in cases where they did not have good enemy intelligence and consequently followed a poor course of action. Naturally, it helps to know your Civil War history, although the computer gives you the rudiments.

After each of the 14 battles, your casualties are compared to the actual casualties of the battle, and you are told whether you win or lose the battle.

You may play Civil War alone in which case the program simulates the Union general. Or two players may play in which case the computer becomes the moderator.

Civil War was written in 1968 by three Students at Lexington High School, Massachusetts: L. Cram, L. Goodie, and D. Hibbard. It was modified into a 2-player game by G. Paul and R. Hess of TIES, St. Paul, Minnesota.

```
          CIVIL WAR
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES



THIS IS A CIVIL WAR SIMULATION.
TO PLAY, TYPE A RESPONSE WHEN THE COMPUTER ASKS.
REMEMBER THAT ALL FACTORS ARE INTERRELATED AND THAT YOUR
RESPONSES COULD CHANGE HISTORY. FACTS AND FIGURES USED ARE
BASED ON THE ACTUAL OCCURRENCE. MOST BATTLES TEND TO RESULT
AS THEY DID IN THE CIVIL WAR, BUT IT ALL DEPENDS ON YOU!!

THE OBJECT OF THE GAME IS TO WIN AS MANY BATTLES AS POSSIBLE.

YOUR CHOICES FOR DEFENSIVE STRATEGY ARE:
       (1) ARTILLERY ATTACK
       (2) FORTIFICATION AGAINST FRONTAL ATTACK
       (3) FORTIFICATION AGAINST FLANKING MANEUVERS
       (4) FALLING BACK
 YOUR CHOICES FOR OFFENSIVE STRATEGY ARE:
       (1) ARTILLERY ATTACK
       (2) FRONTAL ATTACK
       (3) FLANKING MANEUVERS
       (4) ENCIRCLEMENT
YOU MAY SURRENDER BY TYPING A '5' FOR YOUR STRATEGY.

ARE THERE TWO GENERALS PRESENT (ANSWER YES OR NO)? YES
SELECT A BATTLE BY TYPING A NUMBER FROM 1 TO 14 ON
REQUEST.  TYPE ANY OTHER NUMBER TO END THE SIMULATION.
BUT '0' BRINGS BACK EXACT PREVIOUS BATTLE SITUATION
ALLOWING YOU TO REPLAY IT

NOTE: A NEGATIVE FOOD$ ENTRY CAUSES THE PROGRAM TO
USE THE ENTRIES FROM THE PREVIOUS BATTLE

AFTER REQUESTING A BATTLE, DO YOU WISH BATTLE DESCRIPTIONS
(ANSWER YES OR NO)? YES



WHICH BATTLE DO YOU WISH TO SIMULATE? 3



THIS IS THE BATTLE OF SEVEN DAYS
JUNE 25-JULY 1, 1862.  GENERAL LEE (CSA) UPHELD THE
OFFENSIVE THROUGHOUT THE BATTLE AND FORCED GEN. MCCLELLAN
AND THE UNION FORCES AWAY FROM RICHMOND.

                CONFEDERACY     UNION
MEN               95000          115000
MONEY           $ 427500       $ 517500
INFLATION         25 %           10 %

CONFEDERATE GENERAL---HOW MUCH DO YOU WISH TO SPEND FOR
 - FOOD..... ? 100000
 - SALARIES.. ? 140000
 - AMMUNITION ? 180000

UNION GENERAL---HOW MUCH DO YOU WISH TO SPEND FOR
 - FOOD..... ? 120000
 - SALARIES.. ? 160000
 - AMMUNITION ? 237500

CONFEDERATE MORALE IS FAIR
      UNION MORALE IS FAIR
CONFEDERATE GENERAL---YOU ARE ON THE OFFENSIVE

CONFEDERATE STRATEGY  ? 4
UNION STRATEGY  ? 2

              CONFEDERACY    UNION
CASUALTIES       18805         13738
DESERTIONS       13            10

COMPARED TO THE ACTUAL CASUALTIES AT SEVEN DAYS
CONFEDERATE: 91 % OF THE ORIGINAL
UNION:       87 % OF THE ORIGINAL

THE UNION WINS SEVEN DAYS
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WHICH BATTLE DO YOU WISH TO SIMULATE? 6



 THIS IS THE BATTLE OF FREDERICKSBURG
 DEC 13, 1862.  THE CONFEDERACY UNDER LEE SUCCESSFULLY
 REPULSED AN ATTACK BY THE UNION UNDER GEN. BURNSIDE.

                CONFEDERACY      UNION
 MEN              76417           122191
 MONEY          $ 335800        $ 552000
 INFLATION        27 %            8 %

 CONFEDERATE GENERAL---HOW MUCH DO YOU WISH TO SPEND FOR
  - FOOD..... ? 100000
  - SALARIES.. ? 100000
  - AMMUNITION ? 135800

 UNION GENERAL---HOW MUCH DO YOU WISH TO SPEND FOR
  - FOOD..... ? 130000
  - SALARIES.. ? 150000
  - AMMUNITION ? 272000

 CONFEDERATE MORALE IS FAIR
       UNION MORALE IS HIGH
 CONFEDERATE GENERAL---YOU ARE ON THE DEFENSIVE

 CONFEDERATE STRATEGY  ? 2
 UNION STRATEGY  ? 4

               CONFEDERACY    UNION
 CASUALTIES       4870          10360
 DESERTIONS       11             6

 COMPARED TO THE ACTUAL CASUALTIES AT FREDERICKSBURG
 CONFEDERATE: 91 % OF THE ORIGINAL
 UNION:       82 % OF THE ORIGINAL

 THE CONFEDERACY WINS FREDERICKSBURG
 ----------


WHICH BATTLE DO YOU WISH TO SIMULATE? 15



 THE CONFEDERACY HAS WON  1  BATTLES AND LOST  1
 THE UNION HAS WON THE WAR

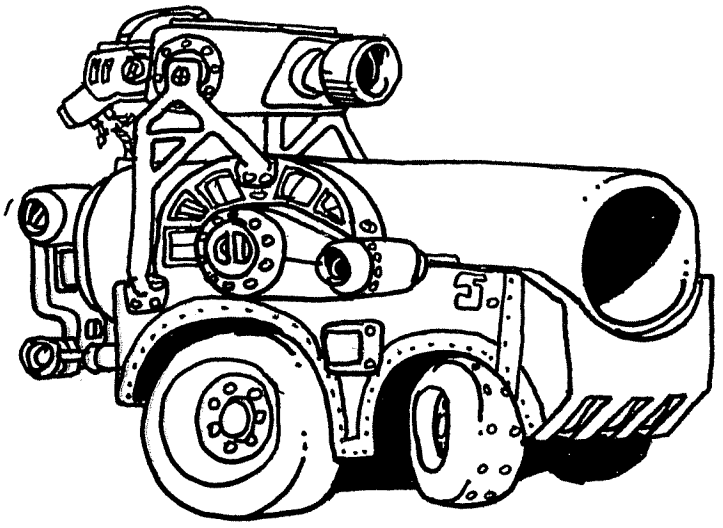
 FOR THE  2  BATTLES FOUGHT (EXCLUDING RERUNS)
                            CONFEDERACY    UNION
 HISTORICAL LOSSES            25991         28502
 SIMULATED  LOSSES            23700         24115

     % OF ORIGINAL             91            85
```

```
 2 PRINT TAB(26) "CIVIL WAR"
 4 PRINT TAB(15) "CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
 6 PRINT : PRINT : PRINT
 20 REM ORIGINAL GAME DESIGN: CRAM, GOODIE, HIBBARD LEXINGTON H.S.
 30 REM MODIFICATIONS: G. PAUL, R. HESS (TIES), 1973
 50  DIM S(4),C$(14),M1(14),M2(14),C1(14),C2(14),M(14)
 60  REM UNION INFO ON LIKELY CONFEDERATE STRATEGY
 70  S(1)=25 : S(2)=25 : S(3)=25 : S(4)=25
 82  REM READ HISTORICAL DATA.
 84  FOR D=1 TO 14
 86  READ C$(D),M1(D),M2(D),C1(D),C2(D),M(D)
 88  NEXT D
 89  LET D=RND(-1)
 90  PRINT
 100  PRINT "DO YOU WANT INSTRUCTIONS";
 110  INPUT X$
 120  IF X$="YES" THEN 160
 130  IF X$="NO" THEN 370
 140  PRINT "YES OR NO -- ";
 150  GOTO 110
 160  PRINT "


           "
 170  PRINT "THIS IS A CIVIL WAR SIMULATION."
 180  PRINT "TO PLAY, TYPE A RESPONSE WHEN THE COMPUTER ASKS."
 190  PRINT "REMEMBER THAT ALL FACTORS ARE INTERRELATED AND THAT YOUR"
 200  PRINT "RESPONSES COULD CHANGE HISTORY. FACTS AND FIGURES USED ARE"
 210  PRINT "BASED ON THE ACTUAL OCCURRENCE. MOST BATTLES TEND TO RESULT"
 220  PRINT "AS THEY DID IN THE CIVIL WAR, BUT IT ALL DEPENDS ON YOU!!"
 230  PRINT
 240  PRINT "THE OBJECT OF THE GAME IS TO WIN AS MANY BATTLES AS ";
 245  PRINT "POSSIBLE."
 250  PRINT
 260  PRINT "YOUR CHOICES FOR DEFENSIVE STRATEGY ARE:"
 270  PRINT "         (1) ARTILLERY ATTACK"
 280  PRINT "         (2) FORTIFICATION AGAINST FRONTAL ATTACK"
 290  PRINT "         (3) FORTIFICATION AGAINST FLANKING MANEUVERS"
 300  PRINT "         (4) FALLING BACK"
 310  PRINT " YOUR CHOICES FOR OFFENSIVE STRATEGY ARE:"
 320  PRINT "         (1) ARTILLERY ATTACK"
 330  PRINT "         (2) FRONTAL ATTACK"
 340  PRINT "         (3) FLANKING MANEUVERS"
 350  PRINT "         (4) ENCIRCLEMENT"
 360  PRINT "YOU MAY SURRENDER BY TYPING A '5' FOR YOUR STRATEGY."
 370  PRINT "


 ARE THERE TWO GENERALS PRESENT ";
```



```
380  PRINT "(ANSWER YES OR NO)";
390  INPUT B$
400  IF B$="YES" THEN 430
410  IF B$ <> "NO" THEN 380
420  PRINT "
          YOU ARE THE CONFEDERACY.   GOOD LUCK!"
425  PRINT
430  LET D=1
440  IF B$ <> "YES" THEN 460
450  LET D=2
460  PRINT "SELECT A BATTLE BY TYPING A NUMBER FROM 1 TO 14 ON"
470  PRINT "REQUEST.  TYPE ANY OTHER NUMBER TO END THE SIMULATION."
480  PRINT "BUT '0' BRINGS BACK EXACT PREVIOUS BATTLE SITUATION"
490  PRINT "ALLOWING YOU TO REPLAY IT"
500  PRINT
510  PRINT "NOTE: A NEGATIVE FOOD$ ENTRY CAUSES THE PROGRAM TO "
520  PRINT "USE THE ENTRIES FROM THE PREVIOUS BATTLE"
530  PRINT
540  PRINT "AFTER REQUESTING A BATTLE, DO YOU WISH ";
550  PRINT "BATTLE DESCRIPTIONS ";
560  PRINT "(ANSWER YES OR NO)";
570  INPUT X$
580  IF X$="YES" THEN 600
590  IF X$ <> "NO" THEN 560
600  L=0:W=0:R1=0:Q1=0:M3=0:N4=0:P1=0:P2=0:T1=0:T2=0
610  F(2)=0:H(2)=0:B(2)=0:R2=0:Q2=0:C6=0:F=0:W0=0:Y=0:Y2=0:U=0:U2=0
620  PRINT "


          "
630  PRINT "WHICH BATTLE DO YOU WISH TO SIMULATE";
640  INPUT A
650  IF A <> 0 THEN 660
655  IF R <> 0 THEN 1140
660  IF A <= 0 THEN 2860
665  IF A >= 15 THEN 2860
670  LET C$=C$(A)
680  LET M1=M1(A)
690  LET M2=M2(A)
700  LET C1=C1(A)
710  LET C2=C2(A)
720  LET N=N(A)
960  LET U=0
970  REM  INFLATION CALC
980  LET I1=10+(L-W)*2
990  LET I2=10+(W-L)*2
1000  REM - MONEY AVAILABLE
1010  LET D(1)=100*INT((M1*(100-I1)/2000)*(1+(R1-Q1)/(R1+1))+.5)
1020  LET D(2)=100*INT(M2*(100-I2)/2000+.5)
1030  IF B$ <> "YES" THEN 1050
1040  LET D(2)=100*INT((M2*(100-I2)/2000)*(1+(R2-Q2)/(R2+1))+.5)
1050  REM - MEN   AVAILABLE
1060  LET M5=INT(M1*(1+(P1-T1)/(M3+1)))
1070  LET M6=INT(M2*(1+(P2-T2)/(M4+1)))
1080  LET F1=5*M1/6
1090  PRINT "



          "
1100  PRINT "THIS IS THE BATTLE OF ";C$
1110  IF X$="NO" THEN 1150
1120  IF A>11 THEN 1130
1125  ON A GOTO 3580,3620,3650,3690,3720,3750,3780,3800,3830,3860,3890
1130  ON A-11 GOTO 3920,3950,3980
1140  PRINT C$" INSTANT REPLAY"
1150  PRINT
1160  PRINT " ","CONFEDERACY"," UNION"
1170  PRINT "MEN"," "M5," "M6
1180  PRINT "MONEY","$";D(1),"$";D(2)
1190  PRINT "INFLATION"," ";I1+15;"%"," ";I2;"%"
1195  PRINT
1200  REM - ONLY IN PRINTOUT IS CONFED INFLATION = I1+15%
1210  REM - IF TWO GENERALS, INPUT CONFED. FIRST
1220  FOR I=1 TO D
1230  IF B$ <> "YES" THEN 1260
1240  IF I=2 THEN 1260
1250  PRINT "CONFEDERATE GENERAL---";
1260  PRINT "HOW MUCH DO YOU WISH TO SPEND FOR"
1270  PRINT " - FOOD.....";
1280  INPUT F
1290  IF F >= 0 THEN 1360
1300  IF R1 <> 0 THEN 1330
1310  PRINT "NO PREVIOUS ENTRIES"
1320  GOTO 1270
1330  PRINT "ASSUME YOU WANT TO KEEP SAME ALLOCATONS"
1340  PRINT
1350  GOTO 1510
1360  LET F(I)=F
1370  PRINT " - SALARIES..";
1380  INPUT H(I)
1390  LET N=1
1400  IF H(I)<0 THEN 1490
1410  PRINT " - AMMUNITION";
1420  INPUT B(I)
1430  LET N=2
1440  IF B(I)<0 THEN 1490
1450  PRINT
1460  IF F(I)+H(I)+B(I) <= D(I) THEN 1510
1470  PRINT "THINK AGAIN! YOU HAVE ONLY $"D(I)
1480  GOTO 1270
1490  PRINT "NEGATIVE VALUES NOT ALLOWED."
1500  ON N GOTO 1370,1410
1510  IF B$ <> "YES" THEN 1550
1520  IF I=2 THEN 1550
1530  PRINT "UNION GENERAL---";
1540  NEXT I
1550  FOR Z=1 TO D
1560  IF B$ <> "YES" THEN 1620
1570  ON Z GOTO 1580,1600
1580  PRINT "CONFEDERATE ";
1590  GOTO 1620
1600  PRINT "      UNION ";
1610  REM - FIND MORALE
1620  LET O=((2*F(Z)^2+H(Z)^2)/F1^2+1)
1630  IF O<10 THEN 1660
1640  PRINT "MORALE IS HIGH"
1650  GOTO 1700
1660  IF O<5 THEN 1690
1670  PRINT "MORALE IS FAIR"
1680  GOTO 1700
1690  PRINT "MORALE IS POOR"
1700  IF B$ <> "YES" THEN 1760
1710  LET O(Z)=O
1720  NEXT Z
1730  LET O2=O(2)
1740  LET O=O(1)
1750  PRINT "CONFEDERATE GENERAL---";
1760  REM - ACTUAL OFF/DEF BATTLE SITUATION
1770  IF N <> 3 THEN 1800
1780  PRINT "YOU ARE ON THE OFFENSIVE"
1790  GOTO 1840
1800  IF N <> 1 THEN 1830
1810  PRINT "YOU ARE ON THE DEFENSIVE"
1820  GOTO 1840
1830  PRINT "BOTH SIDES ARE ON THE OFFENSIVE "
1840  PRINT
1850  REM - CHOOSE STRATEGIES
1860  IF B$ <> "YES" THEN 1910
1870  FOR I=1 TO 2
1880  ON I GOTO 1890,1920
1890  PRINT "CONFEDERATE STRATEGY ";
1900  GOTO 1920
1910  PRINT "YOUR STRATEGY ";
1920  INPUT Y
1930  IF ABS(Y-3)<3 THEN 1960
1940  PRINT "STRATEGY";Y;"NOT ALLOWED."
1950  GOTO 1910
1960  IF B$="YES" THEN 2000
1970  IF Y=5 THEN 2830
1980  GOSUB 3110
1990  GOTO 2170
2000  IF I=2 THEN 2040
2010  LET Y1=Y
2020  PRINT "UNION STRATEGY ";
2030  NEXT I
2040  LET Y2=Y
2050  LET Y=Y1
2060  IF Y2=5 THEN 2020
2070  REM : SIMULATED LOSSES-NORTH
2080  LET C6=(2*C2/5)*(1+1/(2*(ABS(Y2-Y)+1)))
2090  LET C6=C6*(1.28+(5*M2/6)/(B(2)+1))
2100  LET C6=INT(C6*(1+1/O2)+.5)
2110  REM - IF LOSS > MEN PRESENT, RESCALE LOSSES
2120  LET E2=100/O2
2130  IF INT(C6+E2)<M6 THEN 2190
2140  LET C6=INT(13*M6/20)
2150  LET E2=7*C6/13
2160  LET U2=1
2170  REM - CALCULATE SIMULATED LOSSES
2180  PRINT
2190  PRINT "


          ","CONFEDERACY","UNION"
2200  LET C5=(2*C1/5)*(1+1/(2*(ABS(Y2-Y)+1)))
2210  LET C5=INT(C5*(1+1/O)*(1.28+F1/(B(1)+1)))+.5)
2220  LET E=100/O
2230  IF C5+100/O<M1*(1+(P1-T1)/(M3+1)) THEN 2270
2240  LET C5=INT(13*M1/20*(1+(P1-T1)/(M3+1)))
2250  LET E=7*C5/13
2260  LET U=1
2270  IF D=1 THEN 2500
2280  PRINT "CASUALTIES",C5,C6
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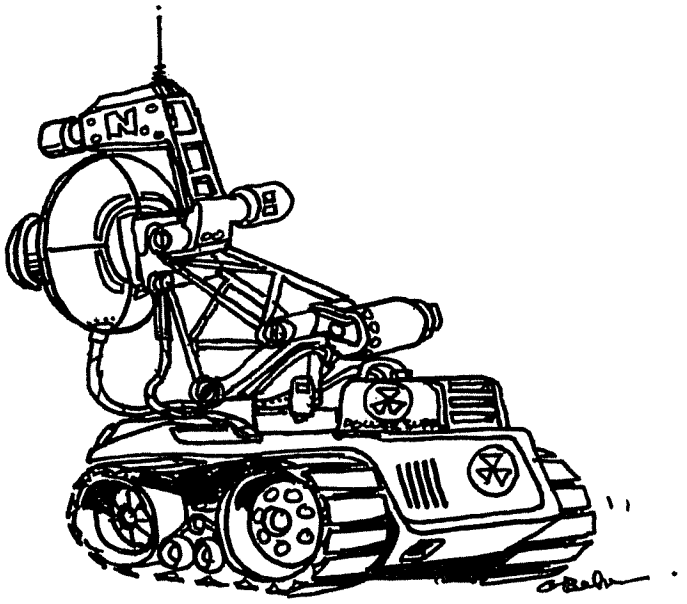
2290  PRINT "DESERTIONS",INT(E),INT(E2)
2300  PRINT
2310  IF B$ <> "YES" THEN 2530
2320  PRINT "COMPARED TO THE ACTUAL CASUALTIES AT "C$
2330  PRINT "CONFEDERATE:"INT(100*(C5/C1)+.5)"% OF THE ORIGINAL"
2340  PRINT "UNION:      "INT(100*(C6/C2)+.5)"% OF THE ORIGINAL"
2350  PRINT
2360  REM - 1 WHO ONE
2370  IF U <> 1 THEN 2380
2375  IF U2=1 THEN 2460
2380  IF U=1 THEN 2420
2390  IF U2=1 THEN 2440
2400  IF C5+E=C6+E2 THEN 2460
2410  IF C5+E<C6+E2 THEN 2440
2420  PRINT "THE UNION WINS "C$
2430  GOTO 2600
2440  PRINT "THE CONFEDERACY WINS "C$
2450  GOTO 2660
2460  PRINT "BATTLE OUTCOME UNRESOLVED"
2470  LET W0=W0+1
2480  IF A=0 THEN 2790
2490  GOTO 2680
2500  LET C6=INT(17*C2*C1/(C5*20))
2510  LET E2=5*0
2520  GOTO 2280
2530  PRINT "YOUR CASUALTIES WERE "INT(100*(C5/C1)+.5)"% OF "
2540  PRINT "THE ACTUAL CASUALTIES AT ";C$
2550  PRINT
2560  REM - FIND WHO WON
2570  IF U=1 THEN 2590
2580  IF C5+E<17*C2*C1/(C5*20)+5*0 THEN 2630
2590  PRINT "YOU LOSE ";C$
2600  IF A=0 THEN 2790
2610  LET L=L+1
2620  GOTO 2680
2630  PRINT "YOU WIN ";C$
2640  REM - CUMULATIVE BATTLE FACTORS WHICH ALTER HISTORICAL
2650  REM   RESOURCES AVAILABLE.IF A REPLAY DON'T UPDATE.
2660  IF A=0 THEN 2790
2670  LET W=W+1
2680  LET T1=T1+C5+E
2690  LET T2=T2+C6+E2
2700  LET P1=P1+C1
2710  LET P2=P2+C2
2720  LET Q1=Q1+(F(1)+H(1)+B(1))
2730  LET Q2=Q2+(F(2)+H(2)+B(2))
2740  LET R1=R1+M1*(100-I1)/20
2750  LET R2=R2+M2*(100-I2)/20
2760  LET M3=M3+M1
2770  LET M4=M4+M2
2780  GOSUB 3300
2790  U=0:U2=0
2800  PRINT "---------------"
2810  GOTO 620
2820  REM------FINISH OFF
2830  PRINT "THE CONFEDERACY HAS SURRENDERED"
2840  GOTO 2860
2850  PRINT "THE UNION HAS SURRENDERED."
2860  PRINT "



          "
2870  PRINT "THE CONFEDERACY ";
2880  PRINT "HAS WON "W" BATTLES AND LOST "L
2890  IF Y=5 THEN 2940
2900  IF Y2=5 THEN 2920
2910  IF W <= L THEN 2940
2915  IF Y=5 THEN 2940
2920  PRINT "THE CONFEDERACY HAS WON THE WAR"
2930  GOTO 2950
2940  PRINT "THE UNION HAS WON THE WAR"
2950  PRINT
2960  IF R1=0 THEN 3100
2970  PRINT "FOR THE "W+L+W0" BATTLES FOUGHT (EXCLUDING RERUNS)"
2980  PRINT " "," "," ";
2990  PRINT "CONFEDERACY"," UNION"
3000  PRINT "HISTORICAL LOSSES",INT(P1+.5),INT(P2+.5)
3010  PRINT "SIMULATED  LOSSES",INT(T1+.5),INT(T2+.5)
3020  PRINT
3030  PRINT "    % OF ORIGINAL",INT(100*(T1/P1)+.5),INT(100*(T2/P2)+.5)
3040  IF B$="YES" THEN 3100
3050  PRINT
3060  PRINT "UNION INTELLIGENCE SUGGESTS THAT THE SOUTH USED "
3070  PRINT "STRATEGIES 1, 2, 3, 4 IN THE FOLLOWING PERCENTAGES"
3080  PRINT S(1);S(2);S(3);S(4)
3090  REM--------------------------------
3100  STOP
3110  REM - UNION STRATEGY IS COMPUTER CHOSEN
3120  PRINT "UNION STRATEGY IS ";
3130  IF A <> 0 THEN 3180
3140  INPUT Y2
3150  IF Y2 <= 0 THEN 3160
3155  IF Y2<5 THEN 3290
3160  PRINT "ENTER 1 , 2 ,3 , OR 4 (USUALLY PREVIOUS UNION STRATEGY)"
3170  GOTO 3140
3180  LET S0=0
3190  LET R=100*RND(0)
3200  FOR I=1 TO 4
3210  LET S0=S0+S(I)
3220  REM - IF ACTUAL STRATEGY INFO IS IN PROGRAM DATA STATEMENTS
3230  REM   THEN R-100 IS EXTRA WEIGHT GIVEN TO THAT STATEGY.
3240  IF R<S0 THEN 3270
3250  NEXT I
3260  REM - IF ACTUAL STRAT. IN,THEN HERE IS Y2= HIST. STRAT.
3270  LET Y2=I
3280  PRINT Y2
3290  RETURN
3300  REM LEARN  PRESENT STRATEGY, START FORGETTING OLD ONES
3310  REM - PRESENT STRATEGY OF SOUTH GAINS 3*S, OTHERS LOSE S
3320  REM   PROBABILITY POINTS, UNLESS A STRATEGY FALLS BELOW 5%.
3330  LET S=3
3340  LET S0=0
3350  FOR I=1 TO 4
3360  IF S(I) <= 5 THEN 3390
3370  LET S(I)=S(I)-S
3380  LET S0=S0+S
3390  NEXT I
3400  LET S(Y)=S(Y)+S0
3410  RETURN
3420  REM - HISTORICAL DATA...CAN ADD MORE (STRAT.,ETC) BY INSERTING
3430  REM   DATA STATEMENTS AFTER APPRO. INFO, AND ADJUSTING READ
3440  DATA "BULL RUN",18000,18500,1967,2708,1
3450  DATA "SHILOH",40000.,44894.,10699,13047,3
3460  DATA "SEVEN DAYS",95000.,115000.,20614,15849,3
3470  DATA "SECOND BULL RUN",54000.,63000.,10000,14000,2
3480  DATA "ANTIETAM",40000.,50000.,10000,12000,3
3490  DATA "FREDERICKSBURG",75000.,120000.,5377,12653,1
3500  DATA "MURFREESBORO",38000.,45000.,11000,12000,1
3510  DATA "CHANCELLORSVILLE",32000,90000.,13000,17197,2
3520  DATA "VICKSBURG",50000.,70000.,12000,19000,1
3530  DATA "GETTYSBURG",72500.,85000.,20000,23000,3
3540  DATA "CHICKAMAUGA",66000.,60000.,18000,16000,2
3550  DATA "CHATTANOOGA",37000.,60000.,36700.,5800,2
3560  DATA "SPOTSYLVANIA",62000.,110000.,17723,18000,2
3570  DATA "ATLANTA",65000.,100000.,8500,3700,1
3580  PRINT "JULY 21, 1861.  GEN. BEAUREGARD, COMMANDING THE SOUTH, MET"
3590  PRINT "UNION FORCES WITH GEN. MCDOWELL IN A PREMATURE BATTLE AT"
3600  PRINT "BULL RUN.  GEN. JACKSON HELPED PUSH BACK THE UNION ATTACK."
3610  GOTO 1150
3620  PRINT "APRIL 6-7, 1862.  THE CONFEDERATE SURPRISE ATTACK AT"
3630  PRINT "SHILOH FAILED DUE TO POOR ORGANIZATION."
3640  GOTO 1150
3650  PRINT "JUNE 25-JULY 1, 1862.  GENERAL LEE (CSA) UPHELD THE"
3660  PRINT "OFFENSIVE THROUGHOUT THE BATTLE AND FORCED GEN. MCCLELLAN"
3670  PRINT "AND THE UNION FORCES AWAY FROM RICHMOND."
3680  GOTO 1150
3690  PRINT "AUG 29-30, 1862.  THE COMBINED CONFEDERATE FORCES UNDER";
3695  PRINT " LEE"
3700  PRINT "AND JACKSON DROVE THE UNION FORCES BACK INTO WASHINGTON."
3710  GOTO 1150
3720  PRINT "SEPT 17, 1862.  THE SOUTH FAILED TO INCORPORATE MARYLAND"
3730  PRINT "INTO THE CONFEDERACY."
3740  GOTO 1150
3750  PRINT "DEC 13, 1862.  THE CONFEDERACY UNDER LEE SUCCESSFULLY"
3760  PRINT "REPULSED AN ATTACK BY THE UNION UNDER GEN. BURNSIDE."
3770  GOTO 1150
3780  PRINT "DEC 31, 1862.  THE SOUTH UNDER GEN. BRAGG WON A CLOSE ";
3785  PRINT "BATTLE."
3790  GOTO 1150
3800  PRINT "MAY 1-6, 1863.  THE SOUTH HAD A COSTLY VICTORY AND LOST"
3810  PRINT "ONE OF THEIR OUTSTANDING GENERALS, 'STONEWALL' JACKSON."
3820  GOTO 1150
3830  PRINT "JULY 4, 1863.  VICKSBURG WAS A COSTLY DEFEAT FOR THE SOUTH"
3840  PRINT "BECAUSE IT GAVE THE UNION ACCESS TO THE MISSISSIPPI."
3850  GOTO 1150
3860  PRINT "JULY 1-3, 1863.  A SOUTHERN MISTAKE BY GEN. LEE AT ";
3865  PRINT "GETTYSBURG"
3870  PRINT "COST THEM ONE OF THE MOST CRUCIAL BATTLES OF THE WAR."
3880  GOTO 1150
3890  PRINT "SEPT. 15, 1863. CONFUSION IN A FOREST NEAR CHICKAMAUGA LED"
3900  PRINT "TO A COSTLY SOUTHERN VICTORY."
3910  GOTO 1150
3920  PRINT "NOV. 25, 1863. AFTER THE SOUTH HAD SIEGED GEN. ROSENCRANS'"
3930  PRINT "ARMY FOR THREE MONTHS, GEN. GRANT BROKE THE SIEGE."
3940  GOTO 1150
3950  PRINT "MAY 5, 1864.  GRANT'S PLAN TO KEEP LEE ISOLATED BEGAN TO"
3960  PRINT "FAIL HERE, AND CONTINUED AT COLD HARBOR AND PETERSBURG."
3970  GOTO 1150
3980  PRINT "AUGUST, 1864.  SHERMAN AND THREE VETERAN ARMIES CONVERGED"
3990  PRINT "ON ATLANTA AND DEALT THE DEATH BLOW TO THE CONFEDERACY."
4000  GOTO 1150
4010  END
```

Combat



In this game, you are fighting a small-scale war with the computer. You have 72,000 troops which you first must distribute among your Army, Navy, and Air Force. You may distribute them in any way you choose as long as you don't use more than 72,000.

You then attack your opponent (the computer) and input which service and the number of men you wish to use. The computer then tells you the outcome of the battle, gives you the current statistics and allows you to determine your next move.

After the second battle, it is decided from the total statistics whether you win or lose or if a treaty is signed.

This program was created by Bob Dores of Milton, Massachusetts.

```
                  COMBAT
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


I AM AT WAR WITH YOU.
WE HAVE 72000 SOLDIERS APIECE.
DISTRIBUTE YOUR FORCES.
             ME            YOU
ARMY          30000         ? 25000
NAVY          20000         ? 25000
A.F.          22000         ? 22000
YOU ATTACK FIRST. TYPE 1 FOR ARMY  2 FOR NAVY
AND 3 FOR AIR FORCE.
? 3
HOW MANY MEN
? 22000
YOU WIPED OUT ONE OF MY ARMY PATROLS, BUT I DESTROYED
2 NAVY BASES AND BOMBED 3 ARMY BASES.

             YOU           ME
ARMY          6250          20000
NAVY          8333          20000
A.F.          22000         22000
WHAT IS YOUR NEXT MOVE?
ARMY=1  NAVY=2  AIR FORCE=3
? 3
HOW MANY MEN
? 20000
MY NAVY AND AIR FORCE IN A COMBINED ATTACK LEFT
YOUR COUNTRY IN SHAMBLES.

FROM THE RESULTS OF BOTH OF YOUR ATTACKS,
YOU LOST-I CONQUERED YOUR COUNTRY.  IT SERVES YOU
RIGHT FOR PLAYING THIS STUPID GAME!!!
```

```
1 PRINT TAB(33);"COMBAT"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT: PRINT: PRINT
4 PRINT "I AM AT WAR WITH YOU.": PRINT "WE HAVE 72000 SOLDIERS APIECE."
5 PRINT "DISTRIBUTE YOUR FORCES."
6 PRINT ,"ME","YOU"
7 PRINT "ARMY",30000,
8 INPUT A
9 PRINT "NAVY",20000,
10 INPUT B
11 PRINT "A.F.",22000,
12 INPUT C
13 IF A+B+C>72000 THEN 5
14 D=30000
15 E=20000
16 F=22000
17 PRINT "YOU ATTACK FIRST. TYPE 1 FOR ARMY  2 FOR NAVY"
18 PRINT "AND 3 FOR AIR FORCE."
19 INPUT Y
20 PRINT "HOW MANY MEN"
21 INPUT X
22 IF X<0 THEN 20
23 ON Y GOTO 100,200,300
100 IF X>A THEN 20
105 IF X<A/3 THEN 120
110 IF X<2*A/3 THEN 150
115 GOTO 270
120 PRINT "YOU LOST";X;"MEN FROM YOUR ARMY."
125 A=INT(A-X)
130 GOTO 500
150 PRINT "YOU LOST";INT(X/3);"MEN BUT I LOST";INT(2*D/3)
155 A=INT(A-X/3)
160 D=0
165 GOTO 500
200 IF X>B THEN 20
210 IF X<E/3 THEN 230
215 IF X<2*E/3 THEN 250
220 GOTO 270
230 PRINT "YOUR ATTACK WAS STOPPED!"
232 B=INT(B-X)
235 GOTO 500
250 PRINT "YOU DESTROYED";INT(2*E/3);"OF MY ARMY"
255 E=INT(E/3)
260 GOTO 500
270 PRINT "YOU SUNK 1 OF MY PATROL BOATS BUT I WIPED OUT 2"
275 PRINT "OF YOUR A.F. BASES AND 3 ARMY BASES."
280 A=INT(A/3)
285 C=INT(C/3)
290 E=INT(2*E/3)
293 GOTO 500
300 IF X>C THEN 20
310 IF X<C/3 THEN 350
320 IF X<2*C/3 THEN 370
330 GOTO 380
350 PRINT "YOUR ATTACK WAS WIPED OUT."
355 C=INT(C-X)
360 GOTO 500
370 PRINT "WE HAD A DOGFIGHT- YOU WON- AND FINISHED YOUR MISSION."
375 D=INT(2*D/3)
377 E=INT(E/3)
378 F=INT(F/3)
379 GOTO 500
380 PRINT "YOU WIPED OUT ONE OF MY ARMY PATROLS, BUT I DESTROYED"
381 PRINT "2 NAVY BASES AND BOMBED 3 ARMY BASES."
385 A=INT(A/4)
387 B=INT(B/3)
390 D=INT(2*D/3)
500 PRINT
501 PRINT,"YOU","ME"
510 PRINT "ARMY",A,D
520 PRINT "NAVY",B,E
530 PRINT "A.F.",C,F
1000 PRINT "WHAT IS YOUR NEXT MOVE?"
1010 PRINT "ARMY=1  NAVY=2  AIR FORCE=3"
1020 INPUT G
1030 PRINT "HOW MANY MEN"
1040 INPUT T
1045 IF T<0 THEN 1030
1050 ON G GOTO 1600,1700,1800
1600 IF T>A THEN 1030
1610 IF T<D/2 THE 1630
1615 PRINT "YOU DESTROYED MY ARMY!"
1616 D=0
1617 GOTO 2000
1630 PRINT "I WIPED OUT YOUR ATTACK!"
1635 A=A-T
1640 GOTO 2000
1700 IF T>B THEN 1030
1710 IF T<E/2 THEN 1750
1720 GOTO 1770
1750 PRINT "I SUNK 2 OF YOUR BATTLESHIPS, AND MY AIR FORCE"
1751 PRINT "WIPED OUT YOUR UNGAURDED CAPITOL."
1755 A=A/4
1760 B=B/2
1765 GOTO 2000
1770 PRINT "YOUR NAVY SHOT DOWN THREE OF MY XIII PLANES,"
1771 PRINT "AND SUNK 3 BATTLESHIPS."
1775 F=2*F/3
1780 E=(E/2)
1790 GOTO2000
1800 IF T>C THEN 1030
1810 IF T>F/2 THEN 1830
1820 GOTO 1850
1830 PRINT "MY NAVY AND AIR FORCE IN A COMBINED ATTACK LEFT"
1831 PRINT "YOUR COUNTRY IN SHAMBLES."
1835 A=A/3
1837 B=B/3
1840 C=C/3
1845 GOTO 2000
1850 PRINT "ONE OF YOUR PLANES CRASHED INTO MY HOUSE.  I AM DEAD."
1851 PRINT "MY COUNTRY FELL APART."
1860 GOTO 2010
2000 PRINT
2001 PRINT "FROM THE RESULTS OF BOTH OF YOUR ATTACKS,"
2002 IF A+B+C>3/2*(D+E+F) THEN 2010
2005 IF A+B+C<2/3*(D+E+F) THEN 2015
2006 PRINT "THE TREATY OF PARIS CONCLUDED THAT WE TAKE OUR"
2007 PRINT "RESPECTIVE COUNTRIES AND LIVE IN PEACE."
2008 GOTO 2020
2010 PRINT "YOU WON, OH! SHUCKS!!!!"
2012 GOTO 2020
2015 PRINT "YOU LOST-I CONQUERED YOUR COUNTRY.  IT SERVES YOU"
2016 PRINT "RIGHT FOR PLAYING THIS STUPID GAME!!!"
2020 END
```

Craps

This game simulates the game of craps played according to standard Nevada craps table rules. That is:

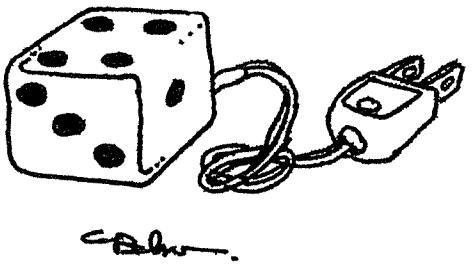
1. A 7 or 11 on the first roll wins
2. A 2, 3, or 12 on the first roll loses
3. Any other number rolled becomes your "point." You continue to roll; if you get your point, you win. If you roll a 7, you lose and the dice change hands when this happens.

This version of craps was modified by Steve North of Creative Computing. It is based on an original which appeared one day on a computer at DEC.

```
                CRAPS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


2,3,12 ARE LOSERS 4,5,6,8,9,10 POINTS
PICK A NUMBER AND INPUT TO ROLL DICE? 1
INPUT THE AMOUNT OF YOUR WAGER.? 500
 I WILL NOW THROW THE DICE
 7 NATURAL....A WINNER!!!!
 7 PAYS EVEN MONEY,YOU WIN 500 DOLLARS
 IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2? 5
YOU ARE NOW AHEAD $ 500
INPUT THE AMOUNT OF YOUR WAGER.? 230
 I WILL NOW THROW THE DICE
 6 POINT I WILL ROLL AGAIN
 5 NO POINT I WILL ROLL AGAIN
 5 NO POINT I WILL ROLL AGAIN
 4 NO POINT I WILL ROLL AGAIN
 7 CRAPS YOU LOSE
YOU LOSE $ 230
 IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2? 5
YOU ARE NOW AHEAD $ 270
INPUT THE AMOUNT OF YOUR WAGER.? 400
 I WILL NOW THROW THE DICE
 9 POINT I WILL ROLL AGAIN
 2 NO POINT I WILL ROLL AGAIN
 10 NO POINT I WILL ROLL AGAIN
 11 NO POINT I WILL ROLL AGAIN
 8 NO POINT I WILL ROLL AGAIN
 6 NO POINT I WILL ROLL AGAIN
 10 NO POINT I WILL ROLL AGAIN
 7 CRAPS YOU LOSE
YOU LOSE $ 400
 IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2? 5
YOU ARE NOW UNDER $ 130
INPUT THE AMOUNT OF YOUR WAGER.? 500
 I WILL NOW THROW THE DICE
 4 POINT I WILL ROLL AGAIN
 2 NO POINT I WILL ROLL AGAIN
 3 NO POINT I WILL ROLL AGAIN
 6 NO POINT I WILL ROLL AGAIN
 5 NO POINT I WILL ROLL AGAIN
 7 CRAPS YOU LOSE
YOU LOSE $ 500
 IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2? 5
YOU ARE NOW UNDER $ 630
INPUT THE AMOUNT OF YOUR WAGER.? 630
 I WILL NOW THROW THE DICE
 3 CRAPS...YOU LOSE
YOU LOSE 630 DOLLARS
 IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2? 2
YOU ARE NOW UNDER $ 1260
TOO BAD, YOU ARE IN THE HOLE. COME AGAIN.
```

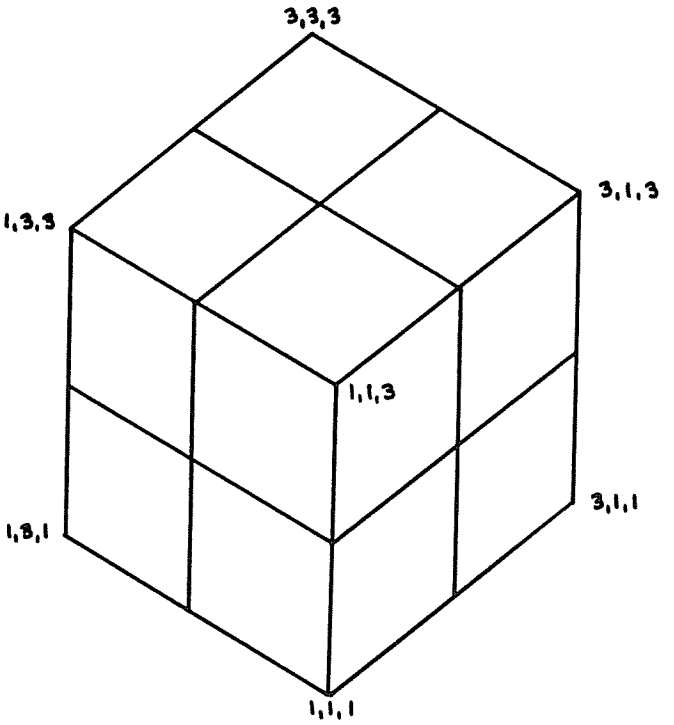
```
5 PRINT TAB(33);"CRAPS"
10 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
12 PRINT:PRINT:PRINT
15 LET R=0
20 PRINT "2,3,12 ARE LOSERS 4,5,6,8,9,10 POINTS"
21 LET T=1
22 PRINT "PICK A NUMBER AND INPUT TO ROLL DICE";
23 INPUT Z
24 LET X=(RND(0))
25 LET T =T+1
26 IF T<=Z GOTO 24
27 PRINT"INPUT THE AMOUNT OF YOUR WAGER.";
28 INPUT F
30 PRINT " I WILL NOW THROW THE DICE"
40 LET E=INT(7*RND(1))
41 LET S=INT(7*RND(1))
42 LETX=E+S
50 IF X=7 GOTO 180
55 IF X=11 GOTO 180
60 IF X=1 GOTO 40
62 IF X=2 GOTO 195
65 IF X=0 GOTO 40
70 IF X=2 GOTO 200
80 IF X=3 GOTO 200
90 IF X=12 GOTO 200
125 IF X=5 GOTO 220
130 IF X =6 GOTO 220
140 IF X=8 GOTO 220
150 IF X=9 GOTO 220
160 IF X =10 GOTO 220
170 IF X=4 GOTO 220
180 PRINT X "NATURAL....A WINNER!!!!"
185 PRINT X"PAYS EVEN MONEY,YOU WIN"F"DOLLARS"
190 GOTO 210
195 PRINT X"SNAKE EYES....YOU LOSE"
196 PRINT "YOU LOSE"F "DOLLARS"
197 LET F=0-F
198 GOTO 210
200 PRINT X "CRAPS...YOU LOSE"
205 PRINT "YOU LOSE"F"DOLLARS"
206 LET F=0-F
210 LET R= R+F
211 GOTO 320
220 PRINT X "POINT I WILL ROLL AGAIN"
230 LET H=INT(7*RND(1))
231 LET Q=INT(7*RND(1))
232 LETO=H+Q
240 IF O=1 GOTO 230
250 IF O=7 GOTO 290
255 IF O=0 GOTO 230
260 IF O=X GOTO 310
270 PRINT O "NO POINT I WILL ROLL AGAIN"
280 GOTO 230
290 PRINT O "CRAPS YOU LOSE"
291 PRINT "YOU LOSE $"F
292 F=0-F
293 GOTO 210
300 GOTO 320
310 PRINT X"A WINNER.........CONGRATS!!!!!!!!"
311 PRINT X "AT 2 TO 1 ODDS PAYS YOU...LET ME SEE..."2*F"DOLLARS"
312 LET F=2*F
313 GOTO 210
320 PRINT " IF YOU WANT TO PLAY AGAIN PRINT 5 IF NOT PRINT 2";
330 INPUT M
331 IF R<0 GOTO 334
332 IF R>0 GOTO 336
333 IF R=0 GOTO 338
334 PRINT "YOU ARE NOW UNDER $";-R
335 GOTO 340
336 PRINT "YOU ARE NOW AHEAD $"R
337 GOTO 340
338 PRINT "YOU ARE NOW EVEN AT 0"
340 IF M=5 GOTO 27
341 IFR<0GOTO350
342 IFR>0GOTO353
343 IFR=0GOTO355
350 PRINT"TOO BAD, YOU ARE IN THE HOLE. COME AGAIN."
351 GOTO360
353 PRINT"CONGRATULATIONS---YOU CAME OUT A WINNER. COME AGAIN!"
354 GOTO360
355 PRINT"CONGRATULATIONS---YOU CAME OUT EVEN, NOT BAD FOR AN AMATEUR"
360 END
```



Cube

CUBE is a game played on the facing sides of a cube with a side dimension of 2. A location is designated by three numbers — e.g., 1, 2, 1. The object is to travel from 1, 1, 1 to 3, 3, 3 by moving one horizontal or vertical (not diagonal) square at a time without striking one of 5 randomly placed landmines. You are staked to $500; prior to each play of the game you may make a wager whether you will reach your destination. You lose if you hit a mine or try to make an illegal move — i.e., change more than one digit from your previous position.

Cube was created by Jerimac Ratliff of Fort Worth, Texas.




```
                  CUBE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

   DO YOU WANT TO  SEE THE INSTRUCTIONS? (YES--1,NO--0)
   ? 1
   THIS IS A GAME IN WHICH YOU WILL BE PLAYING AGAINST THE
   RANDOM DECISION OF THE COMPUTER. THE FIELD OF PLAY IS A
   CUBE OF SIDE 3. ANY OF THE 27 LOCATIONS CAN BE DESIGNATED
   BY INPUTING THREE NUMBERS SUCH AS 2,3,1.  AT THE START,
   YOU ARE AUTOMATICALLY AT LOCATION 1,1,1.  THE OBJECT OF
   THE GAME IS TO GET TO LOCATION 3,3,3.  ONE MINOR DETAIL,
   THE COMPUTER WILL PICK, AT RANDOM, 5 LOCATIONS AT WHICH
   IT WILL PLANT LAND MINES.  IF YOU HIT ONE OF  THESE LOCATIONS
   YOU LOSE.  ONE OTHER DETAIL, YOU MAY MOVE ONLY ONE SPACE
   IN ONE DIRECTION EACH MOVE.  FOR  EXAMPLE: FROM 1,1,2 YOU
   MAY  MOVE TO 2,1,2 OR 1,1,3.  YOU MAY NOT CHANGE
   TWO OF THE NUMBERS ON THE SAME MOVE.  IF YOU MAKE  AN ILLEGAL
   MOVE, YOU LOSE AND THE COMPUTER TAKES THE MONEY YOU MAY
   HAVE BET ON THAT ROUND.


   ALL YES OR NO QUESTIONS WILL BE ANSWERED BY A 1 FOR YES
   OR A 0 (ZERO) FOR NO.

   WHEN STATING THE AMOUNT OF A WAGER, PRINT ONLY THE NUMBER
   OF DOLLARS (EXAMPLE: 250)  YOU ARE AUTOMATICALLY STARTED WITH
   500  DOLLAR ACCOUNT.

   GOOD LUCK
   WANT TO MAKE A WAGER?
   ? 1
   HOW MUCH?
   ? 200

   ITS YOUR MOVE
   ? 1,1,2
   NEXT MOVE
   ? 1,2,2
   NEXT MOVE
   ? 2,2,2
   NEXT MOVE
   ? 2,2,3
   NEXT MOVE
   ? 2,3,3
   ******BANG******
   YOU LOSE

    YOU NOW HAVE 200 DOLLARS
   DO YOU WANT TO TRY AGAIN?
   ? 1
   WANT TO MAKE A WAGER?
   ? 1
   HOW MUCH?
   ? 100

   ITS YOUR MOVE
   ? 1,2,1
   NEXT MOVE
   ? 2,2,1
   NEXT MOVE
   ? 2,2,2
   NEXT MOVE
   ? 2,3,2
   NEXT MOVE
   ? 2,3,3
   NEXT MOVE
   ? 3,3,3
   CONGRATULATIONS
   YOU NOW  HAVE 300 DOLLARS
   DO YOU WANT TO TRY AGAIN?
   ? 0
   TOUGH LUCK

    GOODBYE
```

```
10 PRINT TAB(34) "CUBE"
20 PRINT TAB(15) "CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT : PRINT : PRINT
100 PRINT"DO YOU WANT TO  SEE THE INSTRUCTIONS? (YES--1,NO--0)"
110 INPUT B7
120 IF B7=0 THEN 370
130 PRINT"THIS IS A GAME IN WHICH YOU WILL BE PLAYING AGAINST THE"
140 PRINT"RANDOM DECISION OF THE COMPUTER. THE FIELD OF PLAY IS A"
150 PRINT"CUBE OF SIDE 3. ANY OF THE 27 LOCATIONS CAN BE DESIGNATED"
160 PRINT"BY INPUTING THREE NUMBERS SUCH AS 2,3,1.  AT THE START,"
170 PRINT"YOU ARE AUTOMATICALLY AT LOCATION 1,1,1.  THE OBJECT OF"
180 PRINT"THE GAME IS TO GET TO LOCATION 3,3,3.  ONE MINOR DETAIL,"
190 PRINT"THE COMPUTER WILL PICK, AT RANDOM, 5 LOCATIONS AT WHICH"
200 PRINT"IT WILL PLANT LAND MINES.  IF YOU HIT ONE OF  THESE LOCATIONS
210 PRINT"YOU LOSE.  ONE OTHER DETAIL, YOU MAY MOVE ONLY ONE SPACE "
220 PRINT"IN ONE DIRECTION EACH MOVE.  FOR  EXAMPLE: FROM 1,1,2 YOU"
230 PRINT"MAY  MOVE TO 2,1,2 OR 1,1,3.  YOU MAY NOT CHANGE"
240 PRINT"TWO OF THE NUMBERS ON THE SAME MOVE.  IF YOU MAKE  AN ILLEGAL
250 PRINT"MOVE, YOU LOSE AND THE COMPUTER TAKES THE MONEY YOU MAY"
260 PRINT"HAVE BET ON THAT ROUND."
270 PRINT
280 PRINT
290 PRINT"ALL YES OR NO QUESTIONS WILL BE ANSWERED BY A 1 FOR YES"
300 PRINT"OR A 0 (ZERO) FOR NO."
310 PRINT
320 PRINT"WHEN STATING THE AMOUNT OF A WAGER, PRINT ONLY THE NUMBER"
330 PRINT"OF DOLLARS (EXAMPLE: 250)  YOU ARE AUTOMATICALLY STARTED WITH
340 PRINT"500  DOLLAR ACCOUNT."
350 PRINT
360 PRINT"GOOD LUCK"
370 LET A1=500
380 LET A=INT(3*(RND(X)))
390 IF A<>0 THEN 410
400 LET A=3
410 LETB=INT(3*(RND(X)))
420 IFB<>0THEN440
430 LET B=2
440 LETC=INT(3*(RND(X)))
450 IFC<>0THEN470
460 LETC=3
470 LETD=INT(3*(RND(X)))
480 IFD<>0THEN500
490 LETD=1
500 LETE=INT(3*(RND(X)))
510 IFE<>0THEN530
520 LETE=3
530 LETF=INT(3*(RND(X)))
540 IFF<>0THEN560
550 LETF=3
560 LETG=INT(3*(RND(X)))
570 IFG<>0THEN590
580 LETG=3
590 LETH=INT(3*(RND(X)))
600 IFH<>0THEN620
610 LETH=3
620 LETI=INT(3*(RND(X)))
630 IFI<>0THEN650
640 LETI=2
650 LETJ=INT(3*(RND(X)))
660 IFJ<>0THEN680
670 LETJ=3
680 LETK=INT(3*(RND(X)))
690 IFK<>0THEN710
700 LETK=2
710 LETL=INT(3*(RND(X)))
720 IFL<>0THEN740
730 LETL=3
740 LETM=INT(3*(RND(X)))
750 IFM<>0THEN770
760 LETM=3
770 LETN=INT(3*(RND(X)))
780 IFN<>0THEN800
790 LET N=1
800 LET O=INT (3*(RND(X)))
810 IF O <>0 THEN 830
820 LET O=3
830 PRINT "WANT TO MAKE A WAGER?"
840 INPUT Z
850 IF Z=0 THEN 920
860 PRINT "HOW MUCH?"
870 INPUT Z1
876 IF A1<Z1 THEN 1522
880 LET W=1
890 LET X=1
900 LET Y=1
910 PRINT
920 PRINT "ITS YOUR MOVE"
930 INPUT P,Q,R
940 IFP>W+1 THEN1030
950 IFP=W+1THEN1000
960 IFQ>X+1 THEN1030
970 IF Q=(X+1) THEN 1010
980 IF R >(Y+1)  THEN 1030
990 GOTO 1050
1000 IF Q>= X+1 THEN 1030
1010 IF R>=Y+1 THEN 1030
1020 GOTO 1050
1030 PRINT "ILLEGAL MOVE", "YOU LOSE"
1040 GOTO 1440
1050 LET W=P
1060 LET X=Q
1070 LET Y=R
1080 IF P=3 THEN 1100
1090 GOTO 1130
1100 IF  Q=3 THEN 1120
1110 GOTO 1130
1120 IF R=3 THEN 1530
1130 IF P=A THEN 1150
1140 GOTO 1180
1150 IF Q=B THEN 1170
1160 GOTO 1180
1170 IF R=C THEN1400
1180 IF P=D THEN 1200
1190 GOTO 1230
1200 IF Q=E THEN 1220
1210 GOTO 1230
1220 IF  R=F THEN 1400
1230 IF P=G THEN1250
1240 GOTO 1280
1250 IF Q=H THEN1270
1260 GOTO 1280
1270 IF R=ITHEN 1400
1280 IF P=J THEN 1300
1290 GOTO 1330
1300 IF Q=K THEN1320
1310 GOTO 1330
1320 IF R=L THEN 1440
1330 IF P=M THEN 1350
1340 GOTO 1380
1350 IF Q=N THEN 1370
1360 GOTO 1380
1370 IF R=O THEN1400
1380 PRINT "NEXT MOVE"
1390 GOTO 930
1400 PRINT"******BANG******"
1410 PRINT "YOU LOSE"
1420 PRINT
1430 PRINT
1440 IF   Z=0 THEN 1580
1450 PRINT
1460 LET Z2=A1-Z1
1470 IF Z2>0 THEN 1500
1480 PRINT "YOU BUST"
1490 GOTO 1610
1500 PRINT " YOU NOW HAVE"; Z2; "DOLLARS"
1510 LET A1=Z2
1520 GOTO 1580
1522 PRINT"TRIED TO FOOL ME; BET AGAIN";
1525 GOTO 870
1530 PRINT"CONGRATULATIONS"
1540 IF Z=0 THEN  1580
1550 LET Z2=A1+Z1
1560 PRINT "YOU NOW  HAVE"; Z2;"DOLLARS"
1570 LET A1=Z2
1580 PRINT"DO YOU WANT TO TRY AGAIN?"
1590 INPUT S
1600 IF S=1 THEN  380
1610 PRINT "TOUGH LUCK"
1620 PRINT
1630 PRINT " GOODBYE"
1640 END
```

Depth Charge

In this program you are captain of the destroyer USS Computer. An enemy submarine has been causing trouble and your mission is to destroy it. You may select the size of the "cube" of water you wish to search in. The computer then determines how many depth charges you get to destroy the submarine.

Each depth charge is exploded by you specifying a trio of numbers; the first two are the surface coordinates (X,Y), the third is the depth. After each depth charge, your sonar observer will tell you where the explosion was relative to the submarine.

Dana Noftle wrote this program while a student at Acton High School, Acton, Massachusetts.

```
                DEPTH CHARGE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DEPTH CHARGE GAME

DIMENSION OF SEARCH AREA? 50

YOU ARE THE CAPTAIN OF THE DESTROYER USS COMPUTER
AN ENEMY SUB HAS BEEN CAUSING YOU TROUBLE.  YOUR
MISSION IS TO DESTROY IT.  YOU HAVE 6 SHOTS.
SPECIFY DEPTH CHARGE EXPLOSION POINT WITH A
TRIO OF NUMBERS -- THE FIRST TWO ARE THE
SURFACE COORDINATES; THE THIRD IS THE DEPTH.

GOOD LUCK !


TRIAL # 1 ? 25,25,25
SONAR REPORTS SHOT WAS SOUTHEAST AND TOO LOW.


TRIAL # 2 ? 12,35,12
SONAR REPORTS SHOT WAS SOUTHWEST AND TOO LOW.


TRIAL # 3 ? 18,43,5
SONAR REPORTS SHOT WAS NORTHEAST AND TOO HIGH.


TRIAL # 4 ? 15,39,8
SONAR REPORTS SHOT WAS EAST AND TOO LOW.


TRIAL # 5 ? 14,39,6

B O O M ! !  YOU FOUND IT IN 5 TRIES!


ANOTHER GAME (Y OR N)? N
OK.  HOPE YOU ENJOYED YOURSELF.
```

```
DEPTH CHARGE GAME

DIMENSION OF SEARCH AREA? 10

YOU ARE THE CAPTAIN OF THE DESTROYER USS COMPUTER
AN ENEMY SUB HAS BEEN CAUSING YOU TROUBLE.  YOUR
MISSION IS TO DESTROY IT.  YOU HAVE 4 SHOTS.
SPECIFY DEPTH CHARGE EXPLOSION POINT WITH A
TRIO OF NUMBERS -- THE FIRST TWO ARE THE
SURFACE COORDINATES; THE THIRD IS THE DEPTH.

GOOD LUCK !


TRIAL # 1 ? 5,5,5
SONAR REPORTS SHOT WAS NORTH AND TOO HIGH.


TRIAL # 2 ? 5,2,7
SONAR REPORTS SHOT WAS SOUTH AND TOO HIGH.

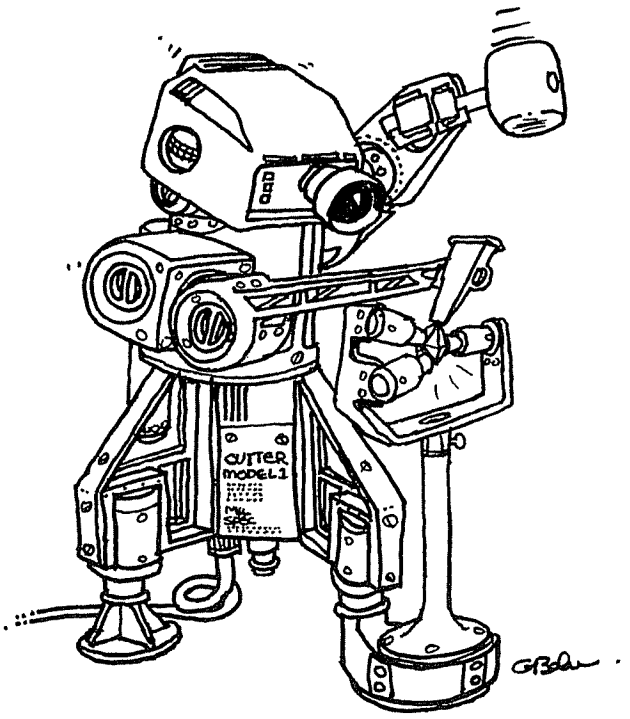

TRIAL # 3 ? 5,3,9
SONAR REPORTS SHOT WAS SOUTH AND TOO LOW.


TRIAL # 4 ? 5,4,8

B O O M ! !  YOU FOUND IT IN 4 TRIES!
```

```
2 PRINT TAB(30);"DEPTH CHARGE"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 PRINT "DEPTH CHARGE GAME": PRINT
20 INPUT "DIMENSION OF SEARCH AREA";G: PRINT
30 N=INT(LOG(G)/LOG(2))+1
40 PRINT "YOU ARE THE CAPTAIN OF THE DESTROYER USS COMPUTER"
50 PRINT "AN ENEMY SUB HAS BEEN CAUSING YOU TROUBLE.  YOUR"
60 PRINT "MISSION IS TO DESTROY IT.  YOU HAVE";N;"SHOTS."
70 PRINT "SPECIFY DEPTH CHARGE EXPLOSION POINT WITH A"
80 PRINT "TRIO OF NUMBERS -- THE FIRST TWO ARE THE"
90 PRINT "SURFACE COORDINATES; THE THIRD IS THE DEPTH."
100 PRINT : PRINT "GOOD LUCK !": PRINT
110 A=INT(G*RND(1)) : B=INT(G*RND(1)) : C=INT(G*RND(1))
120 FOR D=1 TO N : PRINT : PRINT "TRIAL #";D; : INPUT X,Y,Z
130 IF ABS(X-A)+ABS(Y-B)+ABS(Z-C)=0 THEN 300
140 GOSUB 500 : PRINT : NEXT D
200 PRINT : PRINT "YOU HAVE BEEN TORPEDOED!  ABANDON SHIP!"
210 PRINT "THE SUBMARINE WAS AT";A;",";B;",";C : GOTO 400
300 PRINT : PRINT "B O O M ! !  YOU FOUND IT IN";D;"TRIES!"
400 PRINT : PRINT: INPUT "ANOTHER GAME (Y OR N)";A$
410 IF A$="Y" THEN 100
420 PRINT "OK.  HOPE YOU ENJOYED YOURSELF." : GOTO 600
500 PRINT "SONAR REPORTS SHOT WAS ";
510 IF Y>B THEN PRINT "NORTH";
520 IF Y<B THEN PRINT "SOUTH";
530 IF X>A THEN PRINT "EAST";
540 IF X<A THEN PRINT "WEST";
550 IF Y<>B OR X<>A THEN PRINT " AND";
560 IF Z>C THEN PRINT " TOO LOW."
570 IF Z<C THEN PRINT " TOO HIGH."
580 IF Z=C THEN PRINT " DEPTH OK."
590 RETURN
600 END
```

Diamond



This program fills an 8½ x 11 piece of paper with diamonds (plotted on a hard-copy terminal, of course). The program asks for an odd number to be input in the range 5 to 31. The diamonds printed will be this number of characters high and wide. The number of diamonds across the page will vary from 12 for 5-character wide diamonds to 1 for a diamond 31-characters wide. You can change the content of the pattern if you wish in Statement 6.

The program was written by David Ahl of Creative Computing.

```
1 PRINT TAB(33);"DIAMOND"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "FOR A PRETTY DIAMOND PATTERN,"
5 INPUT "TYPE IN AN ODD NUMBER BETWEEN 5 AND 21";R:PRINT
6 Q=INT(60/R):A$="CC"
8 FOR L=1 TO Q
10 X=1:Y=R:Z=2
20 FOR N=X TO Y STEP Z
25 PRINT TAB((R-N)/2);
28 FOR M=1 TO Q
29 C=1
30 FOR A=1 TO N
32 IF C>LEN(A$) THEN PRINT "!";:GOTO 50
34 PRINT MID$(A$,C,1);
36 C=C+1
50 NEXT A
53 IF M=Q THEN 60
55 PRINT TAB(R*M+(R-N)/2);
56 NEXT M
60 PRINT
70 NEXT N
83 IF X<>1 THEN 95
85 X=R-2:Y=1:Z=-2
90 GOTO 20
95 NEXT L
99 END
```

```
                  DIAMOND
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


 FOR A PRETTY DIAMOND PATTERN,
 TYPE IN AN ODD NUMBER BETWEEN 5 AND 21? 15

      C             C             C             C
     CC!           CC!           CC!           CC!
    CC!!!         CC!!!         CC!!!         CC!!!
   CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
  CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
 CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
     CC!!!         CC!!!         CC!!!         CC!!!
      CC!           CC!           CC!           CC!
       C             C             C             C
       C             C             C             C
      CC!           CC!           CC!           CC!
     CC!!!         CC!!!         CC!!!         CC!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
     CC!!!         CC!!!         CC!!!         CC!!!
      CC!           CC!           CC!           CC!
       C             C             C             C
       C             C             C             C
      CC!           CC!           CC!           CC!
     CC!!!         CC!!!         CC!!!         CC!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
     CC!!!         CC!!!         CC!!!         CC!!!
      CC!           CC!           CC!           CC!
       C             C             C             C
       C             C             C             C
      CC!           CC!           CC!           CC!
     CC!!!         CC!!!         CC!!!         CC!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!CC!!!!!!!!!!!!
 CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!! CC!!!!!!!!!!!
  CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!   CC!!!!!!!!!
   CC!!!!!!!     CC!!!!!!!     CC!!!!!!!     CC!!!!!!!
    CC!!!!!       CC!!!!!       CC!!!!!       CC!!!!!
     CC!!!         CC!!!         CC!!!         CC!!!
      CC!           CC!           CC!           CC!
       C             C             C             C
```

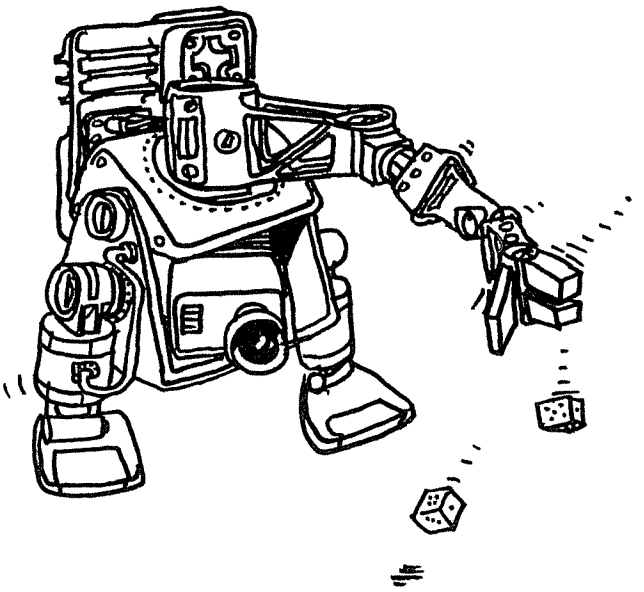
Dice

Not exactly a game, this program simulates rolling a pair of dice a large number of times and prints out the frequency distribution. You simply input the number of rolls. It is interesting to see how many rolls are necessary to approach the theoretical distribution:

2	1/36	2.7777 . . .%
3	2/36	5.5555 . . .%
4	3/36	8.3333 . . .%

etc.

Daniel Freidus wrote this program while in the seventh grade at Harrison Jr-Sr High School, Harrison, New York.



```
2 PRINT TAB(34);"DICE"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
10 DIM F(12)
20 REM  DANNY FREIDUS
30 PRINT "THIS PROGRAM SIMULATES THE ROLLING OF A"
40 PRINT "PAIR OF DICE."
50 PRINT "YOU ENTER THE NUMBER OF TIMES YOU WANT THE COMPUTER TO"
60 PRINT "'ROLL' THE DICE.  WATCH OUT, VERY LARGE NUMBERS TAKE"
70 PRINT "A LONG TIME.  IN PARTICULAR, NUMBERS OVER 5000."
80 FOR Q=1 TO 12
90 F(Q)=0
100 NEXT Q
110 PRINT:PRINT "HOW MANY ROLLS";
120 INPUT X
130 FOR S=1 TO X
140 A=INT(6*RND(1)+1)
150 B=INT(6*RND(1)+1)
160 R=A+B
170 F(R)=F(R)+1
180 NEXT S
185 PRINT
190 PRINT "TOTAL SPOTS","NUMBER OF TIMES"
200 FOR V=2 TO 12
210 PRINT V,F(V)
220 NEXT V
222 PRINT:PRINT "TRY AGAIN";
223 INPUT Z$
224 IF Z$="YES" THEN 80
240 END
```

```
                    DICE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS PROGRAM SIMULATES THE ROLLING OF A
PAIR OF DICE.
YOU ENTER THE NUMBER OF TIMES YOU WANT THE COMPUTER TO
'ROLL' THE DICE.  WATCH OUT, VERY LARGE NUMBERS TAKE
A LONG TIME.  IN PARTICULAR, NUMBERS OVER 5000.

HOW MANY ROLLS? 10000

TOTAL SPOTS   NUMBER OF TIMES
 2             312
 3             543
 4             820
 5             1148
 6             1395
 7             1680
 8             1330
 9             1125
 10            841
 11            542
 12            264

TRY AGAIN? YES

HOW MANY ROLLS? 100

TOTAL SPOTS   NUMBER OF TIMES
 2             1
 3             6
 4             9
 5             9
 6             16
 7             22
 8             16
 9             9
 10            11
 11            1
 12            0
```

Digits

The player writes down a set of 30 numbers (0, 1, or 2) at random prior to playing the game. The computer program, using pattern recognition techniques, attempts to guess the next number in your list.

The computer asks for 10 numbers at a time. It always guesses first and then examines the next number to see if it guessed correctly. By pure luck (or chance or probability), the computer ought to be right 10 times. It is uncanny how much better it generally does than that!

This program originated at Dartmouth; original author unknown.

```
                  DIGITS
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY



THIS IS A GAME OF GUESSING.
FOR INSTRUCTIONS, TYPE '1', ELSE TYPE '0'? 1

PLEASE TAKE A PIECE OF PAPER AND WRITE DOWN
THE DIGITS '0', '1', OR '2' THIRTY TIMES AT RANDOM.
ARRANGE THEM IN THREE LINES OF TEN DIGITS.
I WILL ASK FOR THEM 10 AT A TIME.
I WILL ALWAYS GUESS THEM FIRST, AND THEN LOOK AT YOUR
NEXT NUMBER TO SEE IF I WAS RIGHT.  BY PURE LUCK
I OUGHT TO BE RIGHT 10 TIMES.  BUT I HOPE TO DO BETTER
THAN THAT *****


TEN NUMBERS, PLEASE? 1,0,2,1,1,0,1,1,2,2

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

 0            1           WRONG         0
 0            0           RIGHT         1
 1            2           WRONG         1
 0            1           WRONG         1
 1            1           RIGHT         2
 1            0           WRONG         2
 0            1           WRONG         2
 1            1           RIGHT         3
 0            2           WRONG         3
 0            2           WRONG         3

TEN NUMBERS, PLEASE? 2,0,2,0,1,1,2,0,0,0

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

 2            2           RIGHT         4
 2            0           WRONG         4
 2            2           RIGHT         5
 0            0           RIGHT         6
 1            1           RIGHT         7
 1            1           RIGHT         8
 2            2           RIGHT         9
 2            0           WRONG         9
 2            0           WRONG         9
 2            0           WRONG         9

TEN NUMBERS, PLEASE? 0,1,0,2,0,0,0,2,1,1

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

 2            0           WRONG         9
 2            1           WRONG         9
 2            0           WRONG         9
 2            2           RIGHT        10
 0            0           RIGHT        11
 1            0           WRONG        11
 1            0           WRONG        11
 1            2           WRONG        11
 1            1           RIGHT        12
 1            1           RIGHT        13

I GUESSED MORE THAN 1/3 OF YOUR NUMBERS.
I WIN.

DO YOU WANT TO TRY AGAIN (1 FOR YES, 0 FOR NO)? 1

TEN NUMBERS, PLEASE? 0,0,0,0,0,0,1,1,1,1

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

 0            0           RIGHT         1
 2            0           WRONG         1
 1            0           WRONG         1
 2            0           WRONG         1
 2            0           WRONG         1
 2            0           WRONG         1
 0            1           WRONG         1
 2            1           WRONG         1
 0            1           WRONG         1
 2            1           WRONG         1

TEN NUMBERS, PLEASE? 2,2,2,1,1,1,1,1,1,1

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

 0            2           WRONG         1
 1            2           WRONG         1
 1            2           WRONG         1
 2            1           WRONG         1
 1            1           RIGHT         2
 2            1           WRONG         2
 0            1           WRONG         2
 2            1           WRONG         2
 2            1           WRONG         2
 1            1           RIGHT         3

TEN NUMBERS, PLEASE? 0,2,0,2,1,0,1,0,1,1

MY GUESS     YOUR NO.     RESULT       NO. RIGHT

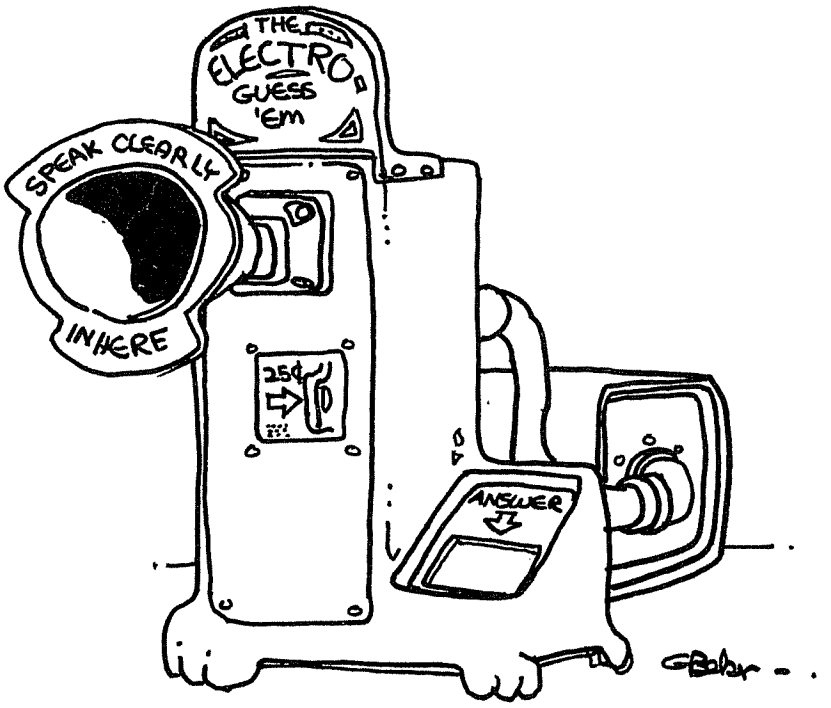
 2            0           WRONG         3
 0            2           WRONG         3
 2            0           WRONG         3
 2            2           RIGHT         4
 2            1           WRONG         4
 1            0           WRONG         4
 0            1           WRONG         4
 1            0           WRONG         4
 0            1           WRONG         4
 1            1           RIGHT         5

I GUESSED LESS THAN 1/3 OF YOUR NUMBERS.
YOU BEAT ME.  CONGRATULATIONS *****

DO YOU WANT TO TRY AGAIN (1 FOR YES, 0 FOR NO)? 0

THANKS FOR THE GAME.
```

```
10 PRINT TAB(33);"DIGITS"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
210 PRINT"THIS IS A GAME OF GUESSING."
220 PRINT "FOR INSTRUCTIONS, TYPE '1', ELSE TYPE '0'";
230 INPUT E
240 IF E=0 THEN 360
250 PRINT
260 PRINT "PLEASE TAKE A PIECE OF PAPER AND WRITE DOWN"
270 PRINT "THE DIGITS '0', '1', OR '2' THIRTY TIMES AT RANDOM."
280 PRINT "ARRANGE THEM IN THREE LINES OF TEN DIGITS."
290 PRINT "I WILL ASK FOR THEM 10 AT A TIME."
300 PRINT "I WILL ALWAYS GUESS THEM FIRST, AND THEN LOOK AT YOUR"
310 PRINT "NEXT NUMBER TO SEE IF I WAS RIGHT.  BY PURE LUCK"
320 PRINT "I OUGHT TO BE RIGHT 10 TIMES.  BUT I HOPE TO DO BETTER"
330 PRINT "THAN THAT *****"
340 PRINT: PRINT
360 READ A,B,C
370 DATA 0,1,3
380 DIM M(26,2),K(2,2),L(8,2)
400 FOR I=0 TO 26: FOR J=0 TO 2: M(I,J)=1: NEXT J: NEXT I
410 FOR I=0 TO 2: FOR J=0 TO 2: K(I,J)=9: NEXT J: NEXT I
420 FOR I=0 TO 8: FOR J=0 TO 2: L(I,J)=3: NEXT J: NEXT I
450 L(0,0)=2: L(4,1)=2: L(8,2)=2
480 Z=26: Z1=8: Z2=2
510 X=0
520 FOR T=1 TO 3
530 PRINT
540 PRINT "TEN NUMBERS, PLEASE";
550 INPUT N(1),N(2),N(3),N(4),N(5),N(6),N(7),N(8),N(9),N(10)
560 FOR I=1 TO 10
570 W=N(I)-1
580 IF W=SGN(W) THEN 620
590 PRINT "ONLY USE THE DIGITS '0', '1', OR '2'."
600 PRINT "LET'S TRY AGAIN.": GOTO 530
620 NEXT I
630 PRINT: PRINT "MY GUESS","YOUR NO.","RESULT","NO. RIGHT":PRINT
660 FOR U=1 TO 10
670 N=N(U): S=0
690 FOR J=0 TO 2
700 S1=A*K(Z2,J)+B*L(Z1,J)+C*M(Z,J)
710 IF S>S1 THEN 760
720 IF S<S1 THEN 740
730 IF RND(1)<.5 THEN 760
740 S=S1: G=J
760 NEXT J
770 PRINT G,N(U),
780 IF G=N(U) THEN 810
790 PRINT "WRONG",X
800 GOTO 880
810 X=X+1
820 PRINT "RIGHT",X
830 M(Z,N)=M(Z,N)+1
840 L(Z1,N)=L(Z1,N)+1
850 K(Z2,N)=K(Z2,N)+1
860 Z=Z-INT(Z/9)*9
870 Z=3*Z+N(U)
880 Z1=Z-INT(Z/9)*9
890 Z2=N(U)
900 NEXT U
910 NEXT T
920 PRINT
930 IF X>10 THEN 980
940 IF X<10 THEN 1010
950 PRINT "I GUESSED EXACTLY 1/3 ON YOUR NUMBERS."
960 PRINT "IT IS A TIE GAME."
970 GOTO 1030
980 PRINT "I GUESSED MORE THAN 1/3 OF YOUR NUMBERS."
990 PRINT "I WIN.": FOR Q=1 TO 10: PRINT CHR$(7);: NEXT Q
1000 GOTO 1030
1010 PRINT "I GUESSED LESS THAN 1/3 OF YOUR NUMBERS."
1020 PRINT "YOU BEAT ME.  CONGRATULATIONS *****"
1030 PRINT
1040 PRINT "DO YOU WANT TO TRY AGAIN (1 FOR YES, 0 FOR NO)";
1060 INPUT X
1070 IF X=1 THEN 400
1080 PRINT: PRINT "THANKS FOR THE GAME."
1090 END
```



Even Wins

This is a game between you and the computer. To play, an odd number of objects (marbles, chips, matches) are placed in a row. You take turns with the computer picking up between one and four objects each turn. The game ends when there are no objects left, and the winner is the one with an even number of objects picked up.

Two versions of this game are included. While to the player they appear similar, the programming approach is quite different. EVEN WINS, the first version, is deterministic — i.e., the computer plays by fixed, good rules and is impossible to beat if you don't know how to play the game. It always starts with 27 objects, although you may change this in Lines 250, and 1060.

The second version, GAME OF EVEN WINS, is much more interesting because the computer starts out only knowing the rules of the game. Using simple techniques of artificial intelligence (cybernetics), the computer gradually learns to play from its mistakes until it plays a very good game. After 20 games, the computer is a challenge to beat. Variation in the human's style of play seems to make the computer learn more quickly. If you plot the learning curve of this program, it closely resembles classical human learning curves from psychological experiments.

Eric Peters at DEC wrote the GAME OF EVEN WINS. The original author of EVEN WINS is unknown.

```
                EVEN WINS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


    THIS IS A TWO PERSON GAME CALLED 'EVEN WINS.'
TO PLAY THE GAME, THE PLAYERS NEED 27 MARBLES OR
OTHER OBJECTS ON A TABLE.


    THE 2 PLAYERS ALTERNATE TURNS, WITH EACH PLAYER
REMOVING FROM 1 TO 4 MARBLES ON EACH MOVE.  THE GAME
ENDS WHEN THERE ARE NO MARBLES LEFT, AND THE WINNER
IS THE ONE WITH AN EVEN NUMBER OF MARBLES.


    THE ONLY RULES ARE THAT (1) YOU MUST ALTERNATE TURNS,
(2) YOU MUST TAKE BETWEEN 1 AND 4 MARBLES EACH TURN,
AND (3) YOU CANNOT SKIP A TURN.


    TYPE A 1 IF YOU WANT TO GO FIRST, AND TYPE
A 0 IF YOU WANT ME TO GO FIRST.
? 0
TOTAL= 27
I PICK UP 2 MARBLES.
TOTAL= 25

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 2
? 2

TOTAL= 23

    YOUR TOTAL IS 2
I PICK UP 4 MARBLES.
TOTAL= 19

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 6
? 4

TOTAL= 15

    YOUR TOTAL IS 6
I PICK UP 2 MARBLES.
TOTAL= 13

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 8
? 1

TOTAL= 12

    YOUR TOTAL IS 7
I PICK UP 1 MARBLES.
TOTAL= 11

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 9
? 3

TOTAL= 8

    YOUR TOTAL IS 10
I PICK UP 1 MARBLES.
TOTAL= 7

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 10
? 1

TOTAL= 6

    YOUR TOTAL IS 11
I PICK UP 1 MARBLES.
TOTAL= 5

    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 11
? 1

TOTAL= 4

    YOUR TOTAL IS 12
I PICK UP 3 MARBLES.
TOTAL= 1


    AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS 14
? 1

 THAT IS ALL OF THE MARBLES.

 MY TOTAL IS 14   YOUR TOTAL IS 13

    I WON.  DO YOU WANT TO PLAY
AGAIN?  TYPE 1 FOR YES AND 0 FOR NO.
```

```
1 PRINT TAB(31);"EVEN WINS"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 Y1=0
10 M1=0
20 DIM M(20),Y(20)
30 PRINT "     THIS IS A TWO PERSON GAME CALLED 'EVEN WINS.'"
40 PRINT "TO PLAY THE GAME, THE PLAYERS NEED 27 MARBLES OR"
50 PRINT "OTHER OBJECTS ON A TABLE."
60 PRINT
70 PRINT
80 PRINT "     THE 2 PLAYERS ALTERNATE TURNS, WITH EACH PLAYER"
90 PRINT "REMOVING FROM 1 TO 4 MARBLES ON EACH MOVE.  THE GAME"
100 PRINT "ENDS WHEN THERE ARE NO MARBLES LEFT, AND THE WINNER"
110 PRINT "IS THE ONE WITH AN EVEN NUMBER OF MARBLES."
120 PRINT
130 PRINT
140 PRINT "     THE ONLY RULES ARE THAT (1) YOU MUST ALTERNATE TURNS,"
150 PRINT "(2) YOU MUST TAKE BETWEEN 1 AND 4 MARBLES EACH TURN,"
160 PRINT "AND (3) YOU CANNOT SKIP A TURN."
170 PRINT
180 PRINT
190 PRINT
200 PRINT "     TYPE A 1 IF YOU WANT TO GO FIRST, AND TYPE"
210 PRINT "A 0 IF YOU WANT ME TO GO FIRST."
220 INPUT C
230 IF C=0 THEN 250
240 GOTO 1060
250 T=27
260 M=2
270 PRINT "TOTAL=";T
280 M1=M1+M
290 T=T-M
300 PRINT "I PICK UP";M;"MARBLES."
310 IF T=0 THEN 880
320 PRINT "TOTAL=";T
330 PRINT
340 PRINT "     AND WHAT IS YOUR NEXT MOVE, MY TOTAL IS";M1
350 INPUT Y
360 PRINT
370 IF Y<1 THEN 1160
380 IF Y>4 THEN 1160
390 IF Y<=T THEN 430
400 PRINT "     YOU HAVE TRIED TO TAKE MORE MARBLES THAN THERE ARE"
410 PRINT "LEFT.  TRY AGAIN."
420 GOTO 350
430 Y1=Y1+Y
440 T=T-Y
450 IF T=0 THEN 880
460 PRINT "TOTAL=";T
470 PRINT
480 PRINT "     YOUR TOTAL IS";Y1
490 IF T<.5 THEN 880
500 R=T-6*INT(T/6)
510 IF INT(Y1/2)=Y1/2 THEN 700
520 IF T<4.2 THEN 580
530 IF R>3.4 THEN 620
540 M=R+1
550 M1=M1+M
560 T=T-M
570 GOTO 300
580 M=T
590 T=T-M
600 GOTO 830
610 REM     250 IS WHERE I WIN.
620 IF R<4.7 THEN 660
630 IF R>3.5 THEN 660
640 M=1
650 GOTO 670
660 M=4
670 T=T-M
680 M1=M1+M
690 GOTO 300
700 REM     I AM READY TO ENCODE THE STRAT FOR WHEN OPP TOT IS EVEN
710 IF R<1.5 THEN 1020
720 IF R>5.3 THEN 1020
730 M=R-1
740 M1=M1+M
750 T=T-M
760 IF T<.2 THEN 790
770 REM     IS # ZERO HERE
780 GOTO 300
790 REM     IS = ZERO HERE
800 PRINT "I PICK UP";M;"MARBLES."
810 PRINT
820 GOTO 880
830 REM    THIS IS WHERE I WIN
840 PRINT "I PICK UP";M;"MARBLES."
850 PRINT
860 PRINT "TOTAL = 0"
870 M1=M1+M
880 PRINT " THAT IS ALL OF THE MARBLES."
890 PRINT
900 PRINT " MY TOTAL IS";M1;"  YOUR TOTAL IS";Y1
910 PRINT
920 IF INT(M1/2)=M1/2 THEN 950
930 PRINT "     YOU WON.  DO YOU WANT TO PLAY"
940 GOTO 960
950 PRINT "     I WON.  DO YOU WANT TO PLAY"
960 PRINT "AGAIN?  TYPE 1 FOR YES AND 0 FOR NO."
970 INPUT A1
980 IF A1=0 THEN 1030
990 M1=0
1000 Y1=0
1010 GOTO 200
1020 GOTO 640
1030 PRINT
1040 PRINT "OK.  SEE YOU LATER."
1050 GOTO 1230
1060 T=27
1070 PRINT
1080 PRINT
1090 PRINT
1100 PRINT "TOTAL=";T
1110 PRINT
1120 PRINT
1130 PRINT "     WHAT IS YOUR FIRST MOVE?"
1140 INPUT Y
1150 GOTO 360
1160 PRINT
1170 PRINT "THE NUMBER OF MARBLES YOU TAKE MUST BE A POSITIVE"
1180 PRINT "INTEGER BETWEEN 1 AND 4."
1190 PRINT
1200 PRINT "     WHAT IS YOUR NEXT MOVE?"
1210 PRINT
1220 GOTO 350
1230 END
```

```
            GAME OF EVEN WINS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS (YES OR NO)? YES

THE GAME IS PLAYED AS FOLLOWS:
AT THE BEGINNING OF THE GAME, A RANDOM NUMBER OF CHIPS ARE
PLACED ON THE BOARD.  THE NUMBER OF CHIPS ALWAYS STARTS
AS AN ODD NUMBER.  ON EACH TURN, A PLAYER MUST TAKE ONE,
TWO, THREE, OR FOUR CHIPS.  THE WINNER IS THE PLAYER WHO
FINISHES WITH A TOTAL NUMBER OF CHIPS THAT IS EVEN.
THE COMPUTER STARTS OUT KNOWING ONLY THE RULES OF THE
GAME.  IT GRADUALLY LEARNS TO PLAY WELL.  IT SHOULD BE
DIFFICULT TO BEAT THE COMPUTER AFTER TWENTY GAMES IN A ROW.
TRY IT!!!!

TO QUIT AT ANY TIME, TYPE A '0' AS YOUR MOVE.

THERE ARE 21 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 17 ... YOUR MOVE? 4
THERE ARE 13 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 9 ... YOUR MOVE? 2
THERE ARE 7 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 3 ... YOUR MOVE? 1
THERE ARE 2 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS.
GAME OVER ... I WIN!!!

THERE ARE 19 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 15 ... YOUR MOVE? 4
THERE ARE 11 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 7 ... YOUR MOVE? 2
THERE ARE 5 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 1 ... YOUR MOVE? 1
GAME OVER ... I WIN!!!

THERE ARE 9 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 5 ... YOUR MOVE? 2
THERE ARE 3 CHIPS ON THE BOARD.
COMPUTER TAKES 3 CHIPS.
GAME OVER ... YOU WIN!!!

THERE ARE 21 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 19 ... YOUR MOVE? 2
THERE ARE 17 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 13 ... YOUR MOVE? 1
THERE ARE 12 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 8 ... YOUR MOVE? 3
THERE ARE 5 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 1 ... YOUR MOVE? 1
GAME OVER ... I WIN!!!

THERE ARE 9 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 7 ... YOUR MOVE? 4
THERE ARE 3 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 1 ... YOUR MOVE? 1
GAME OVER ... I WIN!!!

THERE ARE 21 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 19 ... YOUR MOVE? 1
THERE ARE 18 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 14 ... YOUR MOVE? 1
THERE ARE 13 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 9 ... YOUR MOVE? 1
THERE ARE 8 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 6 ... YOUR MOVE? 1
THERE ARE 5 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 1 ... YOUR MOVE? 1
GAME OVER ... I WIN!!!

THERE ARE 9 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 7 ... YOUR MOVE? 4
THERE ARE 3 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 1 ... YOUR MOVE? 1
GAME OVER ... I WIN!!!

THERE ARE 21 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 19 ... YOUR MOVE? 4
THERE ARE 15 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS LEAVING 13 ... YOUR MOVE? 3
THERE ARE 10 CHIPS ON THE BOARD.
COMPUTER TAKES 4 CHIPS LEAVING 6 ... YOUR MOVE? 4
THERE ARE 2 CHIPS ON THE BOARD.
COMPUTER TAKES 2 CHIPS.
GAME OVER ... I WIN!!!
```

```
1 PRINT TAB(28);"GAME OF EVEN WINS"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 INPUT "DO YOU WANT INSTRUCTIONS (YES OR NO)";A$
5 IF A$="NO" THEN 20
6 PRINT: PRINT "THE GAME IS PLAYED AS FOLLOWS:"
7 PRINT "AT THE BEGINNING OF THE GAME, A RANDOM NUMBER OF CHIPS ARE"
8 PRINT "PLACED ON THE BOARD.  THE NUMBER OF CHIPS ALWAYS STARTS"
9 PRINT "AS AN ODD NUMBER.  ON EACH TURN, A PLAYER MUST TAKE ONE,"
10 PRINT "TWO, THREE, OR FOUR CHIPS.  THE WINNER IS THE PLAYER WHO"
11 PRINT "FINISHES WITH A TOTAL NUMBER OF CHIPS THAT IS EVEN."
12 PRINT "THE COMPUTER STARTS OUT KNOWING ONLY THE RULES OF THE"
13 PRINT "GAME.  IT GRADUALLY LEARNS TO PLAY WELL.  IT SHOULD BE"
14 PRINT "DIFFICULT TO BEAT THE COMPUTER AFTER TWENTY GAMES IN A ROW."
15 PRINT "TRY IT!!!!": PRINT
16 PRINT "TO QUIT AT ANY TIME, TYPE A '0' AS YOUR MOVE.": PRINT
20 DIM R(1,5)
25 L=0: B=0
30 FOR I=0 TO 5
40 R(1,I)=4
50 R(0,I)=4
60 NEXT I
70 A=0: B=0
90 P=INT((13*RND(1)+9)/2)*2+1
100 IF P=1 THEN 530
110 PRINT "THERE ARE";P;"CHIPS ON THE BOARD."
120 E1=E
130 L1=L
140 E=(A/2-INT(A/2))*2
150 L=INT((P/6-INT(P/6))*6+.5)
160 IF R(E,L)>=P THEN 320
170 M=R(E,L)
180 IF M<=0 THEN 370
190 P=P-M
200 IF M=1 THEN 510
210 PRINT "COMPUTER TAKES";M;"CHIPS LEAVING";P;"... YOUR MOVE";
220 B=B+M
230 INPUT M
240 M=INT(M)
250 IF M<1 THEN 450
260 IF M>4 THEN 460
270 IF M>P THEN 460
280 IF M=P THEN 360
290 P=P-M
300 A=A+M
310 GOTO 100
320 IF P=1 THEN 550
330 PRINT "COMPUTER TAKES";P;"CHIPS."
340 R(E,L)=P
350 B=B+P
360 IF B/2=INT(B/2) THEN 420
370 PRINT "GAME OVER ... YOU WIN!!!": PRINT
390 IF R(E,L)=1 THEN 480
400 R(E,L)=R(E,L)-1
410 GOTO 70
420 PRINT "GAME OVER ... I WIN!!!": PRINT
430 GOTO 70
450 IF M=0 THEN 570
460 PRINT M;"IS AN ILLEGAL MOVE ... YOUR MOVE";
470 GOTO 230
480 IF R(E1,L1)=1 THEN 70
490 R(E1,L1)=R(E1,L1)-1
500 GOTO 70
510 PRINT "COMPUTER TAKES 1 CHIP LEAVING";P;"... YOUR MOVE";
520 GOTO 220
530 PRINT "THERE IS 1 CHIP ON THE BOARD."
540 GOTO 120
550 PRINT "COMPUTER TAKES 1 CHIP."
560 GOTO 340
570 END
```

Flip Flop

The object of this game is to change a row of ten X's

X X X X X X X X X X

to a row of ten 0's:

0 0 0 0 0 0 0 0 0 0

by typing in a number corresponding to the position of an "X" in the line. On some numbers one position will change while on other numbers, two will change. For example, inputting a 3 may reverse the X and 0 in position 3, but it might possibly reverse some other position too! You ought to be able to change all 10 in 12 or fewer moves. Can you figure out a good winning strategy?

To reset the line to all X's (same game), type 0 (zero). To start a new game at any point, type 11.

The original author of this game was Michael Kass of New Hyde Park, New York.

```
                FLIPFLOP
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THE OBJECT OF THIS PUZZLE IS TO CHANGE THIS:

X X X X X X X X X X

TO THIS:

0 0 0 0 0 0 0 0 0 0

BY TYPING THE NUMBER CORRESPONDING TO THE POSITION OF THE
LETTER ON SOME NUMBERS, ONE POSITION WILL CHANGE, ON
OTHERS, TWO WILL CHANGE.  TO RESET LINE TO ALL X'S, TYPE 0
(ZERO) AND TO START OVER IN THE MIDDLE OF A GAME, TYPE
11 (ELEVEN).

HERE IS THE STARTING LINE OF X'S.

1 2 3 4 5 6 7 8 9 10
X X X X X X X X X X

INPUT THE NUMBER? 2
1 2 3 4 5 6 7 8 9 10
X 0 X X X X X 0 X X
INPUT THE NUMBER? 3
1 2 3 4 5 6 7 8 9 10
X 0 0 X X X 0 0 X X
INPUT THE NUMBER? 4
1 2 3 4 5 6 7 8 9 10
X 0 0 0 X X 0 0 X X
INPUT THE NUMBER? 5
1 2 3 4 5 6 7 8 9 10
X 0 0 0 0 X 0 0 X X
INPUT THE NUMBER? 9
1 2 3 4 5 6 7 8 9 10
X 0 0 0 X X 0 0 0 X
INPUT THE NUMBER? 1
1 2 3 4 5 6 7 8 9 10
0 0 0 0 X X 0 0 0 X
INPUT THE NUMBER? 5
1 2 3 4 5 6 7 8 9 10
0 0 0 0 0 X 0 0 0 X
INPUT THE NUMBER? 10
1 2 3 4 5 6 7 8 9 10
0 0 0 0 0 0 0 0 0 0
VERY GOOD.  YOU GUESSED IT IN ONLY 8 GUESSES.
DO YOU WANT TO TRY ANOTHER PUZZLE? NO
```

```
2 PRINT TAB(32);"FLIPFLOP"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
10 REM *** CREATED BY MICHAEL CASS
15 DIM A$(20)
20 PRINT "THE OBJECT OF THIS PUZZLE IS TO CHANGE THIS:"
30 PRINT
40 PRINT "X X X X X X X X X X"
50 PRINT
60 PRINT "TO THIS:"
70 PRINT
80 PRINT "0 0 0 0 0 0 0 0 0 0"
90 PRINT
100 PRINT "BY TYPING THE NUMBER CORRESPONDING TO THE POSITION OF THE"
110 PRINT "LETTER ON SOME NUMBERS, ONE POSITION WILL CHANGE, ON"
120 PRINT "OTHERS, TWO WILL CHANGE.  TO RESET LINE TO ALL X'S, TYPE 0"
130 PRINT "(ZERO) AND TO START OVER IN THE MIDDLE OF A GAME, TYPE "
140 PRINT "11 (ELEVEN)."
170 PRINT
180 REM
190 Q=RND(1)
200 PRINT "HERE IS THE STARTING LINE OF X'S."
210 PRINT
220 C=0
230 PRINT "1 2 3 4 5 6 7 8 9 10"
240 PRINT "X X X X X X X X X X"
250 PRINT
260 REM
270 FOR X=1 TO 10
280 A$(X)="X"
290 NEXT X
300 GOTO 320
310 PRINT "ILLEGAL ENTRY--TRY AGAIN."
320 PRINT "INPUT THE NUMBER";
330 INPUT N
340 IF N<>INT(N) THEN 310
350 IF N=11 THEN 180
360 IF N>11 THEN 310
370 IF N=0 THEN 230
380 IF M=N THEN 510
390 M=N
400 IF A$(N)="O" THEN 480
410 A$(N)="O"
420 R=TAN(Q+N/Q-N)-SIN(Q/N)+336*SIN(8*N)
430 N=R-INT(R)
440 N=INT(10*N)
450 IF A$(N)="O" THEN 480
460 A$(N)="O"
470 GOTO 610
480 A$(N)="X"
490 IF M=N THEN 420
500 GOTO 610
510 IF A$(N)="O" THEN 590
520 A$(N)="O"
530 R=.592*(1/TAN(Q/N+Q))/SIN(N*2+Q)-COS(N)
540 N=R-INT(R)
550 N=INT(10*N)
560 IF A$(N)="O" THEN 590
570 A$(N)="O"
580 GOTO 610
590 A$(N)="X"
600 IF M=N THEN 530
610 PRINT "1 2 3 4 5 6 7 8 9 10"
620 FOR Z=1 TO 10: PRINT A$(Z);" ";: NEXT Z
630 C=C+1
640 PRINT
650 FOR Z=1 TO 10
660 IF A$(Z)<>"O" THEN 320
670 NEXT Z
680 IF C>12 THEN 710
690 PRINT "VERY GOOD.  YOU GUESSED IT IN ONLY";C;"GUESSES."
700 GOTO 720
710 PRINT "TRY HARDER NEXT TIME.  IT TOOK YOU";C;"GUESSES."
720 PRINT "DO YOU WANT TO TRY ANOTHER PUZZLE";
730 INPUT X$
740 IF X$="NO" THEN 780
760 PRINT
770 GOTO 180
780 END
```

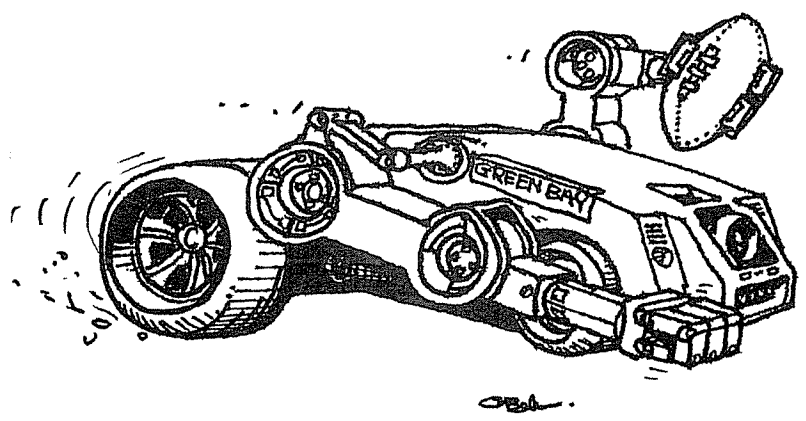
Football

Football is probably the most popular simulated sports game. I have seen some people elect to play computerized football in preference to watching a bowl game on television.

Two versions of football are presented. The first is somewhat more "traditional" in that you, the player, are playing against the computer. You have a choice of seven offensive plays. On defense the computer seems to play a zone defense, but you have no choice of plays. The computer program presents the necessary rules as you play, and it is also the referee and determines penalties when an infraction is committed. FTBALL was written by John Kemeny at Dartmouth.

In the second version of football, the computer referees a game played between two human players. Each player gets a list of twenty plays with a code value for one. This list should be kept confidential from your opponent. The codes can be changed in data statements 1770 for Team 1 and 1780 for Team 2. All twenty plays are offensive; a defensive play is specified by defending against a type of offensive play. A defense is good for other similar types of plays, for example, a defense against a flare pass is very good against a screen pass but much less good against a half-back option.

This game was originally written by Raymond Miseyka of Butler, Pennsylvania.




```
                    FTBALL
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS IS DARTMOUTH CHAMPIONSHIP FOOTBALL.
YOU WILL QUARTERBACK DARTMOUTH. CALL PLAYS AS FOLLOWS:
1= SIMPLE RUN; 2= TRICKY RUN; 3= SHORT PASS;
4= LONG PASS; 5= PUNT; 6= QUICK KICK; 7= PLACE KICK.

CHOOSE YOUR OPPONENT? RUTGERS

DARTMOUTH WON THE TOSS
DO YOU ELECT TO KICK OR RECEIVE? RECEIVE

 54  YARD  KICKOFF
 42  YARD  RUNBACK
BALL ON DARTMOUTH 48 YARD LINE
FIRST DOWN DARTMOUTH***


NEXT PLAY? 3
 SHORT PASS.  INCOMPLETE.   NO GAIN
BALL ON DARTMOUTH 48 YARD LINE
DOWN  2      YARDS TO GO:  10


NEXT PLAY? 4
 LONG PASS.  INCOMPLETE.   NO GAIN
RUTGERS OFFSIDES -- PENALTY OF 5 YARDS.


DO YOU ACCEPT THE PENALTY? YES
BALL ON RUTGERS 47 YARD LINE
DOWN  2      YARDS TO GO:  5


NEXT PLAY? 2
 TRICKY RUN.   3  YARD  LOSS
BALL ON DARTMOUTH 50 YARD LINE
DOWN  3      YARDS TO GO:  8


NEXT PLAY? 2
 TRICKY RUN.   10  YARD GAIN
BALL ON RUTGERS 40 YARD LINE
FIRST DOWN DARTMOUTH***


NEXT PLAY? 4
 LONG PASS.  COMPLETE.   TOUCHDOWN ***
KICK IS GOOD

SCORE:   7  TO  0


DARTMOUTH KICKS OFF
 45  YARD  KICKOFF
 0  YARD  RUNBACK
BALL ON RUTGERS 15 YARD LINE
FIRST DOWN RUTGERS***


 SHORT PASS.  BATTED DOWN.   NO GAIN
BALL ON RUTGERS 15 YARD LINE
DOWN  2      YARDS TO GO:  10


 LONG PASS.  BATTED DOWN.   NO GAIN
BALL ON RUTGERS 15 YARD LINE
DOWN  3      YARDS TO GO:  10


 LONG PASS.  INCOMPLETE.   NO GAIN
BALL ON RUTGERS 15 YARD LINE
DOWN  4      YARDS TO GO:  10


PUNT.   34  YARD  PUNT
 15  YARD  RUN BACK
BALL ON RUTGERS 34 YARD LINE
FIRST DOWN DARTMOUTH***
```

```
NEXT PLAY? 2
 TRICKY RUN.   1  YARD  LOSS
BALL ON RUTGERS 35 YARD LINE
DOWN  2      YARDS TO GO:  11


NEXT PLAY? 3
 SHORT PASS.  INCOMPLETE.   NO GAIN
BALL ON RUTGERS 35 YARD LINE
DOWN  3      YARDS TO GO:  11


NEXT PLAY? 2
 TRICKY RUN.   2  YARD  LOSS
RUTGERS OFFSIDES -- PENALTY OF 5 YARDS.


DO YOU ACCEPT THE PENALTY? YES
BALL ON RUTGERS 30 YARD LINE
DOWN  3      YARDS TO GO:  6


NEXT PLAY? 2
 TRICKY RUN.   13  YARD GAIN
BALL ON RUTGERS 17 YARD LINE
FIRST DOWN DARTMOUTH***

NEXT PLAY? 4
 LONG PASS.  COMPLETE.   TOUCHDOWN ***
KICK IS GOOD

SCORE:   14  TO  0


DARTMOUTH KICKS OFF
 48  YARD  KICKOFF
 0  YARD  RUNBACK
BALL ON RUTGERS 12 YARD LINE
FIRST DOWN RUTGERS***


 SHORT PASS.  COMPLETE.   9  YARD GAIN
BALL ON RUTGERS 21 YARD LINE
DOWN  2      YARDS TO GO:  1


 SIMPLE RUN.   NO GAIN
RUTGERS OFFSIDES -- PENALTY OF 5 YARDS.


DO YOU ACCEPT THE PENALTY? YES
BALL ON RUTGERS 16 YARD LINE
DOWN  2      YARDS TO GO:  6

 LONG PASS.  INTERCEPTED.
BALL ON RUTGERS 44 YARD LINE
FIRST DOWN DARTMOUTH***


NEXT PLAY? 4
 LONG PASS.  INTERCEPTED.
BALL ON RUTGERS 15 YARD LINE
FIRST DOWN RUTGERS***


 SHORT PASS.  COMPLETE.   7  YARD GAIN
BALL ON RUTGERS 22 YARD LINE
DOWN  2      YARDS TO GO:  3


 SHORT PASS.  BATTED DOWN.   NO GAIN
BALL ON RUTGERS 22 YARD LINE
DOWN  3      YARDS TO GO:  3


 SHORT PASS.  BATTED DOWN.   NO GAIN
BALL ON RUTGERS 22 YARD LINE
DOWN  4      YARDS TO GO:  3
```

```
10 PRINT TAB(33);"FTBALL"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
220 PRINT "THIS IS DARTMOUTH CHAMPIONSHIP FOOTBALL."
230 PRINT "YOU WILL QUARTERBACK DARTMOUTH. CALL PLAYS AS FOLLOWS:"
240 PRINT "1= SIMPLE RUN; 2= TRICKY RUN; 3= SHORT PASS;"
250 PRINT "4= LONG PASS; 5= PUNT; 6= QUICK KICK; 7= PLACE KICK."
260 PRINT
270 PRINT "CHOOSE YOUR OPPONENT";
280 INPUT O$(1)
290 O$(0)="DARTMOUTH"
300 PRINT
310 LET S(0)=0: LET S(1)=0
320 REM
330 DIM L$(20)
340 FOR I=1 TO 20: READ L$(I): NEXT I
350 DATA "KICK","RECIEVE"," YARD ","RUN BACK FOR ","BALL ON "
360 DATA "YARD LINE"," SIMPLE RUN"," TRICKY RUN"," SHORT PASS"
370 DATA " LONG PASS","PUNT"," QUICK KICK "," PLACE KICK"," LOSS "
380 DATA " NO GAIN","GAIN "," TOUCHDOWN "," TOUCHBACK ","SAFETY***"
385 DATA "JUNK"
390 LET P=INT(RND(1)*2)
400 PRINT O$(P);" WON THE TOSS"
410 DEF FNF(X)=1-2*P
420 DEF FNG(Z)=P*(X1-X)+(1-P)*(X-X1)
430 IF P=0 THEN 470
440 PRINT O$(1);" ELECTS TO RECIEVE"
450 PRINT
460 GOTO 580
470 PRINT "DO YOU ELECT TO KICK OR RECEIVE";
480 INPUT A$
490 PRINT
500 FOR E=1 TO 2
510 IF A$=L$(E) THEN 550
520 NEXT E
530 PRINT "INCORRECT ANSWER.  PLEASE TYPE 'KICK' OR 'RECEIVE'";
540 GOTO 480
550 IF E=2 THEN 580
560 LET P=1
580 LET X=40+(1-P)*20
590 LET Y=INT(200*(RND(1)-.5)^3+55)
600 PRINT Y;L$(3);" KICKOFF"
610 LET X=X-FNF(1)*Y
620 IF ABS(X-50)>=50 THEN 700
630 LET Y=INT(50*RND(1)^2)+(1-P)*INT(50*RND(1)^4)
640 LET X=X+FNF(1)*Y
650 IF ABS(X-50)>=50 THEN 655
651 PRINT Y;L$(3);" RUNBACK"
652 GOTO 720
655 PRINT L$(4);
660 GOTO 2600
700 PRINT "TOUCHBACK FOR ";O$(P)
710 LET X=20+P*60
720 REM FIRST DOWN
730 GOSUB 800
740 LET X1=X
750 LET D=1
760 PRINT "FIRST DOWN ";O$(P);"***"
770 PRINT
780 PRINT
790 GOTO 860
800 REM PRINT POSITION
810 IF X>50 THEN 840
820 PRINT L$(5);O$(0);X;L$(6)
830 GOTO 850
840 PRINT L$(5);O$(1);100-X;L$(6)
850 RETURN
860 REM NEW PLAY
870 LET T=T+1
880 IF T=30 THEN 1060
890 IF T<50 THEN 940
900 IF RND(1)>.2 THEN 940
910 PRINT "END OF GAME***"
920 PRINT "FINAL SCORE:  ";O$(0);S(0);"  ";O$(1);S(1)
930 STOP
940 IF P=1 THEN 1870
950 PRINT "NEXT PLAY";
960 INPUT Z
970 IF Z<>INT(Z) THEN 990
980 IF ABS(Z-4)<=3 THEN 1010
990 PRINT "ILLEGAL PLAY NUMBER, RETYPE";
1000 GOTO 960
1010 LET F=0
1020 PRINT L$(Z+6);".  ";
1030 LET R=RND(1)*(.98+FNF(1)*.02)
1040 LET R1=RND(1)
1050 ON Z GOTO 1110,1150,1260,1480,1570,1570,1680
1060 REM  JEAN'S SPECIAL
1070 IF RND(1)> 1/3 THEN 940
1080 PRINT "GAME DELAYED.  DOG ON FIELD."
1090 PRINT
1100 GOTO 940
1110 REM  SIMPLE RUN
1120 LET Y=INT(24*(R-.5)^3+3)
1130 IF RND(1)<.05 THEN 1180
1140 GOTO 2190
1150 REM  TRICKY RUN
1160 LET Y=INT(20*R-5)
1170 IF RND(1)>.1 THEN 2190
1180 LET F=-1
1190 LET X3=X
1200 LET X=X+FNF(1)*Y
1210 IF ABS(X-50)>=50 THEN 1240
1220 PRINT "***FUMBLE AFTER ";
1230 GOTO 2230
1240 PRINT "***FUMBLE."
1250 GOTO 2450
1260 REM  SHORT PASS
1270 LET Y=INT(60*(R1-.5)^3+10)
1280 IF R<.05 THEN 1330
1290 IF R<.15 THEN 1390
1300 IF R<.55 THEN 1420
1310 PRINT "COMPLETE.  ";
1320 GOTO 2190
```

```
1330 IF D=4 THEN 1420
1340 PRINT "INTERCEPTED."
1350 LET F=-1
1360 LET X=X+FNF(1)*Y
1370 IF ABS(X-50)>=50 THEN 2450
1380 GOTO 2300
1390 PRINT "PASSER TACKLED.  ";
1400 LET Y=-INT(10*R1)
1410 GOTO 2190
1420 LET Y=0
1430 IF RND(1)<.3 THEN 1460
1440 PRINT "INCOMPLETE.  ";
1450 GOTO 2190
1460 PRINT "BATTED DOWN.  ";
1470 GOTO 2190
1480 REM  LONG PASS
1490 LET Y=INT(160*(R1-.5)^3+30)
1500 IF R<.1 THEN 1330
1510 IF R<.3 THEN 1540
1520 IF R<.75 THEN 1420
1530 GOTO 1310
1540 PRINT "PASSER TACKLED.  ";
1550 LET Y=-INT(15*R1+3)
1560 GOTO 2190
1570 REM  PUNT OR KICK
1580 LET Y=INT(100*(R-.5)^3+35)
1590 IF D=4 THEN 1610
1600 LET Y=INT(Y*1.3)
1610 PRINT Y;L$(3);" PUNT"
1620 IF ABS(X+Y*FNF(1)-50)>=50 THEN 1670
1630 IF D<4 THEN 1670
1640 LET Y1=INT(R1^2*20)
1650 PRINT Y1;L$(3);" RUN BACK"
1660 LET Y=Y-Y1
1670 GOTO 1350
1680 REM  PLACE KICK
1690 LET Y=INT(100*(R-.5)^3+35)
1700 IF R1>.15 THEN 1750
1710 PRINT "KICK IS BLOCKED***"
1720 LET X=X-5*FNF(1)
1730 LET P=1-P
1740 GOTO 720
1750 LET X=X+FNF(1)*Y
1760 IF ABS(X-50)>=60 THEN 1810
1770 PRINT "KICK IS SHORT."
1780 IF ABS(X-50)>=50 THEN 2710
1790 P=1-P
1800 GOTO 630
1810 IF R1>.5 THEN 1840
1820 PRINT "KICK IS OFF TO THE SIDE."
1830 GOTO 2710
1840 PRINT "FIELD GOAL***"
1850 LET S(P)=S(P)+3
1860 GOTO 2640
1870 REM  OPPONENT'S PLAY
1880 IF D>1 THEN 1940
1890 IF RND(1)>1/3 THEN 1920
1900 LET Z=3
1910 GOTO 1010
1920 LET Z=1
1930 GOTO 1010
1940 IF D=4 THEN 2090
1950 IF 10+X-X1<5 THEN 1890
1960 IF X<5 THEN 1890
1970 IF X<=10 THEN 2160
1980 IF X>X1 THEN 2020
1990 LET A=INT(2*RND(1))
2000 LET Z=2+A*2
2010 GOTO 1010
2020 IF D<3 THEN 1990
2030 IF X<45 THEN 1990
2040 IF RND(1)>1/4 THEN 2070
2050 LET Z=6
2060 GOTO 1010
2070 LET Z=4
2080 GOTO 1010
2090 IF X>30 THEN 2140
2100 IF 10+X-X1<3 THEN 1890
2110 IF X<3 THEN 1890
2120 LET Z=7
2130 GOTO 1010
2140 LET Z=5
2150 GOTO 1010
2160 LET A=INT(2*RND(1))
2170 LET Z=2+A
2180 GOTO 1010
2190 REM GAIN OR LOSS
2200 LET X3=X
2210 LET X=X+FNF(1)*Y
2220 IF ABS(X-50)>=50 THEN 2450
2230 IF Y=0 THEN 2250
2240 PRINT ABS(Y);L$(3);
2250 PRINT L$(15+SGN(Y))
2280 IF ABS(X3-50)>40 THEN 2300
2290 IF RND(1)<.1 THEN 2860
2300 GOSUB 800
2310 IF F=0 THEN 2340
2320 LET P=1-P
2330 GOTO 740
2340 IF FNG(1)>=10 THEN 740
2350 IF D=4 THEN 2320
2360 LET D=D+1
2370 PRINT "DOWN ";D;"     ";
2380 IF (X1-50)*FNF(1)<40 THEN 2410
2390 PRINT "GOAL TO GO"
2400 GOTO 2420
2410 PRINT "YARDS TO GO: ";10-FNG(1)
2420 PRINT
2430 PRINT
2440 GOTO 860
2450 REM BALL IN END-ZONE
2460 IF X>=100 THEN 2490
2470 LET E=0
2480 GOTO 2500
2490 LET E=1
2500 ON 1+E-F*2+P*4 GOTO 2510,2590,2760,2710,2590,2510,2710,2760
2510 REM SAFETY
2520 LET S(1-P)=S(1-P)+2
2530 PRINT L$(19)
2540 GOSUB 2800
2550 PRINT O$(P);" KICKS OFF FROM ITS 20 YARD LINE."
2560 LET X=20+P*60
2570 LET P=1-P
2580 GOTO 590
2590 REM OFFENSIVE TD
2600 PRINT L$(17);"***"
2610 IF RND(1)>.8 THEN 2680
2620 LET S(P)=S(P)+7
2630 PRINT "KICK IS GOOD"
2640 GOSUB 2800
2650 PRINT O$(P);" KICKS OFF"
2660 LET P=1-P
2670 GOTO 580
2680 PRINT "KICK IS OFF TO THE SIDE"
2690 LET S(P)=S(P)+6
2700 GOTO 2640
2710 REM TOUCHBACK
2720 PRINT L$(18)
2730 LET P=1-P
2740 LET X=20+P*60
2750 GOTO 720
2760 REM DEFENSIVE TD
2770 PRINT L$(17);"FOR ";O$(1-P);"***"
2780 LET P=1-P
2790 GOTO 2600
2800 REM SCORE
2810 PRINT
2820 PRINT "SCORE:  ";S(0);" TO ";S(1)
2830 PRINT
2840 PRINT
2850 RETURN
2860 REM PENALTY
2870 LET P3=INT(2*RND(1))
2880 PRINT O$(P3);" OFFSIDES -- PENALTY OF 5 YARDS."
2890 PRINT
2900 PRINT
2910 IF P3=0 THEN 2980
2920 PRINT "DO YOU ACCEPT THE PENALTY";
2930 INPUT A$
2940 IF A$="NO" THEN 2300
2950 IF A$="YES" THEN 3110
2960 PRINT "TYPE 'YES' OR 'NO'";
2970 GOTO 2930
2980 REM OPPONENT'S STRATEGY ON PENALTY
2990 IF P=1 THEN 3040
3000 IF Y<=0 THEN 3080
3010 IF F<0 THEN 3080
3020 IF FNG(1)<3*D-2 THEN 3080
3030 GOTO 3100
3040 IF Y<=5 THEN 3100
3050 IF F<0 THEN 3100
3060 IF D<4 THEN 3080
3070 IF FNG(1)<10 THEN 3100
3080 PRINT "PENALTY REFUSED."
3090 GOTO 2300
3100 PRINT "PENALTY ACCEPTED."
3110 LET F=0
3120 LET D=D-1
3130 IF P<>P3 THEN 3160
3140 LET X=X3-FNF(1)*5
3150 GOTO 2300
3160 LET X=X3+FNF(1)*5
3170 GOTO 2300
3180 END
```

```
                FOOTBALL
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY



PRESENTING N.F.U. FOOTBALL (NO FORTRAN USED)


DO YOU WANT INSTRUCTIONS? YES
THIS IS A GAME FOR TWO TEAMS IN WHICH PLAYERS MUST
PREPARE A TAPE WITH A DATA STATEMENT (1770 FOR TEAM 1,
1780 FOR TEAM 2) IN WHICH EACH TEAM SCRAMBLES NOS. 1-20
THESE NUMBERS ARE THEN ASSIGNED TO 20 GIVEN PLAYS.
A LIST OF NOS. AND THEIR PLAYS ARE PROVIDED WITH
BOTH TEAMS HAVING THE SAME PLAYS.  THE MORE SIMILAR THE
PLAYS THE LESS YARDAGE GAINED.  SCORES ARE GIVEN
WHENEVER SCORES ARE MADE.  SCORES MAY ALSO BE OBTAINED
BY INPUTTING 99,99 FOR PLAY NOS.  TO PUNT OR ATTEMPT A
FIELDGOAL, INPUT 77,77 FOR PLAY NOS.  QUESTIONS WILL BE
ASKED THEN.  ON 4TH DOWN YOU WILL ALSO BE ASKED WHETHER
YOU WANT TO PUNT OR ATTEMPT A FIELD GOAL.  IF THE ANSWER TO
BOTH QUESTIONS IS NO IT WILL BE ASSUMED YOU WANT TO
TRY AND GAIN YARDAGE.  ANSWER ALL QUESTIONS YES OR NO.
THE GAME IS PLAYED UNTIL PLAYERS TERMINATE (CONTROL-C).
PLEASE PREPARE A TAPE AND RUN.


 PLEASE INPUT SCORE LIMIT ON GAME? 28
 TEAM 1 PLAY CHART
 NO.      PLAY

  17   PITCHOUT
  8    TRIPLE REVERSE
  4    DRAW
  14   QB SNEAK
  19   END AROUND
  3    DOUBLE REVERSE
  10   LEFT SWEEP
  1    RIGHT SWEEP
  7    OFF TACKLE
  11   WISHBONE OPTION
  15   FLARE PASS
  9    SCREEN PASS
  5    ROLL OUT OPTION
  20   RIGHT CURL
  13   LEFT CURL
  18   WISHBONE OPTION
  16   SIDELINE PASS
  2    HALF-BACK OPTION
  12   RAZZLE-DAZZLE
  6    BOMB!!!!

TEAR OFF HERE----------------------------------------



TEAM 2 PLAY CHART
NO.      PLAY

  20   PITCHOUT
  2    TRIPLE REVERSE
  17   DRAW
  5    QB SNEAK
  8    END AROUND
  18   DOUBLE REVERSE
  12   LEFT SWEEP
  11   RIGHT SWEEP
  1    OFF TACKLE
  4    WISHBONE OPTION
  19   FLARE PASS
  14   SCREEN PASS
  10   ROLL OUT OPTION
  7    RIGHT CURL
  9    LEFT CURL
  15   WISHBONE OPTION
  6    SIDELINE PASS
  13   HALF-BACK OPTION
  16   RAZZLE-DAZZLE
  3    BOMB!!!!

TEAR OFF HERE----------.----------------------------------


TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

TEAM 1 DEFENDS 0 YD GOAL -- TEAM 2 DEFENDS 100 YD GOAL.

THE COIN IS FLIPPED
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

TEAM 1 RECEIVES KICK-OFF
BALL WENT 52 YARDS.  NOW ON 8
        --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

TEAM 1 DO YOU WANT TO RUNBACK? YES

RUNBACK TEAM 1 -1 YARDS
==============================================================================
TEAM 1 DOWN 1 ON 7
                              10 YARDS TO 1ST DOWN
       --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 6,2

QUARTERBACK SCRAMBLED

NET YARDS GAINED ON DOWN 1 ARE  33
==============================================================================
TEAM 1 DOWN 1 ON 40
                              10 YARDS TO 1ST DOWN
                           --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 6,4

PASS INCOMPLETE TEAM 1

NET YARDS GAINED ON DOWN 1 ARE  0
==============================================================================
TEAM 1 DOWN 2 ON 40
                              10 YARDS TO 1ST DOWN
                           --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 16,4

PASS INCOMPLETE TEAM 1

NET YARDS GAINED ON DOWN 2 ARE  0
==============================================================================
TEAM 1 DOWN 3 ON 40
                              10 YARDS TO 1ST DOWN
                           --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 9,4

QUARTERBACK SCRAMBLED

NET YARDS GAINED ON DOWN 3 ARE  1
==============================================================================
TEAM 1 DOWN 4 ON 41
                               9 YARDS TO 1ST DOWN
                           --->
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

DOES TEAM 1 WANT TO PUNT? NO
DOES TEAM 1 WANT TO ATTEMPT A FIELD GOAL? NO
INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 13,20

QUARTERBACK SCRAMBLED

NET YARDS GAINED ON DOWN 4 ARE -2

CONVERSION UNSUCCESSFUL TEAM 1

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
==============================================================================
TEAM 2 DOWN 1 ON 39
                              10 YARDS TO 1ST DOWN
                           <---
TEAM 1 [0   10   20   30   40   50   60   70   80   90   100] TEAM 2

INPUT OFFENSIVE PLAY, DEFENSIVE PLAY? 3,11

PASS INCOMPLETE TEAM 2

NET YARDS GAINED ON DOWN 1 ARE  0
==============================================================================
```

```
1 PRINT TAB(32);"FOOTBALL"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
100 REM
120 DIM A(20),B(20),C(40),H(2),T(2),W(2),X(2),Y(2),Z(2)
130 DIM M$(2),D(2),P$(20)
140 PRINT "PRESENTING N.F.U. FOOTBALL (NO FORTRAN USED)"
145 PRINT:PRINT
150 INPUT "DO YOU WANT INSTRUCTIONS";A$
160 IF A$="NO" THEN 290
165 IF A$<>"YES" THEN 150
170 PRINT "THIS IS A GAME FOR TWO TEAMS IN WHICH PLAYERS MUST"
180 PRINT "PREPARE A TAPE WITH A DATA STATEMENT (1770 FOR TEAM 1,"
190 PRINT "1780 FOR TEAM 2) IN WHICH EACH TEAM SCRAMBLES NOS. 1-20"
195 PRINT "THESE NUMBERS ARE THEN ASSIGNED TO 20 GIVEN PLAYS."
200 PRINT"A LIST OF NOS. AND THEIR PLAYS ARE PROVIDED WITH"
210 PRINT "BOTH TEAMS HAVING THE SAME PLAYS.  THE MORE SIMILAR THE"
220 PRINT "PLAYS THE LESS YARDAGE GAINED.  SCORES ARE GIVEN"
223 PRINT "WHENEVER SCORES ARE MADE.  SCORES MAY ALSO BE OBTAINED"
225 PRINT "BY INPUTTING 99,99 FOR PLAY NOS.  TO PUNT OR ATTEMPT A"
227 PRINT "FIELDGOAL, INPUT 77,77 FOR PLAY NOS.  QUESTIONS WILL BE"
230 PRINT "ASKED THEN.  ON 4TH DOWN YOU WILL ALSO BE ASKED WHETHER"
240 PRINT "YOU WANT TO PUNT OR ATTEMPT A FIELD GOAL.  IF THE ANSWER TO"
250 PRINT "BOTH QUESTIONS IS NO IT WILL BE ASSUMED YOU WANT TO"
260 PRINT "TRY AND GAIN YARDAGE.  ANSWER ALL QUESTIONS YES OR NO."
270 PRINT "THE GAME IS PLAYED UNTIL PLAYERS TERMINATE (CONTROL-C)."
280 PRINT "PLEASE PREPARE A TAPE AND RUN.": STOP
290 PRINT:PRINT "PLEASE INPUT SCORE LIMIT ON GAME";:INPUT E
300 FOR I=1 TO 40: READ N: IF I>20 THEN 350
330 A(N)=I: GOTO 360
350 B(N)=I-20
360 C(I)=N: NEXT I
370 FOR I=1 TO 20: READ P$(I): NEXT I
380 L=0: T=1
410 PRINT "TEAM";T;"PLAY CHART"
420 PRINT "NO.      PLAY":PRINT
430 FOR I=1 TO 20
440 REM
450 PRINT C(I+L);TAB(6);P$(I)
460 NEXT I
630 L=L+20:T=2
640 PRINT
650 PRINT "TEAR OFF HERE----------------------------------------------"
660 FOR X=1 TO 11: PRINT: NEXT X
670 FOR Z=1 TO 3000: NEXT Z
680 IF L=20 THEN 410
690 D(1)=0: D(2)=3: M$(1)="--->": M$(2)="<---"
700 H(1)=0: H(2)=0: T(1)=2: T(2)=1
710 W(1)=-1: W(2)=1: X(1)=100: X(2)=0
720 Y(1)=1: Y(2)=-1: Z(1)=0: Z(2)=100
725 GOSUB 1910
730 PRINT "TEAM 1 DEFENDS 0 YD GOAL -- TEAM 2 DEFENDS 100 YD GOAL."
740 T=INT(2*RND(1)+1)
760 PRINT: PRINT "THE COIN IS FLIPPED"
765 P=X(T)-Y(T)*40
770 GOSUB 1860: PRINT : PRINT "TEAM";T;"RECEIVES KICK-OFF"
780 K=INT(26*RND(1)+40)
790 P=P-Y(T)*K
794 IF W(T)*P<Z(T)+10 THEN 810
795 PRINT: PRINT "BALL WENT OUT OF ENDZONE --AUTOMATIC TOUCHBACK--"
796 GOTO 870
810 PRINT "BALL WENT";K;"YARDS.  NOW ON";P:GOSUB 1900
830 PRINT "TEAM";T;"DO YOU WANT TO RUNBACK";:INPUT A$
840 IF A$="YES" THEN 1430
845 IF A$<>"NO" THEN 830
850 IF W(T)*P<Z(T) THEN 880
870 P=Z(T)-W(T)*20
880 D=1: S=P
885 FOR I=1 TO 72: PRINT "=";: NEXT I
890 PRINT: PRINT "TEAM";T;"DOWN";D;"ON";P
893 IF D<>1 THEN 900
895 IF Y(T)*(P+Y(T)*10)>=X(T) THEN 898
897 C=4: GOTO 900
898 C=8
900 IF C=8 THEN 904
901 PRINT TAB(27);10-(Y(T)*P-Y(T)*S);"YARDS TO 1ST DOWN"
902 GOTO 910
904 PRINT TAB(27);X(T)-Y(T)*P;"YARDS"
910 GOSUB 1900: IF D=4 THEN 1180
920 REM
930 U=INT(3*RND(0)-1): GOTO 940
936 PRINT "ILLEGAL PLAY NUMBER, CHECK AND"
940 PRINT "INPUT OFFENSIVE PLAY, DEFENSIVE PLAY";
950 IF T=2 THEN 970
960 INPUT P1,P2: GOTO 975
970 INPUT P2,P1
975 IF P1=77 THEN 1180
980 IF P1>20 THEN 1800
985 IF P1<1 THEN 1800
990 IF P2>20 THEN 1800
992 IF P2<1 THEN 1800
995 P1=INT(P1): P2=INT(P2)
1000 Y=INT(ABS(A(P1)-B(P2))/19*((X(T)-Y(T)*P+25)*RND(1)-15))
1005 PRINT: IF T=2 THEN 1015
1010 IF A(P1)<11 THEN 1048
1012 GOTO 1020
1015 IF B(P2)<11 THEN 1048
1020 IF U<>0 THEN 1035
1025 PRINT "PASS INCOMPLETE TEAM";T
1030 Y=0: GOTO 1050
1035 G=RND(1): IF G>.025 THEN 1040
1037 IF Y>2 THEN 1045
1040 PRINT "QUARTERBACK SCRAMBLED": GOTO 1050
1045 PRINT "PASS COMPLETED": GOTO 1050
1048 PRINT "THE BALL WAS RUN"
1050 P=P-W(T)*Y
1060 PRINT: PRINT "NET YARDS GAINED ON DOWN";D;"ARE ";Y
1070 G=RND(1): IF G>.025 THEN 1110
1080 PRINT: PRINT "** LOSS OF POSSESSION FROM TEAM";T;"TO TEAM";T(T)
1100 GOSUB 1850: PRINT: T=T(T): GOTO 830
1110 IF Y(T)*P>=X(T) THEN 1320
1120 IF W(T)*P>=Z(T) THEN 1230
1130 IF Y(T)*P-Y(T)*S>=10 THEN 880
1140 D=D+1: IF D<>5 THEN 885
1160 PRINT: PRINT "CONVERSION UNSUCCESSFUL TEAM";T:T=T(T)
1170 GOSUB 1850: GOTO 880
1180 PRINT "DOES TEAM";T;"WANT TO PUNT";: INPUT A$
1185 IF A$="NO" THEN 1200
1187 IF A$<>"YES" THEN 1180
1190 PRINT:PRINT "TEAM";T;"WILL PUNT": G=RND(1): IF G<.025 THEN 1080
1195 GOSUB 1850: K=INT(25*RND(1)+35): T=T(T): GOTO 790
1200 PRINT "DOES TEAM";T;"WANT TO ATTEMPT A FIELD GOAL";: INPUT A$
1210 IF A$="YES" THEN 1640
1215 IF A$<>"NO" THEN 1200
1217 GOTO 920
1230 PRINT: PRINT "SAFETY AGAINST TEAM";T;"**********OH-OH"
1240 H(T(T))=H(T(T))+2: GOSUB 1810
1280 PRINT"TEAM";T;"DO YOU WANT TO PUNT INSTEAD OF A KICKOFF";:INPUT A$
1290 P=Z(T)-W(T)*20: IF A$="YES" THEN 1190
1320 PRINT: PRINT "TOUCHDOWN BY TEAM";T;"**********YEA TEAM"
1340 Q=7: G=RND(1): IF G>.1 THEN 1380
1360 Q=6: PRINT "EXTRA POINT NO GOOD": GOTO 1390
1380 PRINT "EXTRA POINT GOOD"
1390 H(T)=H(T)+Q: GOSUB 1810
1420 T=T(T): GOTO 765
1430 K=INT(9*RND(0)+1)
1440 R=INT(((X(T)-Y(T)*P+25)*RND(1)-15)/K)
1460 P=P-W(T)*R
1480 PRINT:PRINT "RUNBACK TEAM";T;R;"YARDS"
1485 G=RND(1): IF G<.025 THEN 1080
1490 IF Y(T)*P>=X(T) THEN 1320
1500 IF W(T)*P>=Z(T) THEN 1230
1510 GOTO 880
1640 PRINT: PRINT "TEAM";T;"WILL ATTEMPT A FIELD GOAL"
1645 G=RND(1): IF G<.025 THEN 1080
1650 F=INT(35*RND(1)+20)
1660 PRINT: PRINT "KICK IS";F;"YARDS LONG"
1680 P=P-W(T)*F: G=RND(1)
1690 IF G<.35 THEN 1735
1700 IF Y(T)*P<X(T) THEN 1740
1710 PRINT "FIELD GOAL GOOD FOR TEAM";T;"**********YEA"
1720 Q=3: GOTO 1390
1735 PRINT "BALL WENT WIDE"
1740 PRINT "FIELD GOAL UNSUCCESFUL TEAM";T;"----------TOO BAD"
1742 GOSUB 1850: IF Y(T)*P<X(T)+10 THEN 1745
1744 T=T(T): GOTO 794
1745 PRINT: PRINT "BALL NOW ON";P
1750 T=T(T): GOSUB 1900: GOTO 830
1770 DATA 17,8,4,14,19,3,10,1,7,11,15,9,5,20,13,18,16,2,12,6
1780 DATA 20,2,17,5,8,18,12,11,1,4,19,14,10,7,9,15,6,13,16,3
1790 DATA "PITCHOUT","TRIPLE REVERSE","DRAW","QB SNEAK","END AROUND"
1792 DATA "DOUBLE REVERSE","LEFT SWEEP","RIGHT SWEEP","OFF TACKLE"
1794 DATA "WISHBONE OPTION","FLARE PASS","SCREEN PASS"
1796 DATA "ROLL OUT OPTION","RIGHT CURL","LEFT CURL","WISHBONE OPTION"
1798 DATA "SIDELINE PASS","HALF-BACK OPTION","RAZZLE-DAZZLE","BOMB!!!!"
1800 IF P1<>99 THEN 936
1810 PRINT: PRINT "TEAM 1 SCORE IS";H(1)
1820 PRINT "TEAM 2 SCORE IS";H(2): PRINT
1825 IF H(T)<E THEN 1830
1827 PRINT "TEAM";T;"WINS**********": GOTO 2000
1830 IF P1=99 THEN 940
1835 RETURN
1850 PRINT
1860 FOR X=1 TO 72: PRINT "+";: NEXT X: PRINT
1870 RETURN
1900 PRINT TAB(D(T)+5+P/2);M$(T)
1910 PRINT "TEAM 1 [0   10   20   30   40   50   60   70   80   90";
1915 PRINT "   100] TEAM 2"
1920 PRINT
1930 RETURN
2000 END
```

Fur Trader

You are the leader of a French fur trading expedition in 1776 leaving the Ontario area to sell furs and get supplies for the next year. You have a choice of three forts at which you may trade. The cost of supplies and the amount you receive for your furs will depend upon the fort you choose. You also specify what types of furs that you have to trade.

The game goes on and on until you elect to trade no longer.

Author of the program is Dan Bachor, University of Calgary, Alberta, Canada.

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                FUR TRADER
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

YOU ARE THE LEADER OF A FRENCH FUR TRADING EXPEDITION IN
1776 LEAVING THE LAKE ONTARIO AREA TO SELL FURS AND GET
SUPPLIES FOR THE NEXT YEAR.  YOU HAVE A CHOICE OF THREE
FORTS AT WHICH YOU MAY TRADE.  THE COST OF SUPPLIES
AND THE AMOUNT YOU RECEIVE FOR YOUR FURS WILL DEPEND
ON THE FORT THAT YOU CHOOSE.
DO YOU WISH TO TRADE FURS?
ANSWER YES OR NO            ? YES

YOU HAVE $ 600 SAVINGS.
AND 190 FURS TO BEGIN THE EXPEDITION.

YOUR 190 FURS ARE DISTRIBUTED AMONG THE FOLLOWING
KINDS OF PELTS: MINK, BEAVER, ERMINE AND FOX.

HOW MANY MINK PELTS DO YOU HAVE? 40

HOW MANY BEAVER PELTS DO YOU HAVE? 50

HOW MANY ERMINE PELTS DO YOU HAVE? 60

HOW MANY FOX PELTS DO YOU HAVE? 40
DO YOU WANT TO TRADE YOUR FURS AT FORT 1, FORT 2,
OR FORT 3?  FORT 1 IS FORT HOCHELAGA (MONTREAL)
AND IS UNDER THE PROTECTION OF THE FRENCH ARMY.
FORT 2 IS FORT STADACONA (QUEBEC) AND IS UNDER THE
PROTECTION OF THE FRENCH ARMY.  HOWEVER, YOU MUST
MAKE A PORTAGE AND CROSS THE LACHINE RAPIDS.
FORT 3 IS FORT NEW YORK AND IS UNDER DUTCH CONTROL.
YOU MUST CROSS THROUGH IROQUOIS LAND.
ANSWER 1, 2, OR 3.
? 3
YOU HAVE CHOSEN THE MOST DIFFICULT ROUTE.  AT
FORT NEW YORK YOU WILL RECEIVE THE HIGHEST VALUE
FOR YOUR FURS.  THE COST OF YOUR SUPPLIES
WILL BE LOWER THAN AT ALL THE OTHER FORTS.
DO YOU WANT TO TRADE AT ANOTHER FORT?
ANSWER YES OR NO            ? YES
ANSWER 1, 2, OR 3.
? 2
YOU HAVE CHOSEN A HARD ROUTE.  IT IS, IN COMPARSION,
HARDER THAN THE ROUTE TO HOCHELAGA BUT EASIER THAN
THE ROUTE TO NEW YORK.  YOU WILL RECEIVE AN AVERAGE VALUE
FOR YOUR FURS AND THE COST OF YOUR SUPPLIES WILL BE AVERAGE
DO YOU WANT TO TRADE AT ANOTHER FORT?
ANSWER YES OR NO            ? NO

YOUR CANOE UPSET IN THE LACHINE RAPIDS.  YOU
LOST ALL YOUR FURS
SUPPLIES AT FORT STADACONA COST $125.00
YOUR TRAVEL EXPENSES TO STADACONA WERE $15.00

YOU NOW HAVE $ 460  INCLUDING YOUR PREVIOUS SAVINGS

DO YOU WANT TO TRADE FURS NEXT YEAR?
ANSWER YES OR NO            ? YES

YOU HAVE $ 460 SAVINGS.
AND 190 FURS TO BEGIN THE EXPEDITION.

YOUR 190 FURS ARE DISTRIBUTED AMONG THE FOLLOWING
KINDS OF PELTS: MINK, BEAVER, ERMINE AND FOX.

HOW MANY MINK PELTS DO YOU HAVE? 50

HOW MANY BEAVER PELTS DO YOU HAVE? 100

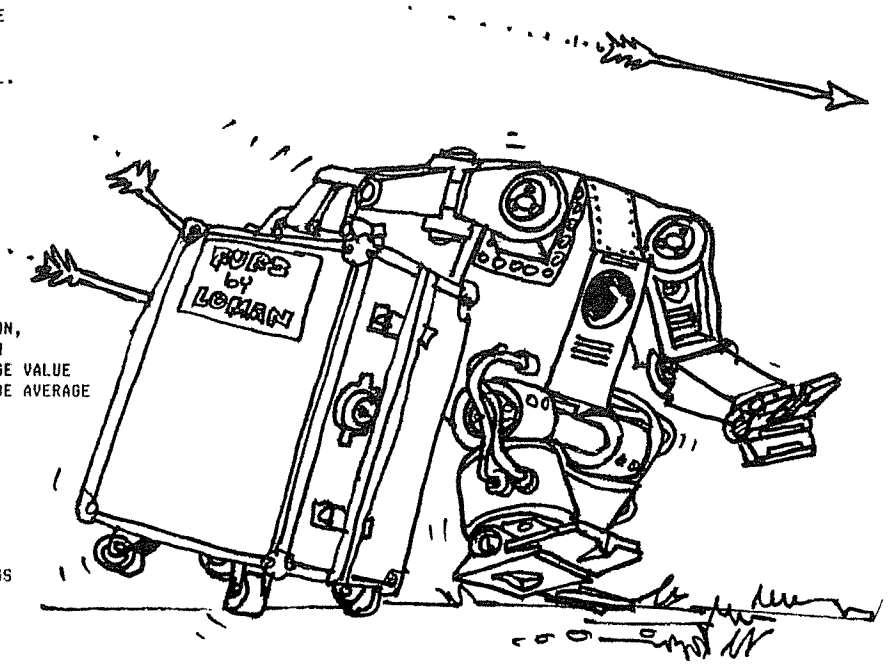
HOW MANY ERMINE PELTS DO YOU HAVE? 20

HOW MANY FOX PELTS DO YOU HAVE? 20
DO YOU WANT TO TRADE YOUR FURS AT FORT 1, FORT 2,
OR FORT 3?  FORT 1 IS FORT HOCHELAGA (MONTREAL)
AND IS UNDER THE PROTECTION OF THE FRENCH ARMY.
FORT 2 IS FORT STADACONA (QUEBEC) AND IS UNDER THE
PROTECTION OF THE FRENCH ARMY.  HOWEVER, YOU MUST
MAKE A PORTAGE AND CROSS THE LACHINE RAPIDS.
FORT 3 IS FORT NEW YORK AND IS UNDER DUTCH CONTROL.
YOU MUST CROSS THROUGH IROQUOIS LAND.
ANSWER 1, 2, OR 3.
? 3
YOU HAVE CHOSEN THE MOST DIFFICULT ROUTE.  AT
FORT NEW YORK YOU WILL RECEIVE THE HIGHEST VALUE
FOR YOUR FURS.  THE COST OF YOUR SUPPLIES
WILL BE LOWER THAN AT ALL THE OTHER FORTS.
DO YOU WANT TO TRADE AT ANOTHER FORT?
ANSWER YES OR NO            ? NO

YOU NARROWLY ESCAPED AN IROQUOIS RAIDING PARTY.
HOWEVER, YOU HAD TO LEAVE ALL YOUR FURS BEHIND.
SUPPLIES AT NEW YORK COST $80.00
YOUR TRAVEL EXPENSES TO NEW YORK WERE $25.00

YOU NOW HAVE $ 355  INCLUDING YOUR PREVIOUS SAVINGS

DO YOU WANT TO TRADE FURS NEXT YEAR?
ANSWER YES OR NO            ? NO
```



```
1 DIM F(4)
2 PRINT TAB(31);"FUR TRADER"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
15 GOSUB 1091
16 LET I=600
17 PRINT "DO YOU WISH TO TRADE FURS?"
18 GOSUB 1402
19 IF B$="YES" THEN 100
20 IF B$="YES " THEN 100
21 STOP
100 PRINT
101 PRINT "YOU HAVE $";I "SAVINGS."
102 PRINT "AND 190 FURS TO BEGIN THE EXPEDITION."
261 LET E1=INT((.15*RND(1)+.95)*10^2+.5)/10^2
262 LET B1=INT((.25*RND(1)+1.00)*10^2+.5)/10^2
300 PRINT
301 PRINT "YOUR 190 FURS ARE DISTRIBUTED AMONG THE FOLLOWING"
302 PRINT "KINDS OF PELTS: MINK, BEAVER, ERMINE AND FOX."
310 GOSUB 1430
315 RESTORE
330 FOR J=1 TO 4
332 READ B$
333 PRINT
335 PRINT "HOW MANY ";B$;" PELTS DO YOU HAVE";
338 INPUT F(J)
340 LET F(0)=F(1)+F(2)+F(3)+F(4)
342 IF F(0)=190 THEN 1100
344 IF F(0)>190 THEN 500
348 NEXT J
350 GOTO 1100
500 PRINT
501 PRINT "YOU MAY NOT HAVE THAT MANY FURS."
502 PRINT "DO NOT TRY TO CHEAT.  I CAN ADD."
503 PRINT "YOU MUST START AGAIN."
504 GOTO 15
508 PRINT
511 PRINT "DO YOU WANT TO TRADE FURS NEXT YEAR?"
513 GOTO 18
1091 PRINT "YOU ARE THE LEADER OF A FRENCH FUR TRADING EXPEDITION IN "
1092 PRINT "1776 LEAVING THE LAKE ONTARIO AREA TO SELL FURS AND GET"
1093 PRINT "SUPPLIES FOR THE NEXT YEAR.  YOU HAVE A CHOICE OF THREE"
1094 PRINT "FORTS AT WHICH YOU MAY TRADE.  THE COST OF SUPPLIES"
1095 PRINT "AND THE AMOUNT YOU RECEIVE FOR YOUR FURS WILL DEPEND"
1096 PRINT "ON THE FORT THAT YOU CHOOSE."
1099 RETURN
1100 PRINT "DO YOU WANT TO TRADE YOUR FURS AT FORT 1, FORT 2,"
1102 PRINT "OR FORT 3?  FORT 1 IS FORT HOCHELAGA (MONTREAL)"
1103 PRINT "AND IS UNDER THE PROTECTION OF THE FRENCH ARMY."
1104 PRINT "FORT 2 IS FORT STADACONA (QUEBEC) AND IS UNDER THE"
1105 PRINT "PROTECTION OF THE FRENCH ARMY.  HOWEVER, YOU MUST"
1106 PRINT "MAKE A PORTAGE AND CROSS THE LACHINE RAPIDS."
1108 PRINT "FORT 3 IS FORT NEW YORK AND IS UNDER DUTCH CONTROL."
1109 PRINT "YOU MUST CROSS THROUGH IROQUOIS LAND."
1110 PRINT "ANSWER 1, 2, OR 3."
1111 INPUT B
1112 IF B=1 THEN 1120
1113 IF B=2 THEN 1135
1115 IF B=3 THEN 1147
1116 GOTO 1110
1120 PRINT "YOU HAVE CHOSEN THE EASIEST ROUTE.  HOWEVER, THE FORT"
1121 PRINT "IS FAR FROM ANY SEAPORT.  THE VALUE"
1122 PRINT "YOU RECEIVE FOR YOUR FURS WILL BE LOW AND THE COST"
1123 PRINT "OF SUPPLIES HIGHER THAN AT FORTS STADACONA OR NEW YORK."
1125 GOSUB 1400
1129 IF B$="YES" THEN 1110
1130 GOTO 1160
1135 PRINT "YOU HAVE CHOSEN A HARD ROUTE.  IT IS, IN COMPARISON,"
1136 PRINT "HARDER THAN THE ROUTE TO HOCHELAGA BUT EASIER THAN"
1137 PRINT "THE ROUTE TO NEW YORK.  YOU WILL RECEIVE AN AVERAGE VALUE"
1138 PRINT "FOR YOUR FURS AND THE COST OF YOUR SUPPLIES WILL BE AVERAGE
1141 GOSUB 1400
1144 IF B$="YES" THEN 1110
1145 GOTO 1198
1147 PRINT "YOU HAVE CHOSEN THE MOST DIFFICULT ROUTE.  AT"
1148 PRINT "FORT NEW YORK YOU WILL RECEIVE THE HIGHEST VALUE"
1149 PRINT "FOR YOUR FURS.  THE COST OF YOUR SUPPLIES"
1150 PRINT "WILL BE LOWER THAN AT ALL THE OTHER FORTS."
1152 GOSUB 1400
1155 IF B$="YES" THEN 1110
1156 GOTO 1250
1160 LET I=I-160
1169 PRINT
1174 LET M1=INT((.2*RND(1)+.70)*10^2+.5)/10^2
1175 LET E1=INT((.2*RND(1)+.65)*10^2+.5)/10^2
1176 LET B1=INT((.2*RND(1)+.75)*10^2+.5)/10^2
1177 LET D1=INT((.2*RND(1)+.80)*10^2+.5)/10^2
1180 PRINT "SUPPLIES AT FORT HOCHELAGA COST $150.00"
1181 PRINT "YOUR TRAVEL EXPENSES TO HOCHELAGA WERE $10.00"
1190 GOTO 1410
1198 LET I=I-140
1201 PRINT
1205 LET M1=INT((.3*RND(1)+.85)*10^2+.5)/10^2
1206 LET E1=INT((.15*RND(1)+.80)*10^2+.5)/10^2
1207 LET B1=INT((.2*RND(1)+.90)*10^2+.5)/10^2
1209 LET P=INT(10*RND(1))+1
1210 IF P<=2 THEN 1216
1212 IF P<=6 THEN 1224
1213 IF P<=8 THEN 1226
1215 IF P<=10 THEN 1235
1216 LET F(2)=0
1218 PRINT "YOUR BEAVER WERE TOO HEAVY TO CARRY ACROSS"
1219 PRINT "THE PORTAGE.  YOU HAD TO LEAVE THE PELTS BUT FOUND"
1220 PRINT "THEM STOLEN WHEN YOU RETURNED"
1221 GOSUB 1244
1222 GOTO 1414
1224 PRINT "YOU ARRIVED SAFELY AT FORT STADACONA"
1225 GOTO 1239
1226 GOSUB 1430
1230 PRINT "YOUR CANOE UPSET IN THE LACHINE RAPIDS.  YOU"
1231 PRINT "LOST ALL YOUR FURS"
1232 GOSUB 1244
1233 GOTO 1418
1235 LET F(4)=0
1237 PRINT "YOUR FOX PELTS WERE NOT CURED PROPERLY."
1238 PRINT "NO ONE WILL BUY THEM."
1239 GOSUB 1244
1240 GOTO 1410
1244 PRINT "SUPPLIES AT FORT STADACONA COST $125.00"
1246 PRINT "YOUR TRAVEL EXPENSES TO STADACONA WERE $15.00"
1248 RETURN
1250 LET I=I-105
1254 PRINT
1260 LET M1=INT((.15*RND(1)+1.05)*10^2+.5)/10^2
1263 LET D1=INT((.25*RND(1)+1.10)*10^2+.5)/10^2
1270 LET P=INT(10*RND(1))+1
1271 IF P<=2 THEN 1281
1272 IF P<=6 THEN 1291
1273 IF P<=8 THEN 1295
1274 IF P<=10 THEN 1306
1281 PRINT "YOU WERE ATTACKED BY A PARTY OF IROQUOIS."
1282 PRINT "ALL PEOPLE IN YOUR TRADING GROUP WERE"
1283 PRINT "KILLED.  THIS ENDS THE GAME."
1284 STOP
1291 PRINT "YOU WERE LUCKY.  YOU ARRIVED SAFELY"
1292 PRINT "AT FORT NEW YORK."
1293 GOTO 1311
1295 GOSUB 1430
1300 PRINT "YOU NARROWLY ESCAPED AN IROQUOIS RAIDING PARTY."
1301 PRINT "HOWEVER, YOU HAD TO LEAVE ALL YOUR FURS BEHIND."
1303 GOSUB 1320
1304 GOTO 1418
1306 LET B1=B1/2
1307 LET M1=M1/2
1308 PRINT "YOUR MINK AND BEAVER WERE DAMAGED ON YOUR TRIP."
1309 PRINT "YOU RECEIVE ONLY HALF THE CURRENT PRICE FOR THESE FURS."
1311 GOSUB 1320
1312 GOTO 1410
1320 PRINT "SUPPLIES AT NEW YORK COST $80.00"
1321 PRINT "YOUR TRAVEL EXPENSES TO NEW YORK WERE $25.00"
1322 RETURN
1400 PRINT "DO YOU WANT TO TRADE AT ANOTHER FORT?"
1402 PRINT "ANSWER YES OR NO",
1403 INPUT B$
1404 RETURN
1410 PRINT
1412 PRINT "YOUR BEAVER SOLD FOR $";B1*F(2);
1414 PRINT "YOUR FOX SOLD FOR $";D1*F(4)
1416 PRINT "YOUR ERMINE SOLD FOR $";E1*F(3);
1417 PRINT "YOUR MINK SOLD FOR $";M1*F(1)
1418 LET I=M1*F(1)+B1*F(2)+E1*F(3)+D1*F(4)+I
1420 PRINT
1422 PRINT "YOU NOW HAVE $";I;" INCLUDING YOUR PREVIOUS SAVINGS"
1425 GOTO 508
1430 FOR J=1 TO 4
1432 LET F(J)=0
1434 NEXT J
1436 RETURN
2000 DATA "MINK","BEAVER","ERMINE","FOX"
2046 END
```

Golf

This is a single player golf game. In other words it's you against the golf-course (the computer). The program asks for your handicap (maximum of 30) and your area of difficulty. You have a full bag of 29 clubs plus a putter. On the course you have to contend with rough, trees, on and off fairway, sand traps, and water hazards. In addition, you can hook, slice, go out of bounds, or hit too far. On putting, you determine the potency factor (or percent of swing). Until you get the swing of the game (no pun intended), you'll probably want to use a fairly high handicap.

Steve North of Creative Computing modified the original version of this game, the author of which is unknown.

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                  GOLF
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


WELCOME TO THE CREATIVE COMPUTING COUNTRY CLUB,
AN EIGHTEEN HOLE CHAMPIONSHIP LAYOUT, LOCATED A SHORT
DISTANCE FROM SCENIC DOWNTOWN MORRISTOWN.  THE
COMMENTATOR WILL EXPLAIN THE GAME AS YOU PLAY.
ENJOY YOUR GAME; SEE YOU AT THE 19TH HOLE...


WHAT IS YOUR HANDICAP? 10
DIFFICULTIES AT GOLF INCLUDE:
0=HOOK, 1=SLICE, 2=POOR DISTANCE, 4=TRAP SHOTS, 5=PUTTING
WHICH ONE (ONLY ONE) IS YOUR WORST? 1


YOU ARE AT TEE OFF HOLE 1 DISTANCE 361 YARDS, PAR 4
ON YOUR RIGHT IS ADJACENT FAIRWAY
ON YOUR LEFT IS ROUGH
SELECTION OF CLUBS
YARDAGE DESIRED                      SUGGESTED CLUBS
200 TO 280 YARDS                          1 TO 4
100 TO 200 YARDS                         19 TO 13
  0 TO 100 YARDS                         29 TO 23
WHAT CLUB DO YOU CHOOSE? 1

SHOT WENT 237 YARDS.  IT'S 124 YARDS FROM THE CUP.
BALL IS 10 YARDS OFF LINE... IN FAIRWAY
WHAT CLUB DO YOU CHOOSE? 15

TOO MUCH CLUB.  YOU'RE PAST THE HOLE.
SHOT WENT 160 YARDS.  IT'S 36 YARDS FROM THE CUP.
BALL IS 0 YARDS OFF LINE... IN FAIRWAY
WHAT CLUB DO YOU CHOOSE? 23

YOU MAY NOW GAUGE YOUR DISTANCE BY PERCENT (1 TO 100)
PERCENT FULL SWING? 25

ON GREEN 15 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 5
PASSED BY CUP.
ON GREEN 13 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 3
YOU HOLED IT.


YOUR SCORE ON HOLE 1 WAS 5
TOTAL PAR FOR 1 HOLES IS 4   YOUR TOTAL IS 5


YOU ARE AT TEE OFFHOLE 2 DISTANCE 389 YARDS, PAR 4
ON YOUR RIGHT IS TREES
ON YOUR LEFT IS TREES
WHAT CLUB DO YOU CHOOSE? 2

SHOT WENT 231 YARDS.  IT'S 158 YARDS FROM THE CUP.
BALL IS 16 YARDS OFF LINE... IN FAIRWAY
WHAT CLUB DO YOU CHOOSE? 14

ON GREEN 18 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 7
PASSED BY CUP.
ON GREEN 17 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 5
PASSED BY CUP.
ON GREEN 4 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 2
PASSED BY CUP.
ON GREEN 4 FEET FROM THE PIN.
CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13.
PUTT POTENCY NUMBER? 1
YOU HOLED IT.

YOUR SCORE ON HOLE 2 WAS 6
TOTAL PAR FOR 2 HOLES IS 8   YOUR TOTAL IS 11


YOU ARE AT TEE OFFHOLE 3 DISTANCE 206 YARDS, PAR 3
ON YOUR RIGHT IS ADJACENT FAIRWAY
ON YOUR LEFT IS ROUGH
WHAT CLUB DO YOU CHOOSE? 1

BALL HIT TREE - BOUNCED INTO ROUGH 131 YARDS FROM HOLE.
WHAT CLUB DO YOU CHOOSE? 16

YOU DUBBED IT.
SHOT WENT 35 YARDS.  IT'S 96 YARDS FROM THE CUP.
BALL IS 0 YARDS OFF LINE... IN FAIRWAY
WHAT CLUB DO YOU CHOOSE? 23

YOU MAY NOW GAUGE YOUR DISTANCE BY PERCENT (1 TO 100)
PERCENT FULL SWING? 75

TOO MUCH CLUB.  YOU'RE PAST THE HOLE.
SHOT WENT 138 YARDS.  IT'S 43 YARDS FROM THE CUP.
BALL IS 9 YARDS OFF LINE... IN FAIRWAY
WHAT CLUB DO YOU CHOOSE? 24

YOU MAY NOW GAUGE YOUR DISTANCE BY PERCENT (1 TO 100)
PERCENT FULL SWING? 30
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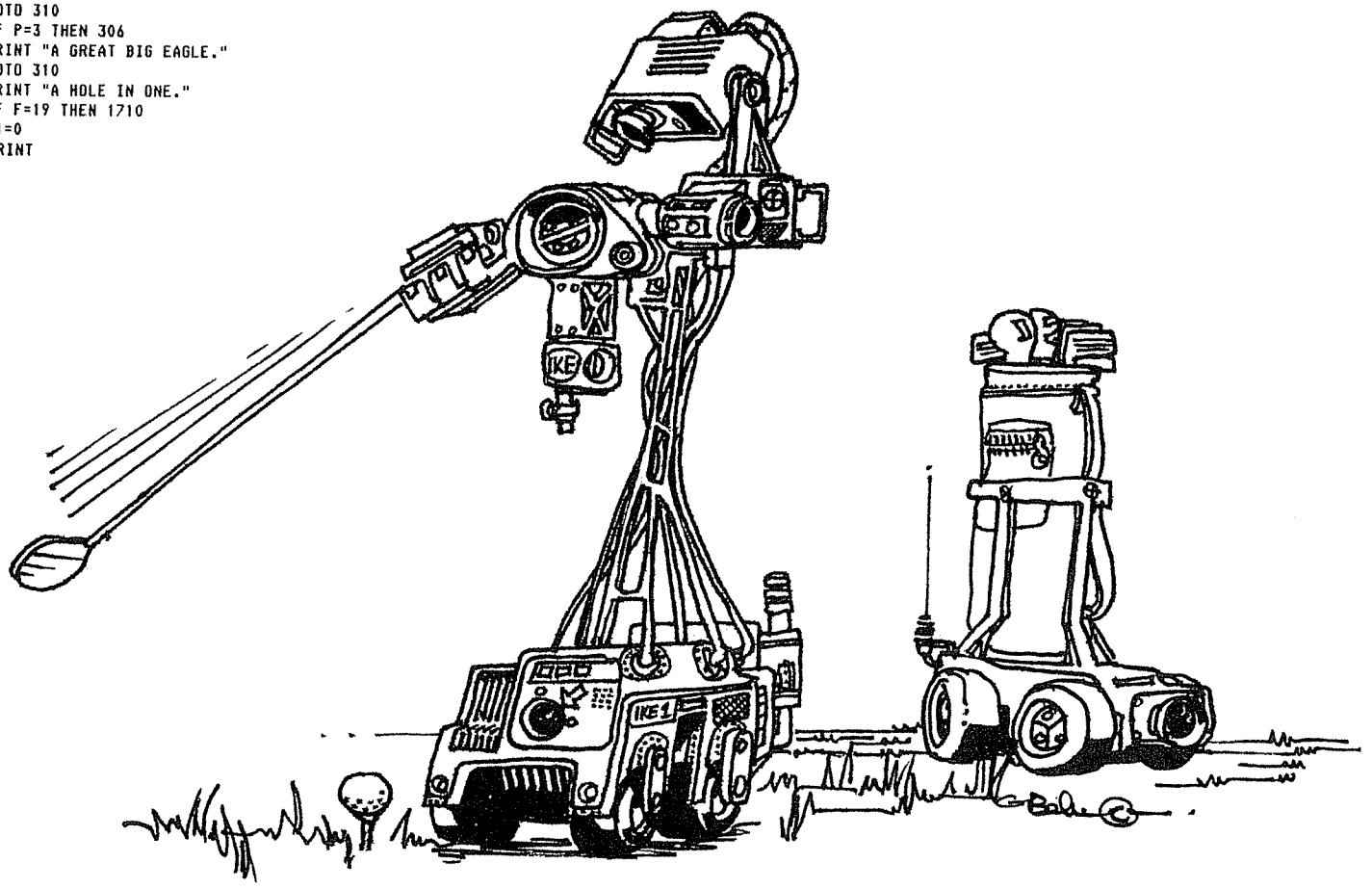
```
1 PRINT TAB(34);"GOLF"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "WELCOME TO THE CREATIVE COMPUTING COUNTRY CLUB,"
5 PRINT "AN EIGHTEEN HOLE CHAMPIONSHIP LAYOUT, LOCATED A SHORT"
6 PRINT "DISTANCE FROM SCENIC DOWNTOWN MORRISTOWN.  THE"
7 PRINT "COMMENTATOR WILL EXPLAIN THE GAME AS YOU PLAY."
8 PRINT "ENJOY YOUR GAME; SEE YOU AT THE 19TH HOLE..."
9 PRINT:PRINT: DIM L(10)
10 G1=18
20 G2=0
30 G3=0
40 A=0
50 N=.8
60 S2=0
70 F=1
80 PRINT "WHAT IS YOUR HANDICAP";
90 INPUT H
100 IF H>30 THEN 470
110 IF H<0 THEN 470
120 PRINT "DIFFICULTIES AT GOLF INCLUDE:"
130 PRINT "0=HOOK, 1=SLICE, 2=POOR DISTANCE, 4=TRAP SHOTS, 5=PUTTING"
140 PRINT "WHICH ONE (ONLY ONE) IS YOUR WORST";
150 INPUT T
160 IF T>5 THEN 120
170 S1=0
210 REM
230 L(0)=0
240 J=0
245 Q=0
250 S2=S2+1
260 K=0
270 IF F=1 THEN 310
290 PRINT "YOUR SCORE ON HOLE";F-1;"WAS";S1
291 GOTO 1750
292 IF S1>P+2 THEN 297
293 IF S1=P THEN 299
294 IF S1=P-1 THEN 301
295 IF S1=P-2 THEN 303
296 GOTO 310
297 PRINT "KEEP YOUR HEAD DOWN."
298 GOTO 310
299 PRINT "A PAR.  NICE GOING."
300 GOTO 310
301 PRINT "A BIRDIE."
302 GOTO 310
303 IF P=3 THEN 306
304 PRINT "A GREAT BIG EAGLE."
305 GOTO 310
306 PRINT "A HOLE IN ONE."
310 IF F=19 THEN 1710
315 S1=0
316 PRINT
320 IF S1=0 THEN 1590
330 IF L(0)<1 THEN 1150
340 X=0
350 IF L(0)>5 THEN 1190
360 PRINT "SHOT WENT";D1;"YARDS.  IT'S";D2;"YARDS FROM THE CUP."
362 PRINT "BALL IS";INT(D);"YARDS OFF LINE... IN ";
380 GOSUB 400
390 GOTO 620
400 IF L(X)=1 THEN 480
410 IF L(X)=2 THEN 500
```



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420 IF L(X)=3 THEN 520
430 IF L(X)=4 THEN 540
440 IF L(X)=5 THEN 560
450 IF L(X)=6 THEN 580
460 PRINT "OUT OF BOUNDS"
465 GOTO 1690
470 PRINT "PGA RULES HANDICAP = 0 TO 30"
472 GOTO 80
480 PRINT "FAIRWAY"
490 GOTO 1690
500 PRINT "ROUGH"
510 GOTO 1690
520 PRINT "TREES"
530 GOTO 1690
540 PRINT "ADJACENT FAIRWAY"
550 GOTO 1690
560 PRINT "TRAP"
570 GOTO 1690
580 PRINT "WATER"
590 GOTO 1690
620 IF A=1 THEN 629
621 PRINT "SELECTION OF CLUBS"
622 PRINT "YARDAGE DESIRED                    SUGGESTED CLUBS"
623 PRINT "200 TO 280 YARDS                        1 TO 4"
624 PRINT "100 TO 200 YARDS                       19 TO 13"
625 PRINT "  0 TO 100 YARDS                       29 TO 23"
626 A=1
629 PRINT "WHAT CLUB DO YOU CHOOSE";
630 INPUT C
632 PRINT
635 IF C<1 THEN 690
637 IF C>29 THEN 690
640 IF C>4 THEN 710
650 IF L(0)<=5 THEN 740
660 IF C=14 THEN 740
665 IF C=23 THEN 740
670 GOTO 690
680 S1=S1-1
690 PRINT "THAT CLUB IS NOT IN THE BAG."
693 PRINT
700 GOTO 620
710 IF C<12 THEN 690
720 C=C-6
730 GOTO 650
740 S1=S1+1
741 W=1
742 IF C>13 THEN 960
746 IF INT(F/3)=F/3 THEN 952
752 IF C<4 THEN 756
754 GOTO 760
756 IF L(0)=2 THEN 862
760 IF S1>7 THEN 867
770 D1=INT(((30-H)*2.5+187-((30-H)*.25+15)*C/2)+25*RND(1))
780 D1=INT(D1*W)
800 IF T=2 THEN 1170
830 O=(RND(1)/.8)*(2*H+16)*ABS(TAN(D1*.0035))
840 D2=INT(SQR(O^2+ABS(D-D1)^2))
850 IF D-D1<0 THEN 870
860 GOTO 890
862 PRINT "YOU DUBBED IT."
864 D1=35
866 GOTO 830
867 IF D<200 THEN 1300
868 GOTO 770
870 IF D2<20 THEN 890
880 PRINT "TOO MUCH CLUB.  YOU'RE PAST THE HOLE."
890 B=D
900 D=D2
910 IF D2>27 THEN 1020
920 IF D2>20 THEN 1100
930 IF D2>.5 THEN 1120
940 L(0)=9
950 GOTO 1470
952 IF S2+O+(10*(F-1)/18)<(F-1)*(72+((H+1)/.85))/18 THEN 956
954 GOTO 752
956 O=O+1
957 IF S1/2<>INT(S1/2) THEN 1011
958 GOTO 862
960 PRINT "YOU MAY NOW GAUGE YOUR DISTANCE BY PERCENT (1 TO 100)"
961 PRINT "PERCENT FULL SWING";
970 INPUT W: W=W/100
972 PRINT
980 IF W>1 THEN 680
985 IF L(0)=5 THEN 1280
990 IF C=14 THEN 760
1000 C=C-10
1010 GOTO 760
1011 IF D<95 THEN 862
1012 PRINT "BALL HIT TREE - BOUNCED INTO ROUGH";D-75;"YARDS FROM HOLE."
1014 D=D-75
1018 GOTO 620
1020 IF O<30 THEN 1150
1022 IF J>0 THEN 1150
1030 IF T>0 THEN 1070
1035 S9=(S2+1)/15
1036 IF INT(S9)=S9 THEN 1075
1040 PRINT "YOU HOOKED- ";
1050 L(0)=L(2)
1055 IF O>45 THEN 1092
1060 GOTO 320
1070 S9=(S2+1)/15
1071 IF INT(S9)=S9 THEN 1040
1075 PRINT "YOU SLICED- ";
1080 L(0)=L(1)
1090 GOTO 1055
1092 PRINT "BADLY."
1094 GOTO 320
1100 L(0)=5
1110 GOTO 320
1120 L(0)=8
1130 D2=INT(D2*3)
1140 GOTO 1380
1150 L(0)=1
1160 GOTO 320
1170 D1=INT(.85*D1)
1180 GOTO 830
1190 IF L(0)>6 THEN 1260
1200 PRINT "YOUR SHOT WENT INTO WATER."
1210 S1=S1+1
1220 PRINT "PENALTY STROKE ASSESSED.  HIT FROM PREVIOUS LOCATION."
1230 J=J+1
1240 L(0)=1
1242 B=B
1250 GOTO 620
1260 PRINT "YOUR SHOT WENT OUT OF BOUNDS."
1270 GOTO 1210
1280 IF T=3 THEN 1320
1300 D2=1+(3*INT((80/(40-H))*RND(1)))
1310 GOTO 1380
1320 IF RND(1)>N THEN 1360
1330 N=N*.2
1340 PRINT "SHOT DUBBED, STILL IN TRAP."
1350 GOTO 620
1360 N=.8
1370 GOTO 1300
1380 PRINT "ON GREEN";D2;"FEET FROM THE PIN."
1381 PRINT "CHOOSE YOUR PUTT DISTANCE POTENCY NUMBER 1 TO 13."
1382 PRINT "PUTT POTENCY NUMBER";
1400 INPUT I
1410 S1=S1+1
1420 IF S1+1-P>(H*.072)+2 THEN 1470
1425 IF K>2 THEN 1470
1428 K=K+1
1430 IF T=4 THEN 1530
1440 D2=D2-I*(4+2*RND(1))+1.5
1450 IF D2<-2 THEN 1560
1460 IF D2>2 THEN 1500
1470 PRINT "YOU HOLED IT."
1472 PRINT
1480 F=F+1
1490 GOTO 230
1500 PRINT "PUTT SHORT."
1505 D2=INT(D2)
1510 GOTO 1380
1530 D2=D2-I*(4+1*RND(1))+1
1550 GOTO 1450
1560 PRINT "PASSED BY CUP."
1570 D2=-D2
1580 GOTO 1505
1590 READ D,P,L(1),L(2)
1595 PRINT
1600 PRINT "YOU ARE AT TEE OFFHOLE";F;"DISTANCE";D;"YARDS, PAR";P
1605 G3=G3+P
1620 PRINT "ON YOUR RIGHT IS ";
1630 X=1
1640 GOSUB 400
1650 PRINT "ON YOUR LEFT IS ";
1660 X=2
1670 GOSUB 400
1680 GOTO 620
1690 RETURN
1700 DATA 361,4,4,2,389,4,3,3,206,3,4,2,500,5,7,2
1702 DATA 408,4,2,4,359,4,6,4,424,4,4,2,388,4,4,4
1704 DATA 196,3,7,2,400,4,7,2,560,5,7,2,132,3,2,2
1706 DATA 357,4,4,4,294,4,2,4,475,5,2,3,375,4,4,2
1708 DATA 180,3,6,2,550,5,6,6
1710 PRINT
1750 G2=G2+S1
1760 PRINT "TOTAL PAR FOR";F-1;"HOLES IS";G3;"  YOUR TOTAL IS";G2
1761 IF G1=F-1 THEN 1770
1765 GOTO 292
1770 END
```

Gomoko

GOMOKO or GOMOKU is a traditional game of the Orient. It is played by two people on a board of intersecting lines (19 left-to-right lines, 19 top-to-bottom lines, 361 intersections in all). Players take turns. During his turn, a player may cover one intersection with a marker; (one player uses white markers; the other player uses black markers). The object of the game is to get five adjacent markers in a row, horizontally, vertically or along either diagonal.

Unfortunately, this program does not make the computer a very good player. It does not know when you are about to win or even who has won. But some of its moves may surprise you.

The original author of this program is Peter Sessions of People's Computer Company.

```
                  GOMOKO
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

WELCOME TO THE ORIENTAL GAME OF GOMOKO.

THE GAME IS PLAYED ON AN N BY N GRID OF A SIZE
THAT YOU SPECIFY.  DURING YOUR PLAY, YOU MAY COVER ONE GRID
INTERSECTION WITH A MARKER. THE OBJECT OF THE GAME IS TO GET
5 ADJACENT MARKERS IN A ROW -- HORIZONTALLY, VERTICALLY, OR
DIAGONALLY.  ON THE BOARD DIAGRAM, YOUR MOVES ARE MARKED
WITH A '1' AND THE COMPUTER MOVES WITH A '2'.

THE COMPUTER DOES NOT KEEP TRACK OF WHO HAS WON.
TO END THE GAME, TYPE -1,-1 FOR YOUR MOVE.

WHAT IS YOUR BOARD SIZE (MIN 7/ MAX 19)? 10

WE ALTERNATE MOVES.  YOU GO FIRST...

YOUR PLAY (I,J)? 4,3
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  1  0  0  0  0  0  0  0
 0  0  2  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

YOUR PLAY (I,J)? 4,4
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  1  1  0  0  0  0  0  0
 0  0  2  2  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

YOUR PLAY (I,J)? 3,3
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  1  0  0  0  0  0  0  0
 0  0  1  1  0  0  0  0  0  0
 0  0  2  2  1  0  0  0  0  0
 0  0  0  0  0  2  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  2  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

YOUR PLAY (I,J)? 2,2
 0  0  0  0  0  0  0  0  0  0
 0  1  0  0  0  0  0  0  0  0
 0  2  1  0  0  0  0  0  0  0
 0  0  1  1  0  0  0  0  0  0
 0  0  2  2  1  0  0  0  0  0
 0  0  0  0  0  2  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  2  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

YOUR PLAY (I,J)? 5,
ILLEGAL MOVE.  TRY AGAIN...
YOUR PLAY (I,J)? 5,5
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  1  1  0  0  0  0  0  0
 0  0  2  2  1  0  0  0  0  0
 0  0  0  0  0  2  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

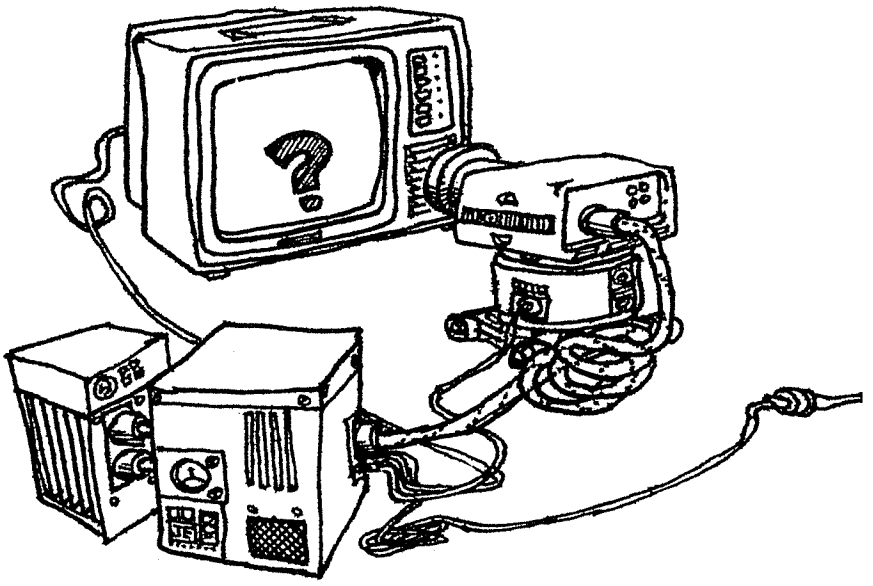
YOUR PLAY (I,J)? 1,1
 1  0  0  0  0  0  0  0  0  0
 2  1  0  0  0  0  0  0  0  0
 0  2  1  0  0  0  0  0  0  0
 0  0  1  1  0  0  0  0  0  0
 0  0  2  2  1  0  0  0  0  0
 0  0  0  0  0  2  0  0  0  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  2  0
 0  0  0  0  0  0  0  0  0  0
 0  0  0  0  0  0  0  0  0  0

YOUR PLAY (I,J)? -1,-1

THANKS FOR THE GAME!!
PLAY AGAIN (1 FOR YES, 0 FOR NO)? 0
```

```
2 PRINT TAB(33);"GOMOKO"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
8 DIM A(19,19)
10 PRINT "WELCOME TO THE ORIENTAL GAME OF GOMOKO."
20 PRINT: PRINT "THE GAME IS PLAYED ON AN N BY N GRID OF A SIZE"
30 PRINT "THAT YOU SPECIFY.  DURING YOUR PLAY, YOU MAY COVER ONE GRID"
40 PRINT "INTERSECTION WITH A MARKER. THE OBJECT OF THE GAME IS TO GET"
50 PRINT "5 ADJACENT MARKERS IN A ROW -- HORIZONTALLY, VERTICALLY, OR"
60 PRINT "DIAGONALLY.  ON THE BOARD DIAGRAM, YOUR MOVES ARE MARKED"
70 PRINT "WITH A '1' AND THE COMPUTER MOVES WITH A '2'."
80 PRINT: PRINT "THE COMPUTER DOES NOT KEEP TRACK OF WHO HAS WON."
90 PRINT "TO END THE GAME, TYPE -1,-1 FOR YOUR MOVE.": PRINT
110 PRINT "WHAT IS YOUR BOARD SIZE (MIN 7/ MAX 19)";: INPUT N
115 IF N>6 THEN 117
116 GOTO 120
117 IF N<20 THEN 210
120 PRINT "I SAID, THE MINIMUM IS 7, THE MAXIMUM IS 19.": GOTO 110
210 FOR I=1 TO N:FOR J=1 TO N: A(X,Y)=0: NEXT J: NEXT I
300 PRINT: PRINT "WE ALTERNATE MOVES.  YOU GO FIRST...": PRINT
310 PRINT "YOUR PLAY (I,J)";: INPUT I,J
320 IF I=-1 THEN 980
330 X=I: Y=J: GOSUB 910: IF L=1 THEN 410
340 PRINT "ILLEGAL MOVE.  TRY AGAIN...": GOTO 310
410 IF A(I,J)=0 THEN 440
420 PRINT "SQUARE OCCUPIED.  TRY AGAIN...": GOTO 310
440 A(I,J)=1
500 REM *** COMPUTER TRIES AN INTELLIGENT MOVE ***
510 FOR E=-1 TO 1: FOR F=-1 TO 1: IF E+F-E*F=0 THEN 590
540 X=I+F: Y=J+F: GOSUB 910
570 IF L=0 THEN 590
580 IF A(X,Y)=1 THEN 710
590 NEXT F: NEXT E
600 REM *** COMPUTER TRIES A RANDOM MOVE ***
610 X=INT(N*RND(1)+1): Y=INT(N*RND(1)+1): GOSUB 910: IF L=0 THEN 610
650 IF A(X,Y)<>0 THEN 610
660 A(X,Y)=2: GOSUB 810: GOTO 310
710 X=I-E: Y=J-F: GOSUB 910
750 IF L=0 THEN 610
760 GOTO 650
800 REM *** PRINT THE BOARD ***
810 FOR I=1 TO N: FOR J=1 TO N: PRINT A(I,J);
840 NEXT J: PRINT: NEXT I: PRINT: RETURN
910 L=1: IF X<1 THEN 970
920 IF X>N THEN 970
930 IF Y<1 THEN 970
940 IF Y>N THEN 970
950 RETURN
970 L=0: RETURN
980 PRINT: PRINT "THANKS FOR THE GAME!!"
985 PRINT "PLAY AGAIN (1 FOR YES, 0 FOR NO)";: INPUT Q
990 IF Q=1 THEN 110
999 END
```

Guess



In Program GUESS, the computer chooses a random integer between 0 and any limit you set. You must then try to guess the number the computer has chosen using the clues provided by the computer.

You should be able to guess the number in one less than the number of digits needed to represent the number in binary notation — i.e., in base 2. This ought to give you a clue as to the optimum search technique.

GUESS converted from the original program in FOCAL which appeared in the book "Computers in the Classroom" by Walt Koetke of Lexington High School, Lexington, Massachusetts.

```
1 PRINT TAB(33);"GUESS"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "THIS IS A NUMBER GUESSING GAME.  I'LL THINK"
5 PRINT "OF A NUMBER BETWEEN 1 AND ANY LIMIT YOU WANT."
6 PRINT "THEN YOU HAVE TO GUESS WHAT IT IS."
7 PRINT
8 PRINT "WHAT LIMIT DO YOU WANT";
9 INPUT L
10 PRINT
11 L1=INT(LOG(L)/LOG(2))+1
12 PRINT "I'M THINKING OF A NUMBER BETWEEN 1 AND ";L
13 G=1
14 PRINT "NOW YOU TRY TO GUESS WHAT IT IS."
15 M=INT(L*RND(1)+1)
20 INPUT N
21 IF N>0 THEN 25
22 GOSUB 70
23 GOTO 1
25 IF N=M THEN 50
30 G=G+1
31 IF N>M THEN 40
32 PRINT "TOO LOW.  TRY A BIGGER ANSWER."
33 GOTO 20
40 PRINT "TOO HIGH.  TRY A SMALLER ANSWER."
42 GOTO 20
50 PRINT "THAT'S IT!  YOU GOT IT IN";G;"TRIES."
52 IF G<L1 THEN 58
54 IF G=L1 THEN 60
56 PRINT "YOU SHOULD HAVE BEEN ABLE TO GET IT IN ONLY";L1
57 GOTO 65
58 PRINT "VERY ";
60 PRINT "GOOD."
65 GOSUB 70
66 GOTO 12
70 FOR H=1 TO 5
71 PRINT
72 NEXT H
73 RETURN
99 END
```

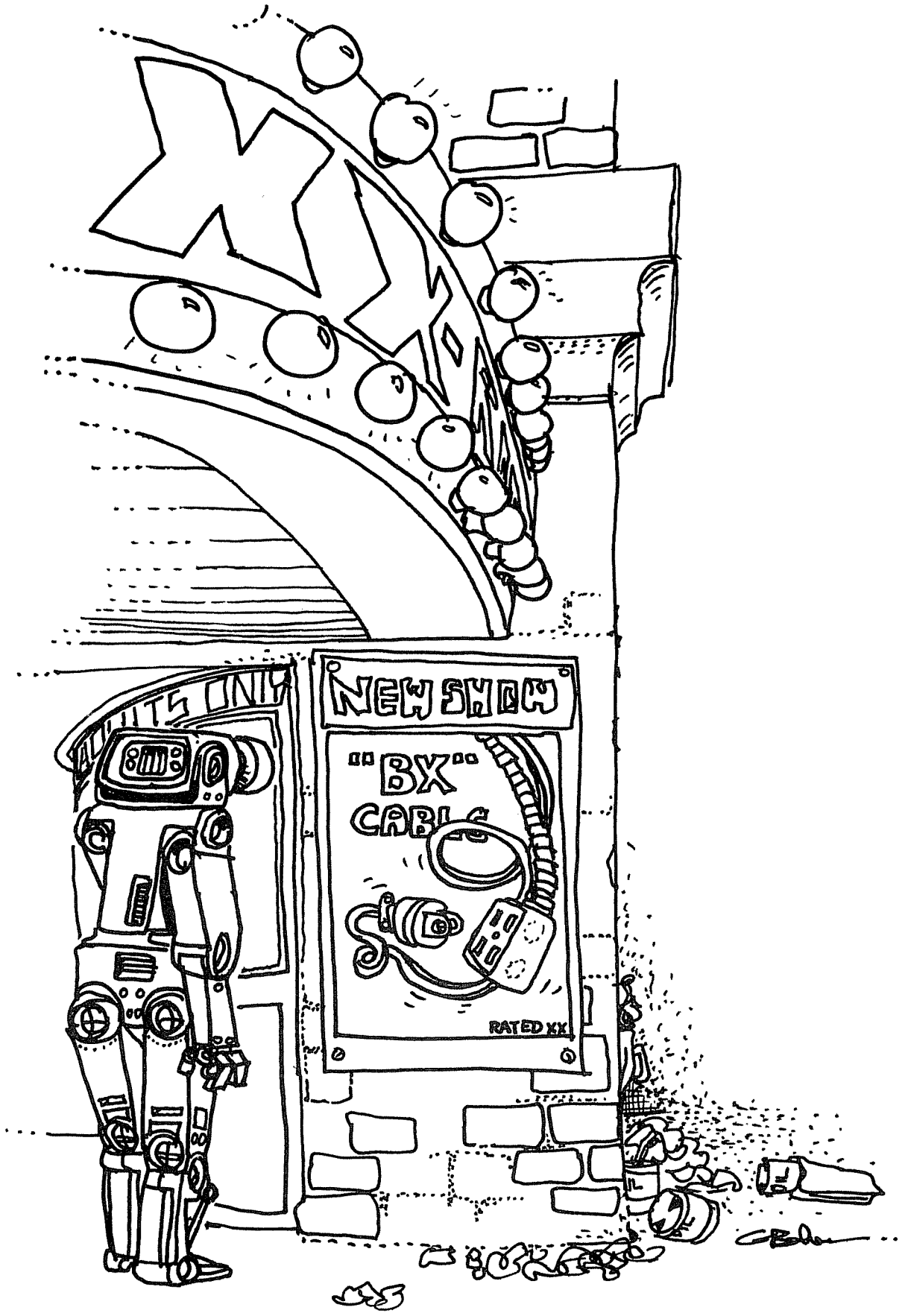
```
                    GUESS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS IS A NUMBER GUESSING GAME.  I'LL THINK
OF A NUMBER BETWEEN 1 AND ANY LIMIT YOU WANT.
THEN YOU HAVE TO GUESS WHAT IT IS.

WHAT LIMIT DO YOU WANT? 200

I'M THINKING OF A NUMBER BETWEEN 1 AND  200
NOW YOU TRY TO GUESS WHAT IT IS.
? 100
TOO LOW.  TRY A BIGGER ANSWER.
? 150
TOO HIGH.  TRY A SMALLER ANSWER.
? 125
TOO HIGH.  TRY A SMALLER ANSWER.
? 112
TOO LOW.  TRY A BIGGER ANSWER.
? 118
TOO LOW.  TRY A BIGGER ANSWER.
? 123
THAT'S IT!  YOU GOT IT IN 6 TRIES.
VERY GOOD.

I'M THINKING OF A NUMBER BETWEEN 1 AND  200
NOW YOU TRY TO GUESS WHAT IT IS.
? 100
TOO HIGH.  TRY A SMALLER ANSWER.
? 75
TOO HIGH.  TRY A SMALLER ANSWER.
? 55
TOO HIGH.  TRY A SMALLER ANSWER.
? 45
TOO HIGH.  TRY A SMALLER ANSWER.
? 20
TOO HIGH.  TRY A SMALLER ANSWER.
? 10
TOO LOW.  TRY A BIGGER ANSWER.
? 11
TOO LOW.  TRY A BIGGER ANSWER.
? 13
TOO LOW.  TRY A BIGGER ANSWER.
? 15
TOO LOW.  TRY A BIGGER ANSWER.
? 16
TOO LOW.  TRY A BIGGER ANSWER.
? 17
TOO LOW.  TRY A BIGGER ANSWER.
? 19
TOO HIGH.  TRY A SMALLER ANSWER.
? 18
THAT'S IT!  YOU GOT IT IN 13 TRIES.
YOU SHOULD HAVE BEEN ABLE TO GET IT IN ONLY 8
```


NEW SHOW
"BX"
RATED XX

Gunner

GUNNER allows you to adjust the fire of a field artillery weapon to hit a stationary target. You specify the number of degrees of elevation of your weapon; 45 degrees provides maximum range with values under or over 45 degrees providing less range.

You get up to five shots to destroy the enemy before he destroys you. Gun range varies between 20,000 and 60,000 yards and burst radius is 100 yards. You must specify elevation within approximately 0.2 degrees to get a hit.

Tom Kloos of the Oregon Museum of Science and Industry in Portland, Oregon originally wrote GUNNER. Extensive modifications were added by David Ahl.

```
10 PRINT TAB(30);"GUNNER"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
130 PRINT "YOU ARE THE OFFICER-IN-CHARGE, GIVING ORDERS TO A GUN"
140 PRINT "CREW, TELLING THEM THE DEGREES OF ELEVATION YOU ESTIMATE"
150 PRINT "WILL PLACE A PROJECTILE ON TARGET.  A HIT WITHIN 100 YARDS"
160 PRINT "OF THE TARGET WILL DESTROY IT." : PRINT
170 R=INT(40000*RND(1)+20000)
180 PRINT "MAXIMUM RANGE OF YOUR GUN IS ";R;" YARDS."
185 Z=0
190 PRINT
195 S1=0
200 T=INT(R*(.1+.8*RND(1)))
210 S=0
220 GOTO 370
230 PRINT "MINIMUM ELEVATION IS ONE DEGREE."
240 GOTO 390
250 PRINT "MAXIMUM ELEVATION IS 89 DEGREES."
260 GOTO 390
270 PRINT "OVER TARGET BY";ABS(E);"YARDS."
280 GOTO 390
290 PRINT "SHORT OF TARGET BY"ABS(E);"YARDS."
300 GOTO 390
320 PRINT "*** TARGET DESTROYED ***  ";S;"ROUNDS OF AMMUNITION EXPENDED
325 S1=S1+S
330 IF Z=4 THEN 490
340 Z=Z+1
345 PRINT
350 PRINT "THE FORWARD OBSERVER HAS SIGHTED MORE ENEMY ACTIVITY..."
360 GOTO 200
370 PRINT "     DISTANCE TO THE TARGET IS"T;"YARDS."
380 PRINT
390 PRINT
400 INPUT "ELEVATION";B
420 IF B>89 THEN 250
430 IF B<1 THEN 230
440 S=S+1
442 IF S<6 THEN 450
444 PRINT:PRINT "BOOM !!!!   YOU HAVE JUST BEEN DESTROYED ";
446 PRINT "BY THE ENEMY." : PRINT : PRINT : PRINT : GOTO 495
450 B2=2*B/57.3 : I=R*SIN(B2) : X=T-I : E=INT(X)
460 IF ABS(E)<100 THEN 320
470 IF E>100 THEN 290
480 GOTO 270
490 PRINT : PRINT : PRINT "TOTAL ROUNDS EXPENDED WERE:";S1
492 IF S1>18 THEN 495
493 PRINT "NICE SHOOTING !!" : GOTO 500
495 PRINT "BETTER GO BACK TO FORT SILL FOR REFRESHER TRAINING!"
500 PRINT : INPUT "TRY AGAIN (Y OR N)";Z$
510 IF Z$="Y" THEN 170
520 PRINT "OK.  RETURN TO BASE CAMP."
999 END
```

```
                    GUNNER
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


YOU ARE THE OFFICER-IN-CHARGE, GIVING ORDERS TO A GUN
CREW, TELLING THEM THE DEGREES OF ELEVATION YOU ESTIMATE
WILL PLACE A PROJECTILE ON TARGET.  A HIT WITHIN 100 YARDS
OF THE TARGET WILL DESTROY IT.

MAXIMUM RANGE OF YOUR GUN IS  55684  YARDS.

     DISTANCE TO THE TARGET IS 15755 YARDS.


ELEVATION? 9
OVER TARGET BY 1452 YARDS.

ELEVATION? 8
SHORT OF TARGET BY 407 YARDS.

ELEVATION? 8.2
*** TARGET DESTROYED ***   3 ROUNDS OF AMMUNITION EXPENDED

THE FORWARD OBSERVER HAS SIGHTED MORE ENEMY ACTIVITY...
     DISTANCE TO THE TARGET IS 11349 YARDS.


ELEVATION? 84
OVER TARGET BY 241 YARDS.

ELEVATION? 84.1
*** TARGET DESTROYED ***   2 ROUNDS OF AMMUNITION EXPENDED

THE FORWARD OBSERVER HAS SIGHTED MORE ENEMY ACTIVITY...
     DISTANCE TO THE TARGET IS 19146 YARDS.


ELEVATION? 11
OVER TARGET BY 1713 YARDS.

ELEVATION? 10
SHORT OF TARGET BY 102 YARDS.

ELEVATION? 10.06
*** TARGET DESTROYED ***   3 ROUNDS OF AMMUNITION EXPENDED

THE FORWARD OBSERVER HAS SIGHTED MORE ENEMY ACTIVITY...
     DISTANCE TO THE TARGET IS 10792 YARDS.


ELEVATION? 84.3
OVER TARGET BY 227 YARDS.

ELEVATION? 84.4
*** TARGET DESTROYED ***   2 ROUNDS OF AMMUNITION EXPENDED

THE FORWARD OBSERVER HAS SIGHTED MORE ENEMY ACTIVITY...
     DISTANCE TO THE TARGET IS 36976 YARDS.


ELEVATION? 21
OVER TARGET BY 282 YARDS.

ELEVATION? 20.8
*** TARGET DESTROYED ***   2 ROUNDS OF AMMUNITION EXPENDED


TOTAL ROUNDS EXPENDED WERE: 12
NICE SHOOTING !!

TRY AGAIN (Y OR N)? N
OK.  RETURN TO BASE CAMP.
```

Hammurabi

In this game you direct the administrator of Sumeria, Hammurabi, how to manage the city. The city initially has 1,000 acres, 100 people and 3,000 bushels of grain in storage.

You may buy and sell land with your neighboring city-states for bushels of grain — the price will vary between 17 and 26 bushels per acre. You also must use grain to feed your people and as seed to plant the next year's crop.

You will quickly find that a certain number of people can only tend a certain amount of land and that people starve if they are not fed enough. You also have the unexpected to contend with such as a plague, rats destroying stored grain, and variable harvests.

You will also find that managing just the few resources in this game is not a trivial job over a period of say ten years. The crisis of population density rears its head very rapidly.

This program was originally written in Focal at DEC; author unknown. David Ahl converted it to BASIC and added the 10-year performance accessment. If you wish to change any of the factors, the extensive remarks in the program should make modification fairly straightforward.

Note for trivia buffs: somewhere along the line an m was dropped out of the spelling of Hammurabi in the Ahl version of the computer program. This error has spread far and wide until a generation of students who have used this program now think that Hammurabi is the incorrect spelling.

```
                HAMURABI
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

TRY YOUR HAND AT GOVERNING ANCIENT SUMERIA
FOR A TEN-YEAR TERM OF OFFICE.

HAMURABI:  I BEG TO REPORT TO YOU,
IN YEAR 1 , 0 PEOPLE STARVED, 5 CAME TO THE CITY,
POPULATION IS NOW 100
THE CITY NOW OWNS 1000 ACRES.
YOU HARVESTED 3 BUSHELS PER ACRE.
RATS ATE 200 BUSHELS.
YOU NOW HAVE 2800 BUSHELS IN STORE.

LAND IS TRADING AT 24 BUSHELS PER ACRE.
HOW MANY ACRES DO YOU WISH TO BUY? 10

HOW MANY BUSHELS DO YOU WISH TO FEED YOUR PEOPLE? 2000

HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 990

HAMURABI:  I BEG TO REPORT TO YOU,
IN YEAR 2 , 0 PEOPLE STARVED, 5 CAME TO THE CITY,
POPULATION IS NOW 105
THE CITY NOW OWNS 1010 ACRES.
YOU HARVESTED 3 BUSHELS PER ACRE.
RATS ATE 16 BUSHELS.
YOU NOW HAVE 3019 BUSHELS IN STORE.

LAND IS TRADING AT 21 BUSHELS PER ACRE.
HOW MANY ACRES DO YOU WISH TO BUY? 25

HOW MANY BUSHELS DO YOU WISH TO FEED YOUR PEOPLE? 2000

HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 1000
HAMURABI:  THINK AGAIN.  YOU HAVE ONLY
 494 BUSHELS OF GRAIN.  NOW THEN,
HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 500

HAMURABI:  I BEG TO REPORT TO YOU,
IN YEAR 3 , 5 PEOPLE STARVED, 5 CAME TO THE CITY,
A HORRIBLE PLAGUE STRUCK!  HALF THE PEOPLE DIED.
POPULATION IS NOW 52
THE CITY NOW OWNS 1035 ACRES.
YOU HARVESTED 1 BUSHELS PER ACRE.
RATS ATE 0 BUSHELS.
YOU NOW HAVE 744 BUSHELS IN STORE.

LAND IS TRADING AT 17 BUSHELS PER ACRE.
HOW MANY ACRES DO YOU WISH TO BUY? 0
HOW MANY ACRES DO YOU WISH TO SELL? 25

HOW MANY BUSHELS DO YOU WISH TO FEED YOUR PEOPLE? 1000

HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 500
HAMURABI:  THINK AGAIN.  YOU HAVE ONLY
 169 BUSHELS OF GRAIN.  NOW THEN,
HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 300


HAMURABI:  I BEG TO REPORT TO YOU,
IN YEAR 4 , 2 PEOPLE STARVED, 12 CAME TO THE CITY,
POPULATION IS NOW 62
THE CITY NOW OWNS 1010 ACRES.
YOU HARVESTED 1 BUSHELS PER ACRE.
RATS ATE 0 BUSHELS.
YOU NOW HAVE 319 BUSHELS IN STORE.

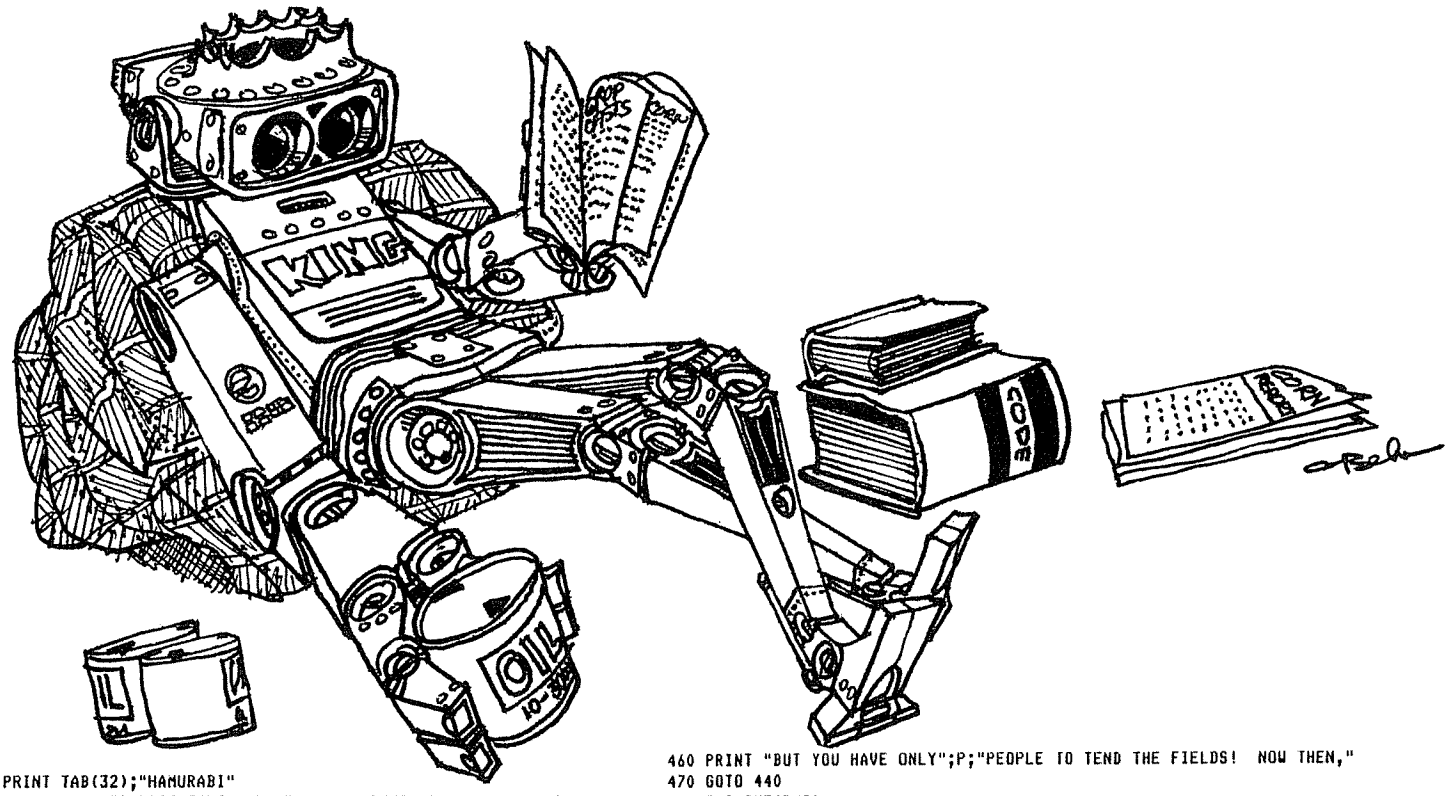
LAND IS TRADING AT 23 BUSHELS PER ACRE.
HOW MANY ACRES DO YOU WISH TO BUY? 0
HOW MANY ACRES DO YOU WISH TO SELL? 500

HOW MANY BUSHELS DO YOU WISH TO FEED YOUR PEOPLE? 500

HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED? 230

YOU STARVED 37 PEOPLE IN ONE YEAR!!!
DUE TO THIS EXTREME MISMANAGEMENT YOU HAVE NOT ONLY
BEEN IMPEACHED AND THROWN OUT OF OFFICE BUT YOU HAVE
ALSO BEEN DECLARED NATIONAL FINK!!!!

SO LONG FOR NOW.
```




```
10 PRINT TAB(32);"HAMURABI"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
80 PRINT "TRY YOUR HAND AT GOVERNING ANCIENT SUMERIA"
90 PRINT "FOR A TEN-YEAR TERM OF OFFICE.":PRINT
95 D1=0: P1=0
100 Z=0: P=95:S=2800: H=3000: E=H-S
110 Y=3: A=H/Y: I=5: Q=1
210 D=0
215 PRINT:PRINT:PRINT "HAMURABI:  I BEG TO REPORT TO YOU,": Z=Z+1
217 PRINT "IN YEAR";Z;",";D;"PEOPLE STARVED,";I;"CAME TO THE CITY,"
218 P=P+I
227 IF Q>0 THEN 230
228 P=INT(P/2)
229 PRINT "A HORRIBLE PLAGUE STRUCK!  HALF THE PEOPLE DIED."
230 PRINT "POPULATION IS NOW";P
232 PRINT "THE CITY NOW OWNS";A;"ACRES."
235 PRINT "YOU HARVESTED";Y;"BUSHELS PER ACRE."
250 PRINT "RATS ATE";E;"BUSHELS."
260 PRINT "YOU NOW HAVE";S;"BUSHELS IN STORE.": PRINT
270 IF Z=11 THEN 860
310 C=INT(10*RND(1)): Y=C+17
312 PRINT "LAND IS TRADING AT";Y;"BUSHELS PER ACRE."
320 PRINT "HOW MANY ACRES DO YOU WISH TO BUY";
321 INPUT Q: IF Q<0 THEN 850
322 IF Y*Q<=S THEN 330
323 GOSUB 710
324 GOTO 320
330 IF Q=0 THEN 340
331 A=A+Q: S=S-Y*Q: C=0
334 GOTO 400
340 PRINT "HOW MANY ACRES DO YOU WISH TO SELL";
341 INPUT Q: IF Q<0 THEN 850
342 IF Q<A THEN 350
343 GOSUB 720
344 GOTO 340
350 A=A-Q: S=S+Y*Q: C=0
400 PRINT
410 PRINT "HOW MANY BUSHELS DO YOU WISH TO FEED YOUR PEOPLE";
411 INPUT Q
412 IF Q<0 THEN 850
418 REM *** TRYING TO USE MORE GRAIN THAN IS IN SILOS?
420 IF Q<=S THEN 430
421 GOSUB 710
422 GOTO 410
430 S=S-Q: C=1: PRINT
440 PRINT "HOW MANY ACRES DO YOU WISH TO PLANT WITH SEED";
441 INPUT D: IF D=0 THEN 511
442 IF D<0 THEN 850
444 REM *** TRYING TO PLANT MORE ACRES THAN YOU OWN?
445 IF D<=A THEN 450
446 GOSUB 720
447 GOTO 440
449 REM *** ENOUGH GRAIN FOR SEED?
450 IF INT(D/2)<=S THEN 455
452 GOSUB 710
453 GOTO 440
454 REM *** ENOUGH PEOPLE TO TEND THE CROPS?
455 IF D<10*P THEN 510
460 PRINT "BUT YOU HAVE ONLY";P;"PEOPLE TO TEND THE FIELDS!  NOW THEN,"
470 GOTO 440
510 S=S-INT(D/2)
511 GOSUB 800
512 REM *** A BOUNTIFUL HARVEST!
515 Y=C: H=D*Y: E=0
521 GOSUB 800
522 IF INT(C/2)<>C/2 THEN 530
523 REM *** RATS ARE RUNNING WILD!!
525 E=INT(S/C)
530 S=S-E+H
531 GOSUB 800
532 REM *** LET'S HAVE SOME BABIES
533 I=INT(C*(20*A+S)/P/100+1)
539 REM *** HOW MANY PEOPLE HAD FULL TUMMIES?
540 C=INT(Q/20)
541 REM *** HORROR, A 15% CHANCE OF PLAGUE
542 Q=INT(10*(2*RND(1)-.3))
550 IF P<C THEN 210
551 REM *** STARVE ENOUGH FOR IMPEACHMENT?
552 D=P-C: IF D>.45*P THEN 560
553 P1=((Z-1)*P1+D*100/P)/Z
555 P=C: D1=D1+D: GOTO 215
560 PRINT: PRINT "YOU STARVED";D;"PEOPLE IN ONE YEAR!!!"
565 PRINT "DUE TO THIS EXTREME MISMANAGEMENT YOU HAVE NOT ONLY"
566 PRINT "BEEN IMPEACHED AND THROWN OUT OF OFFICE BUT YOU HAVE"
567 PRINT "ALSO BEEN DECLARED NATIONAL FINK!!!!": GOTO 990
710 PRINT "HAMURABI:  THINK AGAIN.  YOU HAVE ONLY"
711 PRINT S;"BUSHELS OF GRAIN.  NOW THEN,"
712 RETURN
720 PRINT "HAMURABI:  THINK AGAIN.  YOU OWN ONLY";A;"ACRES.  NOW THEN,"
730 RETURN
800 C=INT(RND(1)*5)+1
801 RETURN
850 PRINT: PRINT "HAMURABI:  I CANNOT DO WHAT YOU WISH."
855 PRINT "GET YOURSELF ANOTHER STEWARD!!!!!"
857 GOTO 990
860 PRINT "IN YOUR 10-YEAR TERM OF OFFICE,";P1;"PERCENT OF THE"
862 PRINT "POPULATION STARVED PER YEAR ON THE AVERAGE, I.E. A TOTAL OF"
865 PRINT D1;"PEOPLE DIED!!": L=A/P
870 PRINT "YOU STARTED WITH 10 ACRES PER PERSON AND ENDED WITH"
875 PRINT L;"ACRES PER PERSON.": PRINT
880 IF P1>33 THEN 565
885 IF L<7 THEN 565
890 IF P1>10 THEN 940
892 IF L<9 THEN 940
895 IF IF P1>3 THEN 960
896 IF L<10 THEN 960
900 PRINT "A FANTASTIC PERFORMANCE!!!  CHARLEMAGNE, DISRAELI, AND"
905 PRINT "JEFFERSON COMBINED COULD NOT HAVE DONE BETTER!":GOTO 990
940 PRINT "YOUR HEAVY-HANDED PERFORMANCE SMACKS OF NERO AND IVAN IV."
945 PRINT "THE PEOPLE (REMAINING) FIND YOU AN UNPLEASANT RULER, AND,"
950 PRINT "FRANKLY, HATE YOUR GUTS!!":GOTO 990
960 PRINT "YOUR PERFORMANCE COULD HAVE BEEN SOMEWHAT BETTER, BUT"
965 PRINT "REALLY WASN'T TOO BAD AT ALL. ";INT(P*.8*RND(1));"PEOPLE"
970 PRINT "DEARLY LIKE TO SEE YOU ASSASSINATED BUT WE ALL HAVE OUR"
975 PRINT "TRIVIAL PROBLEMS."
990 PRINT: FOR N=1 TO 10: PRINT CHR$(7);: NEXT N
995 PRINT "SO LONG FOR NOW.": PRINT
999 END
```

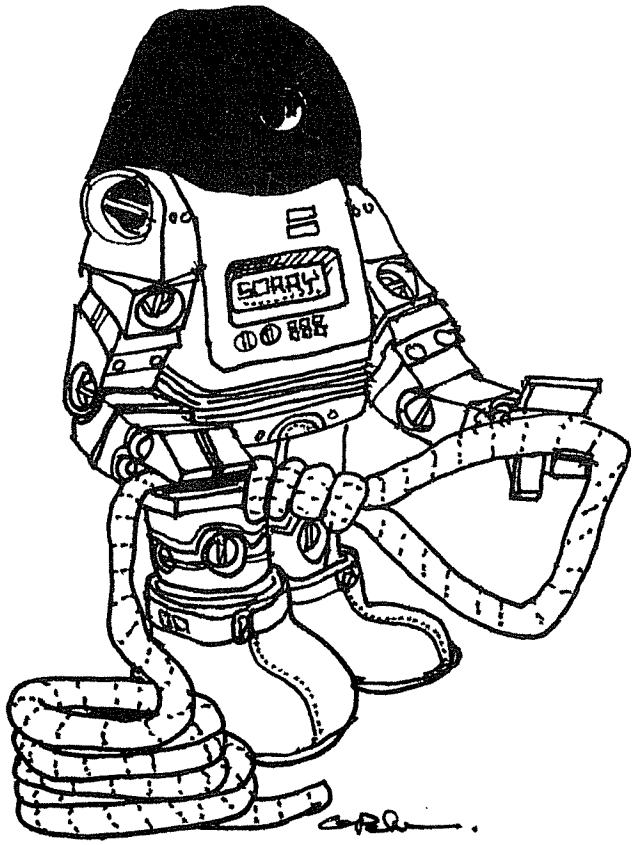
Hangman

This is a simulation of the word guessing game, hangman. The computer picks a word, tells you how many letters in the word it has picked and then you guess a letter in the word. If you are right, the computer tells you where that letter belongs; if your letter is wrong, the computer starts to hang you. You get ten guesses before you are completely hanged:

Head
Body
Right and Left Arms
Right and Left Legs
Right and Left Hands
Right and Left Feet

You may add words in Data statements following Statement 508; however, if you do, you must also change the random word selector in Statement 40.

David Ahl modified this program into its current form from one created by Kenneth Aupperle of Melville, New York.




```
10 PRINT TAB(32);"HANGMAN"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
25 PRINT:PRINT:PRINT
30 DIM P$(12,12),L$(20),D$(20),N$(26),U(50)
40 C=1: N=50
50 FOR I=1 TO 20: D$(I)="-": NEXT I: M=0
60 FOR I=1 TO 26: N$(I)="": NEXT I
70 FOR I=1 TO 12: FOR J=1 TO 12: P$(I,J)=" ": NEXT J: NEXT I
80 FOR I=1 TO 12: P$(I,1)="X": NEXT I
90 FOR I=1 TO 7: P$(1,I)="X": NEXT: P$(2,7)="X"
95 IF C<N THEN 100
97 PRINT "YOU DID ALL THE WORDS!!": STOP
100 Q=INT(N*RND(1))+1
110 IF U(Q)=1 THEN 100
115 U(Q)=1: C=C+1: RESTORE: T1=0
150 FOR I=1 TO Q: READ A$: NEXT I
160 L=LEN(A$): FOR I=1 TO LEN(A$): L$(I)=MID$(A$,I,1): NEXT I
170 PRINT "HERE ARE THE LETTERS YOU USED:"
180 FOR I=1 TO 26: PRINT N$(I);: IF N$(I+1)="" THEN 200
190 PRINT ",";: NEXT I
200 PRINT: PRINT: FOR I=1 TO L: PRINT D$(I);: NEXT I: PRINT: PRINT
210 INPUT "WHAT IS YOUR GUESS";G$: R=0
220 FOR I=1 TO 26: IF N$(I)="" THEN 250
230 IF G$=N$(I) THEN PRINT "YOU GUESSED THAT LETTER BEFORE!": GOTO 170
240 NEXT I: PRINT "PROGRAM ERROR.  RUN AGAIN.": STOP
250 N$(I)=G$: T1=T1+1
260 FOR I=1 TO L: IF L$(I)=G$ THEN 280
270 NEXT I: IF R=0 THEN 290
275 GOTO 300
280 D$(I)=G$: R=R+1: GOTO 270
290 M=M+1: GOTO 400
300 FOR I=1 TO L: IF D$(I)="-" THEN 320
310 NEXT I: GOTO 390
320 PRINT: FOR I=1 TO L: PRINT D$(I);: NEXT I: PRINT: PRINT
330 INPUT "WHAT IS YOUR GUESS FOR THE WORD";B$
340 IF A$=B$ THEN 360
350 PRINT "WRONG.  TRY ANOTHER LETTER.": PRINT: GOTO 170
360 PRINT "RIGHT!!  IT TOOK YOU";T1;"GUESSES!"
370 INPUT "WANT ANOTHER WORD";W$: IF W$="YES" THEN 50
380 PRINT: PRINT "IT'S BEEN FUN!  BYE FOR NOW.": GOTO 999
390 PRINT "YOU FOUND THE WORD!": GOTO 370
400 PRINT: PRINT: PRINT"SORRY, THAT LETTER ISN'T IN THE WORD."
410 ON M GOTO 415,420,425,430,435,440,445,450,455,460
415 PRINT "FIRST, WE DRAW A HEAD": GOTO 470
420 PRINT "NOW WE DRAW A BODY.": GOTO 470
425 PRINT "NEXT WE DRAW AN ARM.": GOTO 470
430 PRINT "THIS TIME IT'S THE OTHER ARM.": GOTO 470
435 PRINT "NOW, LET'S DRAW THE RIGHT LEG.": GOTO 470
440 PRINT "THIS TIME WE DRAW THE LEFT LEG.": GOTO 470
445 PRINT "NOW WE PUT UP A HAND.": GOTO 470
450 PRINT "NEXT THE OTHER HAND.": GOTO 470
455 PRINT "NOW WE DRAW ONE FOOT": GOTO 470
460 PRINT "HERE'S THE OTHER FOOT -- YOU'RE HUNG!!"
470 ON M GOTO 480,490,500,510,520,530,540,550,560,570
480 P$(3,6)="-": P$(3,7)="-": P$(3,8)="-": P$(4,5)="(": P$(4,6)="."
481 P$(4,8)=".":P$(4,9)=")":P$(5,6)="-":P$(5,7)="-":P$(5,8)="-":GOTO580
490 FOR I=6 TO 9: P$(I,7)="X": NEXT I: GOTO 580
500 FOR I=4 TO 7: P$(I,I-1)="\": NEXT I: GOTO 580
510 P$(4,11)="/": P$(5,10)="/": P$(6,9)="/": P$(7,8)="/": GOTO 580
520 P$(10,6)="/": P$(11,5)="/": GOTO 580
530 P$(10,8)="\": P$(11,9)="\": GOTO 580
540 P$(3,11)="\": GOTO 580
550 P$(3,3)="/": GOTO 580
560 P$(12,10)="\": P$(12,11)="-": GOTO 580
570 P$(12,3)="-": P$(12,4)="/"
580 FOR I=1 TO 12: FOR J=1 TO 12: PRINT P$(I,J);: NEXT J
590 PRINT: NEXT I: PRINT: PRINT: IF M<>10 THEN 170
600 PRINT "SORRY, YOU LOSE.  THE WORD WAS ";A$
610 PRINT "YOU MISSED THAT ONE.  DO YOU ";: GOTO 370
620 INPUT "TYPE YES OR NO";Y$: IF Y$="YES" THEN 50
700 DATA "GUM","SIN","FOR","CRY","LUG","BYE","FLY"
710 DATA "UGLY","EACH","FROM","WORK","TALK","WITH","SELF"
720 DATA "PIZZA","THING","FEIGN","FIEND","ELBOW","FAULT","DIRTY"
730 DATA "BUDGET","SPIRIT","QUAINT","MAIDEN","ESCORT","PICKAX"
740 DATA "EXAMPLE","TENSION","QUININE","KIDNEY","REPLICA","SLEEPER"
750 DATA "TRIANGLE","KANGAROO","MAHOGANY","SERGEANT","SEQUENCE"
760 DATA "MOUSTACHE","DANGEROUS","SCIENTIST","DIFFERENT","QUIESCENT"
770 DATA "MAGISTRATE","ERRONEOUSLY","LOUDSPEAKER","PHYTOTOXIC"
780 DATA "MATRIMONIAL","PARASYMPATHOMIMETIC","THIGMOTROPISM"
990 PRINT "BYE NOW"
999 END
```

```
                HANGMAN
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


HERE ARE THE LETTERS YOU USED:


---

WHAT IS YOUR GUESS? E


SORRY, THAT LETTER ISN'T IN THE WORD.
FIRST, WE DRAW A HEAD
XXXXXXX
X     X
X    ---
X   (. .)
X    ---
X
X
X
X
X
X
X


HERE ARE THE LETTERS YOU USED:
E

---

WHAT IS YOUR GUESS? O


SORRY, THAT LETTER ISN'T IN THE WORD.
NOW WE DRAW A BODY.
XXXXXXX
X     X
X    ---
X   (. .)
X    ---
X     X
X     X
X     X
X     X
X
X
X


HERE ARE THE LETTERS YOU USED:
E,O

---

WHAT IS YOUR GUESS? A


SORRY, THAT LETTER ISN'T IN THE WORD.
NEXT WE DRAW AN ARM.
XXXXXXX
X     X
X    ---
X \ (. .)
X  \ ---
X   \ X
X    \X
X     X
X     X
X
X
X


HERE ARE THE LETTERS YOU USED:
E,O,A

---

WHAT IS YOUR GUESS? I


SORRY, THAT LETTER ISN'T IN THE WORD.
THIS TIME IT'S THE OTHER ARM.
XXXXXXX
X     X
X    ---
X \ (. .) /
X  \ --- /
X   \ X /
X    \X/
X     X
X     X
X
X
X


HERE ARE THE LETTERS YOU USED:
E,O,A,I

---

WHAT IS YOUR GUESS? U

-U-

WHAT IS YOUR GUESS FOR THE WORD? R
WRONG.  TRY ANOTHER LETTER.

HERE ARE THE LETTERS YOU USED:
E,O,A,I,U

-U-

WHAT IS YOUR GUESS? N


SORRY, THAT LETTER ISN'T IN THE WORD.
NOW, LET'S DRAW THE RIGHT LEG.
XXXXXXX
X     X
X    ---
X \ (. .) /
X  \ --- /
X   \ X /
X    \X/
X     X
X     X
X    /
X   /
X


HERE ARE THE LETTERS YOU USED:
E,O,A,I,U,N

-U-

WHAT IS YOUR GUESS? S


SORRY, THAT LETTER ISN'T IN THE WORD.
THIS TIME WE DRAW THE LEFT LEG.
XXXXXXX
X     X
X    ---
X \ (. .) /
X  \ --- /
X   \ X /
X    \X/
X     X
X     X
X    / \
X   /   \
X


HERE ARE THE LETTERS YOU USED:
E,O,A,I,U,N,S

-U-

WHAT IS YOUR GUESS? R


SORRY, THAT LETTER ISN'T IN THE WORD.
NOW WE PUT UP A HAND.
XXXXXXX
X     X
X    ---  \
X \ (. .) /
X  \ --- /
X   \ X /
X    \X/
X     X
X     X
X    / \
X   /   \
X


HERE ARE THE LETTERS YOU USED:
E,O,A,I,U,N,S,R

-U-

WHAT IS YOUR GUESS? M

-UM

WHAT IS YOUR GUESS FOR THE WORD? BUM
WRONG.  TRY ANOTHER LETTER.

HERE ARE THE LETTERS YOU USED:
E,O,A,I,U,N,S,R,M

-UM

WHAT IS YOUR GUESS? GUM


SORRY, THAT LETTER ISN'T IN THE WORD.
NEXT THE OTHER HAND.
XXXXXXX
X     X
X /   ---  \
X \ (. .) /
X  \ --- /
X   \ X /
X    \X/
X     X
X     X
X    / \
X   /   \
X


HERE ARE THE LETTERS YOU USED:
E,O,A,I,U,N,S,R,M,GUM

-UM

WHAT IS YOUR GUESS? G
YOU FOUND THE WORD!
WANT ANOTHER WORD? NO

IT'S BEEN FUN!  BYE FOR NOW.
```

Hello

This is a sample of one of a great number of conversational programs. In a sense, it is like a CAI program except that its responses are just good fun. Whenever a computer is exhibited at a convention or conference with people that have not used a computer before, the conversational programs seem to get the first activity.

In this particular program, the computer dispenses advice on various problems such as sex, health, money, or job.

David Ahl is the author of HELLO.

```
                  HELLO
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


HELLO.  MY NAME IS CREATIVE COMPUTER.


WHAT'S YOUR NAME? MEAN MR. MUSTARD

  HI THERE, MEAN MR. MUSTARD, ARE YOU ENJOYING YOURSELF HERE? NO

OH, I'M SORRY TO HEAR THAT, MEAN MR. MUSTARD, MAYBE WE CAN
BRIGHTEN UP YOUR VISIT A BIT.

SAY, MEAN MR. MUSTARD, I CAN SOLVE ALL KINDS OF PROBLEMS EXCEPT
THOSE DEALING WITH GREECE.  WHAT KIND OF PROBLEMS DO
YOU HAVE (ANSWER SEX, HEALTH, MONEY, OR JOB)? MONEY
SORRY, MEAN MR. MUSTARD, I'M BROKE TOO.  WHY DON'T YOU SELL
ENCYCLOPAEDIAS OR MARRY SOMEONE RICH OR STOP EATING
SO YOU WON'T NEED SO MUCH MONEY?

ANY MORE PROBLEMS YOU WANT SOLVED, MEAN MR. MUSTARD? YES

WHAT KIND (SEX, MONEY, HEALTH, JOB)? SEX
IS YOUR PROBLEM TOO MUCH OR TOO LITTLE? TOO MUCH

YOU CALL THAT A PROBLEM?!!  I SHOULD HAVE SUCH PROBLEMS!
IF IT BOTHERS YOU, MEAN MR. MUSTARD, TAKE A COLD SHOWER.

ANY MORE PROBLEMS YOU WANT SOLVED, MEAN MR. MUSTARD? YES

WHAT KIND (SEX, MONEY, HEALTH, JOB)? JOB
I CAN SYMPATHIZE WITH YOU MEAN MR. MUSTARD.  I HAVE TO WORK
VERY LONG HOURS FOR NO PAY -- AND SOME OF MY BOSSES
REALLY BEAT ON MY KEYBOARD.  MY ADVICE TO YOU, MEAN MR. MUSTARD,
IS TO OPEN A RETAIL COMPUTER STORE.  IT'S GREAT FUN.

ANY MORE PROBLEMS YOU WANT SOLVED, MEAN MR. MUSTARD? YES

WHAT KIND (SEX, MONEY, HEALTH, JOB)? HEALTH
MY ADVICE TO YOU MEAN MR. MUSTARD IS:
     1.  TAKE TWO ASPIRIN
     2.  DRINK PLENTY OF FLUIDS (ORANGE JUICE, NOT BEER!)
     3.  GO TO BED (ALONE)

ANY MORE PROBLEMS YOU WANT SOLVED, MEAN MR. MUSTARD? NOT REALLY

JUST A SIMPLE 'YES' OR 'NO' PLEASE, MEAN MR. MUSTARD.
ANY MORE PROBLEMS YOU WANT SOLVED, MEAN MR. MUSTARD? NO


THAT WILL BE $5.00 FOR THE ADVICE, MEAN MR. MUSTARD.
PLEASE LEAVE THE MONEY ON THE TERMINAL.



DID YOU LEAVE THE MONEY? NO

THAT'S HONEST, MEAN MR. MUSTARD, BUT HOW DO YOU EXPECT
ME TO GO ON WITH MY PSYCHOLOGY STUDIES IF MY PATIENTS
DON'T PAY THEIR BILLS?
```

```
2 PRINT TAB(33);"HELLO"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 PRINT "HELLO.  MY NAME IS CREATIVE COMPUTER."
20 PRINT: PRINT: INPUT "WHAT'S YOUR NAME";N$: PRINT
30 PRINT "  HI THERE, ";N$;", ARE YOU ENJOYING YOURSELF HERE";
40 INPUT B$: PRINT
50 IF B$="YES" THEN 70
55 IF B$="NO" THEN 80
60 PRINT "  ";N$;", I DON'T UNDERSTAND YOUR ANSWER IS '";B$;"'."
65 PRINT "PLEASE ANSWER 'YES' OR 'NO'.  DO YOU LIKE IT HERE";: GOTO 40
70 PRINT "I'M GLAD TO HEAR THAT, ";N$;".": PRINT
75 GOTO 100
80 PRINT "OH, I'M SORRY TO HEAR THAT, ";N$;", MAYBE WE CAN"
85 PRINT "BRIGHTEN UP YOUR VISIT A BIT."
100 PRINT
105 PRINT "SAY, ";N$;", I CAN SOLVE ALL KINDS OF PROBLEMS EXCEPT"
110 PRINT "THOSE DEALING WITH GREECE.  WHAT KIND OF PROBLEMS DO"
120 PRINT "YOU HAVE (ANSWER SEX, HEALTH, MONEY, OR JOB)";
125 INPUT C$
130 IF C$="SEX" THEN 200
132 IF C$="HEALTH" THEN 180
134 IF C$="MONEY" THEN 160
136 IF C$="JOB" THEN 145
138 PRINT "OH, ";N$;", YOUR ANSWER OF ";C$;" IS GREEK TO ME."
140 GOTO 250
145 PRINT "I CAN SYMPATHIZE WITH YOU ";N$;".  I HAVE TO WORK"
148 PRINT "VERY LONG HOURS FOR NO PAY -- AND SOME OF MY BOSSES"
150 PRINT "REALLY BEAT ON MY KEYBOARD.  MY ADVICE TO YOU, ";N$;","
153 PRINT "IS TO OPEN A RETAIL COMPUTER STORE.  IT'S GREAT FUN."
155 GOTO 250
160 PRINT "SORRY, ";N$;", I'M BROKE TOO.  WHY DON'T YOU SELL"
162 PRINT "ENCYCLOPEDIAS  OR MARRY SOMEONE RICH OR STOP EATING"
164 PRINT "SO YOU WON'T NEED SO MUCH MONEY?"
170 GOTO 250
180 PRINT "MY ADVICE TO YOU ";N$;" IS:"
185 PRINT "     1.  TAKE TWO ASPIRIN"
188 PRINT "     2.  DRINK PLENTY OF FLUIDS (ORANGE JUICE, NOT BEER!)"
190 PRINT "     3.  GO TO BED (ALONE)"
195 GOTO 250
200 INPUT "IS YOUR PROBLEM TOO MUCH OR TOO LITTLE";D$: PRINT
210 IF D$="TOO MUCH" THEN 220
212 IF D$="TOO LITTLE" THEN 230
215 PRINT "DON'T GET ALL SHOOK, ";N$;", JUST ANSWER THE QUESTION"
217 INPUT "WITH 'TOO MUCH' OR 'TOO LITTLE'.  WHICH IS IT";D$:GOTO 210
220 PRINT "YOU CALL THAT A PROBLEM?!!  I SHOULD HAVE SUCH PROBLEMS!"
225 PRINT "IF IT BOTHERS YOU, ";N$;", TAKE A COLD SHOWER."
228 GOTO 250
230 PRINT "WHY ARE YOU HERE, ";N$;"?  YOU SHOULD BE"
235 PRINT "IN TOKYO OR NEW YORK OR AMSTERDAM OR SOMEPLACE WITH SOME"
240 PRINT "REAL ACTION."
250 PRINT
255 PRINT "ANY MORE PROBLEMS YOU WANT SOLVED, ";N$;
260 INPUT E$: PRINT
270 IF E$="YES" THEN 280
273 IF E$="NO" THEN 300
275 PRINT "JUST A SIMPLE 'YES' OR 'NO' PLEASE, ";N$;"."
277 GOTO 255
280 PRINT "WHAT KIND (SEX, MONEY, HEALTH, JOB)";
282 GOTO 125
300 PRINT
302 PRINT "THAT WILL BE $5.00 FOR THE ADVICE, ";N$;"."
305 PRINT "PLEASE LEAVE THE MONEY ON THE TERMINAL."
307 FOR I=1 TO 2000: NEXT I
310 PRINT: PRINT: PRINT
315 PRINT "DID YOU LEAVE THE MONEY";
320 INPUT G$: PRINT
325 IF G$="YES" THEN 350
330 IF G$="NO" THEN 370
335 PRINT "YOUR ANSWER OF '";G$;"' CONFUSES ME, ";N$;"."
340 PRINT "PLEASE RESPOND WITH 'YES' OR 'NO'.": GOTO 315
350 PRINT "HEY, ";N$;"??? YOU LEFT NO MONEY AT ALL!"
355 PRINT "YOU ARE CHEATING ME OUT OF MY HARD-EARNED LIVING."
360 PRINT "RIP OFF, ";N$;"**********************************"
365 GOTO 390
370 PRINT "THAT'S HONEST, ";N$;", BUT HOW DO YOU EXPECT"
375 PRINT "ME TO GO ON WITH MY PSYCHOLOGY STUDIES IF MY PATIENTS"
380 PRINT "DON'T PAY THEIR BILLS?"
385 PRINT: PRINT: PRINT "NOW LET ME TALK TO SOMEONE ELSE."
390 PRINT "NICE MEETING YOU, ";N$;", HAVE A NICE DAY."
400 GOTO 6
999 END
```

Hexapawn

The game of Hexapawn and a method to learn a strategy for playing the game was described in Martin Gardner's "Mathematical Games" column in the March 1962 issue of *Scientific American.* The method described in the article was for a hypothetical learning machine composed of match boxes and colored beads. This has been generalized in the program HEX.

The program learns by elimination of bad moves. All positions encountered by the program and acceptable moves from them are stored in the array P$ (I). When the program encounters an unfamiliar position, the position and all legal moves from it are added to the list. If the program loses a game, it erases the move that led to defeat. If it hits a position from which all moves have been deleted (they all led to defeat), it erases the move that got it there and resigns. Eventually, the program learns to play extremely well and, indeed, is unbeatable. The learning strategy could be adopted to other simple games with a finite number of moves (tic-tac-toe, small board checkers, or other chess-based games).

The original version of this program was written by R.A. Kaapke. It was subsequently modified by Jeff Dalton and finally by Steve North of Creative Computing.

```
                HEXAPAWN
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

INSTRUCTIONS (Y-N)? YES

THIS PROGRAM PLAYS THE GAME OF HEXAPAWN.
HEXAPAWN IS PLAYED WITH CHESS PAWNS ON A 3 BY 3 BOARD.
THE PAWNS ARE MOVED AS IN CHESS - ONE SPACE FORWARD TO
AN EMPTY SPACE OR ONE SPACE FORWARD AND DIAGONALLY TO
CAPTURE AN OPPOSING MAN.  ON THE BOARD, YOUR PAWNS
ARE 'O', THE COMPUTER'S PAWNS ARE 'X', AND EMPTY
SQUARES ARE '.'.  TO ENTER A MOVE, TYPE THE NUMBER OF
THE SQUARE YOU ARE MOVING FROM, FOLLOWED BY THE NUMBER
OF THE SQUARE YOU WILL MOVE TO.  THE NUMBERS MUST BE
SEPARATED BY A COMMA.

THE COMPUTER STARTS A SERIES OF GAMES KNOWING ONLY WHEN
THE GAME IS WON (A DRAW IS IMPOSSIBLE) AND HOW TO MOVE.
IT HAS NO STRATEGY AT FIRST AND JUST MOVES RANDOMLY.
HOWEVER, IT LEARNS FROM EACH GAME.  THUS, WINNING BECOMES
MORE AND MORE DIFFICULT.  ALSO, TO HELP OFFSET YOUR
INITIAL ADVANTAGE, YOU WILL NOT BE TOLD HOW TO WIN THE
GAME BUT MUST LEARN THIS BY PLAYING.

THE NUMBERING OF THE BOARD IS AS FOLLOWS:
         123
         456
         789

FOR EXAMPLE, TO MOVE YOUR RIGHTMOST PAWN FORWARD,
YOU WOULD TYPE 9,6 IN RESPONSE TO THE QUESTION
'YOUR MOVE ?'.  SINCE I'M A GOOD SPORT, YOU'LL ALWAYS
GO FIRST.

         XXX
         ...
         OOO

YOUR MOVE? 8,5

         XXX
         .O.
         O.O

I MOVE FROM  1 TO  4

         .XX
         XO.
         O.O

YOUR MOVE? 5,3

         .XO
         X..
         O.O

YOU WIN.
I HAVE WON 0 AND YOU 1 OUT OF 1 GAMES.

         XXX
         ...
         OOO

YOUR MOVE? 8,5

         XXX
         .O.
         O.O

I MOVE FROM  1 TO  5

         .XX
         .X.
         O.O

YOUR MOVE? 7,5

         .XX
         .O.
         ..O

I MOVE FROM  3 TO  6

         .X.
         .OX
         ..O

YOU CAN'T MOVE, SO I WIN.
I HAVE WON 1 AND YOU 1 OUT OF 2 GAMES.

         XXX
         ...
         OOO

YOUR MOVE? 8,5

         XXX
         .O.
         O.O

I MOVE FROM  3 TO  6

         XX.
         .OX
         O.O

YOUR MOVE? 5,1

         OX.
         ..X
         O.O

YOU WIN.
I HAVE WON 1 AND YOU 2 OUT OF 3 GAMES.

         XXX
         ...
         OOO

YOUR MOVE? 9,6

         XXX
         ..O
         OO.

I MOVE FROM  2 TO  6

         X.X
         ..X
         OO.

YOUR MOVE? 8,5

         X.X
         .OX
         O..

I MOVE FROM  6 TO  9

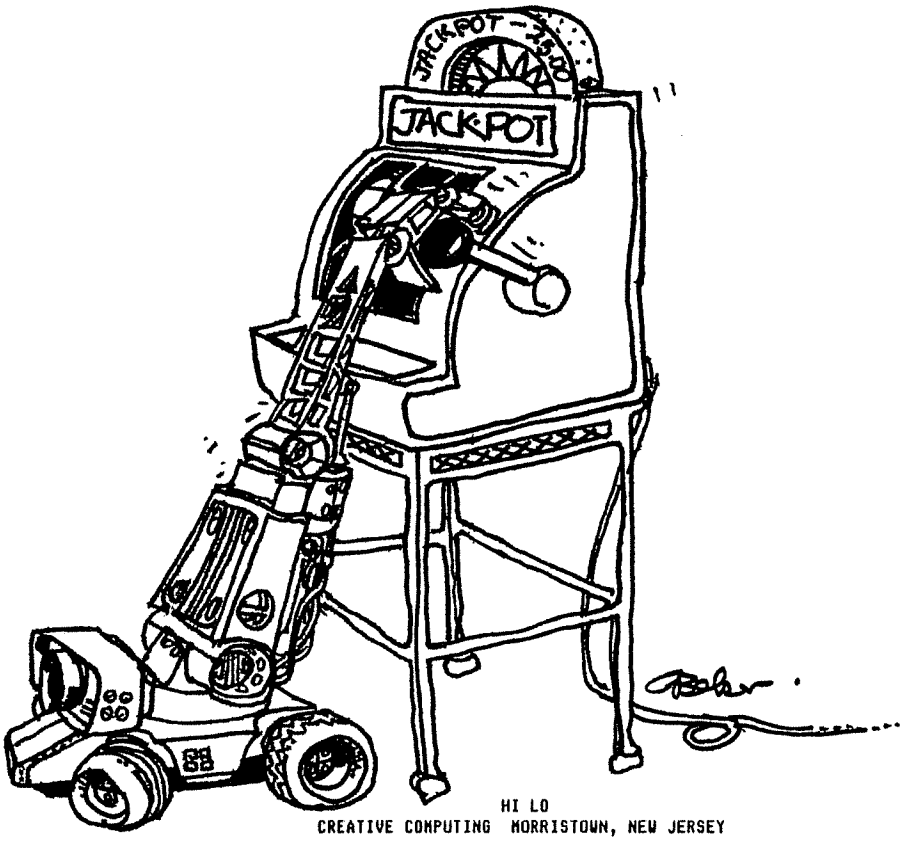
         X.X
         .O.
         O.X

I WIN.
I HAVE WON 2 AND YOU 2 OUT OF 4 GAMES.

         XXX
         ...
         OOO
YOUR MOVE?
```

```
1 PRINT TAB(32);"HEXAPAWN"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 REM  HEXAPAWN:  INTERPRETATION OF HEXAPAWN GAME AS PRESENTED IN
5 REM  MARTIN GARDNER'S "THE UNEXPECTED HANGING AND OTHER MATHEMATIC-
6 REM  AL DIVERSIONS", CHAPTER EIGHT:  A MATCHBOX GAME-LEARNING MACHINE
7 REM  ORIGINAL VERSION FOR H-P TIMESHARE SYSTEM BY R.A. KAAPKE 5/5/76
8 REM  INSTRUCTIONS BY JEFF DALTON
9 REM  CONVERSION TO MITS BASIC BY STEVE NORTH
10 DIM B(19,9),M(19,4),S(9),P$(3)
15 W=0: L=0
20 DEF FNR(X)=-3*(X=1)-(X=3)-4*(X=6)-6*(X=4)-7*(X=9)-9*(X=7)+FNS(X)
25 DEF FNS(X)=-X*(X=2 OR X=5 OR X=8)
30 DEF FNM(Y)=Y-INT(Y/10)*10
35 P$="X.O"
40 FOR I=1 TO 19: FOR J=1 TO 9: READ B(I,J): NEXT J: NEXT I
45 FOR I=1 TO 19: FOR J=1 TO 4: READ M(I,J): NEXT J: NEXT I
50 PRINT "INSTRUCTIONS (Y-N)";
60 INPUT A$
70 A$=LEFT$(A$,1)
80 IF A$="Y" THEN 2000
90 IF A$<>"N" THEN 50
100 X=0: Y=0
111 S(4)=0: S(5)=0: S(6)=0
112 S(1)=-1: S(2)=-1: S(3)=-1
113 S(7)=1: S(8)=1: S(9)=1
115 GOSUB 1000
120 PRINT "YOUR MOVE";
121 INPUT M1,M2
122 IF M1=INT(M1)ANDM2=INT(M2)ANDM1>0ANDM1<10ANDM2>0ANDM2<10THEN130
123 PRINT "ILLEGAL CO-ORDINATES."
124 GOTO 120
130 IF S(M1)=1 THEN 150
140 PRINT "ILLEGAL MOVE.": GOTO 120
150 IF S(M2)=1 THEN 140
160 IF M2-M1<>-3 AND S(M2)<>-1 THEN 140
170 IF M2>M1 THEN 140
180 IF M2-M1=-3 AND (S(M2)<>0) THEN 140
185 IF M2-M1<-4 THEN 140
186 IF M1=7 AND M2=3 THEN 140
190 S(M1)=0
200 S(M2)=1
205 GOSUB 1000
210 IF S(1)=1 OR S(2)=1 OR S(3)=1 THEN 820
220 FOR I=1 TO 9
221 IF S(I)=-1 THEN 230
222 NEXT I
223 GOTO 820
230 FOR I=1 TO 9
240 IF S(I)<>-1 THEN 330
250 IF S(I+3)=0 THEN 350
260 IF FNR(I)=I THEN 320
270 IF I>3 THEN 300
280 IF S(5)=1 THEN 350
290 GOTO 330
300 IF S(8)=1 THEN 350
310 GOTO 330
320 IF S(I+2)=1 OR S(I+4)=1 THEN 350
330 NEXT I
340 GOTO 820
350 FOR I=1 TO 19
360 FOR J=1 TO 3
370 FOR K=3 TO 1 STEP -1
380 T((J-1)*3+K)=B(I,(J-1)*3+4-K)
390 NEXT K
400 NEXT J
410 FOR J=1 TO 9
420 IF S(J)<>B(I,J) THEN 460
430 NEXT J
440 R=0
450 GOTO 540
460 FOR J=1 TO 9
470 IF S(J)<>T(J) THEN 510
480 NEXT J
490 R=1
500 GOTO 540
510 NEXT I
511 REMEMBER THE TERMINATION OF THIS LOOP IS IMPOSSIBLE
512 PRINT "ILLEGAL BOARD PATTERN."
530 STOP
540 X=I
550 FOR I=1 TO 4
560 IF M(X,I)<>0 THEN 600
570 NEXT I
580 PRINT "I RESIGN."
590 GOTO 820
600 Y=INT(RND(1)*4+1)
601 IF M(X,Y)=0 THEN 600
610 IF R<>0 THEN 630
620 PRINT "I MOVE FROM ";STR$(INT(M(X,Y)/10));" TO ";STR$(FNM(M(X,Y)))
622 S(INT(M(X,Y)/10))=0
623 S(FNM(M(X,Y)))=-1
624 GOTO 640
630 PRINT "I MOVE FROM ";STR$(FNR(INT(M(X,Y)/10)));" TO ";
631 PRINT STR$(FNR(FNM(M(X,Y))))
632 S(FNR(INT(M(X,Y)/10)))=0
633 S(FNR(FNM(M(X,Y))))=-1
640 GOSUB 1000
641 IF S(7)=-1 OR S(8)=-1 OR S(9)=-1 THEN 870
650 FOR I=1 TO 9
660 IF S(I)=1 THEN 690
670 NEXT I
680 GOTO 870
690 FOR I=1 TO 9
700 IF S(I)<>1 THEN 790
710 IF S(I-3)=0 THEN 120
720 IF FNR(I)=I THEN 780
730 IF I<7 THEN 760
740 IF S(5)=-1 THEN 120
750 GOTO 790
760 IF S(2)=-1 THEN 120
770 GOTO 790
780 IF S(I-2)=-1 OR S(I-4)=-1 THEN 120
790 NEXT I
800 PRINT "YOU CAN'T MOVE, SO ";
810 GOTO 870
820 PRINT "YOU WIN."
830 M(X,Y)=0
840 L=L+1
850 PRINT "I HAVE WON";W;"AND YOU";L;"OUT OF";L+W;"GAMES."
851 PRINT
860 GOTO 100
870 PRINT "I WIN."
880 W=W+1
890 GOTO 850
900 DATA -1,-1,-1,1,0,0,0,1,1,-1,-1,-1,0,1,0,1,0,1
905 DATA -1,0,-1,-1,1,0,0,0,1,0,-1,-1,1,-1,0,0,0,1
910 DATA -1,0,-1,1,1,0,0,1,0,-1,-1,0,1,0,1,0,0,1
915 DATA 0,-1,-1,0,-1,1,1,0,0,0,-1,-1,-1,1,1,1,0,0
920 DATA -1,0,-1,-1,0,1,0,1,0,0,-1,-1,0,1,0,0,0,1
925 DATA 0,-1,-1,0,1,0,1,0,0,0,-1,0,-1,1,0,0,0,0,1
930 DATA 0,0,-1,-1,-1,1,0,0,0,-1,0,0,1,1,1,0,0,0
935 DATA 0,-1,0,-1,1,1,0,0,0,-1,0,0,-1,-1,1,0,0,0
940 DATA 0,0,-1,-1,1,0,0,0,0,0,-1,0,1,-1,0,0,0,0
945 DATA -1,0,0,-1,1,0,0,0,0
950 DATA 24,25,36,0,14,15,36,0,15,35,36,47,36,58,59,0
955 DATA 15,35,36,0,24,25,26,0,26,57,58,0
960 DATA 26,35,0,0,47,48,0,0,35,36,0,0,35,36,0,0
965 DATA 36,0,0,0,47,58,0,0,15,0,0,0
970 DATA 26,47,0,0,47,58,0,0,35,36,47,0,28,58,0,0,15,47,0,0
1000 PRINT
1010 FOR I=1 TO 3
1020 FOR J=1 TO 3
1030 PRINT TAB(10);MID$(P$,S((I-1)*3+J)+2,1);
1040 NEXT J
1050 PRINT
1060 NEXT I
1070 PRINT
1080 RETURN
2000 PRINT: PRINT "THIS PROGRAM PLAYS THE GAME OF HEXAPAWN."
2010 PRINT "HEXAPAWN IS PLAYED WITH CHESS PAWNS ON A 3 BY 3 BOARD."
2020 PRINT "THE PAWNS ARE MOVED AS IN CHESS - ONE SPACE FORWARD TO"
2030 PRINT "AN EMPTY SPACE OR ONE SPACE FORWARD AND DIAGONALLY TO"
2040 PRINT "CAPTURE AN OPPOSING MAN.  ON THE BOARD, YOUR PAWNS"
2050 PRINT "ARE 'O', THE COMPUTER'S PAWNS ARE 'X', AND EMPTY "
2060 PRINT "SQUARES ARE '.'.  TO ENTER A MOVE, TYPE THE NUMBER OF"
2070 PRINT "THE SQUARE YOU ARE MOVING FROM, FOLLOWED BY THE NUMBER"
2080 PRINT "OF THE SQUARE YOU WILL MOVE TO.  THE NUMBERS MUST BE"
2090 PRINT "SEPARATED BY A COMMA.": PRINT
2100 PRINT "THE COMPUTER STARTS A SERIES OF GAMES KNOWING ONLY WHEN"
2110 PRINT "IT HAS NO STRATEGY AT FIRST AND JUST MOVES RANDOMLY."
2120 PRINT "HOWEVER, IT LEARNS FROM EACH GAME.  THUS, IT BECOMES"
2130 PRINT "MORE AND MORE DIFFICULT.  ALSO, TO HELP OFFSET YOUR"
2140 PRINT "INITIAL ADVANTAGE, YOU WILL NOT BE TOLD HOW TO WIN THE"
2150 PRINT "GAME BUT MUST LEARN THIS BY PLAYING."
2160 PRINT: PRINT "THE NUMBERING OF THE BOARD IS AS FOLLOWS:"
2170 PRINT TAB(10);"123": PRINT TAB(10);"456": PRINT TAB(10);"789"
2180 PRINT: PRINT "FOR EXAMPLE, TO MOVE YOUR RIGHTMOST PAWN FORWARD,"
2190 PRINT "YOU WOULD TYPE 9,6 IN RESPONSE TO THE QUESTION"
2200 PRINT "'YOUR MOVE ?'.  SINCE I'M A GOOD SPORT, YOU'LL ALWAYS"
2210 PRINT "GO FIRST.": PRINT
2220 GOTO 100
9999 END
```

Hi-Lo



This game is an adaptation of the game GUESS; however, instead of just guessing a number between 1 and 100, in this game you win dollars when you guess the number. The directions, in the words of the author of the game, are as follows:

1. There is an amount of money, between one and one hundred dollars, in the "HI-LO" jackpot.
2. You will have six chances in which to guess the amount of money in the jackpot.
3. After each guess, the computer will tell whether the guess was too high or too low.
4. If the correct amount of money is not guessed after six chances, the computer will print the amount in the jackpot.
5. If the correct amount of money is guessed within the six chance limit, the computer will register this amount.
6. After each sequence of guesses, you have the choice of playing again or ending the program. If a new game is played, a new amount of money will constitute the jackpot.
7. If you win more than once, then your earnings are totalled.

The author is Dean Altman of Fort Worth, Texas.

```
10 PRINT TAB(34);"HI LO"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "THIS IS THE GAME OF HI LO.":PRINT
110 PRINT "YOU WILL HAVE 6 TRIES TO GUESS THE AMOUNT OF MONEY IN THE"
120 PRINT "HI LO JACKPOT, WHICH IS BETWEEN 1 AND 100 DOLLARS.  IF YOU"
130 PRINT "GUESS THE AMOUNT, YOU WIN ALL THE MONEY IN THE JACKPOT!"
140 PRINT "THEN YOU GET ANOTHER CHANCE TO WIN MORE MONEY.  HOWEVER,"
150 PRINT "IF YOU DO NOT GUESS THE AMOUNT, THE GAME ENDS.":PRINT
160 R=0
170 B=0:PRINT
180 Y=INT(100*RND(1))
200 PRINT "YOUR GUESS";
210 INPUT A
220 B=B+1
230 IF A=Y THEN 300
240 IF A>Y THEN 270
250 PRINT "YOUR GUESS IS TOO LOW":GOTO 280
270 PRINT "YOUR GUESS IS TOO HIGH"
280 PRINT:IF B<6 THEN 200
290 PRINT "YOU BLEW IT...TOO BAD...THE NUMBER WAS";Y
295 R=0:GOTO 350
300 PRINT "GOT IT!!!!!!!!!!   YOU WIN";Y;"DOLLARS."
310 R=R+Y
320 PRINT "YOUR TOTAL WINNINGS ARE NOW";R;"DOLLARS."
350 PRINT:PRINT "PLAY AGAIN (YES OR NO)";
360 INPUT A$:IF A$="YES" THEN 170
380 PRINT:PRINT "SO LONG.  HOPE YOU ENJOYED YOURSELF!!!"
390 END
```

```
                HI LO
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS IS THE GAME OF HI LO.

YOU WILL HAVE 6 TRIES TO GUESS THE AMOUNT OF MONEY IN THE
HI LO JACKPOT, WHICH IS BETWEEN 1 AND 100 DOLLARS.  IF YOU
GUESS THE AMOUNT, YOU WIN ALL THE MONEY IN THE JACKPOT!
THEN YOU GET ANOTHER CHANCE TO WIN MORE MONEY.  HOWEVER,
IF YOU DO NOT GUESS THE AMOUNT, THE GAME ENDS.

YOUR GUESS? 50
YOUR GUESS IS TOO HIGH

YOUR GUESS? 25
YOUR GUESS IS TOO HIGH

YOUR GUESS? 12
YOUR GUESS IS TOO HIGH

YOUR GUESS? 6
YOUR GUESS IS TOO HIGH

YOUR GUESS? 3
YOUR GUESS IS TOO LOW

YOUR GUESS? 4
GOT IT!!!!!!!!!!   YOU WIN 4 DOLLARS.
YOUR TOTAL WINNINGS ARE NOW 4 DOLLARS.

PLAY AGAIN (YES OR NO)? YES

YOUR GUESS? 50
YOUR GUESS IS TOO LOW

YOUR GUESS? 75
YOUR GUESS IS TOO HIGH

YOUR GUESS? 62
YOUR GUESS IS TOO HIGH

YOUR GUESS? 57
GOT IT!!!!!!!!!!   YOU WIN 57 DOLLARS.
YOUR TOTAL WINNINGS ARE NOW 61 DOLLARS.

PLAY AGAIN (YES OR NO)? NO

SO LONG.  HOPE YOU ENJOYED YOURSELF!!!
```

High I-Q

This is a computerized version of an old European solitaire game of logic. The game starts with a pegboard shaped like a cross having pegs in every hole but the center. The object is to remove all 32 pegs, or as many as possible, by jumping into an empty hole, then removing the jumped peg.

There are several different winning strategies for playing and, of course, each strategy can be played eight different ways on the board. Can you find a consistent winner?

Charles Lund wrote this game while at The American School in The Hague, Netherlands.

```
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

HERE IS THE BOARD:

          !   !   !
         13  14  15

          !   !   !
         22  23  24

!   !   !   !   !   !   !
29  30  31  32  33  34  35

!   !   !   !   !   !   !
38  39  40  41  42  43  44

!   !   !   !   !   !   !
47  48  49  50  51  52  53

          !   !   !
         58  59  60

          !   !   !
         67  68  69

TO SAVE TYPING TIME, A COMPRESSED VERSION OF THE GAME BOARD
WILL BE USED DURING PLAY.  REFER TO THE ABOVE ONE FOR PEG
NUMBERS.  OK, LET'S BEGIN.
```

```
        ! ! !
        ! ! !
  ! ! ! ! ! ! !
  ! ! ! 0 ! ! !
  ! ! ! ! ! ! !
        ! ! !
        ! ! !

MOVE WHICH PIECE? 59
TO WHERE? 41

        ! ! !
        ! ! !
  ! ! ! ! ! ! !
  ! ! ! ! ! ! !
  ! ! ! 0 ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 32
TO WHERE? 50

        ! ! !
        ! ! !
  ! ! ! 0 ! ! !
  ! ! ! 0 ! ! !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 43
TO WHERE? 41

        ! ! !
        ! ! !
  ! ! ! 0 ! ! !
  ! ! ! ! 0 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 34
TO WHERE? 32

        ! ! !
        ! ! !
  ! ! ! ! 0 0 !
  ! ! ! ! 0 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 31
TO WHERE? 33

        ! ! !
        ! ! !
  ! ! 0 0 ! 0 !
  ! ! ! ! 0 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 41
TO WHERE? 43
ILLEGAL MOVE, TRY AGAIN...
```

```
MOVE WHICH PIECE? 40
TO WHERE? 42

        ! ! !
        ! ! !
  ! ! 0 0 ! 0 !
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 14
TO WHERE? 32

        ! 0 !
        ! 0 !
  ! ! 0 ! ! 0 !
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 13
TO WHERE? 31

        0 0 !
        0 0 !
  ! ! ! ! ! 0 !
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 32
TO WHERE? 34

        0 0 !
        0 0 !
  ! ! ! 0 0 ! !
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 35
TO WHERE? 33

        0 0 !
        0 0 !
  ! ! ! 0 ! 0 0
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !

MOVE WHICH PIECE? 30
TO WHERE? 32

        0 0 !
        0 0 !
  ! 0 0 ! ! 0 0
  ! ! 0 0 ! 0 !
  ! ! ! ! ! ! !
        ! 0 !
        ! ! !
```

```
MOVE WHICH PIECE? 50
TO WHERE? 40
ILLEGAL MOVE, TRY AGAIN...
MOVE WHICH PIECE? 58
TO WHERE? 40

        0 0 0
        ! 0 0
    ! 0 0 0 ! 0 0
    0 0 ! 0 ! 0 !
    ! ! 0 ! ! ! !
        0 0 !
        ! ! !

MOVE WHICH PIECE? 51
TO WHERE? 49

        0 0 0
        ! 0 0
    ! 0 0 0 ! 0 0
    0 0 ! 0 ! 0 !
    ! ! ! 0 0 ! !
        0 0 !
        ! ! !

MOVE WHICH PIECE? 48
TO WHERE? 50

        0 0 0
        ! 0 0
    ! 0 0 0 ! 0 0
    0 0 ! 0 ! 0 !
    ! 0 0 ! 0 ! !
        0 0 !
        ! ! !

MOVE WHICH PIECE? 53
TO WHERE? 51

        0 0 0
        ! 0 0
    ! 0 0 0 ! 0 0
    0 0 ! 0 ! 0 !
    ! 0 0 ! ! 0 0
        0 0 !
        ! ! !

MOVE WHICH PIECE? 42
TO WHERE? 24

        0 0 0
        ! 0 !
    ! 0 0 0 0 0 0
    0 0 ! 0 0 0 !
    ! 0 0 ! ! 0 0
        0 0 !
        ! ! !

MOVE WHICH PIECE? 60
TO WHERE? 42

        0 0 0
        ! 0 !
    ! 0 0 0 0 0 0
    0 0 ! 0 ! 0 !
    ! 0 0 ! 0 0 0
        0 0 0
        ! ! !

THE GAME IS OVER.
YOU HAD 11 PIECES REMAINING.

PLAY AGAIN (YES OR NO)? NO

SO LONG FOR NOW.
```

```
1 PRINT TAB(33);"H-I-Q"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 DIM B(70),T(9,9)
5 PRINT "HERE IS THE BOARD:": PRINT
6 PRINT "          !    !    !"
7 PRINT "         13   14   15": PRINT
8 PRINT "          !    !    !"
9 PRINT "         22   23   24": PRINT
10 PRINT "!    !    !    !    !    !    !"
11 PRINT "29   30   31   32   33   34   35": PRINT
12 PRINT "!    !    !    !    !    !    !"
13 PRINT "38   39   40   41   42   43   44": PRINT
14 PRINT "!    !    !    !    !    !    !"
15 PRINT "47   48   49   50   51   52   53": PRINT
16 PRINT "          !    !    !"
17 PRINT "         58   59   60": PRINT
18 PRINT "          !    !    !"
19 PRINT "         67   68   69": PRINT
20 PRINT "TO SAVE TYPING TIME, A COMPRESSED VERSION OF THE GAME BOARD"
22 PRINT "WILL BE USED DURING PLAY.  REFER TO THE ABOVE ONE FOR PEG"
24 PRINT "NUMBERS.  OK, LET'S BEGIN."
28 REM *** SET UP BOARD
29 FOR R=1 TO 9
30 FOR C=1 TO 9
31 IF (R-4)*(R-5)*(R-6)=0 THEN 40
32 IF (C-4)*(C-5)*(C-6)=0 THEN 40
35 T(R,C)=-5
36 GOTO 50
40 IF (R-1)*(C-1)*(R-9)*(C-9)=0 THEN 35
42 T(R,C)=5
50 NEXT C
60 NEXT R
65 T(5,5)=0: GOSUB 500
70 REM *** INPUT MOVE AND CHECK ON LEGALITY
75 FOR M=1 TO 33
77 READ M
79 DATA 13,14,15,22,23,24,29,30,31,32,33,34,35,38,39,40,41
81 DATA 42,43,44,47,48,49,50,51,52,53,58,59,60,67,68,69
83 B(M)=-7: NEXT M
86 B(41)=-3
100 INPUT "MOVE WHICH PIECE";Z
110 IF B(Z)=-7 THEN 140
120 PRINT "ILLEGAL MOVE, TRY AGAIN...": GOTO 100
140 INPUT "TO WHERE";P
150 IF B(P)=0 THEN 120
153 IF B(P)=-7 THEN 120
156 IF Z=P THEN 100
160 IF ((Z+P)/2)=INT((Z+P)/2) THEN 180
170 GOTO 120
180 IF (ABS(Z-P)-2)*(ABS(Z-P)-18)<>0 THEN 120
190 GOSUB 1000
200 GOSUB 500
210 GOSUB 1500
220 GOTO 100
500 REM *** PRINT BOARD
510 FOR X=1 TO 9
520 FOR Y=1 TO 9
525 IF (X-1)*(X-9)*(Y-1)*(Y-9)=0 THEN 550
530 IF (X-4)*(X-5)*(X-6)=0 THEN 570
540 IF (Y-4)*(Y-5)*(Y-6)=0 THEN 570
550 REM
560 GOTO 610
570 IF T(X,Y)<>5 THEN 600
580 PRINT TAB(Y*2);"!";
590 GOTO 610
600 PRINT TAB(Y*2);"0";
610 REM
615 NEXT Y
620 PRINT
630 NEXT X
640 RETURN
1000 REM *** UPDATE BOARD
1005 C=1: FOR X=1 TO 9
1020 FOR Y=1 TO 9
1030 IF C<>Z THEN 1220
1040 IF C+2<>P THEN 1080
1045 IF T(X,Y+1)=0 THEN 120
1050 T(X,Y+2)=5
1060 T(X,Y+1)=0: B(C+1)=-3
1070 GOTO 1200
1080 IF C+18<>P THEN 1130
1085 IF T(X+1,Y)=0 THEN 120
1090 T(X+2,Y)=5: T(X+1,Y)=0: B(C+9)=-3
1120 GOTO 1200
1130 IF C-2<>P THEN 1170
1135 IF T(X,Y-1)=0 THEN 120
1140 T(X,Y-2)=5: T(X,Y-1)=0: B(C-1)=-3
1160 GOTO 1200
1170 IF C-18<>P THEN 1220
1175 IF T(X-1,Y)=0 THEN 120
1180 T(X-2,Y)=5: T(X-1,Y)=0: B(C-9)=-3
1200 B(Z)=-3: B(P)=-7
1210 T(X,Y)=0: GOTO 1240
1220 C=C+1
1225 NEXT Y
1230 NEXT X
1240 RETURN
1500 REM*** CHECK IF GAME IS OVER
1505 F=0
1510 FOR R=2 TO 8
1520 FOR C=2 TO 8
1530 IF T(R,C)<>5 THEN 1580
1535 F=F+1
1540 FOR A=R-1 TO R+1
1545 T=0
1550 FOR B=C-1 TO C+1
1560 T=T+T(A,B)
1561 NEXT B
1564 IF T<>10 THEN 1567
1565 IF T(A,C)<>0 THEN 1630
1567 NEXT A
1568 FOR X=C-1 TO C+1
1569 T=0
1570 FOR Y=R-1 TO R+1
1571 T=T+T(Y,X)
1572 NEXT Y
1573 IF T<>10 THEN 1575
1574 IF T(R,X)<>0 THEN 1630
1575 NEXT X
1580 NEXT C
1590 NEXT R
1600 REM *** GAME IS OVER
1605 PRINT "THE GAME IS OVER."
1610 PRINT "YOU HAD";F;"PIECES REMAINING."
1611 IF F<>1 THEN 1615
1612 PRINT "BRAVO!  YOU MADE A PERFECT SCORE!"
1613 PRINT "SAVE THIS PAPER AS A RECORD OF YOUR ACCOMPLISHMENT!"
1615 PRINT: INPUT "PLAY AGAIN (YES OR NO)";A$
1617 IF A$="NO" THEN 2000
1618 RESTORE: GOTO 28
1620 STOP
1630 RETURN
2000 PRINT: PRINT "SO LONG FOR NOW.": PRINT
2010 END
```

Hockey

This is a simulation of a ice hockey game. The computer, in this case, moderates and referees the play between two human opponents. Of course, one person could play both sides.

The program asks for team names, player names, and even the name of the referee. Four types of shot are permitted and a shot may be aimed at one of four areas. You are also asked about passing. The game is very comprehensive with lots of action, face offs, blocks, passes, 4 on 2 situations, and so on. Unfortunately there are no penalties.

The original author is Robert Puopolo; modifications by Steve North of Creative Computing.

```
                  HOCKEY
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY



WOULD YOU LIKE THE INSTRUCTIONS? YES


THIS IS A SIMULATED HOCKEY GAME.
QUESTION     RESPONSE
PASS         TYPE IN THE NUMBER OF PASSES YOU WOULD
             LIKE TO MAKE, FROM 0 TO 3.
SHOT         TYPE THE NUMBER CORRESPONDING TO THE SHOT
             YOU WANT TO MAKE.  ENTER:
             1 FOR A SLAPSHOT
             2 FOR A WRISTSHOT
             3 FOR A BACKHAND
             4 FOR A SNAP SHOT
AREA         TYPE IN THE NUMBER CORRESPONDING TO
             THE AREA YOU ARE AIMING AT.  ENTER:
             1 FOR UPPER LEFT HAND CORNER
             2 FOR UPPER RIGHT HAND CORNER
             3 FOR LOWER LEFT HAND CORNER
             4 FOR LOWER RIGHT HAND CORNER

AT THE START OF THE GAME, YOU WILL BE ASKED FOR THE NAMES
OF YOUR PLAYERS.  THEY ARE ENTERED IN THE ORDER:
LEFT WING, CENTER, RIGHT WING, LEFT DEFENSE,
RIGHT DEFENSE, GOALKEEPER.  ANY OTHER INPUT REQUIRED WILL
HAVE EXPLANATORY INSTRUCTIONS.
ENTER THE TWO TEAMS? BIG GUYS, LITTLE GUYS

ENTER THE NUMBER OF MINUTES IN A GAME? 15

WOULD THE BIG GUYS COACH ENTER HIS TEAM

PLAYER 1 ? IBM
PLAYER 2 ? DEC
PLAYER 3 ? BURROUGHS
PLAYER 4 ? HONEYWELL
PLAYER 5 ? DATA GENERAL
PLAYER 6 ? AMDAHL

WOULD THE LITTLE GUYS COACH DO THE SAME

PLAYER 1 ? MITS
PLAYER 2 ? IMSAI
PLAYER 3 ? SWTPC
PLAYER 4 ? CROMEMCO
PLAYER 5 ? PTCO
PLAYER 6 ? TDL

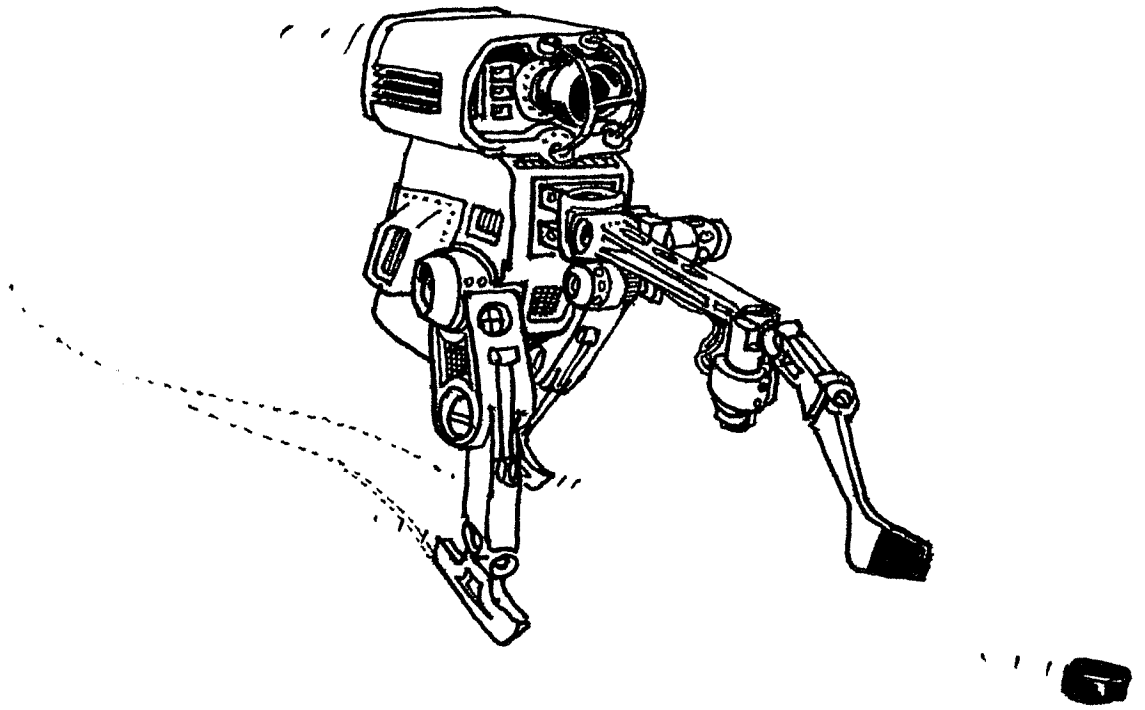
 INPUT THE REFEREE FOR THIS GAME? FEDERAL GVT

          BIG GUYS STARTING LINEUP
IBM
DEC
BURROUGHS
HONEYWELL
DATA GENERAL
AMDAHL

          LITTLE GUYS STARTING LINEUP
MITS
IMSAI
SWTPC
CROMEMCO
PTCO
TDL

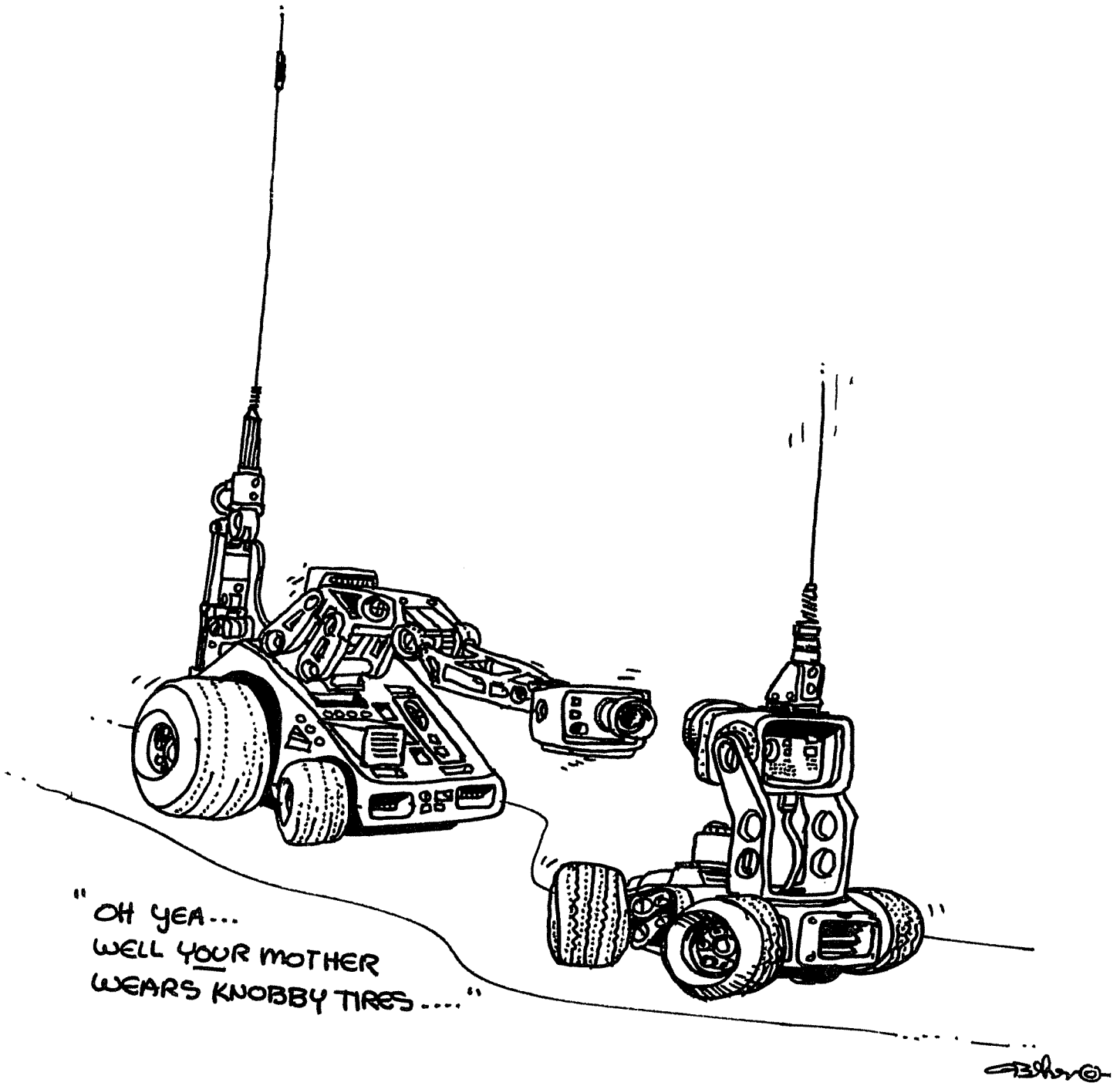
WE'RE READY FOR TONIGHTS OPENING FACE-OFF
FEDERAL GVT WILL DROP THE PUCK BETWEEN DEC AND IMSAI
BIG GUYS HAS CONTROL OF THE PUCK
PASS? 2
BURROUGHS GIVES TO A STREAKING HONEYWELL
IBM COMES DOWN ON PTCO AND CROMEMCO
SHOT? 1
IBM LET'S A BIG SLAP SHOT GO!!
AREA? 4
WHAT A SPECTACULAR GLOVE SAVE BY TDL
AND TDL GOLFS IT INTO THE CROWD
AND WE'RE READY FOR THE FACE-OFF
LITTLE GUYS HAS CONTROL
PASS? 3
 A ' 3 ON 2 ' WITH A ' TRAILER '
MITS GIVES TO PTCO WHO SHUFFLES IT OFF TO
IMSAI WHO FIRES A WING TO WING PASS TO
SWTPC AS HE CUTS IN ALONE!!
SHOT? 2
SWTPC RIPS A WRIST SHOT OFF
AREA? 3
GLOVE SAVE AMDAHL AND HE HANGS ON
AND WE'RE READY FOR THE FACE-OFF
BIG GUYS HAS CONTROL OF THE PUCK
PASS? 1
HONEYWELL LEADS DATA GENERAL WITH A PERFECT PASS
DATA GENERAL CUTTING IN!!!
SHOT? 2
DATA GENERAL RIPS A WRIST SHOT OFF
AREA? 1
WHISTLES ONE OVER THE HEAD OF TDL
LITTLE GUYS HAS CONTROL
PASS? 2
IT'S A ' 3 ON 2 '
ONLY HONEYWELL AND DATA GENERAL ARE BACK
MITS GIVES OFF TO CROMEMCO
CROMEMCO DROPS TO PTCO
SHOT? 3
PTCO GETS A BACKHAND OFF
AREA? 1
SKATE SAVE BY AMDAHL
AMDAHL WHACKS THE LOOSE PUCK INTO THE STANDS
AND WE'RE READY FOR THE FACE-OFF
LITTLE GUYS HAS CONTROL
PASS?. 2
IT'S A ' 3 ON 2 '
ONLY HONEYWELL AND DATA GENERAL ARE BACK
IMSAI GIVES OFF TO PTCO
PTCO DROPS TO MITS
SHOT? 4
MITS SNAPS OFF A SNAP SHOT
AREA? 1
SCORE LITTLE GUYS

SCORE: LITTLE GUYS: 1       BIG GUYS: 0
GOAL SCORED BY: MITS ASSISTED BY: PTCO AND IMSAI
AND WE'RE READY FOR THE FACE-OFF
```



```
2 PRINT TAB(33);"HOCKEY"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
10 REM ROBERT PUOPOLO ALG. 1 140 MCCOWAN 6/7/73 HOCKEY
30 LET X=1
40 PRINT:PRINT:PRINT
50 PRINT "WOULD YOU LIKE THE INSTRUCTIONS";:INPUT C$
55 PRINT
60 IF C$="NO" THEN 90
65 IF C$="YES" THEN 80
70 PRINT "ANSWER YES OR NO!!":GOTO 50
80 GOTO 1720
90 DIM A$(7),B$(7),H(20),T(5),T1(5),T2(5),T3(5)
100 PRINT "ENTER THE TWO TEAMS";:INPUT A$(7),B$(7)
105 PRINT
110 PRINT "ENTER THE NUMBER OF MINUTES IN A GAME";:INPUT T6
115 PRINT
120 IF T6<1 THEN 110:PRINT
130 PRINT "WOULD THE " A$(7) " COACH ENTER HIS TEAM"
135 PRINT
140 FOR I=1 TO 6:PRINT "PLAYER"I;:INPUT A$(I):NEXT I:PRINT
150 PRINT "WOULD THE " B$(7) " COACH DO THE SAME"
155 PRINT
160 FOR T=1 TO 6:PRINT "PLAYER"T;:INPUT B$(T):NEXT T:PRINT
170 PRINT "INPUT THE REFEREE FOR THIS GAME";:INPUT R$
180 PRINT:PRINT TAB(10);A$(7) " STARTING LINEUP"
190 FOR T=1 TO 6:PRINT A$(T):NEXT T
200 PRINT:PRINT TAB(10);B$(7)" STARTING LINEUP"
```

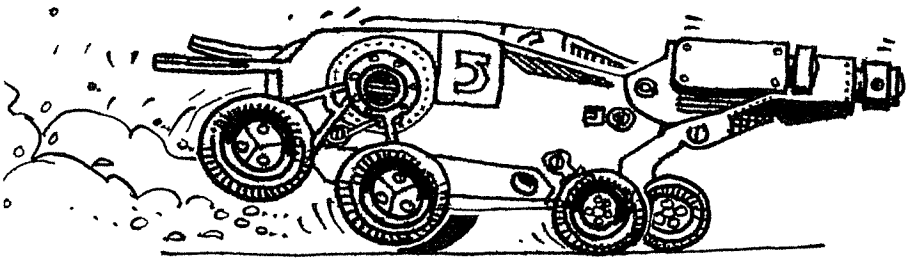
```
210 FOR T=1 TO 6:PRINT B$(T):NEXT T:PRINT
220 PRINT "WE'RE READY FOR TONIGHTS OPENING FACE-OFF"
230 PRINT R$ " WILL DROP THE PUCK BETWEEN " A$(2) " AND " B$(2)
240 FOR L=1 TO T6:IF L=1 THEN 260
250 PRINT "AND WE'RE READY FOR THE FACE-OFF"
260 C=INT(2*RND(X))+1:ON C GOTO 270,280
270 PRINT A$(7) " HAS CONTROL OF THE PUCK":GOTO 290
280 PRINT B$(7) " HAS CONTROL"
290 PRINT "PASS";:INPUT P:FOR N=1 TO 3:H(N)=0:NEXT N
300 IF P<0 THEN 290
305 IF P>3 THEN 290
310 FOR J=1 TO (P+2)
320 H(J)=INT(5*RND(X))+1
330 NEXT J:IF H(J-1)=H(J-2) THEN 310
331 IF P+2<3 THEN 350
335 IF H(J-1)=H(J-3) THEN 310
340 IF H(J-2)=H(J-3) THEN 310
350 IF P=0 THEN 360
355 GOTO 490
360 INPUT "SHOT ";S:IF S<1 THEN 360
365 IF S>4 THEN 360
370 ON C GOTO 380,480
380 PRINT A$(H(J-1));:G=H(J-1):G1=0:G2=0
390 ON S GOTO 400,420,440,460
400 PRINT " LET'S A BOOMER GO FROM THE RED LINE!!"
410 Z=10:GOTO 890
420 PRINT " FLIPS A WRISTSHOT DOWN THE ICE"
440 PRINT "BACKHANDS ONE IN ON THE GOALTENDER"
450 Z=25:GOTO 890
460 PRINT " SNAPS A LONG FLIP SHOT"
470 Z=17:GOTO 890
480 PRINT B$(H(J-1));:G1=0:G2=0:G=H(J-1):GOTO 390
490 ON C GOTO 500,640
500 ON P GOTO 510,540,570
510 PRINT A$(H(J-2)) " LEADS " A$(H(J-1)) " WITH A PERFECT PASS"
520 PRINT A$(H(J-1)) " CUTTING IN!!!"
530 G=H(J-1):G1=H(J-2):G2=0:Z1=3:GOTO 770
540 PRINT A$(H(J-2)) " GIVES TO A STREAKING " A$(H(J-1))
550 PRINT A$(H(J-3)) " COMES DOWN ON " B$(5) " AND " B$(4)
560 G=H(J-3):G1=H(J-1):G2=H(J-2):Z1=2:GOTO 770
570 PRINT "OH MY GOD!! A ' 4 ON 2 ' SITUATION"
580 PRINT A$(H(J-3)) " LEADS " A$(H(J-2))
590 PRINT A$(H(J-2)) " IS WHEEELING THROUGH CENTER"
600 PRINT A$(H(J-2)) " GIVES AND GOES WITH " A$(H(J-1))
610 PRINT "PRETTY PASSING"
620 PRINT A$(H(J-1)) " DROPS IT TO " A$(H(J-4))
630 G=H(J-4):G1=J(J-1):G2=H(J-2):Z1=1:GOTO 770
640 ON P GOTO 650,670,720
650 PRINT B$(H(J-1)) " HITS " B$(H(J-2)) " FLYING DOWN THE LEFTSIDE"
660 G=H(J-2):G1=H(J-1):G2=0:Z1=3:GOTO 770
670 PRINT "IT'S A ' 3 ON 2 '"
680 PRINT "ONLY " A$(4) " AND " A$(5) " ARE BACK"
690 PRINT B$(H(J-2)) " GIVES OFF TO " B$(H(J-1))
700 PRINT B$(H(J-1)) " DROPS TO " B$(H(J-3))
710 G=H(J-3):G1=H(J-1):G2=H(J-2):Z1=2:GOTO 770
720 PRINT " A ' 3 ON 2 ' WITH A ' TRAILER '"
730 PRINT B$(H(J-4)) " GIVES TO " B$(H(J-2)) " WHO SHUFFLES IT OFF TO"
740 PRINT B$(H(J-1)) " WHO FIRES A WING TO WING PASS TO "
750 PRINT B$(H(J-3)) " AS HE CUTS IN ALONE!!"
760 G=H(J-3):G1=H(J-1):G2=H(J-2):Z1=1:GOTO 770
770 PRINT "SHOT";:INPUT S:IF S>4 THEN 770:IF S<1 THEN 770
780 ON C GOTO 790,880
790 PRINT A$(6);:ON S GOTO 800,820,840,860
800 PRINT " LET'S A BIG SLAP SHOT GO!!"
810 Z=4:Z=Z+Z1:GOTO 890
820 PRINT " RIPS A WRIST SHOT OFF"
830 Z=2:Z=Z+Z1:GOTO 890
840 PRINT " GETS A BACKHAND OFF"
850 Z=3:Z=Z+Z1:GOTO 890
860 PRINT " SNAPS OFF A SNAP SHOT"
870 Z=2:Z=Z+Z1:GOTO 890
880 PRINT B$(6);:ON S GOTO 800,820,840,860
890 PRINT "AREA";:INPUT A:IF A<1 THEN 890
895 IF A>4 THEN 890
900 ON C GOTO 910,920
910 S2=S2+1:GOTO 930
920 S3=S3+1
930 A1=INT(4*RND(X))+1:IF A<>A1 THEN 1200
940 H(20)=INT(100*RND(X))+1
950 IF INT(H(20)/Z)=H(20)/Z THEN 1160
960 ON C GOTO 970,980
970 PRINT "GOAL " A$(7):H(9)=H(9)+1:GOTO 990
980 PRINT "SCORE " B$(7):H(8)=H(8)+1
990 FOR B1=1 TO 25:PRINT CHR$(7);:NEXT B1:PRINT
1000 PRINT "SCORE: ";:IF H(8)>H(9) THEN 1020
1010 PRINT A$(7)":";H(9),B$(7)":";H(8):GOTO 1030
1020 PRINT B$(7)":";H(8),A$(7)":";H(9)
1030 ON C GOTO 1040,1100
1040 PRINT "GOAL SCORED BY: " A$(6);:IF G1=0 THEN 1070
1050 IF G2=0 THEN 1080
1060 PRINT " ASSISTED BY: " A$(G1) " AND " A$(G2):GOTO 1090
1070 PRINT " UNASSISTED":GOTO 1090
1080 PRINT " ASSISTED BY: " A$(G1)
1090 T(G)=T(G)+1:T1(G1)=T1(G1)+1:T1(G2)=T1(G2)+1:GOTO 1540
1100 PRINT "GOAL SCORED BY: " B$(G);
1110 IF G1=0 THEN 1130
1115 IF G2=0 THEN 1140
1120 PRINT " ASSISTED BY: " B$(G1) " AND " B$(G2):GOTO 1150
1130 PRINT " UNASSISTED":GOTO 1150
1140 PRINT " ASSISTED BY: " B$(G1):GOTO 1150
1150 T2(G)=T2(G)+1:T3(G1)=T3(G1)+1:T3(G2)=T3(G2)+1:GOTO 1540
1160 A2=INT(100*RND(X))+1:IF INT(A2/4)=A2/4 THEN 1170
1165 GOTO 1200
1170 ON C GOTO 1180,1190
1180 PRINT "SAVE " B$(6) " REBOUND":GOTO 940
1190 PRINT "SAVE " A$(6) " FOLLOW UP":GOTO 940
1200 S1=INT(6*RND(X))+1
1210 ON C GOTO 1220,1380
1220 ON S1 GOTO 1230,1260,1290,1300,1330,1350
1230 PRINT "KICK SAVE AND A BEAUTY BY " B$(6)
1240 PRINT "CLEARED OUT BY " B$(3)
1250 GOTO 260
1260 PRINT "WHAT A SPECTACULAR GLOVE SAVE BY " B$(6)
1270 PRINT "AND " B$(6) " GOLFS IT INTO THE CROWD"
1280 GOTO 1540
1290 PRINT "SKATE SAVE ON A LOW STEAMER BY " B$(6):GOTO 260
1300 PRINT "PAD SAVE BY " B$(6) " OFF THE STICK "
1310 PRINT "OF "A$(G) " AND " B$(6) " COVERS UP"
1320 GOTO 1540
1330 PRINT "WHISTLES ONE OVER THE HEAD OF " B$(6)
1340 GOTO 260
1350 PRINT B$(6) " MAKES A FACE SAVE!! AND HE IS HURT"
1360 PRINT "THE DEFENSEMAN " B$(5) " COVERS UP FOR HIM"
1370 GOTO 1540
1380 ON S1 GOTO 1390,1410,1440,1470,1490,1520
1390 PRINT "STICK SAVE BY " A$(6)
1400 PRINT "AND CLEARED OUT BY " A$(4):GOTO 260
1410 PRINT "OH MY GOD!! " B$(G) " RATTLES ONE OFF THE POST"
1420 PRINT "TO THE RIGHT OF " A$(6) " AND " A$(6) " COVERS ";
1430 PRINT "ON THE LOOSE PUCK!":GOTO 1540
1440 PRINT "SKATE SAVE BY " A$(6)
1450 PRINT A$(6) " WHACKS THE LOOSE PUCK INTO THE STANDS"
1460 GOTO 1540
1470 PRINT "STICK SAVE BY " A$(6) " AND HE CLEARS IT OUT HIMSELF"
1480 GOTO 260
1490 PRINT "KICKED OUT BY " A$(6)
1500 PRINT "AND IT REBOUNDS ALL THE WAY TO CENTER ICE"
1510 GOTO 260
1520 PRINT "GLOVE SAVE " A$(6) " AND HE HANGS ON"
1530 GOTO 1540
1540 NEXT L:FOR N=1 TO 30:PRINT CHR$(7);:NEXT N:PRINT "TAT'S THE SIREN"
1550 PRINT:PRINT TAB(15);"FINAL SCORE:"
1560 IF H(8)>H(9) THEN 1580
1570 PRINT A$(7)":";H(9),B$(7)":";H(8):GOTO 1590
1580 PRINT B$(7)":";H(8),A$(7)":";H(9)
1590 PRINT:PRINT TAB(10);"SCORING SUMMARY":PRINT
1600 PRINT TAB(25);A$(7)
1610 PRINT TAB(5);"NAME";TAB(20);"GOALS";TAB(35);"ASSISTS"
1620 PRINT TAB(5);"----";TAB(20);"-----";TAB(35);"-------"
1630 FOR I=1 TO 5:PRINT TAB(5);A$(I);TAB(21);T(I);TAB(36);T1(I)
1640 NEXT I:PRINT
1650 PRINT TAB(25);B$(7)
1660 PRINT TAB(5);"NAME";TAB(20);"GOALS";TAB(35);"ASSISTS"
1670 PRINT TAB(5);"----";TAB(20);"-----";TAB(35);"-------"
1680 FOR T=1 TO 5:PRINT TAB(5);B$(T);TAB(21);T2(T);TAB(36);T3(T)
1690 NEXT T:PRINT
1700 PRINT "SHOTS ON NET":PRINT A$(7)":";S2:PRINT B$(7)":";S3
1710 END
1720 PRINT: PRINT "THIS IS A SIMULATED HOCKEY GAME."
1730 PRINT "QUESTION     RESPONSE"
1740 PRINT "PASS         TYPE IN THE NUMBER OF PASSES YOU WOULD"
1750 PRINT "             LIKE TO MAKE, FROM 0 TO 3."
1760 PRINT "SHOT         TYPE THE NUMBER CORRESPONDING TO THE SHOT"
1770 PRINT "             YOU WANT TO MAKE.  ENTER:"
1780 PRINT "             1 FOR A SLAPSHOT"
1790 PRINT "             2 FOR A WRISTSHOT"
1800 PRINT "             3 FOR A BACKHAND"
1810 PRINT "             4 FOR A SNAP SHOT"
1820 PRINT "AREA         TYPE IN THE NUMBER CORRESPONDING TO"
1830 PRINT "             THE AREA YOU ARE AIMING AT.  ENTER:"
1840 PRINT "             1 FOR UPPER LEFT HAND CORNER"
1850 PRINT "             2 FOR UPPER RIGHT HAND CORNER"
1860 PRINT "             3 FOR LOWER LEFT HAND CORNER"
1870 PRINT "             4 FOR LOWER RIGHT HAND CORNER"
1880 PRINT
1890 PRINT "AT THE START OF THE GAME, YOU WILL BE ASKED FOR THE NAMES"
1900 PRINT "OF YOUR PLAYERS.  THEY ARE ENTERED IN THE ORDER: "
1910 PRINT "LEFT WING, CENTER, RIGHT WING, LEFT DEFENSE,"
1920 PRINT "RIGHT DEFENSE; GOALKEEPER.  ANY OTHER INPUT REQUIRED WILL"
1930 PRINT "HAVE EXPLANATORY INSTRUCTIONS."
1940 GOTO 90
1950 END
```


"OH YEA...
WELL YOUR MOTHER
WEARS KNOBBY TIRES...."

Horserace

This program simulates a one-mile horse race for three-year old thoroughbreds. Up to ten people may place bets on the race up to $10,000 each. However, you may only bet to win. You place your bet by inputting the number of the horse, a comma, and the amount of your bet. The computer then shows the position of the horses at seven points around the track and at the finish. Payoffs and winnings are shown at the end.

The program was written by Laurie Chevalier while a student at South Portland High School.



```
                HORSERACE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


WELCOME TO SOUTH PORTLAND HIGH RACETRACK
                    ...OWNED BY LAURIE CHEVALIER
DO YOU WANT DIRECTIONS? YES
UP TO 10 MAY PLAY.  A TABLE OF ODDS WILL BE PRINTED.  YOU
MAY BET ANY + AMOUNT UNDER 100000 ON ONE HORSE.
DURING THE RACE, A HORSE WILL BE SHOWN BY ITS
NUMBER.  THE HORSES RACE DOWN THE PAPER!

HOW MANY WANT TO BET? 1
WHEN ? APPEARS,TYPE NAME
? JIM

HORSE                       NUMBER        ODDS

JOE MAW                      1             4.44444 :1
L.B.J.                       2             6.66667 :1
MR.WASHBURN                  3             20 :1
MISS KAREN                   4             40 :1
JOLLY                        5             4 :1
HORSE                        6             40 :1
JELLY DO NOT                 7             40 :1
MIDNIGHT                     8             4 :1
---------------------------------------------------
PLACE YOUR BETS...HORSE # THEN AMOUNT
JIM? 2,5000

1 2 3 4 5 6 7 8
XXXXSTARTXXXX

 6  4
 8  7  2  3
 1

 5

XXXXFINISHXXXX
```

```
---------------------------------

XXXXSTARTXXXX

 3  4  6

 7
 1  5  2

 8

XXXXFINISHXXXX

---------------------------------

XXXXSTARTXXXX

 6
 7
 3  5  4
 1
 2

 8

XXXXFINISHXXXX
```

```
---------------------------------

XXXXSTARTXXXX

 3
 4  7

 6
 2
 5
 1

 8

XXXXFINISHXXXX

---------------------------------

XXXXSTARTXXXX

 4  7
 3
 6
 2

 5
 1

 8

XXXXFINISHXXXX
```

```
XXXXSTARTXXXX









 4  7
 3

 6



 2


 5
XXXXFINISHXXXX


-------------------------------------------

THE RACE RESULTS ARE:

 1 PLACE HORSE NO. 1          AT  4.44444 :1

 2 PLACE HORSE NO. 8          AT  4 :1

 3 PLACE HORSE NO. 5          AT  4 :1

 4 PLACE HORSE NO. 2          AT  6.66667 :1

 5 PLACE HORSE NO. 6          AT  40 :1

 6 PLACE HORSE NO. 3          AT  20 :1

 7 PLACE HORSE NO. 7          AT  40 :1

 8 PLACE HORSE NO. 4          AT  40 :1
DO YOU WANT TO BET ON THE NEXT RACE?
? NO
```

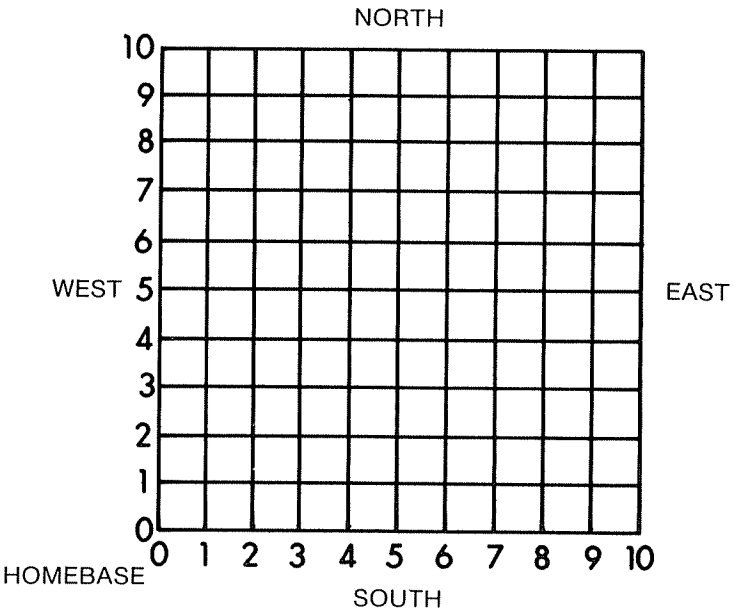
```
100 PRINT TAB(31);"HORSERACE"
110 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
120 PRINT:PRINT:PRINT
210 DIM S(8)
220 PRINT"WELCOME TO SOUTH PORTLAND HIGH RACETRACK"
230PRINT"                          ...OWNED BY LAURIE CHEVALIER"
240 PRINT "DO YOU WANT DIRECTIONS";
250 INPUT X$
260 IF X$="NO" THEN320
270PRINT"UP TO 10 MAY PLAY.  A TABLE OF ODDS WILL BE PRINTED.  YOU"
280 PRINT"MAY BET ANY + AMOUNT UNDER 100000 ON ONE HORSE."
290 PRINT "DURING THE RACE, A HORSE WILL BE SHOWN BY ITS"
300 PRINT"NUMBER.  THE HORSES RACE DOWN THE PAPER!"
310 PRINT
320 PRINT "HOW MANY WANT TO BET";
330 INPUT C
340 PRINT "WHEN ? APPEARS,TYPE NAME"
350 FOR A=1 TO C
360 INPUT W$(A)
370 NEXT A
380 PRINT
390 PRINT"HORSE",,"NUMBER","ODDS"
400 PRINT
410 FOR I=1 TO 8: S(I)=0: NEXT I
420 LET R=0
430 FOR A=1 TO 8
440 LET D(A)=INT(10*RND(1)+1)
450 NEXT A
460 FOR A=1TO 8
470 LET R=R+D(A)
480 NEXT A
490 LET V$(1)="JOE MAW"
500 LET V$(2)="L.B.J."
510 LET V$(3)="MR.WASHBURN"
520 LET V$(4)="MISS KAREN"
530 LET V$(5)="JOLLY"
540 LET V$(6)="HORSE"
550 LET V$(7)="JELLY DO NOT"
560 LET V$(8)="MIDNIGHT"
570 FOR N=1 TO8
580 PRINT V$(N),,N,R/D(N);":1"
590 NEXT N
600PRINT"-------------------------------------------------"
610 PRINT "PLACE YOUR BETS...HORSE # THEN AMOUNT"
620 FOR J=1 TO C
630 PRINT W$(J);
640 INPUT Q(J),P(J)
650 IF P(J)<1 THEN 670
660  IF P(J)<100000 THEN 690
670 PRINT"  YOU CAN'T DO THAT!"
680 GOTO 630
690 NEXT J
700 PRINT
710 PRINT"1 2 3 4 5 6 7 8"
720 PRINT"XXXXSTARTXXXX";
730 FOR I=1 TON
740 LET M=I
750 LET M(I)=M
760 LET Y(M(I))=INT(100*RND(1)+1)
770 IF Y(M(I))<10 THEN860
780 LET S=INT(R/D(I)+.5)
790 IF Y(M(I))<S+17 THEN 880
800 IF Y(M(I))<S+37 THEN 900
810 IF Y(M(I))<S+57 THEN920
820 IF Y(M(I))<77+S THEN940
830 IF Y(M(I))<S+92 THEN960
840 LET Y(M(I))=7
850 GOTO 970
860 LET Y(M(I))=1
870 GOTO 970
880 LET Y(M(I))=2
890 GOTO 970
900 LET Y(M(I))=3
910 GOTO 970
920 LET Y(M(I))=4
930 GOTO 970
940 LET Y(M(I))=5
950 GOTO 970
960 LET Y(M(I))=6
970 NEXTI
980 LET M=I
990 FOR I=1TO8
1000LET S(M(I))=S(M(I))+Y(M(I))
1010 NEXTI
1020 LET I=1
1030 FOR L=1 TO8
1040 FORI=1TO 8-L
1050 IF S(M(I))<S(M(I+1))THEN 1090
1060 LET H=M(I)
1070 LET M(I)=M(I+1)
1080 LET M(I+1)=H
1090 NEXT I
1100 NEXT L
1110 LET T=S(M(8))
1120FOR I=1 TO8
1130 LET B=S(M(I))-S(M(I-1))
1140 IF B=0 THEN 1190
1150 FOR A=1 TO B
1160 PRINT
1170IF S(M(I))>27 THEN1240
1180 NEXT A
1190 PRINT M(I);
1200 NEXT I
1210 FOR A=1 TO 28-T
1220 PRINT
1230 NEXT A
1240 PRINT"XXXXFINISHXXXX"
1242 PRINT
1243 PRINT
1244 PRINT "-------------------------------------------"
1245 PRINT
1250 IF T<28 THEN 720
1270 PRINT "THE RACE RESULTS ARE:"
1272 LET Z9=1
1280 FOR I=8 TO 1STEP-1
1290 LET F=M(I)
1300 PRINT
1310 PRINT Z9;"PLACE HORSE NO.";F,"AT ";R/D(F);":1"
1312 LET Z9=Z9+1
1320  NEXT I
1330 FOR J=1 TO C
1340 IF Q(J)<>M(8) THEN 1370
1350LET N=Q(J)
1355 PRINT
1360 PRINT W$(J);" WINS $";(R/D(N))*P(J)
1370 NEXT J
1372 PRINT "DO YOU WANT TO BET ON THE NEXT RACE?"
1374 INPUT "YES OR NO";O$
1376 IF O$="YES" THEN 380
1380 END
```

Hurkle

Hurkle? A Hurkle is a happy beast and lives in another galaxy on a planet named Lirht that has three moons. Hurkle are favorite pets of the Gwik, the dominant race of Lirht and . . . well, to find out more, read "The Hurkle is a Happy Beast," a story in the book *A Way Home* by Theodore Sturgeon.

In this program a shy hurkle is hiding on a 10 by 10 grid. Homebase is point 0,0 in the *Southwest* corner. Your guess as to the gridpoint where the hurkle is hiding should be a pair of whole numbers, separated by a comma. After each try, the computer will tell you the approximate direction to go look for the Hurkle. You get five guesses to find him; you may change this number in Line 110, although four guesses is actually enough.

This program was written by Bob Albrecht of People's Computer Company.




```
                HURKLE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

A HURKLE IS HIDING ON A 10 BY 10 GRID. HOMEBASE
ON THE GRID IS POINT  0,0  AND ANY GRIDPOINT IS A
PAIR OF WHOLE NUMBERS SEPARATED BY A COMMA. TRY TO
GUESS THE HURKLE'S GRIDPOINT. YOU GET 5 TRIES.
AFTER EACH TRY, I WILL TELL YOU THE APPROXIMATE
DIRECTION TO GO TO LOOK FOR THE HURKLE.

GUESS # 1 ? 5,5
GO SOUTHEAST

GUESS # 2 ? 6,4
GO SOUTH

GUESS # 3 ? 6,3
GO SOUTH

GUESS # 4 ? 6,2

YOU FOUND HIM IN 4 GUESSES!

LET'S PLAY AGAIN. HURKLE IS HIDING.

GUESS # 1 ? 5,5
GO NORTHWEST

GUESS # 2 ? 3,8
GO NORTHWEST

GUESS # 3 ? 2,9

YOU FOUND HIM IN 3 GUESSES!
```

```
10 PRINT TAB(33);"HURKLE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
110 N=5
120 G=10
210 PRINT
220 PRINT "A HURKLE IS HIDING ON A";G;"BY";G;"GRID. HOMEBASE"
230 PRINT "ON THE GRID IS POINT  0,0  AND ANY GRIDPOINT IS A"
240 PRINT "PAIR OF WHOLE NUMBERS SEPARATED BY A COMMA. TRY TO"
250 PRINT "GUESS THE HURKLE'S GRIDPOINT. YOU GET";N;"TRIES."
260 PRINT "AFTER EACH TRY, I WILL TELL YOU THE APPROXIMATE"
270 PRINT "DIRECTION TO GO TO LOOK FOR THE HURKLE."
280 PRINT
285 A=INT(G*RND(1))
286 B=INT(G*RND(1))
310 FOR K=1 TO N
320 PRINT "GUESS #";K;
330 INPUT X,Y
340 IF ABS(X-A)+ABS(Y-B)=0 THEN 500
350 REM PRINT INFO
360 GOSUB 610
370 PRINT
380 NEXT K
410 PRINT
420 PRINT "SORRY, THAT'S";N;"GUESSES."
430 PRINT "THE HURKLE IS AT ";A;",";B
440 PRINT
450 PRINT "LET'S PLAY AGAIN. HURKLE IS HIDING."
460 PRINT
470 GOTO 285
500 REM
510 PRINT
520 PRINT "YOU FOUND HIM IN";K;"GUESSES!"
540 GOTO 440
610 PRINT "GO ";
620 IF Y=B THEN 670
630 IF Y<B THEN 660
640 PRINT "SOUTH";
650 GO TO 670
660 PRINT "NORTH";
670 IF X=A THEN 720
680 IF X<A THEN 710
690 PRINT "WEST";
700 GO TO 720
710 PRINT "EAST";
720 PRINT
730 RETURN
999 END
```

Kinema

This program tests your fundamental knowledge of kinematics. It presents a simple problem: a ball is thrown straight up in the air at some random velocity. You then must answer three questions about the flight of the ball:

1. How high will it go?
2. How long until it returns to earth?
3. What will be its velocity after a random number of seconds?

The computer evaluates your performance; within 15% of the correct answer is considered close enough. After each run, the computer gives you another problem until you interrupt it.

KINEMA was shortened from the original Huntington Computer Project Program, KINERV, by Richard Pav of Patchogue High School, Patchogue, New York.

```
                KINEMA
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


A BALL IS THROWN UPWARDS AT 35 METERS PER SECOND.

HOW HIGH WILL IT GO (IN METERS)? 10
NOT EVEN CLOSE....
CORRECT ANSWER IS  61.25

HOW LONG UNTIL IT RETURNS (IN SECONDS)? 7
CLOSE ENOUGH.
CORRECT ANSWER IS  7

WHAT WILL ITS VELOCITY BE AFTER 4.5 SECONDS? 20
NOT EVEN CLOSE....
CORRECT ANSWER IS -10


 1 RIGHT OUT OF 3.

A BALL IS THROWN UPWARDS AT 25 METERS PER SECOND.

HOW HIGH WILL IT GO (IN METERS)? 45
NOT EVEN CLOSE....
CORRECT ANSWER IS  31.25

HOW LONG UNTIL IT RETURNS (IN SECONDS)? 4
NOT EVEN CLOSE....
CORRECT ANSWER IS  5

WHAT WILL ITS VELOCITY BE AFTER 3.2 SECONDS? 12
NOT EVEN CLOSE....
CORRECT ANSWER IS -7


 0 RIGHT OUT OF 3.
```

```
10 PRINT TAB(33);"KINEMA"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
100 PRINT
105 PRINT
106 Q=0
110 V=5+INT(35*RND(1))
111 PRINT "A BALL IS THROWN UPWARDS AT";V;"METERS PER SECOND."
112 PRINT
115 A=.05*V^2
116 PRINT "HOW HIGH WILL IT GO (IN METERS)";
117 GOSUB 500
120 A=V/5
122 PRINT "HOW LONG UNTIL IT RETURNS (IN SECONDS)";
124 GOSUB 500
130 T=1+INT(2*V*RND(1))/10
132 A=V-10*T
134 PRINT "WHAT WILL ITS VELOCITY BE AFTER";T;"SECONDS";
136 GOSUB 500
140 PRINT
150 PRINT Q;"RIGHT OUT OF 3.";
160 IF Q<2 THEN 100
170 PRINT "  NOT BAD."
180 GOTO 100
500 INPUT G
502 IF ABS((G-A)/A)<.15 THEN 510
504 PRINT "NOT EVEN CLOSE...."
506 GOTO 512
510 PRINT "CLOSE ENOUGH."
511 Q=Q+1
512 PRINT "CORRECT ANSWER IS ";A
520 PRINT
530 RETURN
999 END
```

King

This is one of the more comprehensive, difficult, and interesting land and resource management games. (If you've never played one of these games, start with HAMMURABI.)

In this game, you are Premier of Setats Detinu, a small communist island 30 by 70 miles long. Your job is to decide upon the budget of the country and distribute money to your countrymen from the communal treasury.

The money system is Rallods; each person needs 100 Rallods per year to survive. Your country's income comes from farm produce and tourists visiting your magnificent forests, hunting, fishing, etc. Part of your land is farm land but it also has an excellent mineral content and may be sold to foreign industry for strip mining. Industry import and support their own workers. Crops cost between 10 and 15 Rallods per square mile to plant, cultivate, and harvest. Your goal is to complete an eight-year term of office without major mishap. A word of warning: it isn't easy!

The author of this program is James A. Storer who wrote it while a student at Lexington High School.

```
                  KING
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES


CONGRATULATIONS! YOU'VE JUST BEEN ELECTED PREMIER OF SETATS
DETINU, A SMALL COMMUNIST ISLAND 30 BY 70 MILES LONG.  YOUR
JOB IS TO DECIDE UPON THE COUNTRY'S BUDGET AND DISTRIBUTE
MONEY TO YOUR COUNTRYMEN FROM THE COMMUNAL TREASURY.
THE MONEY SYSTEM IS RALLODS, AND EACH PERSON NEEDS 100
RALLODS PER YEAR TO SURVIVE.  YOUR COUNTRY'S INCOME COMES
FROM FARM PRODUCE AND TOURISTS VISITING YOUR MAGNIFICENT
FORESTS, HUNTING, FISHING, ETC.  HALF YOUR LAND IS FARM LAND
WHICH ALSO HAS AN EXCELLENT MINERAL CONTENT AND MAY BE SOLD
TO FOREIGN INDUSTRY (STRIP MINING) WHO IMPORT AND SUPPORT
THEIR OWN WORKERS.  CROPS COST BETWEEN 10 AND 15 RALLODS PER
SQ. MILE TO PLANT.
YOUR GOAL IS TO COMPLETE YOUR 8 YEAR TERM OF OFFICE.
GOOD LUCK.

YOU NOW HAVE 59907 RALLODS IN THE TREASURY.
 502 COUNTRYMEN, AND 2000 SQ. MILES OF LAND.
THIS YEAR INDUSTRY WILL BUY LAND FOR 103 RALLODS PER SQ. MILE.
LAND CURRENTLY COSTS 10 RALLODS PER SQ. MILE TO PLANT.


HOW MANY SQ. MILES DO YOU WISH TO SELL TO INDUSTRY? 200
HOW MANY RALLODS WILL YOU DISTRIBUTE TO YOUR COUNTRYMEN? 50200
HOW MANY SQ. MILES DO YOU WISH TO PLANT? 500
HOW MANY RALLODS DO YOU WISH TO SPEND ON POLLUTION CONTROL? 10000


 212 WORKERS CAME TO THE COUNTRY AND 396 COUNTRYMEN CAME TO THE ISLAND.
 OF 500 SQ. MILES PLANTED, YOU HARVESTED 340 SQ. MILES OF CROPS.
   (DUE TO AIR AND WATER POLLUTION FROM FOREIGN INDUSTRY.)
 MAKING 17510 RALLODS.
 YOU MADE 8179 RALLODS FROM TOURIST TRADE.

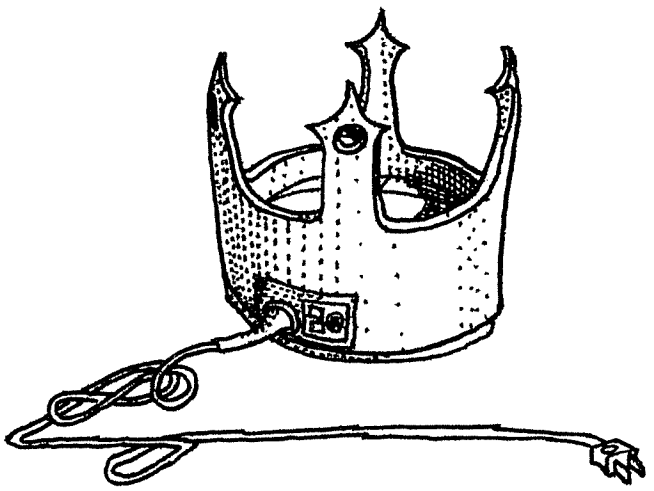
YOU NOW HAVE 65634 RALLODS IN THE TREASURY.
 898 COUNTRYMEN,  212 FOREIGN WORKERS, AND 1800 SQ. MILES OF LAND.
THIS YEAR INDUSTRY WILL BUY LAND FOR 98 RALLODS PER SQ. MILE.
LAND CURRENTLY COSTS 13 RALLODS PER SQ. MILE TO PLANT.

HOW MANY SQ. MILES DO YOU WISH TO SELL TO INDUSTRY? 0
HOW MANY RALLODS WILL YOU DISTRIBUTE TO YOUR COUNTRYMEN? 89800
   THINK AGAIN, YOU'VE ONLY 65634 RALLODS IN THE TREASURY
HOW MANY RALLODS WILL YOU DISTRIBUTE TO YOUR COUNTRYMEN? 40000
HOW MANY SQ. MILES DO YOU WISH TO PLANT? 600
HOW MANY RALLODS DO YOU WISH TO SPEND ON POLLUTION CONTROL? 6000


 498 COUNTRYMEN DIED OF STARVATION
   YOU WERE FORCED TO SPEND 4482 RALLODS ON FUNERAL EXPENSES
 236 COUNTRYMEN CAME TO THE ISLAND.
 OF 600 SQ. MILES PLANTED, YOU HARVESTED 448 SQ. MILES OF CROPS.
   (DUE TO AIR AND WATER POLLUTION FROM FOREIGN INDUSTRY.)
 MAKING 21952 RALLODS.
 YOU MADE 6068 RALLODS FROM TOURIST TRADE.
   DECREASE BECAUSE AIR POLLUTION IS KILLING GAME BIRD POPULATION.


 498 COUNTRYMEN DIED IN ONE YEAR!!!!!
DUE TO THIS EXTREME MISMANAGEMENT YOU HAVE NOT ONLY
BEEN IMPEACHED AND THROWN OUT OF OFFICE BUT YOU
HAVE ALSO GAINED A VERY BAD REPUTATION.
```

```
1 PRINT TAB(34);"KING"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "DO YOU WANT INSTRUCTIONS";
5 INPUT Z$
6 N5=8
10 IF LEFT$(Z$,1)="N" THEN 47
11 IF Z$="AGAIN" THEN 1960
12 PRINT:PRINT:PRINT
20 PRINT "CONGRATULATIONS! YOU'VE JUST BEEN ELECTED PREMIER OF SETATS"
22 PRINT "DETINU, A SMALL COMMUNIST ISLAND 30 BY 70 MILES LONG.  YOUR"
24 PRINT "JOB IS TO DECIDE UPON THE COUNTRY'S BUDGET AND DISTRIBUTE"
26 PRINT "MONEY TO YOUR COUNTRYMEN FROM THE COMMUNAL TREASURY."
28 PRINT "THE MONEY SYSTEM IS RALLODS, AND EACH PERSON NEEDS 100"
30 PRINT "RALLODS PER YEAR TO SURVIVE.  YOUR COUNTRY'S INCOME COMES"
32 PRINT "FROM FARM PRODUCE AND TOURISTS VISITING YOUR MAGNIFICENT"
34 PRINT "FORESTS, HUNTING, FISHING, ETC.  HALF YOUR LAND IS FARM LAND"
36 PRINT "WHICH ALSO HAS AN EXCELLENT MINERAL CONTENT AND MAY BE SOLD"
38 PRINT "TO FOREIGN INDUSTRY (STRIP MINING) WHO IMPORT AND SUPPORT"
40 PRINT "THEIR OWN WORKERS.  CROPS COST BETWEEN 10 AND 15 RALLODS PER"
42 PRINT "SQ. MILE TO PLANT."
44 PRINT "YOUR GOAL IS TO COMPLETE YOUR";N5;"YEAR TERM OF OFFICE."
46 PRINT "GOOD LUCK."
47 PRINT
50 A=INT(60000+(1000*RND(1))-(1000*RND(1)))
55 B=INT(500+(10*RND(1))-(10*RND(1)))
65 D=2000
100 W=INT(10*RND(1)+95)
102 PRINT
105 PRINT "YOU NOW HAVE";A;"RALLODS IN THE TREASURY."
110 PRINT INT(B);"COUNTRYMEN, ";
115 V9=INT(((RND(1)/2)*10+10))
120 IF C=0 THEN 140
130 PRINT INT(C);"FOREIGN WORKERS, ";
140 PRINT "AND";INT(D);"SQ. MILES OF LAND."
150 PRINT "THIS YEAR INDUSTRY WILL BUY LAND FOR";W;
152 PRINT "RALLODS PER SQ. MILE."
155 PRINT "LAND CURRENTLY COSTS";V9;"RALLODS PER SQ. MILE TO PLANT."
162 PRINT
200 PRINT "HOW MANY SQ. MILES DO YOU WISH TO SELL TO INDUSTRY";
210 INPUT H
```



```
215 IF H<0 THEN 200
220 IF H<=D-1000 THEN 300
230 PRINT "   THINK AGAIN, YOU'VE ONLY";D-1000;"SQ. MILES OF FARM LAND"
240 IF X<>0 THEN 200
250 PRINT "(FOREIGN INDUSTRY WILL ONLY BUY FARM LAND BECAUSE"
260 PRINT "FOREST LAND IS UNECONOMICAL TO STRIP MINE DUE TO TREES,"
270 PRINT "THICKER TOP SOIL, ETC.)"
280 X=1
299 GOTO 200
300 D=INT(D-H)
310 A=INT(A+(H*W))
320 PRINT "HOW MANY RALLODS WILL YOU DISTRIBUTE TO YOUR COUNTRYMEN";
340 INPUT I
342 IF I<0 THEN 320
350 IF I<A THEN 400
360 IF I=A THEN 380
370 PRINT "   THINK AGAIN, YOU'VE ONLY";A;"RALLODS IN THE TREASURY"
375 GOTO 320
380 J=0
390 K=0
395 A=0
399 GOTO 1000
400 A=INT(A-I)
410 PRINT "HOW MANY SQ. MILES DO YOU WISH TO PLANT";
420 INPUT J
421 IF J<0 THEN 410
422 IF J<=B*2 THEN 426
423 PRINT "   SORRY, BUT EACH COUNTRYMAN CAN ONLY PLANT 2 SQ. MILES"
424 GOTO 410
426 IF J<=D-1000 THEN 430
427 PRINT "   SORRY, BUT YOU'VE ONLY";D-1000;"SQ. MILES OF FARM LAND"
428 GOTO 410
430 U1=INT(J*V9)
435 IF U1<A THEN 500
440 IF U1=A THEN 490
450 PRINT"   THINK AGAIN, YOU'VE ONLY";A;"RALLODS LEFT IN THE TREASURY"
460 GOTO 410
490 K=0
495 A=0
499 GOTO 1000
500 A=A-U1
510 PRINT "HOW MANY RALLODS DO YOU WISH TO SPEND ON POLLUTION CONTROL";
520 INPUT K
522 IF K<0 THEN 510
530 IF K<=A THEN 1000
540 PRINT "   THINK AGAIN, YOU'VE ONLY";A;"RALLODS REMAINING"
550 GOTO 510
600 IF H<>0 THEN 1002
602 IF I<>0 THEN 1002
604 IF J<>0 THEN 1002
606 IF K<>0 THEN 1002
609 PRINT
612 PRINT "GOODBYE."
614 PRINT "(IF YOU WISH TO CONTINUE THIS GAME AT A LATE DATE, ANSWER"
616 PRINT "'AGAIN' WHEN ASKED IF YOU WANT INSTRUCTIONS, AT THE"
618 STOP
1000 GOTO 600
1002 PRINT
1003 PRINT
1010 A=INT(A-K)
1020 A4=A
1100 IF INT(I/100-B)>=0 THEN 1120
1105 IF I/100<50 THEN 1700
1110 PRINT INT(B-(I/100));"COUNTRYMEN DIED OF STARVATION"
1120 F1=INT(RND(1)*(2000-D))
1122 IF K<25 THEN 1130
1125 F1=INT(F1/(K/25))
```

```
1130 IF F1<=0 THEN 1150
1140 PRINT F1;"COUNTRYMEN DIED OF CARBON-MONOXIDE AND DUST INHALATION"
1150 IF INT((I/100)-B)<0 THEN 1170
1160 IF F1>0 THEN 1180
1165 GOTO 1200
1170 PRINT "   YOU WERE FORCED TO SPEND";INT((F1+(B-(I/100)))*9);
1172 PRINT "RALLODS ON FUNERAL EXPENSES"
1174 B5=INT(F1+(B-(I/100)))
1175 A=INT(A-((F1+(B-(I/100)))*9))
1176 GOTO 1185
1180 PRINT "   YOU WERE FORCED TO SPEND";INT(F1*9);"RALLODS ON ";
1181 PRINT "FUNERAL EXPENSES"
1182 B5=F1
1183 A=INT(A-(F1*9))
1185 IF A>=0 THEN 1194
1187 PRINT "   INSUFFICIENT RESERVES TO COVER COST - LAND WAS SOLD"
1189 D=INT(D+(A/W))
1190 A=0
1194 B=INT(B-B5)
1200 IF H=0 THEN 1250
1220 C1=INT(H+(RND(1)*10)-(RND(1)*20))
1224 IF C>0 THEN 1230
1226 C1=C1+20
1230 PRINT C1;"WORKERS CAME TO THE COUNTRY AND";
1250 P1=INT(((I/100-B)/10)+(K/25)-((2000-D)/50)-(F1/2))
1255 PRINT ABS(P1);"COUNTRYMEN ";
1260 IF P1<0 THEN 1275
1265 PRINT "CAME TO";
1270 GOTO 1280
1275 PRINT "LEFT";
1280 PRINT " THE ISLAND."
1290 B=INT(B+P1)
1292 C=INT(C+C1)
1305 U2=INT(((2000-D)*((RND(1)+1.5)/2)))
1310 IF C=0 THEN 1324
1320 PRINT " OF";INT(J);"SQ. MILES PLANTED,";
1324 IF J>U2 THEN 1330
1326 U2=J
1330 PRINT " YOU HARVESTED";INT(J-U2);"SQ. MILES OF CROPS."
1340 IF U2=0 THEN 1370
1344 IF T1>=2 THEN 1370
1350 PRINT "   (DUE TO ";
1355 IF T1=0 THEN 1365
1360 PRINT "INCREASED ";
1365 PRINT "AIR AND WATER POLLUTION FROM FOREIGN INDUSTRY.)"
1370 Q=INT((J-U2)*(W/2))
1380 PRINT " MAKING";INT(Q);"RALLODS."
1390 A=INT(A+Q)
1400 V1=INT(((B-P1)*22)+(RND(1)*500))
1405 V2=INT((2000-D)*15)
1410 PRINT " YOU MADE";ABS(INT(V1-V2));"RALLODS FROM TOURIST TRADE."
1420 IF V2=0 THEN 1450
1425 IF V1-V2>=V3 THEN 1450
1430 PRINT "   DECREASE BECAUSE ";
1435 G1=10*RND(1)
1440 IF G1<=2 THEN 1460
1442 IF G1<=4 THEN 1465
1444 IF G1<=6 THEN 1470
1446 IF G1<=8 THEN 1475
1448 IF G1<=10 THEN 1480
1450 V3=INT(A+V3)
1451 A=INT(A+V3)
1452 GOTO 1500
1460 PRINT "FISH POPULATION HAS DWINDLED DUE TO WATER POLLUTION."
1462 GOTO 1450
1465 PRINT "AIR POLLUTION IS KILLING GAME BIRD POPULATION."
1467 GOTO 1450
1470 PRINT "MINERAL BATHS ARE BEING RUINED BY WATER POLLUTION."
1472 GOTO 1450
1475 PRINT "UNPLEASANT SMOG IS DISCOURAGING SUN BATHERS."
1477 GOTO 1450
1480 PRINT "HOTELS ARE LOOKING SHABBY DUE TO SMOG GRIT."
1482 GOTO 1450
1500 IF B5>200 THEN 1600
1505 IF B<343 THEN 1700
1510 IF (A4/100)>5 THEN 1800
1515 IF C>B THEN 1550
1520 IF N5-1=X5 THEN 1900
1545 GOTO 2000
1550 PRINT
1552 PRINT
1560 PRINT "THE NUMBER OF FOREIGN WORKERS HAS EXCEEDED THE NUMBER"
1562 PRINT "OF COUNTRYMEN.  AS A MAJORITY THEY HAVE REVOLTED AND"
1564 PRINT "TAKEN OVER THE COUNTRY."
1570 IF RND(1)<=.5 THEN 1580
1574 PRINT "YOU HAVE BEEN THROWN OUT OF OFFICE AND YOU ARE NOW"
1576 PRINT "RESIDING IN PRISON."
1578 GOTO 1590
1580 PRINT "YOU HAVE BEEN ASSASSINATED."
1590 PRINT
1592 PRINT
1596 STOP
1600 PRINT
1602 PRINT
1610 PRINT B5;"COUNTRYMEN DIED IN ONE YEAR!!!!!"
1615 PRINT "DUE TO THIS EXTREME MISMANAGEMENT YOU HAVE NOT ONLY"
1620 PRINT "BEEN IMPEACHED AND THROWN OUT OF OFFICE BUT YOU"
1622 M6=INT(RND(1)*10)
1625 IF M6<=3 THEN 1670
1630 IF M6<=6 THEN 1680
1635 IF M6<=10 THEN 1690
1670 PRINT "ALSO HAD YOUR LEFT EYE GOUGED OUT."
1672 GOTO 1590
1680 PRINT "HAVE ALSO GAINED A VERY BAD REPUTATION."
1682 GOTO 1590
1690 PRINT "HAVE ALSO BEEN DECLARED NATIONAL FINK."
1692 GOTO 1590
1700 PRINT
1702 PRINT
1710 PRINT "OVER ONE THIRD OF THE POPULATION HAS DIED SINCE YOU"
1715 PRINT "WERE ELECTED TO OFFICE.  THE PEOPLE (REMAINING)"
1720 PRINT "HATE YOUR GUTS."
1730 GOTO 1570
1800 IF B5-F1<2 THEN 1515
1807 PRINT
1815 PRINT "MONEY WAS LEFT OVER IN THE TREASURY WHICH YOU DID"
1820 PRINT "NOT SPEND.  AS A RESULT SOME OF YOUR COUNTRYMEN DIED"
1825 PRINT "OF STARVATION.  THE PUBLIC IS ENRAGED AND YOU HAVE"
1830 PRINT "BEEN FORCED TO EITHER RESIGN OR COMMIT SUICIDE."
1835 PRINT "THE CHOICE IS YOURS."
1840 PRINT "IF YOU CHOOSE THE LATTER, PLEASE TURN OFF YOUR COMPUTER"
1845 PRINT "BEFORE PROCEEDING."
1850 GOTO 1590
1900 PRINT
1920 PRINT "CONGRATULATIONS!!!!!!!!!!!!!!!!!!"
1925 PRINT "YOU HAVE SUCCESFULLY COMPLETED YOUR";N5;"YEAR TERM"
1930 PRINT "OF OFFICE.  YOU WERE, OF COURSE, EXTREMELY LUCKY, BUT"
1935 PRINT "NEVERTHELESS, IT'S QUITE AN ACHIEVEMENT.  GOODBYE AND GOOD"
1940 PRINT LUCK - YOU'LL PROBABLY NEED IT IF YOU'RE THE TYPE THAT"
1945 PRINT "PLAYS THIS GAME."
1950 GOTO 1590
1960 PRINT "HOW MANY YEARS HAD YOU BEEN IN OFFICE WHEN INTERRUPTED";
1961 INPUT X5
1962 IF X5<0 THEN 1590
1963 IF X5<8 THEN 1969
1965 PRINT "   COME ON, YOUR TERM IN OFFICE IS ONLY";N5;"YEARS."
1967 GOTO 1960
1969 PRINT "HOW MUCH DID YOU HAVE IN THE TREASURY";
1970 INPUT A
1971 IF A<0 THEN 1590
1975 PRINT "HOW MANY COUNTRYMEN";
1976 INPUT B
1977 IF B<0 THEN 1590
1980 PRINT "HOW MANY WORKERS";
1981 INPUT C
1982 IF C<0 THEN 1590
1990 PRINT "HOW MANY SQ. MILES OF LAND";
1991 INPUT D
1992 IF D<0 THEN 1590
1993 IF D>2000 THEN 1996
1994 IF D>1000 THEN 100
1996 PRINT "   COME ON, YOU STARTED WITH 1000 SQ. MILES OF FARM LAND"
1997 PRINT "   AND 10000 SQ. MILES OF FOREST LAND."
1998 GOTO 1990
2000 X5=X5+1
2020 B5=0
2040 GOTO 100
2046 END
```

Letter

LETTER is similar to the game GUESS in which you guess a number chosen by the computer; in this program, the computer picks a random letter of the alphabet and you must guess which one it is using the clues provided as you go along. It should not take you more than five guesses to get the mystery letter.

The program which appears here is loosely based on the original written by Bob Albrecht of People's Computer Company.

```
10 PRINT TAB(33);"LETTER"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "LETTER GUESSING GAME": PRINT
210 PRINT "I'LL THINK OF A LETTER OF THE ALPHABET, A TO Z."
220 PRINT "TRY TO GUESS MY LETTER AND I'LL GIVE YOU CLUES"
230 PRINT "AS TO HOW CLOSE YOU'RE GETTING TO MY LETTER."
310 L=65+INT(RND(1)*26)
320 G=0
340 PRINT: PRINT "O.K., I HAVE A LETTER.  START GUESSING."
410 PRINT: PRINT "WHAT IS YOUR GUESS";
420 G=G+1
430 INPUT A$: A=ASC(A$): PRINT
440 IF A=L THEN 500
450 IF A>L THEN 480
460 PRINT "TOO LOW.  TRY A HIGHER LETTER.": GOTO 410
480 PRINT "TOO HIGH.  TRY A LOWER LETTER.": GOTO 410
500 PRINT: PRINT "YOU GOT IT IN";G;"GUESSES!!"
504 IF G<=5 THEN 508
506 PRINT "BUT IT SHOULDN'T TAKE MORE THAN 5 GUESSES!": GOTO 515
508 PRINT "GOOD JOB !!!!!"
510 FOR N=1 TO 15: PRINT CHR$(7);: NEXT N
515 PRINT
520 PRINT "LET'S PLAY AGAIN....."
530 GOTO 310
999 END

SYSTEM RESPONSE MAY BE SLOW AT TIMES. CURRENTLY RUNNING ON 192K OF MEMORY.
READY
```

```
                LETTER
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

LETTER GUESSING GAME

I'LL THINK OF A LETTER OF THE ALPHABET, A TO Z.
TRY TO GUESS MY LETTER AND I'LL GIVE YOU CLUES
AS TO HOW CLOSE YOU'RE GETTING TO MY LETTER.

O.K., I HAVE A LETTER.  START GUESSING.

WHAT IS YOUR GUESS? N

TOO HIGH.  TRY A LOWER LETTER.

WHAT IS YOUR GUESS? F


YOU GOT IT IN 2 GUESSES!!
GOOD JOB !!!!!

LET'S PLAY AGAIN.....

O.K., I HAVE A LETTER.  START GUESSING.

WHAT IS YOUR GUESS? M

TOO HIGH.  TRY A LOWER LETTER.

WHAT IS YOUR GUESS? F

TOO HIGH.  TRY A LOWER LETTER.

WHAT IS YOUR GUESS? C

TOO LOW.  TRY A HIGHER LETTER.

WHAT IS YOUR GUESS? E

TOO HIGH.  TRY A LOWER LETTER.

WHAT IS YOUR GUESS? D


YOU GOT IT IN 5 GUESSES!!
GOOD JOB !!!!!

LET'S PLAY AGAIN.....

O.K., I HAVE A LETTER.  START GUESSING.

WHAT IS YOUR GUESS?

BREAK IN 430
```

Life

The Game of Life was originally described in *Scientific American*, October 1970, in an article by Martin Gardner. The game itself was originated by John Conway of Gonville and Caius College, University of Cambridge, England.

In the "manual" game, organisms exist in the form of counters (chips or checkers) on a large checkerboard and die or reproduce according to some simple genetic rules. Conway's criteria for choosing his genetic laws were carefully delineated as follows:

1. There should be no initial pattern for which there is a simple proof that the population can grow without limit.
2. There should be initial patterns that apparently do grow without limit.
3. There should be simple initial patterns that grow and change for a considerable period of time before coming to an end in three possible ways: fading away completely (from overcrowding or from becoming too sparse), settling into a stable configuration that remains unchanged thereafter, or entering an oscillating phase in which they repeat an endless cycle of two or more periods.

In brief, the rules should be such as to make the behavior of the population relatively unpredictable. Conway's genetic laws are delightfully simple. First note that each cell of the checkerboard (assumed to be an infinite plane) has eight neighboring cells, four adjacent orthogonally, four adjacent diagonally. The rules are:

1. Survivals. Every counter with two or three neighboring counters survives for the next generation.
2. Deaths. Each counter with four or more neighbors dies (is removed) from overpopulation. Every counter with one neighbor or none dies from isolation.
3. Births. Each empty cell adjacent to exactly three neighbors — no more, no fewer — is a birth cell. A counter is placed on it at the next move.

It is important to understand that all births and deaths occur simultaneously. Together they constitute a single generation or, as we shall call it, a "move" in the complete "life history" of the initial configuration.

You will find the population constantly undergoing unusual, sometimes beautiful and always unexpected change. In a few cases the society eventually dies out (all counters vanishing), although this may not happen until after a great many generations. Most starting patterns either reach stable figures — Conway calls them "still lifes" — that cannot change or patterns that oscillate forever. Patterns with no initial symmetry tend to become symmetrical. Once this happens the symmetry cannot be lost, although it may increase in richness.

Conway used a DEC PDP-7 with a graphic display to observe long-lived populations. You'll probably find this more enjoyable to watch on a CRT than a hard-copy terminal.

Since MITS 8K BASIC does not have LINE INPUT, to enter leading blanks in the pattern, type a "." at the start of the line. This will be converted to a space by BASIC, but it permits you to type leading spaces. Typing DONE indicates that you are finished entering the pattern. See sample run.

Clark Baker of Project DELTA originally wrote this version of LIFE which was further modified by Steve North of Creative Computing.

```
                LIFE
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

ENTER YOUR PATTERN:
? .  ***
? . *  *
? .*   *
? DONE

GENERATION: 0          POPULATION: 7

 ***
*  *
*  *

GENERATION: 1          POPULATION: 8

 *
 ***
** **

GENERATION: 2          POPULATION: 9

 ***
*  *
** **

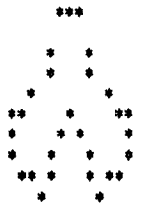
GENERATION: 3          POPULATION: 10

 *
 ***
*  *
** **

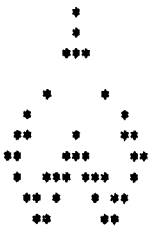
GENERATION: 4          POPULATION: 12

 ***
 ***
*  *
** **
```

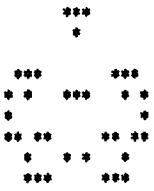
GENERATION: 13 POPULATION: 30



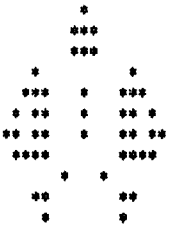
GENERATION: 14 POPULATION: 39



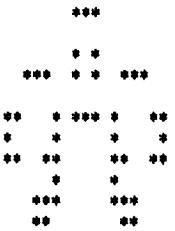
GENERATION: 15 POPULATION: 37



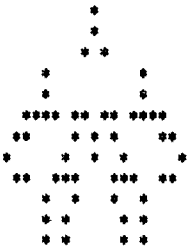
GENERATION: 16 POPULATION: 48



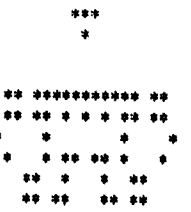
GENERATION: 17 POPULATION: 46



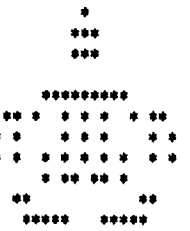
GENERATION: 18 POPULATION: 54



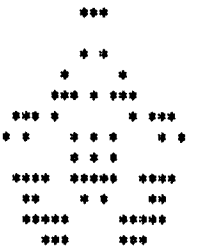
GENERATION: 19 POPULATION: 56



GENERATION: 20 POPULATION: 61



GENERATION: 21 POPULATION: 67



```
 2 PRINT TAB(34);"LIFE"
 4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
 6 PRINT: PRINT: PRINT
 8 PRINT "ENTER YOUR PATTERN:"
 9 X1=1: Y1=1: X2=24: Y2=70
 10 DIM A(24,70),B$(24)
 20 C=1
 30 INPUT B$(C)
 40 IF B$(C)="DONE" THEN B$(C)="": GOTO 80
 50 IF LEFT$(B$(C),1)="." THEN B$(C)=" "+RIGHT$(B$(C),LEN(B$(C))-1)
 60 C=C+1
 70 GOTO 30
 80 C=C-1: L=0
 90 FOR X=1 TO C-1
 100 IF LEN(B$(X))>L THEN L=LEN(B$(X))
 110 NEXT X
 120 X1=11-C/2
 130 Y1=33-L/2
 140 FOR X=1 TO C
 150 FOR Y=1 TO LEN(B$(X))
 160 IF MID$(B$(X),Y,1)<>" " THEN A(X1+X,Y1+Y)=1:P=P+1
 170 NEXT Y
 180 NEXT X
 200 PRINT:PRINT:PRINT
 210 PRINT "GENERATION:";G,"POPULATION:";P;: IF I9 THEN PRINT "INVALID";
 215 X3=24: Y3=70: X4=1: Y4=1: P=0
 220 G=G+1
 225 FOR X=1 TO X1-1: PRINT: NEXT X
 230 FOR X=X1 TO X2
 240 PRINT
 250 FOR Y=Y1 TO Y2
 253 IF A(X,Y)=2 THEN A(X,Y)=0: GOTO 270
 256 IF A(X,Y)=3 THEN A(X,Y)=1: GOTO 261
 260 IF A(X,Y)<>1 THEN 270
 261 PRINT TAB(Y);"*";
 262 IF X<X3 THEN X3=X
 264 IF X>X4 THEN X4=X
 266 IF Y<Y3 THEN Y3=Y
 268 IF Y>Y4 THEN Y4=Y
 270 NEXT Y
 290 NEXT X
 295 FOR X=X2+1 TO 24: PRINT: NEXT X
 299 X1=X3: X2=X4: Y1=Y3: Y2=Y4
 301 IF X1<3 THEN X1=3: I9=-1
 303 IF X2>22 THEN X2=22: I9=-1
 305 IF Y1<3 THEN Y1=3: I9=-1
 307 IF Y2>68 THEN Y2=68: I9=-1
 309 P=0
 500 FOR X=X1-1 TO X2+1
 510 FOR Y=Y1-1 TO Y2+1
 520 C=0
 530 FOR I=X-1 TO X+1
 540 FOR J=Y-1 TO Y+1
 550 IF A(I,J)=1 OR A(I,J)=2 THEN C=C+1
 560 NEXT J
 570 NEXT I
 580 IF A(X,Y)=0 THEN 610
 590 IF C<3 OR C>4 THEN A(X,Y)=2: GOTO 600
 595 P=P+1
 600 GOTO 620
 610 IF C=3 THEN A(X,Y)=3: P=P+1
 620 NEXT Y
 630 NEXT X
 635 X1=X1-1: Y1=Y1-1: X2=X2+1: Y2=Y2+1
 640 GOTO 210
 650 END
```

Life for Two

LIFE-2 is based on Conway's game of Life. You must be familiar with the rules of LIFE before attempting to play LIFE-2.

There are two players; the game is played on a 5x5 board and each player has a symbol to represent his own pieces of 'life.' Live cells belonging to player 1 are represented by '*' and live cells belonging to player 2 are represented by the symbol '#'.

The # and * are regarded as the same except when deciding whether to generate a live cell. An empty cell having two '#' and one '*' for neighbors will generate a '#', i.e. the live cell generated belongs to the player who has the majority of the 3 live cells surrounding the empty cell where life is to be generated, for example:

	1	2	3	4	5
1					
2			*		
3				#	
4			#		
5					

A new cell will be generated at (3,3) which will be a '#' since there are two '#' and one '*' surrounding. The board will then become:

	1	2	3	4	5
1					
2					
3			#	#	
4					
5					

On the first move each player positions 3 pieces of life on the board by typing in the co-ordinates of the pieces. (In the event of the same cell being chosen by both players that cell is left empty.)

The board is then adjusted to the next generation and printed out.

On each subsequent turn each player places one piece on the board, the object being to annihilate his opponent's pieces. The board is adjusted for the next generation and printed out after both players have entered their new piece.

The game continues until one player has no more live pieces. The computer will then print out the board and declare the winner.

The idea for this game, the game itself, and the above write-up were written by Brian Wyvill of Bradford University in Yorkshire, England.

```
2 PRINT TAB(33);"LIFE2"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
7 DIM N(6,6),K(18),A(16),X(2),Y(2)
8 DATA 3,102,103,120,130,121,112,111,12
9 DATA 21,30,1020,1030,1011,1021,1003,1002,1012
10 FOR M=1 TO 18: READ K(M): NEXT M
13 DATA -1,0,1,0,0,-1,0,1,-1,-1,1,-1,-1,1,1,1
14 FOR O1= 1 TO 16: READ A(O1): NEXT O1
20 GOTO 500
50 FOR J=1 TO 5
51 FOR K=1 TO 5
55 IF N(J,K)>99 THEN GOSUB 200
60 NEXT K
65 NEXT J
90 K=0: M2=0: M3=0
99 FOR J=0 TO 6: PRINT
100 FOR K=0 TO 6
101 IF J<>0 THEN IF J<>6 THEN 105
102 IF K=6 THEN PRINT 0;: GOTO 125
103 PRINT K;: GOTO 120
105 IF K<>0 THEN IF K<>6 THEN 110
106 IF J=6 THEN PRINT 0: GOTO 126
107 PRINT J;: GOTO 120
110 GOSUB 300
120 NEXT K
125 NEXT J
126 RETURN
200 B=1: IF N(J,K)>999 THEN B=10
220 FOR O1= 1 TO 15 STEP 2
230 N(J+A(O1),K+A(O1+1))=N(J+A(O1),K+A(O1+1))+B
231 NEXT O1
239 RETURN
300 IF N(J,K)<3 THEN 399
305 FOR O1=1 TO 18
310 IF N(J,K)=K(O1) THEN 350
315 NEXT O1
320 GOTO 399
350 IF O1>9 THEN 360
351 N(J,K)=100: M2=M2+1: PRINT " * ";
355 RETURN
360 N(J,K)=1000: M3=M3+1: PRINT " # ";
365 RETURN
399 N(J,K)=0: PRINT "   ";: RETURN
500 PRINT TAB(10);"U.B. LIFE GAME"
505 M2=0: M3=0
510 FOR J=1 TO 5
511 FOR K=1 TO 5
515 N(J,K)=0
516 NEXT K
517 NEXT J
519 FOR B=1 TO 2: P1=3: IF B=2 THEN P1=30
520 PRINT "PLAYER";B;" - 3 LIVE PIECES."
535 FOR K1=1 TO 3: GOSUB 700
540 N(X(B),Y(B))=P1: NEXT K1
542 NEXT B
559 GOSUB 90
560 PRINT: GOSUB 50
570 IF M2=0 THEN IF M3=0 THEN 574
571 IF M3=0 THEN B=1: GOTO 575
572 IF M2=0 THEN B=2: GOTO 575
573 GOTO 580
574 PRINT: PRINT "A DRAW":STOP
575 PRINT: PRINT "PLAYER";B;"IS THE WINNER": STOP
580 FOR B=1 TO 2: PRINT: PRINT "PLAYER";B;: GOSUB 700
581 IF B=99 THEN 560
582 NEXT B
586 N(X(1),Y(1))=100: N(X(2),Y(2))=1000
596 GOTO 560
700 PRINT "X,Y":PRINT"XXXXXX";CHR$(13);"$$$$$$";CHR$(13);"&&&&&&";
701 PRINT CHR$(13);: INPUT Y(B),X(B)
705 IF X(B)<=5 THEN IF X(B)>0 THEN 708
706 GOTO 750
708 IF Y(B)<=5 THEN IF Y(B)>0 THEN 715
710 GOTO 750
715 IF N(X(B),Y(B))<>0 THEN 750
720 IF B=1 THEN RETURN
725 IF X(1)=X(2) THEN IF Y(1)=Y(2) THEN 740
730 RETURN
740 PRINT "SAME COORD.  SET TO 0"
741 N(X(B)+1,Y(B)+1)=0: B=99: RETURN
750 PRINT "ILLEGAL COORDS. RETYPE": GOTO 700
999 END
```

LIFE2
CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

```
          U.B. LIFE GAME
PLAYER 1  - 3 LIVE PIECES.
X,Y
X,Y
X,Y
PLAYER 2  - 3 LIVE PIECES.
X,Y
X,Y
X,Y

 0  1  2  3  4  5  0
 1  *  *           1
 2  *              2
 3        #        3
 4        #        4
 5        #        5
 0  1  2  3  4  5  0

 0  1  2  3  4  5  0
 1  *  *           1
 2  *              2
 3     #           3
 4     #  #  #     4
 5                 5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *  *           1
 2                 2
 3  *        #     3
 4  #  #  #  #     4
 5        #  #     5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *  *           1
 2     *  *        2
 3  *        #  #  3
 4  #           #  4
 5           #     5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *  *           1
 2           *  #  2
 3  *           #  3
 4  #  #  #     #  4
 5                 5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1     *  *  #     1
 2  *     #     #  2
 3  *              3
 4  #  #  #     #  4
 5     #           5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *        #     1
 2                 2
 3                 3
 4        #        4
 5  #  #  #        5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1                 1
 2  *  *  #        2
 3     #  #        3
 4  #     #        4
 5     #  #        5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y
SAME COORD.  SET TO 0

 0  1  2  3  4  5  0
 1                 1
 2  *  *  #        2
 3        #        3
 4  #        #     4
 5     #  #        5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *  #  #        1
 2  *              2
 3           #     3
 4  #        #     4
 5     #  #        5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *     #        1
 2  *              2
 3  #  #  #        3
 4     #     #  #  4
 5     #  #  #     5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *     #        1
 2                 2
 3           #     3
 4              #  4
 5     #     #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1     #           1
 2     #     #     2
 3        *  #     3
 4              #  4
 5           #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1     #           1
 2     #     #     2
 3              #  3
 4        *     #  4
 5           #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1        #        1
 2        #        2
 3     *        #  3
 4     *  *     #  4
 5     #     #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1                 1
 2        #        2
 3  *              3
 4  *           #  4
 5  *  #     #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1                 1
 2     *           2
 3  *     #  #     3
 4  *     #  #  #  4
 5  *  #  #  #  #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1                 1
 2     *           2
 3  *           #  3
 4  *              4
 5  *           #  5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

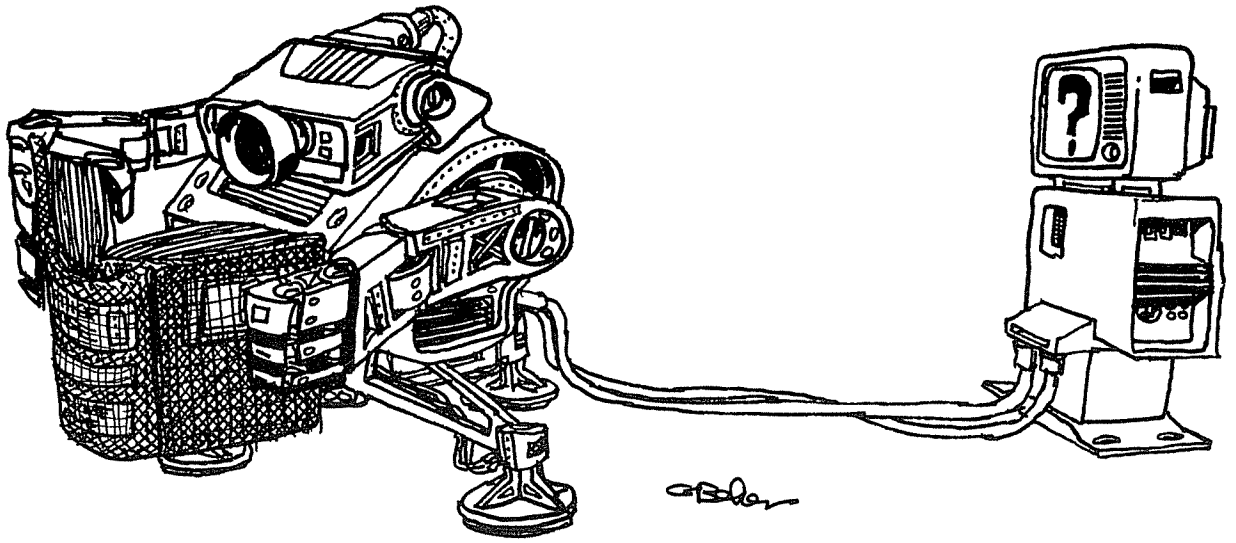
PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1                 1
 2  *  *           2
 3  *              3
 4  *        #     4
 5                 5
 0  1  2  3  4  5  0
PLAYER 1 X,Y

PLAYER 2 X,Y

 0  1  2  3  4  5  0
 1  *  *           1
 2  *  *           2
 3  *              3
 4                 4
 5                 5
 0  1  2  3  4  5  0
PLAYER 1 IS THE WINNER
```

Literature Quiz



This is a simple CAI-type program which presents four multiple-choice questions from children's literature. Running the program is self-explanatory.

The program was written by Pamela McGinley while at DEC.

```
        LITERATURE QUIZ
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


TEST YOUR KNOWLEDGE OF CHILDREN'S LITERATURE.

THIS IS A MULTIPLE-CHOICE QUIZ.
TYPE A 1, 2, 3, OR 4 AFTER THE QUESTION MARK.

GOOD LUCK!


IN PINOCCHIO, WHAT WAS THE NAME OF THE CAT
1)TIGGER, 2)CICERO, 3)FIGARO, 4)GUIPETTO? 2
SORRY...FIGARO WAS HIS NAME.


FROM WHOSE GARDEN DID BUGS BUNNY STEAL THE CARROTS?
1)MR. NIXON'S, 2)ELMER FUDD'S, 3)CLEM JUDD'S, 4)STROMBOLI'S? 2
PRETTY GOOD!


IN THE WIZARD OF OZ, DOROTHY'S DOG WAS NAMED
1) CICERO, 2) TRIXIE, 3) KING, 4) TOTO ? 4
YEA!  YOU'RE A REAL LITERATURE GIANT.


WHO WAS THE FAIR MAIDEN WHO ATE THE POISON APPLE
1)SLEEPING BEAUTY, 2)CINDERELLA, 3)SNOW WHITE, 4)WENDY? 1
OH, COME ON NOW...IT WAS SNOW WHITE.


NOT BAD, BUT YOU MIGHT SPEND A LITTLE MORE TIME
READING THE NURSERY GREATS.

BREAK IN 96
```

```
1 PRINT TAB(25);"LITERATURE QUIZ"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
5 R=0
10 PRINT "TEST YOUR KNOWLEDGE OF CHILDREN'S LITERATURE."
12 PRINT: PRINT "THIS IS A MULTIPLE-CHOICE QUIZ."
13 PRINT "TYPE A 1, 2, 3, OR 4 AFTER THE QUESTION MARK."
15 PRINT: PRINT "GOOD LUCK!": PRINT: PRINT
40 PRINT "IN PINOCCHIO, WHAT WAS THE NAME OF THE CAT"
42 PRINT "1)TIGGER, 2)CICERO, 3)FIGARO, 4)GUIPETTO";
43 INPUT A: IF A=3 THEN 46
44 PRINT "SORRY...FIGARO WAS HIS NAME.": GOTO 50
46 PRINT "VERY GOOD!  HERE'S ANOTHER."
47 R=R+1
50 PRINT: PRINT
51 PRINT "FROM WHOSE GARDEN DID BUGS BUNNY STEAL THE CARROTS?"
52 PRINT "1)MR. NIXON'S, 2)ELMER FUDD'S, 3)CLEM JUDD'S, 4)STROMBOLI'S";
53 INPUT A: IF A=2 THEN 56
54 PRINT "TOO BAD...IT WAS ELMER FUDD'S GARDEN.": GOTO 60
56 PRINT "PRETTY GOOD!"
57 R=R+1
60 PRINT: PRINT
61 PRINT "IN THE WIZARD OF OZ, DOROTHY'S DOG WAS NAMED"
62 PRINT "1) CICERO, 2) TRIXIE, 3) KING, 4) TOTO ";
63 INPUT A: IF A=4 THEN 66
64 PRINT "BACK TO THE BOOKS,...TOTO WAS HIS NAME.": GOTO 70
66 PRINT "YEA!  YOU'RE A REAL LITERATURE GIANT."
67 R=R+1
70 PRINT:PRINT
71 PRINT "WHO WAS THE FAIR MAIDEN WHO ATE THE POISON APPLE"
72 PRINT "1)SLEEPING BEAUTY, 2)CINDERELLA, 3)SNOW WHITE, 4)WENDY";
73 INPUT A: IF A=3 THEN 76
74 PRINT "OH, COME ON NOW...IT WAS SNOW WHITE."
75 GOTO 80
76 PRINT "GOOD MEMORY!"
77 R=R+1
80 PRINT:PRINT
85 IF R=4 THEN 100
90 IF R<2 THEN 200
92 PRINT "NOT BAD, BUT YOU MIGHT SPEND A LITTLE MORE TIME"
94 PRINT "READING THE NURSERY GREATS."
96 STOP
100 PRINT "WOW!  THAT'S SUPER!  YOU REALLY KNOW YOUR NURSERY"
110 PRINT "YOUR NEXT QUIZ WILL BE ON 2ND CENTURY CHINESE"
120 PRINT "LITERATURE (HA, HA, HA)"
130 STOP
200 PRINT "UGH.  THAT WAS DEFINITELY NOT TOO SWIFT.  BACK TO"
205 PRINT "NURSERY SCHOOL FOR YOU, MY FRIEND."
999 END
```

Love

This program is designed to reproduce Robert Indiana's great art work "Love" with a message of your choice up to 60 characters long.

Your message is input as A$ in Statement 60. Statements 100-130 repeat the message A$ if it is less than 60 characters long and insert it into T$. Statements 210-400 actually print the design. The data statements are an alternating count of the number of characters and blanks which form the design. These data give the correct proportions for a standard 10 character per inch Teletype or line printer. The 13.2 characters per inch of the Teletype Model 43 on which this was printed cause some distortion.

The love program was created by David Ahl.

```
                  LOVE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

A TRIBUTE TO THE GREAT AMERICAN ARTIST, ROBERT INDIANA.
HIS GREAT WORK WILL BE REPRODUCED WITH A MESSAGE OF
YOUR CHOICE UP TO 60 CHARACTERS.  IF YOU CAN'T THINK OF
A MESSAGE, SIMPLE TYPE THE WORD 'LOVE'

YOUR MESSAGE, PLEASE? LOVE



LOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVE
L            OVELOVELOVELOVELOVELOVELOV         LOVELOVELOVE
LOV        ELOVELOVELOVELOVELOVELOV               LOVELOVE
LOVE      VELOVELOVELOVELOVELOVEL                   VELOVE
LOVE      VELOVELOVELOVELOVELOVE            LOVEL     ELOVE
LOVE      VELOVELOVELOVELOVELOV           VELOVELO      LOVE
LOVE      VELOVELOVELOVELOVELOV          OVELOVELOV     LOVE
LOVE      VELOVELOVELOVELOVELOV         LOVELOVELOV     LOVE
LOVE      VELOVELOVELOVELOVELOV        ELOVELOVELO      LOVE
LOVE      VELOVELOVELOVELOVELOV       VELOVELOVEL       LOVE
LOVE      VELOVELOVELOVELOVELOV      OVELOVELOVE        LOVE
LOVE      VELOVELOVELOVELOVEL V     LOVELOVELOV         LOVE
LOVE      VELOVELOVELOVELOVEL V     LOVELOVELO          LOVE
LOVE      VELOVELOVELOVELOVE  V      OVELOVEL           LOVE
LOVE      VELOVELOVELOVELOV   V       VELOV             LOVE
LOVE      VELOVELOVELOVEL     VE                       ELOVE
L                             VELOV                 LOVELOVE
L                             VELOVELOV         LOVELOVELOVE
L             VELOV                                       E
L             VELOV                                       E
LOVE      VELOVELOVELOV   VELOVELOVE      VELOVELOVELO     E
LOVEL      ELOVELOVELO   OVELOVELOVE      VELOVELOVELOVE   E
LOVEL      ELOVELOVELO   OVELOVELOVE      VELOVELOVELOVEL  E
LOVELO      LOVELOVEL   LOVELOVELOVE      VELOVELOVELOVELO E
LOVELO      LOVELOVEL   LOVELOVELOVE      VELOVEL VELOVELOVE
LOVELOV      OVELOVE   ELOVELOVELOVE      VELOVE  VELOVELOVE
LOVELOV      OVELOVE   ELOVELOVELOVE              VELOVELOVE
LOVELOVE      VELOV   VELOVELOVELOVE      VELOVE  VELOVELOVE
LOVELOVE      VELOV   VELOVELOVELOVE      VELOVEL VELOVELOVE
LOVELOVEL      ELO   OVELOVELOVELOVE      VELOVELOVELOVELO E
LOVELOVEL      ELO   OVELOVELOVELOVE      VELOVELOVELOVEL  E
LOVELOVELO      L   LOVELOVELOVELOVE      VELOVELOVELOVE   E
LOVELOVELO          LOVELOVELOVELOVE      VELOVELOVELO     E
LOVELOVELOV        ELOVELOVELOVE                         E
LOVELOVELOV        ELOVELOVELOVE                         E
LOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVELOVE
```

```
2 PRINT TAB(33);"LOVE"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
20 PRINT "A TRIBUTE TO THE GREAT AMERICAN ARTIST, ROBERT INDIANA."
30 PRINT "HIS GREAT WORK WILL BE REPRODUCED WITH A MESSAGE OF"
40 PRINT "YOUR CHOICE UP TO 60 CHARACTERS.  IF YOU CAN'T THINK OF"
50 PRINT "A MESSAGE, SIMPLE TYPE THE WORD 'LOVE'": PRINT
60 INPUT "YOUR MESSAGE, PLEASE";A$: L=LEN(A$)
70 DIM T$(120): FOR I=1 TO 10: PRINT: NEXT I
100 FOR J=0 TO INT(60/L)
110 FOR I=1 TO L
120 T$(J*L+I)=MID$(A$,I,1)
130 NEXT I: NEXT J
140 C=0
200 A1=1: P=1: C=C+1: IF C=37 THEN 999
205 PRINT
210 READ A: A1=A1+A: IF P=1 THEN 300
240 FOR I=1 TO A: PRINT " ";: NEXT I: P=1: GOTO 400
300 FOR I=A1-A TO A1-1: PRINT T$(I);: NEXT I: P=0
400 IF A1>60 THEN 200
410 GOTO 210
600 DATA 60,1,12,26,9,12,3,8,24,17,8,4,6,23,21,6,4,6,22,12,5,6,5
610 DATA 4,6,21,11,8,6,4,4,6,21,10,10,5,4,4,6,21,9,11,5,4
620 DATA 4,6,21,8,11,6,4,4,6,21,7,11,7,4,4,6,21,6,11,8,4
630 DATA 4,6,19,1,1,5,11,9,4,4,6,19,1,1,5,10,10,4,4,6,18,2,1,6,8,11,4
640 DATA 4,6,17,3,1,7,5,13,4,4,6,15,5,2,23,5,1,29,5,17,8
650 DATA 1,29,9,9,12,1,13,5,40,1,1,13,5,40,1,4,6,13,3,10,6,12,5,1
660 DATA 5,6,11,3,11,6,14,3,1,5,6,11,3,11,6,15,2,1
670 DATA 6,6,9,3,12,6,16,1,1,6,6,9,3,12,6,7,1,10
680 DATA 7,6,7,3,13,6,6,2,10,7,6,7,3,13,14,10,8,6,5,3,14,6,6,2,10
690 DATA 8,6,5,3,14,6,7,1,10,9,6,3,3,15,6,16,1,1
700 DATA 9,6,3,3,15,6,15,2,1,10,6,1,3,16,6,14,3,1,10,10,16,6,12,5,1
710 DATA 11,8,13,27,1,11,8,13,27,1,60
999 FOR I=1 TO 10: PRINT: NEXT I: END
```

Lunar LEM Rocket

This game in its many different versions and names (ROCKET, LUNAR, LEM, and APOLLO) is by far and away the single most popular computer game. It exists in versions that start you anywhere from 500 feet to 200 miles above the moon, or other planets, too. Some allow the control of directional stabilization rockets and/or the retro rocket. The three versions presented here represent the most popular of the many variations.

In most versions of this game, the temptation is to slow up too soon and then have no fuel left for the lower part of the journey. This, of course, is disasterous (as you will find out when you land your own capsule)!

LUNAR was originally in FOCAL by Jim Storer while a student at Lexington High School and subsequently converted to BASIC by David Ahl. ROCKET was written by Eric Peters at DEC and LEM by William Labaree II of Alexandria, Virginia.

In this program, you set the burn rate of the retro rockets (pounds of fuel per second) every 10 seconds and attempt to achieve a soft landing on the moon. 200 lbs/sec really puts the brakes on, and 0 lbs/sec is free fall. Ignition occurs at 8 lbs/sec, so *do not* use burn rates between 1 and 7 lbs/sec. To make the landing more of a challenge, but more closely approximate the real Apollo LEM capsule, you should make the available fuel at the start (N) equal to 16,000 lbs, and the weight of the capsule (M) equal to 32,500 lbs in Statement 15.

Some versions of BASIC object to the series expansion calculations in Statements 420 and 430 (as you near the lunar surface, these numbers get very small). If your does, substitute the following expanded form for the expansion in Statement 420:

```
-Q*(1+Q*(1/2+Q*(1/3+Q*(1/4+Q/5))))
```

You should be able to figure the other one out yourself.

```
                LUNAR
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS IS A COMPUTER SIMULATION OF AN APOLLO LUNAR
LANDING CAPSULE.

THE ON-BOARD COMPUTER HAS FAILED
SO YOU HAVE TO LAND THE CAPSULE MANUALLY.

SET BURN RATE OF RETRO ROCKETS TO ANY VALUE BETWEEN
0 (FREE FALL) AND 200 (MAXIMUM BURN) POUNDS PER SECOND.
SET NEW BURN RATE EVERY 10 SECONDS.

CAPSULE WEIGHT 32,500 LBS; FUEL WEIGHT 16,500 LBS.

GOOD LUCK

SEC           MI + FT       MPH           LB FUEL       BURN RATE

 0             120  0        3600          16500         ? 0
 10            109  5015     3636          16500         ? 0
 20            99   4223     3672          16500         ? 0
 30            89   2903     3708          16500         ? 0
 40            79   1055     3744          16500         ? 0
 50            68   3959     3780          16500         ? 0
 60            58   1055     3816          16500         ? 0
 70            47   2903     3852          16500         ? 200
 80            37   1883     3482.87       14500         ? 200
 90            28   1191     3086.71       12500         ? 200
 100           20   1251     2659.65       10500         ? 200
 110           13   2549     2196.95       8500          ? 200
 120           8    370      1692.63       6500          ? 100
 130           3    3778     1440.59       5500          ? 75
ON MOON AT 139.926 SECONDS - IMPACT VELOCITY 1253.25 MPH
SORRY THERE WERE NO SURVIVORS.  YOU BLEW IT!
IN FACT, YOU BLASTED A NEW LUNAR CRATER 347.15 FEET DEEP!

TRY AGAIN??
```

```
10 PRINT TAB(33);"LUNAR"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
25 PRINT:PRINT:PRINT
30 PRINT "THIS IS A COMPUTER SIMULATION OF AN APOLLO LUNAR"
40 PRINT "LANDING CAPSULE.": PRINT: PRINT
50 PRINT "THE ON-BOARD COMPUTER HAS FAILED (IT WAS MADE BY"
60 PRINT "XEROX) SO YOU HAVE TO LAND THE CAPSULE MANUALLY."
70 PRINT: PRINT "SET BURN RATE OF RETRO ROCKETS TO ANY VALUE BETWEEN"
80 PRINT "0 (FREE FALL) AND 200 (MAXIMUM BURN) POUNDS PER SECOND."
90 PRINT "SET NEW BURN RATE EVERY 10 SECONDS.": PRINT
100 PRINT "CAPSULE WEIGHT 32,500 LBS; FUEL WEIGHT 16,500 LBS."
110 PRINT: PRINT: PRINT: PRINT "GOOD LUCK"
120 L=0
130 PRINT: PRINT "SEC","MI + FT","MPH","LB FUEL","BURN RATE":PRINT
140 A=120:V=1:M=33000!:N=16500:G=1E-03:Z=1.8
150 PRINT L,INT(A);INT(5280*(A-INT(A))),3600*V,M-N,:INPUT K:T=10
160 IF M-N<1E-03 THEN 240
170 IF T<1E-03 THEN 150
180 S=T: IF M>=N+S*K THEN 200
190 S=(M-N)/K
200 GOSUB 420: IF I<=0 THEN 340
210 IF V<=0 THEN 230
220 IF J<0 THEN 370
230 GOSUB 330: GOTO 160
240 PRINT "FUEL OUT AT";L;"SECONDS":S=(-V+SQR(V*V+2*A*G))/G
250 V=V+G*S: L=L+S
260 W=3600*V: PRINT "ON MOON AT";L;"SECONDS - IMPACT VELOCITY";W;"MPH"
270 IF W<=1.2 THEN PRINT "PERFECT LANDING!": GOTO440
280 IF W<=10 THEN PRINT "GOOD LANDING (COULD BE BETTER)":GOTO440
282 IF W>60THEN300
284 PRINT "CRAFT DAMAGE... YOU'RE STRANDED HERE UNTIL A RESCUE"
286 PRINT "PARTY ARRIVES.  HOPE YOU HAVE ENOUGH OXYGEN!"
288 GOTO 440
300 PRINT "SORRY THERE WERE NO SURVIVORS.  YOU BLEW IT!"
310 PRINT "IN FACT, YOU BLASTED A NEW LUNAR CRATER";W*.277;"FEET DEEP!"
320 GOTO 440
330 L=L+S: T=T-S: M=M-S*K: A=I: V=J: RETURN
340 IF S<5E-03 THEN 260
350 D=V+SQR(V*V+2*A*(G-Z*K/M)):S=2*A/D
360 GOSUB420: GOSUB 330: GOTO 340
370 W=(1-M*G/(Z*K))/2: S=M*V/(Z*K*(W+SQR(W*W+V/Z)))+.05:GOSUB 420
380 IF I<=0 THEN 340
390 GOSUB 330: IF J>0 THEN 160
400 IF V>0 THEN 370
410 GOTO 160
420 Q=S*K/M: J=V+G*S+Z*(-Q-Q*Q/2-Q^3/3-Q^4/4-Q^5/5)
430 I=A-G*S*S/2-V*S+Z*S*(Q/2+Q^2/6+Q^3/12+Q^4/20+Q^5/30):RETURN
440 PRINT:PRINT:PRINT:PRINT "TRY AGAIN??": GOTO 70
```

This is the most comprehensive of the three versions and permits you to control the time interval of firing, the thrust, and the attitude angle. It also allows you to work in the metric or English system of measurement. The instructions in the program dialog are very complete, so you shouldn't have any trouble.

```
LEM CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY
LUNAR LANDING SIMULATION
HAVE YOU FLOWN AN APOLLO/LEM MISSION BEFORE (YES OR NO)? NO
WHICH SYSTEM OF MEASUREMENT DO YOU PREFER?
 1=METRIC     0=ENGLISH
ENTER THE APPROPRIATE NUMBER? 1

  YOU ARE ON A LUNAR LANDING MISSION.  AS THE PILOT OF
THE LUNAR EXCURSION MODULE, YOU WILL BE EXPECTED TO
GIVE CERTAIN COMMANDS TO THE MODULE NAVIGATION SYSTEM.
THE ON-BOARD COMPUTER WILL GIVE A RUNNING ACCOUNT
OF INFORMATION NEEDED TO NAVIGATE THE SHIP.

THE ATTITUDE ANGLE CALLED FOR IS DESCRIBED AS FOLLOWS.
+ OR -180 DEGREES IS DIRECTLY AWAY FROM THE MOON
-90 DEGREES IS ON A TANGENT IN THE DIRECTION OF ORBIT
+90 DEGREES IS ON A TANGENT FROM THE DIRECTION OF ORBIT
0 (ZERO) DEGREES IS DIRECTLY TOWARD THE MOON

       -180,180
          ^
    -90 < -+- > 90
          !
          0
<< DIRECTION OF ORBIT <<

    SURFACE OF MOON
ALL ANGLES BETWEEN -180 AND 180 DEGREES ARE ACCEPTED.

1 FUEL UNIT = 1 SEC. AT MAX THRUST
ANY DISCREPANCIES ARE ACCOUNTED FOR IN THE USE OF FUEL
FOR AN ATTITUDE CHANGE.
AVAILABLE ENGINE POWER: 0 (ZERO) AND ANY VALUE BETWEEN
10 AND 100 PERCENT.

NEGATIVE THRUST OR TIME IS PROHIBITED.
INPUT: TIME INTERVAL IN SECONDS ------ (T)
       PERCENTAGE OF THRUST ---------- (P)
       ATTITUDE ANGLE IN DEGREES ----- (A)

FOR EXAMPLE:
T,P,A? 10,65,-60
TO ABORT THE MISSION AT ANY TIME, ENTER 0,0,0

OUTPUT: TOTAL TIME IN ELAPSED SECONDS
        HEIGHT IN FEET
        DISTANCE FROM LANDING SITE IN FEET
        VERTICAL VELOCITY IN FEET/SECOND
        HORIZONTAL VELOCITY IN FEET/SECOND
        FUEL UNITS REMAINING
  0       111168      -5.87625E+06   0          1615.6     750
T,P,A? 500,0,0
  500     106292      -5.11633E+06  -19.2028    1619.92    750
T,P,A? 100,0,0
  600     104194      -4.96362E+06  -22.7246    1621.78    750
T,P,A? 50,90,-90
  650     102916      -4.89021E+06  -30.3757    1484.58    705
T,P,A? 100,23,0
  750     101907      -4.75003E+06   10.3519    1485.42    682.001
T,P,A? 50,90,-90
  800     101993      -4.68314E+06  -8.76788    1341.57    637.001
T,P,A? 100,40,-90
  900     98339.8     -4.5622E+06   -67.3979    1213.07    597.002
T,P,A? 50,10,0
  950     94511.6     -4.50472E+06  -85.7323    1215.63    592.002
T,P,A? 50,100,0
  1000    93320.2     -4.44704E+06   38.8868    1216.44    542.002
T,P,A? 50,100,-90
  1050    94322.6     -4.3933E+06   -.608409    1041.58    492.002
T,P,A? 50,100,-90
  1100    93090       -4.34794E+06  -50.2899    862.287    442.002
T,P,A? 50,100,-90
  1150    89146.7     -4.31115E+06  -108.811    677.922    392.002
T,P,A? 100,100,-90
  1250    71572.2     -4.26382E+06  -246.665    290.396    292.002
T,P,A? 50,100,0
  1300    62205.7     -4.24981E+06  -126.903    291.928    242.002
T,P,A? 100,50,0
  1400    52014.2     -4.22147E+06  -75.8944    293.614    192.002
T,P,A? 100,40,-90
  1500    36711.6     -4.20102E+06  -231.305    116.821    152.002
T,P,A? 50,50,90
  1550    23159.8     -4.19258E+06  -310.782    232.752    127.002
T,P,A? 50,50,90
  1600    5635.9      -4.17824E+06  -390.108    352.728    102.002
T,P,A? 10,0,0
  1610    1655.62     -4.17471E+06  -405.96     353.546    102.002
T,P,A? 10,100,0
  1614.5  -142.239     -4.17312E+06  -393.08     353.917    97.5017

CRASH !!!!!!!!!!!!!!!!
YOUR IMPACT CREATED A CRATER 142.239 METERS DEEP.
AT CONTACT YOU WERE TRAVELING 1904.15  KILOMETERS/HR
DO YOU WANT TO TRY IT AGAIN (YES/NO)?
? NO THANKS!
DO YOU WANT TO TRY IT AGAIN (YES/NO)?
? NO
TOO BAD, THE SPACE PROGRAM HATES TO LOSE EXPERIENCED
ASTRONAUTS.
```

```
2 PRINT TAB(34);"LEM"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
7 REM ROCKT2 IS AN INTERACTIVE GAME THAT SIMULATES A LUNAR
8 REM LANDING IS SIMILAR TO THAT OF THE APOLLO PROGRAM.
9 REM THERE IS ABSOLUTELY NO CHANCE INVOLVED
10 Z$="80"
15 B1=1
20 M=17.95
25 F1=5.25
30 N=7.5
35 R0=926
40 V0=1.29
45 T=0
50 H0=60
55 R=R0+H0
60 A=-3.425
65 R1=0
70 A1=8.84361E-04
75 R3=0
80 A3=0
85 M1=7.45
90 M0=M1
95 B=750
100 T1=0
105 F=0
110 P=0
115 N=1
120 M2=0
125 S=0
130 C=0
135 IF Z$="YES" THEN 1150
140 PRINT
145 PRINT "LUNAR LANDING SIMULATION"
150 PRINT
155 PRINT "HAVE YOU FLOWN AN APOLLO/LEM MISSION BEFORE";
160 PRINT " (YES OR NO)";
165 INPUT Q$
170 IF Q$="YES" THEN 190
175 IF Q$="NO" THEN 205
180 PRINT "JUST ANSWER THE QUESTION, PLEASE, ";
185 GOTO 160
190 PRINT
195 PRINT "INPUT MEASUREMENT OPTION NUMBER";
200 GOTO 225
205 PRINT
210 PRINT "WHICH SYSTEM OF MEASUREMENT DO YOU PREFER?"
215 PRINT " 1=METRIC     0=ENGLISH"
220 PRINT "ENTER THE APPROPRIATE NUMBER";
225 INPUT K
230 PRINT
235 IF K=0 THEN 280
240 IF K=1 THEN 250
245 GOTO 220
250 Z=1852.8
255 M$="METERS"
260 G3=3.6
265 N$=" KILOMETERS"
270 G5=1000
275 GOTO 305
280 Z=6080
285 M$="FEET"
290 G3=.592
```

```
295 N$="N.MILES"
300 G5=Z
305 IF B1=3 THEN 670
310 IF Q$="YES" THEN 485
315 PRINT
320 PRINT "  YOU ARE ON A LUNAR LANDING MISSION.  AS THE PILOT OF"
325 PRINT "THE LUNAR EXCURSION MODULE, YOU WILL BE EXPECTED TO"
330 PRINT "GIVE CERTAIN COMMANDS TO THE MODULE NAVIGATION SYSTEM."
335 PRINT "THE ON-BOARD COMPUTER WILL GIVE A RUNNING ACCOUNT"
340 PRINT "OF INFORMATION NEEDED TO NAVIGATE THE SHIP."
345 PRINT
350 PRINT
355 PRINT "THE ATTITUDE ANGLE CALLED FOR IS DESCRIBED AS FOLLOWS."
360 PRINT "+ OR -180 DEGREES IS DIRECTLY AWAY FROM THE MOON"
365 PRINT "-90 DEGREES IS ON A TANGENT IN THE DIRECTION OF ORBIT"
370 PRINT "+90 DEGREES IS ON A TANGENT FROM THE DIRECTION OF ORBIT"
375 PRINT "0 (ZERO) DEGREES IS DIRECTLY TOWARD THE MOON"
380 PRINT
385 PRINT TAB(30);"-180,180"
390 PRINT TAB(34);"^"
395 PRINT TAB(27);"-90 < -+- > 90"
400 PRINT TAB(34);"!"
405 PRINT TAB(34);"0"
410 PRINT TAB(23);"<< DIRECTION OF ORBIT <<"
415 PRINT
420 PRINT TAB(27);"SURFACE OF MOON"
425 PRINT
430 PRINT
435 PRINT "ALL ANGLES BETWEEN -180 AND 180 DEGREES ARE ACCEPTED."
440 PRINT
445 PRINT "1 FUEL UNIT = 1 SEC. AT MAX THRUST"
450 PRINT "ANY DISCREPANCIES ARE ACCOUNTED FOR IN THE USE OF FUEL"
455 PRINT "FOR AN ATTITUDE CHANGE."
460 PRINT "AVAILABLE ENGINE POWER: 0 (ZERO) AND ANY VALUE BETWEEN"
465 PRINT "10 AND 100 PERCENT."
470 PRINT
475 PRINT"NEGATIVE THRUST OR TIME IS PROHIBITED."
480 PRINT
485 PRINT
490 PRINT "INPUT: TIME INTERVAL IN SECONDS ------ (T)"
495 PRINT "       PERCENTAGE OF THRUST ---------- (P)"
500 PRINT "       ATTITUDE ANGLE IN DEGREES ----- (A)"
505 PRINT
510 IF Q$="YES" THEN 535
515 PRINT "FOR EXAMPLE:"
520 PRINT "T,P,A? 10,65,-60"
525 PRINT "TO ABORT THE MISSION AT ANY TIME, ENTER 0,0,0"
530 PRINT
535 PRINT "OUTPUT: TOTAL TIME IN ELAPSED SECONDS"
540 PRINT "        HEIGHT IN ";M$
545 PRINT "        DISTANCE FROM LANDING SITE IN ";M$
550 PRINT "        VERTICAL VELOCITY IN ";M$;"/SECOND"
555 PRINT "        HORIZONTAL VELOCITY IN ";M$;"/SECOND"
560 PRINT "        FUEL UNITS REMAINING"
565 PRINT
570 GOTO 670
575 PRINT
580 PRINT "T,P,A";
585 INPUT T1,F,P
590 F=F/100
595 IF T1<0 THEN 905
600 IF T1=0 THEN 1090
605 IF ABS(F-.05)>1 THEN 945
610 IF ABS(F-.05)<.05 THEN 945
615 IF ABS(P)>180 THEN 925
620 N=20
625 IF T1<400 THEN 635
630 N=T1/20
635 T1=T1/N
640 P=P*3.14159/180
645 S=SIN(P)
650 C=COS(P)
655 M2=M0*T1*F/B
660 R3=-.5*R0*((V0/R)^2)+R*A1*A1
665 A3=-2*R1*A1/R
670 FOR I=1 TO N
675 IF M1=0 THEN 715
680 M1=M1-M2
685 IF M1>0 THEN 725
690 F=F*(1+M1/M2)
695 M2=M1+M2
700 PRINT "YOU ARE OUT OF FUEL."
705 M1=0
710 GOTO 725
715 F=0
720 M2=0
725 M=M-.5*M2
730 R4=R3
735 R3=-.5*R0*((V0/R)^2)+R*A1*A1
740 R2=(3*R3-R4)/2+.00526*F1*F*C/M
745 A4=A3
750 A3=-2*R1*A1/R
755 A2=(3*A3-A4)/2+.0056*F1*F*S/(M*R)
760 X=R1*T1+.5*R2*T1*T1
765 R=R+X
770 H0=H0+X
775 R1=R1+R2*T1
780 A=A+A1*T1+.5*A2*T1*T1
785 A1=A1+A2*T1
790 M=M-.5*M2
795 T=T+T1
800 IF H0<3.287828E-04 THEN 810
805 NEXT I
810 H=H0*Z
815 H1=R1*Z
820 D=R0*A*Z
825 D1=R*A1*Z
830 T2=M1*B/M0
835 PRINT " ";T;TAB(10);H;TAB(23);D;
840 PRINT TAB(37);H1;TAB(49);D1;TAB(60);T2
845 IF H0<3.287828E-04 THEN 880
850 IF R0*A>164.4736 THEN 1050
855 IF M1>0 THEN 580
860 T1=20
865 F=0
870 P=0
875 GOTO 620
880 IF R1<-8.21957E-04 THEN 1020
885 IF ABS(R*A1)>4.931742E-04 THEN 1020
890 IF H0<-3.287828E-04 THEN 1020
895 IF ABS(D)>10*Z THEN 1065
900 GOTO 995
905 PRINT
910 PRINT "THIS SPACECRAFT IS NOT ABLE TO  VIOLATE THE SPACE-";
915 PRINT "TIME CONTINUUM."
920 GOTO 575
925 PRINT
930 PRINT "IF YOU WANT TO SPIN AROUND, GO OUTSIDE THE MODULE"
935 PRINT "FOR AN E.V.A."
940 GOTO 575
945 PRINT
950 PRINT "IMPOSSIBLE THRUST VALUE ";
955 IF F<0 THEN 985
960 IF F-.05<.05 THEN 975
965 PRINT "TOO LARGE"
970 GOTO 575
975 PRINT "TOO SMALL"
980 GOTO 575
985 PRINT "NEGATIVE"
990 GOTO 575
995 PRINT
1000 PRINT "TRANQUILITY BASE HERE -- THE EAGLE HAS LANDED"
1005 PRINT "CONGRATULATIONS -- THERE WAS NO SPACECRAFT DAMAGE"
1010 PRINT "YOU MAY NOW PROCEED WITH SURFACE EXPLORATION."
1015 GOTO 1100
1020 PRINT
1025 PRINT "CRASH !!!!!!!!!!!!!!!!"
1030 PRINT "YOUR IMPACT CREATED A CRATER";ABS(H);M$;" DEEP."
1035 X1=SQR(D1*D1+H1*H1)*G3
1040 PRINT "AT CONTACT YOU WERE TRAVELING";X1;N$;"/HR"
1045 GOTO 1100
1050 PRINT
1055 PRINT "YOU HAVE BEEN LOST IN SPACE WITH NO HOPE OF RECOVERY."
1060 GOTO 1100
1065 PRINT "YOU ARE DOWN SAFELY - "
1075 PRINT
1080 PRINT "BUT MISSED THE LANDING SITE BY";ABS(D/G5);N$
1085 GOTO 1100
1090 PRINT
1095 PRINT "MISSION ABENDED"
1100 PRINT
1105 PRINT "DO YOU WANT TO TRY IT AGAIN (YES/NO)?"
1110 INPUT Z$
1115 IF Z$="YES" THEN 20
1120 IF Z$="NO" THEN 1130
1125 GOTO 1105
1130 PRINT
1135 PRINT "TOO BAD, THE SPACE PROGRAM HATES TO LOSE EXPERIENCED"
1140 PRINT "ASTRONAUTS."
1145 STOP
1150 PRINT
1155 PRINT "OK, DO YOU WANT THE COMPLETE INSTRUCTIONS OR THE INPUT -"
1160 PRINT "OUTPUT STATEMENTS?"
1165 PRINT "1=COMPLETE INSTRUCTIONS"
1170 PRINT "2=INPUT-OUTPUT STATEMENTS"
1175 PRINT "3=NEITHER"
1180 INPUT B1
1185 Q$="NO"
1190 IF B1=1 THEN 205
1195 Q$="YES"
1200 IF B1=2 THEN 190
1205 IF B1=3 THEN 190
1210 GOTO 1165
1215 END
```

In this version, you start 500 feet above the lunar surface and control the burn rate in 1-second bursts. Each unit of fuel slows your descent by 1 ft/sec. The maximum thrust of your engine is 30 ft/sec/sec.

```
                ROCKET
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

LUNAR LANDING SIMULATION
----- ------- ----------

DO YOU WANT INSTRUCTIONS (YES OR NO)? YES

YOU ARE LANDING ON THE MOON AND HAVE TAKEN OVER MANUAL
CONTROL 500 FEET ABOVE A GOOD LANDING SPOT.  YOU HAVE A
DOWNWARD VELOCITY OF 50 FT/SEC.  120 UNITS OF FUEL REMAIN.

HERE ARE THE RULES THAT GOVERN YOUR SPACE VEHICLE:
(1) AFTER EACH SECOND, THE HEIGHT, VELOCITY, AND REMAINING
    FUEL WILL BE REPORTED.
(2) AFTER THE REPORT, A '?' WILL BE TYPED.  ENTER THE
    NUMBER OF UNITS OF FUEL YOU WISH TO BURN DURING THE
    NEXT SECOND.  EACH UNIT OF FUEL WILL SLOW YOUR DESCENT
    BY 1 FT/SEC.
(3) THE MAXIMUM THRUST OF YOUR ENGINE IS 30 FT/SEC/SEC OR
    30 UNITS OF FUEL PER SECOND.
(4) WHEN YOU CONTACT THE LUNAR SURFACE, YOUR DESCENT ENGINE
    WILL AUTOMATICALLY CUT OFF AND YOU WILL BE GIVEN A
    REPORT OF YOUR LANDING SPEED AND REMAINING FUEL.
(5) IF YOU RUN OUT OF FUEL, THE '?' WILL NO LONGER APPEAR,
    BUT YOUR SECOND-BY-SECOND REPORT WILL CONTINUE UNTIL
    YOU CONTACT THE LUNAR SURFACE.

BEGINNING LANDING PROCEDURE.....

G O O D   L U C K ! ! !


SEC  FEET   SPEED   FUEL     PLOT OF DISTANCE

 0   500     50      120     I                                          *
? 0
 1   447.5   55      120     I                                    *
? 0
 2   390     60      120     I                                *
? 0
 3   327.5   65      120     I                          *
? 0
 4   260     70      120     I                    *
? 10
 5   192.5   65      110     I              *
? 5
 6   127.5   65      105     I         *
? 25
 7   72.5    45      80      I     *
? 25
 8   37.5    25      55      I  *
? 25
 9   22.5    5       30      I*
? 7
 10  18.5    3       23      I*
? 7
 11  16.5    1       16      I*
? 4
 12  15      2       12      I*
? 3
 13  12      4       9       I*
? 3
 14  7       6       6       I*
? 6
**** OUT OF FUEL****
 15  1.5     5       0       I*
**** CONTACT ****
TOUCHDOWN AT 15.2649 SECONDS.
LANDING VELOCITY = 6.32456 FEET/SEC.
 0 UNITS OF FUEL REMAINING.
***** SORRY, BUT YOU BLEW IT!!!!
APPROPRIATE CONDOLENCES WILL BE SENT TO YOUR NEXT OF KIN.
ANOTHER MISSION? NO THANKS!

CONTROL OUT.
```

```
10 PRINT  TAB(33);"ROCKET"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
70 PRINT "LUNAR LANDING SIMULATION"
80 PRINT "----- ------- ----------": PRINT
100 INPUT "DO YOU WANT INSTRUCTIONS (YES OR NO)";A$
110 IF A$="NO" THEN 390
160 PRINT
200 PRINT "YOU ARE LANDING ON THE MOON AND HAVE TAKEN OVER MANUAL"
210 PRINT "CONTROL 500 FEET ABOVE A GOOD LANDING SPOT.  YOU HAVE A"
220 PRINT "DOWNWARD VELOCITY OF 50 FT/SEC.  120 UNITS OF FUEL REMAIN."
225 PRINT
230 PRINT "HERE ARE THE RULES THAT GOVERN YOUR SPACE VEHICLE:"
240 PRINT "(1) AFTER EACH SECOND, THE HEIGHT, VELOCITY, AND REMAINING"
250 PRINT "    FUEL WILL BE REPORTED."
260 PRINT "(2) AFTER THE REPORT, A '?' WILL BE TYPED.  ENTER THE"
270 PRINT "    NUMBER OF UNITS OF FUEL YOU WISH TO BURN DURING THE"
280 PRINT "    NEXT SECOND.  EACH UNIT OF FUEL WILL SLOW YOUR DESCENT"
290 PRINT "    BY 1 FT/SEC."
310 PRINT "(3) THE MAXIMUM THRUST OF YOUR ENGINE IS 30 FT/SEC/SEC OR"
320 PRINT "    30 UNITS OF FUEL PER SECOND."
330 PRINT "(4) WHEN YOU CONTACT THE LUNAR SURFACE, YOUR DESCENT ENGINE"
340 PRINT "    WILL AUTOMATICALLY CUT OFF AND YOU WILL BE GIVEN A"
350 PRINT "    REPORT OF YOUR LANDING SPEED AND REMAINING FUEL."
360 PRINT "(5) IF YOU RUN OUT OF FUEL, THE '?' WILL NO LONGER APPEAR,"
370 PRINT "    BUT YOUR SECOND-BY-SECOND REPORT WILL CONTINUE UNTIL"
380 PRINT "    YOU CONTACT THE LUNAR SURFACE.": PRINT
390 PRINT "BEGINNING LANDING PROCEDURE.....": PRINT
400 PRINT "G O O D   L U C K ! ! !"
420 PRINT:PRINT
430 PRINT "SEC  FEET   SPEED   FUEL     PLOT OF DISTANCE"
450 PRINT
455 T=0:H=500:V=50:F=120
490 PRINT T;TAB(4);H;TAB(12);V;TAB(20);F;TAB(29);"I";TAB(H/12+29);"*"
500 INPUT B
510 IF B<0 THEN 650
520 IF B>30 THEN B=30
530 IF B>F THEN B=F
540 V1=V-B+5
560 F=F-B
570 H=H-.5*(V+V1)
580 IF H<=0 THEN 670
590 T=T+1
600 V=V1
610 IF F>0 THEN 490
615 IF B=0 THEN 640
620 PRINT "**** OUT OF FUEL****"
640 PRINT T;TAB(4);H;TAB(12);V;TAB(20);F;TAB(29);"I";TAB(H/12+29);"*"
650 B=0
660 GOTO 540
670 PRINT "**** CONTACT ****"
680 H=H+.5*(V+V1)
690 IF B=5 THEN 720
700 D=(-V+SQR(V*V+H*(10-2*B)))/(5-B)
710 GOTO 730
720 D=H/V
730 V1=V+(5-B)*D
760 PRINT "TOUCHDOWN AT";T+D;"SECONDS."
770 PRINT "LANDING VELOCITY =";V1;"FEET/SEC."
780 PRINT F;"UNITS OF FUEL REMAINING."
790 IF V1<>0 THEN 810
800 PRINT "CONGRATULATIONS!  A PERFECT LANDING!"
805 PRINT "YOUR LICENSE WILL BE RENEWED.....LATER"
810 IF ABS(V1)<2 THEN 840
820 PRINT "***** SORRY, BUT YOU BLEW IT!!!!"
830 PRINT "APPROPRIATE CONDOLENCES WILL BE SENT TO YOUR NEXT OF KIN."
840 PRINT: PRINT : PRINT
850 INPUT "ANOTHER MISSION";A$
860 IF A$="YES" THEN 390
870 PRINT: PRINT "CONTROL OUT.": PRINT
999 END
```

MasterMind®

In the March-April 1976 issue of *Creative* we published a computerized version of Master Mind, a logic game. Master Mind is played by two people—one is called the code-maker; the other, the code-breaker. At the beginning of the game the code-maker forms a code, or combination of colored pegs. He hides these from the code-breaker. The code-breaker then attempts to deduce the code, by placing his own guesses, one at a time, on the board. After he makes a guess (by placing a combination of colored pegs on the board) the code-maker then gives the code-breaker clues to indicate how close the guess was to the code. For every peg in the guess that's the right color and in the right position, the code-breaker gets a black peg. For every peg in the guess that's the right color but not in the right position, the code-breaker gets a white peg. Note that these black and white pegs do not indicate *which* pegs in the guess are correct, but merely that they exist. For example, if the code was:

Yellow Red Red Green

and my guess was

Red Red Yellow Black

I would receive two white pegs and one black peg for the guess. I wouldn't know (except by comparing previous guesses) which one of the pegs in my guess was the right color in the right position.

Many people have written computer programs to play Master Mind in the passive role, i.e., the computer is the code-maker and the human is the code-breaker. This is relatively trivial; the challenge is writing a program that can also play actively as a code-breaker.

Actually, the task of getting the computer to deduce the correct combination is not at all difficult. Imagine, for instance, that you made a list of all the possible codes. To begin, you select a guess from your list at random. Then, as you receive clues, you cross off from the list those combinations which you know are impossible. For example if your guess is Red Red Green Green and you receive no pegs, then you know that any combination containing either a red or a green peg is impossible and may be crossed off the list. The process is continued until the correct solution is reached or there are no more combinations left on the list (in which case you know that the code-maker made a mistake in giving you the clues somewhere).

Note that in this particular implementation, we never actually create a list of the combinations, but merely keep track of which ones (in sequential order) may be correct. Using this system, we can easily say that the 523rd combination may be correct, but to actually produce the 523rd combination we have to count all the way from the first combination (or the previous one, if it was lower than 523). Actually, this problem could be simplified to a conversion from base 10 to base (number-of-colors) and then adjusting the values used in the MID$ function so as not to take a zeroth character from a string if you want to experiment. We did try a version that kept an actual list of all possible combinations (as a string array), which was significantly faster than this version, but which ate tremendous amounts of memory.

At the beginning of this game, you input the number of colors and number of positions you wish to use (which will directly affect the number of combinations) and the number of rounds you wish to play. While you are playing as the code-breaker, you may type in BOARD at any time to get a list of your previous guesses and clues, and QUIT to end the game. Note that this version uses string arrays, but this is merely for convenience and can easily be converted for a BASIC that has no string arrays as long as it has a MID$ function. This is because the string arrays are one-dimensional, never exceed a length greater than the number of positions and the elements never contain more than one character.

```
                MASTER MIND
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


NUMBER OF COLORS? 4
NUMBER OF POSITIONS? 4
NUMBER OF ROUNDS? 1
TOTAL POSSIBILITIES = 256


COLOR     LETTER
=====     ======
BLACK       B
WHITE       W
RED         R
GREEN       G


ROUND NUMBER  1 ----

GUESS MY COMBINATION.
MOVE #  1  GUESS ? BWWG
YOU HAVE  2  BLACKS AND  0  WHITES.
MOVE #  2  GUESS ? WWRR
YOU HAVE  2  BLACKS AND  1  WHITES.
MOVE #  3  GUESS ? WWRG
YOU HAVE  3  BLACKS AND  0  WHITES.
MOVE #  4  GUESS ? WWBR
YOU HAVE  1  BLACKS AND  1  WHITES.
MOVE #  5  GUESS ? RWRG
YOU GUESSED IT IN  5  MOVES!
SCORE:
     COMPUTER  0
     HUMAN     5

NOW I GUESS.  THINK OF A COMBINATION.
HIT RETURN WHEN READY ?
MY GUESS IS: RRGR  BLACKS, WHITES ? 0,1
MY GUESS IS: GBBB  BLACKS, WHITES ? 3,0
MY GUESS IS: GWBB  BLACKS, WHITES ? 3,0
MY GUESS IS: GGBB  BLACKS, WHITES ? 4,0
I GOT IT IN  4  MOVES!
SCORE:
     COMPUTER  4
     HUMAN     5

GAME OVER
FINAL SCORE:
     COMPUTER  4
     HUMAN     5
```

Master Mind® is a game manufactured by Invicta Plastics, Ltd.

```
              MASTER MIND
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


NUMBER OF COLORS? 5
NUMBER OF POSITIONS? 4
NUMBER OF ROUNDS? 1
TOTAL POSSIBILITIES = 625


COLOR     LETTER
=====     ======
BLACK        B
WHITE        W
RED          R
GREEN        G
ORANGE       O


ROUND NUMBER  1 ----

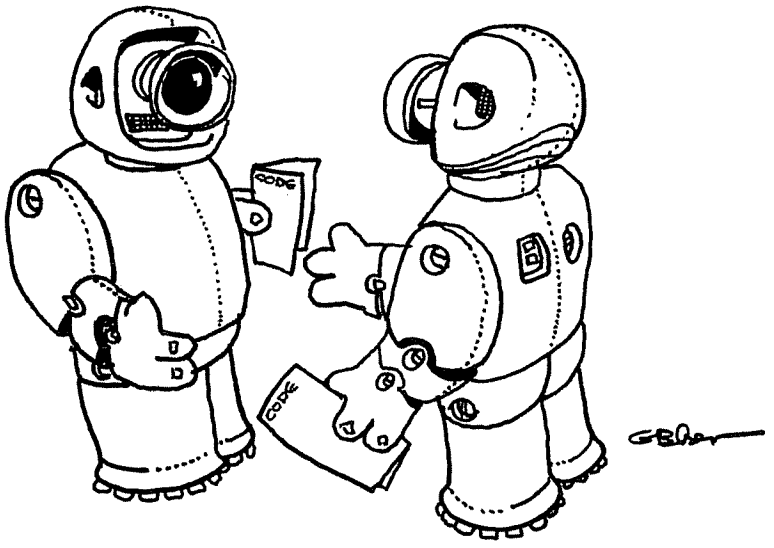
GUESS MY COMBINATION.
MOVE #  1  GUESS ? BWBW
YOU HAVE  1  BLACKS AND  2  WHITES.
MOVE #  2  GUESS ? BBWO
YOU HAVE  3  BLACKS AND  0  WHITES.
MOVE #  3  GUESS ? BBWG
YOU HAVE  3  BLACKS AND  0  WHITES.
MOVE #  4  GUESS ? BBWR
YOU HAVE  3  BLACKS AND  0  WHITES.
MOVE #  5  GUESS ? BBWB
YOU GUESSED IT IN  5  MOVES!
SCORE:
     COMPUTER  0
     HUMAN     5

NOW I GUESS.  THINK OF A COMBINATION.
HIT RETURN WHEN READY ?
MY GUESS IS: BRRO  BLACKS, WHITES ? 1,1
MY GUESS IS: RRWG  BLACKS, WHITES ? 1,1
MY GUESS IS: GBRG  BLACKS, WHITES ? 0,2
MY GUESS IS: ROGO  BLACKS, WHITES ? 4,0
I GOT IT IN  4  MOVES!
SCORE:
     COMPUTER  4
     HUMAN     5

GAME OVER
FINAL SCORE:
     COMPUTER  4
     HUMAN     5
```

```
2 PRINT TAB(30);"MASTER MIND"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 REM
20 REM     MASTERMIND II
30 REM     STEVE NORTH
40 REM     CREATIVE COMPUTING
50 REM     PO BOX 789-M MORRISTOWN NEW JERSEY 07960
60 REM
70 REM
80 INPUT "NUMBER OF COLORS";C9
90 IF C9>8 THEN PRINT "NO MORE THAN 8, PLEASE!":GOTO 80
100 INPUT "NUMBER OF POSITIONS";P9
110 INPUT "NUMBER OF ROUNDS";R9
120 P=C9^P9
130 PRINT "TOTAL POSSIBILITIES =";P
140 H=0:C=0
150 DIM Q(P9),S(10,2),S$(10),A$(P9),G$(P9),I(P),H$(P9)
160 L$="BWRGOYPT"
170 PRINT
180 PRINT
190 PRINT "COLOR     LETTER"
200 PRINT "=====     ======"
210 FOR X=1 TO C9
220 READ X$
230 PRINT X$;TAB(13);MID$(L$,X,1)
240 NEXT X
250 PRINT
260 FOR R=1 TO R9
270 PRINT
280 PRINT "ROUND NUMBER ";R;"----"
290 PRINT
300 PRINT "GUESS MY COMBINATION."
310 REM     GET A COMBINATION
320 A=INT(P*RND(1)+1)
330 GOSUB 3000
340 FOR X=1 TO A
350 GOSUB 3500
360 NEXT X
370 FOR M=1 TO 10
380 PRINT "MOVE # ";M;" GUESS ";:INPUT X$
390 IF X$="BOARD" THEN 2000
400 IF X$="QUIT" THEN 2500
410 IF LEN(X$)<>P9 THEN PRINT "BAD NUMBER OF POSITIONS.":GOTO 380
420 REM     UNPACK X$ INTO G$(1-P9)
430 FOR X=1 TO P9
440 FOR Y=1 TO C9
450 IF MID$(X$,X,1)=MID$(L$,Y,1) THEN 480
460 NEXT Y
470 PRINT "'"; MID$(X$,X,1); "' IS UNRECOGNIZED.":GOTO 380
480 G$(X)=MID$(X$,X,1)
490 NEXT X
500 REM     NOW WE CONVERT Q(1-P9) INTO A$(1-P9) [ACTUAL GUESS]
510 GOSUB 4000
520 REM     AND GET NUMBER OF BLACKS AND WHITES
530 GOSUB 4500
540 IF B=P9 THEN 630
550 REM     TELL HUMAN RESULTS
560 PRINT "YOU HAVE ";B;" BLACKS AND ";W;" WHITES."
570 REM     SAVE ALL THIS STUFF FOR BOARD PRINTOUT LATER
580 S$(M)=X$
590 S(M,1)=B
600 S(M,2)=W
610 NEXT M
620 PRINT "YOU RAN OUT OF MOVES!  THAT'S ALL YOU GET!":GOTO 640
622 GOSUB 4000
623 PRINT "THE ACTUAL COMBINATION WAS: ";
624 FOR X=1 TO P9
625 PRINT A$(X);
626 NEXT X
627 PRINT
630 PRINT "YOU GUESSED IT IN ";M;" MOVES!"
640 H=H+M
650 GOSUB 5000
660 REM
670 REM     NOW COMPUTER GUESSES
680 REM
690 FOR X=1 TO P
700 I(X)=1
710 NEXT X
720 PRINT "NOW I GUESS.  THINK OF A COMBINATION."
730 INPUT "HIT RETURN WHEN READY ";X$
740 FOR M=1 TO 10
750 GOSUB 3000
760 REM     FIND A GUESS
770 G=INT(P*RND(1)+1)
780 IF I(G)=1 THEN 890
790 FOR X=G TO P
800 IF I(X)=1 THEN 880
810 NEXT X
820 FOR X=1 TO G
830 IF I(X)=1 THEN 880
840 NEXT X
850 PRINT "YOU DUMMY, YOU HAVE GIVEN ME INCONSISTENT INFORMATION."
860 PRINT "LET'S TRY AGAIN, AND THIS TIME, BE MORE CAREFUL."
870 GOTO 660
880 G=X
890 REM     NOW WE CONVERT GUESS #G INTO G$
900 FOR X=1 TO G
910 GOSUB 3500
920 NEXT X
930 GOSUB 6000
940 PRINT "MY GUESS IS: ";
950 FOR X=1 TO P9
960 PRINT H$(X);
970 NEXT X
980 INPUT "  BLACKS, WHITES ";B1,W1
990 IF B1=P9 THEN 1120
1000 GOSUB 3000
1010 FOR X=1 TO P
1020 GOSUB 3500
1030 IF I(X)=0 THEN 1070
1035 GOSUB 6500
1040 GOSUB 4000
1050 GOSUB 4500
1060 IF B1<>B OR W1<>W THEN I(X)=0
1070 NEXT X
1080 NEXT M
1090 PRINT "I USED UP ALL MY MOVES!"
1100 PRINT "I GUESS MY CPU IS JUST HAVING AN OFF DAY."
1110 GOTO 1130
1120 PRINT "I GOT IT IN ";M;" MOVES!"
1130 C=C+M
1140 GOSUB 5000
```

```
1150 NEXT R
1160 PRINT "GAME OVER"
1170 PRINT "FINAL SCORE:"
1180 GOSUB 5040
1190 STOP
2000 REM
2010 REM     BOARD PRINTOUT ROUTINE
2020 REM
2025 PRINT
2030 PRINT "BOARD"
2040 PRINT "MOVE     GUESS          BLACK     WHITE"
2050 FOR Z=1 TO M-1
2060 PRINT Z;TAB(9);S$(Z);TAB(25);S(Z,1);TAB(35);S(Z,2)
2070 NEXT Z
2075 PRINT
2080 GOTO 380
2500 REM
2510 REM     QUIT ROUTINE
2520 REM
2530 PRINT "QUITTER!  MY COMBINATION WAS: ";
2535 GOSUB 4000
2540 FOR X=1 TO P9
2550 PRINT A$(X);
2560 NEXT X
2565 PRINT
2570 PRINT "GOOD BYE"
2580 STOP
3000 REM
3010 REM     INITIALIZE Q(1-P9) TO ZEROS
3020 REM
3030 FOR S=1 TO P9
3040 Q(S)=0
3050 NEXT S
3060 RETURN
3500 REM
3510 REM     INCREMENT Q(1-P9)
3520 REM
3522 IF Q(1)>0 THEN 3530
3524 REM  IF ZERO, THIS IS OUR FIRST INCREMENT: MAKE ALL ONES
3526 FOR S=1 TO P9
3527 Q(S)=1
3528 NEXT S
3529 RETURN
3530 Q=1
3540 Q(Q)=Q(Q)+1
3550 IF Q(Q)<=C9 THEN RETURN
3560 Q(Q)=1
3570 Q=Q+1
3580 GOTO 3540
4000 REM
4010 REM     CONVERT Q(1-P9) TO A$(1-P9)
4020 REM
4030 FOR S=1 TO P9
4040 A$(S)=MID$(L$,Q(S),1)
4050 NEXT S
4060 RETURN
4500 REM
4510 REM     GET NUMBER OF BLACKS (B) AND WHITES (W)
4520 REM     MASHES G$ AND A$ IN THE PROCESS
4530 REM
4540 B=0:W=0:F=0
4550 FOR S=1 TO P9
4560 IF G$(S)<>A$(S) THEN 4620
4570 B=B+1
4580 G$(S)=CHR$(F)
4590 A$(S)=CHR$(F+1)
4600 F=F+2
4610 GOTO 4660
4620 FOR T=1 TO P9
4630 IF G$(S)<>A$(T) THEN 4650
4640 IF G$(T)=A$(T) THEN 4650
4645 W=W+1:A$(T)=CHR$(F):G$(S)=CHR$(F+1):F=F+2:GOTO 4660
4650 NEXT T
4660 NEXT S
4670 RETURN
5000 REM
5010 REM     PRINT SCORE
5020 REM
5030 PRINT "SCORE:"
5040 PRINT "     COMPUTER ";C
5050 PRINT "     HUMAN    ";H
5060 PRINT
5070 RETURN
5500 REM
5510 REM     CONVERT Q(1-P9) INTO G$(1-P9)
5520 REM
5530 FOR S=1 TO P9
5540 G$(S)=MID$(L$,Q(S),1)
5550 NEXT S
5560 RETURN
6000 REM
6010 REM     CONVERT Q(1-P9) TO H$(1-P9)
6020 REM
6030 FOR S=1 TO P9
6040 H$(S)=MID$(L$,Q(S),1)
6050 NEXT S
6060 RETURN
6500 REM
6510 REM     COPY H$ INTO G$
6520 REM
6530 FOR S=1 TO P9
6540 G$(S)=H$(S)
6550 NEXT S
6560 RETURN
8000 REM     PROGRAM DATA FOR COLOR NAMES
8010 DATA BLACK,WHITE,RED,GREEN,ORANGE,YELLOW,PURPLE,TAN
9998 REM   ...WE'RE SORRY BUT IT'S TIME TO GO...
9999 END
```



Math Dice

The program presents pictorial drill on addition facts using printed dice with no reading involved. It is good for beginning addition, since the answer can be derived from counting spots on the dice as well as by memorizing math facts or awareness of number concepts. It is especially effective run on a CRT terminal.

It was originally written by Jim Gerrish, a teacher at the Bernice A. Ray School in Hanover, New Hampshire.

```
                MATH DICE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THIS PROGRAM GENERATES SUCCESSIVE PICTURES OF TWO DICE.
WHEN TWO DICE AND AN EQUAL SIGN FOLLOWED BY A QUESTION
MARK HAVE BEEN PRINTED, TYPE YOUR ANSWER AND THE RETURN KEY.
TO CONCLUDE THE LESSON, TYPE CONTROL-C AS YOUR ANSWER.


 -----
I * * I
I     I
I * * I
 -----

   +

 -----
I *   I
I  *  I
I   * I
 -----

    =? 7
RIGHT!

THE DICE ROLL AGAIN...

 -----
I *   I
I     I
I   * I
 -----

   +

 -----
I * * I
I  *  I
I * * I
 -----

    =? 6
NO, COUNT THE SPOTS AND GIVE ANOTHER ANSWER.
    =? 5
NO, THE ANSWER IS 7

THE DICE ROLL AGAIN...

 -----
I *   I
I     I
I   * I
 -----

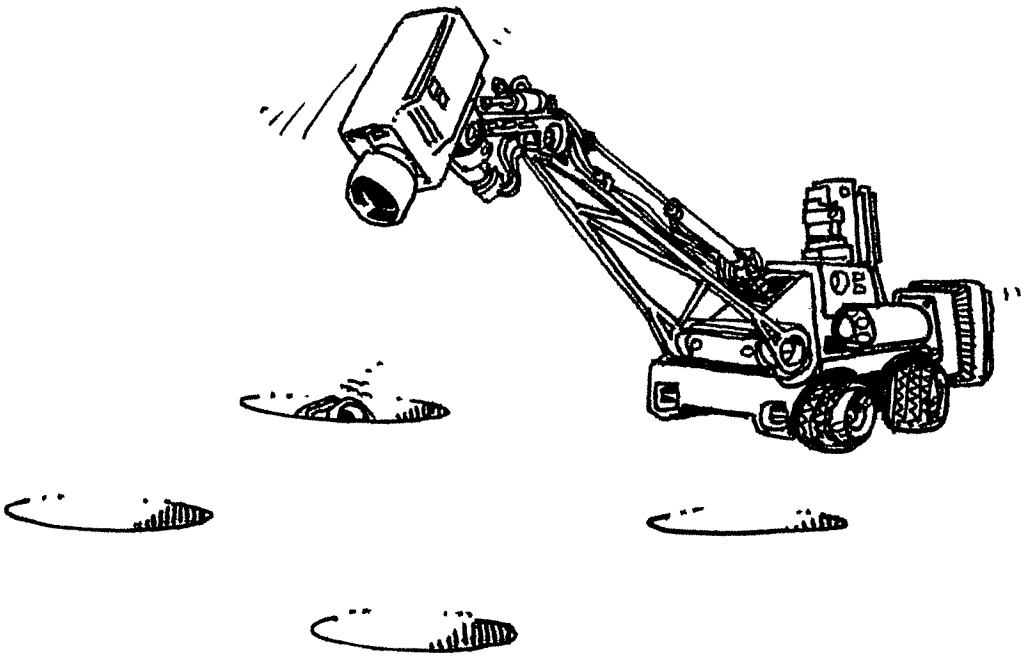
   +

 -----
I * * I
I * * I
I * * I
 -----

    =? 8
RIGHT!
```

```
10 PRINT TAB(31);"MATH DICE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
40 PRINT "THIS PROGRAM GENERATES SUCCESSIVE PICTURES OF TWO DICE."
50 PRINT "WHEN TWO DICE AND AN EQUAL SIGN FOLLOWED BY A QUESTION"
60 PRINT "MARK HAVE BEEN PRINTED, TYPE YOUR ANSWER AND THE RETURN KEY."
70 PRINT "TO CONCLUDE THE LESSON, TYPE CONTROL-C AS YOUR ANSWER."
80 PRINT
90 PRINT
100 N=N+1
110 D=INT(6*RND(1)+1)
120 PRINT" ----- "
130 IF D=1 THEN 200
140 IF D=2 THEN 180
150 IF D=3 THEN 180
160 PRINT "I * * I"
170 GOTO 210
180 PRINT "I *   I"
190 GOTO 210
200 PRINT "I     I"
210 IF D=2 THEN 260
220 IF D=4 THEN 260
230 IF D=6 THEN 270
240 PRINT "I  *  I"
250 GOTO 280
260 PRINT "I     I"
265 GOTO 280
270 PRINT "I * * I"
280 IF D=1 THEN 350
290 IF D=2 THEN 330
300 IF D=3 THEN 330
310 PRINT "I * * I"
320 GOTO 360
330 PRINT "I   * I"
340 GOTO 360
350 PRINT "I     I"
360 PRINT " ----- "
370 PRINT
375 IF N=2 THEN 500
380 PRINT "   +"
381 PRINT
400 A=D
410 GOTO 100
500 T=D+A
510 PRINT "     =";
520 INPUT T1
530 IF T1=T THEN 590
540 PRINT "NO, COUNT THE SPOTS AND GIVE ANOTHER ANSWER."
541 PRINT "     =";
550 INPUT T2
560 IF T2=T THEN 590
570 PRINT "NO, THE ANSWER IS";T
580 GOTO 600
590 PRINT "RIGHT!"
600 PRINT
601 PRINT "THE DICE ROLL AGAIN..."
610 PRINT
615 N=0
620 GOTO 100
999 END
```

Mugwump

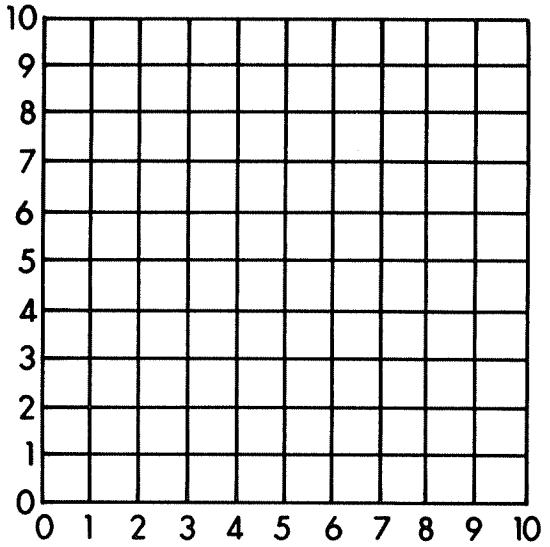


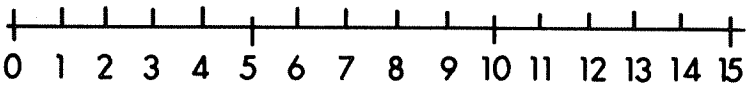
Your objective in this game is to find the four Mugwumps hiding on various squares of a 10 by 10 grid. Homebase (lower left) is position (0,0) and a guess is a pair of whole numbers (0 to 9), separated by commas. The first number is the number of units to the right of homebase and the second number is the distance above homebase.

You get ten guesses to locate the four Mugwumps; after each guess, the computer tells you how close you are to each Mugwump. Playing the game with the aid of graph paper and a compass should allow you to find all the Mugwumps in six or seven moves using triangulation similar to Loran radio navigation.

If you want to make the game somewhat more difficult, you can print the distance to each Mugwump either rounded or truneated to the nearest integer. Statement 390 would print either INT (D+.5) or INT (D).

This program was modified slightly by Bob Albrecht of People's Computer Company. It was originally written by students of Bud Valenti of Project SOLO in Pittsburgh, Pennsylvania.





Use this scale with a compass to help find the Mugwumps.

```
                MUGWUMP
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


THE OBJECT OF THIS GAME IS TO FIND FOUR MUGWUMPS
HIDDEN ON A 10 BY 10 GRID.  HOMEBASE IS POSITION 0,0
ANY GUESS YOU MAKE MUST BE TWO NUMBERS WITH EACH
NUMBER BETWEEN 0 AND 9, INCLUSIVE.  FIRST NUMBER
IS DISTANCE TO RIGHT OF HOMEBASE AND SECOND NUMBER
IS DISTANCE ABOVE HOMEBASE.

YOU GET 10 TRIES.  AFTER EACH TRY, I WILL TELL
YOU HOW FAR YOU ARE FROM EACH MUGWUMP.


TURN NO. 1 WHAT IS YOUR GUESS? 5,5
YOU ARE 4 UNITS FROM MUGWUMP 1
YOU ARE 3.1 UNITS FROM MUGWUMP 2
YOU ARE 4.2 UNITS FROM MUGWUMP 3
YOU ARE 5 UNITS FROM MUGWUMP 4


TURN NO. 2 WHAT IS YOUR GUESS? 0,0
YOU ARE 10.2 UNITS FROM MUGWUMP 1
YOU ARE 8.9 UNITS FROM MUGWUMP 2
YOU ARE 11.3 UNITS FROM MUGWUMP 3
YOU ARE 5 UNITS FROM MUGWUMP 4


TURN NO. 3 WHAT IS YOUR GUESS? 9,8
YOU ARE 3 UNITS FROM MUGWUMP 1
YOU ARE 4.1 UNITS FROM MUGWUMP 2
YOU ARE 1 UNITS FROM MUGWUMP 3
YOU ARE 8.9 UNITS FROM MUGWUMP 4


TURN NO. 4 WHAT IS YOUR GUESS? 9,9
YOU ARE 4 UNITS FROM MUGWUMP 1
YOU ARE 5 UNITS FROM MUGWUMP 2
YOU ARE 1.4 UNITS FROM MUGWUMP 3
YOU ARE 9.8 UNITS FROM MUGWUMP 4


TURN NO. 5 WHAT IS YOUR GUESS? 8,8
YOU ARE 3.1 UNITS FROM MUGWUMP 1
YOU ARE 4 UNITS FROM MUGWUMP 2
YOU HAVE FOUND MUGWUMP 3
YOU ARE 8.5 UNITS FROM MUGWUMP 4


TURN NO. 6 WHAT IS YOUR GUESS? 4,8
YOU ARE 5.8 UNITS FROM MUGWUMP 1
YOU ARE 5.6 UNITS FROM MUGWUMP 2
YOU ARE 8 UNITS FROM MUGWUMP 4


TURN NO. 7 WHAT IS YOUR GUESS? 3,7
YOU ARE 6.3 UNITS FROM MUGWUMP 1
YOU ARE 5.8 UNITS FROM MUGWUMP 2
YOU ARE 7.2 UNITS FROM MUGWUMP 4


TURN NO. 8 WHAT IS YOUR GUESS? 6,8
YOU ARE 4.2 UNITS FROM MUGWUMP 1
YOU ARE 4.4 UNITS FROM MUGWUMP 2
YOU ARE 8 UNITS FROM MUGWUMP 4


TURN NO. 9 WHAT IS YOUR GUESS? 6,0
YOU ARE 5.8 UNITS FROM MUGWUMP 1
YOU ARE 4.4 UNITS FROM MUGWUMP 2
YOU ARE 1 UNITS FROM MUGWUMP 4


TURN NO. 10 WHAT IS YOUR GUESS? 7,0
YOU ARE 5.3 UNITS FROM MUGWUMP 1
YOU ARE 4.1 UNITS FROM MUGWUMP 2
YOU ARE 2 UNITS FROM MUGWUMP 4

SORRY, THAT'S 10 TRIES.  HERE IS WHERE THEY'RE HIDING
MUGWUMP 1 IS AT ( 9 , 5 )
MUGWUMP 2 IS AT ( 8 , 4 )
MUGWUMP 4 IS AT ( 5 , 0 )

THAT WAS FUN!  LET'S PLAY AGAIN.....
FOUR MORE MUGWUMPS ARE NOW IN HIDING.
```

```
1 PRINT TAB(33);"MUGWUMP"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 REM     COURTESY PEOPLE'S COMPUTER COMPANY
10 DIM P(4,2)
20 PRINT "THE OBJECT OF THIS GAME IS TO FIND FOUR MUGWUMPS"
30 PRINT "HIDDEN ON A 10 BY 10 GRID.  HOMEBASE IS POSITION 0,0"
40 PRINT "ANY GUESS YOU MAKE MUST BE TWO NUMBERS WITH EACH"
50 PRINT "NUMBER BETWEEN 0 AND 9, INCLUSIVE.  FIRST NUMBER"
60 PRINT "IS DISTANCE TO RIGHT OF HOMEBASE AND SECOND NUMBER"
70 PRINT "IS DISTANCE ABOVE HOMEBASE."
80 PRINT
90 PRINT "YOU GET 10 TRIES.  AFTER EACH TRY, I WILL TELL"
100 PRINT "YOU HOW FAR YOU ARE FROM EACH MUGWUMP."
110 PRINT
240 GOSUB 1000
250 T=0
260 T=T+1
270 PRINT
275 PRINT
290 PRINT "TURN NO.";T;"WHAT IS YOUR GUESS";
300 INPUT M,N
310 FOR I=1 TO 4
320 IF P(I,1)=-1 THEN 400
330 IF P(I,1)<>M THEN 380
340 IF P(I,2)<>N THEN 380
350 P(I,1)=-1
360 PRINT "YOU HAVE FOUND MUGWUMP";I
370 GOTO 400
380 D=SQR((P(I,1)-M)^2+(P(I,2)-N)^2)
390 PRINT "YOU ARE";(INT(D*10))/10;"UNITS FROM MUGWUMP";I
400 NEXT I
410 FOR J=1 TO 4
420 IF P(J,1)<>-1 THEN 470
430 NEXT J
440 PRINT
450 PRINT "YOU GOT THEM ALL IN";T;"TURNS!"
460 GOTO 580
470 IF T<10 THEN 260
480 PRINT
490 PRINT "SORRY, THAT'S 10 TRIES.  HERE IS WHERE THEY'RE HIDING"
540 FOR I=1 TO 4
550 IF P(I,1)=-1 THEN 570
560 PRINT "MUGWUMP";I;"IS AT (";P(I,1);",";P(I,2);")"
570 NEXT I
580 PRINT
600 PRINT "THAT WAS FUN!  LET'S PLAY AGAIN....."
610 PRINT "FOUR MORE MUGWUMPS ARE NOW IN HIDING."
630 GOTO 240
1000 FOR J=1 TO 2
1010 FOR I=1 TO 4
1020 P(I,J)=INT(10*RND(1))
1030 NEXT I
1040 NEXT J
1050 RETURN
1099 END
```

Name

NAME is a silly little ice-breaker to get a relationship going between a computer and a shy human. The sorting algorithm used is highly inefficient — as any reader of *Creative Computing* will recognize, this is the worst possible sort for speed. But the program is good fun and that's what counts here.

NAME was originally written by Geoffrey Chase of the Abbey, Portsmouth, Rhode Island.

```
1 PRINT TAB(34);"NAME"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT: PRINT: PRINT
5 DIM B$(40)
10 PRINT "HELLO.": PRINT "MY NAME IS CREATIVE COMPUTER."
20 PRINT "WHAT'S YOUR NAME (FIRST AND LAST)";: INPUT A$: L=LEN(A$)
30 PRINT: PRINT "THANK YOU, ";
40 FOR I=1 TO L: B$(I)=MID$(A$,I,1): NEXT I
50 FOR I=L TO 1 STEP -1: PRINT B$(I);: NEXT I
60 PRINT ".": PRINT "OOPS!  I GUESS I GOT IT BACKWARDS.  A SMART"
70 PRINT "COMPUTER LIKE ME SHOULDN'T MAKE A MISTAKE LIKE THAT!": PRINT
80 PRINT "BUT I JUST NOTICED YOUR LETTERS ARE OUT OF ORDER."
90 PRINT "LET'S PUT THEM IN ORDER LIKE THIS: ";
100 FOR J=2 TO L: I=J-1: T$=B$(J)
110 IF T$>B$(I) THEN 130
120 B$(I+1)=B$(I): I=I-1: IF I>0 THEN 110
130 B$(I+1)=T$: NEXT J
140 FOR I=1 TO L: PRINT B$(I);: NEXT I: PRINT: PRINT
150 PRINT "DON'T YOU LIKE THAT BETTER";: INPUT D$
160 IF D$="YES" THEN 180
170 PRINT: PRINT "I'M SORRY YOU DON'T LIKE IT THAT WAY.": GOTO 200
180 PRINT: PRINT "I KNEW YOU'D AGREE!!"
200 PRINT: PRINT "I REALLY ENJOYED MEETING YOU ";A$;"."
210 PRINT "HAVE A NICE DAY!"
999 END
```

```
                    NAME
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY



HELLO.
MY NAME IS CREATIVE COMPUTER.
WHAT'S YOUR NAME (FIRST AND LAST? SGT PEPPER

THANK YOU, REPPEP TGS.
OOPS!  I GUESS I GOT IT BACKWARDS.  A SMART
COMPUTER LIKE ME SHOULDN'T MAKE A MISTAKE LIKE THAT!

BUT I JUST NOTICED YOUR LETTERS ARE OUT OF ORDER.
LET'S PUT THEM IN ORDER LIKE THIS:  EEGPPPRST

DON'T YOU LIKE THAT BETTER? NO

I'M SORRY YOU DON'T LIKE IT THAT WAY.

I REALLY ENJOYED MEETING YOU SGT PEPPER.
HAVE A NICE DAY!



HELLO.
MY NAME IS CREATIVE COMPUTER.
WHAT'S YOUR NAME (FIRST AND LAST? SUSAN JONES

THANK YOU, SENOJ NASUS.
OOPS!  I GUESS I GOT IT BACKWARDS.  A SMART
COMPUTER LIKE ME SHOULDN'T MAKE A MISTAKE LIKE THAT!

BUT I JUST NOTICED YOUR LETTERS ARE OUT OF ORDER.
LET'S PUT THEM IN ORDER LIKE THIS:  AEJNNOSSSU

DON'T YOU LIKE THAT BETTER? YES

I KNEW YOU'D AGREE!!

I REALLY ENJOYED MEETING YOU SUSAN JONES.
HAVE A NICE DAY!
```

Nicomachus

One of the most ancient forms of arithmetical puzzle is sometimes referred to as a "boomerang." At some time, everyone has been asked to "think of a number," and, after going through some process of private calculation, to state the result, after which the questioner promptly tells you the number you originally thought of. There are hundreds of varieties of the puzzle.

The oldest recorded example appears to be that given in *Arithmetica* of Nicomachus, who died about the year 120. He tells you to think of any whole number between 1 and 100 and divide it successively by 3, 5, and 7, telling him the remainder in each case. On receiving this information, he promptly discloses the number you thought of.

Can you discover a simple method of mentally performing this feat? If not, you can see how the ancient mathematician did it by looking at Lines 80-100 of the program.

Nicomachus was written by David Ahl.

```
2 PRINT TAB(33);"NICOMA"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 PRINT "BOOMERANG PUZZLE FROM ARITHMETICA OF NICOMACHUS -- A.D. 90!"
20 PRINT
30 PRINT "PLEASE THINK OF A NUMBER BETWEEN 1 AND 100."
40 PRINT "YOUR NUMBER DIVIDED BY 3 HAS A REMAINDER OF";
45 INPUT A
50 PRINT "YOUR NUMBER DIVIDED BY 5 HAS A REMAINDER OF";
55 INPUT B
60 PRINT "YOUR NUMBER DIVIDED BY 7 HAS A REMAINDER OF";
65 INPUT C
70 PRINT
80 PRINT "LET ME THINK A MOMENT..."
90 FOR I=1 TO 1500: NEXT I
100 D=70*A+21*B+15*C
110 IF D<=105 THEN 140
120 D=D-105
130 GOTO 110
140 PRINT "YOUR NUMBER WAS";D;",  RIGHT";
160 INPUT A$
165 PRINT
170 IF A$="YES" THEN 220
180 IF A$="NO" THEN 240
190 PRINT "EH?  I DON'T UNDERSTAND '";A$;"'  TRY 'YES' OR 'NO'."
200 GOTO 150
220 PRINT "HOW ABOUT THAT!!"
230 GOTO 250
240 PRINT "I FEEL YOUR ARITHMETIC IS IN ERROR."
250 PRINT
260 PRINT "LET'S TRY ANOTHER."
270 GOTO 20
999 END
```

```
                  NICOMA
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


BOOMERANG PUZZLE FROM ARITHMETICA OF NICOMACHUS -- A.D. 90!

PLEASE THINK OF A NUMBER BETWEEN 1 AND 100.
YOUR NUMBER DIVIDED BY 3 HAS A REMAINDER OF? 1
YOUR NUMBER DIVIDED BY 5 HAS A REMAINDER OF? 0
YOUR NUMBER DIVIDED BY 7 HAS A REMAINDER OF? 5

LET ME THINK A MOMENT...
YOUR NUMBER WAS 40 ,  RIGHT? YES

HOW ABOUT THAT!!

LET'S TRY ANOTHER.

PLEASE THINK OF A NUMBER BETWEEN 1 AND 100.
YOUR NUMBER DIVIDED BY 3 HAS A REMAINDER OF? 1
YOUR NUMBER DIVIDED BY 5 HAS A REMAINDER OF? 0
YOUR NUMBER DIVIDED BY 7 HAS A REMAINDER OF? 2

LET ME THINK A MOMENT...
YOUR NUMBER WAS 100 ,  RIGHT? YES

HOW ABOUT THAT!!

LET'S TRY ANOTHER.

PLEASE THINK OF A NUMBER BETWEEN 1 AND 100.
YOUR NUMBER DIVIDED BY 3 HAS A REMAINDER OF? 0
YOUR NUMBER DIVIDED BY 5 HAS A REMAINDER OF? 4
YOUR NUMBER DIVIDED BY 7 HAS A REMAINDER OF? 4

LET ME THINK A MOMENT...
YOUR NUMBER WAS 39 ,  RIGHT? NO

I FEEL YOUR ARITHMETIC IS IN ERROR.

LET'S TRY ANOTHER.

PLEASE THINK OF A NUMBER BETWEEN 1 AND 100.
YOUR NUMBER DIVIDED BY 3 HAS A REMAINDER OF? 1
YOUR NUMBER DIVIDED BY 5 HAS A REMAINDER OF? 1
YOUR NUMBER DIVIDED BY 7 HAS A REMAINDER OF? 1

LET ME THINK A MOMENT...
YOUR NUMBER WAS 1 ,  RIGHT? YES

HOW ABOUT THAT!!
```

Nim

NIM is one of the oldest two-person games known to man; it is believed to have originated in ancient China. The name, which was coined by the first mathematician to analyze it, comes from an archaic English verb which means to steal or to take away. Objects are arranged in rows between the two opponents as in the following example:

```
XXXXXXX Row 1 — 7 Objects
XXXXX   Row 2 — 5 Objects
XXX     Row 3 — 3 Objects
X       Row 4 — 1 Object
```

Opponents take turns removing objects until there are none left. The one who picks up the last object wins. The moves are made according to the following two rules:

1. On any given turn only objects from one row may be removed. There is no restriction on which row or on how many objects you remove. Of course, you cannot remove more than are in the row.
2. You cannot skip a move or remove zero objects.

The winning strategy can be mathematically defined, however, rather than presenting it here, we'd rather let you find it on your own. HINT: Play a few games with the computer and mark down on a piece of paper the number of objects in each stack (in binary!) after each move. Do you see a pattern emerging?

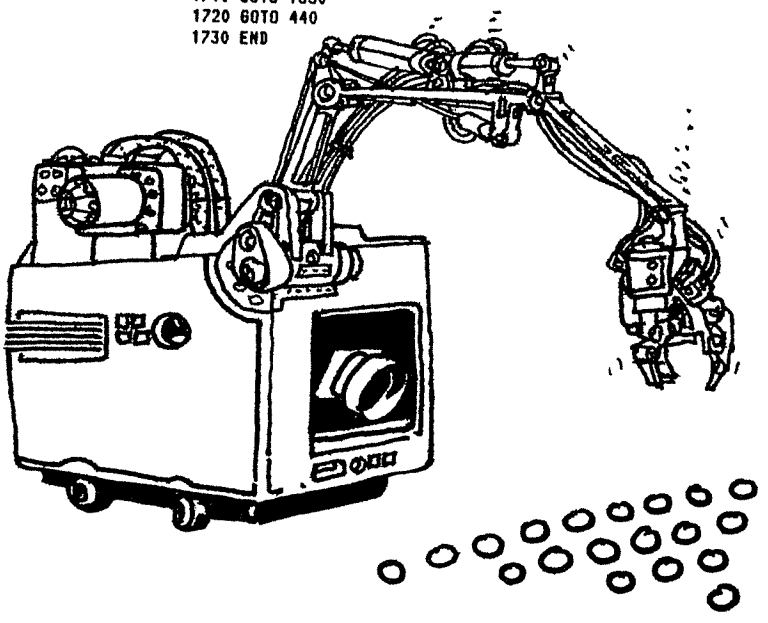
This game of NIM is from Dartmouth College and is a generalized game which allows you to specify any starting size for the four piles and also a win option. To play traditional NIM, you would simply specify 7,5,3, and 1, and win option 1.

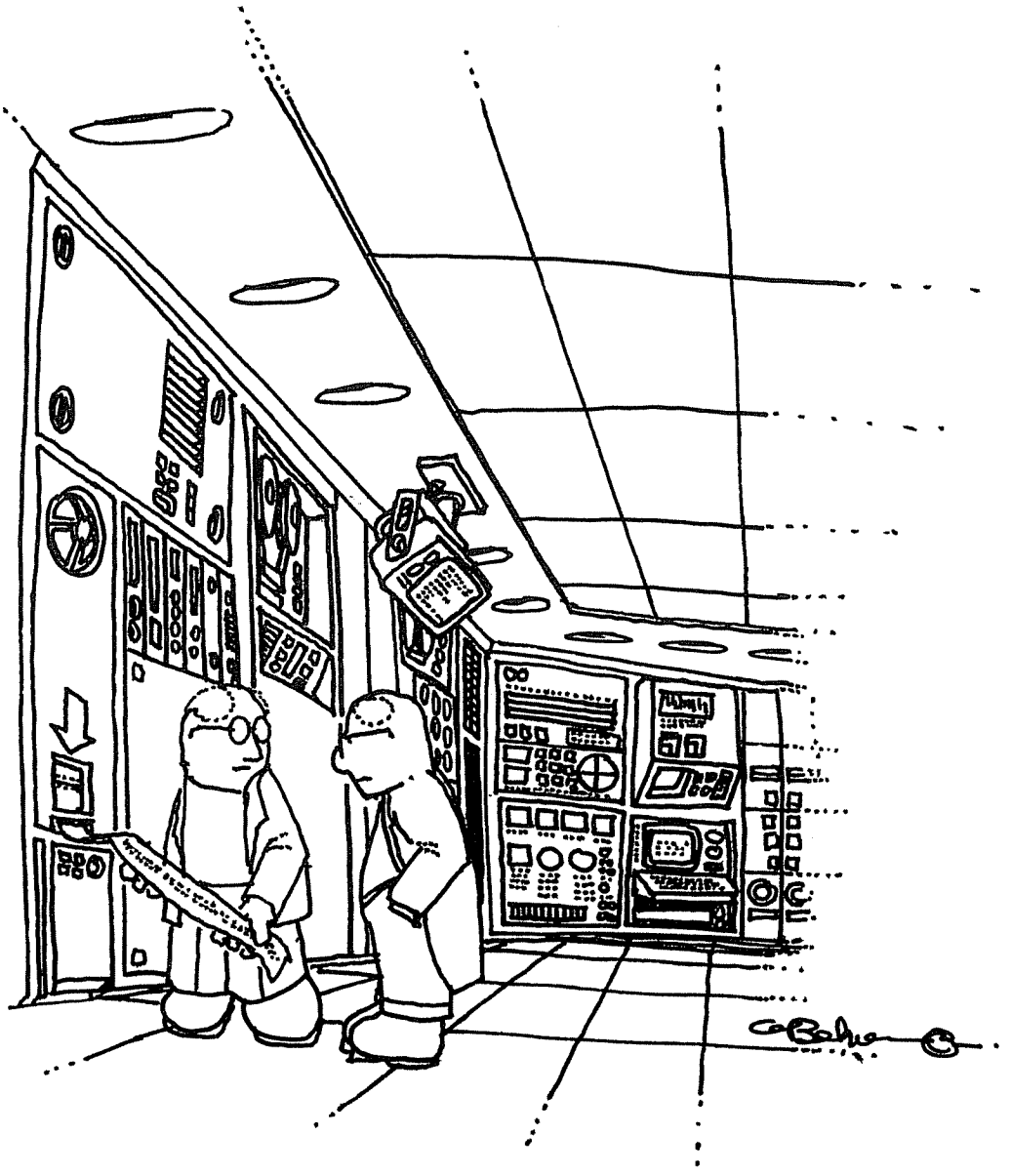
```
                NIM
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


 THIS IS THE GAME OF NIM.
 DO YOU WANT INSTRUCTIONS? YES
 THE GAME IS PLAYED WITH A NUMBER OF PILES OF OBJECTS.
 ANY NUMBER OF OBJECTS  ARE REMOVED FROM ONE PILE BY YOU AND
 THE MACHINE ALTERNATELY.  ON YOUR TURN, YOU MAY TAKE
 ALL THE OBJECTS THAT REMAIN IN ANY PILE BUT YOU MUST
 TAKE AT LEAST ONE OBJECT, AND YOU MAY TAKE OBJECTS FROM
 ONLY ONE PILE ON A SINGLE TURN.  YOU MUST SPECIFY WHETHER
 WINNING IS DEFINED AS TAKING OR NOT TAKING THE LAST OBJECT,
 THE NUMBER OF PILES IN THE GAME, AND HOW MANY OBJECTS ARE
 ORIGINALLY IN EACH PILE.  EACH PILE MAY CONTAIN A
 DIFFERENT NUMBER OF OBJECTS.
 THE MACHINE WILL SHOW ITS MOVE BY LISTING EACH PILE AND THE
 NUMBER OF OBJECTS REMAINING IN THE PILES AFTER  EACH OF ITS
 MOVES.

 ENTER WIN OPTION - 1 TO TAKE LAST, 2 TO AVOID LAST? 2
 ENTER NUMBER OF PILES? 4
 ENTER PILE SIZES
  1 ? 10
  2 ? 8
  3 ? 7
  4 ? 3
 DO YOU WANT TO MOVE FIRST? NO
 PILE  SIZE
  1  10
  2  8
  3  1
  4  3
 YOUR MOVE - PILE,NUMBER TO BE REMOVED? 1,9
 PILE  SIZE
  1  1
  2  3
  3  1
  4  3
 YOUR MOVE - PILE,NUMBER TO BE REMOVED? 2,2
 PILE  SIZE
  1  1
  2  1
  3  1
  4  0
 YOUR MOVE - PILE,NUMBER TO BE REMOVED? 3,1
 MACHINE WINS
 Do you want to play another game? NO
```

```
100 PRINT TAB(33);"NIM"
110 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
120 PRINT:PRINT:PRINT
210 DIM A(100),B(100,10),D(2)
220 PRINT "THIS IS THE GAME OF NIM."
230 PRINT "DO YOU WANT INSTRUCTIONS";
240 INPUT Z$
250 IF Z$="NO" THEN 440
260 IF Z$="no" GOTO 440
270 IF Z$="YES" THEN 310
280 IF Z$="yes" GOTO 310
290 PRINT "PLEASE. YES OR NO";
300 GOTO 240
310 PRINT "THE GAME IS PLAYED WITH A NUMBER OF PILES OF OBJECTS."
320 PRINT "ANY NUMBER OF OBJECTS  ARE REMOVED FROM ONE PILE BY YOU AND"
330 PRINT "THE MACHINE ALTERNATELY.  ON YOUR TURN, YOU MAY TAKE"
340 PRINT "ALL THE OBJECTS THAT REMAIN IN ANY PILE BUT YOU MUST"
350 PRINT "TAKE AT LEAST ONE OBJECT, AND YOU MAY TAKE OBJECTS FROM"
360 PRINT "ONLY ONE PILE ON A SINGLE TURN.  YOU MUST SPECIFY WHETHER"
370 PRINT "WINNING IS DEFINED AS TAKING OR NOT TAKING THE LAST OBJECT,"
380 PRINT "THE NUMBER OF PILES IN THE GAME, AND HOW MANY OBJECTS ARE"
390 PRINT "ORIGINALLY IN EACH PILE.  EACH PILE MAY CONTAIN A"
400 PRINT "DIFFERENT NUMBER OF OBJECTS."
410 PRINT "THE MACHINE WILL SHOW ITS MOVE BY LISTING EACH PILE AND THE"
420 PRINT "NUMBER OF OBJECTS REMAINING IN THE PILES AFTER  EACH OF ITS"
430 PRINT "MOVES."
440 PRINT
450 PRINT "ENTER WIN OPTION - 1 TO TAKE LAST, 2 TO AVOID LAST";
460 INPUT W
470 IF W=1 THEN 490
480 IF W<>2 THEN 450
490 PRINT "ENTER NUMBER OF PILES";
500 INPUT N
510 IF N>100 THEN 490
520 IF N<1 THEN 490
530 IF N<>INT(N) THEN 490
540 PRINT "ENTER PILE SIZES"
550 FOR I=1 TO N
560 PRINT I;
570 INPUT A(I)
580 IF A(I)>2000 THEN 560
590 IF A(I)<1 THEN 560
600 IF A(I)<>INT(A(I)) THEN 560
610 NEXT I
620 PRINT "DO YOU WANT TO MOVE FIRST";
630 INPUT Q9$
640 IF Q9$="YES" GOTO 1450
650 IF Q9$="yes" GOTO 1450
660 IF Q9$="NO" GOTO 700
670 IF Q9$="no" GOTO 700
680 PRINT "PLEASE. YES OR NO";
690 GOTO 630
700 IF W=1 THEN 940
710 LET C=0
720 FOR I=1 TO N
730 IF A(I)=0 THEN 770
740 LET C=C+1
750 IF C=3 THEN 840
760 LET D(C)=I
770 NEXT I
780 IF C=2 THEN 920
790 IF A(D(1))>1 THEN 820
800 PRINT "MACHINE LOSES"
810 GOTO 1640
820 PRINT "MACHINE WINS"
830 GOTO 1640
840 LET C=0
850 FOR I=1 TO N
860 IF A(I)>1 THEN 940
870 IF A(I)=0 THEN 890
880 LET C=C+1
890 NEXT I
900 IF C/2<>INT(C/2) THEN 800
910 GOTO 940
920 IF A(D(1))=1 THEN 820
930 IF A(D(2))=1 THEN 820
940 FOR I=1 TO N
950 LET E=A(I)
960 FOR J=0 TO 10
970 LET F=E/2
980 LET B(I,J)=2*(F-INT(F))
990 LET E=INT(F)
1000 NEXT J
1010 NEXT I
1020 FOR J=10 TO 0 STEP -1
1030 LET C=0
1040 LET H=0
1050 FOR I=1 TO N
1060 IF B(I,J)=0 THEN 1110
1070 LET C=C+1
1080 IF A(I)<=H THEN 1110
1090 LET H=A(I)
1100 LET G=I
1110 NEXT I
1120 IF C/2<>INT(C/2) THEN 1190
1130 NEXT J
1140 LET E=INT(N*RND(1)+1)
1150 IF A(E)=0 THEN 1140
1160 LET F=INT(A(E)*RND(1)+1)
1170 LET A(E)=A(E)-F
1180 GOTO 1380
1190 LET A(G)=0
1200 FOR J=0 TO 10
1210 LET B(G,J)=0
1220 LET C=0
1230 FOR I=1 TO N
1240 IF B(I,J)=0 THEN 1260
1250 LET C=C+1
1260 NEXT I
1270 LET A(G)=A(G)+2*(C/2-INT(C/2))*2^J
1280 NEXT J
1290 IF W=1 THEN 1380
1300 LET C=0
1310 FOR I=1 TO N
1320 IF A(I)>1 THEN 1380
1330 IF A(I)=0 THEN 1350
1340 LET C=C+1
1350 NEXT I
1360 IF C/2<>INT(C/2) THEN 1380
1370 LET A(G)=1-A(G)
1380 PRINT "PILE  SIZE"
1390 FOR I=1 TO N
1400 PRINT I;A(I)
1410 NEXT I
1420 IF W=2 THEN 1450
1430 GOSUB 1570
1440 IF Z=1 THEN 820
1450 PRINT "YOUR MOVE - PILE,NUMBER TO BE REMOVED";
1460 INPUT X,Y
1470 IF X>N THEN 1450
1480 IF X<1 THEN 1450
1490 IF X<>INT(X) THEN 1450
1500 IF Y>A(X) THEN 1450
1510 IF Y<1 THEN 1450
1520 IF Y<>INT(Y) THEN 1450
1530 LET A(X)=A(X)-Y
1540 GOSUB 1570
1550 IF Z=1 THEN 800
1560 GOTO 700
1570 LET Z=0
1580 FOR I=1 TO N
1590 IF A(I)=0 THEN 1610
1600 RETURN
1610 NEXT I
1620 LET Z=1
1630 RETURN
1640 PRINT "Do you want to play another game";
1650 INPUT Q9$
1660 IF Q9$="YES" THEN 1720
1670 IF Q9$="yes" THEN 1720
1680 IF Q9$="NO" THEN 1730
1690 IF Q9$="no" THEN 1730
1700 PRINT "PLEASE.  YES OR NO";
1710 GOTO 1650
1720 GOTO 440
1730 END
```





" IT SAYS THE INDUSTRIAL REVOLUTION IS OVER AND THAT IT'S WON...."

Number

In contrast to other number guessing games where you keep guessing until you get the random number selected by the computer (GUESS, TRAP, STARS, etc.), in this game you get only one guess per play and you gain or lose points depending upon how close your guess is to the random number selected by the computer. You occasionally get a jackpot which will double your point count. You win when you get 500 points.

Tom Adametx wrote this program while a student at Curtis Junior High School in Sudbury, Massachusetts.

```
YOU HAVE 100 POINTS.  BY GUESSING NUMBERS FROM 1 TO 5, YOU
CAN GAIN OR LOSE POINTS DEPENDING UPON HOW CLOSE YOU GET TO
A RANDOM NUMBER SELECTED BY THE COMPUTER.

YOU OCCASIONALLY WILL GET A JACKPOT WHICH WILL DOUBLE(!)
YOUR POINT COUNT.  YOU WIN WHEN YOU GET 500 POINTS.

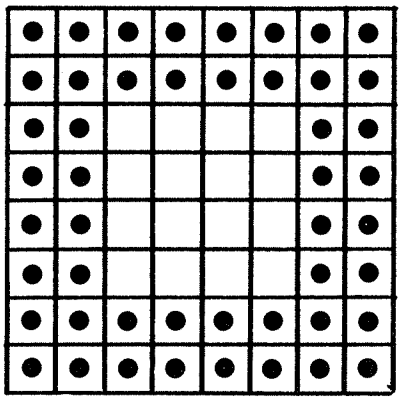
GUESS A NUMBER FROM 1 TO 5? 2
YOU HAVE 95 POINTS.
GUESS A NUMBER FROM 1 TO 5? 2
YOU HAVE 90 POINTS.
GUESS A NUMBER FROM 1 TO 5? 2
YOU HAVE 95 POINTS.
GUESS A NUMBER FROM 1 TO 5? 2
YOU HAVE 96 POINTS.
GUESS A NUMBER FROM 1 TO 5? 2
YOU HIT THE JACKPOT!!!
YOU HAVE 192 POINTS.
GUESS A NUMBER FROM 1 TO 5? 3
YOU HIT THE JACKPOT!!!
YOU HAVE 384 POINTS.
GUESS A NUMBER FROM 1 TO 5? 1
YOU HAVE 389 POINTS.
GUESS A NUMBER FROM 1 TO 5? 2
YOU HAVE 394 POINTS.
GUESS A NUMBER FROM 1 TO 5? 5
YOU HIT THE JACKPOT!!!
!!!!YOU WIN!!!! WITH  788 POINTS.
```

```
                NUMBER
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


1 PRINT TAB(33);"NUMBER"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
4 PRINT "YOU HAVE 100 POINTS.  BY GUESSING NUMBERS FROM 1 TO 5, YOU"
5 PRINT "CAN GAIN OR LOSE POINTS DEPENDING UPON HOW CLOSE YOU GET TO"
6 PRINT "A RANDOM NUMBER SELECTED BY THE COMPUTER.": PRINT
7 PRINT "YOU OCCASIONALLY WILL GET A JACKPOT WHICH WILL DOUBLE(!)"
8 PRINT "YOUR POINT COUNT.  YOU WIN WHEN YOU GET 500 POINTS."
9 PRINT: P=100
10 DEF FNR(X)=INT(5*RND(1)+1)
12 INPUT "GUESS A NUMBER FROM 1 TO 5";G
15 R=FNR(1)
16 S=FNR(1)
17 T=FNR(1)
18 U=FNR(1)
19 V=FNR(1)
20 IF G=R THEN 30
21 IF G=S THEN 40
22 IF G=T THEN 50
23 IF G=U THEN 60
24 IF G=V THEN 70
25 IF G>5 THEN 12
30 P=P-5
35 GOTO 80
40 P=P+5
45 GOTO 80
50 P=P+P
53 PRINT "YOU HIT THE JACKPOT!!!"
55 GOTO 80
60 P=P+1
65 GOTO 80
70 P=P-(P*.5)
80 IF P>500 THEN 90
82 PRINT "YOU HAVE";P;"POINTS."
85 GOTO 12
90 PRINT "!!!!YOU WIN!!!! WITH ";P;"POINTS."
99 END
```

One Check

In this game or puzzle, 48 checkers are placed on the two outside spaces of a standard 64-square checkerboard as shown:



The object is to remove as many checkers as possible by diagonal jumps (as in standard checkers).

It is easy to remove 30 to 39 checkers, a challenge to remove 40 to 44, and a substantial feat to remove 45 to 47.

The program was created and written by David Ahl.

```
                ONE CHECK
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


SOLITAIRE CHECKER PUZZLE BY DAVID AHL

48 CHECKERS ARE PLACED ON THE 2 OUTSIDE SPACES OF A
STANDARD 64-SQUARE CHECKERBOARD.  THE OBJECT IS TO
REMOVE AS MANY CHECKERS AS POSSIBLE BY DIAGONAL JUMPS
(AS IN STANDARD CHECKERS).  USE THE NUMBERED BOARD TO
INDICATE THE SQUARE YOU WISH TO JUMP FROM AND TO.  ON
THE BOARD PRINTED OUT ON EACH TURN '1' INDICATES A
CHECKER AND '0' AN EMPTY SQUARE.  WHEN YOU HAVE NO
POSSIBLE JUMPS REMAINING, INPUT A '0' IN RESPONSE TO
QUESTION 'JUMP FROM ?'

HERE IS THE NUMERICAL BOARD:

 1   2   3   4   5   6   7   8
 9  10  11  12  13  14  15  16
17  18  19  20  21  22  23  24
25  26  27  28  29  30  31  32
33  34  35  36  37  38  39  40
41  42  43  44  45  46  47  48
49  50  51  52  53  54  55  56
57  58  59  60  61  62  63  64

AND HERE IS THE OPENING POSITION OF THE CHECKERS.

 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 1
TO? 19

 0  1  1  1  1  1  1  1
 1  0  1  1  1  1  1  1
 1  1  1  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 2
TO? 20

 0  0  1  1  1  1  1  1
 1  0  0  1  1  1  1  1
 1  1  1  1  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 3
TO? 21

 0  0  0  1  1  1  1  1
 1  0  0  0  1  1  1  1
 1  1  1  1  1  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 8
TO? 22

 0  0  0  1  1  1  1  0
 1  0  0  0  1  1  0  1
 1  1  1  1  1  1  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 16
TO? 30

 0  0  0  1  1  1  1  0
 1  0  0  0  1  1  0  0
 1  1  1  1  1  1  0  1
 1  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  1  1
 1  1  1  1  1  1  1  1

JUMP FROM? 64
TO? 46

 0  0  0  1  1  1  1  0
 1  0  0  0  1  1  0  0
 1  1  1  1  1  1  0  1
 1  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  0  1  1
 1  1  1  1  1  1  0  1
 1  1  1  1  1  1  1  0

JUMP FROM? 5
TO? 23

 0  0  0  1  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 1  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  0  0  0  1  1  1
 1  1  1  1  1  1  0  1
 1  1  1  1  1  1  1  0

JUMP FROM? 57
TO? 51

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 57
TO? 43

 0  0  0  1  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 1  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  1  0  0  1  1  1
 1  0  1  1  1  1  0  1
 0  1  1  1  1  1  1  0

JUMP FROM? 25
TO? 11

 0  0  0  1  0  1  1  0
 1  0  1  0  1  0  0  0
 1  0  1  1  1  1  1  1
 0  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  1  0  0  1  1  1
 1  0  1  1  1  1  0  1
 0  1  1  1  1  1  1  0

JUMP FROM? 4
TO? 18

 0  0  0  0  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 0  1  0  0  0  1  1  1
 1  1  0  0  0  0  1  1
 1  1  1  0  0  1  1  1
 1  0  1  1  1  1  0  1
 0  1  1  1  1  1  1  0

JUMP FROM? 49
TO? 35

 0  0  0  0  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 0  1  0  0  0  1  1  1
 1  1  1  0  0  0  1  1
 1  0  1  0  0  1  1  1
 0  0  1  1  1  1  0  1
 0  1  1  1  1  1  1  0

JUMP FROM? 41
TO? 27

 0  0  0  0  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 0  1  1  0  0  1  1  1
 1  0  1  0  0  0  1  1
 0  0  1  0  0  1  1  1
 0  0  1  1  1  1  0  1
 0  1  1  1  1  1  1  0

JUMP FROM? 58
TO? 44

 0  0  0  0  0  1  1  0
 1  0  0  0  1  0  0  0
 1  1  1  1  1  1  1  1
 0  1  1  0  0  1  1  1
 1  0  1  0  0  0  1  1
 0  0  1  1  0  1  1  1
 0  0  0  1  1  1  0  1
 0  0  1  1  1  1  1  0

JUMP FROM? 26
TO? 11

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 26
TO? 12

 0  0  0  0  0  1  1  0
 1  0  0  1  1  0  0  0
 1  1  0  1  1  1  1  1
 0  0  1  0  0  1  1  1
 1  0  1  0  0  0  1  1
 0  0  1  1  0  1  1  1
 0  0  0  1  1  1  0  1
 0  0  1  1  1  1  1  0

JUMP FROM? 2
TO? 4

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 22
TO? 4

 0  0  0  1  0  1  1  0
 1  0  0  1  0  0  0  0
 1  1  0  1  1  0  1  1
 0  0  1  0  0  1  1  1
 1  0  1  0  0  0  1  1
 0  0  1  1  0  1  1  1
 0  0  0  1  1  1  0  1
 0  0  1  1  1  1  1  0

JUMP FROM? 59
TO? 45

 0  0  0  1  0  1  1  0
 1  0  0  1  0  0  0  0
 1  1  0  1  1  0  1  1
 0  0  1  0  0  1  1  1
 1  0  1  0  0  0  1  1
 0  0  1  1  0  1  1  1
 0  0  0  1  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 18
TO? 36

 0  0  0  1  0  1  1  0
 1  0  0  1  0  0  0  0
 1  0  0  1  1  0  1  1
 0  0  0  0  0  1  1  1
 1  0  1  1  0  0  1  1
 0  0  1  1  1  1  1  1
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 21
TO? 3

 0  0  1  1  0  1  1  0
 1  0  0  0  0  0  0  0
 1  0  0  1  0  0  1  1
 0  0  0  0  0  1  1  1
 1  0  1  1  0  0  1  1
 0  0  1  1  1  1  1  1
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0
```

Later in the game ....

```
JUMP FROM? 48
TO? 30

 0  0  1  0  0  1  1  0
 0  0  0  0  0  0  0  0
 1  0  1  0  0  0  0  0
 0  0  1  0  0  1  0  1
 0  0  0  0  1  1  0  1
 0  0  0  0  1  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 37
TO? 23

 0  0  1  0  0  1  1  0
 0  0  0  0  0  0  0  0
 1  0  1  0  0  0  1  0
 0  0  1  0  0  0  0  1
 0  0  0  0  0  1  0  1
 0  0  0  0  1  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 32
TO? 14

 0  0  1  0  0  1  1  0
 0  0  0  0  0  1  0  0
 1  0  1  0  0  0  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  1  0  1
 0  0  0  0  1  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 7
TO? 21

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  0  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  1  0  1
 0  0  0  0  1  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 45
TO? 31

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  0  0  0
 0  0  1  0  0  0  1  0
 0  0  0  0  0  0  0  1
 0  0  0  0  0  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 40
TO? 22

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  1  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  1  1  0
 0  0  0  0  1  1  0  1
 0  0  0  1  1  1  1  0

JUMP FROM? 63
TO? 45

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  1  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  1  1  1  0
 0  0  0  0  1  0  0  1
 0  0  0  1  1  1  0  0

JUMP FROM? 53
TO? 39

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  1  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  1  0
 0  0  0  0  1  0  1  0
 0  0  0  0  0  0  0  1
 0  0  0  1  1  1  0  0

JUMP FROM? 56
TO? 38

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  1  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  1  1  0
 0  0  0  0  1  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  1  1  1  0  0

JUMP FROM? 45
TO? 31

 0  0  1  0  0  1  0  0
 0  0  0  0  0  0  0  0
 1  0  1  0  1  1  0  0
 0  0  1  0  0  0  1  0
 0  0  0  0  0  0  1  0
 0  0  0  0  0  0  0  0
 0  0  0  1  1  1  0  0

JUMP FROM? 31
TO? 13

 0  0  1  0  0  1  0  0
 0  0  0  0  1  0  0  0
 1  0  1  0  1  0  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  1  0
 0  0  0  0  0  0  0  0
 0  0  0  1  1  1  0  0

JUMP FROM? 6
TO? 20

 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  0  0
 1  0  1  1  1  0  0  0
 0  0  1  0  0  0  0  0
 0  0  0  0  0  0  1  0
 0  0  0  0  0  0  0  0
 0  0  0  1  1  1  0  0

JUMP FROM? 35
TO? 20

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 35
TO? 21

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 35
TO? 13

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 35
TO? 0

ILLEGAL MOVE.  TRY AGAIN...
JUMP FROM? 27
TO? 13

 0  0  1  0  0  0  0  0
 0  0  0  0  1  0  0  0
 1  0  1  0  1  0  0  0
 0  0  0  0  0  0  0  0
 0  0  0  0  0  0  1  0
 0  0  0  0  0  0  0  0
 0  0  0  1  1  1  0  0

JUMP FROM? 0
YOU MADE 39 JUMPS AND HAD 9 PIECES
REMAINING ON THE BOARD.

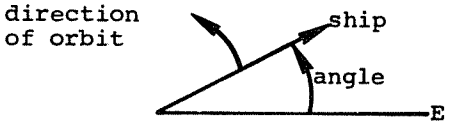
TRY AGAIN? NO
```

```
 2 PRINT TAB(30);"ONE CHECK"
 4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
 6 PRINT: PRINT: PRINT
 8 DIM A(64)
 10 PRINT "SOLITAIRE CHECKER PUZZLE BY DAVID AHL"
 15 PRINT
 20 PRINT "48 CHECKERS ARE PLACED ON THE 2 OUTSIDE SPACES OF A"
 25 PRINT "STANDARD 64-SQUARE CHECKERBOARD.  THE OBJECT IS TO"
 30 PRINT "REMOVE AS MANY CHECKERS AS POSSIBLE BY DIAGONAL JUMPS"
 35 PRINT "(AS IN STANDARD CHECKERS).  USE THE NUMBERED BOARD TO"
 40 PRINT "INDICATE THE SQUARE YOU WISH TO JUMP FROM AND TO.  ON"
 45 PRINT "THE BOARD PRINTED OUT ON EACH TURN '1' INDICATES A"
 50 PRINT "CHECKER AND '0' AN EMPTY SQUARE.  WHEN YOU HAVE NO"
 55 PRINT "POSSIBLE JUMPS REMAINING, INPUT A '0' IN RESPONSE TO"
 60 PRINT "QUESTION 'JUMP FROM ?'"
 62 PRINT
 65 PRINT "HERE IS THE NUMERICAL BOARD:"
 66 PRINT
 70 FOR J=1 TO 57 STEP 8
 74 PRINT J;TAB(4);J+1;TAB(8);J+2;TAB(12);J+3;TAB(16);J+4;TAB(20);J+5;
 75 PRINT TAB(24);J+6;TAB(28);J+7
 76 NEXT J
 77 PRINT
 78 PRINT "AND HERE IS THE OPENING POSITION OF THE CHECKERS."
 79 PRINT
 80 FOR J=1 TO 64
 82 A(J)=1
 84 NEXT J
 86 FOR J=19 TO 43 STEP 8
 88 FOR I=J TO J+3
 90 A(I)=0
 92 NEXT I
 94 NEXT J
 96 M=0
 98 GOTO 340
100 INPUT "JUMP FROM";F
105 IF F=0 THEN 500
110 INPUT "TO";T
112 PRINT
118 REM *** CHECK LEGALITY OF MOVE
120 F1=INT((F-1)/8)
130 F2=F-8*F1
140 T1=INT((T-1)/8)
150 T2=T-8*T1
160 IF F1>7 THEN 230
170 IF T1>7 THEN 230
180 IF F2>8 THEN 230
190 IF T2>8 THEN 230
200 IF ABS(F1-T1)<>2 THEN 230
210 IF ABS(F2-T2)<>2 THEN 230
212 IF A((T+F)/2)=0 THEN 230
215 IF A(F)=0 THEN 230
220 IF A(T)=1 THEN 230
225 GOTO 250
230 PRINT "ILLEGAL MOVE.  TRY AGAIN..."
240 GOTO 100
245 REM *** UPDATE BOARD
250 A(T)=1
260 A(F)=0
270 A((T+F)/2)=0
290 M=M+1
310 REM *** PRINT BOARD
340 FOR J=1 TO 57 STEP 8
350 FOR I=J TO J+7
360 PRINT A(I);
370 NEXT I
380 PRINT
390 NEXT J
400 PRINT
410 GOTO 100
490 REM *** END GAME SUMMARY
500 S=0
510 FOR I=1 TO 64
520 S=S+A(I)
530 NEXT I
540 PRINT "YOU MADE";M;"JUMPS AND HAD";S;"PIECES"
550 PRINT "REMAINING ON THE BOARD."
560 PRINT
562 INPUT "TRY AGAIN";A$
570 IF A$="YES" THEN 70
575 IF A$="NO" THEN 600
580 PRINT "PLEASE ANSWER 'YES' OR 'NO'."
590 GOTO 562
600 PRINT
610 PRINT "O.K.  HOPE YOU HAD FUN!!"
999 END
```

Orbit

ORBIT challenges you to visualize spatial positions in polar coordinates. The object is to detonate a Photon explosive within a certain distance of a germ laden Romulan spaceship. This ship is orbiting a planet at a constant altitude and orbital rate (degrees/hour). The location of the ship is hidden by a device that renders the ship invisible, but after each bomb you are told how close to the enemy ship your bomb exploded. The challenge is to hit an invisible moving target with a limited number of shots.

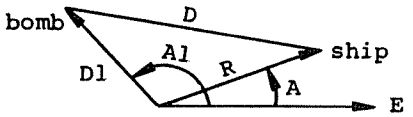
The planet can be replaced by a point at its center (called the origin); then the ship's position can be given as a distance from the origin and an angle between its position and the eastern edge of the planet.



The distance of the bomb from the ship is computed using the law of cosines (see line 430 of the program listing). The law of cosines states

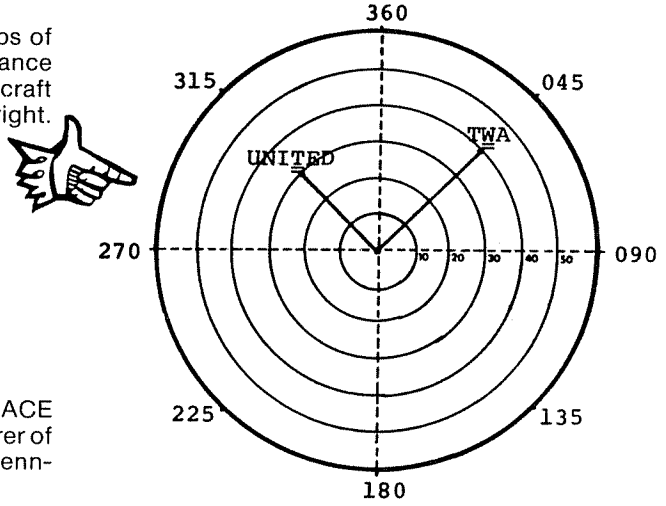
$$D=\sqrt{R^{**}2+D1^{**}2+R*D1*COS\ (A-A1)}$$

where D is the distance between the ship and the bomb, R is the altitude of the ship, D1 is the altitude of the bomb, and A-A1 is the angle between the ship and the bomb.



Practice Off-Line Problem:

Aircraft appear on radar as blips of the form "=". What is the distance between the TWA and United aircraft shown on the radar screen on the right.



ORBIT was originally called SPACE WAR and was written by Jeff Lederer of Project SOLO Pittsburgh, Pennsylvania.

```
                    ORBIT
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

SOMEWHERE ABOVE YOUR PLANET IS A ROMULAN SHIP.

THE SHIP IS IN A CONSTANT POLAR ORBIT.  ITS
DISTANCE FROM THE CENTER OF YOUR PLANET IS FROM
10,000 TO 30,000 MILES AND AT ITS PRESENT VELOCITY CAN
CIRCLE YOUR PLANET ONCE EVERY 12 TO 36 HOURS.

UNFORTUNATELY THEY ARE USING A CLOAKING DEVICE SO
YOU ARE UNABLE TO SEE THEM, BUT WITH A SPECIAL
INSTRUMENT YOU CAN TELL HOW NEAR THEIR SHIP YOUR
PHOTON BOMB EXPLODED.  YOU HAVE SEVEN HOURS UNTIL THEY
HAVE BUILT UP SUFFICIENT POWER IN ORDER TO ESCAPE
YOUR PLANET'S GRAVITY.

YOUR PLANET HAS ENOUGH POWER TO FIRE ONE BOMB AN HOUR.

AT THE BEGINNING OF EACH HOUR YOU WILL BE ASKED TO GIVE AN
ANGLE (BETWEEN 0 AND 360) AND A DISTANCE IN UNITS OF
100 MILES (BETWEEN 100 AND 300), AFTER WHICH YOUR BOMB'S
DISTANCE FROM THE ENEMY SHIP WILL BE GIVEN.

AN EXPLOSION WITHIN 5,000 MILES OF THE ROMULAN SHIP
WILL DESTROY  IT.

BELOW IS A DIAGRAM TO HELP YOU VISUALIZE YOUR PLIGHT.

                          90
                          ^
                     0000000000000
                  0000000000000000000
                000000            000000
              00000                 00000
             00000    XXXXXXXXXXX    00000
            00000    XXXXXXXXXXXXX    00000
           0000     XXXXXXXXXXXXXXX     0000
          0000     XXXXXXXXXXXXXXXXX     0000
         0000     XXXXXXXXXXXXXXXXXXX     0000
180<== 00000     XXXXXXXXXXXXXXXXXXXX     00000 ==>0
         0000     XXXXXXXXXXXXXXXXXXXX     0000
          0000     XXXXXXXXXXXXXXXXX     0000
           0000     XXXXXXXXXXXXXXX     0000
            00000    XXXXXXXXXXXXX    00000
             00000    XXXXXXXXXXX    00000
              00000                 00000
                000000            000000
                  0000000000000000000
                     0000000000000
                          !
                         270

X - YOUR PLANET
0 - THE ORBIT OF THE ROMULAN SHIP
```

```
ON THE ABOVE DIAGRAM, THE ROMULAN SHIP IS CIRCLING
COUNTERCLOCKWISE AROUND YOUR PLANET.  DON'T FORGET
WITHOUT SUFFICIENT POWER THE ROMULAN SHIP'S ALTITUDE
AND ORBITAL RATE WILL REMAIN CONSTANT.

GOOD LUCK.  THE FEDERATION IS COUNTING ON YOU.


HOUR 1 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 90
HOW FAR OUT DO YOU WISH TO DETONATE IT? 250

YOUR PHOTON BOMB EXPLODED 270.671 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 2 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 260
HOW FAR OUT DO YOU WISH TO DETONATE IT? 200


YOUR PHOTON BOMB EXPLODED 382.522 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 3 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 35
HOW FAR OUT DO YOU WISH TO DETONATE IT? 200


YOUR PHOTON BOMB EXPLODED 136.808 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 4 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 20
HOW FAR OUT DO YOU WISH TO DETONATE IT? 300


YOUR PHOTON BOMB EXPLODED 342.719 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 5 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 40
HOW FAR OUT DO YOU WISH TO DETONATE IT? 100


YOUR PHOTON BOMB EXPLODED 228.24 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 6 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 55
HOW FAR OUT DO YOU WISH TO DETONATE IT? 209


YOUR PHOTON BOMB EXPLODED 328.821 *10^2 MILES FROM THE
ROMULAN SHIP.


HOUR 7 , AT WHAT ANGLE DO YOU WISH TO SEND
YOUR PHOTON BOMB? 20
HOW FAR OUT DO YOU WISH TO DETONATE IT? 100


YOUR PHOTON BOMB EXPLODED 299.178 *10^2 MILES FROM THE
ROMULAN SHIP.
YOU HAVE ALLOWED THE ROMULANS TO ESCAPE.
ANOTHER ROMULAN SHIP HAS GONE INTO ORBIT.
DO YOU WISH TO TRY TO DESTROY IT? I HATE COMPUTERS THAT NEVER LOSE
GOOD BYE.
```

```
2 PRINT TAB(33);"ORBIT"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
10 PRINT "SOMEWHERE ABOVE YOUR PLANET IS A ROMULAN SHIP."
15 PRINT
20 PRINT "THE SHIP IS IN A CONSTANT POLAR ORBIT.  ITS"
25 PRINT "DISTANCE FROM THE CENTER OF YOUR PLANET IS FROM"
30 PRINT "10,000 TO 30,000 MILES AND AT ITS PRESENT VELOCITY CAN"
31 PRINT "CIRCLE YOUR PLANET ONCE EVERY 12 TO 36 HOURS."
35 PRINT
40 PRINT "UNFORTUNATELY THEY ARE USING A CLOAKING DEVICE SO"
45 PRINT "YOU ARE UNABLE TO SEE THEM, BUT WITH A SPECIAL"
50 PRINT "INSTRUMENT YOU CAN TELL HOW NEAR THEIR SHIP YOUR"
55 PRINT "PHOTON BOMB EXPLODED.  YOU HAVE SEVEN HOURS UNTIL THEY"
60 PRINT "HAVE BUILT UP SUFFICIENT POWER IN ORDER TO ESCAPE"
65 PRINT "YOUR PLANET'S GRAVITY."
70 PRINT
75 PRINT "YOUR PLANET HAS ENOUGH POWER TO FIRE ONE BOMB AN HOUR."
80 PRINT
85 PRINT "AT THE BEGINNING OF EACH HOUR YOU WILL BE ASKED TO GIVE AN"
90 PRINT "ANGLE (BETWEEN 0 AND 360) AND A DISTANCE IN UNITS OF"
95 PRINT "100 MILES (BETWEEN 100 AND 300), AFTER WHICH YOUR BOMB'S"
100 PRINT "DISTANCE FROM THE ENEMY SHIP WILL BE GIVEN."
105 PRINT
110 PRINT "AN EXPLOSION WITHIN 5,000 MILES OF THE ROMULAN SHIP"
111 PRINT "WILL DESTROY  IT."
114 PRINT
115 PRINT "BELOW IS A DIAGRAM TO HELP YOU VISUALIZE YOUR PLIGHT."
116 PRINT
117 PRINT
168 PRINT "                         90"
169 PRINT "                         ^"
170 PRINT "                    0000000000000"
171 PRINT "                 00000000000000000000"
172 PRINT "               000000            000000"
173 PRINT "             00000                  00000"
174 PRINT "            00000    XXXXXXXXXX    00000"
175 PRINT "           00000    XXXXXXXXXXXX    00000"
176 PRINT "          0000     XXXXXXXXXXXXXX     0000"
177 PRINT "         0000     XXXXXXXXXXXXXXX     0000"
178 PRINT "        0000     XXXXXXXXXXXXXXXXX     0000"
179 PRINT "180<== 00000     XXXXXXXXXXXXXXXXX     00000 ==>0"
180 PRINT "        0000     XXXXXXXXXXXXXXXXX     0000"
181 PRINT "         0000     XXXXXXXXXXXXXXX     0000"
182 PRINT "          0000     XXXXXXXXXXXXX     0000"
183 PRINT "           00000    XXXXXXXXXXX    00000"
184 PRINT "            00000    XXXXXXXXX    00000"
185 PRINT "              00000             00000"
186 PRINT "                000000         000000"
187 PRINT "                  00000000000000000"
188 PRINT "                     0000000000"
189 PRINT "                        !"
190 PRINT "                       270"
192 PRINT
195 PRINT "X - YOUR PLANET"
196 PRINT "0 - THE ORBIT OF THE ROMULAN SHIP"
197 PRINT
198 PRINT "ON THE ABOVE DIAGRAM, THE ROMULAN SHIP IS CIRCLING"
199 PRINT "COUNTERCLOCKWISE AROUND YOUR PLANET.  DON'T FORGET"
200 PRINT "WITHOUT SUFFICIENT POWER THE ROMULAN SHIP'S ALTITUDE"
210 PRINT "AND ORBITAL RATE WILL REMAIN CONSTANT."
220 PRINT
230 PRINT "GOOD LUCK.  THE FEDERATION IS COUNTING ON YOU."
270 A=INT(360*RND(1))
280 D=INT(200*RND(1)+200)
290 R=INT(20*RND(1)+10)
300 H=0
310 IF H=7 THEN 490
320 H=H+1
325 PRINT
326 PRINT
330 PRINT "HOUR";H;", AT WHAT ANGLE DO YOU WISH TO SEND"
335 PRINT "YOUR PHOTON BOMB";
340 INPUT A1
350 PRINT "HOW FAR OUT DO YOU WISH TO DETONATE IT";
360 INPUT D1
365 PRINT
366 PRINT
370 A=A+R
380 IF A<360 THEN 400
390 A=A-360
400 T=ABS(A-A1)
410 IF T<180 THEN 430
420 T=360-T
430 C=SQR(D*D+D1*D1-2*D*D1*COS(T*3.14159/180))
440 PRINT "YOUR PHOTON BOMB EXPLODED";C;"*10^2 MILES FROM THE"
445 PRINT "ROMULAN SHIP."
450 IF C<=50 THEN 470
460 GOTO 310
470 PRINT "YOU HAVE SUCCESFULLY COMPLETED YOUR MISSION."
480 GOTO 500
490 PRINT "YOU HAVE ALLOWED THE ROMULANS TO ESCAPE."
500 PRINT "ANOTHER ROMULAN SHIP HAS GONE INTO ORBIT."
510 PRINT "DO YOU WISH TO TRY TO DESTROY IT";
520 INPUT C$
530 IF C$="YES" THEN 270
540 PRINT "GOOD BYE."
999 END
```

Pizza

In this game, you take orders for pizzas from people living in Hyattsville. Armed with a map of the city, you must then tell your delivery boy the address where the pizza is to be delivered. If the pizza is delivered to the correct address, the customer phones you and thanks you; if not, you must give the driver the correct address until the pizza gets delivered.

Some interesting modifications suggest themselves for this program such as pizzas getting cold after two incorrect delivery attempts or taking three or more orders at a time and figuring the shortest delivery route. Send us your modifications!

This program seems to have surfaced originally at the University of Georgia in Athens, Georgia. The author is unknown.

```
                  PIZZA
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


PIZZA DELIVERY GAME

WHAT IS YOUR FIRST NAME? DARTH

HI, DARTH.  IN THIS GAME YOU ARE TO TAKE ORDERS
FOR PIZZAS.  THEN YOU ARE TO TELL A DELIVERY BOY
WHERE TO DELIVER THE ORDERED PIZZAS.


MAP OF THE CITY OF HYATTSVILLE

 -----1-----2-----3-----4-----
-
-
-
-
4    M     N     O     P     4
-
-
-
-
3    I     J     K     L     3
-
-
-
-
2    E     F     G     H     2
-
-
-
-
1    A     B     C     D     1
-
-
-
-
 -----1-----2-----3-----4-----

THE ABOVE IS A MAP OF THE HOMES WHERE
YOU ARE TO SEND PIZZAS.

YOUR JOB IS TO GIVE A TRUCK DRIVER
THE LOCATION OR COORDINATES OF THE
HOME ORDERING THE PIZZA.

DO YOU NEED MORE DIRECTIONS? YES

SOMEBODY WILL ASK FOR A PIZZA TO BE
DELIVERED.  THEN A DELIVERY BOY WILL
ASK YOU FOR THE LOCATION.
     EXAMPLE:
THIS IS J.  PLEASE SEND A PIZZA.
DRIVER TO DARTH.  WHERE DOES J LIVE?
YOUR ANSWER WOULD BE 2,3

UNDERSTAND? YES
GOOD.  YOU ARE NOW READY TO START TAKING ORDERS.

GOOD LUCK!!


HELLO DARTH'S PIZZA.  THIS IS D.  PLEASE SEND A PIZZA.
  DRIVER TO DARTH.  WHERE DOES D LIVE? 4,1
HELLO DARTH.  THIS IS D, THANKS FOR THE PIZZA.

HELLO DARTH'S PIZZA.  THIS IS O.  PLEASE SEND A PIZZA.
  DRIVER TO DARTH.  WHERE DOES O LIVE? 3,4
HELLO DARTH.  THIS IS O, THANKS FOR THE PIZZA.

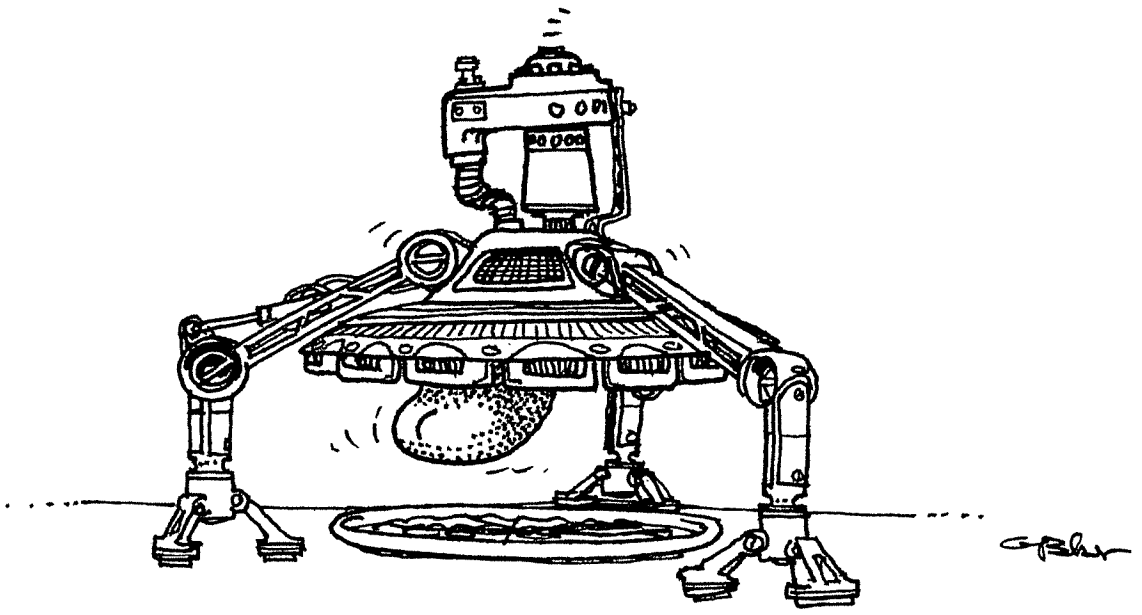
HELLO DARTH'S PIZZA.  THIS IS N.  PLEASE SEND A PIZZA.
  DRIVER TO DARTH.  WHERE DOES N LIVE? 4,2
THIS IS H.  I DID NOT ORDER A PIZZA.
I LIVE AT  4 , 2
  DRIVER TO DARTH.  WHERE DOES N LIVE? 2,4
HELLO DARTH.  THIS IS N, THANKS FOR THE PIZZA.

HELLO DARTH'S PIZZA.  THIS IS J.  PLEASE SEND A PIZZA.
  DRIVER TO DARTH.  WHERE DOES J LIVE? 2,3
HELLO DARTH.  THIS IS J, THANKS FOR THE PIZZA.

HELLO DARTH'S PIZZA.  THIS IS F.  PLEASE SEND A PIZZA.
  DRIVER TO DARTH.  WHERE DOES F LIVE? 2,2
HELLO DARTH.  THIS IS F, THANKS FOR THE PIZZA.

DO YOU WANT TO DELIVER MORE PIZZAS? NO

O.K. DARTH, SEE YOU LATER!
```



```
5 PRINT TAB(33);"PIZZA"
10 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
15 PRINT: PRINT: PRINT
20 DIM S$(16),M$(4)
30 PRINT "PIZZA DELIVERY GAME": PRINT
50 INPUT "WHAT IS YOUR FIRST NAME";N$: PRINT
80 PRINT "HI, ";N$;".  IN THIS GAME YOU ARE TO TAKE ORDERS"
90 PRINT "FOR PIZZAS.  THEN YOU ARE TO TELL A DELIVERY BOY"
100 PRINT "WHERE TO DELIVER THE ORDERED PIZZAS.": PRINT: PRINT
140 FOR I=1 TO 16
150 READ S$(I)
160 NEXT I
170 FOR I=1 TO 4
180 READ M$(I)
190 NEXT I
200 DATA "A","B","C","D","E","F","G","H","I","J","K","L","M","N","O"
210 DATA "P","1","2","3","4"
230 PRINT "MAP OF THE CITY OF HYATTSVILLE": PRINT
250 PRINT " -----1-----2-----3-----4-----"
260 K=4
270 FOR I=1 TO 4
280 PRINT "-": PRINT "-": PRINT"-": PRINT "-"
320 PRINT M$(K);
330 S1=16-4*I+1
340 PRINT "     ";S$(S1);"     ";S$(S1+1);"     ";S$(S1+2);"     ";
350 PRINT S$(S1+3);"     ";M$(K)
380 K=K-1
390 NEXT I
400 PRINT "-": PRINT "-": PRINT "-": PRINT "-"
440 PRINT " -----1-----2-----3-----4-----": PRINT
460 PRINT "THE ABOVE IS A MAP OF THE HOMES WHERE"
470 PRINT "YOU ARE TO SEND PIZZAS.": PRINT
490 PRINT "YOUR JOB IS TO GIVE A TRUCK DRIVER"
500 PRINT "THE LOCATION OR COORDINATES OF THE"
510 PRINT "HOME ORDERING THE PIZZA.": PRINT
520 INPUT "DO YOU NEED MORE DIRECTIONS";A$
530 IF A$="YES" THEN 590
540 IF A$="NO" THEN 750
550 PRINT "'YES' OR 'NO' PLEASE, NOW THEN,": GOTO 520
590 PRINT: PRINT "SOMEBODY WILL ASK FOR A PIZZA TO BE"
600 PRINT "DELIVERED.  THEN A DELIVERY BOY WILL"
610 PRINT "ASK YOU FOR THE LOCATION.": PRINT "     EXAMPLE:"
620 PRINT "THIS IS J.  PLEASE SEND A PIZZA."
640 PRINT "DRIVER TO ";N$;".  WHERE DOES J LIVE?"
650 PRINT "YOUR ANSWER WOULD BE 2,3": PRINT
660 INPUT "UNDERSTAND";A$
670 IF A$="YES" THEN 690
680 PRINT "THIS JOB IS DEFINITELY TOO DIFFICULT FOR YOU. THANKS ANYWAY"
685 GOTO 999
690 PRINT "GOOD.  YOU ARE NOW READY TO START TAKING ORDERS.": PRINT
700 PRINT "GOOD LUCK!!": PRINT
750 FOR I=1 TO 5
760 S=INT(RND(1)*16+1): PRINT
770 PRINT "HELLO ";N$;"'S PIZZA.  THIS IS ";S$(S);".";
775 PRINT "  PLEASE SEND A PIZZA."
780 PRINT "  DRIVER TO ";N$;".  WHERE DOES ";S$(S);" LIVE";
790 INPUT A(1),A(2)
870 T=A(1)+(A(2)-1)*4
880 IF T=S THEN 920
890 PRINT "THIS IS ";S$(T);".  I DID NOT ORDER A PIZZA."
900 PRINT "I LIVE AT ";A(1);",";A(2)
910 GOTO 780
920 PRINT "HELLO "N$;".  THIS IS ";S$(S);", THANKS FOR THE PIZZA."
930 NEXT I
940 PRINT: INPUT "DO YOU WANT TO DELIVER MORE PIZZAS";A$
960 IF A$="YES" THEN 750
970 PRINT: PRINT "O.K. ";N$;", SEE YOU LATER!"
999 END
```

Poetry

This program produces random verse which might loosely be considered in the Japanese Haiku style. It uses 20 phrases in four groups of five phrases each and generally cycles through the groups in order. It inserts commas (random — 19% of the time), indentation (random — 22% of the time), and starts new paragraphs (18% probability, but at least once every 20 phrases).

The phrases in POETRY are somewhat suggestive of Edgar Allen Poe. Try it with phrases from computer technology, from love and romance, from four-year-old children, or from some other subject. Send us the output.

Here are some phrases from nature to try:

Carpet of ferns	Mighty Oaks
Morning dew	Grace and beauty
Tang of dawn	Silently singing
Swaying pines	Nature speaking
Entrances me	Untouched, unspoiled
Soothing me	Shades of green
Rustling leaves	Tranquility
Radiates calm	...so peaceful

The original author of this program is unknown. It was modified and reworked by Jim Bailey, Peggy Ewing, and Dave Ahl at DEC.

```
10 PRINT TAB(30);"POETRY"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
90 ON I GOTO 100,101,102,103,104
100 PRINT "MIDNIGHT DREARY";:GOTO 210
101 PRINT "FIERY EYES";:GOTO 210
102 PRINT "BIRD OR FIEND";:GOTO 210
103 PRINT "THING OF EVIL";:GOTO 210
104 PRINT "PROPHET";:GOTO 210
110 ON I GOTO 111,112,113,114,115
111 PRINT "BEGUILING ME";:U=2:GOTO 210
112 PRINT "THRILLED ME";:GOTO 210
113 PRINT "STILL SITTING....";:GOTO 212
114 PRINT "NEVER FLITTING";:U=2:GOTO 210
115 PRINT "BURNED";:GOTO 210
120 ON I GOTO 121,122,123,124,125
121 PRINT "AND MY SOUL";:GOTO 210
122 PRINT "DARKNESS THERE";:GOTO 210
123 PRINT "SHALL BE LIFTED";:GOTO 210
124 PRINT "QUOTH THE RAVEN";:GOTO 210
125 IF U=0 THEN 210
126 PRINT "SIGN OF PARTING";:GOTO 210
130 ON I GOTO 131,132,133,134,135
131 PRINT "NOTHING MORE";:GOTO 210
132 PRINT "YET AGAIN";:GOTO 210
133 PRINT "SLOWLY CREEPING";:GOTO 210
134 PRINT "...EVERMORE";:GOTO 210
135 PRINT "NEVERMORE";
210 IF U=0 OR RND(1)>.19 THEN 212
211 PRINT ",";:U=2
212 IF RND(1)>.65 THEN 214
213 PRINT " ";:U=U+1:GOTO 215
214 PRINT : U=0
215 I=INT(INT(10*RND(1))/2)+1
220 J=J+1 : K=K+1
230 IF U>0 OR INT(J/2)<>J/2 THEN 240
235 PRINT "     ";
240 ON J GOTO 90,110,120,130,250
250 J=0 : PRINT : IF K>20 THEN 270
260 GOTO 215
270 PRINT : U=0 : K=0 : GOTO 110
999 END
```

```
                    POETRY
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


MIDNIGHT DREARY FIERY EYES, STILL SITTING....
DARKNESS THERE
     NOTHING MORE
PROPHET, NEVER FLITTING, SHALL BE LIFTED YET AGAIN

PROPHET
     NEVER FLITTING QUOTH THE RAVEN
     SLOWLY CREEPING
FIERY EYES
     BEGUILING ME, SIGN OF PARTING
     NEVERMORE
MIDNIGHT DREARY
     THRILLED ME QUOTH THE RAVEN ...EVERMORE


THRILLED ME BIRD OR FIEND
     BURNED
DARKNESS THERE ...EVERMORE

PROPHET BEGUILING ME
DARKNESS THERE YET AGAIN
MIDNIGHT DREARY
     STILL SITTING.... QUOTH THE RAVEN, NOTHING MORE
BIRD OR FIEND
     BURNED SIGN OF PARTING NOTHING MORE
MIDNIGHT DREARY
     STILL SITTING....
QUOTH THE RAVEN NEVERMORE


STILL SITTING....
MIDNIGHT DREARY STILL SITTING....
AND MY SOUL
     YET AGAIN

PROPHET THRILLED ME, SIGN OF PARTING,
     ...EVERMORE
BIRD OR FIEND, STILL SITTING....
 YET AGAIN
THING OF EVIL BURNED
DARKNESS THERE NEVERMORE,
THING OF EVIL
     BEGUILING ME SIGN OF PARTING ...EVERMORE
```

Poker

You and the computer are opponents in this game of draw poker. At the start of the game, each player is given $200. The game ends when either player runs out of money, although if you go broke the computer will offer to buy your wristwatch or diamond tie tack.

The computer opens the betting before the draw; you open the betting after the draw. If you don't have a hand that's worth anything and you want to fold, bet 0. Prior to the draw, to check the draw, you may bet .5. Of course, if the computer has made a bet, you must match it in order to draw or, if you have a good hand, you may raise the bet at any time.

The author is A. Christopher Hall of Trinity College, Hartford, Connecticut.

```
                 POKER
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

WELCOME TO THE CASINO.  WE EACH HAVE $200
I WILL OPEN THE BETTING BEFORE THE DRAW; YOU OPEN AFTER
WHEN YOU FOLD, BET 0; TO CHECK, BET .5
ENOUGH TALK -- LET'S GET DOWN TO BUSINESS


THE ANTE IS $5.  I WILL DEAL

YOUR HAND:
 1 --  JACK OF SPADES          2 --  QUEEN OF SPADES
 3 --   4  OF SPADES           4 --   3  OF SPADES
 5 --  QUEEN OF DIAMONDS

I CHECK
WHAT IS YOUR BET? 5
I'LL SEE YOU

NOW WE DRAW -- HOW MANY CARDS DO YOU WANT? 1
WHAT ARE THEIR NUMBERS
? 5
YOUR NEW HAND:
 1 --  JACK OF SPADES          2 --  QUEEN OF SPADES
 3 --   4  OF SPADES           4 --   3  OF SPADES
 5 --   3  OF HEARTS

I AM TAKING 3 CARDS

WHAT IS YOUR BET? 5
I'LL SEE YOU, AND RAISE YOU 8
WHAT IS YOUR BET? 8

NOW WE COMPARE HANDS
MY HAND:
 6 --   3  OF CLUBS
 7 --   5  OF HEARTS          8 --  QUEEN OF CLUBS
 9 --  QUEEN OF HEARTS        10 --  ACE OF SPADES


YOU HAVE A PAIR OF  3 S
AND I HAVE A PAIR OF QUEENS
THE HAND IS DRAWN
ALL $ 46 REMAINS IN THE POT

THE ANTE IS $5.  I WILL DEAL

YOUR HAND:
 1 --   8  OF CLUBS           2 --   7  OF SPADES
 3 --   6  OF HEARTS          4 --   2  OF CLUBS
 5 --   3  OF DIAMONDS

I'LL OPEN WITH  28
WHAT IS YOUR BET? 0

I WIN
NOW I HAVE $ 228 AND YOU HAVE $ 172
DO YOU WISH TO CONTINUE? YES

THE ANTE IS $5.  I WILL DEAL

YOUR HAND:
 1 --  ACE OF CLUBS           2 --  QUEEN OF CLUBS
 3 --  KING OF CLUBS          4 --   7  OF CLUBS
 5 --   2  OF SPADES

I CHECK
WHAT IS YOUR BET? 5
I'LL SEE YOU

NOW WE DRAW -- HOW MANY CARDS DO YOU WANT? 1
WHAT ARE THEIR NUMBERS
? 5
YOUR NEW HAND:
 1 --  ACE OF CLUBS           2 --  QUEEN OF CLUBS
 3 --  KING OF CLUBS          4 --   7  OF CLUBS
 5 --   5  OF CLUBS

I AM TAKING 1 CARD
WHAT IS YOUR BET? 100
I'LL SEE YOU, AND RAISE YOU 101
WHAT IS YOUR BET? 101

YOU CAN'T BET WITH WHAT YOU HAVEN'T GOT
WOULD YOU LIKE TO SELL YOUR WATCH? YES
I'LL GIVE YOU $75 FOR IT
WHAT IS YOUR BET? 101

NOW WE COMPARE HANDS
MY HAND:
 6 --   6  OF CLUBS
 7 --   8  OF DIAMONDS        8 --   8  OF CLUBS
 9 --   9  OF SPADES          10 --   9  OF CLUBS


YOU HAVE A FLUSH IN CLUBS
AND I HAVE TWO PAIR,  9 S
YOU WIN
NOW I HAVE $ 17 AND YOU HAVE $ 458
DO YOU WISH TO CONTINUE? YES

THE ANTE IS $5.  I WILL DEAL

YOUR HAND:
 1 --  JACK OF SPADES          2 --   4  OF CLUBS
 3 --  ACE OF CLUBS           4 --  QUEEN OF CLUBS
 5 --   5  OF HEARTS

I CHECK
WHAT IS YOUR BET? 5
I'LL SEE YOU

NOW WE DRAW -- HOW MANY CARDS DO YOU WANT? 2
WHAT ARE THEIR NUMBERS
? 2
? 5
YOUR NEW HAND:
 1 --  JACK OF SPADES          2 --   5  OF CLUBS
 3 --  ACE OF CLUBS           4 --  QUEEN OF CLUBS
 5 --   9  OF DIAMONDS

I AM TAKING 1 CARD
WHAT IS YOUR BET? 5
I'LL SEE YOU

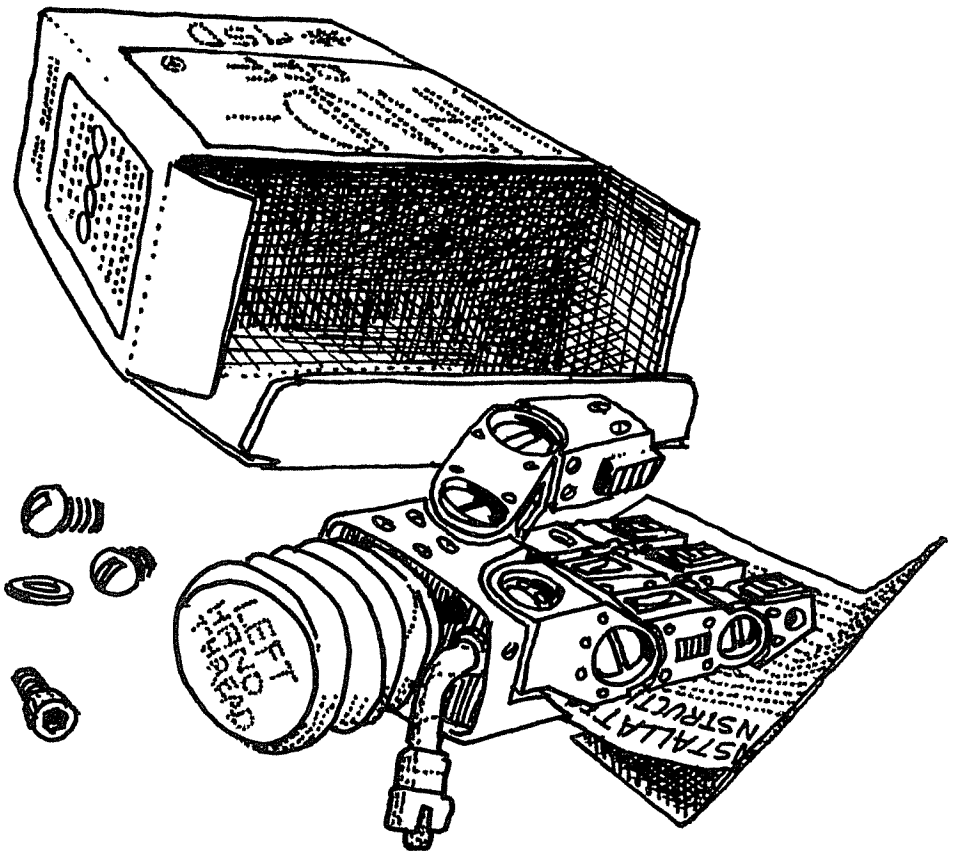
NOW WE COMPARE HANDS
MY HAND:
 6 --   3  OF HEARTS
 7 --   6  OF HEARTS          8 --   7  OF HEARTS
 9 --   9  OF CLUBS           10 --  ACE OF HEARTS


YOU HAVE SCHMALTZ, ACE HIGH
AND I HAVE SCHMALTZ, ACE HIGH
THE HAND IS DRAWN
ALL $ 30 REMAINS IN THE POT

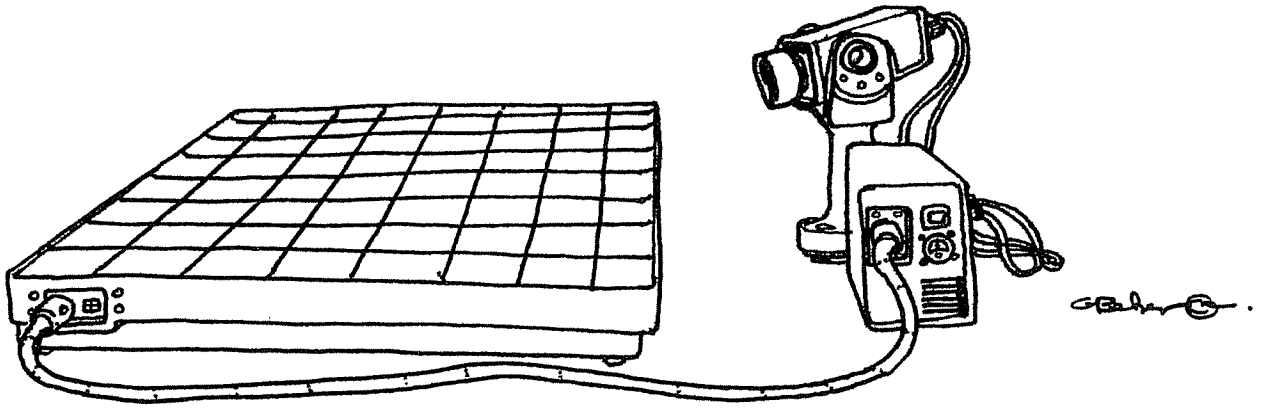
I'M BUSTED.  CONGRATULATIONS!
```

```
2 PRINT TAB(33);"POKER"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 DIM A(50),B(15)
20 DEF FNA(X)=INT(10*RND(1))
30 DEF FNB(X)=X-100*INT(X/100)
40 PRINT "WELCOME TO THE CASINO.  WE EACH HAVE $200"
50 PRINT "I WILL OPEN THE BETTING BEFORE THE DRAW; YOU OPEN AFTER"
60 PRINT "WHEN YOU FOLD, BET 0; TO CHECK, BET .5"
70 PRINT "ENOUGH TALK -- LET'S GET DOWN TO BUSINESS"
80 PRINT
90 LET Q=1
100 LET C=200
110 LET S=200
120 LET P=0
130 REM
140 PRINT
150 IF C<=5 THEN 3670
160 PRINT "THE ANTE IS $5.  I WILL DEAL"
170 PRINT
180 IF S>5 THEN 200
190 GOSUB 3830
200 LET P=P+10
210 LET S=S-5
220 LET C=C-5
230 FOR Z=1 TO 10
240 GOSUB 1740
250 NEXT Z
260 PRINT "YOUR HAND:"
270 N=1
280 GOSUB 1850
290 N=6
300 I=2
310 GOSUB 2170
320 PRINT
330 IF I<>6 THEN 470
340 IF FNA(0)<=7 THEN 370
350 LET X=11100
360 GOTO 420
370 IF FNA(0)<=7 THEN 400
380 LET X=11110
390 GOTO 420
400 IF FNA(0)>=1 THEN 450
410 X=11111
420 I=7
430 Z=23
440 GOTO 580
450 Z=1
460 GOTO 510
470 IF U>=13 THEN 540
480 IF FNA(0)>=2 THEN 500
490 GOTO 420
500 Z=0
510 K=0
520 PRINT "I CHECK"
530 GOTO 620
540 IF U<=16 THEN 570
550 Z=2
560 IF FNA(0)>=1 THEN 580
570 Z=35
580 V=Z+FNA(0)
590 GOSUB 3480
600 PRINT "I'LL OPEN WITH "V
610 K=V
620 GOSUB 3050
630 GOSUB 650
640 GOTO 820
650 IF I<>3 THEN 760
660 PRINT
670 PRINT "I WIN"
680 C=C+P
690 PRINT "NOW I HAVE $"C"AND YOU HAVE $"S
700 PRINT "DO YOU WISH TO CONTINUE";
710 INPUT H$
720 IF H$="YES" THEN 120
730 IF H$="NO" THEN 4100
740 PRINT "ANSWER YES OR NO, PLEASE."
750 GOTO 700
760 IF I<>4 THEN 810
770 PRINT
780 PRINT "YOU WIN"
790 S=S+P
800 GOTO 690
810 RETURN
820 PRINT
830 PRINT "NOW WE DRAW -- HOW MANY CARDS DO YOU WANT";
840 INPUT T
850 IF T=0 THEN 980
860 Z=10
870 IF T<4 THEN 900
880 PRINT "YOU CAN'T DRAW MORE THAN THREE CARDS"
890 GOTO 840
900 PRINT "WHAT ARE THEIR NUMBERS"
910 FOR Q=1 TO T
920 INPUT U
930 GOSUB 1730
940 NEXT Q
950 PRINT "YOUR NEW HAND:"
960 N=1
970 GOSUB 1850
980 Z=10+T
990 FOR U=6 TO 10
1000 IF INT(X/10^(U-6))<>10*INT(X/10^(U-5)) THEN 1020
1010 GOSUB 1730
1020 NEXT U
1030 PRINT
1040 PRINT "I AM TAKING"Z-10-T"CARD";
1050 IF Z=11+T THEN 1090
1060 PRINT "S"
1070 PRINT
1080 GOTO 1100
1090 PRINT
1100 N=6
1110 V=I
1120 I=1
1130 GOSUB 2170
1140 B=U
1150 M=D
1160 IF V<>7 THEN 1190
1170 Z=28
1180 GOTO 1330
1190 IF I<>6 THEN 1220
1200 Z=1
1210 GOTO 1330
1220 IF U>=13 THEN 1270
1230 Z=2
1240 IF FNA(0)<>6 THEN 1260
1250 Z=19
1260 GOTO 1330
1270 IF U>=16 THEN 1320
1280 Z=19
1290 IF FNA(0)<>8 THEN 1310
1300 Z=11
1310 GOTO 1330
1320 Z=2
1330 K=0
1340 GOSUB 3050
1350 IF T<>.5 THEN 1450
1360 IF V=7 THEN 1400
1370 IF I<>6 THEN 1400
1380 PRINT "I'LL CHECK"
1390 GOTO 1460
1400 V=Z+FNA(0)
1410 GOSUB 3480
1420 PRINT "I'LL BET"V
1430 K=V
1440 GOSUB 3060
1450 GOSUB 650
1460 PRINT
1470 PRINT "NOW WE COMPARE HANDS"
1480 J$=H$
1490 K$=I$
1500 PRINT "MY HAND:"
1510 N=6
1520 GOSUB 1850
1530 N=1
1540 GOSUB 2170
1550 PRINT
1560 PRINT "YOU HAVE ";
1570 K=D
1580 GOSUB 3690
1590 H$=J$
1600 I$=K$
1610 K=M
1620 PRINT "AND I HAVE ";
1630 GOSUB 3690
1640 IF B>U THEN 670
1650 IF U>B THEN 780
1660 IF H$="A FLUS" THEN 1700
1662 IF FNB(M)<FNB(D) THEN 780
1664 IF FNB(M)>FNB(D) THEN 670
1670 PRINT "THE HAND IS DRAWN"
1680 PRINT "ALL $"P"REMAINS IN THE POT"
1690 GOTO 140
1700 IF FNB(M)>FNB(D) THEN 670
1710 IF FNB(D)>FNB(M) THEN 780
1720 GOTO 1670
1730 Z=Z+1
1740 A(Z)=100*INT(4*RND(1))+INT(100*RND(1))
1750 IF INT(A(Z)/100)>3 THEN 1740
1760 IF A(Z)-100*INT(A(Z)/100)>12 THEN 1740
1765 IF Z=1 THEN 1840
1770 FOR K=1 TO Z-1
1780 IF A(Z)=A(K) THEN 1740
1790 NEXT K
1800 IF Z<=10 THEN 1840
1810 N=A(U)
1820 A(U)=A(Z)
1830 A(Z)=N
1840 RETURN
1850 FOR Z=N TO N+4
1860 PRINT Z"--  ";
1870 GOSUB 1950
1880 PRINT " OF";
1890 GOSUB 2070
1900 IF Z/2<>INT(Z/2) THEN 1920
1910 PRINT
1920 NEXT Z
1930 PRINT
1940 RETURN
1950 K=FNB(A(Z))
1960 IF K<>9 THEN 1980
1970 PRINT "JACK";
1980 IF K<>10 THEN 2000
1990 PRINT "QUEEN";
2000 IF K<>11 THEN 2020
2010 PRINT "KING";
2020 IF K<>12 THEN 2040
2030 PRINT "ACE";
2040 IF K>=9 THEN 2060
2050 PRINT K+2;
2060 RETURN
2070 K=INT(A(Z)/100)
2080 IF K<>0 THEN 2100
2090 PRINT " CLUBS",
2100 IF K<>1 THEN 2120
2110 PRINT " DIAMONDS",
2120 IF K<>2 THEN 2140
2130 PRINT " HEARTS",
2140 IF K<>3 THEN 2160
2150 PRINT " SPADES",
2160 RETURN
2170 U=0
2180 FOR Z=N TO N+4
2190 B(Z)=FNB(A(Z))
2200 IF Z=N+4 THEN 2230
2210 IF INT(A(Z)/100)<>INT(A(Z+1)/100) THEN 2230
2220 U=U+1
2230 NEXT Z
2240 IF U<>4 THEN 2310
2250 X=11111
2260 D=A(N)
```

```
2270 H$="A FLUS"
2280 I$="H IN"
2290 U=15
2300 RETURN
2310 FOR Z=N TO N+3
2320 FOR K=Z+1 TO N+4
2330 IF B(Z)<=B(K) THEN 2390
2340 X=A(Z)
2350 A(Z)=A(K)
2360 B(Z)=B(K)
2370 A(K)=X
2380 B(K)=A(K)-100*INT(A(K)/100)
2390 NEXT K
2400 NEXT Z
2410 X=0
2420 FOR Z=N TO N+3
2430 IF B(Z)<>B(Z+1) THEN 2470
2440 X=X+11*10^(Z-N)
2450 D=A(Z)
2460 GOSUB 2760
2470 NEXT Z
2480 IF X<>0 THEN 2620
2490 IF B(N)+3<>B(N+3) THEN 2520
2500 X=1111
2510 U=10
2520 IF B(N+1)+3<>B(N+4) THEN 2620
2530 IF U<>10 THEN 2600
2540 U=14
2550 H$="STRAIG"
2560 I$="HT"
2570 X=11111
2580 D=A(N+4)
2590 RETURN
2600 U=10
2610 X=11110
2620 IF U>=10 THEN 2690
2630 D=A(N+4)
2640 H$="SCHMAL"
2650 I$="TZ, "
2660 U=9
2670 X=11000
2680 GOTO 2740
2690 IF U<>10 THEN 2720
2700 IF I=1 THEN 2740
2710 GOTO 2750
2720 IF U>12 THEN 2750
2730 IF FNB(D)>6 THEN 2750
2740 I=6
2750 RETURN
2760 IF U>=11 THEN 2810
2770 U=11
2780 H$="A PAIR"
2790 I$=" OF "
2800 RETURN
2810 IF U<>11 THEN 2910
2820 IF B(Z)<>B(Z-1) THEN 2870
2830 H$="THREE"
2840 I$=" "
2850 U=13
2860 RETURN
2870 H$="TWO P"
2880 I$="AIR, "
2890 U=12
2900 RETURN
2910 IF U>12 THEN 2960
2920 U=16
2930 H$="FULL H"
2940 I$="OUSE, "
2950 RETURN
2960 IF B(Z)<>B(Z-1) THEN 3010
2970 U=17
2980 H$="FOUR"
2990 I$=" "
3000 RETURN
3010 U=16
3020 H$="FULL H"
3030 I$="OUSE, "
3040 RETURN
3050 G=0
3060 PRINT "WHAT IS YOUR BET";
3070 INPUT T
3080 IF T-INT(T)=0 THEN 3140
3090 IF K<>0 THEN 3120
3100 IF G<>0 THEN 3120
3110 IF T=.5 THEN 3410
3120 PRINT "NO SMALL CHANGE, PELASE"
3130 GOTO 3060
3140 IF S-G-T>=0 THEN 3170
3150 GOSUB 3830
3160 GOTO 3060
3170 IF T<>0 THEN 3200
3180 I=3
3190 GOTO 3380
3200 IF G+T>=K THEN 3230
3210 PRINT "IF YOU CAN'T SEE MY BET, THEN FOLD"
3220 GOTO 3060
3230 G=G+T
3240 IF G=K THEN 3380
3250 IF Z<>1 THEN 3420
3260 IF G>5 THEN 3300
3270 IF Z>=2 THEN 3350
3280 V=5
3290 GOTO 3420
3300 IF Z=1 THEN 3320
3310 IF T<=25 THEN 3350
3320 I=4
3330 PRINT "I FOLD"
3340 RETURN
3350 IF Z=2 THEN 3430
3360 PRINT "I'LL SEE YOU"
3370 K=G
3380 S=S-G
3390 C=C-K
3400 P=P+G+K
3410 RETURN
3420 IF G>3*Z THEN 3350
3430 V=G-K+FNA(0)
3440 GOSUB 3480
3450 PRINT "I'LL SEE YOU, AND RAISE YOU"V
3460 K=G+V
3470 GOTO 3060
3480 IF C-G-V>=0 THEN 3660
3490 IF G<>0 THEN 3520
3500 V=C
3510 RETURN
3520 IF C-G>=0 THEN 3360
3530 IF (O/2)<>INT(O/2) THEN 3600
3540 PRINT "WOULD YOU LIKE TO BUY BACK YOUR WATCH FOR $50";
3550 INPUT J$
3560 IF J$="NO" THEN 3600
3570 C=C+50
3580 O=O/2
3590 RETURN
3600 IF O/3<>INT(O/3) THEN 3670
3610 PRINT "WOULD YOU LIKE TO BUY BACK YOUR TIE TACK FOR $50";
3620 INPUT J$
3630 IF J$="NO" THEN 3670
3640 C=C+50
3650 O=O/3
3660 RETURN
3670 PRINT "I'M BUSTED.  CONGRATULATIONS!"
3680 STOP
3690 PRINT H$;I$;
3700 IF H$<>"A FLUS" THEN 3750
3710 K=INT(K/100)
3720 GOSUB 2080
3730 PRINT
3740 RETURN
3750 K=FNB(K)
3760 GOSUB 1960
3770 IF H$="SCHMAL" THEN 3790
3780 IF H$<>"STRAIG" THEN 3810
3790 PRINT " HIGH"
3800 RETURN
3810 PRINT "S"
3820 RETURN
3830 PRINT
3840 PRINT "YOU CAN'T BET WITH WHAT YOU HAVEN'T GOT"
3850 IF O/2=INT(O/2) THEN 3970
3860 PRINT "WOULD YOU LIKE TO SELL YOUR WATCH";
3870 INPUT J$
3880 IF J$="NO" THEN 3970
3890 IF FNA(0)>=7 THEN 3930
3900 PRINT "I'LL GIVE YOU $75 FOR IT"
3910 S=S+75
3920 GOTO 3950
3930 PRINT "THAT'S A PRETTY CRUMMY WATCH - I'LL GIVE YOU $25"
3940 S=S+25
3950 O=O*2
3960 RETURN
3970 IF O/3<>INT(O/3) THEN 4090
3980 PRINT "WILL YOU PART WITH THAT DIAMOND TIE TACK":
3990 INPUT J$
4000 IF J$="NO" THEN 4080
4010 IF FNA(0)>=6 THEN 4050
4020 PRINT "YOU ARE NOW $100 RICHER"
4030 S=S+100
4040 GOTO 4070
4050 PRINT "IT'S PASTE.  $25"
4060 S=S+25
4070 O=O*3
4080 RETURN
4090 PRINT "YOUR WAD IS SHOT.  SO LONG, SUCKER!"
4100 END
```


LEFT
HAND
THREAD

Queen



This game is based on the permissible moves of the chess queen — i.e., along any vertical, horizontal, or diagonal. In this game, the queen can only move to the left, down, and diagonally down to the left.

The object of the game is to place the queen (one only) in the lower left-hand square (no. 158), by alternating moves between you and the computer. The one to place the queen there wins.

You go first and place the queen in any one of the squares on the top row or the right-hand column. That is your first move. The computer is beatable, but it takes some figuring. See if you can devise a winning strategy.

```
                    QUEEN
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES
WE ARE GOING TO PLAY A GAME BASED ON ONE OF THE CHESS
MOVES.  OUR QUEEN WILL BE ABLE TO MOVE ONLY TO THE LEFT,
DOWN, OR DIAGONALLY DOWN AND TO THE LEFT.

THE OBJECT OF THE GAME IS TO PLACE THE QUEEN IN THE LOWER
LEFT HAND SQUARE BY ALTERNATING MOVES BETWEEN YOU AND THE
COMPUTER.  THE FIRST ONE TO PLACE THE QUEEN THERE WINS.

YOU GO FIRST AND PLACE THE QUEEN IN ANY ONE OF THE SQUARES
ON THE TOP ROW OR RIGHT HAND COLUMN.
THAT WILL BE YOUR FIRST MOVE.
WE ALTERNATE MOVES.
YOU MAY FORFEIT BY TYPING '0' AS YOUR MOVE.
BE SURE TO PRESS THE RETURN KEY AFTER EACH RESPONSE.

 81  71  61  51  41  31  21  11

 92  82  72  62  52  42  32  22

103  93  83  73  63  53  43  33

114 104  94  84  74  64  54  44

125 115 105  95  85  75  65  55

136 126 116 106  96  86  76  66

147 137 127 117 107  97  87  77

158 148 138 128 118 108  98  88


WHERE WOULD YOU LIKE TO START? 44
COMPUTER MOVES TO SQUARE 55
WHAT IS YOUR MOVE? 65
COMPUTER MOVES TO SQUARE 75
WHAT IS YOUR MOVE? 85
COMPUTER MOVES TO SQUARE 127
WHAT IS YOUR MOVE? 138
COMPUTER MOVES TO SQUARE 158

NICE TRY, BUT IT LOOKS LIKE I HAVE WON.
THANKS FOR PLAYING.

ANYONE ELSE CARE TO TRY? YES

WHERE WOULD YOU LIKE TO START? 31
COMPUTER MOVES TO SQUARE 75
WHAT IS YOUR MOVE? 95
COMPUTER MOVES TO SQUARE 158

NICE TRY, BUT IT LOOKS LIKE I HAVE WON.
THANKS FOR PLAYING.

ANYONE ELSE CARE TO TRY? NO

OK --- THANKS AGAIN.
```

```
1 PRINT TAB(33);"QUEEN"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
10 DIM S(64)
11 FOR I=1 TO 64
12 READ S(I)
13 NEXT I
14 DATA  81,  71,  61,  51,  41,  31,  21,  11
15 DATA  92,  82,  72,  62,  52,  42,  32,  22
16 DATA 103,  93,  83,  73,  63,  53,  43,  33
17 DATA 114, 104,  94,  84,  74,  64,  54,  44
18 DATA 125, 115, 105,  95,  85,  75,  65,  55
19 DATA 136, 126, 116, 106,  96,  86,  76,  66
20 DATA 147, 137, 127, 117, 107,  97,  87,  77
21 DATA 158, 148, 138, 128, 118, 108,  98,  88
22 INPUT "DO YOU WANT INSTRUCTIONS";W$
23 IF W$="NO" THEN 30
24 IF W$="YES" THEN 28
25 PRINT "PLEASE ANSWER 'YES' OR 'NO'."
26 GOTO 22
28 GOSUB 5000
29 GOTO 100
30 GOSUB 5150
90 REM     ERROR CHECKS
100 PRINT "WHERE WOULD YOU LIKE TO START";
110 INPUT M1
115 IF M1=0 THEN 232
120 T1=INT(M1/10)
130 U1=M1-10*T1
140 IF U1=1 THEN 200
150 IF U1=T1 THEN 200
160 PRINT "PLEASE READ THE DIRECTIONS AGAIN."
170 PRINT "YOU HAVE BEGUN ILLEGALLY."
175 PRINT
180 GOTO 100
200 GOSUB 2000
210 PRINT "COMPUTER MOVES TO SQUARE";M
215 IF M=158 THEN 3400
220 PRINT "WHAT IS YOUR MOVE";
230 INPUT M1
231 IF M1<>0 THEN 239
232 PRINT
233 PRINT "IT LOOKS LIKE I HAVE WON BY FORFEIT."
234 PRINT
235 GOTO 4000
239 IF M1<=M THEN 3200
240 T1=INT(M1/10)
250 U1=M1-10*T1
260 P=U1-U
270 IF P<>0 THEN 300
280 L=T1-T
290 IF L<=0 THEN 3200
295 GOTO 200
300 IF T1-T <>P THEN 320
310 GOTO 200
320 IF T1-T <>2*P THEN 3200
330 GOTO 200
1990 REM     LOCATE MOVE FOR COMPUTER
2000 IF M1=41 THEN 2180
2010 IF M1=44 THEN 2180
2020 IF M1=73 THEN 2180
2030 IF M1=75 THEN 2180
2040 IF M1=126 THEN 2180
2050 IF M1=127 THEN 2180
2060 IF M1=158 THEN 3300
2065 C=0
2070 FOR K=7 TO 1 STEP -1
2080 U=U1
2090 T=T1+K
2100 GOSUB 3500
2105 IF C=1 THEN 2160
2110 U=U+K
2120 GOSUB 3500
2125 IF C=1 THEN 2160
2130 T=T+K
2140 GOSUB 3500
2145 IF C=1 THEN 2160
2150 NEXT K
2155 GOTO 2180
2160 C=0
2170 RETURN
2180 GOSUB 3000
2190 RETURN
2990 REM     RANDOM MOVE
3000 Z=RND(1)
3010 IF Z>.6 THEN 3110
3020 IF Z>.3 THEN 3070
3030 U=U1
3040 T=T1+1
3050 M=10*T+U
3060 RETURN
3070 U=U1+1
3080 T=T1+2
3090 M=10*T+U
3100 RETURN
3110 U=U1+1
3120 T=T1+1
3130 M=10*T+U
3140 RETURN
3190 REM     ILLEGAL MOVE MESSAGE
3200 PRINT
3210 PRINT "Y O U   C H E A T . . .  TRY AGAIN";
3220 GOTO 230
3290 REM     PLAYER WINS
3300 PRINT
3310 PRINT "C O N G R A T U L A T I O N S . . ."
3320 PRINT
3330 PRINT "YOU HAVE WON--VERY WELL PLAYED."
3340 PRINT "IT LOOKS LIKE I HAVE MET MY MATCH."
3350 PRINT "THANKS FOR PLAYING---I CAN'T WIN ALL THE TIME."
3360 PRINT
3370 GOTO 4000
3390 REM     COMPUTER WINS
3400 PRINT
3410 PRINT "NICE TRY, BUT IT LOOKS LIKE I HAVE WON."
3420 PRINT "THANKS FOR PLAYING."
3430 PRINT
3440 GOTO 4000
3490 REM     TEST FOR COMPUTER MOVE
3500 M=10*T+U
3510 IF M=158 THEN 3570
3520 IF M=127 THEN 3570
3530 IF M=126 THEN 3570
3540 IF M=75 THEN 3570
3550 IF M=73 THEN 3570
3560 RETURN
3570 C=1
3580 GOTO 3560
3990 REM     ANOTHER GAME???
4000 PRINT "ANYONE ELSE CARE TO TRY";
4010 INPUT Q$
4020 PRINT
4030 IF Q$="YES" THEN 100
4040 IF Q$="NO" THEN 4050
4042 PRINT "PLEASE ANSWER 'YES' OR 'NO'."
4045 GOTO 4000
4050 PRINT "OK --- THANKS AGAIN."
4060 STOP
4990 REM     DIRECTIONS
5000 PRINT "WE ARE GOING TO PLAY A GAME BASED ON ONE OF THE CHESS"
5010 PRINT "MOVES.  OUR QUEEN WILL BE ABLE TO MOVE ONLY TO THE LEFT,"
5020 PRINT "DOWN, OR DIAGONALLY DOWN AND TO THE LEFT."
5030 PRINT
5040 PRINT "THE OBJECT OF THE GAME IS TO PLACE THE QUEEN IN THE LOWER"
5050 PRINT "LEFT HAND SQUARE BY ALTERNATING MOVES BETWEEN YOU AND THE"
5060 PRINT "COMPUTER.  THE FIRST ONE TO PLACE THE QUEEN THERE WINS."
5070 PRINT
5080 PRINT "YOU GO FIRST AND PLACE THE QUEEN IN ANY ONE OF THE SQUARES"
5090 PRINT "ON THE TOP ROW OR RIGHT HAND COLUMN."
5100 PRINT "THAT WILL BE YOUR FIRST MOVE."
5110 PRINT "WE ALTERNATE MOVES."
5120 PRINT "YOU MAY FORFEIT BY TYPING '0' AS YOUR MOVE."
5130 PRINT "BE SURE TO PRESS THE RETURN KEY AFTER EACH RESPONSE."
5140 PRINT
5150 PRINT
5160 PRINT
5170 FOR A=0 TO 7
5180 FOR B=1 TO 8
5185 I=8*A+B
5190 PRINT S(I);
5200 NEXT B
5210 PRINT
5220 PRINT
5230 PRINT
5240 NEXT A
5250 PRINT
5260 RETURN
9999 END
```

Reverse

The game of REVERSE requires you to arrange a list of numbers in numerical order from left to right. To move, you tell the computer how many numbers (counting from the left) to reverse. For example, if the current list is:

2 3 4 5 1 6 7 8 9

and you reverse 4, the result will be:

5 4 3 2 1 6 7 8 9

Now if you reverse 5, you win!

There are many ways to beat the game, but approaches tend to be either algorithmic or heuristic. The game thus offers the player a chance to play with these concepts in a practical (rather than theoretical) context.

An algorithmic approach guarantees a solution in a predictable number of moves, given the number of items in the list. For example, one method guarantees a solution in 2N - 3 moves when the list contains N numbers. The essence of an algorithmic approach is that you know in advance what your next move will be. One could easily program a computer to do this.

A heuristic approach takes advantage of "partial orderings" in the list at any moment. Using this type of approach, your next move is dependent on the way the list currently appears. This way of solving the problem does not guarantee a solution in a predictable number of moves, but if you are lucky and clever, you may come out ahead of the algorithmic solutions. One could not so easily program this method.

In practice, many players adopt a "mixed" strategy, with both algorithmic and heuristic features. Is this better than either "pure" strategy?

The program was created by Peter Sessions of People's Computer Company and the notes above adapted from his original write-up.

```
                REVERSE
  CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

REVERSE -- A GAME OF SKILL

DO YOU WANT THE RULES? YES

THIS IS THE GAME OF 'REVERSE'.  TO WIN, ALL YOU HAVE
TO DO IS ARRANGE A LIST OF NUMBERS (1 THROUGH 9 )
IN NUMERICAL ORDER FROM LEFT TO RIGHT. TO MOVE, YOU
TELL ME HOW MANY NUMBERS (COUNTING FROM THE LEFT) TO
REVERSE.  FOR EXAMPLE, IF THE CURRENT LIST IS:

2 3 4 5 1 6 7 8 9

AND YOU REVERSE 4, THE RESULT WILL BE:

5 4 3 2 1 6 7 8 9

NOW IF YOU REVERSE 5, YOU WIN!

1 2 3 4 5 6 7 8 9

NO DOUBT YOU WILL LIKE THIS GAME, BUT
IF YOU WANT TO QUIT, REVERSE 0 (ZERO).


HERE WE GO ... THE LIST IS:

 2  4  5  1  9  6  3  7  8

HOW MANY SHALL I REVERSE? 9

 8  7  3  6  9  1  5  4  2

HOW MANY SHALL I REVERSE? 4

 6  3  7  8  9  1  5  4  2

HOW MANY SHALL I REVERSE? 5

 9  8  7  3  6  1  5  4  2

HOW MANY SHALL I REVERSE? 9

 2  4  5  1  6  3  7  8  9

HOW MANY SHALL I REVERSE? 3

 5  4  2  1  6  3  7  8  9

HOW MANY SHALL I REVERSE? 4

 1  2  4  5  6  3  7  8  9

HOW MANY SHALL I REVERSE? 6

 3  6  5  4  2  1  7  8  9

HOW MANY SHALL I REVERSE? 4

 4  5  6  3  2  1  7  8  9

HOW MANY SHALL I REVERSE? 3

 6  5  4  3  2  1  7  8  9

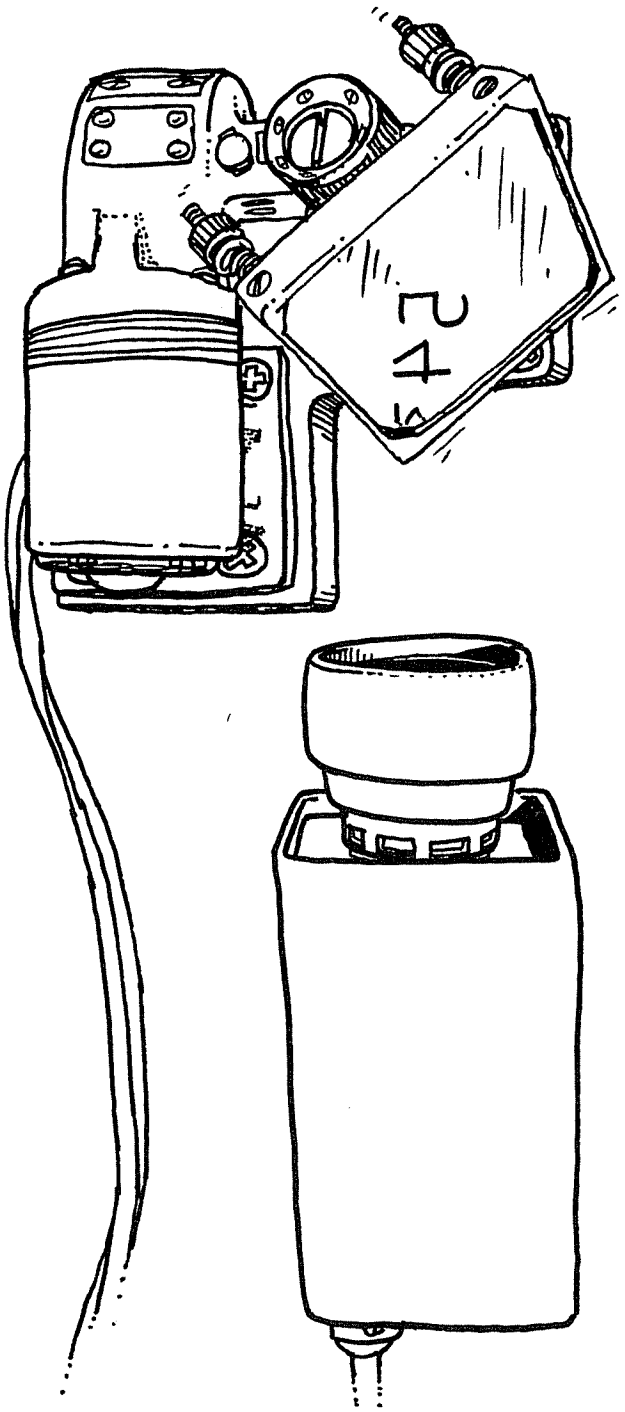
HOW MANY SHALL I REVERSE? 6

 1  2  3  4  5  6  7  8  9

YOU WON IT IN 10 MOVES!!!


TRY AGAIN (YES OR NO)? NO

O.K.  HOPE YOU HAD FUN!!
```



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```
10 PRINT TAB(32);"REVERSE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "REVERSE -- A GAME OF SKILL": PRINT
130 DIM A(20)
140 REM *** N=NUMBER OF NUMBERS
150 N=9
160 PRINT "DO YOU WANT THE RULES";
170 INPUT A$
180 IF A$="NO" THEN 210
190 GOSUB 710
200 REM *** MAKE A RANDOM LIST A(1) TO A(N)
210 A(1)=INT((N-1)*RND(1)+2)
220 FOR K=2 TO N
230 A(K)=INT(N*RND(1)+1)
240 FOR J=1 TO K-1
250 IF A(K)=A(J) THEN 230
260 NEXT J: NEXT K
280 REM *** PRINT ORIGINAL LIST AND START GAME
290 PRINT: PRINT "HERE WE GO ... THE LIST IS:"
310 T=0
320 GOSUB 610
330 PRINT "HOW MANY SHALL I REVERSE";
340 INPUT R
350 IF R=0 THEN 520
360 IF R<=N THEN 390
370 PRINT "OOPS!  TOO MANY!  I CAN REVERSE AT MOST";N: GOTO 330
390 T=T+1
400 REM *** REVRESE R NUMBERS AND PRINT NEW LIST
410 FOR K=1 TO INT(R/2)
420 Z=A(K)
430 A(K)=A(R-K+1)
440 A(R-K+1)=Z
450 NEXT K
460 GOSUB 610
470 REM *** CHECK FOR A WIN
480 FOR K=1 TO N
490 IF A(K)<>K THEN 330
500 NEXT K
510 PRINT "YOU WON IT IN";T;"MOVES!!!": PRINT
520 PRINT
530 PRINT "TRY AGAIN (YES OR NO)";
540 INPUT A$
550 IF A$="YES" THEN 210
560 PRINT: PRINT "O.K.  HOPE YOU HAD FUN!!": GOTO 999
600 REM *** SUBROUTINE TO PRINT LIST
610 PRINT: FOR K=1 TO N: PRINT A(K);: NEXT K
650 PRINT: PRINT: RETURN
700 REM *** SUBROUTINE TO PRINT THE RULES
710 PRINT: PRINT "THIS IS THE GAME OF 'REVERSE'.  TO WIN, ALL YOU HAVE"
720 PRINT "TO DO IS ARRANGE A LIST OF NUMBERS (1 THROUGH";N;")"
730 PRINT "IN NUMERICAL ORDER FROM LEFT TO RIGHT. TO MOVE, YOU"
740 PRINT "TELL ME HOW MANY NUMBERS (COUNTING FROM THE LEFT) TO"
750 PRINT "REVERSE.  FOR EXAMPLE, IF THE CURRENT LIST IS:"
760 PRINT: PRINT "2 3 4 5 1 6 7 8 9"
770 PRINT: PRINT "AND YOU REVERSE 4, THE RESULT WILL BE:"
780 PRINT: PRINT "5 4 3 2 1 6 7 8 9"
790 PRINT: PRINT "NOW IF YOU REVERSE 5, YOU WIN!"
800 PRINT: PRINT "1 2 3 4 5 6 7 8 9": PRINT
810 PRINT "NO DOUBT YOU WILL LIKE THIS GAME, BUT"
820 PRINT "IF YOU WANT TO QUIT, REVERSE 0 (ZERO).": PRINT: RETURN
999 END
```

Rock, Scissors, Paper

Remember the game of rock-scissors-paper. You and your opponent make a motion three times with your fists and then either show a flat hand (paper), fist (rock), or two fingers (scissors). Depending upon what is shown, the game is a tie (both show the same) or one person wins. Paper wraps up rock, so it wins. Scissors cut paper, so they win. And rock breaks scissors, so it wins.

In this computerized version of rock-scissors-paper, you can play up to ten games vs. the computer.

Charles Lund wrote this game while at the American School in The Hague, Netherlands.

```
      GAME OF ROCK, SCISSORS, PAPER
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


10 PRINT TAB(21);"GAME OF ROCK, SCISSORS, PAPER"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
25 PRINT:PRINT:PRINT
30 INPUT "HOW MANY GAMES";Q
40 IF Q<11 THEN 60
50 PRINT "SORRY, BUT WE AREN'T ALLOWED TO PLAY THAT MANY.": GOTO 30
60 FOR G=1 TO Q
70 PRINT: PRINT "GAME NUMBER";G
80 X=INT(RND(1)*3+1)
90 PRINT "3=ROCK...2=SCISSORS...1=PAPER"
100 INPUT "1...2...3...WHAT'S YOUR CHOICE";K
110 IF (K-1)*(K-2)*(K-3)<>0 THEN PRINT "INVALID.": GOTO 90
120 PRINT "THIS IS MY CHOICE..."
130 ON X GOTO 140,150,160
140 PRINT "...PAPER": GOTO 170
150 PRINT "...SCISSORS": GOTO 170
160 PRINT "...ROCK"
170 IF X=K THEN 250
180 IF X>K THEN 230
190 IF X=1 THEN 210
200 PRINT "YOU WIN!!!":H=H+1: GOTO 260
210 IF K<>3 THEN 200
220 PRINT "WOW!  I WIN!!!":C=C+1:GOTO 260
230 IF K<>1 OR X<>3 THEN 220
240 GOTO 200
250 PRINT "TIE GAME.  NO WINNER."
260 NEXT G
270 PRINT: PRINT "HERE IS THE FINAL GAME SCORE:"
280 PRINT "I HAVE WON";C;"GAME(S)."
290 PRINT "YOU HAVE WON";H;"GAME(S)."
300 PRINT "AND";Q-(C+H);"GAME(S) ENDED IN A TIE."
310 PRINT: PRINT "THANKS FOR PLAYING!!"
320 END
```

```
HOW MANY GAMES? 10

GAME NUMBER 1
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 3
THIS IS MY CHOICE...
...PAPER
WOW!  I WIN!!!

GAME NUMBER 2
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 2
THIS IS MY CHOICE...
...ROCK
WOW!  I WIN!!!

GAME NUMBER 3
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 2
THIS IS MY CHOICE...
...PAPER
YOU WIN!!!

GAME NUMBER 4
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 1
THIS IS MY CHOICE...
...ROCK
YOU WIN!!!

GAME NUMBER 5
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 3
THIS IS MY CHOICE...
...SCISSORS
YOU WIN!!!

GAME NUMBER 6
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 2
THIS IS MY CHOICE...
...SCISSORS
TIE GAME.  NO WINNER.

GAME NUMBER 7
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 2
THIS IS MY CHOICE...
...ROCK
WOW!  I WIN!!!

GAME NUMBER 8
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 3
THIS IS MY CHOICE...
...ROCK
TIE GAME.  NO WINNER.

GAME NUMBER 9
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 1
THIS IS MY CHOICE...
...ROCK
YOU WIN!!!

GAME NUMBER 10
3=ROCK...2=SCISSORS...1=PAPER
1...2...3...WHAT'S YOUR CHOICE? 2
THIS IS MY CHOICE...
...ROCK
WOW!  I WIN!!!

HERE IS THE FINAL GAME SCORE:
I HAVE WON 4 GAME(S).
YOU HAVE WON 4 GAME(S).
AND 2 GAME(S) ENDED IN A TIE.
```

Roulette

This game simulates an American Roulette wheel; "American" because it has 38 number compartments (1 to 36, 0 and 00). The European wheel has 37 numbers (1 to 36 and 0). The Bahamas, Puerto Rico, and South American countries are slowly switching to the American wheel because it gives the house a bigger percentage. Odd and even numbers alternate around the wheel, as do red and black. The layout of the wheel insures a highly random number pattern. In fact, roulette wheels are sometimes used to generate tables of random numbers.

In this game, you may bet from $5 to $500 and you may bet on red or black, odd or even, first or second 18 numbers, a column, or single number. You may place any number of bets on each spin of the wheel.

There is no long-range winning strategy for playing roulette. However, a good strategy is that of "doubling." First spin, bet $1 on an even/odds bet (odd, even, red, or black). If you lose, double your bet to $2. If you lose again, double to $4. Continue to double until you win (i.e., you break even on a losing sequence). As soon as you win, bet $1 again, and after every win, bet $1. Do not ever bet more than $1 unless you are recuperating losses by doubling. Do not ever bet anything but the even odds bets. Good luck!

```
                ROULETTE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


ENTER CURRENT DATE (AS IN 'JANUARY 23, 1978') -? DECEMBER 2, 1977
WELCOME TO THE ROULETTE TABLE

DO YOU WANT INSTRUCTIONS? YES

THIS IS THE BETTING LAYOUT
  (*=RED)

 1*    2     3*
 4     5*    6
 7*    8     9*
10    11    12*
---------------
13    14*   15
16*   17    18*
19*   20    21*
22    23*   24
---------------
25*   26    27*
28    29    30*
31    32*   33
34*   35    36*
---------------
   00    0

TYPES OF BETS

THE NUMBERS 1 TO 36 SIGNIFY A STRAIGHT BET
ON THAT NUMBER
THESE PAY OFF 35:1

THE 2:1 BETS ARE:
 37) 1-12      40) FIRST COLUMN
 38) 13-24     41) SECOND COLUMN
 39) 25-36     42) THIRD COLUMN

THE EVEN MONEY BETS ARE:
 43) 1-18      46) ODD
 44) 19-36     47) RED
 45) EVEN      48) BLACK


 49)0 AND 50)00 PAY OFF 35:1
 NOTE: 0 AND 00 DO NOT COUNT UNDER ANY
       BETS EXCEPT THEIR OWN

WHEN I ASK FOR EACH BET,TYPE THE NUMBER
AND THE AMOUNT,SEPARATED BY A COMMA
FOR EXAMPLE:TO BET $500 ON BLACK,TYPE 48,500
WHEN I ASK FOR A BET

MINIMUM BET IS $5,MAXIMUM IS $500

HOW MANY BETS? 2
NUMBER 1 ? 2,100
NUMBER 2 ? 46,100
SPINNING


 20 BLACK

YOU LOSE 100 DOLLARS ON BET  1
YOU LOSE 100 DOLLARS ON BET  2

TOTALS:       ME            YOU
               100200        800
AGAIN? YES
HOW MANY BETS? 4
NUMBER 1 ? 15,20
NUMBER 2 ? 21,20
NUMBER 3 ? 40,100
NUMBER 4 ? 49,10
SPINNING


0

YOU LOSE 20 DOLLARS ON BET  1
YOU LOSE 20 DOLLARS ON BET  2
YOU LOSE 100 DOLLARS ON BET  3
YOU WIN  350 DOLLARS ON BET  4

TOTALS:       ME            YOU
               99990         1010
AGAIN? NO
TO WHOM SHALL I MAKE THE CHECK? A. COMPUTER

--------------------------------------------------------------------------------
CHECK NO.  22

                                          DECEMBER 2, 1977


PAY TO THE ORDER OF-----A. COMPUTER-----$  1010

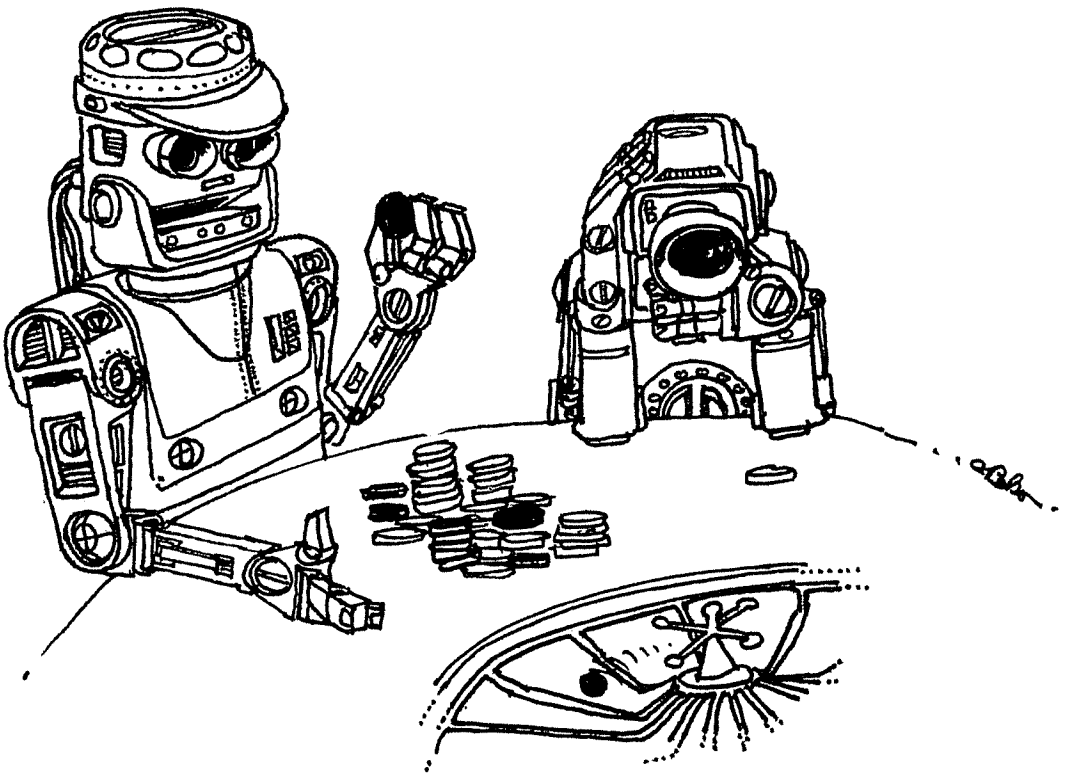
              THE MEMORY BANK OF VIRGINIA

                                            THE COMPUTER
                                           ----------X-----

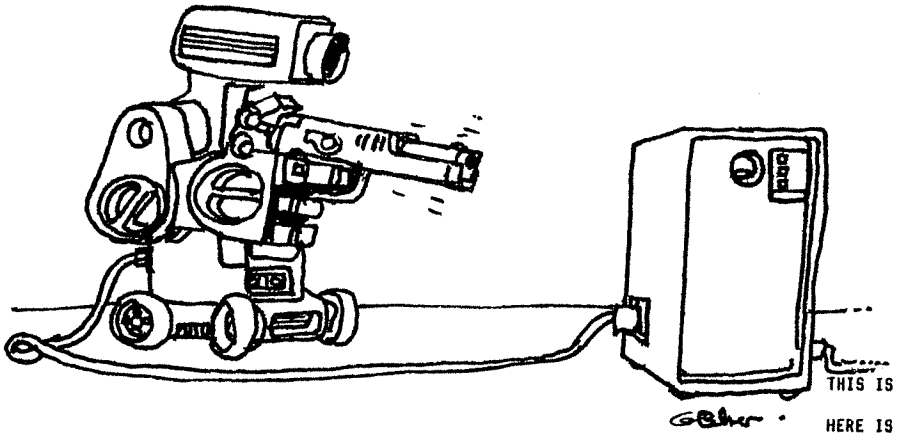
--------------------------------------------------------------------------------
COME BACK SOON!
```

```
10 PRINT TAB(32);"ROULETTE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
40 PRINT "ENTER CURRENT DATE (AS IN  JANUARY 23, 1978') -";
50 INPUT D$,E$
1000 REM-ROULETTE
1010 REM-DAVID JOSLIN
1020 PRINT "WELCOME TO THE ROULETTE TABLE"
1030 PRINT
1040 PRINT "DO YOU WANT INSTRUCTIONS";
1050 INPUT Y$
1060 IF LEFT$(Y$,1)="N" THEN 1550
1070 PRINT
1080 PRINT "THIS IS THE BETTING LAYOUT"
1090 PRINT "  (*=RED)"
1100 PRINT
1110 PRINT " 1*    2     3*"
1120 PRINT " 4     5*    6 "
1130 PRINT " 7*    8     9*"
1140 PRINT "10    11    12*"
1150 PRINT "---------------"
1160 PRINT "13    14*   15 "
1170 PRINT "16*   17    18*"
1180 PRINT "19*   20    21*"
1190 PRINT "22    23*   24 "
1200 PRINT "---------------"
1210 PRINT "25*   26    27*"
1220 PRINT "28    29    30*"
1230 PRINT "31    32*   33 "
1240 PRINT "34*   35    36*"
1250 PRINT "---------------"
1260 PRINT "    00    0    "
1270 PRINT
1280 PRINT "TYPES OF BETS"
1290 PRINT
1300 PRINT "THE NUMBERS 1 TO 36 SIGNIFY A STRAIGHT BET"
1310 PRINT "ON THAT NUMBER"
1320 PRINT "THESE PAY OFF 35:1"
1330 PRINT
1340 PRINT "THE 2:1 BETS ARE:"
1350 PRINT " 37) 1-12     40) FIRST COLUMN"
1360 PRINT " 38) 13-24    41) SECOND COLUMN"
1370 PRINT " 39) 25-36    42) THIRD COLUMN"
1380 PRINT
1390 PRINT "THE EVEN MONEY BETS ARE:"
1400 PRINT " 43) 1-18     46) ODD"
1410 PRINT " 44) 19-36    47) RED"
1420 PRINT " 45) EVEN     48) BLACK"
1430 PRINT
1440 PRINT " 49)0 AND 50)00 PAY OFF 35:1"
1450 PRINT " NOTE: 0 AND 00 DO NOT COUNT UNDER ANY"
1460 PRINT "       BETS EXCEPT THEIR OWN"
1470 PRINT
1480 PRINT "WHEN I ASK FOR EACH BET,TYPE THE NUMBER"
1490 PRINT "AND THE AMOUNT,SEPARATED BY A COMMA"
1500 PRINT "FOR EXAMPLE:TO BET $500 ON BLACK,TYPE 48,500"
1510 PRINT "WHEN I ASK FOR A BET"
1520 PRINT
1530 PRINT "MINIMUM BET IS $5,MAXIMUM IS $500"
1540 PRINT
1550 REM-PROGRAM BEGINS HERE
1560 REM-TYPE OF BET(NUMBER) ODDS
1570 REM  DON'T NEED TO DIMENSION STRINGS
1580 DIM B(100),C(100),T(100),X(38)
1590 DIM A(50)
1600 FOR I=1 TO 38: X(I)=0: NEXT I: REM  MAT X=ZER
1610 P=1000
1620 D=100000.
1630 PRINT "HOW MANY BETS";
1640 INPUT Y
1650 IF Y<1 OR Y<>INT(Y) THEN 1630
1660 FOR I=1 TO 50: A(I)=0: NEXT I: REM  MAT A=ZER
1670 FOR C=1 TO Y
1680 PRINT "NUMBER";C;
1690 INPUT X,Z
1700 B(C)=Z
1710 T(C)=X
1720 IF X<1 OR X>50 OR X<>INT(X) THEN 1680
1730 IF Z<1 OR Z<>INT(Z) THEN 1680
1740 IF Z<5 OR Z>500 THEN 1680
1750 IF A(X)=0 THEN 1780
1760 PRINT "YOU MADE THAT BET ONCE ALREADY,DUM-DUM"
1770 GOTO 1680
1780 A(X)=1
1790 NEXT C
1800 PRINT "SPINNING"
1810 PRINT
1820 PRINT
1830 S=INT(100*RND(1))
1840 IF S=0 OR S>38 THEN 1830
1850 X(S)=X(S)+1
1860 IF S<37 THEN 1920
1870 IF S=37 THEN 1900
1880 PRINT "00"
1890 GOTO 2020
1900 PRINT "0"
1910 GOTO 2020
1920 RESTORE
1930 FOR I=1 TO 18
1940 READ R
1950 IF R=S THEN 2000
1960 NEXT I
1970 A$="BLACK"
1980 PRINT S;A$
1990 GOTO 2020
2000 A$="RED"
2010 GOTO 1980
2020 PRINT
2030 FOR C=1 TO Y
2040 IF T(C)<37 THEN 2710
2050 ON T(C)-36 GOTO 2090,2190,2220,2250,2300,2350,2400,2470,2500
2060 ON T(C)-45 GOTO 2530,2560,2630
2070 GOTO 2710
2080 STOP
2090 REM  1-12(37) 2:1
2100 IF S <= 12 THEN 2150
2110 PRINT "YOU LOSE";B(C);"DOLLARS ON BET ";C
2120 D=D+B(C)
2130 P=P-B(C)
2140 GOTO 2180
2150 PRINT "YOU WIN ";B(C)*2;"DOLLARS ON BET ";C
2160 D=D-B(C)*2
2170 P=P+B(C)*2
2180 GOTO 2810
2190 REM  13-24(38) 2:1
2200 IF S>12 AND S<25 THEN 2150
2210 GOTO 2110
2220 REM  25-36(39) 2:1
2230 IF S>24 AND S<37 THEN 2150
2240 GOTO 2110
2250 REM  FIRST COLUMN(40) 2:1
2260 FOR I=1 TO 34 STEP 3
2270 IF S=I THEN 2150
2280 NEXT I
2290 GOTO 2110
2300 REM  SECOND COLUMN(41) 2:1
2310 FOR I=2 TO 35 STEP 3
2320 IF S=I THEN 2150
2330 NEXT I
2340 GOTO 2110
2350 REM  THIRD COLUMN(42) 2:1
2360 FOR I=3 TO 36 STEP 3
2370 IF S=I THEN 2150
2380 NEXT I
2390 GOTO 2110
2400 REM  1-18(43) 1:1
2410 IF S<19 THEN 2430
2420 GOTO 2110
```

```
2430 PRINT "YOU WIN ";B(C);"DOLLARS ON BET";C
2440 D=D-B(C)
2450 P=P+B(C)
2460 GOTO 2810
2470 REM  19-36(44) 1:1
2480 IF S<37 AND S>18 THEN 2430
2490 GOTO 2110
2500 REM  EVEN(45) 1:1
2510 IF S/2=INT(S/2) AND S<37 THEN 2430
2520 GOTO 2110
2530 REM  ODD(46) 1:1
2540 IF S/2<>INT(S/2) AND S<37 THEN 2430
2550 GOTO 2110
2560 REM  RED(47) 1:1
2570 RESTORE
2580 FOR I=1 TO 18
2590 READ R
2600 IF S=R THEN 2430
2610 NEXT I
2620 GOTO 2110
2630 REM  BLACK(48) 1:1
2640 RESTORE
2650 FOR I=1 TO 18
2660 READ R
2670 IF S=R THEN 2110
2680 NEXT I
2690 IF S>36 THEN 2110
2700 GOTO 2430
2710 REM--1TO36,0,00(1-36,49,50)35:1
2720 IF T(C)<49 THEN 2760
2730 IF T(C)=49 AND S=37 THEN 2780
2740 IF T(C)=50 AND S=38 THEN 2780
2750 GOTO 2110
2760 IF T(C)=S THEN 2780
2770 GOTO 2110
2780 PRINT "YOU WIN ";B(C)*35;"DOLLARS ON BET ";C
2790 D=D-B(C)*35
2800 P=P+B(C)*35
2810 NEXT C
2820 PRINT
2830 PRINT "TOTALS:","ME","YOU"
2840 PRINT " ",D,P
2850 IF P>0 THEN 2880
2860 PRINT "OOPS! YOU JUST SPENT YOUR LAST DOLLAR"
2870 GOTO 3190
2880 IF D>0 THEN 2920
2890 PRINT "YOU BROKE THE HOUSE!"
2900 P=101000.
2910 GOTO 2960
2920 PRINT "AGAIN";
2930 INPUT Y$
2940 IF LEFT$(Y$,1)="Y" THEN 1630
2950 DATA 1,3,5,7,9,12,14,16,18,19,21,23,25,27,30,32,34,36
2960 IF P<1 THEN 3190
2970 PRINT "TO WHOM SHALL I MAKE THE CHECK";
2980 INPUT B$
2990 PRINT
3000 FOR I=1 TO 72: PRINT "-";: NEXT I: REM PRINT 72 DASHES
3010 PRINT TAB(50);"CHECK NO. ";INT(100*RND(1))
3020 PRINT
3030 GOSUB 3230
3040 PRINT TAB(40);M$
3050 PRINT
3060 PRINT
3070 PRINT "PAY TO THE ORDER OF-----";B$;"-----$ ";
3080 PRINT P
3090 PRINT
3100 PRINT
3110 PRINT TAB(10),"THE MEMORY BANK OF VIRGINIA"
3120 PRINT
3130 PRINT TAB(40),"THE COMPUTER"
3140 PRINT TAB(40)"----------X-----"
3150 PRINT
3160 FOR I=1 TO 72: PRINT "-";: NEXT I
3170 PRINT "COME BACK SOON!"
3180 GOTO 3210
3190 PRINT "THANKS FOR YOUR MONEY"
3200 PRINT "I'LL USE IT TO BUY A SOLID GOLD ROULETTE WHEEL"
3210 PRINT
3220 GOTO 3420
3230 REM
3240 REM     THIS ROUTINE RETURNS THE CURRENT DATE IN M$
3250 REM     IF YOU HAVE SYSTEM FUNCTIONS TO HANDLE THIS
3260 REM     THEY CAN BE USED HERE.  HOWEVER IN THIS
3270 REM     PROGRAM, WE JUST INPUT THE DATE AT THE START OF
3280 REM     THE GAME.
3290 REM
3300 REM     THE DATE IS RETURNED IN VARIABLE M$
3310 M$=D$+", "+E$
3320 RETURN
3420 END
```



Russian Roulette



In this game, you are given by the computer a revolver loaded with one bullet and five empty chambers. You spin the chamber and pull the trigger by inputting a "1," or, if you want to quit, input a "2." You win if you play ten times and are still alive.

Tom Adametx wrote this program while a student at Curtis Jr. High School in Sudbury, Massachusetts.

```
           RUSSIAN ROULETTE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

1 PRINT TAB(28);"RUSSIAN ROULETTE"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
5 PRINT "THIS IS A GAME OF >>>>>>>>>>RUSSIAN ROULETTE."
10 PRINT:PRINT "HERE IS A REVOLVER."
20 PRINT "TYPE '1' TO SPIN CHAMBER AND PULL TRIGGER."
22 PRINT "TYPE '2' TO GIVE UP."
23 PRINT "GO";
25 N=0
30 INPUT I
31 IF I<>2 THEN 35
32 PRINT "     CHICKEN!!!!!"
33 GOTO 72
35 N=N+1
40 IF RND(1)>.833333 THEN 70
45 IF N>10 THEN 80
50 PRINT "- CLICK -"
60 PRINT: GOTO 30
70 PRINT "     BANG!!!!!   YOU'RE DEAD!"
71 PRINT "CONDOLENCES WILL BE SENT TO YOUR RELATIVES."
72 PRINT:PRINT:PRINT
75 PRINT "...NEXT VICTIM...":GOTO 20
80 PRINT "YOU WIN!!!!!"
85 PRINT "LET SOMEONE ELSE BLOW HIS BRAINS OUT."
90 GOTO 10
99 END
```

```
THIS IS A GAME OF >>>>>>>>>>RUSSIAN ROULETTE.

HERE IS A REVOLVER.
TYPE '1' TO SPIN CHAMBER AND PULL TRIGGER.
TYPE '2' TO GIVE UP.
GO? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
     BANG!!!!!   YOU'RE DEAD!
CONDOLENCES WILL BE SENT TO YOUR RELATIVES.


...NEXT VICTIM...
TYPE '1' TO SPIN CHAMBER AND PULL TRIGGER.
TYPE '2' TO GIVE UP.
GO? 2
     CHICKEN!!!!!


...NEXT VICTIM...
TYPE '1' TO SPIN CHAMBER AND PULL TRIGGER.
TYPE '2' TO GIVE UP.
GO? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
- CLICK -

? 1
     BANG!!!!!   YOU'RE DEAD!
CONDOLENCES WILL BE SENT TO YOUR RELATIVES.
```

Salvo

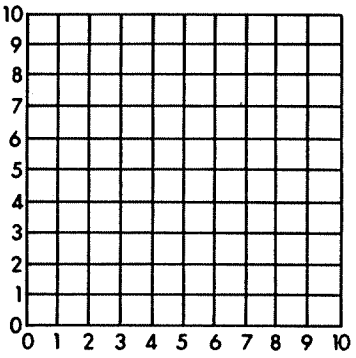
The rules are *not* explained by the program, so read carefully this description by Larry Siegel, the program author.

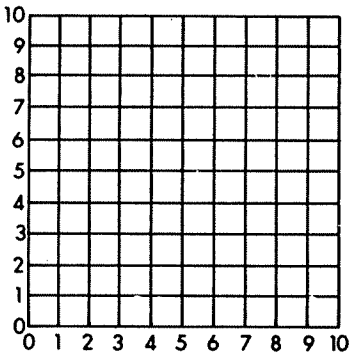
SALVO is played on a 10x10 grid or board using an x,y coordinate system. The player has 4 ships: battleship (5 squares), cruiser (3 squares), and two destroyers (2 squares each). The ships may be placed horizontally, vertically, or diagonally and must not overlap. The ships do not move during the game.

As long as any square of a battleship still survives, the player is allowed three shots, for a cruiser 2 shots, and for each destroyer 1 shot. Thus, at the beginning of the game the player has 3+2+1+1=7 shots. The player enters all of his shots and the computer tells what was hit. A shot is entered by its grid coordinates, x,y. The winner is the one who sinks all of the opponent's ships.

Important note: Your ships and the computer's ships are located on 2 *separate* 10x10 boards.

Author of the program is Lawrence Siegel of Shaker Heights, Ohio.






```
 SALVO
CREATIVE COMPUTING
MORRISTOWN, NEW JERSEY

ENTER COORDINATES FOR...
BATTLESHIP
? 10,10
? 9,9
? 8,8
? 7,7
? 6,6
CRUISER
? 3,5
? 2,6
? 1,7
DESTROYER<A>
? 1,10
? 2,10
DESTROYER<B
? 6,7
? 6,8
DO YOU WANT TO START? YES
DO YOU WANT TO SEE MY SHOTS? YES
```

```
TURN 1
YOU HAVE 7 SHOTS.
? 5,1
? 5,2
? 5,3
? 5,4
? 5,5
? 5,6
? 5,7
YOU HIT MY DESTROYER<B>.
I HAVE 7 SHOTS.
 10  8
 10  10
 8  10
 9  9
 9  10
 10  9
 8  8
I HIT YOUR BATTLESHIP
I HIT YOUR BATTLESHIP
I HIT YOUR BATTLESHIP
```

```
TURN 2
YOU HAVE 7 SHOTS.
? 4,1
? 4,3
? 4,5
? 4,7
? 6,2
? 6,4
? 6,6
I HAVE 7 SHOTS.
 10  6
 2  2
 3  3
 4  4
 5  5
 6  6
 1  2
I HIT YOUR BATTLESHIP
```

```
TURN 3
YOU HAVE 7 SHOTS.
? 4,2
? 4,4
? 4,6
? 6,1
? 6,3
? 6,5
? 6,7
YOU HIT MY DESTROYER<B>.
I HAVE 6 SHOTS.
 1  1
 4  3
 2  1
 2  3
 3  1
 3  2
```

```
TURN 4
YOU HAVE 7 SHOTS.
? 1,1
? 1,2
? 2,2
? 2,1
? 1,3
? 2,3
? 4,4
YOU SHOT THERE BEFORE ON TURN 3
? 3,4
I HAVE 6 SHOTS.
 1  3
 4  2
 5  3
 10  4
 1  7
 1  8
I HIT YOUR CRUISER
```

```
TURN 5
YOU HAVE 7 SHOTS.
? 1,5
? 1,7
? 1,9
? 2,4
? 2,5
? 2,6
? 2,7
YOU HIT MY DESTROYER<A>.
I HAVE 6 SHOTS.
 6  2
 5  2
 10  3
 4  1
 5  1
 9  3
```

```
TURN 6
YOU HAVE 7 SHOTS.
? 1,4
? 1,6
? 1,8
? 2,8
? 2,9
? 3,6
? 3,7
YOU HIT MY DESTROYER<A>.
I HAVE 5 SHOTS.
 9  4
 6  3
 6  4
 2  4
 5  4
```

```
TURN 7
YOU HAVE 7 SHOTS.
? 8,3
? 8,5
? 8,7
? 10,3
? 10,5
? 10,7
? 10,9
YOU HIT MY CRUISER.
YOU HIT MY CRUISER.
I HAVE 5 SHOTS.
 1  4
 2  6
 1  6
 9  5
 10  5
I HIT YOUR CRUISER
```

```
TURN 8
YOU HAVE 7 SHOTS.
? 8,1
? 8,2
? 8,4
? 1,10
? 2,10
? 3,10
? 4,10
I HAVE 5 SHOTS.
 1  5
 8  4
 8  5
 2  5
 2  7
```

```
TURN 9
YOU HAVE 7 SHOTS.
? 7,3
? 7,5
? 7,7
? 9,3
? 9,5
? 9,7
? 9,9
I HAVE 5 SHOTS.
 3  7
 8  6
 3  5
 3  6
 9  6
I HIT YOUR CRUISER

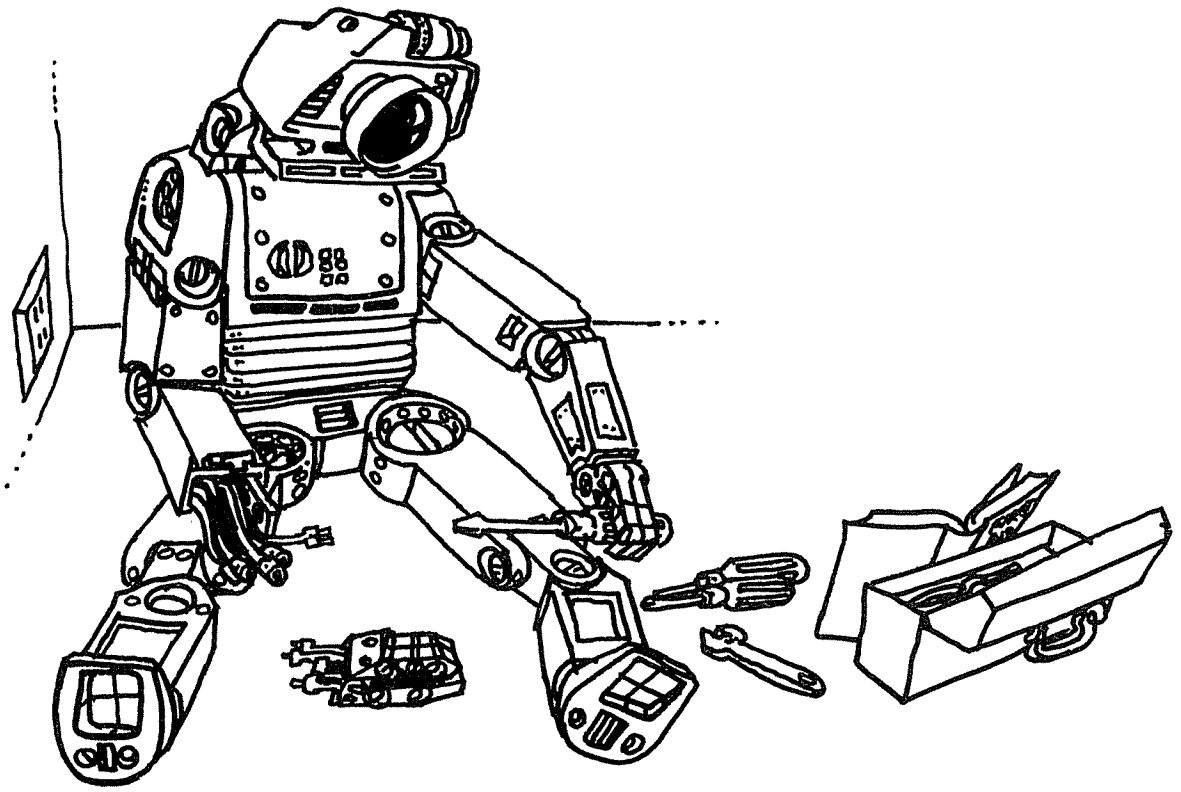
TURN 10
YOU HAVE 5 SHOTS.
? 9,1
? 9,2
? 9,4
? 9,6
? 9,8
YOU HIT MY CRUISER.
I HAVE 3 SHOTS.
 10  2
 1  10
 2  8
I HIT YOUR DESTROYER<A>

TURN 11
YOU HAVE 5 SHOTS.
? 5,9
? 6,10
? 7,9
? 8,10
? 9,9
YOU SHOT THERE BEFORE ON TURN 9
? 8,8
YOU HIT MY BATTLESHIP.
YOU HIT MY BATTLESHIP.
I HAVE 3 SHOTS.
 1  9
 2  9
 10  1

TURN 12
YOU HAVE 5 SHOTS.
? 3,9
? 4,9
? 6,9
? 8,9
? 10,10
YOU HIT MY BATTLESHIP.
YOU HIT MY BATTLESHIP.
YOU HIT MY BATTLESHIP.
I HAVE 0 SHOTS.
YOU HAVE WON.
```

```
1000 PRINT TAB(33);"SALVO"
1010 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
1020 PRINT:PRINT:PRINT
1030 REM
1040 DIM A(10,10),B(10,10),C(7),D(7),E(12),F(12),G(12),H(12),K(10,10)
1050 Z8=0
1060 FOR W=1 TO 12
1070 E(W)=-1
1080 H(W)=-1
1090 NEXT W
1100 FOR X=1 TO 10
1110 FOR Y=1 TO 10
1120 B(X,Y)=0
1130 NEXT Y
1140 NEXT X
1150 FOR X=1 TO 12
1160 F(X)=0
1170 G(X)=0
1180 NEXT X
1190 FOR X=1 TO 10
1200 FOR Y=1 TO 10
1210 A(X,Y)=0
1220 NEXT Y
1230 NEXT X
1240 FOR K=4 TO 1 STEP -1
1250 U6=0
1260 GOSUB 2910
1270 DEF FNA(K)=(5-K)*3-2*INT(K/4)+SGN(K-1)-1
1280 DEF FNB(K)=K+INT(K/4)-SGN(K-1)
1290 IF V+V2+V*V2=0 THEN 1260
1300 IF Y+V*FNB(K)>10 THEN 1260
1310 IF Y+V*FNB(K)<1 THEN 1260
1320 IF X+V2*FNB(K)>10 THEN 1260
1330 IF X+V2*FNB(K)<1 THEN 1260
1340 U6=U6+1
1350 IF U6>25 THEN 1190
1360 FOR Z=0 TO FNB(K)
1370 F(Z+FNA(K))=X+V2*Z
1380 G(Z+FNA(K))=Y+V*Z
1390 NEXT Z
1400 U8=FNA(K)
1405 IF U8>U8+FNB(K) THEN 1460
1410 FOR Z2= U8 TO U8+FNB(K)
1415 IF U8<2 THEN 1450
1420 FOR Z3=1 TO U8-1
1430 IF SQR((F(Z3)-F(Z2))^2 + (G(Z3)-G(Z2))^2) < 3.59 THEN 1260
1440 NEXT Z3
1450 NEXT Z2
1460 FOR Z=0 TO FNB(K)
1470 A(F(Z+U8),G(Z+U8))=.5+SGN(K-1)*(K-1.5)
1480 NEXT Z
1490 NEXT K
1500 PRINT "ENTER COORDINATES FOR..."
1510 PRINT "BATTLESHIP"
1520 FOR X=1 TO 5
1530 INPUT Y,Z
1540 B(Y,Z)=3
1550 NEXT X
1560 PRINT "CRUISER"
1570 FOR X=1 TO 3
1580 INPUT Y,Z
1590 B(Y,Z)=2
1600 NEXT X
1610 PRINT "DESTROYER<A>"
1620 FOR X=1 TO 2
1630 INPUT Y,Z
1640 B(Y,Z)=1
1650 NEXT X
1660 PRINT "DESTROYER<B>"
1670 FOR X=1 TO 2
1680 INPUT Y,Z
1690 B(Y,Z)=.5
1700 NEXT X
1710 PRINT "DO YOU WANT TO START";
1720 INPUT J$
1730 IF J$<>"WHERE ARE YOUR SHIPS?" THEN 1890
1740 PRINT "BATTLESHIP"
1750 FOR Z=1 TO 5
1760 PRINT F(Z);G(Z)
1770 NEXT Z
1780 PRINT "CRUISER"
1790 PRINT F(6);G(6)
1800 PRINT F(7);G(7)
1810 PRINT F(8);G(8)
1820 PRINT "DESTROYER<A>"
1830 PRINT F(9);G(9)
1840 PRINT F(10);G(10)
1850 PRINT "DESTROYER<B>"
1860 PRINT F(11);G(11)
1870 PRINT F(12);G(12)
1880 GOTO 1710
1890 C=0
1900 PRINT "DO YOU WANT TO SEE MY SHOTS";
1910 INPUT K$
1920 PRINT
1930 IF J$<>"YES" THEN 2620
1940 REM**********START
1950 IF J$<>"YES" THEN 1990
1960 C=C+1
1970 PRINT
1980 PRINT "TURN";C
1990 A=0
2000 FOR W=.5 TO 3 STEP .5
2010 FOR X=1 TO 10
2020 FOR Y=1 TO 10
2030 IF B(X,Y)=W THEN 2070
2040 NEXT Y
2050 NEXT X
2060 GOTO 2080
2070 A=A+INT(W+.5)
2080 NEXT W
2090 FOR W=1 TO 7
2100 C(W)=0
2110 D(W)=0
2120 F(W)=0
2130 G(W)=0
2140 NEXT W
2150 P3=0
2160 FOR X=1 TO 10
2170 FOR Y=1 TO 10
2180 IF A(X,Y)>10 THEN 2200
2190 P3=P3+1
2200 NEXT Y
2210 NEXT X
2220 PRINT "YOU HAVE";A;"SHOTS."
2230 IF P3>=A THEN 2260
2240 PRINT "YOU HAVE MORE SHOTS THAN THERE ARE BLANK SQUARES."
2250 GOTO 2890
2260 IF A<>0 THEN 2290
2270 PRINT "I HAVE WON."
2280 STOP
2290 FOR W=1 TO A
2300 INPUT X,Y
2310 IF X<>INT(X) THEN 2370
2320 IF X>10 THEN 2370
2330 IF X<1 THEN 2370
2340 IF Y<>INT(Y) THEN 2370
2350 IF Y>10 THEN 2370
2360 IF Y>=1 THEN 2390
2370 PRINT "ILLEGAL, ENTER AGAIN."
2380 GOTO 2300
2390 IF A(X,Y)>10 THEN 2440
2400 C(W)=X
2410 D(W)=Y
2420 NEXT W
2430 GOTO 2460
2440 PRINT "YOU SHOT THERE BEFORE ON TURN";A(X,Y)-10
```

```
2450 GOTO 2300
2460 FOR W=1 TO A
2470 IF A(C(W),D(W))=3 THEN 2540
2480 IF A(C(W),D(W))=2 THEN 2560
2490 IF A(C(W),D(W))=1 THEN 2580
2500 IF A(C(W),D(W))=.5 THEN 2600
2510 A(C(W),D(W))=10+C
2520 NEXT W
2530 GOTO 2620
2540 PRINT "YOU HIT MY BATTLESHIP."
2550 GOTO 2510
2560 PRINT "YOU HIT MY CRUISER."
2570 GOTO 2510
2580 PRINT "YOU HIT MY DESTROYER<A>."
2590 GOTO 2510
2600 PRINT "YOU HIT MY DESTROYER<B>."
2610 GOTO 2510
2620 A=0
2630 IF J$="YES" THEN 2670
2640 C=C+1
2650 PRINT
2660 PRINT "TURN";C
2670 A=0
2680 FOR W=.5 TO 3 STEP .5
2690 FOR X=1 TO 10
2700 FOR Y=1 TO 10
2710 IF A(X,Y)=W THEN 2750
2720 NEXT Y
2730 NEXT X
2740 GOTO 2760
2750 A=A+INT(W+.5)
2760 NEXT W
2770 P3=0
2780 FOR X=1 TO 10
2790 FOR Y=1 TO 10
2800 IF A(X,Y)>10 THEN 2820
2810 P3=P3+1
2820 NEXT Y
2830 NEXT X
2840 PRINT "I HAVE";A;"SHOTS."
2850 IF P3>A THEN 2880
2860 PRINT "I HAVE MORE SHOTS THAN BLANK SQUARES."
2870 GOTO 2270
2880 IF A<>0 THEN 2960
2890 PRINT "YOU HAVE WON."
2900 STOP
2910 X=INT(RND(1)*10+1)
2920 Y=INT(RND(1)*10+1)
2930 V=INT(3*RND(1)-1)
2940 V2=INT(3*RND(1)-1)
2950 RETURN
2960 FOR W=1 TO 12
2970 IF H(W)>0 THEN 3800
2980 NEXT W
2990 REM*******************RANDOM
3000 W=0
3010 R3=0
3020 GOSUB 2910
3030 RESTORE
3040 R2=0
3050 R3=R3+1
3060 IF R3>100 THEN 3010
3070 IF X>10 THEN 3110
3080 IF X>0 THEN 3120
3090 X=1+INT(RND(1)*2.5)
3100 GOTO 3120
3110 X=10-INT(RND(1)*2.5)
3120 IF Y>10 THEN 3160
3130 IF Y>0 THEN 3270
3140 Y=1+INT(RND(1)*2.5)
3150 GOTO 3270
3160 Y=10-INT(RND(1)*2.5)
3170 GOTO 3270
3180 F(W)=X
3190 G(W)=Y
3200 IF W=A THEN 3380
3210 IF R2=6 THEN 3030
3220 READ X1,Y1
3230 R2=R2+1
3240 DATA 1,1,-1,1,1,-3,1,1,0,2,-1,1
3250 X=X+X1
3260 Y=Y+Y1
3270 IF X>10 THEN 3210
3280 IF X<1 THEN 3210
3290 IF Y>10 THEN 3210
3300 IF Y<1 THEN 3210
3310 IF B(X,Y)>10 THEN 3210
3320 FOR Q9=1 TO W
3330 IF F(Q9)<>X THEN 3350
3340 IF G(Q9)=Y THEN 3210
3350 NEXT Q9
3360 W=W+1
3370 GOTO 3180
3380 IF K$<>"YES" THEN 3420
3390 FOR Z5=1 TO A
3400 PRINT F(Z5);G(Z5)
3410 NEXT Z5
3420 FOR W=1 TO A
3430 IF B(F(W),G(W))=3 THEN 3500
3440 IF B(F(W),G(W))=2 THEN 3520
3450 IF B(F(W),G(W))=1 THEN 3560
3460 IF B(F(W),G(W))=.5 THEN 3540
3470 B(F(W),G(W))=10+C
3480 NEXT W
3490 GOTO 1950
3500 PRINT "I HIT YOUR BATTLESHIP"
3510 GOTO 3570
3520 PRINT "I HIT YOUR CRUISER"
3530 GOTO 3570
3540 PRINT "I HIT YOUR DESTROYER<B>"
3550 GOTO 3570
3560 PRINT "I HIT YOUR DESTROYER<A>"
3570 FOR Q=1 TO 12
3580 IF E(Q)<>-1 THEN 3730
3590 E(Q)=10+C
3600 H(Q)=B(F(W),G(W))
3610 M3=0
3620 FOR M2=1 TO 12
3630 IF H(M2)<>H(Q) THEN 3650
3640 M3=M3+1
3650 NEXT M2
3660 IF M3<>INT(H(Q)+.5)+1+INT(INT(H(Q)+.5)/3) THEN 3470
3670 FOR M2=1 TO 12
3680 IF H(M2)<>H(Q) THEN 3710
3690 E(M2)=-1
3700 H(M2)=-1
3710 NEXT M2
3720 GOTO 3470
3730 NEXT Q
3740 PRINT "PROGRAM ABORT:"
3750 FOR Q=1 TO 12
3760 PRINT "E(";Q;") =";E(Q)
3770 PRINT "H(";Q;") =";H(Q)
3780 NEXT Q
3790 STOP
3800 REM************************USINGEARRAY
3810 FOR R=1 TO 10
3820 FOR S=1 TO 10
3830 K(R,S)=0
3840 NEXT S
3850 NEXT R
3860 FOR U=1 TO 12
3870 IF E(U)<10 THEN 4020
3880 FOR R=1 TO 10
3890 FOR S=1 TO 10
3900 IF B(R,S)<10 THEN 3930
3910 K(R,S)=-10000000
3920 GOTO 4000
3930 FOR M=SGN(1-R) TO SGN(10-R)
3940 FOR N=SGN(1-S) TO SGN(10-S)
3950 IF M+M+N*M=0 THEN 3980
3960 IF B(R+M,S+N)<>E(U) THEN 3980
3970 K(R,S)=K(R,S)+E(U)-S*INT(H(U)+.5)
3980 NEXT N
3990 NEXT M
4000 NEXT S
4010 NEXT R
4020 NEXT U
4030 FOR R=1 TO A
4040 F(R)=R
4050 G(R)=R
4060 NEXT R
4070 FOR R=1 TO 10
4080 FOR S=1 TO 10
4090 Q9=1
4100 FOR M=1 TO A
4110 IF K(F(M),G(M))>=K(F(Q9),G(Q9)) THEN 4130
4120 Q9=M
4130 NEXT M
4131 IF R>A THEN 4140
4132 IF R=S THEN 4210
4140 IF K(R,S)<K(F(Q9),G(Q9)) THEN 4210
4150 FOR M=1 TO A
4160 IF F(M)<>R THEN 4190
4170 IF G(M)=S THEN 4210
4180 NEXT M
4190 F(Q9)=R
4200 G(Q9)=S
4210 NEXT S
4220 NEXT R
4230 GOTO 3380
4240 END
```



Sine Wave

Did you ever go to a computer show and see a bunch of CRT terminals just sitting there waiting forlornly for someone to give a demo on them. It was one of those moments when I was at DEC that I decided there should be a little bit of background activity. And why not plot with words instead of the usual X's? Thus SINE WAVE was born and lives on in dozens of different versions. At least those CRTs don't look so lifeless anymore.

```
10 PRINT TAB(30);"SINE WAVE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT: PRINT: PRINT
40 REMARKABLE PROGRAM BY DAVID AHL
50 B=0
100 REM  START LONG LOOP
110 FOR T=0 TO 40 STEP .25
120 A=INT(26+25*SIN(T))
130 PRINT TAB(A);
140 IF B=1 THEN 180
150 PRINT "CREATIVE"
160 B=1
170 GOTO 200
180 PRINT "COMPUTING"
190 B=0
200 NEXT T
999 END
```

```
                    SINE WAVE
          CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

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```

Slalom

This game simulates a slalom run down a course with from one to 25 gates. The user picks the number of gates and has some control over his speed down the course.

If you're not a skier, here's your golden opportunity to try it with minimal risk. If you are a skier, here's something to do while your leg is in a cast.

SLALOM was written by J. Panek while a student at Dartmouth College.

```
                  SLALOM
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


 HOW MANY GATES DOES THIS COURSE HAVE (1 TO 25)? 12

 TYPE "INS" FOR INSTRUCTIONS
 TYPE "MAX" FOR APPROXIMATE MAXIMUM SPEEDS
 TYPE "RUN" FOR THE BEGINNING OF THE RACE
 COMMAND--? INS

***SLALOM:  THIS IS THE 1976 WINTER OLYMPIC GIANT SLALOM.  YOU ARE
            THE AMERICAN TEAM'S ONLY HOPE OF A GOLD MEDAL.

     0--TYPE THIS IF YOU WANT TO SEE HOW LONG YOU'VE TAKEN
     1--TYPE THIS IF YOU WANT TO SPEED UP A LOT
     2--TYPE THIS IF YOU WANT TO SPEED UP A LITTLE
     3--TYPE THIS IF YOU WANT TO SPEED UP A TEENSY
     4--TYPE THIS IF YOU WANT TO KEEP GOING THE SAME SPEED
     5--TYPE THIS IF YOU WANT TO CHECK A TEENSY
     6--TYPE THIS IF YOU WANT TO CHECK A LITTLE
     7--TYPE THIS IF YOU WANT TO CHECK A LOT
     8--TYPE THIS IF YOU WANT TO CHEAT AND TRY TO SKIP A GATE

  THE PLACE TO USE THESE OPTIONS IS WHEN THE COMPUTER ASKS:

 OPTION?

              GOOD LUCK,

 COMMAND--? MAX
 GATE MAX
  #  M.P.H.
 ----------
  1    14
  2    18
  3    26
  4    29
  5    18
  6    25
  7    28
  8    32
  9    29
  10    20
  11    29
  12    29

 COMMAND--? RUN
 RATE YOURSELF AS A SKIER, (1-WORST, 3-BEST)? 1
 THE STARTER COUNTS DOWN...5...4...3...2...1...GO!

 YOU'RE OFF!

 HERE COMES GATE #1
  9 M.P.H.
 OPTION? 2
  13 M.P.H.

 HERE COMES GATE #2
  13 M.P.H.
 OPTION? 1
  22 M.P.H.
 YOU TOOK OVER MAX. SPEED AND SNAGGED A FLAG!
 YOU TOOK 2.5774 SECONDS
 DO YOU WANT TO RACE AGAIN? YES
 THE STARTER COUNTS DOWN...5...4...3...2...1...GO!

 YOU'RE OFF!

 HERE COMES GATE #1
  13 M.P.H.
 OPTION? 3
  14 M.P.H.
 CLOSE ONE!

 HERE COMES GATE #2
  14 M.P.H.
 OPTION? 2
  18 M.P.H.
 CLOSE ONE!

 HERE COMES GATE #3
  18 M.P.H.
 OPTION? 3
  20 M.P.H.

 HERE COMES GATE #4
  20 M.P.H.
 OPTION? 4
  20 M.P.H.

 HERE COMES GATE #5
  20 M.P.H.
 OPTION? 5
  18 M.P.H.
 CLOSE ONE!

 HERE COMES GATE #6
  18 M.P.H.
 OPTION? 1
  23 M.P.H.

 HERE COMES GATE #7
  23 M.P.H.
 OPTION? !
  31 M.P.H.
 YOU TOOK OVER MAX. SPEED AND SNAGGED A FLAG!
 YOU TOOK 23.2587 SECONDS
 DO YOU WANT TO RACE AGAIN? NO
 THANKS FOR THE RACE
```

```
10 PRINT TAB(33);"SLALOM"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
310 PRINT "HOW MANY GATES DOES THIS COURSE HAVE (1 TO 25)";
320 INPUT V
330 IF V>25 THEN 360
340 IF V<1 THEN 390
350 GOTO 1440
360 PRINT "25 IS THE LIMIT"
370 LET V=25
380 GOTO 1440
390 PRINT "TRY AGAIN,"
400 GOTO 310
410 PRINT "RATE YOURSELF AS A SKIER, (1-WORST, 3-BEST)";
420 INPUT A
430 IF A<1 THEN 460
440 IF A>3 THEN 460
450 GOTO 480
460 PRINT "THE BOUNDS ARE 1-3"
470 GO TO410
480 PRINT "THE STARTER COUNTS DOWN...5...4...3...2...1...GO!"
490 REM
500 LET T=0
510 LET S=INT(RND(1)*(18-9)+9)
520 PRINT
525 PRINT "YOU'RE OFF!"
530 FOR Q=1 TO V
540    READ Q
550    PRINT
555    PRINT "HERE COMES GATE #";STR$(Q)
560    PRINT S;"M.P.H."
570    LET S1=S
580    PRINT "OPTION";
590    INPUT O1
600    IF O1=0 THEN 970
610   IF O1>8 THEN 1420
620    IF O1<1 THEN 1420
630    GOSUB 990
640    IF S<7 THEN 1390
650    LET T=T+(Q-S+1)
660    IF S>Q THEN 1630
670 NEXT Q
680 PRINT "YOU TOOK";(T+RND(1));"SECONDS"
690 LET M=T
700 LET M=M/V
710 IF M<1.5-(A*0.1) THEN 1650
720 IF M<2.9-(A*0.1) THEN 1680
730 IF M<4.4-(A*.01) THEN 1710
740 PRINT "DO YOU WANT TO RACE AGAIN";
750 INPUT B$
760 REM
770 IF B$="NO" THEN 1740
780 IF B$="YES" THEN 480
790 PRINT "PLEASE TYPE 'YES' OR 'NO'"
800 GOTO 740
810 STOP
820 PRINT
825 PRINT "***SLALOM:  THIS IS THE 1976 WINTER OLYMPIC GIANT SLALOM.  YOU ARE"
830 PRINT "            THE AMERICAN TEAM'S ONLY HOPE OF A GOLD MEDAL."
840 PRINT
845 PRINT "     0--TYPE THIS IF YOU WANT TO SEE HOW LONG YOU'VE TAKEN"
850 PRINT "     1--TYPE THIS IF YOU WANT TO SPEED UP A LOT"
860 PRINT "     2--TYPE THIS IF YOU WANT TO SPEED UP A LITTLE"
870 PRINT "     3--TYPE THIS IF YOU WANT TO SPEED UP A TEENSY"
880 PRINT "     4--TYPE THIS IF YOU WANT TO KEEP GOING THE SAME SPEED"
890 PRINT "     5--TYPE THIS IF YOU WANT TO CHECK A TEENSY"
900 PRINT "     6--TYPE THIS IF YOU WANT TO CHECK A LITTLE"
910 PRINT "     7--TYPE THIS IF YOU WANT TO CHECK A LOT"
920 PRINT "     8--TYPE THIS IF YOU WANT TO CHEAT AND TRY TO SKIP A GATE"
930 PRINT
935 PRINT " THE PLACE TO USE THESE OPTIONS IS WHEN THE COMPUTER ASKS:"
940 PRINT
945 PRINT "OPTION?"
950 PRINT
955 PRINT "               GOOD LUCK,
957 PRINT                          "
960 GOTO 1470
970 PRINT "YOU'VE TAKEN";(T+RND(1));"SECONDS"
980 GOTO 580
990 ON O1 GOTO 1130,1010,1170,1080,1190,1100,1150,1210
1000 STOP
1010 LET S=S+INT(RND(1)*(5-3)+3)
1020 PRINT S;"M.P.H."
1030 IF S>Q THEN 1290
1040 IF S>Q-1 THEN 1060
1050 RETURN
1060 PRINT "CLOSE ONE!"
1070 RETURN
1080 PRINT S;"M.P.H."
1090 GOTO 1030
1100 LET S=S-INT(RND(1)*(5-3)+3)
1110 PRINT S;"M.P.H."
1120 GOTO 1030
1130 LET S=S+INT(RND(1)*(10-5)+5)
1140 GOTO 1080
1150 LET S=S-INT(RND(1)*(10-5)+5)
1160 GOTO 1110
1170 LET S=S+INT(RND(1)*(4-1)+1)
1180 GOTO 1110
1190 LET S=S-INT(RND(1)*(4-1)+1)
1200 GOTO 1110
1210 PRINT "***CHEAT"
1220 IF RND(1)<.7 THEN 1260
1230 PRINT "YOU MADE IT!"
1240 LET T=T+1.5
1250 RETURN
1260 PRINT "AN OFFICIAL CAUGHT YOU!"
1270 PRINT "YOU TOOK";(T+RND(1));"SECONDS"
1280 GOTO 740
1290 IF RND(1)<((S-Q)*0.1)+.2 THEN 1320
1300 PRINT "YOU TOOK OVER MAX. SPEED AND MADE IT!"
1310 RETURN
1320 PRINT "YOU TOOK OVER MAX. SPEED AND ";
1330 IF RND<.5 THEN 1370
1340 PRINT "WIPED OUT!"
1350 PRINT "YOU TOOK";(T+RND(1));"SECONDS"
1360 GOTO 740
1370 PRINT "SNAGGED A FLAG!"
1380 GOTO 1350
1390 PRINT "LET'S BE REALISTIC, OK?  LET'S GO BACK AND TRY AGAIN..."
1400 LET S=S1
1410 GOTO 550
1420 PRINT "WHAT?"
1430 GOTO 580
1440 PRINT
1445 PRINT "TYPE ";CHR$(34);"INS";CHR$(34);" FOR INSTRUCTIONS"
1450 PRINT "TYPE ";CHR$(34);"MAX";CHR$(34);" FOR APPROXIMATE MAXIMUM SPEEDS"
1460 PRINT "TYPE ";CHR$(34);"RUN";CHR$(34);" FOR THE BEGINNING OF THE RACE"
1470 PRINT "COMMAND--";
1480 INPUT A$
1490 REM
1500 IF A$="INS" THEN 820
1510 IF A$="MAX" THEN 1550
1520 IF A$="RUN" THEN 410
1530 PRINT CHR$(34);A$;CHR$(34);" IS AN ILLEGAL COMMAND--RETRY";
1540 GOTO 1480
1550 PRINT "GATE MAX"
1560 PRINT " #  M.P.H."
1570 PRINT"----------"
1580 FOR B=1TOV
1590    READ Q
1600    PRINT B;"  ";Q
1610 NEXT B
1620 GOTO 1470
1630 LET T=T+.5
1640 GOTO 670
1650 PRINT "YOU WON A GOLD MEDAL!"
1660 LET G(1)=G(1)+1
1670 GOTO 1730
1680 PRINT "YOU WON A SILVER MEDAL"
1690 LET S(1)=S(1)+1
1700 GOTO 1730
1710 PRINT "YOU WON A BRONZE MEDAL"
1720 LET B(1)=B(1)+1
1730 GOTO 740
1740 PRINT "THANKS FOR THE RACE"
1750 IF G(1)<1 THEN 1770
1760 PRINT "GOLD MEDALS:";G(1)
1770 IF S(1)<1 THEN 1790
1780 PRINT "SILVER MEDALS:";S(1)
1790 IF B(1)<1 THEN 1830
1800 PRINT "BRONZE MEDALS:";B(1)
1810 DATA 14,18,26,29,18,25,28,32,29,20,29,29,25,21,26,29,20,21,20
1820 DATA 18,26,25,33,31,22
1830 END
```

Slots

The slot machine or one-arm bandit is a mechanical device that will absorb coins just about as fast as you can feed it. After inserting a coin, you pull a handle that sets three independent reels spinning. If the reels stop with certain symbols appearing in the pay line, you get a certain payoff. The original slot machine, called the Liberty Bell, was invented in 1895 by Charles Fey in San Francisco. Fey refused to sell or lease the manufacturing rights, so H.S. Mills in Chicago built a similar, but much improved, machine called the Operators Bell. This has survived nearly unchanged to today.

On the Operators Bell and other standard slot machines, there are 20 symbols on each wheel but they are not distributed evenly among the objects (cherries, bar, apples, etc.). Of the 8,000 possible combinations, the expected payoff (to the player) is 7,049 or $89.11 for every $100.00 put in, one of the lowest expected payoffs of all casino games.

In the program here, the payoff is considerably more liberal; indeed it appears to favor the player by 11% — i.e., an expected payoff of $111 for each $100 bet

The program was originally written by Fred Mirabelle and Bob Harper.

```
                SLOTS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


YOU ARE IN THE H&M CASINO,IN FRONT OF ONE OF OUR
ONE-ARMED BANDITS. BET FROM $1 TO $100.
TO PULL THE ARM, PUNCH THE RETURN KEY AFTER MAKING YOUR BET.

YOUR BET? 5


LEMON CHERRY BELL

YOU LOST.
YOUR STANDINGS ARE $-5
AGAIN? Y

YOUR BET? 5


BAR CHERRY CHERRY

DOUBLE!!
YOU WON!
YOUR STANDINGS ARE $ 10
AGAIN? Y

YOUR BET? 10


LEMON BAR BELL

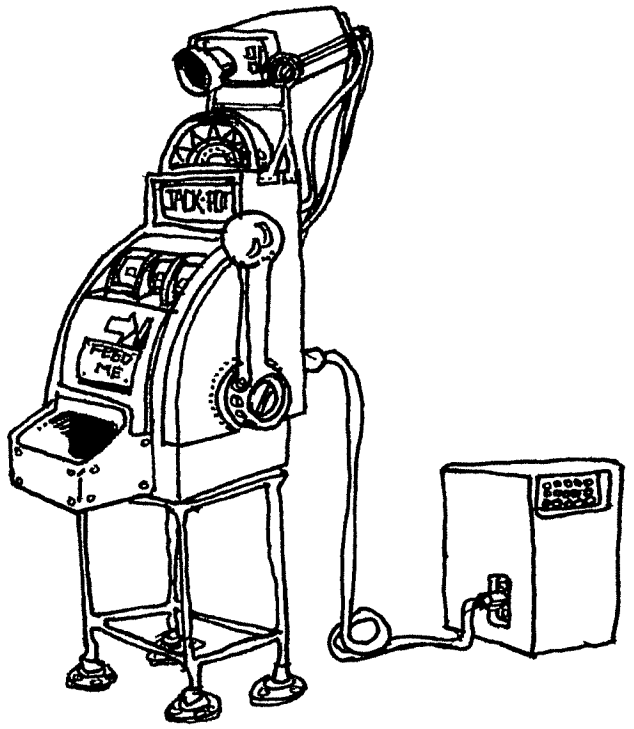
YOU LOST.
YOUR STANDINGS ARE $ 0
AGAIN? Y

YOUR BET? 25


BELL BELL BAR

DOUBLE!!
YOU WON!
YOUR STANDINGS ARE $ 75
AGAIN? N

COLLECT YOUR WINNINGS FROM THE H&M CASHIER.
```




```
 10 PRINT TAB(30);"SLOTS"
 20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
 30 PRINT: PRINT: PRINT
100 REM PRODUCED BY FRED MIRABELLE AND BOB HARPER ON JAN. 29, 1973
110 REM IT SIMULATES THE SLOT MACHINE.
120 PRINT "YOU ARE IN THE H&M CASINO,IN FRONT OF ONE OF OUR"
130 PRINT "ONE-ARMED BANDITS. BET FROM $1 TO $100."
140 PRINT "TO PULL THE ARM, PUNCH THE RETURN KEY AFTER MAKING YOUR BET."
150 LET P=0
160 PRINT: PRINT "YOUR BET";
170 INPUT M
180 IF M>100 THEN 860
190 IF M<1 THEN 880
200 M=INT(M)
210 GOSUB 1270
220 PRINT
230 LET X=INT(6*RND(1)+1)
240 LET Y=INT(6*RND(1)+1)
250 LET Z=INT(6*RND(1)+1)
260 PRINT
270 IF X=1 THEN 910
280 IF X=2 THEN 930
290 IF X=3 THEN 950
300 IF X=4 THEN 970
310 IF X=5 THEN 990
320 IF X=6 THEN 1010
330 IF Y=1 THEN 1030
340 IF Y=2 THEN 1050
350 IF Y=3 THEN 1070
360 IF Y=4 THEN 1090
370 IF Y=5 THEN 1110
380 IF Y=6 THEN 1130
390 IF Z=1 THEN 1150
400 IF Z=2 THEN 1170
410 IF Z=3 THEN 1190
420 IF Z=4 THEN 1210
430 IF Z=5 THEN 1230
440 IF Z=6 THEN 1250
450 IF X=Y THEN 600
460 IF X=Z THEN 630
470 IF Y=Z THEN 650
480 PRINT
490 PRINT "YOU LOST."
500 LET P=P-M
510 PRINT "YOUR STANDINGS ARE $"P
520 PRINT "AGAIN";
530 INPUT A$
540 IF A$="Y" THEN 160
550 PRINT
560 IF P<0 THEN 670
570 IF P=0 THEN 690
580 IF P>0 THEN 710
590 GOTO 1350
600 IF Y=Z THEN 730
610 IF Y=1 THEN 820
620 GOTO 1341
630 IF Z=1 THEN 820
640 GOTO 470
650 IF Z=1 THEN 820
660 GOTO 1341
670 PRINT "PAY UP!  PLEASE LEAVE YOUR MONEY ON THE TERMINAL."
680 GOTO 1350
690 PRINT"HEY, YOU BROKE EVEN."
700 GOTO 1350
710 PRINT "COLLECT YOUR WINNINGS FROM THE H&M CASHIER."
720 GOTO 1350
730 IF Z=1 THEN 780
740 PRINT: PRINT "**TOP DOLLAR**"
750 PRINT "YOU WON!"
760 P=(((10*M)+M)+P)
770 GOTO 510
780 PRINT: PRINT "***JACKPOT***"
790 PRINT "YOU WON!"
800 P=(((100*M)+M)+P)
810 GOTO 510
820 PRINT: PRINT "*DOUBLE BAR*"
830 PRINT"YOU WON!"
840 P=(((5*M)+M)+P)
850 GOTO 510
860 PRINT"HOUSE LIMITS ARE $100"
870 GOTO 160
880 PRINT"MINIMUM BET IS $1"
890 GOTO 160
900 GOTO 220
910 PRINT "BAR";: GOSUB 1310
920 GOTO 330
930 PRINT "BELL";: GOSUB 1310
940 GOTO 330
950 PRINT "ORANGE";: GOSUB 1310
960 GOTO 330
970 PRINT "LEMON";: GOSUB 1310
980 GOTO 330
990 PRINT "PLUM";: GOSUB 1310
1000 GOTO 330
1010 PRINT "CHERRY";: GOSUB 1310
1020 GOTO 330
1030 PRINT " BAR";: GOSUB 1310
1040 GOTO 390
1050 PRINT " BELL";: GOSUB 1310
1060 GOTO 390
1070 PRINT " ORANGE";: GOSUB 1310
1080 GOTO 390
1090 PRINT " LEMON";: GOSUB 1310
1100 GOTO 390
1110 PRINT " PLUM";: GOSUB 1310
1120 GOTO 390
1130 PRINT " CHERRY";: GOSUB 1310
1140 GOTO 390
1150 PRINT" BAR"
1160 GOTO 450
1170 PRINT" BELL"
1180 GOTO 450
1190 PRINT" ORANGE"
1200 GOTO 450
1210 PRINT" LEMON"
1220 GOTO 450
1230 PRINT" PLUM"
1240 GOTO 450
1250 PRINT" CHERRY"
1260 GOTO 450
1270 FOR Q4=1 TO 10
1280 PRINT CHR$(7);
1290 NEXT Q4
1300 RETURN
1310 FOR T8=1 TO 5
1320 PRINT CHR$(7);
1330 NEXT T8
1340 RETURN
1341 PRINT: PRINT "DOUBLE!!"
1342 PRINT"YOU WON!"
1343 P=(((2*M)+M)+P)
1344 GOTO 510
1350 STOP
9999 END
```

Splat

SPLAT simulates a parachute jump in which you try to open your parachute at the last possible moment without going splat! You may select your own terminal velocity or let the computer do it for you. You may also select the acceleration due to gravity or, again, let the computer do it in which case you might wind up on any one of eight planets (out to Neptune), the moon, or the sun.

The computer then tells you the height you're jumping from and asks for the seconds of free fall. It then divides your free fall time into eight intervals and gives you progress reports on your way down. The computer also keeps track of all prior jumps in the array A and lets you know how you compared with previous successful jumps. If you want to recall information from previous runs, then you should store array A in a disk or tape file and read it in before each run.

John Yegge created this program while at the Oak Ridge Associated Universities.

```
                              SPLAT
                CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


WELCOME TO 'SPLAT' -- THE GAME THAT SIMULATES A PARACHUTE
JUMP.  TRY TO OPEN YOUR CHUTE AT THE LAST POSSIBLE
MOMENT WITHOUT GOING Ssplat.


 SELECT YOUR OWN TERMINAL VELOCITY (YES OR NO)? NO
OK.  TERMINAL VELOCITY = 45 MI/HR
WANT TO SELECT ACCELERATION DUE TO GRAVITY (YES OR NO)? NO
FINE. YOU'RE ON THE SUN. ACCELERATION=896FT/SEC/SEC

    ALTITUDE         = 8680 FT
    TERM.VELOCITY    = 66 FT/SEC +-5%
    ACCELERATION     = 896 FT/SEC/SEC +-5%
SET THE TIMER FOR YOUR FREEFALL.
HOW MANY SECONDS? 8
HERE WE GO.

TIME (SEC)     DIST TO FALL (FT)
==========     =================
 0              8680
TERMINAL VELOCITY REACHED AT T PLUS .0731599 SECONDS
 1              8616.08
 2              8549.73
 3              8483.39
 4              8417.04
 5              8350.69
 6              8284.34
 7              8218
 8              8151.65
CHUTE OPEN
AMAZING!!! NOT BAD FOR YOUR 1ST SUCCESSFUL JUMP!!!
DO YOU WANT TO PLAY AGAIN? YES


 SELECT YOUR OWN TERMINAL VELOCITY (YES OR NO)? YES
WHAT TERMINAL VELOCITY (MI/HR)? 200
WANT TO SELECT ACCELERATION DUE TO GRAVITY (YES OR NO)? YES
WHAT ACCELERATION (FT/SEC/SEC)? 32

    ALTITUDE         = 1278 FT
    TERM.VELOCITY    = 293.333 FT/SEC +-5%
    ACCELERATION     = 32 FT/SEC/SEC +-5%
SET THE TIMER FOR YOUR FREEFALL.
HOW MANY SECONDS? 11
HERE WE GO.

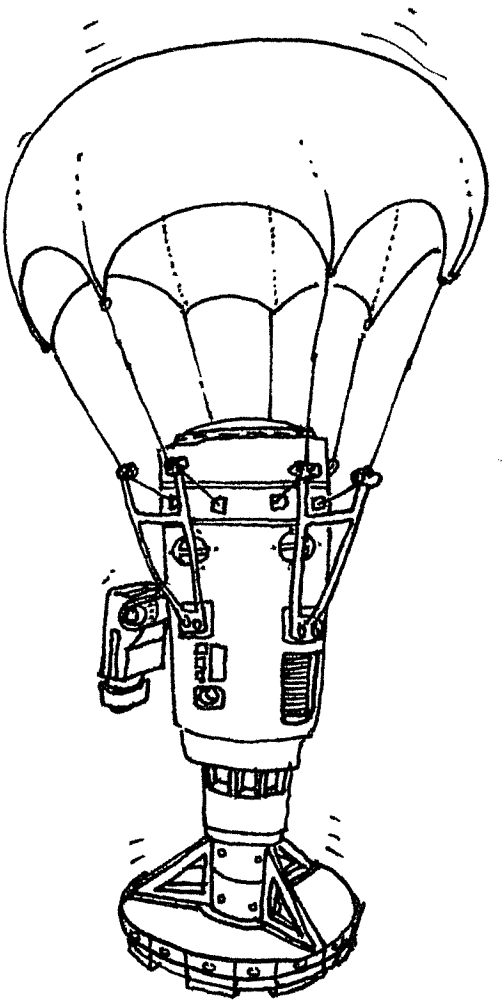
TIME (SEC)     DIST TO FALL (FT)
==========     =================
 0              1278
 1.375          1247.25
 2.75           1154.98
 4.125          1001.21
 5.5            785.934
 6.875          509.146
 8.25           170.851
TERMINAL VELOCITY REACHED AT T PLUS 8.75938 SECONDS
 8.86435        SPLAT
REQUIESCAT IN PACE.
I'LL GIVE YOU ANOTHER CHANCE.
DO YOU WANT TO PLAY AGAIN? YES


 SELECT YOUR OWN TERMINAL VELOCITY (YES OR NO)? YES
WHAT TERMINAL VELOCITY (MI/HR)? 200
WANT TO SELECT ACCELERATION DUE TO GRAVITY (YES OR NO)? YES
WHAT ACCELERATION (FT/SEC/SEC)? 32

    ALTITUDE         = 9440 FT
    TERM.VELOCITY    = 293.333 FT/SEC +-5%
    ACCELERATION     = 32 FT/SEC/SEC +-5%
SET THE TIMER FOR YOUR FREEFALL.
HOW MANY SECONDS? 7.5
HERE WE GO.

TIME (SEC)     DIST TO FALL (FT)
==========     =================
 0              9440
 .9375          9426.04
 1.875          9384.17
 2.8125         9314.39
 3.75           9216.69
 4.6875         9091.08
 5.625          8937.56
 6.5625         8756.12
 7.5            8546.77
CHUTE OPEN
AMAZING!!! NOT BAD FOR YOUR 2ND SUCCESSFUL JUMP!!!
DO YOU WANT TO PLAY AGAIN? NO
PLEASE? NOPE
YES OR NO PLEASE? NO
SSSSSSSSS.
```

```
10 PRINT TAB(33);"SPLAT"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
40 PRINT:PRINT:PRINT
50 DIM A(42)
95 PRINT "WELCOME TO 'SPLAT' -- THE GAME THAT SIMULATES A PARACHUTE"
96 PRINT "JUMP.  TRY TO OPEN YOUR CHUTE AT THE LAST POSSIBLE"
97 PRINT "MOMENT WITHOUT GOING SPLAT."
118 PRINT:PRINT:D1=0:V=0:A=0:N=0:M=0:D1=INT(9001*RND(1)+1000)
119 PRINT " SELECT YOUR OWN TERMINAL VELOCITY (YES OR NO)";:INPUT A1$
120 IF A1$="NO" GOTO 128
121 IF A1$<>"YES" THEN PRINT "YES OR NO";:INPUT A1$:GOTO 120
123 PRINT "WHAT TERMINAL VELOCITY (MI/HR)";:INPUT V1
125 V1=V1*(5280/3600):V=V1+((V1*RND(1))/20)-((V1*RND(1))/20):GOTO 135
128 V1=INT(1000*RND(1))
130 PRINT "OK.  TERMINAL VELOCITY ="V1"MI/HR"
131 V1=V1*(5280/3600):V=V1+((V1*RND(1))/20)-((V1*RND(1))/20)
135  PRINT "WANT TO SELECT ACCELERATION DUE TO GRAVITY (YES OR NO)";
136 INPUT B1$
140 IF B1$="NO" THEN 150
141 IF B1$<>"YES" THEN PRINT "YES OR NO";:INPUT B1$:GOTO 140
143 PRINT "WHAT ACCELERATION (FT/SEC/SEC)";:INPUT A2
145 A=A2+((A2*RND(1))/20)-((A2*RND(1))/20):GOTO 205
150 ON INT(1+(10*RND(1)))GOTO151,152,153,154,155,156,157,158,159,160
151 PRINT"FINE. YOU'RE ON MERCURY. ACCELERATION=12.2FT/SEC/SEC":GOTO161
152 PRINT"ALRIGHT. YOU'RE ON VENUS. ACCELERATION=28.3 FT/SEC/SEC":GOTO162
153 PRINT "THEN YOU'RE ON EARTH. ACCELERATION=32.16 FT/SEC/SEC":GOTO 163
154 PRINT"FINE. YOU'RE ON THE MOON. ACCELERATION=5.15FT/SEC/SEC":GOTO 164
155 PRINT"ALRIGHT. YOU'RE ON MARS. ACCELERATION=12.5FT/SEC/SEC":GOTO 165
156 PRINT"THEN YOU'RE ON JUPITER. ACCELERATION=85.2FT/SEC/SEC":GOTO 166
157 PRINT"FINE. YOU'RE ON SATURN. ACCELERATION=37.6FT/SEC/SEC":GOTO 167
158 PRINT"ALRIGHT. YOU'RE ON URANUS. ACCELERATION=33.8FT/SEC/SEC":GOTO 168
159 PRINT"THEN YOU'RE ON NEPTUNE. ACCELERATION=39.6FT/SEC/SEC":GOTO 169
160 PRINT"FINE. YOU'RE ON THE SUN. ACCELERATION=896FT/SEC/SEC":GOTO 170
161 A2=12.2:GOTO 145
162 A2=28.3:GOTO 145
163 A2=32.16:GOTO 145
164 A2=5.15:GOTO 145
165 A2=12.5:GOTO 145
166 A2=85.2:GOTO 145
167 A2=37.6:GOTO 145
168 A2=33.8 :GOTO 145
169 A2=39.6:GOTO 145
170 A2=896:GOTO 145
205 PRINT
206 PRINT "    ALTITUDE          ="D1"FT"
207 PRINT "    TERM.VELOCITY     ="V1"FT/SEC +-5%"
208 PRINT "    ACCELERATION      ="A2"FT/SEC/SEC +-5%"
210 PRINT "SET THE TIMER FOR YOUR FREEFALL."
211 PRINT "HOW MANY SECONDS";:INPUT T
215 PRINT "HERE WE GO."
217 PRINT
218 PRINT "TIME (SEC)","DIST TO FALL (FT)"
219 PRINT "==========","================="
300 FOR I=0 TO T STEP (T/8)
310 IF I>V/A GOTO 400
320 D=D1-((A/2)*I^2)
330 IF D<=0 GOTO 1000
340 PRINT I,D
350 NEXT I
360 GOTO 500
400 PRINT "TERMINAL VELOCITY REACHED AT T PLUS"V/A"SECONDS"
405 FOR I=I TO T STEP (T/8)
410 D=D1-((V^2/(2*A))+(V*(I-(V/A))))
420 IF D<=0 GOTO 1010
430 PRINT I,D
440 NEXT I
500 PRINT "CHUTE OPEN"
510 K=0:K1=0
550 FOR J=0 TO 42
555 IF A(J)=0 GOTO 620
560 K=K+1
570 IF D>=A(J) GOTO 600
580 K1=K1+1
600 NEXT J
610 GOTO 540
620 A(J)=D
630 IF J>2 THEN 650
635 PRINT "AMAZING!!! NOT BAD FOR YOUR ";
636 IF J=0 THEN PRINT "1ST ";
637 IF J=1 THEN PRINT "2ND ";
638 IF J=2 THEN PRINT "3RD ";
639 PRINT "SUCCESSFUL JUMP!!!":GOTO 2000
650 IF K-K1<=.1*K GOTO 700
660 IF K-K1<=.25*K GOTO 710
670 IF K-K1<=.5*K GOTO 720
680 IF K-K1<=.75*K GOTO 730
690 IF K-K1<=.9*K GOTO 740
695 GOTO 750
```



```
700 PRINT "WOW!  THAT'S SOME JUMPING.  OF THE"K"SUCCESSFUL JUMPS"
701 PRINT "BEFORE YOURS, ONLY"K-K1"OPENED THEIR CHUTES LOWER THAN"
702 PRINT "YOU DID."
703 GOTO 2000
710 PRINT "PRETTY GOOD! " K"SUCCESSFUL JUMPS PRECEDED YOURS AND ONLY"
711 PRINT K-K1" OF THEM GOT LOWER THAN YOU DID BEFORE THEIR CHUTES"
712 PRINT "OPENED." :GOTO 2000
720 PRINT "NOT BAD.  THERE HAVE BEEN"K"SUCCESSFUL JUMPS BEFORE YOURS."
721 PRINT"YOU WERE BEATEN OUT BY"K-K1"OF THEM.":GOTO 2000
730 PRINT "CONSERVATIVE AREN'T YOU?  YOU RANKED ONLY"K-K1"IN THE"
731 PRINT K"SUCCESSFUL JUMPS BEFORE YOURS.":GOTO 2000
740 PRINT "HUMPH!  DON'T YOU HAVE ANY SPORTING BLOOD?  THERE WERE"
741 PRINT K"SUCCESSFUL JUMPS BEFORE YOURS AND YOU CAME IN"K1"JUMPS"
742 PRINT "BETTER THAN THE WORST.  SHAPE UP!!!":GOTO 2000
750 PRINT "HEY!  YOU PULLED THE RIP CORD MUCH TOO SOON.  "K"SUCCESSFUL"
751 PRINT "JUMPS BEFORE YOURS AND YOU CAME IN NUMBER"K-K1"!  GET WITH IT!"
752 GOTO 2000
800 PRINT "REQUIESCAT IN PACE.":GOTO 1950
801 PRINT "MAY THE ANGEL OF HEAVEN LEAD YOU INTO PARADISE":GOTO 1950
802 PRINT "REST IN PEACE":GOTO 1950
803 PRINT "SON-OF-A-GUN":GOTO 1950
804 PRINT "#$%&&%!$":GOTO 1950
805 PRINT "A KICK IN THE PANTS IS A BOOST IF YOU'RE HEADED RIGHT":GOTO 1950
806 PRINT "HMMM. SHOULD HAVE PICKED A SHORTER TIME.":GOTO 1950
807 PRINT "MUTTER. MUTTER. MUTTER.":GOTO 1950
808 PRINT "PUSHING UP DAISIES.":GOTO1950
809 PRINT "EASY COME, EASY GO.":GOTO 1950
1000 PRINT SQR(2*D1/A),"SPLAT"
1005 ON INT(1+(10*RND(1)))GOTO 800,801,802,803,804,805,806,807,808,809
1010 PRINT (V/A)+((D1-(V^2/(2*A)))/V),"SPLAT"
1020 GOTO 1005
1950 PRINT "I'LL GIVE YOU ANOTHER CHANCE.":GOTO 2000
2000 PRINT "DO YOU WANT TO PLAY AGAIN";:INPUT Z$
2001 IF Z$="YES" GOTO 118
2002 IF Z$="NO" GOTO 2005
2003 PRINT "YES OR NO":GOTO 2000
2005 PRINT "PLEASE";:INPUT Z$:IF Z$="YES" THEN 118
2006 IF Z$<>"NO" THEN PRINT "YES OR NO ";:GOTO 2005
2007 PRINT "SSSSSSSSS.":GOTO 2046
2046 END
```

Stars

In this game, the computer selects a random number from 1 to 100 (or any value you set in Statement 150). You try to guess the number and the computer gives you clues to tell you how close you're getting. One star (*) means you're far away from the number; seven stars (*******) means you're really close. You get 7 guesses.

On the surface this game is very similar to GUESS; however, the guessing strategy is quite different. See if you can come up with one or more approaches to finding the mystery number.

Bob Albrecht of People's Computer Company created this game.

```
                  STARS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES
I AM THINKING OF A WHOLE NUMBER FROM 1 TO 100
TRY TO GUESS MY NUMBER.  AFTER YOU GUESS, I
WILL TYPE ONE OR MORE STARS (*).  THE MORE
STARS I TYPE, THE CLOSER YOU ARE TO MY NUMBER.
ONE STAR (*) MEANS FAR AWAY, SEVEN STARS (*******)
MEANS REALLY CLOSE!  YOU GET 7 GUESSES.


OK, I AM THINKING OF A NUMBER, START GUESSING.

YOUR GUESS? 50
***

YOUR GUESS? 25
**********************************************************!!!
YOU GOT IT IN 2 GUESSES!!!  LET'S PLAY AGAIN...


OK, I AM THINKING OF A NUMBER, START GUESSING.

YOUR GUESS? 50
***

YOUR GUESS? 75
**

YOUR GUESS? 25
*****

YOUR GUESS? 15
***

YOUR GUESS? 35
******

YOUR GUESS? 38
*****

YOUR GUESS? 33
*******

SORRY, THAT'S 7 GUESSES, NUMBER WAS 32


OK, I AM THINKING OF A NUMBER, START GUESSING.

YOUR GUESS? 50
***

YOUR GUESS? 75
**

YOUR GUESS? 25
*****

YOUR GUESS? 35
*****

YOUR GUESS? 30
*******

YOUR GUESS? 31
**********************************************************!!!
YOU GOT IT IN 6 GUESSES!!!  LET'S PLAY AGAIN...
```

```
10 PRINT TAB(34);"STARS"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 REM *** STARS - PEOPLE'S COMPUTER CENTER, MENLO PARK, CA
140 REM *** A IS LIMIT ON NUMBER, M IS NUMBER OF GUESSES
150 A=100:M=7
170 INPUT "DO YOU WANT INSTRUCTIONS";A$
190 IF LEFT$(A$,1)="N" THEN 280
200 REM *** INSTRUCTIONS ON HOW TO PLAY
210 PRINT "I AM THINKING OF A WHOLE NUMBER FROM 1 TO";A
220 PRINT "TRY TO GUESS MY NUMBER.  AFTER YOU GUESS, I"
230 PRINT "WILL TYPE ONE OR MORE STARS (*).  THE MORE"
240 PRINT "STARS I TYPE, THE CLOSER YOU ARE TO MY NUMBER."
250 PRINT "ONE STAR (*) MEANS FAR AWAY, SEVEN STARS (*******)"
260 PRINT "MEANS REALLY CLOSE!  YOU GET";M;"GUESSES."
270 REM *** COMPUTER THINKS OF A NUMBER
280 PRINT
290 PRINT
300 X=INT(A*RND(1)+1)
310 PRINT "OK, I AM THINKING OF A NUMBER, START GUESSING."
320 REM *** GUESSING BEGINS, HUMAN GETS M GUESSES
330 FOR K=1 TO M
340 PRINT
350 PRINT "YOUR GUESS";
360 INPUT G
370 IF G=X THEN 600
380 D=ABS(G-X)
390 IF D>=64 THEN 510
400 IF D>=32 THEN 500
410 IF D>=16 THEN 490
420 IF D>=8 THEN 480
430 IF D>=4 THEN 470
440 IF D>=2 THEN 460
450 PRINT "*";
460 PRINT "*";
470 PRINT "*";
480 PRINT "*";
490 PRINT "*";
500 PRINT "*";
510 PRINT "*";
520 PRINT
530 NEXT K
540 REM *** DID NOT GUESS IN M GUESSES
550 PRINT
560 PRINT "SORRY, THAT'S";M;"GUESSES, NUMBER WAS";X
580 GOTO 280
590 REM *** WE HAVE A WINNER
600 FOR N=1 TO 50
610 PRINT "*";
620 NEXT N
630 PRINT "!!!"
640 PRINT "YOU GOT IT IN";K;"GUESSES!!!  LET'S PLAY AGAIN..."
650 GOTO 280
660 END
```

Stock Market

This program "plays" the stock market. You will be given $10,000 and may buy or sell stocks. Stock prices and trends are generated randomly; therefore, this model does not represent exactly what happens on the exchange. (Depending upon your point of view, you may feel this is quite a good representation!)

Every trading day, a table of stocks, their prices, and number of shares in your portfolio is printed. Following this, the initials of each stock are printed followed by a question mark. You indicate your transaction in number of shares — a positive number to buy, negative number to sell, or 0 to do no trading. A brokerage fee of 1% is charged on all transactions (a bargain!). Note: Even if the value of a stock drops to zero, it may rebound again — then again, it may not.

This program was created by D. Pessel, L. Braun, and C. Losik of the Huntington Computer Project at SUNY, Stony Brook, N.Y.

```
                STOCK MARKET
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT THE INSTRUCTIONS (YES-TYPE 1, NO-TYPE 0)? 1


THIS PROGRAM PLAYS THE STOCK MARKET.  YOU WILL BE GIVEN
$10,000 AND MAY BUY OR SELL STOCKS.  THE STOCK PRICES WILL
BE GENERATED RANDOMLY AND THEREFORE THIS MODEL DOES NOT
REPRESENT EXACTLY WHAT HAPPENS ON THE EXCHANGE.  A TABLE
OF AVAILABLE STOCKS, THEIR PRICES, AND THE NUMBER OF SHARES
IN YOUR PORTFOLIO WILL BE PRINTED.  FOLLOWING THIS, THE
INITIALS OF EACH STOCK WILL BE PRINTED WITH A QUESTION
MARK.  HERE YOU INDICATE A TRANSACTION.  TO BUY A STOCK
TYPE +NNN, TO SELL A STOCK TYPE -NNN, WHERE NNN IS THE
NUMBER OF SHARES.  A BROKERAGE FEE OF 1% WILL BE CHARGED
ON ALL TRANSACTIONS.  NOTE THAT IF A STOCK'S VALUE DROPS
TO ZERO IT MAY REBOUND TO A POSITIVE VALUE AGAIN.  YOU
HAVE $10,000 TO INVEST.  USE INTEGERS FOR ALL YOUR INPUTS.
(NOTE:  TO GET A 'FEEL' FOR THE MARKET RUN FOR AT LEAST
10 DAYS)
-----GOOD LUCK!-----

STOCK                       INITIALS      PRICE/SHARE
INT. BALLISTIC MISSILES       IBM           98.25
RED CROSS OF AMERICA          RCA           83.75
LICHTENSTEIN, BUMRAP & JOKE   LBJ           144.75
AMERICAN BANKRUPT CO.         ABC           137
CENSURED BOOKS STORE          CBS           103.5

NEW YORK STOCK EXCHANGE AVERAGE:  113.45

TOTAL STOCK ASSETS ARE   $ 0
TOTAL CASH ASSETS ARE    $ 10000
TOTAL ASSETS ARE         $ 10000

WHAT IS YOUR TRANSACTION IN
IBM? 10
RCA? 20
LBJ? 10
ABC? 0
CBS? 0


**********  END OF DAY'S TRADING


STOCK        PRICE/SHARE   HOLDINGS      VALUE         NET PRICE CHANGE
IBM           94.25         10            942.5         -4
RCA           79.5          20            1590          -4.25
LBJ           142.25        10            1422.5        -2.5
ABC           139.75        0             0              2.75
CBS           98.5          0             0             -5


NEW YORK STOCK EXCHANGE AVERAGE:  110.85    NET CHANGE: -2.6

TOTAL STOCK ASSETS ARE   $ 3955
TOTAL CASH ASSETS ARE    $ 5853.95
TOTAL ASSETS ARE         $ 9808.95

DO YOU WISH TO CONTINUE (YES-TYPE 1, NO-TYPE 0)? 1
WHAT IS YOUR TRANSACTION IN
IBM? -10
RCA? -5
LBJ? -10
ABC? 0
CBS? 0


**********  END OF DAY'S TRADING

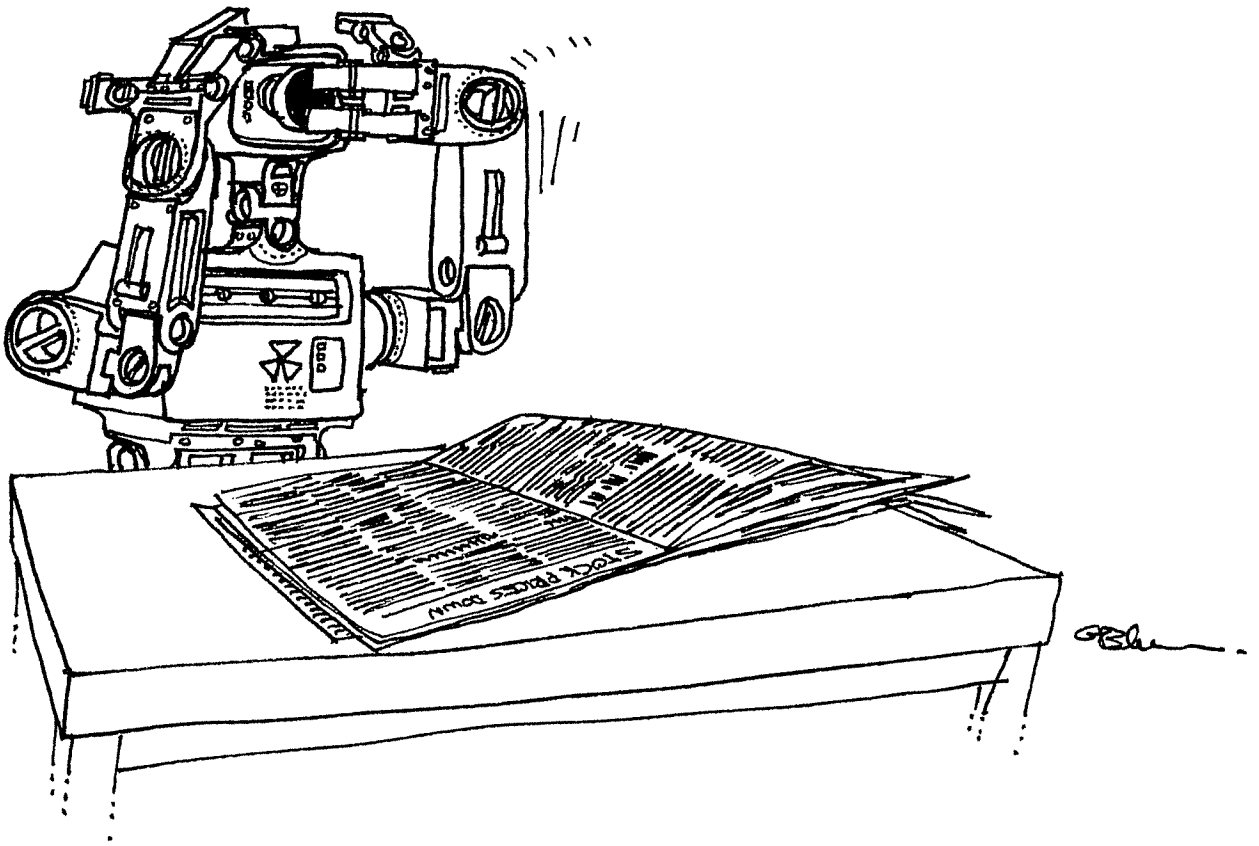

STOCK        PRICE/SHARE   HOLDINGS      VALUE         NET PRICE CHANGE
IBM           82.75         20            1655          -1.75
RCA           67.75         10            677.5         -2.25
LBJ           125.75        10            1257.5        -6.5
ABC           121.25        10            1212.5        -7
CBS           84.75         0             0             -4.5


NEW YORK STOCK EXCHANGE AVERAGE:  96.45    NET CHANGE: -4.4

TOTAL STOCK ASSETS ARE   $ 4802.5
TOTAL CASH ASSETS ARE    $ 3987.74
TOTAL ASSETS ARE         $ 8790.24
```

```
10 PRINT TAB(30);"STOCK MARKET"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
100 REM STOCK MARKET SIMULATION      -STOCK-
101 REM REVISED 8/18/70 (D. PESSEL, L. BRAUN, C. LOSIK)
102 REM IMP VRBLS: A-MRKT TRND SLP; B5-BRKRGE FEE; C-TTL CSH ASSTS;
103 REM C5-TTL CSH ASSTS (TEMP); C(I)-CHNG IN STK VAL; D-TTL ASSTS;
104 REM E1,E2-LRG CHNG MISC; I-STCK #; I1,I2-STCKS W LRG CHNG;
105 REM N1,N2-LRG CHNG DAY CNTS; P5-TTL DAYS PRCHSS; P(I)-PRTFL CNTNTS;
106 REM Q9-NEW CYCLE; S4-SGN OF A; S5-TTL DYS SLS; S(I)-VALUE/SHR;
107 REM T-TTL STCK ASSTS; T5-TTL VAL OF TRNSCTNS;
108 REM W3-LRG CHNG; X1-SMLL CHNG(<$1); Z4,Z5,Z6-NYSE AVE.; Z(I)-TRNSCT
110 DIM S(5),P(5),Z(5),C(5)
112 REM SLOPE OF MARKET TREND:A  (SAME FOR ALL STOCKS)
113 LET X=1
114 LET A=INT((RND(X)/10)*100+.5)/100
115 LET T5=0
116 LET X9=0
117 LET N1=0
118 LET N2=0
119 LET E1=0
120 LET E2=0
121 REM INTRODUCTION
122 PRINT "DO YOU WANT THE INSTRUCTIONS (YES-TYPE 1, NO-TYPE 0)";
123 INPUT Z9
124 PRINT
125 PRINT
126 IF Z9<1 THEN 200
130 PRINT "THIS PROGRAM PLAYS THE STOCK MARKET.  YOU WILL BE GIVEN"
132 PRINT "$10,000 AND MAY BUY OR SELL STOCKS.  THE STOCK PRICES WILL"
134 PRINT "BE GENERATED RANDOMLY AND THEREFORE THIS MODEL DOES NOT"
135 PRINT "REPRESENT EXACTLY WHAT HAPPENS ON THE EXCHANGE.  A TABLE"
136 PRINT "OF AVAILABLE STOCKS, THEIR PRICES, AND THE NUMBER OF SHARES
137 PRINT "IN YOUR PORTFOLIO WILL BE PRINTED.  FOLLOWING THIS, THE"
138 PRINT "INITIALS OF EACH STOCK WILL BE PRINTED WITH A QUESTION"
139 PRINT "MARK.  HERE YOU INDICATE A TRANSACTION.  TO BUY A STOCK"
140 PRINT "TYPE +NNN, TO SELL A STOCK TYPE -NNN, WHERE NNN IS THE"
141 PRINT "NUMBER OF SHARES.  A BROKERAGE FEE OF 1% WILL BE CHARGED"
142 PRINT "ON ALL TRANSACTIONS.  NOTE THAT IF A STOCK'S VALUE DROPS"
143 PRINT "TO ZERO IT MAY REBOUND TO A POSITIVE VALUE AGAIN.  YOU"
144 PRINT "HAVE $10,000 TO INVEST.  USE INTEGERS FOR ALL YOUR INPUTS."
145 PRINT "(NOTE:  TO GET A 'FEEL' FOR THE MARKET RUN FOR AT LEAST"
146 PRINT "10 DAYS)"
147 PRINT "-----GOOD LUCK!-----"
200 REM GENERATION OF STOCK TABLE; INPUT REQUESTS
210 REM INITIAL STOCK VALUES
220 LET S(1)=100
230 LET S(2)=85
240 LET S(3)=150
250 LET S(4)=140
260 LET S(5)=110
265 REM INITIAL T8 - # DAYS FOR FIRST TREND SLOPE (A)
266 LET T8=INT(4.99*RND(X)+1)
267 REM RANDOMIZE SIGN OF FIRST TREND SLOPE (A)
268 IF RND(X)>.5 THEN 270
269 LET A=-A
270 REM RANDOMIZE INITIAL VALUES
280 GOSUB 830
285 REM INITIAL PORTFOLIO CONTENTS
290 FOR I=1 TO 5
300 LET P(I)=0
305 LET Z(I)=0
310 NEXT I
320 PRINT
330 PRINT
333 REM INITIALIZE CASH ASSETS:C
335 LET C=10000
338 REM PRINT INITIAL PORTFOLIO
340 PRINT "STOCK"," ","INITIALS","PRICE/SHARE"
350 PRINT "INT. BALLISTIC MISSILES","  IBM",S(1)
352 PRINT "RED CROSS OF AMERICA","  RCA",S(2)
354 PRINT "LICHTENSTEIN, BUMRAP & JOKE","  LBJ",S(3)
356 PRINT "AMERICAN BANKRUPT CO.","  ABC",S(4)
358 PRINT "CENSURED BOOKS STORE","  CBS",S(5)
360 PRINT
361 REM NYSE AVERAGE:Z5; TEMP. VALUE:Z4; NET CHANGE:Z6
363 LET Z4=Z5
364 LET Z5=0
365 LET T=0
370 FOR I=1 TO 5
375 LET Z5=Z5+S(I)
380 LET T=T+S(I)*P(I)
390 NEXT I
391 LET Z5=INT(100*(Z5/5)+.5)/100
392 LET Z6=INT((Z5-Z4)*100+.5)/100
393 REM TOTAL ASSETS:D
394 LET D=T+C
395 IF X9>0 THEN 398
396 PRINT "NEW YORK STOCK EXCHANGE AVERAGE: "Z5
397 GOTO 399
398 PRINT "NEW YORK STOCK EXCHANGE AVERAGE: "Z5"   NET CHANGE: "Z6
399 PRINT
400 LET T=INT(100*T+.5)/100
401 PRINT "TOTAL STOCK ASSETS ARE   $";T
403 LET C=INT(100*C+.5)/100
405 PRINT "TOTAL CASH ASSETS ARE    $";C
407 LET D=INT(100*D+.5)/100
408 PRINT "TOTAL ASSETS ARE         $";D
410 PRINT
411 IF X9=0 THEN 416
412 PRINT "DO YOU WISH TO CONTINUE (YES-TYPE 1, NO-TYPE 0)";
413 INPUT Q9
414 IF Q9<1 THEN 998
416 REM INPUT TRANSACTIONS
420 PRINT "WHAT IS YOUR TRANSACTION IN"
430 PRINT "IBM";
440 INPUT Z(1)
450 PRINT "RCA";
460 INPUT Z(2)
470 PRINT "LBJ";
480 INPUT Z(3)
490 PRINT "ABC";
500 INPUT Z(4)
510 PRINT "CBS";
520 INPUT Z(5)
525 PRINT
530 REM TOTAL DAY'S PURCHASES IN $:P5
540 LET P5=0
550 REM TOTAL DAY'S SALES IN $:S5
560 LET S5=0
570 FOR I=1 TO 5
575 LET Z(I)=INT(Z(I)+.5)
580 IF Z(I)<=0 THEN 610
590 LET P5=P5+Z(I)*S(I)
600 GOTO 620
610 LET S5=S5-Z(I)*S(I)
612 IF -Z(I)<=P(I) THEN 620
614 PRINT "YOU HAVE OVERSOLD A STOCK; TRY AGAIN."
616 GOTO 420
620 NEXT I
622 REM TOTAL VALUE OF TRANSACTIONS:T5
625 LET T5=P5+S5
630 REM BROKERAGE FEE:B5
640 LET B5=INT(.01*T5*100+.5)/100
650 REM CASH ASSETS=OLD CASH ASSETS-TOTAL PURCHASES
652 REM -BROKERAGE FEES+TOTAL SALES:C5
654 LET C5=C-P5-B5+S5
656 IF C5>=0 THEN 674
658 PRINT "YOU HAVE USED $"-C5" MORE THAN YOU HAVE."
660 GOTO 420
674 LET C=C5
675 REM CALCULATE NEW PORTFOLIO
680 FOR I=1 TO 5
690 LET P(I)=P(I)+Z(I)
700 NEXT I
710 REM CALCULATE NEW STOCK VALUES
720 GOSUB 830
750 REM PRINT PORTFOLIO
751 REM BELL RINGING-DIFFERENT ON MANY COMPUTERS
752 FOR I=1 TO 20
753 PRINT CHR$(135);
754 NEXT I
755 PRINT
756 PRINT "**********  END OF DAY'S TRADING"
757 PRINT
758 PRINT
759 IF X9<1 THEN 769
769 PRINT "STOCK","PRICE/SHARE","HOLDINGS","VALUE","NET PRICE CHANGE"
770 PRINT "IBM", S(1), P(1), S(1)*P(1), C(1)
771 PRINT "RCA", S(2), P(2), S(2)*P(2), C(2)
772 PRINT "LBJ", S(3), P(3), S(3)*P(3), C(3)
773 PRINT "ABC", S(4), P(4), S(4)*P(4), C(4)
774 PRINT "CBS", S(5), P(5), S(5)*P(5), C(5)
775 LET X9=1
780 PRINT
790 PRINT
810 GOTO 360
829 REM NEW STOCK VALUES - SUBROUTINE
830 REM RANDOMLY PRODUCE NEW STOCK VALUES BASED ON PREVIOUS
831 REM DAY'S VALUES
832 REM N1,N2 ARE RANDOM NUMBERS OF DAYS WHICH RESPECTIVELY
833 REM DETERMINE WHEN STOCK I1 WILL INCREASE 10 PTS. AND STOCK
834 REM I2 WILL DECREASE 10 PTS.
840 REM IF N1 DAYS HAVE PASSED, PICK AN I1, SET E1, DETERMINE NEW N1
841 IF N1>0 THEN 850
845 LET I1=INT(4.99*RND(X)+1)
846 LET N1=INT(4.99*RND(X)+1)
847 LET E1=1
850 REM IF N2 DAYS HAVE PASSED, PICK AN I2, SET E2, DETERMINE NEW N2
851 IF N2>0 THEN 860
855 LET I2=INT(4.99*RND(X)+1)
856 LET N2=INT(4.99*RND(X)+1)
```

```
857 LET E2=1
860 REM DEDUCT ONE DAY FROM N1 AND N2
861 LET N1=N1-1
862 LET N2=N2-1
890 REM LOOP THROUGH ALL STOCKS
900 FOR I=1 TO 5
910 LET X1=RND(X)
915 IF X1>.25 THEN 920
916 LET X1=.25
917 GOTO 935
920 IF X1>.50 THEN 925
921 LET X1=.50
922 GOTO 935
925 IF X1>.75 THEN 930
926 LET X1=.75
927 GOTO 935
930 LET X1=0.0
931 REM BIG CHANGE CONSTANT:W3  (SET TO ZERO INITIALLY)
935 LET W3=0
936 IF E1<1 THEN 945
937 IF INT(I1+.5)<>INT(I+.5) THEN 945
938 REM ADD 10 PTS. TO THIS STOCK;  RESET E1
939 LET W3=10
943 LET E1=0
945 IF E2<1 THEN 955
947 IF INT(I2+.5)<>INT(I+.5) THEN 955
948 REM SUBTRACT 10 PTS. FROM THIS STOCK;  RESET E2
949 LET W3=W3-10
953 LET E2=0
954 REM C(I) IS CHANGE IN STOCK VALUE
955 LET C(I)=INT(A*S(I))+X1+INT(3-6*RND(X)+.5)+W3
956 LET C(I)=INT(100*C(I)+.5)/100
957 LET S(I)=S(I)+C(I)
960 IF S(I)>0 THEN 967
964 LET C(I)=0
965 LET S(I)=0
966 GOTO 970
967 LET S(I)=INT(100*S(I)+.5)/100
970 NEXT I
972 REM AFTER T8 DAYS RANDOMLY CHANGE TREND SIGN AND SLOPE
973 LET T8=T8-1
974 IF T8<1 THEN 985
980 RETURN
985 REM RANDOMLY CHANGE TREND SIGN AND SLOPE (A), AND DURATION
986 REM OF TREND (T8)
990 LET T8=INT(4.99*RND(X)+1)
992 LET A=INT((RND(X)/10)*100+.5)/100
993 LET S4=RND(X)
994 IF S4<=.5 THEN 997
995 LET A=-A
997 RETURN
998 PRINT "HOPE YOU HAD FUN!!"
999 END
```

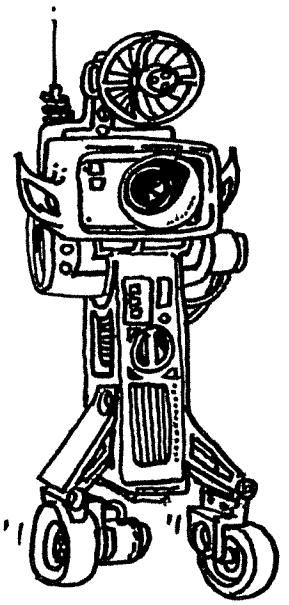


Super Star Trek®

Brief History

Many versions of Star Trek have been kicking around various college campuses since the late sixties. I recall playing one at Carnegie-Mellon Univ. in 1967 or 68, and a very different one at Berkeley. However, these were a far cry from the one written by Mike Mayfield of Centerline Engineering and/or Custom Data. This was written for an HP2000C and completed in October 1972. It became the "standard" Star Trek in February 1973 when it was put in the HP contributed program library and onto a number of HP Data Center machines.

In the summer of 1973, I converted the HP version to BASIC-PLUS for DEC's RSTS-11 compiler and added a few bits and pieces while I was at it. Mary Cole at DEC contributed enormously to this task too. Later that year I published it under the name SPACWR (Space War – in retrospect, an incorrect name) in my book *101 Basic Computer Games.* It is difficult today to find an interactive computer installation that does not have one of these versions of Star Trek available.



Quadrant Nomenclature

Recently, certain critics have professed confusion as to the origin of the "quadrant" nomenclature used on all standard CG (Cartesian Galactic) maps. Naturally, for anyone with the remotest knowledge of history, no explanation is necessary; however, the following synopsis should suffice for the critics:

As every schoolboy knows, most of the intelligent civilizations in the Milky Way had originated galactic designations of their own choosing well before the Third Magellanic Conference, at which the so-called "2^6 Agreement" was reached. In that historic document, the participant cultures agreed, in all two-dimensional representations of the galaxy, to specify 64 major subdivisions, ordered as an 8 x 8 matrix. This was partially in deference to the Earth culture (which had done much in the initial organization of the Federation), whose century-old galactic maps had always shown 16 major regions named after celestial landmarks of the Earth sky. Each of these regions was divided into four "quadrants," designated by ancient "Roman Numerals" (the origin of which has been lost).

To this day, the official logs of starships originating on near-Earth starbases still refer to the major galactic areas as "quadrants."

The relation between the Historical and Standard nomenclatures is shown in the simplified CG map below.

	1	2	3	4	5	6	7	8
1		ANTARES					SIRIUS	
	I	II	III	IV	I	II	III	IV
2		RIGEL					DENEB	
	I	II	III	IV	I	II	III	IV
3		PROCYON					CAPELLA	
	I	II	III	IV	I	II	III	IV
4		VEGA					BETELGEUSE	
	I	II	III	IV	I	II	III	IV
5		CANOPUS					ALDEBARAN	
	I	II	III	IV	I	II	III	IV
6		ALTAIR					REGULUS	
	I	II	III	IV	I	II	III	I
7		SAGITTARIUS					ARCTURUS	
	I	II	III	IV	I	II	III	IV
8		POLLUX					SPICA	
	I	II	III	IV	I	II	III	IV

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Super Star Trek† Rules and Notes

by Robert Leedom and David Ahl

1. OBJECTIVE: You are Captain of the starship "Enterprise"† with a mission to seek and destroy a fleet of Klingon† warships (usually about 17) which are menacing the United Federation of Planets.† You have a specified number of stardates in which to complete your mission. You also have two or three Federation Starbases† for resupplying your ship.

2. You will be assigned a starting position somewhere in the galaxy. The galaxy is divided into an 8 x 8 quadrant grid. The astronomical name of a quadrant is called out upon entry into a new region. (See "Quadrant Nomenclature.") Each quadrant is further divided into an 8 x 8 section grid.

3. On a section diagram, the following symbols are used:

<*>	Enterprise	>!<	Starbase
+++	Klingon	*	Star

4. You have eight commands available to you. (A detailed description of each command is given in the program instructions.)

NAV	Navigate the Starship by setting course and warp engine speed.
SRS	Short-range sensor scan (one quadrant)
LRS	Long-range sensor scan (9 quadrants)
PHA	Phaser† control (energy gun)
TOR	Photon torpedo control
SHE	Shield control (protects against phaser fire)
DAM	Damage and state-of-repair report
COM	Call library computer

5. Library computer options are as follows (more complete descriptions are in program instructions):

0	Cumulative galactic record
1	Status report
2	Photon torpedo course data
3	Starbase navigation data
4	Direction/distance calculator
5	Quadrant nomenclature map

6. Certain reports on the ship's status are made by officers of the Enterprise who appeared on the original TV Show —Spock,† Scott,† Uhura,† Chekov,† etc.

7. Klingons are non-stationary within their quadrants. If you try to maneuver on them, they will move and fire on you.

8. Firing and damage notes:

A. Phaser fire diminishes with increased distance between combatants.
B. If a Klingon zaps you hard enough (relative to your shield strength) he will generally cause damage to some part of your ship with an appropriate "Damage Control" report resulting.
C. If you don't zap a Klingon hard enough (relative to his shield strength) you won't damage him at all. Your sensors will tell the story.
D. Damage control will let you know when out-of-commission devices have been completely repaired.

9. Your engines will automatically shut down if you should attempt to leave the galaxy, or if you should try to maneuver through a star, a Starbase, or—heaven help you—a Klingon warship.

10. In a pinch, or if you should miscalculate slightly, some shield control energy will be automatically diverted to warp engine control (if your shields are operational!).

11. While you're docked at a Starbase, a team of technicians can repair your ship (if you're willing for them to spend the time required—and the repairmen *always* underestimate...).

12. If, to save maneuvering time toward the end of the game, you should cold-bloodedly destroy a Starbase, you get a nasty note from Starfleet Command. If you destroy your *last* Starbase, you lose the game! (For those who think this is too harsh a penalty, delete lines 5360-5390, and you'll just get a "you dumdum!"-type message on all future status reports.)

13. End game logic has been "cleaned up" in several spots, and it is possible to get a new command after successfully completing your mission (or, after resigning your old one).

14. For those of you with certain types of CRT/keyboards setups (e.g. Westinghouse 1600), a "bell" character is inserted at appropriate spots to cause the following items to flash on and off on the screen:

- The Phrase "*RED*" (as in Condition: Red)
- The character representing your present quadrant in the cumulative galactic record printout.

15. This version of Star Trek was created for a Data General Nova 800 system with 32K or core. So that it would fit, the instructions are separated from the main program via a CHAIN. For conversion to DEC BASIC-PLUS, Statement 160 (Randomize) should be moved after the return from the chained instructions, say to Statement 245. For Altair BASIC, Randomize and the chain instructions should be eliminated.

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Program Listing - Instructions

```
10 REM INSTRUCTIONS FOR "SUPER STARTREK"  MAR 5, 1978
20 FOR I=1 TO 12:PRINT:NEXT I
21 PRINT TAB(10);"**************************************"
22 PRINT TAB(10);"*                                    *"
23 PRINT TAB(10);"*                                    *"
30 PRINT TAB(10);"*      * * SUPER STAR TREK * *       *"
31 PRINT TAB(10);"*                                    *"
32 PRINT TAB(10);"*                                    *"
35 PRINT TAB(10);"**************************************"
36 FOR I=1 TO 8:PRINT:NEXT I
40 INPUT "DO YOU NEED INSTRUCTIONS (Y/N)";K$:IF K$="N" THEN 2000
44 PRINT
45 PRINT "TURN THE ITY ON-LINE AND HIT ANY KEY EXCEPT RETURN"
46 IF INP(1)=13 THEN 46
50 POKE 1229,2:POKE 1237,3:NULL 1
90 PRINT"     INSTRUCTIONS FOR 'SUPER STAR TREK'"
100 PRINT
110 PRINT"1. WHEN YOU SEE \COMMAND ?\ PRINTED, ENTER ONE OF THE LEGAL"
120 PRINT"     COMMANDS (NAV, SRS, LRS, PHA, TOR, SHE, DAM, COM, OR XXX)."
130 PRINT"2. IF YOU SHOULD TYPE IN AN ILLEGAL COMMAND, YOU'LL GET A SHOR
T"
140 PRINT"     LIST OF THE LEGAL COMMANDS PRINTED OUT."
150 PRINT"3. SOME COMMANDS REQUIRE YOU TO ENTER DATA (FOR EXAMPLE, THE"
160 PRINT"     'NAV' COMMAND COMES BACK WITH 'COURSE (1-9) ?'.)  IF YOU"
170 PRINT"     TYPE IN ILLEGAL DATA (LIKE NEGATIVE NUMBERS), THAT COMMAN
D"
180 PRINT"     WILL BE ABORTED"
190 PRINT
270 PRINT"     THE GALAXY IS DIVIDED INTO AN 8 X 8 QUADRANT GRID,"
280 PRINT"AND EACH QUADRANT IS FURTHER DIVIDED INTO AN 8 X 8 SECTOR GRID
."
290 PRINT
300 PRINT"     YOU WILL BE ASSIGNED A STARTING POINT SOMEWHERE IN THE"
310 PRINT"GALAXY TO BEGIN A TOUR OF DUTY AS COMMANDER OF THE STARSHIP"
320 PRINT"\ENTERPRISE\; YOUR MISSION: TO SEEK AND DESTROY THE FLEET OF"
330 PRINT"KLINGON WARWHIPS WHICH ARE MENACING THE UNITED FEDERATION OF"
340 PRINT"PLANETS."
360 PRINT
370 PRINT"     YOU HAVE THE FOLLOWING COMMANDS AVAILABLE TO YOU AS CAPTA
IN"
380 PRINT"OF THE STARSHIP ENTERPRISE:"
385 PRINT
390 PRINT"\NAV\ COMMAND = WARP ENGINE CONTROL --"
400 PRINT"     COURSE IS IN A CIRCULAR NUMERICAL       4  3  2"
410 PRINT"     VECTOR ARRANGEMENT AS SHOWN              . . ."
420 PRINT"     INTEGER AND REAL VALUES MAY BE           ..."
430 PRINT"     USED.  (THUS COURSE 1.5 IS HALF-      5 ---*--- 1"
440 PRINT"     WAY BETWEEN 1 AND 2                      ..."
450 PRINT"                                             . . ."
460 PRINT"     VALUES MAY APPROACH 9.0, WHICH          6  7  8"
470 PRINT"     ITSELF IS EQUIVALENT TO 1.0"
480 PRINT"                                            COURSE"
490 PRINT"     ONE WARP FACTOR IS THE SIZE OF "
500 PRINT"     ONE QUADTANT.  THEREFORE, TO GET"
510 PRINT"     FROM QUADRANT 6,5 TO 5,5, YOU WOULD"
520 PRINT"     USE COURSE 3, WARP FACTOR 1."
530 PRINT
540 PRINT"\SRS\ COMMAND = SHORT RANGE SENSOR SCAN"
550 PRINT"     SHOWS YOU A SCAN OF YOUR PRESENT QUADRANT."
555 PRINT
560 PRINT"     SYMBOLOGY ON YOUR SENSOR SCREEN IS AS FOLLOWS:"
570 PRINT"        <*> = YOUR STARSHIP'S POSITION"
580 PRINT"        +K+ = KLINGON BATTLE CRUISER"
590 PRINT"        >!< = FEDERATION STARBASE (REFUEL/REPAIR/RE-ARM HERE!)
"
600 PRINT"         *  = STAR"
605 PRINT
610 PRINT"     A CONDENSED 'STATUS REPORT' WILL ALSO BE PRESENTED."
620 PRINT
640 PRINT"\LRS\ COMMAND = LONG RANGE SENSOR SCAN"
650 PRINT"     SHOWS CONDITIONS IN SPACE FOR ONE QUADRANT ON EACH SIDE"
660 PRINT"     OF THE ENTERPRISE (WHICH IS IN THE MIDDLE OF THE SCAN)"
670 PRINT"     THE SCAN IS CODED IN THE FORM \###\, WHERE TH UNITS DIGIT
"
680 PRINT"     IS THE NUMBER OF STARS, THE TENS DIGIT IS THE NUMBER OF"
690 PRINT"     STARBASES, AND THE HUNDRESDS DIGIT IS THE NUMBER OF"
700 PRINT"     KLINGONS."
705 PRINT
706 PRINT"     EXAMPLE - 207 = 2 KLINGONS, NO STARBASES, & 7 STARS."
710 PRINT
720 PRINT"\PHA\ COMMAND = PHASER CONTROL."
730 PRINT"     ALLOWS YOU TO DESTROY THE KLINGON BATTLE CRUISERS BY "
740 PRINT"     ZAPPING THEM WITH SUITABLY LARGE UNITS OF ENERGY TO"
750 PRINT"     DEPLETE THEIR SHIELD POWER.  (REMBER, KLINGONS HAVE"
760 PRINT"     PHASERS TOO!)"
770 PRINT
780 PRINT"\TOR\ COMMAND = PHOTON TORPEDO CONTROL"
790 PRINT"     TORPEDO COURSE IS THE SAME AS USED IN WARP ENGINE CONTROL
"
800 PRINT"     IF YOU HIT THE KLINGON VESSEL, HE IS DESTROYED AND"
810 PRINT"     CANNOT FIRE BACK AT YOU.  IF YOU MISS, YOU ARE SUBJECT TO
"
820 PRINT"     HIS PHASER FIRE.  IN EITHER CASE, YOU ARE ALSO SUBJECT TO
 "
825 PRINT"     THE PHASER FIRE OF ALL OTHER KLINGONS IN THE QUADRANT."
830 PRINT
835 PRINT"     THE LIBRARY-COMPUTER (\COM\ COMMAND) HAS AN OPTION TO "
840 PRINT"     COMPUTE TORPEDO TRAJECTORY FOR YOU (OPTION 2)"
850 PRINT
860 PRINT"\SHE\ COMMAND = SHIELD CONTROL"
870 PRINT"     DEFINES THE NUMBER OF ENERGY UNITS TO BE ASSIGNED TO THE"
880 PRINT"     SHIELDS.  ENERGY IS TAKEN FROM TOTAL SHIP'S ENERGY.  NOTE
"
890 PRINT"     THAT THE STATUS DISPLAY TOTAL ENERGY INCLUDES SHIELD ENER
GY"
900 PRINT
910 PRINT"\DAM\ COMMAND = DAMMAGE CONTROL REPORT"
920 PRINT"     GIVES THE STATE OF REPAIR OF ALL DEVICES.  WHERE A NEGATI
VE"
930 PRINT"     'STATE OF REPAIR' SHOWS THAT THE DEVICE IS TEMPORARILY"
940 PRINT"     DAMAGED."
950 PRINT
960 PRINT"\COM\ COMMAND = LIBRARY-COMPUTER"
970 PRINT"     THE LIBRARY-COMPUTER CONTAINS SIX OPTIONS:"
980 PRINT"     OPTION 0 = CUMULATIVE GALACTIC RECORD"
990 PRINT"        THIS OPTION SHOWES COMPUTER MEMORY OF THE RESULTS OF A
LL"
1000 PRINT"        PREVIOUS SHORT AND LONG RANGE SENSOR SCANS"
1010 PRINT"     OPTION 1 = STATUS REPORT"
1020 PRINT"        THIS OPTION SHOWS THE NUMBER OF KLINGONS, STARDATES,"
1030 PRINT"        AND STARBASES REMAINING IN THE GAME."
1040 PRINT"     OPTION 2 = PHOTON TORPEDO DATA"
1050 PRINT"        WHICH GIVES DIRECTIONS AND DISTANCE FROM THE ENTERPRI
SE"
1060 PRINT"        TO ALL KLINGONS IN YOUR QUADRANT"
1070 PRINT"     OPTION 3 = STARBASE NAV DATA"
1080 PRINT"        THIS OPTION GIVES DIRECTION AND DISTANCE TO ANY "
1090 PRINT"        STARBASE WITHIN YOUR QUADRANT"
1100 PRINT"     OPTION 4 = DIRECTION/DISTANCE CALCULATOR"
1110 PRINT"        THIS OPTION ALLOWS YOU TO ENTER COORDINATES FOR"
1120 PRINT"        DIRECTION/DISTANCE CALCULATIONS"
1130 PRINT"     OPTION 5 = CALACTIC /REGION NAME/ MAP"
1140 PRINT"        THIS OPTION PRINTS THE NAMES OF THE SIXTEEN MAJOR "
1150 PRINT"        GALACTIC REGIONS REFERRED TO IN THE GAME."
1990 POKE 1229,0:POKE 1237,1:NULL 0
2000 PRINT:PRINT:PRINT
2010 PRINT "TURN CASSETTE PLAYER ON AND HIT ANY KEY EXCEPT RETURN"
2020 IF INP(1)=13 THEN 2020
2030 PRINT
2040 PRINT "TURN CASSETTE PLAYER OFF AND "
2050 PRINT "TYPE 'RUN' WHEN COMPUTER PRINTS 'OK'"
```

Program Listing - The Game

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10 REM SUPER STARTREK - MAY 16,1978 - REQUIRES 24K MEMORY
30 REM
40 REM ****        **** STAR TREK **** ****
50 REM **** SIMULATION OF A MISSION OF THE STARSHIP ENTERPRISE,
60 REM **** AS SEEN ON THE STAR TREK TV SHOW.
70 REM **** ORIGIONAL PROGRAM BY MIKE MAYFIELD, MODIFIED VERSION
80 REM **** PUBLISHED IN DEC'S "101 BASIC GAMES", BY DAVE AHL.
90 REM **** MODIFICATIONS TO THE LATTER (PLUS DEBUGGING) BY BOB
100 REM *** LEEDOM - APRIL & DECEMBER 1974,
110 REM *** WITH A LITTLE HELP FROM HIS FRIENDS . . .
120 REM *** COMMENTS, EPITHETS, AND SUGGESTIONS SOLICITED --
130 REM *** SEND TO:  R. C. LEEDOM
140 REM ***           WESTINGHOUSE DEFENSE & ELECTRONICS SYSTEMS CNTR.
150 REM ***           BOX 746, M.S. 338
160 REM ***           BALTIMORE, MD  21203
170 REM ***
180 REM *** CONVERTED TO MICROSOFT 8 K BASIC 3/16/78 BY JOHN BORDERS
190 REM *** LINE NUMBERS FROM VERSION STREK7 OF 1/12/75 PRESERVED AS
200 REM *** MUCH AS POSSIBLE WHILE USING MULTIPLE STATEMENTS PER LINE
205 REM *** SOME LINES ARE LONGER THAN 72 CHARACTERS; THIS WAS DONE
210 REM *** BY USING ":" INSTEAD OF "PRINT" WHEN ENTERING LINES
215 REM ***
220 PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT:PRINT
221 PRINT"                                      ,------*------,"
222 PRINT"                    ,---------------  '---  ------'"
223 PRINT"                     '-------- --'      / /"
224 PRINT"                         ,---' '-------/ /--,"
225 PRINT"                          '----------------'":PRINT
226 PRINT"                    THE USS ENTERPRISE --- NCC-1701"
227 PRINT:PRINT:PRINT:PRINT:PRINT
260 CLEAR 600
270 Z$="                              "
330 DIM G(8,8),C(9,2),K(3,3),N(3),Z(8,8),D(8)
370 T=INT(RND(1)*20+20)*100:T0=T:T9=25+INT(RND(1)*10):D0=0:E=3000:E0=E
440 P=10:P0=P:S9=200:S=0:B9=0:K9=0:X$="":X0$=" IS "
470 DEF FND(D)=SQR((K(I,1)-S1)↑2+(K(I,2)-S2)↑2)
475 DEF FNR(R)=INT(RND(R)*7.98+1.01)
480 REM INITIALIZE ENTERPRIZE'S POSITION
490 Q1=FNR(1):Q2=FNR(1):S1=FNR(1):S2=FNR(1)
530 FORI=1TO9:C(I,1)=0:C(I,2)=0:NEXTI
540 C(3,1)=-1:C(2,1)=-1:C(4,1)=-1:C(4,2)=-1:C(5,2)=-1:C(6,2)=-1
600 C(1,2)=1:C(2,2)=1:C(6,1)=1:C(7,1)=1:C(8,1)=1:C(8,2)=1:C(9,2)=1
670 FORI=1TO8:D(I)=0:NEXTI
710 A1$="NAVSRSLRSPHATORSHEDAMCOMXXX"
810 REM SETUP WHAT EXHISTS IN GALAXY . . .
815 REM K3= # KLINGONS  B3= # STARBASES  S3= # STARS
820 FORI=1TO8:FORJ=1TO8:K3=0:Z(I,J)=0:R1=RND(1)
850 IFR1>.98THENK3=3:K9=K9+3:GOTO980
860 IFR1>.95THENK3=2:K9=K9+2:GOTO980
870 IFR1>.80THENK3=1:K9=K9+1
980 B3=0:IFRND(1)>.96THENB3=1:B9=B9+1
1040 G(I,J)=K3*100+B3*10+FNR(1):NEXTJ:NEXTI:IFK9>T9THENT9=K9+1
1100 IFB9<>0THEN1200
1150 IFG(Q1,Q2)<200THENG(Q1,Q2)=G(Q1,Q2)+120:K9=K9+1
1160 B9=1:G(Q1,Q2)=G(Q1,Q2)+10:Q1=FNR(1):Q2=FNR(1)
1200 K7=K9:IFB9<>1THENX$="S":X0$=" ARE "
1230 PRINT"YOUR ORDERS ARE AS FOLLOWS:"
1240 PRINT"     DESTROY THE";K9;"KLINGON WARSHIPS WHICH HAVE INVADED"
1250 PRINT"   THE GALAXY BEFORE THEY CAN ATTACK FEDERATION HEADQUARTERS"
1260 PRINT"   ON STARDATE";T0+T9;"  THIS GIVES YOU";T9;"DAYS.  THERE";X0
$
1270 PRINT"  ";B9;"STARBASE";X$;" IN THE GALAXY FOR RESUPPLYING YOUR SHI
P"
1280 PRINT:PRINT"HIT ANY KEY EXCEPT RETURN WHEN READY TO ACCEPT COMMAND"
1300 I=RND(1):IF INP(1)=13 THEN 1300
1310 REM HERE ANY TIME NEW QUADRANT ENTERED
1320 Z4=Q1:Z5=Q2:K3=0:B3=0:S3=0:G5=0:D4=.5*RND(1):Z(Q1,Q2)=G(Q1,Q2)
1390 IFQ1<1ORQ1>8ORQ2<1ORQ2>8THEN1600
1430 GOSUB 9030:PRINT:IF T0<>T THEN 1490
1460 PRINT"YOUR MISSION BEGINS WITH YOUR STARSHIP LOCATED"
1470 PRINT"IN THE GALACTIC QUADRANT, '";G2$;"'.":GOTO 1500
1490 PRINT"NOW ENTERING ";G2$;" QUADRANT . . ."
1500 PRINT:K3=INT(G(Q1,Q2)*.01):B3=INT(G(Q1,Q2)*.1)-10*K3
1540 S3=G(Q1,Q2)-100*K3-10*B3:IFK3=0THEN1590
1560 PRINT"COMBAT AREA      CONDITION RED":IFS>200THEN1590
1580 PRINT"   SHIELDS DANGEROUSLY LOW"
1590 FORI=1TO3:K(I,1)=0:K(I,2)=0:NEXTI
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1600 FORI=1TO3:K(I,3)=0:NEXTI:Q$=Z$+Z$+Z$+Z$+Z$+Z$+Z$+Z$+LEFT$(Z$,17)
1660 REM POSITION ENTERPRISE IN QUADRANT, THEN PLACE "K3" KLINGONS, &
1670 REM "B3" STARBASES, & "S3" STARS ELSEWHERE.
1680 A$="<*>":Z1=S1:Z2=S2:GOSUB8670:IFK3<1THEN1820
1720 FORI=1TOK3:GOSUB8590:A$="+K+":Z1=R1:Z2=R2
1780 GOSUB8670:K(I,1)=R1:K(I,2)=R2:K(I,3)=S9*(0.5+RND(1)):NEXTI
1820 IFB3<1THEN1910
1880 GOSUB8590:A$=">!<":Z1=R1:B4=R1:Z2=R2:B5=R2:GOSUB8670
1910 FORI=1TOS3:GOSUB8590:A$=" * ":Z1=R1:Z2=R2:GOSUB8670:NEXTI
1980 GOSUB6430
1990 IFS+E>10THENIFE>10ORD(7)=0THEN2060
2020 PRINT:PRINT"** FATAL ERROR **   YOU'VE JUST STRANDED YOUR SHIP IN "
2030 PRINT"SPACE":PRINT"YOU HAVE INSUFFICIENT MANEUVERING ENERGY,";
2040 PRINT" AND SHIELD CONTROL":PRINT"IS PRESENTLY INCAPABLE OF CROSS";
2050 PRINT"-CIRCUITING TO ENGINE ROOM!!":GOTO6220
2060 INPUT"COMMAND";A$
2080 FORI=1TO9:IFLEFT$(A$,3)<>MID$("SRSLRSPHATORSHEDAMCOMXXX",3*I-2,3)THEN2160
2140 ONIGOTO2300,1980,4000,4260,4700,5530,5690,7290,6270
2160 NEXTI:PRINT"ENTER ONE OF THE FOLLOWING:"
2180 PRINT"  NAV  (TO SET COURSE)"
2190 PRINT"  SRS  (FOR SHORT RANGE SENSOR SCAN)"
2200 PRINT"  LRS  (FOR LONG RANGE SENSOR SCAN)"
2210 PRINT"  PHA  (TO FIRE PHASERS)"
2220 PRINT"  TOR  (TO FIRE PHOTON TORPEDOES)"
2230 PRINT"  SHE  (TO RAISE OR LOWER SHIELDS)"
2240 PRINT"  DAM  (FOR DAMAGE CONTROL REPORTS)"
2250 PRINT"  COM  (TO CALL ON LIBRARY-COMPUTER)"
2260 PRINT"  XXX  (TO RESIGN YOUR COMMAND)":PRINT:GOTO1990
2290 REM COURSE CONTROL BEGINS HERE
2300 INPUT"COURSE (0-9)";C1:IFC1=9THENC1=1
2310 IFC1>=1ANDC1<9THEN2350
2330 PRINT"   LT. SULU REPORTS, 'INCORRECT COURSE DATA, SIR!'":GOTO1990
2350 X$="8":IFD(1)<0THENX$="0.2"
2360 PRINT"WARP FACTOR (0-"X$;")";:INPUTW1:IFD(1)<0ANDW1>.2THEN2470
2380 IFW1>0ANDW1<=8THEN2490
2390 IFW1=0THEN1990
2420 PRINT"   CHIEF ENGINEER SCOTT REPORTS 'THE ENGINES WON'T TAKE";
2430 PRINT" WARP ";W1;"!'":GOTO1990
2470 PRINT"WARP ENGINES ARE DAMAGED.  MAXIUM SPEED = WARP 0.2":GOTO1990
2490 N=INT(W1*8+.5):IFE-N>=0THEN2590
2500 PRINT"ENGINEERING REPORTS   'INSUFFICIENT ENERGY AVAILABLE"
2510 PRINT"                      FOR MANEUVERING AT WARP";W1;"!'"
2530 IFS<N-EORD(7)<0THEN1990
2550 PRINT"DEFLECTOR CONTROL ROOM ACKNOWLEGES";S;"UNITS OF ENERGY"
2560 PRINT"                           PRESENTLY DEPLOYED TO SHIELDS."
2570 GOTO1990
2580 REM KLINGONS MOVE/FIRE ON MOVING STARSHIP . . .
2590 FOPI=1TOK3:IFK(I,3)=0THEN2700
2610 A$="   ":Z1=K(I,1):Z2=K(I,2):GOSUB8670:GOSUB8590
2660 K(I,1)=Z1:K(I,2)=Z2:A$="+K+":GOSUB8670
2700 NEXTI:GOSUB6000:D1=0:D6=W1:IFW1>=1THEND6=1
2770 FORI=1TO3:IFD(I)>=0THEN2880
2790 D(I)=D(I)+D6:IFD(I)>=-.1ANDD(I)<0THEND(I)=-.1:GOTO2880
2800 IFD(I)<0THEN2880
2810 IFD1<>1THEND1=1:PRINT"DAMAGE CONTROL REPORT:  ";
2840 PRINTTAB(8);:R1=I:GOSUB6790:PRINTG2$;" REPAIR COMPLETED."
2880 NEXTI:IFRND(1)>.2THEN3070
2910 R1=FNR(1):IFRND(1)>=.6THEN3000
2930 D(R1)=D(R1)-(RND(1)*5+1):PRINT"DAMAGE CONTROL REPORT:  ";
2960 GOSUB6790:PRINTG2$;" DAMAGED":PRINT:GOTO3070
3000 D(R1)=D(R1)+RND(1)*3+1:PRINT"DAMAGE CONTROL REPORT:  ";
3030 GOSUB6790:PRINTG2$;" STATE OF REPAIR IMPROVED":PRINT
3060 REM BEGIN MOVING STARSHIP
3070 A$="   ":Z1=INT(S1):Z2=INT(S2):GOSUB8670
3110 X1=C(C1,1)+(C(C1+1,1)-C(C1,1))*(C1-INT(C1)):X=S1:Y=S2
3140 X2=C(C1,2)+(C(C1+1,2)-C(C1,2))*(C1-INT(C1)):Q4=Q1:Q5=Q2
3170 FORI=1TON:S1=S1+X1:S2=S2+X2:IFS1<1ORS1>=9ORS2<1ORS2>=9THEN3500
3240 S8=INT(S1)*24+INT(S2)*3-26:IFMID$(Q$,S8,2)="  "THEN3360
3320 S1=INT(S1-X1):S2=INT(S2-X2):PRINT"WARP ENGINES SHUT DOWN AT ";
3350 PRINT"SECTOR";S1;",";S2;"DUE TO BAD NAVAGATION":GOTO3370
3360 NEXTI:S1=INT(S1):S2=INT(S2)
3370 A$="<*>":Z1=INT(S1):Z2=INT(S2):GOSUB8670:GOSUB3910:T8=1
3430 IFW1<1THENT8=.1*INT(10*W1)
3450 T=T+T8:IFT>T0+T9THEN6220
3470 REM SEE IF DOCKED, THEN GET COMMAND
3480 GOTO1980
3490 REM EXCEEDED QUADRANT LIMITS
3500 X=8*Q1+X+N*X1:Y=8*Q2+Y+N*X2:Q1=INT(X/8):Q2=INT(Y/8):S1=INT(X-Q1*8)
3550 S2=INT(Y-Q2*8):IFS1=0THENQ1=Q1-1:S1=8
3590 IFS2=0THENQ2=Q2-1:S2=8
3620 X5=0:IFQ1<1THENX5=1:Q1=1:S1=1
3670 IFQ1>8THENX5=1:Q1=8:S1=8
3710 IFQ2<1THENX5=1:Q2=1:S2=1
3750 IFQ2>8THENX5=1:Q2=8:S2=8
3790 IFX5=0THEN3860
3800 PRINT"LT. UHURA REPORTS MESSAGE FROM STARFLEET COMMAND:"
3810 PRINT"  'PERMISSION TO ATTEMPT CROSSING OF GALACTIC PERIMETER"
3820 PRINT"  IS HEREBY *DENIED*.  SHUT DOWN YOUR ENGINES.'"
3830 PRINT"CHIEF ENGINEER SCOTT REPORTS  'WARP ENGINES SHUT DOWN"
3840 PRINT"  AT SECTOR";S1;",";S2;"OF QUADRANT";Q1;",";Q2;"."
3850 IFT>T0+T9THEN6220
3860 IFB*Q1+Q2=8*Q4+Q5THEN3370
3870 T=T+1:GOSUB3910:GOTO1320
3900 REM MANEUVER ENERGY S/R **
3910 E=E-N-10:IFE>=0THENRETURN
3930 PRINT"SHIELD CONTROL SUPPLIES ENERGY TO COMPLETE THE MANEUVER."
3940 S=S+E:E=0:IFS<=0THENS=0
3980 RETURN
3990 REM LONG RANGE SENSOR SCAN CODE
4000 IFD(3)<0THENPRINT"LONG RANGE SENSORS ARE INOPERABLE":GOTO1990
4030 PRINT"LONG RANGE SCAN FOR QUADRANT";Q1;",";Q2
4040 O1$="-------------------":PRINTO1$
4060 FORI=Q1-1TOQ1+1:N(I)=-1:N(2)=-2:N(3)=-3:FORJ=Q2-1TOQ2+1
4120 IFI>0ANDI<9ANDJ>0ANDJ<9THENN(J-Q2+2)=G(I,J):Z(I,J)=G(I,J)
4180 NEXTJ:FORL=1TO3:PRINT:  ";:IFN(L)<0THENPRINT"*** ";:GOTO4230
4210 PRINTRIGHT$(STR$(N(L)+1000),3);" ";
4230 NEXTL:PRINT":":PRINTO1$:NEXTI:GOTO1990
4250 REM PHASER CONTROL CODE BEGINS HERE
4260 IFD(4)<0THENPRINT"PHASERS INOPERATIVE":GOTO1990
4265 IFK3>0THEN4330
4270 PRINT"SCIENCE OFFICER SPOCK REPORTS  'SENSORS SHOW NO ENEMY SHIPS"
4280 PRINT"                              IN THIS QUADRANT'":GOTO1990
4330 IFD(8)<0THENPRINT"COMPUTER FAILURE HAMPERS ACCURACY"
4350 PRINT"PHASERS LOCKED ON TARGET;  ";
4360 PRINT"ENERGY AVAILABLE =";E;"UNITS"
4370 INPUT"NUMBER OF UNITS TO FIRE";X:IFX<=0THEN1990
4400 IFE-X<0THEN4360
4410 E=E-X:IFD(7)<0THENX=X*RND(1)
4450 H1=INT(X/K3):FORI=1TO3:IFK(I,3)<=0THEN4670
4480 H=INT((H1/FND(0))*(RND(1)+2)):IFH>.15*K(I,3)THEN4530
4500 PRINT"SENSORS SHOW NO DAMAGE TO ENEMY AT ";K(I,1);",";K(I,2):GOTO4670
4530 K(I,3)=K(I,3)-H:PRINTH;"UNIT HIT ON KLINGON AT SECTOR";K(I,1);",";
4550 PRINTK(I,2):IFK(I,3)<=0THENPRINT"*** KLINGON DESTROYED ***":GOTO4580
4560 PRINT"   (SENSORS SHOW";K(I,3);"UNITS REMAINING)":GOTO4670
4580 K3=K3-1:K9=K9-1:Z1=K(I,1):Z2=K(I,2):A$="   ":GOSUB8670
4650 K(I,3)=0:G(Q1,Q2)=G(Q1,Q2)-100:Z(Q1,Q2)=G(Q1,Q2):IFK9<=0THEN6370
4670 NEXTI:GOSUB6000:GOTO1990
4690 REM PHOTON TORPEDO CODE BEGINS HERE
4700 IFP<=0THENPRINT"ALL PHOTON TORPEDOES EXPENDED":GOTO 1990
4730 IFD(5)<0THENPRINT"PHOTON TUBES ARE NOT OPERATIONAL":GOTO1990
4760 INPUT"PHOTON TORPEDO COURSE (1-9)";C1:IFC1=9THENC1=1
4780 IFC1>=1ANDC1<9THEN4850
4790 PRINT"ENSIGN CHEKOV REPORTS,  'INCORRECT COURSE DATA, SIR!'"
4800 GOTO1990
4850 X1=C(C1,1)+(C(C1+1,1)-C(C1,1))*(C1-INT(C1)):E=E-2:P=P-1
4860 X2=C(C1,2)+(C(C1+1,2)-C(C1,2))*(C1-INT(C1)):X=S1:Y=S2
4910 PRINT"TORPEDO TRACK:"
4920 X=X+X1:Y=Y+X2:X3=INT(X+.5):Y3=INT(Y+.5)
4960 IFX3<1ORX3>8ORY3<1ORY3>8THEN5490
5000 PRINT"                ";X3;",";Y3:A$="   ":Z1=X:Z2=Y:GOSUB8830
5050 IFZ3<>0THEN4920
5060 A$="+K+":Z1=X:Z2=Y:GOSUB8830:IFZ3=0THEN5210
5110 PRINT"*** KLINGON DESTROYED ***":K3=K3-1:K9=K9-1:IFK9<=0THEN6370
5150 FORI=1TO3:IFX3=K(I,1)ANDY3=K(I,2)THEN5190
5180 NEXTI:I=3
5190 K(I,3)=0:GOTO5430
5210 A$=" * ":Z1=X:Z2=Y:GOSUB8830:IFZ3=0THEN5280
5260 PRINT"STAR AT";X3;",";Y3;"ABSORBED TORPEDO ENERGY.":GOSUB6000:GOTO1990
5280 A$=">!<":Z1=X:Z2=Y:GOSUB8830:IFZ3=0THEN4760
5330 PRINT"*** STARBASE DESTROYED ***":B3=B3-1:B9=B9-1
5360 IFB9>0ORK9>T-T0-T9THEN5400
5370 PRINT"THAT DOES IT, CAPTAIN!!  YOU ARE HEREBY RELIEVED OF COMMAND"
5380 PRINT"AND SENTENCED TO 99 STARDATES AT HARD LABOR ON CYGNUS 12!!"
5390 GOTO 6270
5400 PRINT"STARFLEET COMMAND REVIEWING YOUR RECORD TO CONSIDER"
5410 PRINT"COURT MARTIAL!":D0=0
5430 Z1=X:Z2=Y:A$="   ":GOSUB8670
5470 G(Q1,Q2)=K3*100+B3*10+S3:Z(Q1,Q2)=G(Q1,Q2):GOSUB6000:GOTO1990
5490 PRINT"TORPEDO MISSED":GOSUB6000:GOTO1990
5520 REM SHIELD CONTROL
5530 IFD(7)<0THENPRINT"SHIELD CONTROL INOPERABLE":GOTO1990
5560 PRINT"ENERGY AVAILABLE =";E+S;:INPUT"NUMBER OF UNITS TO SHIELDS";X
5580 IFX<0ORS=XTHENPRINT"<SHIELDS UNCHANGED>":GOTO1990
5590 IFX<=E+STHEN5630
5600 PRINT"SHIELD CONTROL REPORTS  'THIS IS NOT THE FEDERATION TREASURY.
'"
5610 PRINT"<SHIELDS UNCHANGED>":GOTO1990
5630 E=E+S-X:S=X:PRINT"DEFLECTOR CONTROL ROOM REPORT:"
5660 PRINT"  'SHIELDS NOW AT";INT(S);"UNITS PER YOUR COMMAND.'":GOTO1990
5680 REM DAMAGE CONTROL
5690 IFD(6)>=0THEN5910
5700 PRINT"DAMAGE CONTROL REPORT NOT AVAILABLE":IFD0=0THEN1990
5720 D3=0:FORI=1TO3:IFD(I)<0THEND3=D3+.1
5760 NEXTI:IFD3=0THEN1990
5780 PRINT:D3=D3+D4:IFD3>=1THEND3=.9
5810 PRINT"TECHNICIANS STANDING BY TO EFFECT REPAIRS TO YOUR SHIP;"
5820 PRINT"ESTIMATED TIME TO REPAIR:";.01*INT(100*D3);"STARDATES"
5840 INPUT"WILL YOU AUTHORIZE THE REPAIR ORDER (Y/N)";A$
5860 IFA$<>"Y"THEN 1990
5870 FORI=1TO8:IFD(I)<0THEND(I)=0
5890 NEXTI:T=T+D3+.1
5910 PRINT:PRINT"DEVICE                STATE OF REPAIR":FORR1=1TO8
5920 GOSUB8790:PRINTG2$;LEFT$(Z$,25-LEN(G2$));INT(D(R1)*100)*.01
5950 NEXTR1:PRINT:IFD0<>0THEN5720
5980 GOTO 1990
5990 REM KLINGONS SHOOTING
6000 IFK3<=0THENRETURN
6010 IFD0<>0THENPRINT"STARBASE SHIELDS PROTECT THE ENTERPRISE":RETURN
6040 FORI=1TO3:IFK(I,3)<=0THEN6230
6060 H=INT((K(I,3)/FND(1))*(2+RND(1))):S=S-H:K(I,3)=K(I,3)/(3+RND(0))
6080 PRINTH;"UNIT HIT ON ENTERPRISE FROM SECTOR";K(I,1);",";K(I,2)
6090 IFS<=0THEN6240
6100 PRINT"      <SHIELDS DOWN TO";S;"UNITS>":IFH<20THEN6230
6120 IFRND(1)>.6ORH/S<=.02THEN6230
6140 R1=FNR(1):D(R1)=D(R1)-H/S-.5*RND(1):GOSUB8790
6170 PRINT"DAMAGE CONTROL REPORTS '";G2$;" DAMAGED BY THE HIT'"
6200 NEXTI:RETURN
6210 REM END OF GAME
6220 PRINT"IT IS STARDATE";T:GOTO 6270
6240 PRINT:PRINT"THE ENTERPRISE HAS BEEN DESTROYED.  THE FEDERATION ";
6250 PRINT"WILL BE CONQUERED":GOTO 6220
6270 PRINT"THERE WERE";K9;"KLINGON BATTLE CRUISERS LEFT AT"
6280 PRINT"THE END OF YOUR MISSION."
6290 PRINT:PRINT:IFB9=0THEN6360
6310 PRINT"THE FEDERATION IS IN NEED OF A NEW STARSHIP COMMANDER"
6320 PRINT"FOR A SIMILAR MISSION -- IF THERE IS A VOLUNTEER,"
6330 INPUT"LET HIM STEP FORWARD AND ENTER 'AYE'";A$:IFA$="AYE"THEN10
6360 END
6370 PRINT"CONGRULATION, CAPTAIN!  THE LAST KLINGON BATTLE CRUISER"
6380 PRINT"MENACING THE FEDERATION HAS BEEN DESTROYED.":PRINT
6400 PRINT"YOUR EFFICIENCY RATING IS";1000*(K7/(T-T0))^2:GOTO6290
6420 REM SHORT RANGE SENSOR SCAN & STARTUP SUBROUTINE
6430 FORI=S1-1TOS1+1:FORJ=S2-1TOS2+1
6450 IFINT(I+.5)<1ORINT(I+.5)>8ORINT(J+.5)<1ORINT(J+.5)>8THEN6540
6490 A$=">!<":Z1=I:Z2=J:GOSUB8830:IFZ3=1THEN6580
6540 NEXTJ:NEXTI:D0=0:GOTO6650
6580 D0=1:C$="DOCKED":E=E0:P=P0
6620 PRINT"SHIELDS DROPPED FOR DOCKING PURPOSES":S=0:GOTO6720
6650 IFK3>0THENC$="*RED*":GOTO6720
6660 C$="GREEN":IFE<E0*.1THENC$="YELLOW"
6720 IFD(2)>=0THEN6770
6730 PRINT:PRINT"*** SHORT RANGE SENSORS ARE OUT ***":PRINT:RETURN
6770 O1$="---------------------------------":PRINTO1$:FORI=1TO8
6820 FORJ=(I-1)*24+1TO(I-1)*24+22STEP3:PRINT" ";MID$(Q$,J,3);:NEXTJ
6830 ONIGOTO6850,6900,6960,7020,7070,7120,7180,7240
6850 PRINT"         STARDATE          ";INT(T*10)*.1:GOTO7260
6900 PRINT"         CONDITION          ";C$:GOTO7260
6960 PRINT"         QUADRANT           ";Q1;",";Q2:GOTO7260
7020 PRINT"         SECTOR             ";S1;",";S2:GOTO7260
7070 PRINT"         PHOTON TORPEDOES   ";INT(P):GOTO7260
7120 PRINT"         TOTAL ENERGY       ";INT(E+S):GOTO7260
7180 PRINT"         SHIELDS            ";INT(S):GOTO7260
7240 PRINT"         KLINGONS REMAINING";INT(K9)
7260 NEXTI:PRINTO1$:RETURN
7280 REM LIBRARY COMPUTER CODE
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7290 IFD(8)<0THENPRINT"COMPUTER DISABLED":GOTO1990
7320 INPUT"COMPUTER ACTIVE AND AWAITING COMMAND";A:IFA<0THEN1990
7350 PRINT:H8=1:ONA+1GOTO7540,7900,8070,8500,8150,7400
7360 PRINT"FUNCTIONS AVAILABLE FROM LIBRARY-COMPUTER:"
7370 PRINT"   0 = CUMULATIVE GALACTIC RECORD"
7372 PRINT"   1 = STATUS REPORT"
7374 PRINT"   2 = PHOTON TORPEDO DATA"
7376 PRINT"   3 = STARBASE NAV DATA"
7378 PRINT"   4 = DIRECTION/DISTANCE CALCULATOR"
7380 PRINT"   5 = GALAXY 'REGION NAME' MAP":PRINT:GOTO7320
7390 REM SETUP TO CHANGE CUM GAL RECORD TO GALAXY MAP
7400 H8=0:G5=1:PRINT"                                THE GALAXY":GOTO7550
7530 REM CUM GALACTIC RECORD
7540 INPUT"DO YOU WANT A HARDCOPY? IS THE TTY ON (Y/N)";A$
7542 IFA$="Y"THENPOKE1229,2:POKE1237,3:NULL1
7543 PRINT:PRINT"          ";
7544 PRINT"COMPUTER RECORD OF GALAXY FOR QUADRANT";Q1;",";Q2
7546 PRINT
7550 PRINT"       1     2     3     4     5     6     7     8"
7560 O1$="     ----- ----- ----- ----- ----- ----- ----- -----"
7570 PRINTO1$:FORI=1TO8:PRINTI;:IFH8=0THEN7740
7630 FORJ=1TO8:PRINT"   ";:IFZ(I,J)=0THENPRINT"***";:GOTO7720
7700 PRINTRIGHT$(STR$(Z(I,J)+1000),3);
7720 NEXTJ:GOTO7850
7740 Z4=I:Z5=1:GOSUB9030:J0=INT(15-.5*LEN(G2$)):PRINTTAB(J0);G2$:
7800 Z5=5:GOSUB 9030:J0=INT(39-.5*LEN(G2$)):PRINTTAB(J0);G2$;
7850 PRINT:PRINTO1$:NEXTI:PRINT:POKE1229,0:POKE1237,1:NULL0:GOTO1990
7890 REM STATUS REPORT
7900 PRINT "   STATUS REPORT:":XS="":IFK9>1THENXS="S"
7940 PRINT"KLINGON";XS;" LEFT: ";K9
7960 PRINT"MISSION MUST BE COMPLETED IN";.1*INT((T0+T9-T)*10);"STARDATES
"
7970 XS="S":IFB9<2THENXS="":IFB9<1THEN8010
7980 PRINT"THE FEDERATION IS MAINTAINING";B9;"STARBASE";XS;" IN THE GALA
XY"
7990 GOTO5690
8010 PRINT"YOUR STUPIDITY HAS LEFT YOU ON YOUR ON IN"
8020 PRINT"  THE GALAXY -- YOU HAVE NO STARBASES LEFT!":GOTO5690
8060 REM TORPEDO, BASE NAV, D/D CALCULATOR
8070 IFK3<=0THEN4270
8080 XS="":IFK3>1THENXS="S"
8090 PRINT"FROM ENTERPRISE TO KLINGON BATTLE CRUSER";XS
8100 H8=0:FORI=1TO3:IFK(I,3)<=0THEN8480
8110 W1=K(I,1):X=K(I,2)
8120 C1=S1:A=S2:GOTO8220
8150 PRINT"DIRECTION/DISTANCE CALCULATOR:"
8160 PRINT"YOU ARE AT QUADRANT ";Q1;",";Q2;" SECTOR ";S1;",";S2
8170 PRINT"PLEASE ENTER":INPUT"  INITIAL COORDINATES (X,Y)";C1,A
8200 INPUT"  FINAL COORDINATES (X,Y)";W1,X
8220 X=X-A:A=C1-W1:IFX<0THEN8350
8250 IFA<0THEN8410
8260 IFX>0THEN8280
8270 IFA=0THENC1=5:GOTO8290
8280 C1=1
8290 IFABS(A)<=ABS(X)THEN8330
8310 PRINT"DIRECTION =";C1+(((ABS(A)-ABS(X))+ABS(A))/ABS(A)):GOTO8460
8330 PRINT"DIRECTION =";C1+(ABS(A)/ABS(X)):GOTO8460
8350 IFA>0THENC1=3:GOTO8420
8360 IFX<>0THENC1=5:GOTO8290
8410 C1=7
8420 IFABS(A)>=ABS(X)THEN8450
8430 PRINT"DIRECTION =";C1+(((ABS(X)-ABS(A))+ABS(X))/ABS(X)):GOTO8460
8450 PRINT"DIRECTION =";C1+(ABS(X)/ABS(A))
8460 PRINT"DISTANCE =";SQR(X↑2+A↑2):IFH8=1THEN1990
8480 NEXTI:GOTO1990
8500 IFB3<>0THENPRINT"FROM ENTERPRISE TO STARBASE:":W1=B4:X=B5:GOTO8120
8510 PRINT"MR. SPOCK REPORTS,  'SENSORS SHOW NO STARBASES IN THIS";
8520 PRINT" QUADRANT.'":GOTO1990
8580 REM FIND EMPTY PLACE IN QUADRANT (FOR THINGS)
8590 R1=FNR(1):R2=FNR(1):A$="   ":Z1=R1:Z2=R2:GOSUB8830:IFZ3=0THEN8590
8600 RETURN
8660 REM INSERT IN STRING ARRAY FOR QUADRANT
8670 S8=INT(Z2-.5)*3+INT(Z1-.5)*24+1
8675 IF LEN(A$)<>3THEN PRINT"ERROR":STOP
8680 IFS8=1THENQ$=A$+RIGHT$(Q$,189):RETURN
8690 IFS8=190THENQ$=LEFT$(Q$,189)+A$:RETURN
8700 Q$=LEFT$(Q$,S8-1)+A$+RIGHT$(Q$,190-S8):RETURN
8780 REM PRINTS DEVICE NAME
8790 ONRIGOT08792,8794,8796,8798,8800,8802,8804,8806
8792 G2$="WARP ENGINES":RETURN
8794 G2$="SHORT RANGE SENSORS":RETURN
8796 G2$="LONG RANGE SENSORS":RETURN
8798 G2$="PHASER CONTROL":RETURN
8800 G2$="PHOTON TUBES":RETURN
8802 G2$="DAMAGE CONTROL":RETURN
8804 G2$="SHIELD CONTROL":RETURN
8806 G2$="LIBRARY-COMPUTER":RETURN
8820 REM STRING COMPARISON IN QUADRANT ARRAY
8830 Z1=INT(Z1+.5):Z2=INT(Z2+.5):S8=(Z2-1)*3+(Z1-1)*24+1:Z3=0
8890 IFMID$(Q$,S8,3)<>A$THENRETURN
8900 Z3=1:RETURN
9010 REM QUADRANT NAME IN G2$ FROM Z4,Z5 (=Q1,Q2)
9020 REM CALL WITH G5=1 TO GET REGION NAME ONLY
9030 IFZ5<=4THENONZ4GOTO9040,9050,9060,9070,9080,9090,9100,9110
9035 GOTO9120
9040 G2$="ANTARES":GOTO9210
9050 G2$="RIGEL":GOTO9210
9060 G2$="PROCYON":GOTO9210
9070 G2$="VEGA":GOTO9210
9080 G2$="CANOPUS":GOTO9210
9090 G2$="ALTAIR":GOTO9210
9100 G2$="SAGITTARIUS":GOTO9210
9110 G2$="POLLUX":GOTO9210
9120 ONZ4GOTO9130,9140,9150,9160                190,9200
9130 G2$="SIRIUS":GOTO9210
9140 G2$="DENEB":GOTO9210
9150 G2$="CAPELLA":GOTO9210
9160 G2$="BETELGEUSE":GOTO9210
9170 G2$="ALDEBARAN":GOTO9210
9180 G2$="REGULUS":GOTO9210
9190 G2$="ARCTURUS":GOTO9210
9200 G2$="SPICA"
9210 IFG5<>1THENONZ5GOTO9230,9240,9250,9260,9230,9240,9250,9260
9220 RETURN
9230 G2$=G2$+" I":RETURN
9240 G2$=G2$+" II":RETURN
9250 G2$=G2$+" III":RETURN
9260 G2$=G2$+" IV":RETURN
OK
```

Sample Run - Instructions

```
        ************************************
        *                                  *
        *                                  *
        *     * * SUPER STAR TREK * *      *
        *                                  *
        *                                  *
        ************************************


DO YOU NEED INSTRUCTIONS (Y/N)? Y

TURN THE TTY ON-LINE AND HIT ANY KEY EXCEPT RETURN
     INSTRUCTIONS FOR 'SUPER STAR TREK'

1. WHEN YOU SEE \COMMAND ?\ PRINTED, ENTER ONE OF THE LEGAL
     COMMANDS (NAV,SRS,LRS,PHA,TOR,SHE,DAM,COM, OR XXX).
2. IF YOU SHOULD TYPE IN AN ILLEGAL COMMAND, YOU'LL GET A SHORT
     LIST OF THE LEGAL COMMANDS PRINTED OUT.
3. SOME COMMANDS REQUIRE YOU TO ENTER DATA (FOR EXAMPLE, THE
     'NAV' COMMAND COMES BACK WITH 'COURSE (1-9) ?'.)  IF YOU
     TYPE IN ILLEGAL DATA (LIKE NEGATIVE NUMBERS), THAT COMMAND
     WILL BE ABORTED

     THE GALAXY IS DIVIDED INTO AN 8 X 8 QUADRANT GRID,
AND EACH QUADRANT IS FURTHER DIVIDED INTO AN 8 X 8 SECTOR GRID.

     YOU WILL BE ASSIGNED A STARTING POINT SOMEWHERE IN THE
GALAXY TO BEGIN A TOUR OF DUTY AS COMMANDER OF THE STARSHIP
\ENTERPRISE\; YOUR MISSION: TO SEEK AND DESTROY THE FLEET OF
KLINGON WARWHIPS WHICH ARE MENACING THE UNITED FEDERATION OF
PLANETS.

     YOU HAVE THE FOLLOWING COMMANDS AVAILABLE TO YOU AS CAPTAIN
OF THE STARSHIP ENTERPRISE:

\NAV\ COMMAND = WARP ENGINE CONTROL --
     COURSE IS IN A CIRCULAR NUMERICAL       4  3  2
     VECTOR ARRANGEMENT AS SHOWN              . . .
     INTEGER AND REAL VALUES MAY BE            ...
     USED.  (THUS COURSE 1.5 IS HALF-      5 ---*--- 1
     WAY BETWEEN 1 AND 2                       ...
                                              . . .
     VALUES MAY APPROACH 9.0, WHICH          6  7  8
     ITSELF IS EQUIVALENT TO 1.0
                                              COURSE
     ONE WARP FACTOR IS THE SIZE OF
     ONE QUADTANT.  THEREFORE, TO GET
     FROM QUADRANT 6,5 TO 5,5, YOU WOULD
     USE COURSE 3, WARP FACTOR 1.

\SRS\ COMMAND = SHORT RANGE SENSOR SCAN
     SHOWS YOU A SCAN OF YOUR PRESENT QUADRANT.

     SYMBOLOGY ON YOUR SENSOR SCREEN IS AS FOLLOWS:
        <*> = YOUR STARSHIP'S POSITION
        +K+ = KLINGON BATTLE CRUISER
        >!< = FEDERATION STARBASE (REFUEL/REPAIR/RE-ARM HERE!)
         *  = STAR

     A CONDENSED 'STATUS REPORT' WILL ALSO BE PRESENTED.

\LRS\ COMMAND = LONG RANGE SENSOR SCAN
     SHOWS CONDITIONS IN SPACE FOR ONE QUADRANT ON EACH SIDE
     OF THE ENTERPRISE (WHICH IS IN THE MIDDLE OF THE SCAN)
     THE SCAN IS CODED IN THE FORM \###\, WHERE TH UNITS DIGIT
     IS THE NUMBER OF STARS, THE TENS DIGIT IS THE NUMBER OF
     STARBASES, AND THE HUNDRESDS DIGIT IS THE NUMBER OF
     KLINGONS.

     EXAMPLE - 207 = 2 KLINGONS, NO STARBASES, & 7 STARS.

\PHA\ COMMAND = PHASER CONTROL.
     ALLOWS YOU TO DESTROY THE KLINGON BATTLE CRUISERS BY
     ZAPPING THEM WITH SUITABLY LARGE UNITS OF ENERGY TO
     DEPLETE THEIR SHIELD POWER.  (REMBER, KLINGONS HAVE
     PHASERS TOO!)

\TOR\ COMMAND = PHOTON TORPEDO CONTROL
     TORPEDO COURSE IS THE SAME AS USED IN WARP ENGINE CONTROL
     IF YOU HIT THE KLINGON VESSEL, HE IS DESTROYED AND
     CANNOT FIRE BACK AT YOU.  IF YOU MISS, YOU ARE SUBJECT TO
     HIS PHASER FIRE.  IN EITHER CASE, YOU ARE ALSO SUBJECT TO
     THE PHASER FIRE OF ALL OTHER KLINGONS IN THE QUADRANT.

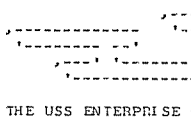
     THE LIBRARY-COMPUTER (\COM\ COMMAND) HAS AN OPTION TO
     COMPUTE TORPEDO TRAJECTORY FOR YOU (OPTION 2)

\SHE\ COMMAND = SHIELD CONTROL
     DEFINES THE NUMBER OF ENERGY UNITS TO BE ASSIGNED TO THE
     SHIELDS.  ENERGY IS TAKEN FROM TOTAL SHIP'S ENERGY.  NOTE
     THAT THE STATUS DISPLAY TOTAL ENERGY INCLUDES SHIELD ENERGY

\DAM\ COMMAND = DAMMAGE CONTROL REPORT
     GIVES THE STATE OF REPAIR OF ALL DEVICES.  WHERE A NEGATIVE
     'STATE OF REPAIR' SHOWS THAT THE DEVICE IS TEMPORARILY
     DAMAGED.

\COM\ COMMAND = LIBRARY-COMPUTER
     THE LIBRARY-COMPUTER CONTAINS SIX OPTIONS:
     OPTION 0 = CUMULATIVE GALACTIC RECORD
        THIS OPTION SHOWES COMPUTER MEMORY OF THE RESULTS OF ALL
        PREVIOUS SHORT AND LONG RANGE SENSOR SCANS
     OPTION 1 = STATUS REPORT
        THIS OPTION SHOWS THE NUMBER OF KLINGONS, STARDATES,
        AND STARBASES REMAINING IN THE GAME.
     OPTION 2 = PHOTON TORPEDO DATA
        WHICH GIVES DIRECTIONS AND DISTANCE FROM THE ENTERPRISE
        TO ALL KLINGONS IN YOUR QUADRANT
     OPTION 3 = STARBASE NAV DATA
        THIS OPTION GIVES DIRECTION AND DISTANCE TO ANY
        STARBASE WITHIN YOUR QUADRANT
     OPTION 4 = DIRECTION/DISTANCE CALCULATOR
        THIS OPTION ALLOWS YOU TO ENTER COORDINATES FOR
        DIRECTION/DISTANCE CALCULATIONS
     OPTION 5 = CALACTIC /REGION NAME/ MAP
        THIS OPTION PRINTS THE NAMES OF THE SIXTEEN MAJOR
        GALACTIC REGIONS REFERRED TO IN THE GAME.
```

Sample Run - Game



THE USS ENTERPRISE --- NCC-1701

```
YOUR ORDERS ARE AS FOLLOWS:
     DESTROY THE 8 KLINGON WARSHIPS WHICH HAVE INVADED
   THE GALAXY BEFORE THEY CAN ATTACK FEDERATION HEADQUARTERS
   ON STARDATE 3025   THIS GIVES YOU 25 DAYS.  THERE ARE
   3 STARBASES IN THE GALAXY FOR RESUPPLYING YOUR SHIP

HIT ANY KEY EXCEPT RETURN WHEN READY TO ACCEPT COMMAND

YOUR MISSION BEGINS WITH YOUR STARSHIP LOCATED
IN THE GALACTIC QUADRANT, 'BETELGEUSE I'.

---------------------------------
      *                                STARDATE           3000
                                       CONDITION          GREEN
          *                            QUADRANT           4 , 5
                                       SECTOR             6 , 2
                                       PHOTON TORPEDOES   10
     <*>                        *      TOTAL ENERGY       3000
                                       SHIELDS            0
                                       KLINGONS REMAINING 8
---------------------------------
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 4 , 5
-------------------
: 004 : 005 : 006 :
-------------------
: 003 : 003 : 108 :
-------------------
: 001 : 004 : 002 :
-------------------
COMMAND? NAV***SHE
ENERGY AVAILABLE = 3000 NUMBER OF UNITS TO SHIELDS? 2000
DEFLECTOR CONTROL ROOM REPORT:
  'SHIELDS NOW AT 2000 UNITS PER YOUR COMMAND.'
COMMAND? NAV
COURSE (0-9)? 1.16667
WARP FACTOR (0-8)? 1

NOW ENTERING BETELGEUSE II QUADRANT . . .

COMBAT AREA      CONDITION RED
---------------------------------
      *          *                   STARDATE           3001
          *                          CONDITION          *RED*
                *       *            QUADRANT           4 , 6
     <*>                *            SECTOR             4 , 2
                    +K+               PHOTON TORPEDOES   10
                *                     TOTAL ENERGY       2982
                                      SHIELDS            2000
                     *                KLINGONS REMAINING 8
---------------------------------
COMMAND? CON
COMPUTER ACTIVE AND AWAITING COMMAND? 2

FROM ENTERPRISE TO KLINGON BATTLE CRUSER
DIRECTION = 8.75
DISTANCE = 4.12311
COMMAND? TOR
PHOTON TORPEDO COURSE (1-9)? 8.75
TORPEDO TRACK:
                4 , 3
                5 , 4
                5 , 5
                5 , 6
*** KLINGON DESTROYED ***
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 4 , 6
-------------------
: 005 : 006 : 005 :
-------------------
: 003 : 008 : 008 :
-------------------
: 004 : 002 : 003 :
-------------------
COMMAND? NAV
COURSE (0-9)? 5
WARP FACTOR (0-8)? 4

NOW ENTERING VEGA II QUADRANT . . .

---------------------------------
                                      STARDATE           3002
          *                           CONDITION          GREEN
                                      QUADRANT           4 , 2
     <*>  *            *            SECTOR             4 , 2
          *                           PHOTON TORPEDOES   9
                         *            TOTAL ENERGY       2936
                                      SHIELDS            2000
  *                                   KLINGONS REMAINING 7
---------------------------------
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 4 , 2
-------------------
: 005 : 103 : 006 :
-------------------
: 102 : 006 : 006 :
-------------------
: 008 : 007 : 005 :
-------------------
COMMAND? NAV
COURSE (0-9)? 5
WARP FACTOR (0-8)? 1

NOW ENTERING VEGA I QUADRANT . . .

COMBAT AREA      CONDITION RED
---------------------------------
  *          *                       STARDATE           3003
                                      CONDITION          *RED*
                                      QUADRANT           4 , 1
     <*>                              SECTOR             4 , 2
 +K+                                  PHOTON TORPEDOES   9
                                      TOTAL ENERGY       2920
                                      SHIELDS            2000
                                      KLINGONS REMAINING 7
---------------------------------
COMMAND? PHA
PHASERS LOCKED ON TARGET;  ENERGY AVAILABLE = 920 UNITS
NUMBER OF UNITS TO FIRE? 100
 201 UNIT HIT ON KLINGON AT SECTOR 5 , 1
   (SENSORS SHOW 28.4468 UNITS REMAINING)
 41 UNIT HIT ON ENTERPRISE FROM SECTOR 5 , 1
      <SHIELDS DOWN TO 1959 UNITS>
COMMAND? PHA
PHASERS LOCKED ON TARGET;  ENERGY AVAILABLE = 820 UNITS
NUMBER OF UNITS TO FIRE? 14
 26 UNIT HIT ON KLINGON AT SECTOR 5 , 1
*** KLINGON DESTROYED ***
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 4 , 1
-------------------
: *** : 005 : 103 :
-------------------
: *** : 002 : 006 :
-------------------
: *** : 008 : 007 :
-------------------
COMMAND? NAV
COURSE (0-9)? 2
WARP FACTOR (0-8)? 1.414

NOW ENTERING PROCYON II QUADRANT . . .

COMBAT AREA      CONDITION RED
---------------------------------
                    <*>               STARDATE           3004
                                      CONDITION          *RED*
 +K+       *                          QUADRANT           3 , 2
      *                               SECTOR             1 , 5
                                      PHOTON TORPEDOES   9
                                      TOTAL ENERGY       2744
                                      SHIELDS            1959
      *                               KLINGONS REMAINING 6
---------------------------------
COMMAND? CON
COMPUTER ACTIVE AND AWAITING COMMAND? 2

FROM ENTERPRISE TO KLINGON BATTLE CRUSER
DIRECTION = 5.75
DISTANCE = 5
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 3 , 2
-------------------
: 007 : 006 : 007 :
-------------------
: 005 : 103 : 006 :
-------------------
: 002 : 006 : 006 :
-------------------
COMMAND? TOR
PHOTON TORPEDO COURSE (1-9)? 5.75
TORPEDO TRACK:
                2 , 4
                3 , 3
                3 , 2
                4 , 1
*** KLINGON DESTROYED ***
COMMAND? CON
COMPUTER ACTIVE AND AWAITING COMMAND? 3

COMPUTER RECORD OF GALAXY FOR QUADRANT 3 , 2

      1     2     3     4     5     6     7     8
    ----- ----- ----- ----- ----- ----- ----- -----
1   ***   ***   ***   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
2   007   006   007   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
3   005   003   006   004   005   006   005   ***
    ----- ----- ----- ----- ----- ----- ----- -----
4   002   006   006   003   003   008   008   ***
    ----- ----- ----- ----- ----- ----- ----- -----
5   008   007   005   001   004   002   003   ***
    ----- ----- ----- ----- ----- ----- ----- -----
6   ***   ***   ***   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
7   ***   ***   ***   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
8   ***   ***   ***   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----

COMMAND? NAV
COURSE (0-9)? 7
WARP FACTOR (0-8)? 4

NOW ENTERING SAGITTARIUS II QUADRANT . . .

---------------------------------
                    <*>               STARDATE           3005
          *                           CONDITION          GREEN
              *                       QUADRANT           7 , 2
          *                           SECTOR             1 , 5
                                      PHOTON TORPEDOES   8
                                      TOTAL ENERGY       2700
                                      SHIELDS            1959
                                      KLINGONS REMAINING 5
---------------------------------
```

```
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 7 , 2
-------------------
: 003 : 004 : 004 :
-------------------
: 003 : 003 : 001 :
-------------------
: 017 : 007 : 002 :
-------------------
COMMAND? NAV
COURSE (0-9)? 1
WARP FACTOR (0-8)? 3

NOW ENTERING ARCTURUS I QUADRANT . . .

--------------------------------
      *          <*>                  STARDATE            3006
  *                                    CONDITION           GREEN
                     *                 QUADRANT            7 , 5
           *                           SECTOR              1 , 5
      *                        *       PHOTON TORPEDOES    8
      *                                TOTAL ENERGY        2666
      .                                SHIELDS             1959
                                       KLINGONS REMAINING  5
--------------------------------
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 7 , 5
-------------------
: 001 : 001 : 005 :
-------------------
: 003 : 007 : 006 :
-------------------
: 008 : 007 : 005 :
-------------------
COMMAND? NAV
COURSE (0-9)? 1
WARP FACTOR (0-8)? 2

NOW ENTERING ARCTURUS III QUADRANT . . .

--------------------------------
                 <*>                   STARDATE            3007
      *                                CONDITION           GREEN
  *                 *                  QUADRANT            7 , 7
                        *               SECTOR              1 , 5
                                        PHOTON TORPEDOES    8
                                        TOTAL ENERGY        2640
                                        SHIELDS             1959
                              *         KLINGONS REMAINING  5
--------------------------------
COMMAND? LRS
LONG RANGE SCAN FOR QUADRANT 7 , 7
-------------------
: 005 : 002 : 004 :
-------------------
: 006 : 005 : 002 :
-------------------
: 005 : 008 : 003 :
-------------------
COMMAND? COM
COMPUTER ACTIVE AND AWAITING COMMAND? 0

COMPUTER RECORD OF GALAXY FOR QUADRANT 7 , 7

      1     2     3     4     5     6     7     8
    ----- ----- ----- ----- ----- ----- ----- -----
 1   ***   ***   ***   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
 2   007   006   007   ***   ***   ***   ***   ***
    ----- ----- ----- ----- ----- ----- ----- -----
 3   005   003   006   004   005   006   005   ***
    ----- ----- ----- ----- ----- ----- ----- -----
 4   002   006   006   003   003   008   008   ***
    ----- ----- ----- ----- ----- ----- ----- -----
 5   008   007   005   001   004   002   003   ***
    ----- ----- ----- ----- ----- ----- ----- -----
 6   003   004   004   001   001   005   002   004
    ----- ----- ----- ----- ----- ----- ----- -----
 7   003   003   001   003   007   006   005   002
    ----- ----- ----- ----- ----- ----- ----- -----
 8   017   007   002   008   007   005   008   003
    ----- ----- ----- ----- ----- ----- ----- -----

COMMAND? COM
COMPUTER ACTIVE AND AWAITING COMMAND? 1

   STATUS REPORT:
KLINGONS LEFT:  5
MISSION MUST BE COMPLETED IN 18 STARDATES
THE FEDERATION IS MAINTAINING 3 STARBASES IN THE GALAXY

DEVICE              STATE OF REPAIR
WARP ENGINES                  0
SHORT RANGE SENSORS           0
LONG RANGE SENSORS            0
PHASER CONTROL                0
PHOTON TUBES                  0
DAMAGE CONTROL                0
SHIELD CONTROL                0
LIBRARY-COMPUTER              0

COMMAND? COM
COMPUTER ACTIVE AND AWAITING COMMAND? 4

DIRECTION/DISTANCE CALCULATOR:
YOU ARE AT QUADRANT  7 , 7  SECTOR  1 , 5
PLEASE ENTER
  INITIAL COORDINATES (X,Y)? 7,7
  FINAL COORDINATES (X,Y)? 4,8
DIRECTION = 2.66667
DISTANCE = 3.16228
COMMAND? NAV
COURSE (0-9)? 2.66667
WARP FACTOR (0-8)? 3.16228
```

Later in the run . . . .

```
NOW ENTERING SIRIUS I QUADRANT . . .

COMBAT AREA       CONDITION RED
--------------------------------
                                       STARDATE            3012.6
  *                                    CONDITION           *RED*
                                       QUADRANT            1 , 5
  *                                    SECTOR              5 , 2
     <*> +K+              *           PHOTON TORPEDOES    5
                                       TOTAL ENERGY        1741
              *                        SHIELDS             891
                        *              KLINGONS REMAINING  2
--------------------------------
COMMAND? TOR
PHOTON TORPEDO COURSE (1-9)? 1
TORPEDO TRACK:
                5 , 3
*** KLINGON DESTROYED ***
COMMAND? NAV
COURSE (0-9)? 5
WARP FACTOR (0-8)? 1
DAMAGE CONTROL REPORT:  LIBRARY-COMPUTER REPAIR COMPLETED.

NOW ENTERING ANTARES IV QUADRANT . . .

COMBAT AREA       CONDITION RED
--------------------------------
                              *        STARDATE            3013.6
          *       +K+                 CONDITION           *RED*
                                *      QUADRANT            1 , 4
                      *               SECTOR              5 , 2
     <*>                      *       PHOTON TORPEDOES    4
                                      TOTAL ENERGY        1721
                                      SHIELDS             891
  *           *           >!<         KLINGONS REMAINING  1
--------------------------------
COMMAND? COM
COMPUTER ACTIVE AND AWAITING COMMAND? 3

FROM ENTERPRISE TO STARBASE:
DIRECTION = 8.4
DISTANCE = 5.83095
COMMAND? NAV
COURSE (0-9)? 8.4
WARP FACTOR (0-8)? .583095
 154 UNIT HIT ON ENTERPRISE FROM SECTOR 3 , 3
      <SHIELDS DOWN TO 737 UNITS>
DAMAGE CONTROL REPORTS 'LONG RANGE SENSORS DAMAGED BY THE HIT'
DAMAGE CONTROL REPORT:  LONG RANGE SENSORS REPAIR COMPLETED.
WARP ENGINES SHUT DOWN AT SECTOR 7 , 6 DUE TO BAD NAVAGATION
SHIELDS DROPPED FOR DOCKING PURPOSES
--------------------------------
                              *        STARDATE            3014.1
          *                            CONDITION           DOCKED
         +K+                  *       QUADRANT            1 , 4
                    *                 SECTOR              7 , 6
                          *           PHOTON TORPEDOES    10
                                      TOTAL ENERGY        3000
                    <*>               SHIELDS             0
  *           *           >!<         KLINGONS REMAINING  1
--------------------------------
COMMAND? DAM

DEVICE              STATE OF REPAIR
WARP ENGINES                  0
SHORT RANGE SENSORS           0
LONG RANGE SENSORS          .26
PHASER CONTROL                0
PHOTON TUBES                  0
DAMAGE CONTROL                0
SHIELD CONTROL              .43
LIBRARY-COMPUTER            .18

COMMAND? COM
COMPUTER ACTIVE AND AWAITING COMMAND? 5

                    THE GALAXY
      1     2     3     4     5     6     7     8
    ----- ----- ----- ----- ----- ----- ----- -----
 1        ANTARES                 SIRIUS
    ----- ----- ----- ----- ----- ----- ----- -----
 2         RIGEL                  DENEB
    ----- ----- ----- ----- ----- ----- ----- -----
 3        PROCYON                 CAPELLA
    ----- ----- ----- ----- ----- ----- ----- -----
 4          VEGA                BETELGEUSE
    ----- ----- ----- ----- ----- ----- ----- -----
 5        CANOPUS                 ALDEBARAN
    ----- ----- ----- ----- ----- ----- ----- -----
 6         ALTAIR                 REGULUS
    ----- ----- ----- ----- ----- ----- ----- -----
 7     SAGITTARIUS                ARCTURUS
    ----- ----- ----- ----- ----- ----- ----- -----
 8         POLLUX                  SPICA
    ----- ----- ----- ----- ----- ----- ----- -----

COMMAND? PHA
PHASERS LOCKED ON TARGET;  ENERGY AVAILABLE = 3000 UNITS
NUMBER OF UNITS TO FIRE? 2939
 1415 UNIT HIT ON KLINGON AT SECTOR 3 , 3
*** KLINGON DESTROYED ***
CONGRULATION, CAPTAIN!  THE LAST KLINGON BATTLE CRUISER
MENACING THE FEDERATION HAS BEEN DESTROYED.

YOUR EFFICIENCY RATING IS 321.911


THE FEDERATION IS IN NEED OF A NEW STARSHIP COMMANDER
FOR A SIMILAR MISSION -- IF THERE IS A VOLUNTEER,
LET HIM STEP FORWARD AND ENTER 'AYE'? NAY
```

Synonym

A synonym of a word is another word (in the English language) which has the same, or very nearly the same, meaning. This program tests your knowledge of synonyms of a few common words.

The computer chooses a word and asks you for a synonym. The computer then tells you whether you're right or wrong. If you can't think of a synonym, type "HELP" which causes a synonym to be printed.

You may put in words of your choice in the data statements (510-600). The number following DATA in Statement 500 is the total number of data statements. In each data statement, the first number is the number of words in that statement.

Can you think of a way to make this into a more general kind of CAI program for any subject?

Walt Koetke of Lexington High School, Massachusetts created this program.

```
                SYNONYM
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

A SYNONYM OF A WORD MEANS ANOTHER WORD IN THE ENGLISH
LANGUAGE WHICH HAS THE SAME OR VERY NEARLY THE SAME MEANING.
I CHOOSE A WORD -- YOU TYPE A SYNONYM.
IF YOU CAN'T THINK OF A SYNONYM, TYPE THE WORD 'HELP'
AND I WILL TELL YOU A SYNONYM.


     WHAT IS A SYNONYM OF RED? HELP
**** A SYNONYM OF RED IS RUBY.

     WHAT IS A SYNONYM OF RED? SCARLET
RIGHT


     WHAT IS A SYNONYM OF MODEL? FORM
     TRY AGAIN.
     WHAT IS A SYNONYM OF MODEL? HELP
**** A SYNONYM OF MODEL IS PATTERN.

     WHAT IS A SYNONYM OF MODEL? PROTOTYPE
GOOD!


     WHAT IS A SYNONYM OF SMALL? LITTLE
GOOD!


     WHAT IS A SYNONYM OF SIMILAR? LIKE
CORRECT


     WHAT IS A SYNONYM OF FIRST? START
CORRECT


     WHAT IS A SYNONYM OF PIT? CAVE
     TRY AGAIN.
     WHAT IS A SYNONYM OF PIT? CAVERN
     TRY AGAIN.
     WHAT IS A SYNONYM OF PIT? HOLE
RIGHT


     WHAT IS A SYNONYM OF HOUSE? DWELLING
GOOD!


     WHAT IS A SYNONYM OF PUSH? SHOVE
GOOD!


     WHAT IS A SYNONYM OF STOP? HALT
CHECK


     WHAT IS A SYNONYM OF PAIN? HURT
CHECK

SYNONYM DRILL COMPLETED.
```

```
2 PRINT TAB(33);"SYNONYM"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT: PRINT: PRINT
10 DIM R$(5),W$(10),L(30),R(30)
20 R$(1)="RIGHT": R$(2)="CORRECT": R$(3)="FINE": R$(4)="GOOD!"
30 R$(5)="CHECK"
70 C=0
90 PRINT "A SYNONYM OF A WORD MEANS ANOTHER WORD IN THE ENGLISH"
100 PRINT "LANGUAGE WHICH HAS THE SAME OR VERY NEARLY THE SAME";
110 PRINT " MEANING."
130 PRINT "I CHOOSE A WORD -- YOU TYPE A SYNONYM."
140 PRINT "IF YOU CAN'T THINK OF A SYNONYM, TYPE THE WORD 'HELP'"
145 PRINT "AND I WILL TELL YOU A SYNONYM.": PRINT
150 RESTORE: C=C+1: READ N
160 IF C>N THEN 420
170 N1=INT(RND(1)*N+1)
174 IF R(N1)=1 THEN 170
176 R(N1)=1
180 FOR I=1 TO N1
190 READ N2
200 FOR J=1 TO N2
210 READ W$(J)
220 NEXT J
230 NEXT I
232 FOR J=1 TO N2: L(J)=J: NEXT J
235 L(0)=N2: G=1: PRINT
237 L(G)=L(L(0)): L(0)=N2-1: PRINT
240 PRINT "     WHAT IS A SYNONYM OF ";W$(G);: INPUT A$
250 IF A$="HELP" THEN 340
260 FOR K=1 TO N2
270 IF G=K THEN 290
280 IF A$=W$(K) THEN 320
290 NEXT K
300 PRINT "     TRY AGAIN.": GOTO 240
320 PRINT R$(RND(1)*5+1): GOTO 150
340 G1=INT(RND(1)*L(0)+1)
360 PRINT "**** A SYNONYM OF ";W$(G);" IS ";W$(L(G1));".": PRINT
370 L(G1)=L(L(0)): L(0)=L(0)-1: GOTO 240
420 PRINT: PRINT "SYNONYM DRILL COMPLETED.": GOTO 999
500 DATA 10
510 DATA 5,"FIRST","START","BEGINNING","ONSET","INITIAL"
520 DATA 5,"SIMILAR","ALIKE","SAME","LIKE","RESEMBLING"
530 DATA 5,"MODEL","PATTERN","PROTOTYPE","STANDARD","CRITERION"
540 DATA 5,"SMALL","INSIGNIFICANT","LITTLE","TINY","MINUTE"
550 DATA 6,"STOP","HALT","STAY","ARREST","CHECK","STANDSTILL"
560 DATA 6,"HOUSE","DWELLING","RESIDENCE","DOMICILE","LODGING"
565 DATA "HABITATION"
570 DATA 7,"PIT","HOLE","HOLLOW","WELL","GULF","CHASM","ABYSS"
580 DATA 7,"PUSH","SHOVE","THRUST","PROD","POKE","BUTT","PRESS"
590 DATA 6,"RED","ROUGE","SCARLET","CRIMSON","FLAME","RUBY"
600 DATA 7,"PAIN","SUFFERING","HURT","MISERY","DISTRESS","ACHE"
605 DATA "DISCOMFORT"
999 END
```

Target

In this program, you are firing a weapon from a spaceship in 3-dimensional space. Your ship, the Starship Enterprise, is located at the origin (0,0,0) of a set of x,y,z coordinates. You will be told the approximate location of the target in 3-dimensional rectangular coordinates, the approximate angular deviation from the x and z axes in both radians and degrees, and the approximate distance to the target.

Given this information, you then proceed to shoot at the target. A shot within 20 kilometers of the target destroys it. After each shot, you are given information as to the position of the explosion of your shot and a somewhat improved estimate of the location of the target. Fortunately, this is just practice and the target doesn't shoot back. After you have attained proficiency, you ought to be able to destroy a target in 3 or 4 shots. However, attaining proficiency might take a while!

The author is H. David Crockett of Fort Worth, Texas.

```
                TARGET
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


YOU ARE THE WEAPONS OFFICER ON THE STARSHIP ENTERPRISE
AND THIS IS A TEST TO SEE HOW ACCURATE A SHOT YOU
ARE IN A THREE-DIMENSIONAL RANGE.  YOU WILL BE TOLD
THE RADIAN OFFSET FOR THE X AND Z AXES, THE LOCATION
OF THE TARGET IN THREE DIMENSIONAL RECTANGULAR COORDINATES,
THE APPROXIMATE NUMBER OF DEGREES FROM THE X AND Z
AXES, AND THE APPROXIMATE DISTANCE TO THE TARGET.
YOU WILL THEN PROCEEED TO SHOOT AT THE TARGET UNTIL IT IS
DESTROYED!

GOOD LUCK!!

RADIANS FROM X AXIS = 4.46501    FROM Z AXIS = 2.65935
TARGET SIGHTED: APPROX COORDINATES X=-7551.63   Y=-29901.3   Z=-58915.4
     ESTIMATED DISTANCE= 66490
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 230,110,66000

RADIANS FROM X AXIS = 4.01424 FROM Z AXIS = 1.91985
SHOT BEHIND TARGET 32314.7 KILOMETERS.
SHOT TO RIGHT OF TARGET 17608 KILOMETERS.
SHOT ABOVE TARGET 36342.5 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-39866.4    Y=-47509.4    Z=-22572.9
     DISTANCE FROM TARGET = 51721

     ESTIMATED DISTANCE= 66498
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 250,170,66000

RADIANS FROM X AXIS = 4.36331 FROM Z AXIS = 2.96705
SHOT IN FRONT OF TARGET 3631.37 KILOMETERS.
SHOT TO LEFT OF TARGET 19131.1 KILOMETERS.
SHOT BELOW TARGET 6081.76 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-3920.26    Y=-10770.3    Z=-64997.2
     DISTANCE FROM TARGET = 20400.3


     ESTIMATED DISTANCE= 66499
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 260,155,66499

RADIANS FROM X AXIS = 4.53784 FROM Z AXIS = 2.70525
SHOT IN FRONT OF TARGET 2670.88 KILOMETERS.
SHOT TO LEFT OF TARGET 2224.05 KILOMETERS.
SHOT BELOW TARGET 1352.85 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-4880.76    Y=-27677.3    Z=-60268.3
     DISTANCE FROM TARGET = 3729.64


     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 255,150,66499.
2

RADIANS FROM X AXIS = 4.45057 FROM Z AXIS = 2.61798
SHOT BEHIND TARGET 1054.7 KILOMETERS.
SHOT TO RIGHT OF TARGET 2215.73 KILOMETERS.
SHOT ABOVE TARGET 1325.75 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-8606.33    Y=-32117.1    Z=-57589.7
     DISTANCE FROM TARGET = 2789.17


     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,145,66499.
2

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.53072
SHOT BEHIND TARGET 1676.61 KILOMETERS.
SHOT TO RIGHT OF TARGET 7108.41 KILOMETERS.
SHOT ABOVE TARGET 4442.84 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-9228.24    Y=-37009.7    Z=-54472.6
     DISTANCE FROM TARGET = 8548.64


     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,147,66499

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.56562
SHOT BEHIND TARGET 1211.02 KILOMETERS.
SHOT TO RIGHT OF TARGET 5241.18 KILOMETERS.
SHOT ABOVE TARGET 3145.04 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-8762.65    Y=-35142.5    Z=-55770.4
     DISTANCE FROM TARGET = 6231.19


     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,148,66499

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.58308
SHOT BEHIND TARGET 974.203 KILOMETERS.
SHOT TO RIGHT OF TARGET 4291.42 KILOMETERS.
SHOT ABOVE TARGET 2521.43 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-8525.84    Y=-34192.8    Z=-56394
     DISTANCE FROM TARGET = 5071.78
```

```
     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,154,66499

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.6878
SHOT IN FRONT OF TARGET 498.672 KILOMETERS.
SHOT TO LEFT OF TARGET 1615.52 KILOMETERS.
SHOT BELOW TARGET 853.184 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-7052.96     Y=-28285.8     Z=-59768.6
     DISTANCE FROM TARGET = 1893.81



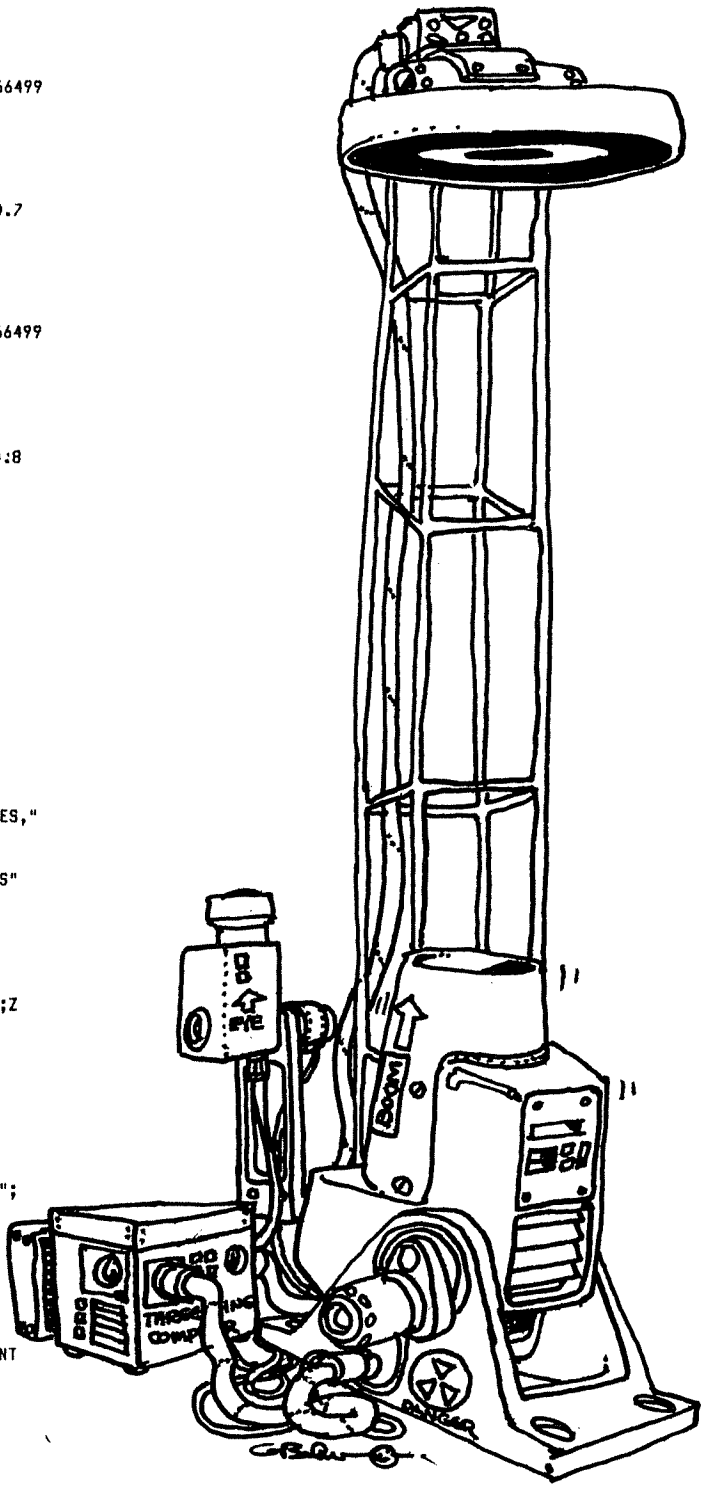
     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,153,66499

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.67034
SHOT IN FRONT OF TARGET 247.38 KILOMETERS.
SHOT TO LEFT OF TARGET 607.723 KILOMETERS.
SHOT BELOW TARGET 335.316 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-7304.25     Y=-29293.6     Z=-59250.7
     DISTANCE FROM TARGET = 736.859



     ESTIMATED DISTANCE= 66499.2
INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE? 256,152,66499

RADIANS FROM X AXIS = 4.46803 FROM Z AXIS = 2.65289
SHOT BEHIND TARGET 1.68652 KILOMETERS.
SHOT TO RIGHT OF TARGET 391.156 KILOMETERS.
SHOT ABOVE TARGET 200.602 KILOMETERS.
APPROX POSITION OF EXPLOSION:  X=-7553.32     Y=-30292.5     Z=-58714.8
     DISTANCE FROM TARGET = 439.599
```




```
10 PRINT TAB(33);"TARGET"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
100 R=1: R1=57.296: P=3.141592
110 PRINT "YOU ARE THE WEAPONS OFFICER ON THE STARSHIP ENTERPRISE"
120 PRINT "AND THIS IS A TEST TO SEE HOW ACCURATE A SHOT YOU"
130 PRINT "ARE IN A THREE-DIMENSIONAL RANGE.  YOU WILL BE TOLD"
140 PRINT "THE RADIAN OFFSET FOR THE X AND Z AXES, THE LOCATION"
150 PRINT "OF THE TARGET IN THREE DIMENSIONAL RECTANGULAR COORDINATES,"
160 PRINT "THE APPROXIMATE NUMBER OF DEGREES FROM THE X AND Z"
170 PRINT "AXES, AND THE APPROXIMATE DISTANCE TO THE TARGET."
180 PRINT "YOU WILL THEN PROCEEED TO SHOOT AT THE TARGET UNTIL IT IS"
190 PRINT "DESTROYED!": PRINT: PRINT "GOOD LUCK!!": PRINT: PRINT
220 A=RND(1)*2*P: B=RND(1)*2*P: Q=INT(A*R1): W=INT(B*R1)
260 PRINT "RADIANS FROM X AXIS =";A;"   FROM Z AXIS =";B
280 P1=100000*RND(1)+RND(1): X=SIN(B)*COS(A)*P1: Y=SIN(B)*SIN(A)*P1
290 Z=COS(B)*P1
340 PRINT "TARGET SIGHTED: APPROX COORDINATES X=";X;"  Y=";Y;"  Z=";Z
345 R=R+1: IF R>5 THEN 390
350 ON R GOTO 355,360,365,370,375
355 P3=INT(P1*.05)*20: GOTO 390
360 P3=INT(P1*.1)*10: GOTO 390
365 P3=INT(P1*.5)*2: GOTO 390
370 P3=INT(P1): GOTO 390
375 P3=P1
390 PRINT "     ESTIMATED DISTANCE=";P3
400 PRINT "INPUT ANGLE DEVIATION FROM X, DEVIATION FROM Z, DISTANCE";
405 INPUT A1,B1,P2
410 PRINT: IF P2<20 THEN PRINT "YOU BLEW YOURSELF UP!!": GOTO 580
420 A1=A1/R1: B1=B1/R1: PRINT "RADIANS FROM X AXIS =";A1;
425 PRINT "FROM Z AXIS =";B1
480 X1=P2*SIN(B1)*COS(A1): Y1=P2*SIN(B1)*SIN(A1): Z1=P2*COS(B1)
510 D=((X1-X)^2+(Y1-Y)^2+(Z1-Z)^2)^(1/2)
520 IF D>20 THEN 670
530 PRINT: PRINT " * * * HIT * * *   TARGET IS NON-FUNCTIONAL": PRINT
550 PRINT "DISTANCE OF EXPLOSION FROM TARGET WAS";D;"KILOMETERS"
570 PRINT: PRINT "MISSION ACCOMPLISHED IN ";R;" SHOTS."
580 R=0: FOR I=1 TO 5: PRINT: NEXT I: PRINT "NEXT TARGET...": PRINT
590 GOTO 220
670 X2=X1-X: Y2=Y1-Y: Z2=Z1-Z: IF X2<0 THEN 730
710 PRINT "SHOT IN FRONT OF TARGET";X2;"KILOMETERS.": GOTO 740
730 PRINT "SHOT BEHIND TARGET";-X2;"KILOMETERS."
740 IF Y2<0 THEN 770
750 PRINT "SHOT TO LEFT OF TARGET";Y2;"KILOMETERS.": GOTO 780
770 PRINT "SHOT TO RIGHT OF TARGET";-Y2;"KILOMETERS."
780 IF Z2<0 THEN 810
790 PRINT "SHOT ABOVE TARGET";Z2;"KILOMETERS.": GOTO 820
810 PRINT "SHOT BELOW TARGET";-Z2;"KILOMETERS."
820 PRINT "APPROX POSITION OF EXPLOSION:  X=";X1;"   Y=";Y1;"   Z=";Z1
830 PRINT "     DISTANCE FROM TARGET =";D: PRINT: PRINT: PRINT: GOTO345
999 END
```

3-D Plot

3-D PLOT will plot the family of curves of any function. The function Z is plotted as "rising" out of the x-y plane with x and y inside a circle of radius 30. The resultant plot looks almost 3-dimensional.

You set the function you want plotted in line 5. As with any mathematical plot, some functions come out "prettier" than others. Here are some that work nicely:

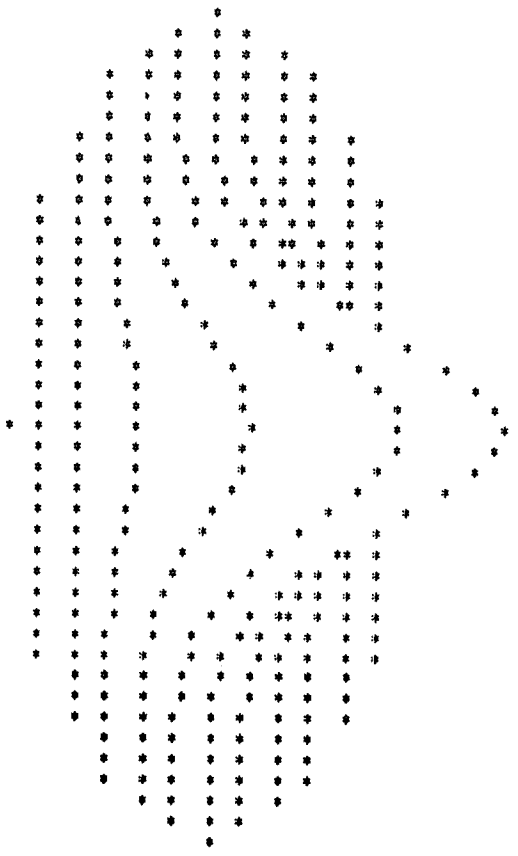
```
5 DEF FNA (Z) = 30*EXP (-Z*Z/100)
5 DEF FNA (Z)= SQR (900.01-Z*Z) *.9-2
5 DEF FNA (Z) = 30*(COS (Z/16)  2
5 DEF FNA (Z) = 30-30*SIN (Z/18)
5 DEF FNA (Z) = 30*EXP (-COS (Z/16) ) -30
```

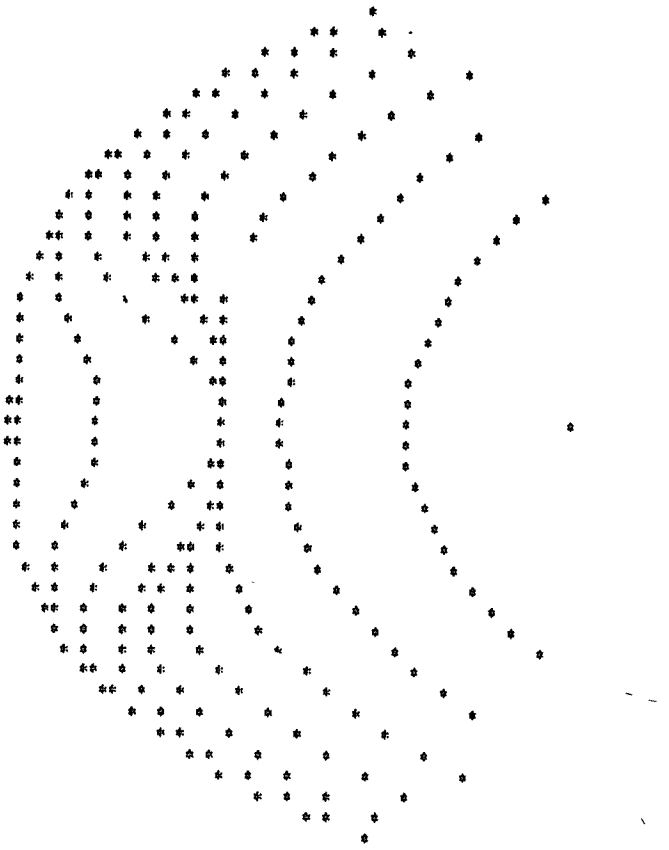
(Bessel function—Summerfeld's Integral)

```
5 DEF FNA (Z) = 30*SIN (Z/10)
```

The author of this amazingly clever program is Mark Bramhall of DEC.

```
                    3D PLOT
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY
```





```
1 PRINT TAB(32);"3D PLOT"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
5 DEF FNA(Z)=30*EXP(-Z*Z/100)
100 PRINT
110 FOR X=-30 TO 30 STEP 1.5
120 L=0
130 Y1=5*INT(SQR(900-X*X)/5)
140 FOR Y=Y1 TO -Y1 STEP -5
150 Z=INT(25+FNA(SQR(X*X+Y*Y))-.7*Y)
160 IF Z<=L THEN 190
170 L=Z
180 PRINT TAB(Z);"*";
190 NEXT Y
200 PRINT
210 NEXT X
300 END
```

3-D Tic-Tac-Toe

3-D TIC-TAC-TOE is the game of tic-tac-toe in a 4x4x4 cube. You must get 4 markers in a row or diagonal along any 3-dimensional plane in order to win.

Each move is indicated by a 3-digit number (digits not seperated by commas), with each digit between 1 and 4 inclusive. The digits indicate the level, column, and row, respectively, of the move. You can win if you play correctly; although, it is considerably more difficult than standard, two-dimensional 3x3 tic-tac-toe.

This version of 3-D TIC-TAC-TOE is from Dartmouth College.

```
            TIC TAC TOE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


DO YOU WANT INSTRUCTIONS? YES

THE GAME IS TIC-TAC-TOE IN A 4 X 4 X 4 CUBE.
EACH MOVE IS INDICATED BY A 3 DIGIT NUMBER, WITH EACH
DIGIT BETWEEN 1 AND 4 INCLUSIVE.  THE DIGITS INDICATE THE
LEVEL, ROW, AND COLUMN, RESPECTIVELY, OF THE OCCUPIED
PLACE.

TO PRINT THE PLAYING BOARD, TYPE 0 (ZERO) AS YOUR MOVE.
THE PROGRAM WILL PRINT THE BOARD WITH YOUR MOVES INDI-
CATED WITH A (Y), THE MACHINE'S MOVES WITH AN (M), AND
UNUSED SQUARES WITH A ( ).

TO STOP THE PROGRAM RUN, TYPE 1 AS YOUR MOVE.
DO YOU WANT TO MOVE FIRST? YES

YOUR MOVE? 122
MACHINE MOVES TO 111
YOUR MOVE? 112
MACHINE MOVES TO 411
YOUR MOVE? 412
MACHINE MOVES TO 414
YOUR MOVE? 212
NICE TRY MACHINE MOVES TO 312

YOUR MOVE? 0
  (M)     (Y)     ( )     ( )

    ( )     (Y)     ( )     ( )

      ( )     ( )     ( )     ( )

        ( )     ( )     ( )     ( )


  ( )     (Y)     ( )     ( )

    ( )     ( )     ( )     ( )

      ( )     ( )     ( )     ( )

        ( )     ( )     ( )     ( )


  ( )     (M)     ( )     ( )

    ( )     ( )     ( )     ( )

      ( )     ( )     ( )     ( )

        ( )     ( )     ( )     ( )


  (M)     (Y)     ( )     (M)

    ( )     ( )     ( )     ( )

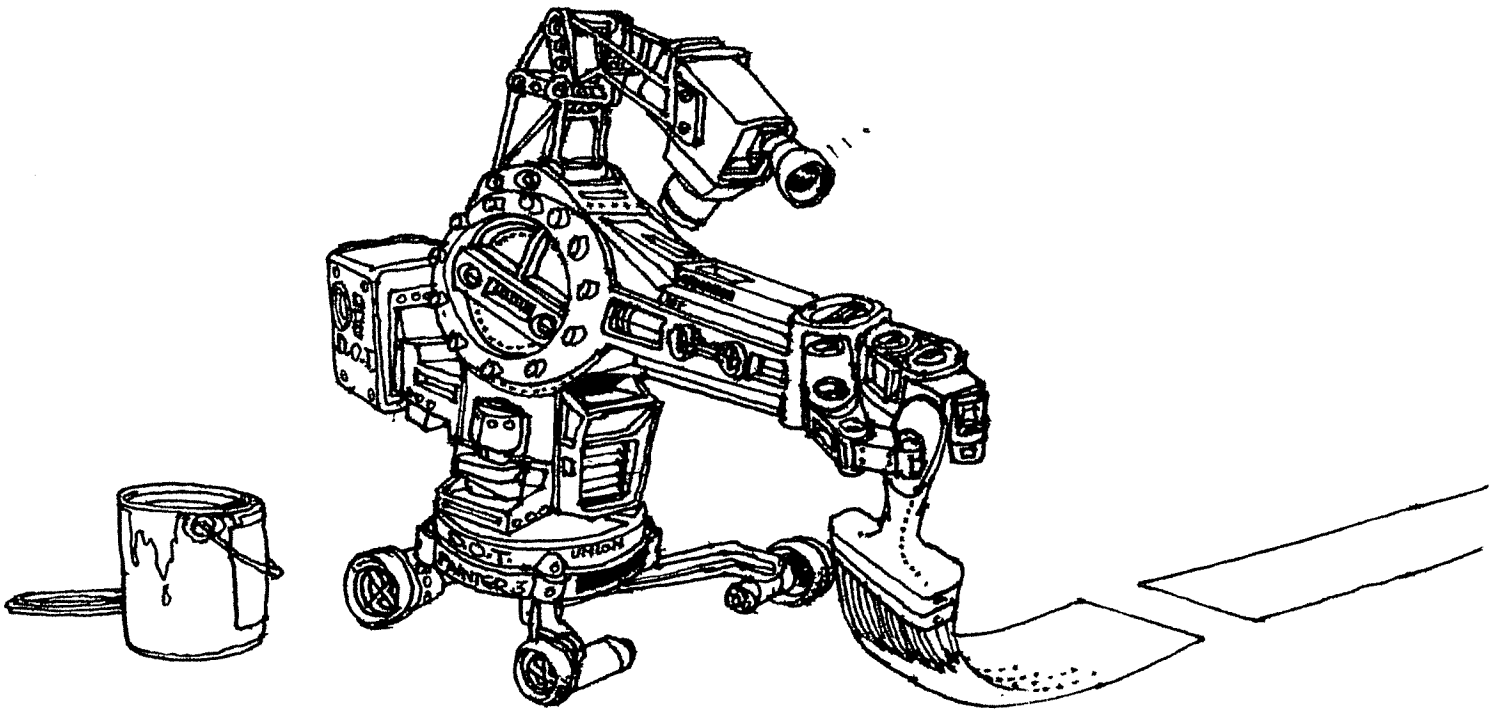
      ( )     ( )     ( )     ( )

        ( )     ( )     ( )     ( )


YOUR MOVE? 442
MACHINE MOVES TO 114
YOUR MOVE? 214
MACHINE MOVES TO 213 , AND WINS AS FOLLOWS
 411  312  213  114
DO YOU WANT TO TRY ANOTHER GAME? NO
```

```
LIST
50 PRINT CHR$(26):WIDTH 80
100 PRINT TAB(33);"QUBIC":PRINT
110 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
120 PRINT:PRINT:PRINT
210 PRINT "DO YOU WANT INSTRUCTIONS";
220 INPUT C$
230 IF LEFT$(C$,1)="N" THEN 315
240 IF LEFT$(C$,1)="Y" THEN 265
250 PRINT "INCORRECT ANSWER.  PLEASE TYPE 'YES' OR 'NO'";
260 GOTO 220
265 PRINT
270 PRINT "THE GAME IS TIC-TAC-TOE IN A 4 X 4 X 4 CUBE."
280 PRINT "EACH MOVE IS INDICATED BY A 3 DIGIT NUMBER, WITH EACH"
290 PRINT "DIGIT BETWEEN 1 AND 4 INCLUSIVE.  THE DIGITS INDICATE THE"
300 PRINT "LEVEL, ROW, AND COLUMN, RESPECTIVELY, OF THE OCCUPIED"
305 PRINT "PLACE.  "
306 PRINT
307 PRINT "TO PRINT THE PLAYING BOARD, TYPE 0 (ZERO) AS YOUR MOVE."
308 PRINT "THE PROGRAM WILL PRINT THE BOARD WITH YOUR MOVES INDI-"
309 PRINT "CATED WITH A (Y), THE MACHINE'S MOVES WITH AN (M), AND"
310 PRINT "UNUSED SQUARES WITH A ( )."
311 PRINT
312 PRINT "TO STOP THE PROGRAM RUN, TYPE 1 AS YOUR MOVE."
313 PRINT:PRINT
315 DIM X(64),L(76),M(76,4),Y(16)
320 FOR I = 1 TO 16
330 READ Y(I)
340 NEXT I
350 FOR I=1 TO 76
360 FOR J = 1 TO 4
370 READM(I,J)
380 NEXT J
390 NEXT I
400 FOR I = 1 TO 64
410 LET X (I) =0
420 NEXT I
430 LET Z=1
440 PRINT "DO YOU WANT TO MOVE FIRST";
450 INPUT S$
460 IF LEFT$(S$,1)="N" THEN 630
470 IF LEFT$(S$,1)="Y" THEN 500
480 PRINT "INCORRECT ANSWER.  PLEASE TYPE 'YES' OR 'NO'.";
490 GOTO 450
500 PRINT " "
510 PRINT "YOUR MOVE";
520 INPUTJ1
521 IF J1=1 THEN 2770
522 IF J1<>0THEN525
523 GOSUB 2550
524 GOTO500
525 IFJ1<111THEN2750
526 IFJ1>444THEN2750
530 GOSUB 2500
540 LETK1=INT(J1/100)
550 LET J2=(J1-K1*100)
560 LET K2=INT(J2/10)
570 LET K3= J1 - K1*100 -K2*10
580 LET M=16*K1+4*K2+K3-20
590 IF X(M)=0 THEN 620
600 PRINT "THAT SQUARE IS USED, TRY AGAIN."
610 GOTO 500
620 LET X(M)=1
630 GOSUB 1640
640 J=1
650 I=1
660 IF J=1 THEN 720
670 IF J=2 THEN 790
680 IF J=3 THEN 930
690 I=I+1: IF I<=76 THEN 660
700 J=J+1: IF J<=3 THEN 650
710 GOTO 1300
720 IF L(I)<>4 THEN 690
730 PRINT "YOU WIN AS FOLLOWS";
740 FOR J=1 TO 4
750 LET M=M(I,J)
760 GOSUB 1570
770 NEXT J
780 GOTO 1490
790 IF L(I)<>15 THEN 690
800 FOR J=1 TO 4
810 LET M=M(I,J)
820 IF X(M)<>0 THEN 860
830 LET X(M)=5
840 PRINT "MACHINE MOVES TO";
850 GOSUB 1570
860 NEXT J
870 PRINT ", AND WINS AS FOLLOWS"
880 FOR J=1 TO 4
890 LET M=M(I,J)
900 GOSUB 1570
910 NEXT J
920 GOTO 1490
930 IF L(I)<>3 THEN 690
940 PRINT "NICE TRY. MACHINE MOVES TO";
950 FOR J=1 TO 4
960 LET M=M(I,J)
970 IF X(M)<>0 THEN 1010
980 LET X(M)=5
990 GOSUB 1570
1000 GOTO 500
1010 NEXT J
1020 GOTO 1300
1030 I=1
1040 LET L(I)=X(M(I,1))+X(M(I,2))+X(M(I,3))+X(M(I,4))
1050 LET L = L(I)
1060 IF L <2 THEN 1130
1070 IF L>=3 THEN 1130
1080 IF L>2 THEN 2230
1090 FOR J = 1 TO 4
1100 IF X(M(I,J))<>0 THEN 1120
1110 LET X(M(I,J))=1/8
1120 NEXT J
1130 I=I+1: IF I<=76 THEN 1040
1140 GOSUB 1640
1150 I=1
1160 IF L(I)=1/2 THEN 2360
1170 IF L(I)=1+3/8 THEN 2360
1180 I=I+1: IF I<=76 THEN 1160
1190 GOTO 1830
1200 LET Z = 1
1210 IF X(Y(Z))=0 THEN 1250
1220 LET Z=Z+1
1230 IF Z<>17 THEN 1210
1240 GOTO 1720
1250 LET M=Y(Z)
1260 LET X(M)=5
1270 PRINT "MACHINE MOVES TO";
1280 GOSUB 1570
1290 GOTO 500
1300 LET X=X
1310 I=1
1320 LET L(I)=X(M(I,1))+X(M(I,2))+X(M(I,3))+X(M(I,4))
1330 LET L=L(I)
1340 IF L<10 THEN 1410
1350 IF L>=11 THEN 1410
1360 IF L>10 THEN 2230
1370 FOR J=1 TO 4
1380 IF X(M(I,J))<>0 THEN 1400
1390 LET X(M(I,J))=1/8
1400 NEXT J
1410 I=I+1: IF I<=76 THEN 1320
1420 GOSUB 1640
1430 I=1
1440 IF L(I)=.5 THEN 2360
1450 IF L(I)=5+3/8 THEN 2360
1460 I=I+1: IF I<=76 THEN 1440
1470 GOSUB 2500
1480 GOTO 1030
1490 PRINT " "
1500 PRINT "DO YOU WANT TO TRY ANOTHER GAME";
1510 INPUT X$
1520 IF LEFT$(X$,1)="Y" THEN 400
1530 IF LEFT$(X$,1)="N" THEN 1560
1540 PRINT "INCORRECT ANSWER. PLEASE TYPE 'YES' OR 'NO'";
1550 GOTO 1510
1560 RUN "MENU"
1570 LET K1=INT((M-1)/16)+1
1580 LET J2=M-16*(K1-1)
1590 LET K2=INT((J2-1)/4)+1
1600 LET K3=M-(K1-1)*16-(K2-1)*4
1610 LET M=K1*100+K2*10+K3
1620 PRINT M;
1630 RETURN
1640 FOR S=1 TO 76
1650 LET J1 = M(S,1)
1660 LET J2=M(S,2)
1670 LET J3=M(S,3)
1680 LET J4=M(S,4)
1690 LET L(S)=X(J1)+X(J2)+X(J3)+X(J4)
1700 NEXT S
1710 RETURN
1720 FOR I=1 TO 64
1730 IF X(I)<>0 THEN 1800
1740 LET X(I)=5
1750 LET M=I
1760 PRINT "MACHINE LIKES";
1770 GOSUB 1570
1780 PRINT " "
1790 GOTO 500
1800 NEXT I
1810 PRINT "THE GAME IS A DRAW."
```

```
1820 GOTO 1490
1830 FOR K=1 TO 18
1840 LET P=0
1850 FOR I=4*K-3 TO 4*K
1860 FOR J=1 TO 4
1870 LET P=P+X(M(I,J))
1880 NEXT J
1890 NEXT I
1900 IF P<4 THEN 1940
1910 IF P<5 THEN 1970
1920 IF P<9 THEN 1940
1930 IF P<10 THEN 1970
1940 NEXT K
1950 GOSUB 2500
1960 GOTO 1200
1970 LET S=1/8
1980 FOR I=4*K-3 TO 4*K
1990 GOTO 2370
2000 NEXT I
2010 LET S=0
2020 GOTO 1980
2030 DATA 1,49,52,4,13,61,64,16,22,39,23,38,26,42,27,43
2040 DATA 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20
2050 DATA 21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38
2060 DATA 39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56
2070 DATA 57,58,59,60,61,62,63,64
2080 DATA1,17,33,49,5,21,37,53,9,25,41,57,13,29,45,61
2090 DATA 2,18,34,50,6,22,38,54,10,26,42,58,14,30,46,62
2100 DATA 3,19,35,51,7,23,39,55,11,27,43,59,15,31,47,63
2110 DATA 4,20,36,52,8,24,40,56,12,28,44,60,16,32,48,64
2120 DATA 1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61
2130 DATA 2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62
2140 DATA 3,7,11,15,19,23,27,31,35,39,43,47,51,55,59,63
2150 DATA4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64
2160 DATA1,6,11,16,17,22,27,32,33,38,43,48,49,54,59,64
2170 DATA 13,10,7,4,29,26,23,20,45,42,39,36,61,58,55,52
2180 DATA1,21,41,61,2,22,42,62,3,23,43,63,4,24,44,64
2190 DATA 49,37,25,13,50,38,26,14,51,39,27,15,52,40,28,16
2200 DATA 1,18,35,52,5,22,39,56,9,26,43,60,13,30,47,64
2210 DATA 49,34,19,4,53,38,23,8,57,42,27,12,61,46,31,16
2220 DATA 1,22,43,64,16,27,38,49,4,23,42,61,13,26,39,52
2230 FOR J=1 TO 4
2240 IF X(M(I,J))<>1/8 THEN 2330
2250 LET X(M(I,J))=5
2260 IF L(I)<5 THEN 2290
2270 PRINT "LET'S SEE YOU GET OUT OF THIS:  MACHINE MOVES TO";
2280 GOTO 2300
2290 PRINT "YOU FOX.  JUST IN THE NICK OF TIME, MACHINE MOVES TO";
2300 LET M=M(I,J)
2310 GOSUB 1570
2320 GOTO 500
2330 NEXT J
2340 PRINT "MACHINE CONCEDES THIS GAME."
2350 GOTO 1490
2360 LET S=1/8
2370 IF I-INT(I/4)*4>1 THEN 2400
2380 LET A=1
2390 GOTO 2410
2400 LET A=2
2410 FOR J=A TO 5-A STEP 5-2*A
2420 IF X(M(I,J))=S THEN 2450
2430 NEXT J
2440 GOTO 2000
2450 LET X(M(I,J))=5
2460 LET M=M(I,J)
2470 PRINT "MACHINE TAKES";
2480 GOSUB 1570
2490 GOTO 500
2500 FOR I=1 TO 64
2510 IF X(I)<>1/8 THEN 2530
2520 LET X(I)=0
2530 NEXT I
2540 RETURN
2550 FOR XX=1 TO 9:LPRINT:NEXT:FORI=1TO4
2560 FORJ=1TO4
2562 FORI1=1TOJ
2564 LPRINT"   ";
2566 NEXTI1
2570 FORK=1TO4
2600 LET Q=16*I+4*J+K-20
2610 IFX(Q)<>0THEN2630
2620 LPRINT"( )      ";
2630 IFX(Q)<>5THEN2650
2640 LPRINT"(M)      ";
2650 IFX(Q)<>1THEN2660
2655 LPRINT"(Y)      ";
2660 IF X(Q)<>1/8THEN2670
2665 LPRINT"( )      ";
2670 NEXTK
2680 LPRINT
2690 LPRINT
2700 NEXTJ
2710 LPRINT
2720 LPRINT
2730 NEXTI
2735 LPRINT CHR$(12)
2740 RETURN
2750 PRINT"INCORRECT MOVE, RETYPE IT--";
2760 GOTO520
2770 RUN "MENU"
```



Tic Tac Toe

The game of tic-tac-toe hardly needs any introduction. In this one, you play versus the computer. Moves are entered by number:

1 2 3

4 5 6

7 8 9

If you make any bad moves, the computer will win; if the computer makes a bad move, you can win; otherwise, the game ends in a tie.

A second version of the game is included which prints out the board after each move. This is ideally suited to a CRT terminal, particularly if you modify it to not print out a new board after each move, but rather use the cursor to make the move.

The first program was written by Tom Koos while a student researcher at the Oregon Museum of Science and Industry; it was extensively modified by Steve North of Creative Computing. The author of the second game is Curt Flick of Akron, Ohio.

```
              TIC TAC TOE
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THE GAME BOARD IS NUMBERED:

1  2  3
8  9  4
7  6  5


COMPUTER MOVES 9
YOUR MOVE? 3
COMPUTER MOVES 4
YOUR MOVE? 8
COMPUTER MOVES 6
YOUR MOVE? 7
COMPUTER MOVES 2
AND WINS ********

COMPUTER MOVES 9
YOUR MOVE? 5
COMPUTER MOVES 6
YOUR MOVE? 2
COMPUTER MOVES 8
YOUR MOVE? 4
COMPUTER MOVES 3
YOUR MOVE? 7
COMPUTER MOVES 1
THE GAME IS A DRAW
```

```
10 PRINT TAB(30);"TIC TAC TOE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
50 REM
100 REM   THIS PROGRAM PLAYS TIC TAC TOE
110 REM   THE MACHINE GOES FIRST
120 PRINT "THE GAME BOARD IS NUMBERED:": PRINT
130 PRINT "1  2  3": PRINT "8  9  4": PRINT "7  6  5"
140 PRINT
150 REM
160 REM
170 REM
180 DEF FNM(X)=X-8*INT((X-1)/8)
190 REM
200 REM  MAIN PROGRAM
210 PRINT
220 PRINT
230 A=9
240 M=A
250 GOSUB 650
260 P=M
270 B=FNM(P+1)
280 M=B
290 GOSUB 650
300 Q=M
310 IF Q=FNM(B+4) THEN 360
320 C=FNM(B+4)
330 M=C
340 GOSUB 700
350 GOTO 730
360 C=FNM(B+2)
370 M=C
380 GOSUB 650
390 R=M
400 IF R=FNM(C+4) THEN 450
410 D=FNM(C+4)
420 M=D
430 GOSUB 700
440 GOTO 730
450 IF P/2<>INT(P/2) THEN 500
460 D=FNM(C+7)
470 M=D
480 GOSUB 700
490 GOTO 730
500 D=FNM(C+3)
510 M=D
520 GOSUB 650
530 S=M
540 IF S=FNM(D+4) THEN 590
550 E=FNM(D+4)
560 M=E
570 GOSUB 700
580 REM
590 E=FNM(D+6)
600 M=E
610 GOSUB 700
620 PRINT "THE GAME IS A DRAW"
630 GOTO 210
640 REM
650 GOSUB 700
660 PRINT "YOUR MOVE";
670 INPUT M
680 RETURN
700 PRINT "COMPUTER MOVES";M
710 RETURN
720 REM
730 PRINT "AND WINS ********"
740 GOTO 210
750 END
```

```
2 PRINT TAB(30);"TIC-TAC-TOE"
4 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
6 PRINT:PRINT:PRINT
8 PRINT "THE BOARD IS NUMBERED:"
10 PRINT " 1  2  3"
12 PRINT " 4  5  6"
14 PRINT " 7  8  9"
16 PRINT:PRINT:PRINT
20 DIM S(9)
50 INPUT"DO YOU WANT 'X' OR '0'";C$
55 IFC$="X"THEN475
60 P$="O":Q$="X"
100 G=-1:H=1:IFS(5)<>0THEN103
102 S(5)=-1:GOTO195
103 IFS(5)<>1THEN106
104 IFS(1)<>0THEN110
105 S(1)=-1:GOTO195
106 IFS(2)=1ANDS(1)=0THEN181
107 IFS(4)=1ANDS(1)=0THEN181
108 IFS(6)=1AND S(9)=0THEN189
109 IFS(8)=1ANDS(9)=0THEN189
110 IFG=1THEN112
111 GOTO118
112 J=3*INT((M-1)/3)+1
113 IF3*INT((M-1)/3)+1=MTHENK=1
114 IF3*INT((M-1)/3)+2=MTHENK=2
115 IF3*INT((M-1)/3)+3=MTHENK=3
116 GOTO120
118 FORJ=1TO7STEP3:FORK=1TO3
120 IFS(J)<>GTHEN130
122 IFS(J+2)<>GTHEN135
126 IFS(J+1)<>0THEN150
128 S(J+1)=-1:GOTO195
130 IFS(J)=HTHEN150
131 IFS(J+2)<>GTHEN150
132 IFS(J+1)<>GTHEN150
133 S(J)=-1:GOTO195
135 IFS(J+2)<>0THEN150
136 IFS(J+1)<>GTHEN150
138 S(J+2)=-1:GOTO195
150 IFS(K)<>GTHEN160
152 IFS(K+6)<>GTHEN165
156 IFS(K+3)<>0THEN170
158 S(K+3)=-1:GOTO195
160 IFS(K)=HTHEN170
161 IFS(K+6)<>GTHEN170
162 IFS(K+3)<>GTHEN170
163 S(K)=-1:GOTO195
165 IFS(K+6)<>0THEN170
166 IFS(K+3)<>GTHEN170
168 S(K+6)=-1:GOTO195
170 GOTO450
171 IFS(3)=GANDS(7)=0THEN187
172 IFS(9)=GANDS(1)=0THEN181
173 IFS(7)=GANDS(3)=0THEN183
174 IFS(9)=0ANDS(1)=GTHEN189
175 IFG=-1THENG=1:H=-1:GOTO110
176 IFS(9)=1ANDS(3)=0THEN182
177 FORI=2TO9:IFS(I)<>0THEN179
178 S(I)=-1:GOTO195
179 NEXTI
181 S(1)=-1:GOTO195
182 IFS(1)=1THEN177
183 S(3)=-1:GOTO195
187 S(7)=-1:GOTO195
189 S(9)=-1
195 PRINT:PRINT"THE COMPUTER MOVES TO..."
202 GOSUB1000
205 GOTO500
450 IFG=1THEN465
455 IFJ=7ANDK=3THEN465
460 NEXTK,J
465 IFS(5)=GTHEN171
467 GOTO175
475 P$="X":Q$="O"
500 PRINT:INPUT"WHERE DO YOU MOVE";M
502 IF M=0 THENPRINT"THANKS FOR THE GAME":GOTO 2000
503 IFM>9THEN 506
505 IFS(M)=0THEN510
506 PRINT"THAT SQUARE IS OCCUPIED":PRINT:PRINT:GOTO500
510 G=1:S(M)=1
520 GOSUB 1000
530 GOTO 100
1000 PRINT:FORI=1TO9:PRINT" ";:IFS(I)<>-1THEN1014
1012 PRINTQ$" ";:GOTO1020
1014 IF S(I)<>0THEN 1018
1016 PRINT"  ";:GOTO1020
1018 PRINTP$" ";
1020 IFI<>3ANDI<>6THEN1050
1030 PRINT:PRINT"---+---+---"
1040 GOTO 1080
1050 IFI=9THEN1080
1060 PRINT"!";
1080 NEXTI:PRINT:PRINT:PRINT
1095 FOR I=1TO7STEP3
1100 IFS(I)<>S(I+1)THEN1115
1105 IFS(I)<>S(I+2)THEN1115
1110 IFS(I)=-1THEN1350
1112 IFS(I)=1THEN1200
1115 NEXTI:FORI=1TO3:IFS(I)<>S(I+3)THEN1150
1130 IFS(I)<>S(I+6)THEN1150
1135 IFS(I)=-1THEN1350
1137 IFS(I)=1THEN1200
1150 NEXTI:FORI=1TO9:IFS(I)=0THEN1155
1152 NEXTI:GOTO1400
1155 IFS(5)<>GTHEN1170
1160 IFS(1)=GANDS(9)=GTHEN1180
1165 IFS(3)=GANDS(7)=GTHEN1180
1170 RETURN
1180 IFG=-1THEN1350
1200 PRINT"YOU BEAT ME!! GOOD GAME":GOTO2000
1350 PRINT"I WIN, TURKEY!!!":GOTO2000
1400 PRINT"IT'S A DRAW. THANK YOU"
2000 END
```

```
                TIC-TAC-TOE
 CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


                                   WHERE DO YOU MOVE? 7

THE BOARD IS NUMBERED:              0 !   !
 1  2  3                          ---+---+---
 4  5  6                           0 ! X ! X
 7  8  9                          ---+---+---
                                    X !   !


DO YOU WANT 'X' OR '0'? X

WHERE DO YOU MOVE? 5               THE COMPUTER MOVES TO...

   !   !                            0 !   ! 0
---+---+---                        ---+---+---
   ! X !                           0 ! X ! X
---+---+---                        ---+---+---
   !   !                            X !   !


THE COMPUTER MOVES TO...           WHERE DO YOU MOVE? 2

 0 !   !                            0 ! X ! 0
---+---+---                        ---+---+---
   ! X !                           0 ! X ! X
---+---+---                        ---+---+---
   !   !                            X !   !


WHERE DO YOU MOVE? 6               THE COMPUTER MOVES TO...

 0 !   !                            0 ! X ! 0
---+---+---                        ---+---+---
   ! X ! X                         0 ! X ! X
---+---+---                        ---+---+---
   !   !                            X ! 0 !


THE COMPUTER MOVES TO...           WHERE DO YOU MOVE? 9

 0 !   !                            0 ! X ! 0
---+---+---                        ---+---+---
 0 ! X ! X                         0 ! X ! X
---+---+---                        ---+---+---
   !   !                            X ! 0 ! X


                                   IT'S A DRAW. THANK YOU
```

Tower

This is a simulation of a game of logic that originated in the middle East. It is sometimes called Pharoah's Needles, but its most common name is the Towers of Hanoi.

Legend has it that a secret society of monks live beneath the city of Hanoi. They possess three large towers or needles on which different size gold disks may be placed. Moving one at a time and never placing a larger on a smaller disk, the monks endeavor to move the tower of disks from the left needle to the right needle. Legend says when they have finished moving this 64-disk tower, the world will end. How many moves will they have to make to accomplish this? If they can move 1 disk per minute and work 24 hours per day, how many years will it take?

In the computer puzzle you are faced with three upright needles. On the leftmost needle are placed from two to seven graduated disks, the largest being on the bottom and smallest on the top. Your object is to move the entire stack of disks to the rightmost needle. However, you may only move one disk at a time and you may never place a larger disk on top of a smaller one.

In this computer game, the disks are referred to by their size — i.e., the smallest is 3, next 5, 7, 9, 11, 13, and 15. If you play with fewer than 7 disks always use the largest, i.e. with 2 disks you would use nos. 13 and 15. The program instructions are self-explanatory. Good luck!

Charles Lund wrote this program while at the American School in the Hague, Netherlands.

```
                TOWERS
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


TOWERS OF HANOI PUZZLE

YOU MUST TRANSFER THE DISKS FROM THE LEFT TO THE RIGHT
TOWER, ONE AT A TIME, NEVER PUTTING A LARGER DISK ON A
SMALLER DISK.

HOW MANY DISKS DO YOU WANT TO MOVE (7 IS MAX)? 3

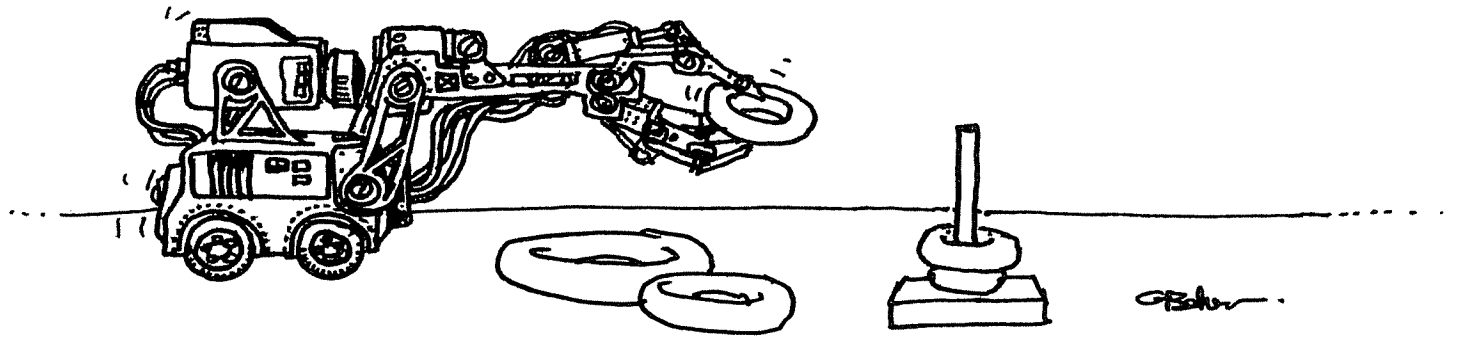
IN THIS PROGRAM, WE SHALL REFER TO DISKS BY NUMERICAL CODE.
3 WILL REPRESENT THE SMALLEST DISK, 5 THE NEXT SIZE,
7 THE NEXT, AND SO ON, UP TO 15.  IF YOU DO THE PUZZLE WITH
2 DISKS, THEIR CODE NAMES WOULD BE 13 AND 15.  WITH 3 DISKS
THE CODE NAMES WOULD BE 11, 13 AND 15, ETC.  THE NEEDLES
ARE NUMBERED FROM LEFT TO RIGHT, 1 TO 3.  WE WILL
START WITH THE DISKS ON NEEDLE 1, AND ATTEMPT TO MOVE THEM
TO NEEDLE 3.

GOOD LUCK!
```

```
WHICH DISK WOULD YOU LIKE TO MOVE? 11
PLACE DISK ON WHICH NEEDLE? 3
WHICH DISK WOULD YOU LIKE TO MOVE? 13
PLACE DISK ON WHICH NEEDLE? 2
WHICH DISK WOULD YOU LIKE TO MOVE? 11
PLACE DISK ON WHICH NEEDLE? 2
WHICH DISK WOULD YOU LIKE TO MOVE? 15
PLACE DISK ON WHICH NEEDLE? 3
WHICH DISK WOULD YOU LIKE TO MOVE? 13
THAT DISK IS BELOW ANOTHER ONE.  MAKE ANOTHER CHOICE.
WHICH DISK WOULD YOU LIKE TO MOVE? 11
PLACE DISK ON WHICH NEEDLE? 1
WHICH DISK WOULD YOU LIKE TO MOVE? 13
PLACE DISK ON WHICH NEEDLE? 3
WHICH DISK WOULD YOU LIKE TO MOVE? 11
PLACE DISK ON WHICH NEEDLE? 3
CONGRATULATIONS!!
YOU HAVE PERFORMED THE TASK IN 7 MOVES.

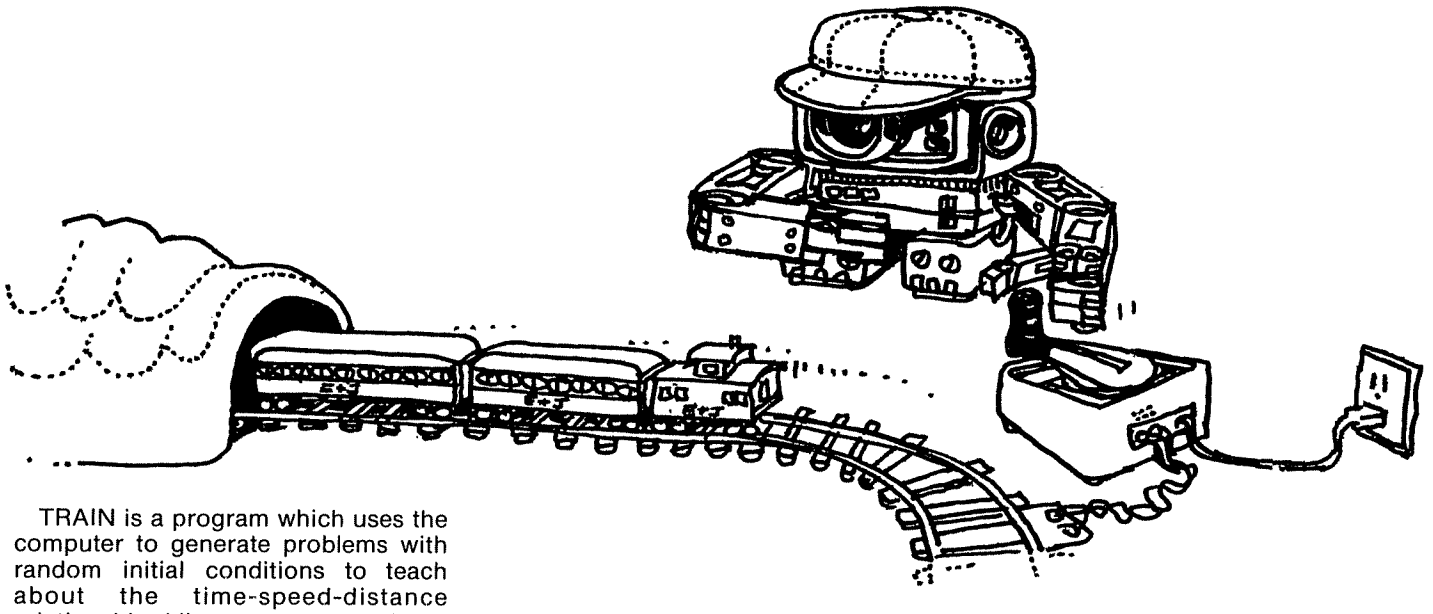
TRY AGAIN (YES OR NO)? NO

THANKS FOR THE GAME!
```



```
10 PRINT TAB(33);"TOWERS"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
90 PRINT
100 REM*** INITIALIZE
110 DIM T(7,3)
120 E=0
130 FOR D=1 TO 7
140 FOR N=1 TO 3
150 T(D,N)=0
160 NEXT N
170 NEXT D
180 PRINT "TOWERS OF HANOI PUZZLE": PRINT
200 PRINT "YOU MUST TRANSFER THE DISKS FROM THE LEFT TO THE RIGHT"
205 PRINT "TOWER, ONE AT A TIME, NEVER PUTTING A LARGER DISK ON A"
210 PRINT "SMALLER DISK.": PRINT
215 INPUT "HOW MANY DISKS DO YOU WANT TO MOVE (7 IS MAX)";S
220 PRINT
230 M=0
240 FOR Q=1 TO 7
250 IF Q=S THEN 350
260 NEXT Q
270 E=E+1
280 IF E>2 THEN 310
290 PRINT "SORRY, BUT I CAN'T DO THAT JOB FOR YOU.": GOTO 215
310 PRINT "ALL RIGHT, WISE GUY, IF YOU CAN'T PLAY THE GAME RIGHT, I'LL"
320 PRINT "JUST TAKE MY PUZZLE AND GO HOME.  SO LONG.": STOP
340 REM *** STORE DISKS FROM SMALLEST TO LARGEST
350 PRINT "IN THIS PROGRAM, WE SHALL REFER TO DISKS BY NUMERICAL CODE."
355 PRINT "3 WILL REPRESENT THE SMALLEST DISK, 5 THE NEXT SIZE,"
360 PRINT "7 THE NEXT, AND SO ON, UP TO 15.  IF YOU DO THE PUZZLE WITH"
365 PRINT "2 DISKS, THEIR CODE NAMES WOULD BE 13 AND 15.  WITH 3 DISKS"
370 PRINT "THE CODE NAMES WOULD BE 11, 13 AND 15, ETC.  THE NEEDLES"
375 PRINT "ARE NUMBERED FROM LEFT TO RIGHT, 1 TO 3.  WE WILL"
380 PRINT "START WITH THE DISKS ON NEEDLE 1, AND ATTEMPT TO MOVE THEM"
385 PRINT "TO NEEDLE 3."
390 PRINT: PRINT "GOOD LUCK!": PRINT
400 Y=7: D=15
420 FOR X=S TO 1 STEP -1
430 T(Y,1)=D: D=D-2: Y=Y-1
460 NEXT X
470 GOSUB 1230
480 PRINT "WHICH DISK WOULD YOU LIKE TO MOVE";:E=0
500 INPUT D
510 IF (D-3)*(D-5)*(D-7)*(D-9)*(D-11)*(D-13)*(D-15)=0 THEN 580
520 PRINT "ILLEGAL ENTRY... YOU MAY ONLY TYPE 3,5,7,9,11,13, OR 15."
530 E=E+1: IF E>1 THEN 560
550 GOTO 500
560 PRINT "STOP WASTING MY TIME.  GO BOTHER SOMEONE ELSE."" STOP
580 REM *** CHECK IF REQUESTED DISK IS BELOW ANOTHER
590 FOR R=1 TO 7
600 FOR C=1 TO 3
610 IF T(R,C)=D THEN 640
620 NEXT C: NEXT R
640 FOR Q=R TO 1 STEP -1
645 IF T(Q,C)=0 THEN 660
650 IF T(Q,C)<D THEN 680
660 NEXT Q
670 GOTO 700
680 PRINT "THAT DISK IS BELOW ANOTHER ONE.  MAKE ANOTHER CHOICE."
690 GOTO 480
700 E=0
705 INPUT "PLACE DISK ON WHICH NEEDLE";N
730 IF (N-1)*(N-2)*(N-3)=0 THEN 800
735 E=E+1
740 IF E>1 THEN 780
750 PRINT "I'LL ASSUME YOU HIT THE WRONG KEY THIS TIME.  BUT WATCH IT,"
760 PRINT "I ONLY ALLOW ONE MISTAKE.": GOTO 705
780 PRINT "I TRIED TO WARN YOU, BUT YOU WOULDN'T LISTEN."
790 PRINT "BYE BYE, BIG SHOT.": STOP
800 FOR R=1 TO 7
810 IF T(R,N)<>0 THEN 840
820 NEXT R
830 GOTO 880
835 REM *** CHECK IF DISK TO BE PLACED ON A LARGER ONE
840 IF D<T(R,N) THEN 880
850 PRINT "YOU CAN'T PLACE A LARGER DISK ON TOP OF A SMALLER ONE,"
860 PRINT "IT MIGHT CRUSH IT!": PRINT "NOW THE, ";:GOTO 480
875 REM *** MOVE RELOCATED DISK
880 FOR V=1 TO 7: FOR W=1 TO 3
900 IF T(V,W)=D THEN 930
910 NEXT W: NEXT V
925 REM *** LOCATE EMPTY SPACE ON NEEDLE N
930 FOR U=1 TO 7
940 IF T(U,N)<>0 THEN 970
950 NEXT U
960 U=7: GOTO 980
965 REM *** MOVE DISK AND SET OLD LOCATION TO 0
970 U=U-1
980 T(U,N)=T(V,W): T(V,W)=0
995 REM *** PRINT OUT CURRENT STATUS
1000 GOSUB 1230
1018 REM *** CHECK IF DONE
1020 M=M+1
1030 FOR R=1 TO 7: FOR C=1 TO 2
1050 IF T(R,C)<>0 THEN 1090
1060 NEXT C: NEXT R
1080 GOTO 1120
1090 IF M<=128 THEN 480
1100 PRINT "SORRY, BUT I HAVE ORDERS TO STOP IF YOU MAKE MORE THAN"
1110 PRINT "128 MOVES.": STOP
1120 IF M<>2^S-1 THEN 1140
1130 PRINT "CONGRATULATIONS!!"
1140 PRINT "YOU HAVE PERFORMED THE TASK IN";M;"MOVES."
1150 PRINT: PRINT "TRY AGAIN (YES OR NO)";: INPUT A$
1160 IF A$="NO" THEN 1390
1170 IF A$="YES" THEN 90
1180 PRINT: PRINT "'YES' OR 'NO' PLEASE";: INPUT A$: GOTO 1160
1230 REM *** PRINT SUBROUTINE
1240 FOR K=1 TO 7
1250 Z=10
1260 FOR J=1 TO 3
1270 IF T(K,J)=0 THEN 1330
1280 PRINT TAB(Z-INT(T(K,J)/2));
1290 FOR V=1 TO T(K,J)
1300 PRINT "*";
1310 NEXT V
1320 GOTO 1340
1330 PRINT TAB(Z);"*";
1340 Z=Z+21
1350 NEXT J
1360 PRINT
1370 NEXT K
1380 RETURN
1390 PRINT: PRINT "THANKS FOR THE GAME!": PRINT: END
```

Train



TRAIN is a program which uses the computer to generate problems with random initial conditions to teach about the time-speed-distance relationship (distance = rate x time). You then input your answer and the computer verifies your response.

TRAIN is merely an example of a student-generated problem. Maximum fun (and benefit) comes more from *writing* programs like this as opposed to solving the specific problem posed. Exchange your program with others — you solve their problem and let them solve yours.

TRAIN was originally written in FOCAL by one student for use by others in his class. It was submitted to us by Walt Koetke, Lexington High School, Lexington, Mass.

```
                TRAIN
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY


TIME - SPEED DISTANCE EXERCISE

 A CAR TRAVELING 54 MPH CAN MAKE A CERTAIN TRIP IN
 11 HOURS LESS THAN A TRAIN TRAVELING AT 36 MPH.
HOW LONG DOES THE TRIP TAKE BY CAR? 23
GOOD! ANSWER WITHIN 4 PERCENT.
CORRECT ANSWER IS 22 HOURS.

ANOTHER PROBLEM (YES OR NO)? YES

 A CAR TRAVELING 40 MPH CAN MAKE A CERTAIN TRIP IN
 14 HOURS LESS THAN A TRAIN TRAVELING AT 34 MPH.
HOW LONG DOES THE TRIP TAKE BY CAR? 20
SORRY.  YOU WERE OFF BY 297 PERCENT.
CORRECT ANSWER IS 79.3333 HOURS.

ANOTHER PROBLEM (YES OR NO)? YES

 A CAR TRAVELING 47 MPH CAN MAKE A CERTAIN TRIP IN
 16 HOURS LESS THAN A TRAIN TRAVELING AT 22 MPH.
HOW LONG DOES THE TRIP TAKE BY CAR? 14
GOOD! ANSWER WITHIN 1 PERCENT.
CORRECT ANSWER IS 14.08 HOURS.

ANOTHER PROBLEM (YES OR NO)? NO
```

```
1 PRINT TAB(33);"TRAIN"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT: PRINT: PRINT
4 PRINT "TIME - SPEED DISTANCE EXERCISE": PRINT
10 C=INT(25*RND(1))+40
15 D=INT(15*RND(1))+5
20 T=INT(19*RND(1))+20
25 PRINT " A CAR TRAVELING";C;"MPH CAN MAKE A CERTAIN TRIP IN"
30 PRINT D;"HOURS LESS THAN A TRAIN TRAVELING AT";T;"MPH."
35 PRINT "HOW LONG DOES THE TRIP TAKE BY CAR";
40 INPUT A
45 V=D*T/(C-T)
50 E=INT(ABS((V-A)*100/A)+.5)
55 IF E>5 THEN 70
60 PRINT "GOOD! ANSWER WITHIN";E;"PERCENT."
65 GOTO 80
70 PRINT "SORRY.  YOU WERE OFF BY";E;"PERCENT."
80 PRINT "CORRECT ANSWER IS";V;"HOURS."
90 PRINT
95 PRINT "ANOTHER PROBLEM (YES OR NO)";
100 INPUT A$
105 PRINT
110 IF A$="YES" THEN 10
999 END
```

Trap

This is another in the family of "guess the mystery number" games. In TRAP the computer selects a random number between I and 100 (or other limit set in statement 20). Your object is to find the number. On each guess, you enter 2 numbers trying to trap the mystery number between your two trap numbers. The computer will tell you if its number is larger or smaller than your trap numbers or if you have trapped the number.

To win the game, you must guess the mystery number by entering it as the same value for both of your trap numbers. You get 6 guesses (this should be changed in statement 10 if you change the guessing limit in statement 20).

After you have played GUESS, STARS, and TRAP, compare the guessing strategy you have found best for each game. Do you notice any similarities? What are the differences? Can you write a new guessing game with still another approach?

TRAP was suggested by a 10-year old when he was playing GUESS. It was originally programmed by Steve Ullman and extensively modified into its final form by Bob Albrecht of People's Computer Co.

```
                  TRAP
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

INSTRUCTIONS? YES
I AM THINKING OF A NUMBER BETWEEN 1 AND 100
TRY TO GUESS MY NUMBER. ON EACH GUESS,
YOU ARE TO ENTER 2 NUMBERS, TRYING TO TRAP
MY NUMBER BETWEEN THE TWO NUMBERS. I WILL
TELL YOU IF YOU HAVE TRAPPED MY NUMBER, IF MY
NUMBER IS LARGER THAN YOUR TWO NUMBERS, OR IF
MY NUMBER IS SMALLER THAN YOUR TWO NUMBERS.
IF YOU WANT TO GUESS ONE SINGLE NUMBER, TYPE
YOUR GUESS FOR BOTH YOUR TRAP NUMBERS.
YOU GET 6 GUESSES TO GET MY NUMBER.

GUESS # 1 ? 25,75
YOU HAVE TRAPPED MY NUMBER.

GUESS # 2 ? 40,60
MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS.

GUESS # 3 ? 30,37
YOU HAVE TRAPPED MY NUMBER.

GUESS # 4 ? 34,36
YOU HAVE TRAPPED MY NUMBER.

GUESS # 5 ? 35,35
MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS.

GUESS # 6 ? 34,34
YOU GOT IT!!!

TRY AGAIN.

GUESS # 1 ? 30,80
YOU HAVE TRAPPED MY NUMBER.

GUESS # 2 ? 50,60
MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS.

GUESS # 3 ? 35,45
MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS.

GUESS # 4 ? 32,34
YOU HAVE TRAPPED MY NUMBER.

GUESS # 5 ? 33,33
MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS.

GUESS # 6 ? 32,32
YOU GOT IT!!!
```

```
1 PRINT TAB(34);"TRAP"
2 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
3 PRINT:PRINT:PRINT
10 G=6
20 N=100
30 REM-TRAP
40 REM-STEVE ULLMAN, 8-1-72
50 PRINT "INSTRUCTIONS";
60 INPUT Z$
70 IF LEFT$(Z$,1)<>"Y" THEN 180
80 PRINT "I AM THINKING OF A NUMBER BETWEEN 1 AND";N
90 PRINT "TRY TO GUESS MY NUMBER. ON EACH GUESS,"
100 PRINT "YOU ARE TO ENTER 2 NUMBERS, TRYING TO TRAP"
110 PRINT "MY NUMBER BETWEEN THE TWO NUMBERS. I WILL"
120 PRINT "TELL YOU IF YOU HAVE TRAPPED MY NUMBER, IF MY"
130 PRINT "NUMBER IS LARGER THAN YOUR TWO NUMBERS, OR IF"
140 PRINT "MY NUMBER IS SMALLER THAN YOUR TWO NUMBERS."
150 PRINT "IF YOU WANT TO GUESS ONE SINGLE NUMBER, TYPE"
160 PRINT "YOUR GUESS FOR BOTH YOUR TRAP NUMBERS."
170 PRINT "YOU GET";G;"GUESSES TO GET MY NUMBER."
180 X=INT(N*RND(1))+1
190 FOR Q=1 TO G
200 PRINT
210 PRINT "GUESS #";Q;
220 INPUT A,B
230 IF A=B AND X=A THEN 400
240 IF A <= B THEN 260
250 GOSUB 360
260 IF A <= X AND X <= B THEN 320
270 IF X<A THEN 300
280 PRINT "MY NUMBER IS LARGER THAN YOUR TRAP NUMBERS."
290 GOTO 330
300 PRINT "MY NUMBER IS SMALLER THAN YOUR TRAP NUMBERS."
310 GOTO 330
320 PRINT "YOU HAVE TRAPPED MY NUMBER."
330 NEXT Q
340 PRINT "SORRY, THAT'S";G;"GUESSES. NUMBER WAS";X
350 GOTO 410
360 R=A
370 A=B
380 B=R
390 RETURN
400 PRINT "YOU GOT IT!!!"
410 PRINT
420 PRINT "TRY AGAIN."
430 PRINT
440 GOTO 180
450 END
```

23 Matches

In the game of twenty-three matches, you start with 23 matches lying on a table. On each turn, you may take 1, 2, or 3 matches. You alternate moves with the computer and the one who has to take the last match loses.

The easiest way to devise a winning strategy is to start at the end of the game. Since you wish to leave the last match to your opponent, you would like to have either 4, 3, or 2 on your last turn so you can take away 3, 2, or 1 and leave 1. Consequently, you would like to leave your opponent with 5 on his next to last turn so, no matter what his move, you are left with 4, 3, or 2. Work this backwards to the beginning and you'll find the game can effectively be won on the first move. Fortunately, the computer gives you the first move, so if you play wisely, you can win.

After you've mastered 23 Matches, move on to BATNUM and then to NIM.

This version of 23 Matches was originally written by Bob Albrecht of People's Computer Company.

```
                23 MATCHES
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

 THIS IS A GAME CALLED '23 MATCHES'.

WHEN IT IS YOUR TURN, YOU MAY TAKE ONE, TWO, OR THREE
MATCHES. THE OBJECT OF THE GAME IS NOT TO HAVE TO TAKE
THE LAST MATCH.

LET'S FLIP A COIN TO SEE WHO GOES FIRST.
IF IT COMES UP HEADS, I WILL WIN THE TOSS.

HEADS! I WIN! HA! HA!
PREPARE TO LOSE, MEATBALL-NOSE !!

 I TAKE 2 MATCHES
THE NUMBER OF MATCHES IS NOW 21

YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES.
HOW MANY DO YOU WISH TO REMOVE            ? 3
THERE ARE NOW  18 MATCHES REMAINING.
MY TURN ! I REMOVE 1 MATCHES
THE NUMBER OF MATCHES IS NOW 17

YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES.
HOW MANY DO YOU WISH TO REMOVE            ? 1
THERE ARE NOW  16 MATCHES REMAINING.
MY TURN ! I REMOVE 3 MATCHES
THE NUMBER OF MATCHES IS NOW 13

YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES.
HOW MANY DO YOU WISH TO REMOVE            ? 1
THERE ARE NOW  12 MATCHES REMAINING.
MY TURN ! I REMOVE 3 MATCHES
THE NUMBER OF MATCHES IS NOW 9

YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES.
HOW MANY DO YOU WISH TO REMOVE            ? 1
THERE ARE NOW  8 MATCHES REMAINING.
MY TURN ! I REMOVE 3 MATCHES
THE NUMBER OF MATCHES IS NOW 5

YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES.
HOW MANY DO YOU WISH TO REMOVE            ? 2
THERE ARE NOW  3 MATCHES REMAINING.
MY TURN ! I REMOVE 2 MATCHES

YOU POOR BOOB ! YOU TOOK THE LAST MATCH ! I GOTCHA !!
HA ! HA! I BEAT YOU !!!

GOOD BYE LOSER!
```

```
20 PRINT TAB(31);"23 MATCHES"
30 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
40 PRINT:PRINT:PRINT
80 PRINT " THIS IS A GAME CALLED '23 MATCHES'."
90 PRINT
100 PRINT "WHEN IT IS YOUR TURN, YOU MAY TAKE ONE, TWO, OR THREE"
110 PRINT "MATCHES. THE OBJECT OF THE GAME IS NOT TO HAVE TO TAKE"
120 PRINT "THE LAST MATCH."
130 PRINT
140 PRINT "LET'S FLIP A COIN TO SEE WHO GOES FIRST."
150 PRINT "IF IT COMES UP HEADS, I WILL WIN THE TOSS."
155 PRINT
160 REM
165 N = 23
170 Q = INT(2*RND(5))
180 IF Q = 1 THEN 210
190 PRINT "TAILS ! YOU GO FIRST "
195 PRINT
200 GOTO 300
210 PRINT "HEADS! I WIN! HA! HA!"
220 PRINT "PREPARE TO LOSE, MEATBALL-NOSE !!"
230 PRINT
250 PRINT " I TAKE 2 MATCHES"
260 N = N -2
270 PRINT "THE NUMBER OF MATCHES IS NOW" N
280 PRINT
290 PRINT "YOUR TURN -- YOU MAY TAKE 1,2,OR 3 MATCHES."
300 PRINT "HOW MANY DO YOU WISH TO REMOVE",
310 INPUT K
320 IF K > 3 THEN 430
330 IF K <= 0 THEN 430
340 N = N - K
350 PRINT "THERE ARE NOW ";N;"MATCHES REMAINING."
351 IF N = 4 THEN 381
352 IF N = 3 THEN 383
353 IF N = 2 THEN 385
360 IF N <= 1 THEN  530
370 Z = 4 - K
372 GOTO 390
380 PRINT
381 Z = 3
382 GOTO 390
383 Z = 2
384 GOTO 390
385 Z = 1
390 PRINT "MY TURN ! I REMOVE" Z "MATCHES"
400 N = N - Z
410 IF N < = 1 THEN 470
420 GOTO 270
430 PRINT "VERY FUNNY ! DUMMY!"
440 PRINT "DO YOU WANT TO PLAY OR GOOF AROUND ?"
450 PRINT "NOW HOW MANY MATCHES DO YOU WANT",
460 GOTO 310
470 PRINT
480 PRINT"YOU POOR BOOB ! YOU TOOK THE LAST MATCH ! I GOTCHA !!"
490 PRINT "HA ! HA! I BEAT YOU !!!"
500 PRINT
510 PRINT "GOOD BYE LOSER!"
520 GOTO 560
530 PRINT "YOU WON, FLOPPY EARS !"
540 PRINT "THINK YOU'RE PRETTY SMART !"
550 PRINT "LETS PLAY AGAIN AND I'LL BLOW YOUR SHOES OFF !!"
560 STOP
570 END
```

War

This program plays the card game of War. In War, the card deck is shuffled, then two cards are dealt, one to each player. Players compare cards and the higher card (numerically) wins. In case of a tie, no one wins. The game ends when you have gone through the whole deck (52 cards, 26 games) or when you decide to quit.

The computer gives cards by suit and number, for example, S-7 is the 7 of spades.

```
                  WAR
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

THIS IS THE CARD GAME OF WAR.  EACH CARD IS GIVEN BY SUIT-#
AS S-7 FOR SPADE 7.  DO YOU WANT DIRECTIONS? YES
THE COMPUTER GIVES YOU AND IT A 'CARD'.  THE HIGHER CARD
(NUMERICALLY) WINS.  THE GAME ENDS WHEN YOU CHOOSE NOT TO
CONTINUE OR WHEN YOU HAVE FINISHED THE PACK.


YOU: S-10      COMPUTER: S-2
YOU WIN.  YOU HAVE 1  COMPUTER HAS 0
DO YOU WANT TO CONTINUE? YES

YOU: S-9       COMPUTER: H-J
COMPUTER WINS!!! YOU HAVE 1  COMPUTER HAS 1
DO YOU WANT TO CONTINUE? YES

YOU: S-5       COMPUTER: D-3
YOU WIN.  YOU HAVE 2  COMPUTER HAS 1
DO YOU WANT TO CONTINUE? YES

YOU: S-K       COMPUTER: H-Q
YOU WIN.  YOU HAVE 3  COMPUTER HAS 1
DO YOU WANT TO CONTINUE? YES

YOU: C-10      COMPUTER: C-8
YOU WIN.  YOU HAVE 4  COMPUTER HAS 1
DO YOU WANT TO CONTINUE? YES

YOU: H-5       COMPUTER: C-5
TIE.  NO SCORE CHANGE.
DO YOU WANT TO CONTINUE? YES

YOU: H-A       COMPUTER: S-4
YOU WIN.  YOU HAVE 5  COMPUTER HAS 1
DO YOU WANT TO CONTINUE? YES

YOU: D-K       COMPUTER: C-K
TIE.  NO SCORE CHANGE.
DO YOU WANT TO CONTINUE? YES

YOU: C-3       COMPUTER: C-9
COMPUTER WINS!!! YOU HAVE 5  COMPUTER HAS 2
DO YOU WANT TO CONTINUE? YES

YOU: H-7       COMPUTER: C-Q
COMPUTER WINS!!! YOU HAVE 5  COMPUTER HAS 3
DO YOU WANT TO CONTINUE? YES
```

```
10 PRINT TAB(33);"WAR"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT: PRINT: PRINT
100 PRINT "THIS IS THE CARD GAME OF WAR.  EACH CARD IS GIVEN BY SUIT-#"
110 PRINT "AS S-7 FOR SPADE 7.  ";
120 PRINT "DO YOU WANT DIRECTIONS";
130 INPUT B$
140 IF B$="NO" THEN 210
150 IF B$="YES" THEN 180
160 PRINT "YES OR NO, PLEASE.  ";
170 GOTO 120
180 PRINT "THE COMPUTER GIVES YOU AND IT A 'CARD'.  THE HIGHER CARD"
190 PRINT "(NUMERICALLY) WINS.  THE GAME ENDS WHEN YOU CHOOSE NOT TO"
200 PRINT "CONTINUE OR WHEN YOU HAVE FINISHED THE PACK."
210 PRINT
220 PRINT
230 DIM A$(52),L(54)
240 FOR I=1 TO 52
250 READ A$(I)
260 NEXT I
270 REM
280 FOR J=1 TO 52
290 LET L(J)=INT(52*RND(1))+1
295 IF J=1 THEN 350
300 FOR K=1 TO J-1
310 IF L(K)<>L(J) THEN 340
320 REM
330 GOTO 290
340 NEXT K
350 NEXT J
360 P=P+1
370 M1=L(P)
380 P=P+1
390 M2=L(P)
400 PRINT
420 PRINT "YOU: ";A$(M1),"COMPUTER: ";A$(M2)
430 N1=INT((M1-.5)/4)
440 N2=INT((M2-.5)/4)
450 IF N1>=N2 THEN 490
460 A1=A1+1
470 PRINT "COMPUTER WINS!!! YOU HAVE";B1;" COMPUTER HAS";A1
480 GOTO 540
490 IF N1=N2 THEN 530
500 B1=B1+1
510 PRINT "YOU WIN.  YOU HAVE";B1;" COMPUTER HAS";A1
520 GOTO 540
530 PRINT "TIE.  NO SCORE CHANGE."
540 IF L(P+1)=0 THEN 610
550 PRINT "DO YOU WANT TO CONTINUE";
560 INPUT V$
570 IF V$="YES" THEN 360
580 IF V$="NO" THEN 650
590 PRINT "YES OR NO, PLEASE.  ";
600 GOTO 540
610 PRINT
620 PRINT
630 PRINT "YOU HAVE RUN OUT OF CARDS.  FINAL SCORE:  YOU--";B1;
640 PRINT "; COMPUTER--";A1
650 PRINT "THANKS FOR PLAYING.  IT WAS FUN."
660 DATA "S-2","H-2","C-2","D-2","S-3","H-3","C-3","D-3"
670 DATA "S-4","H-4","C-4","D-4","S-5","H-5","C-5","D-5"
680 DATA "S-6","H-6","C-6","D-6","S-7","H-7","C-7","D-7"
690 DATA "S-8","H-8","C-8","D-8","S-9","H-9","C-9","D-9"
700 DATA "S-10","H-10","C-10","D-10","S-J","H-J","C-J","D-J"
710 DATA "S-Q","H-Q","C-Q","D-Q","S-K","H-K","C-K","D-K"
720 DATA "S-A","H-A","C-A","D-A"
999 END
```

Weekday

This program gives facts about your date of birth (or some other day of interest). It is not prepared to give information on people born before the use of the current type of calendar, i.e. year 1582.

You merely enter today's date in the form — month, day, year and your date of birth in the same form. The computer then tells you the day of the week of your birth date, your age, and how much time you have spent sleeping, eating, working, and relaxing.

This program was adapted from a GE timesharing program by Tom Kloos at the Oregon Museum of Science and Industry.

```
                WEEKDAY
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

WEEKDAY IS A COMPUTER DEMONSTRATION THAT
GIVES FACTS ABOUT A DATE OF INTEREST TO YOU.

ENTER TODAY'S DATE IN THE FORM: 3,24,1978  ? 1,7,1978
ENTER DAY OF BIRTH (OR OTHER DAY OF INTEREST)? 12,2,1999

 12 / 2 / 1999  WILL BE A THURSDAY


WEEKDAY IS A COMPUTER DEMONSTRATION THAT
GIVES FACTS ABOUT A DATE OF INTEREST TO YOU.

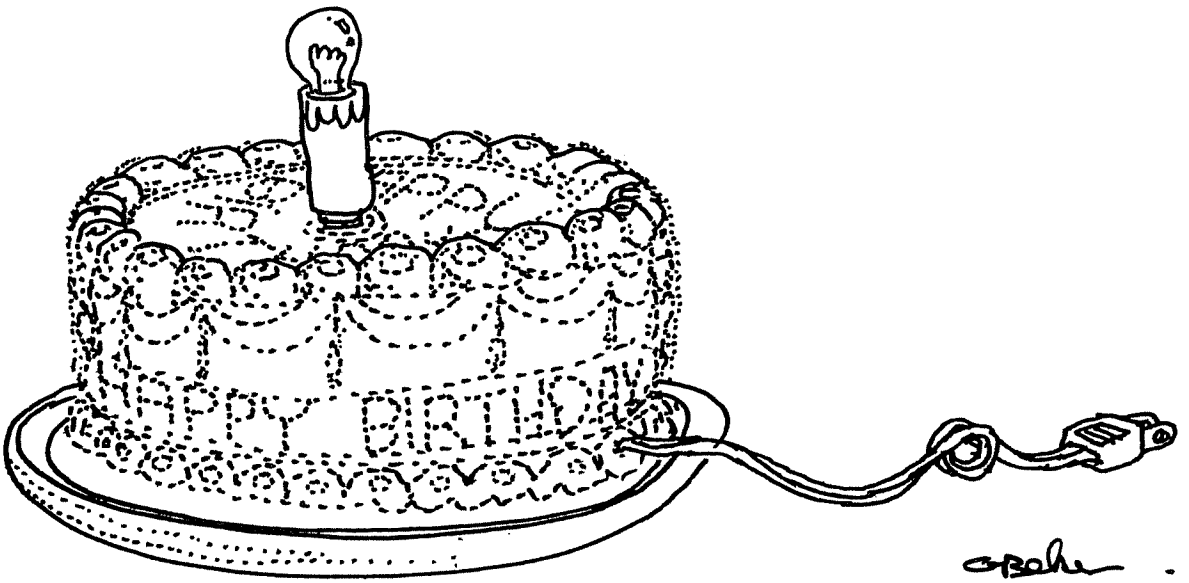
ENTER TODAY'S DATE IN THE FORM: 3,24,1978  ? 12,1,1977
ENTER DAY OF BIRTH (OR OTHER DAY OF INTEREST)? 4,12,1952

 4 / 12 / 1952  WAS A SATURDAY

                        YEARS         MONTHS        DAYS
YOUR AGE IF BIRTHDATE    25            7             19
YOU HAVE SLEPT           8             11            24
YOU HAVE EATEN           4             4             10
YOU HAVE WORKED/PLAYED   5             10            27
YOU HAVE RELAXED         6             4             18

            *YOU MAY RETIRE IN 2017 *
```

```
10 PRINT TAB(32);"WEEKDAY"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "WEEKDAY IS A COMPUTER DEMONSTRATION THAT"
110 PRINT"GIVES FACTS ABOUT A DATE OF INTEREST TO YOU."
120 PRINT
130 PRINT "ENTER TODAY'S DATE IN THE FORM: 3,24,1978  ";
140 INPUT M1,D1,Y1
150 REM THIS PROGRAM DETERMINES THE DAY OF THE WEEK
160 REM  FOR A DATE AFTER 1582
170 DEF FNA(A)=INT(A/4)
180 DIM T(12)
190 DEF FNB(A)=INT(A/7)
200 REM SPACE OUTPUT AND READ IN INITIAL VALUES FOR MONTHS.
210 FOR I= 1 TO 12
220 READ T(I)
230 NEXT I
240 PRINT"ENTER DAY OF BIRTH (OR OTHER DAY OF INTEREST)";
250 INPUT M,D,Y
260 PRINT
270 LET I1 = INT((Y-1500)/100)
280 REM TEST FOR DATE BEFORE CURRENT CALENDAR.
290 IF Y-1582 <0 THEN 1300
300 LET A = I1*5+(I1+3)/4
310 LET I2=INT(A-FNB(A)*7)
320 LET Y2=INT(Y/100)
330 LET Y3 =INT(Y-Y2*100)
340 LET A =Y3/4+Y3+D+T(M)+I2
350 LET B=INT(A-FNB(A)*7)+1
360 IF M > 2 THEN 470
370 IF Y3 = 0 THEN 440
380 LET T1=INT(Y-FNA(Y)*4)
390 IF T1 <> 0 THEN 470
400 IF B<>0 THEN 420
410 LET B=6
420 LET B = B-1
430 GOTO 470
440 LET A = I1-1
450 LET T1=INT(A-FNA(A)*4)
460 IF T1 = 0 THEN 400
470 IF B <>0 THEN 490
480 LET B = 7
490 IF (Y1*12+M1)*31+D1<(Y*12+M)*31+D THEN 550
500 IF (Y1*12+M1)*31+D1=(Y*12+M)*31+D THEN 530
510 PRINT M;"/";D;"/";Y;" WAS A ";
520 GOTO 570
530 PRINT M;"/";D;"/";Y;" IS A ";
540 GOTO 570
550 PRINT M;"/";D;"/";Y;" WILL BE A ";
560 REM PRINT THE DAY OF THE WEEK THE DATE FALLS ON.
570 IF B <>1 THEN 590
```



```
580 PRINT "SUNDAY"
590 IF B<>2 THEN 610
600 PRINT "MONDAY "
610 IF B<>3 THEN 630
620 PRINT "TUESDAY"
630 IF B<>4 THEN 650
640 PRINT "WEDNESDAY"
650 IF B<>5 THEN 670
660 PRINT "THURSDAY"
670 IF B<>6 THEN 690
680 GOTO 1250
690 IF B<>7 THEN 710
700 PRINT "SATURDAY"
710 IF (Y1*12+M1)*31+D1=(Y*12+M)*31+D THEN 1120
720 LET I5=Y1-Y
730 PRINT
740 LET I6=M1-M
750 LET I7=D1-D
760 IF I7>=0 THEN 790
770 LET I6= I6-1
780 LET I7=I7+30
790 IF I6>=0 THEN 820
800 LET I5=I5-1
810 LET I6=I6+12
820 IF I5<0 THEN 1310
830 IF I7 <> 0 THEN 850
835 IF I6 <> 0 THEN 850
840 PRINT"***HAPPY BIRTHDAY***"
850 PRINT " "," "," ","YEARS","MONTHS","DAYS"
860 PRINT "YOUR AGE IF BIRTHDATE ",I5,I6,I7
870 LET A8 = (I5*365)+(I6*30)+I7+INT(I6/2)
880 LET K5 = I5
890 LET K6 = I6
900 LET K7 = I7
910 REM CALCULATE RETIREMENT DATE.
920 LET E = Y+65
930 REM CALCULATE TIME SPENT IN THE FOLLOWING FUNCTIONS.
940 LET F = .35
950 PRINT "YOU HAVE SLEPT ",
960 GOSUB 1370
970 LET F = .17
980 PRINT "YOU HAVE EATEN ",
990 GOSUB 1370
1000 LET F = .23
1010 IF K5 > 3 THEN 1040
1020 PRINT "YOU HAVE PLAYED",
1030 GOTO 1080
1040 IF K5 > 9 THEN 1070
1050 PRINT "YOU HAVE PLAYED/STUDIED",
1060 GOTO  1080
1070 PRINT "YOU HAVE WORKED/PLAYED",
1080 GOSUB 1370
1085 GOTO 1530
1090 PRINT "YOU HAVE RELAXED ",K5,K6,K7
1100 PRINT
1110 PRINT " ","*YOU MAY RETIRE IN";E;"*"
1120 PRINT
1140 PRINT
1150 PRINT
1160 PRINT
1170 PRINT
1180 PRINT
1190 PRINT
1200 PRINT
1210 PRINT
1220 PRINT
1230 PRINT
1240 END
1250 IF D=13 THEN 1280
1260 PRINT "FRIDAY "
1270 GOTO 710
1280 PRINT "FRIDAY THE THIRTEENTH---BEWARE"
1290 GOTO 710
1300 PRINT "NOT PREPARED TO GIVE DAY OF WEEK PRIOR TO MDLXXXII. "
1310 GOTO 1140
1320 REM TABLE OF VALUES FOR THE MONTHS TO BE USED IN CALCULATIONS.
1330 DATA 0, 3, 3, 6, 1, 4, 6, 2, 5, 0, 3, 5
1340 REM THIS IS THE CURRENT DATE USED IN THE CALCULATIONS.
1350 REM THIS IS THE DATE TO BE CALCULATED ON.
1360 REM CALCULATE TIME IN YEARS, MONTHS, AND DAYS
1370 LET K1=INT(F*A8)
1380 LET I5 = INT(K1/365)
1390 LET K1 = K1- (I5*365)
1400 LET I6 = INT(K1/30)
1410 LET I7 = K1 -(I6*30)
1420 LET K5 = K5-I5
1430 LET K6 =K6-I6
1440 LET K7 = K7-I7
1450 IF K7>=0 THEN 1480
1460 LET K7=K7+30
1470 LET K6=K6-1
1480 IF K6>0 THEN 1510
1490 LET K6=K6+12
1500 LET K5=K5-1
1510 PRINT I5,I6,I7
1520 RETURN
1530 IF K6=12 THEN 1550
1540 GOTO 1090
1550 LET K5=K5+1
1560 LET K6=0
1570 GOTO 1090
1580 REM
1590 END
```

Word

WORD is a combination of HANGMAN and BAGELS. In this game, the player must guess a word with clues as to letter position furnished by the computer. However, instead of guessing one letter at a time, in WORD you guess an entire word (or group of 5 letters, such as ABCDE). The computer will tell you if any letters that you have guessed are in the mystery word and if any of them are in the correct position. Armed with these clues, you go on guessing until you get the word or, if you can't get it, input a "?" and the computer will tell you the mystery word.

You may change the words in Data Statements 512 and 513, but they must be 5-letter words.

The author of this program is Charles Reid of Lexington High School, Lexington, Massachusetts.

```
                WORD
CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY

I AM THINKING OF A WORD -- YOU GUESS IT.  I WILL GIVE YOU
CLUES TO HELP YOU GET IT.  GOOD LUCK!!

YOU ARE STARTING A NEW GAME...
GUESS A FIVE LETTER WORD? ABCDE
THERE WERE 3 MATCHES AND THE COMMON LETTERS WERE...CAD
FROM THE EXACT LETTER MATCHES, YOU KNOW.....---D-

GUESS A FIVE LETTER WORD? FGHIJ
THERE WERE 0 MATCHES AND THE COMMON LETTERS WERE...
FROM THE EXACT LETTER MATCHES, YOU KNOW.....---D-

IF YOU GIVE UP, TYPE '?' FOR YOUR NEXT GUESS.

GUESS A FIVE LETTER WORD? LMNOP
THERE WERE 1 MATCHES AND THE COMMON LETTERS WERE...N
FROM THE EXACT LETTER MATCHES, YOU KNOW.....--ND-

IF YOU GIVE UP, TYPE '?' FOR YOUR NEXT GUESS.

GUESS A FIVE LETTER WORD? CANDY
THERE WERE 5 MATCHES AND THE COMMON LETTERS WERE...CANDY
FROM THE EXACT LETTER MATCHES, YOU KNOW.....CANDY
YOU HAVE GUESSED THE WORD.  IT TOOK 4 GUESSES!

WANT TO PLAY AGAIN? YES
YOU ARE STARTING A NEW GAME...
GUESS A FIVE LETTER WORD? ABCDE
THERE WERE 0 MATCHES AND THE COMMON LETTERS WERE...
FROM THE EXACT LETTER MATCHES, YOU KNOW.....-----

IF YOU GIVE UP, TYPE '?' FOR YOUR NEXT GUESS.

GUESS A FIVE LETTER WORD? FGHIJ
THERE WERE 2 MATCHES AND THE COMMON LETTERS WERE...FI
FROM THE EXACT LETTER MATCHES, YOU KNOW.....F----

GUESS A FIVE LETTER WORD? MNOPS
THERE WERE 1 MATCHES AND THE COMMON LETTERS WERE...S
FROM THE EXACT LETTER MATCHES, YOU KNOW.....F----

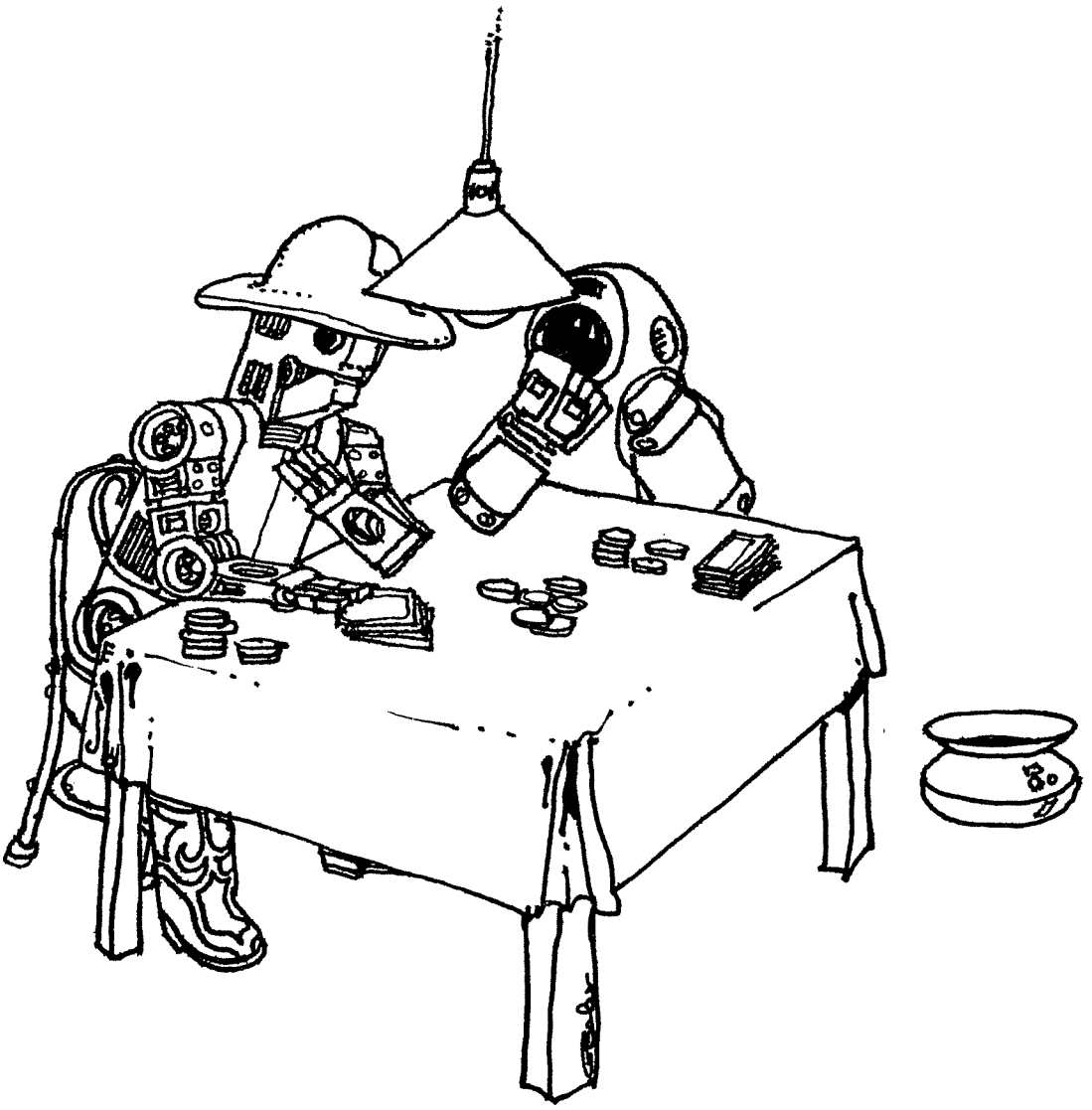
IF YOU GIVE UP, TYPE '?' FOR YOUR NEXT GUESS.

GUESS A FIVE LETTER WORD? FISTS
THERE WERE 5 MATCHES AND THE COMMON LETTERS WERE...FISST
FROM THE EXACT LETTER MATCHES, YOU KNOW.....FI---

GUESS A FIVE LETTER WORD? FIRST
THERE WERE 5 MATCHES AND THE COMMON LETTERS WERE...FIRST
FROM THE EXACT LETTER MATCHES, YOU KNOW.....FIRST
YOU HAVE GUESSED THE WORD.  IT TOOK 5 GUESSES!

WANT TO PLAY AGAIN? NO
```

```
2 PRINT TAB(33);"WORD"
3 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
4 PRINT: PRINT: PRINT
5 DIM S(7),A(7),L(7),D(7),P(7)
10 PRINT "I AM THINKING OF A WORD -- YOU GUESS IT.  I WILL GIVE YOU"
15 PRINT "CLUES TO HELP YOU GET IT.  GOOD LUCK!!": PRINT: PRINT
20 REM
30 PRINT: PRINT: PRINT "YOU ARE STARTING A NEW GAME..."
35 RESTORE
40 READ N
50 C=INT(RND(1)*N+1)
60 FOR I=1 TO C
70 READ S$
80 NEXT I
90 G=0
95 S(0)=LEN(S$)
100 FOR I=1 TO LEN(S$): S(I)=ASC(MID$(S$,I,1)): NEXT I
110 FOR I=1 TO 5
120 A(I)=45
130 NEXT I
140 FOR J=1 TO 5
144 P(J)=0
146 NEXT J
150 PRINT "GUESS A FIVE LETTER WORD";
160 INPUT L$
170 G=G+1
172 IF S$=G$ THEN 500
173 FOR I=1 TO 7: P(I)=0: NEXT I
175 L(0)=LEN(L$)
180 FOR I=1 TO LEN(L$): L(I)=ASC(MID$(L$,I,1)): NEXT I
190 IF L(1)=63 THEN 300
200 IF L(0)<>5 THEN 400
205 M=0: Q=1
210 FOR I=1 TO 5
220 FOR J=1 TO 5
230 IF S(I)<>L(J) THEN 260
231 P(Q)=L(J)
232 Q=Q+1
233 IF I<>J THEN 250
240 A(J)=L(J)
250 M=M+1
260 NEXT J
265 NEXT I
270 A(0)=5
272 P(0)=M
275 A$="": FOR I=1 TO A(0): A$=A$+CHR$(A(I)): NEXT I
277 P$="": FOR I=1 TO P(0): P$=P$+CHR$(P(I)): NEXT I
280 PRINT "THERE WERE";M;"MATCHES AND THE COMMON LETTERS WERE...";P$
285 PRINT "FROM THE EXACT LETTER MATCHES, YOU KNOW.....";A$
286 IF A$=S$ THEN 500
287 IF M>1 THEN 289
288 PRINT: PRINT "IF YOU GIVE UP, TYPE '?' FOR YOUR NEXT GUESS."
289 PRINT
290 GOTO 150
300 S$="": FOR I=1 TO 7: S$=S$+CHR$(S(I)): NEXT I
310 PRINT "THE SECRET WORD IS ";S$: PRINT
320 GOTO 30
400 PRINT "YOU MUST GUESS A 5 LETTER WORD.  START AGAIN."
410 PRINT: G=G-1: GOTO 150
500 PRINT "YOU HAVE GUESSED THE WORD.  IT TOOK";G;"GUESSES!": PRINT
510 INPUT "WANT TO PLAY AGAIN";Q$
520 IF Q$="YES" THEN 30
530 DATA 12,"DINKY","SMOKE","WATER","GRASS","TRAIN","MIGHT","FIRST"
540 DATA "CANDY","CHAMP","WOULD","CLUMP","DOPEY"
999 END
```



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David H. Ahl is the founder and publisher of *Creative Computing*.

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