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.

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                      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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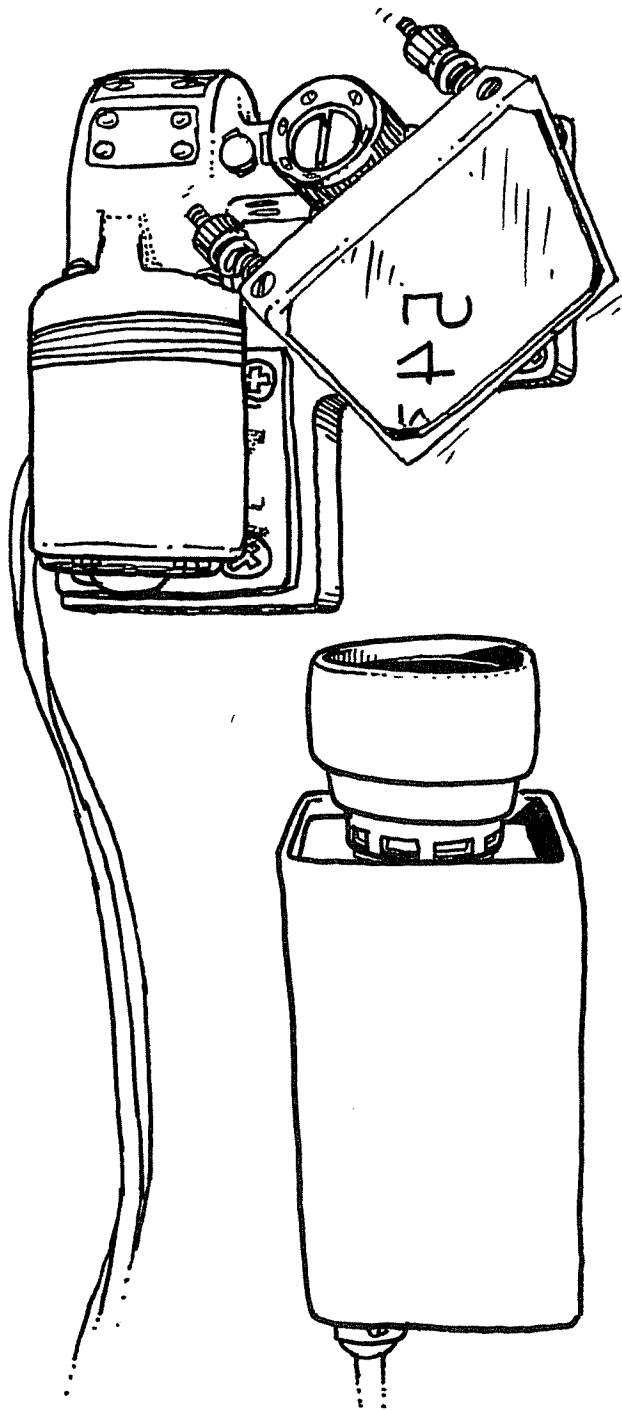
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10 PRINT TAB(32);"REVERSE"
20 PRINT TAB(15);"CREATIVE COMPUTING  MORRISTOWN, NEW JERSEY"
30 PRINT:PRINT:PRINT
100 PRINT "REVERSE -- A GAME OF SKILL": PRINT
130 DIM A(20)
140 REM *** N=NUMBER OF NUMBERS
150 N=9
160 PRINT "DO YOU WANT THE RULES";
170 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
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