

# 33. Back to Front

## *General Description*

This program is an old mathematical favourite. Once you get the 'knack' it is easy but for the first years through to the fifth years it has provided great entertainment in trying to get the knack. It is a test of logical thinking.

You are given a line of numbers, in this case digits 1-9. They can be in any order. The object is to re-order the line of numbers in as few steps as possible using the following rule:

You specify the number of digits at the left of the line that you wish to reverse from their currently displayed order.

e.g. line of digits >>> 3 2 1 5 6 8 7 9 4

If I specify three digits reversed I will end up with a line like this:

new line of digits >>> 1 2 3 5 6 8 7 9 4

Then if I specify eight digits reversed I will end up with a line like this:

new lines of digits >>>9 7 8 6 5 3 2 1 4

If you don't know the puzzle, can't solve it but need to solve it to save losing face in the classroom, the solution is in the educational hints. This program uses sound and colour well. It runs on a Model 'A'.

## *Detailed Description*

**Lines 10-330** Mode 7. Initialises variables, disables cursor, displays titles with sound and waits for user response.

**340-500** Main structure of program. Line 490 checks user's answer.

**510-720** Reverses the required number of digits.

**740-880** Locates the string the user has to solve. Line 830

ensures that no number is repeated.

**920-990** Ask how many numbers required by user (range 2-9).

**1030-1070** Display number of tries.

**1110-1410** Gives example of play.

**1430-1470** Closing credits

**1480-1610** Correct answer procedure and invitation for another game.

### *Educational Note*

This program captivates. I have watched and listened to groups of children in heated discussion about which numbers to reverse, and it gives the lie to the theory that the computer stifles conversation. It can actively encourage discussion amongst young people. The solution by the way is, repeating from the highest digit down to the lowest digit, bring it to the left-hand end of the line before sending it into its final position.

I would suggest that you can safely use this program for 15 minutes with a group of children before they show signs of restlessness. The only problem is how to lead up in the classroom to using it, and I have tended to offer it as a lesson 'break' .

### *Program Listing*

```
>
10  REM *****
20  REM **          BACK TO FRONT          **
30  REM **          PROGRAM WRITTEN        **
40  REM **          Ian Clarke.            **
50  REM **          Jan 83.                **
60  REM *****
70  MODE 7
75  VDU 23;8202;0;0;0;
76  PRINT
77  *FX4,1
80  ON ERROR GOTO 1430
90  DIM M$(2),H$(9)
100 ENVELOPE 3,2,4,2,3,6,7,4,2,0,0,-2,120,100
110 ENVELOPE 2,2,3,3,3,3,3,3,2,0,0,-2,120,100
120 ENVELOPE 1,1,20,0,-20,20,1,20,0,-2,0,-2,120,90
130 A=0
140 G=0
150 S$="
160 A$=" 1 2 3 4 5 6 7 8 9 "
170 G$=" 4 2 6 5 1 8 9 7 3 "
```

```

180 PRINTTAB(13,10);CHR$(141);CHR$(130);CHR$(136);"BACK T
O FRONT"
190 PRINTTAB(13);CHR$(141);CHR$(130);CHR$(136);"BACK TO F
RONT"
200 FOR X=1 TO 80
210     SOUND 1,-10,95,1
220     SOUND 1,0,1,1
230 NEXT
240 CLS
250 PRINT TAB(0,14);CHR$(141);CHR$(131);"Do you know this
puzzle."
260 PRINT CHR$(141);CHR$(131);"Do you know this puzzle."
270 PRINT
280 *FX15
290 YN$=GET$
300 IF YN$<>"N"ANDYN$<>"Y"ANDYN$<>"n"ANDYN$<>"y" THEN GOT
O290
310 IF YN$="Y" OR YN$="y" THEN PRINTCHR$(141);CHR$(131);"
yes":PRINTCHR$(141);CHR$(131);"yes":GOTO330
320 PROCintro
330 *FX15
340 PROCnumber
350 CLS
360 PRINTTAB(8,12);G$
370 PRINTTAB(25,18);CHR$(141);CHR$(133);"TRIES="
380 PRINTTAB(25);CHR$(141);CHR$(133);"TRIES="
390 PRINTTAB(27,20);CHR$(141);CHR$(133);G:PRINTTAB(27);CH
R$(141);CHR$(133);G
400 PRINTTAB(2,5);CHR$(141);CHR$(133);"Enter how many num
bers do you"
410 PRINTTAB(2);CHR$(141);CHR$(133);"Enter how many numbe
rs do you"
420 PRINTTAB(9);CHR$(141);CHR$(133);"want to reverse?"
430 PRINTTAB(9);CHR$(141);CHR$(133);"want to reverse?"
440 PROCinput
450 PROCtries
460 PROCreverse
470 PRINTTAB(15,9);CHR$(141);CHR$(128);" "
480 PRINTTAB(15);CHR$(141);CHR$(128);" "
490 IF G$=A$ THEN GOTO 1480
500 GOTO 440
510 REM -----
520 REM             Reverse T numbers
530 DEF PROCreverse
540 PRINTTAB(8,13);LEFT$(G$,T*2+1)
550 PRINTTAB(8,12);RIGHT$(S$,T*2+1)
560 H1$=RIGHT$(G$,18-(T*2))
570 H$=" "
580 W=2
590 SOUND 1,1,120,120
600 FOR X=T TO 1 STEP -1
610     H$=H$+MID$(G$,X*2+1,1)+" "
620     PRINT TAB(X*2+8,13);CHR$(32)
630     FOR Y=T*2 TO W STEP -1
640         PRINTTAB(Y+9,12);CHR$(32)
650         PRINTTAB(Y+8,12);MID$(G$,X*2+1,1)
660     FOR E=1 TO 100:NEXT
670     NEXT
680     W=W+2
690 NEXT
700 *FX15
710 G$=G$+H1$
720 ENDPROC
730 REM .....
740 DEF PROCnumber
750 REM -----
760 REM Create a number for the user to reverse
770 G$=" "
780 FOR X=1 TO 9

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790     Y%=0
800     H%=RND(9)
810     REPEAT
820         Y%=Y%+1
830         IF H%(Y%)=H% THEN Y%=0:H%=RND(9):GOTO 820
840     UNTIL Y%=X
850     H%(X)=H%
860     G$=G$+STR$(H%)+ " "
870 NEXT X
880 ENDPROC
890 REM .....
900 REM -----
910 REM Get a number from the keyboard
920 DEF PROCinput
930 *FX15
940 T=GET
950 IF T<50 OR T>57 THEN GOTO 940
960 T=T-48
970 PRINTTAB(15,9);CHR$(141);CHR$(133);T
980 PRINTTAB(15)CHR$(141);CHR$(133);T
990 ENDPROC
1000 REM .....
1010 REM -----
1020 REM Print out how many tries.
1030 DEF PROCtries
1040 G=G+1
1050 PRINTTAB(27,20);CHR$(141);CHR$(133);G
1060 PRINTTAB(27);CHR$(141);CHR$(133);G
1070 ENDPROC
1080 REM .....
1090 REM -----
1100 REM Introductory message.
1110 DEFPROCintro
1120 PRINT CHR$(141);CHR$(131);"no":PRINTCHR$(141);CHR$(13
1);"no"
1130 FOR X=1 TO 1000:NEXT
1140 CLS
1150 PRINT TAB(2,5);CHR$(129);"You will see the numbers 1
to 9 in"
1160 PRINTTAB(12);CHR$(129);"the wrong order"
1170 PRINT TAB(8,12);G$
1180 FOR X=1TO9000:NEXT
1190 T=3+RND(5)
1200 PRINT TAB(2,8);CHR$(129);"If you type ";T;" I'll turn
the first"
1210 PRINTTAB(10);CHR$(129);T;" numbers round like this:"
1220 FOR X=1 TO 10000:NEXT
1230 PROCreverse
1240 FOR X=1 TO 5000:NEXT
1250 FOR X=0 TO 11
1260 PRINTTAB(0,X);S$+S$
1270 NEXT
1280 T=11-T
1290 PRINT TAB(2,8);CHR$(129);"If you type ";T;" I'll reve
rse the first"
1300 PRINTTAB(10);CHR$(129);T;" numbers like this:"
1310 FORX=1TO6500:NEXT
1320 PROCreverse
1330 PRINTTAB(18,10);CHR$(129);"and so on."
1340 FORX=1TO5000:NEXT
1350 CLS
1360 PRINTTAB(8,8);CHR$(133);"You have to finish with"
1370 PRINTTAB(8,12);" 1 2 3 4 5 6 7 8 9 "
1380 FORX=1TO5000:NEXT
1390 PRINTTAB(16,15);CHR$(133);" OK?"
1400 FORX=1TO5000:NEXT
1410 ENDPROC
1420 REM -----
1430 CLS

```

```

1440 SOUND 1,2,120,60
1450 PRINTTAB(15,10);CHR$(141);CHR$(130);CHR$(136);"BYE!!!"
"
1460 PRINTTAB(15);CHR$(141);CHR$(130);CHR$(136);"BYE!!!"
1470 GOTO 1590
1480 FOR X=1 TO 2000:NEXT
1490 CLS
1500 SOUND 1,3,120,90
1510 PRINTTAB(5,12);CHR$(136);CHR$(141);CHR$(134);"You got
the answer in ";G;" moves"
1520 PRINTTAB(5);CHR$(136);CHR$(134);CHR$(141);"You got th
e answer in ";G;" moves"
1530 PRINTTAB(10,16);CHR$(141);CHR$(134);"Play again ???"
1540 PRINTTAB(10);CHR$(141);CHR$(134);"Play again ???"
1550 *FX15,1
1560 G=0
1570 YN$=GET$
1580 IF YN$="Y" THEN PRINT CHR$(141);"yes":PRINT CHR$(141)
;"yes":FORX=1 TO 3000:NEXT:GOTO 330 ELSE PRINT"no."
1590 FOR X=1TO 9000:NEXT
1591 *FX4
1592 *FX11,25
1600 MODE 7
1610 END

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