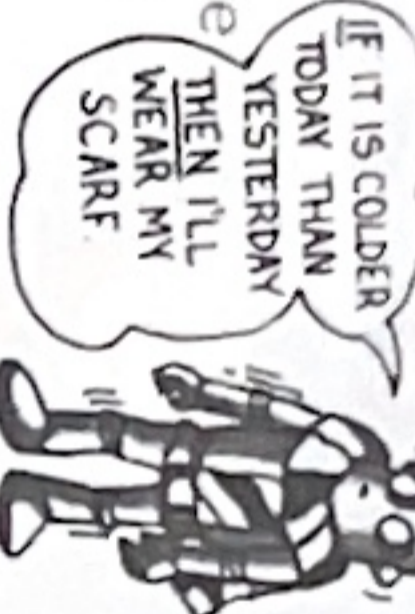


How computers compare things

One of the most useful things a computer can do is to compare pieces of information and then do different things according to the results. To do this you use the words IF... THEN



Equal
 Greater than
 Not equal
 Less than

The computer can do several different tests on information to compare it. The symbols for the tests are shown above. It can test to see if two pieces of data are equal, different, or if one is greater or less than the other.

2

```

IF A=B THEN PRINT "THEY ARE EQUAL"
IF A>B THEN PRINT "A IS BIGGER"
IF A<B THEN PRINT "A IS SMALLER"
IF A<>B THEN PRINT "THEY ARE NOT EQUAL"
    
```

These lines show how you use the symbols with IF and THEN to make the computer compare two pieces of data - You can compare any kind of data - words, numbers and variables, i.e. the contents of memory spaces, too.

3 Weather program

```

10 PRINT "WHAT'S THE WEATHER LIKE TODAY"
20 INPUT WS
30 IF WS="RAIN" THEN PRINT "UMBRELLA TIME"
40 IF WS="SUNNY" THEN PRINT "GOOD"
50 END
    
```

SNOWY
 HOT

If you input these words nothing will happen

4

```

RUN
WHAT'S THE WEATHER
LIKE TODAY
TSUNNY
GOOD
RUN
WHAT'S THE WEATHER
LIKE TODAY
TRAIN
UMBRELLA TIME
    
```

Here is a program using IF and THEN. At line 20 the computer stores the word you input in variable WS. Then, at lines 30 and 40 it checks to see if the word in WS is the same as "rain" or "sunny". If it is, it prints

out one of the responses. If you put in a different word at line 20 nothing will happen. You could change the words in lines 30 and 40, though, then try inputting one of the new words.

5 Age program

```

10 PRINT "HOW OLD ARE YOU"
20 INPUT A
30 IF A>16 THEN PRINT "OLD"
40 IF A<16 THEN PRINT "YOUNG"
50 IF A=16 THEN PRINT "JUST RIGHT"
RUN
HOW OLD ARE YOU
16
JUST RIGHT
    
```

In the age program, the computer compares input A with the figure 16. If it is bigger than 16 it prints "old". If it is smaller it prints "young" and if it is 16 it prints "just

6 French lesson

```

10 PRINT "HOW DO YOU SAY RED IN
FRENCH"
20 INPUT AS
30 IF AS="ROUGE" THEN PRINT "CORRECT"
40 IF AS<>"ROUGE" THEN PRINT "NO,
ROUGE"
RUN
HOW DO YOU SAY RED IN FRENCH
BLEU
NO, ROUGE
    
```

right". In the other program the computer prints out one of two different responses depending on whether AS equals "rouge" or not.

Branching programs

1

```

IF A=6 THEN LET AS="SIX"
IF X=Y-2 THEN LET Z=0
IF S=T THEN STOP
IF R<10 THEN GOTO 30
    
```

This tells the computer to go to line 30.

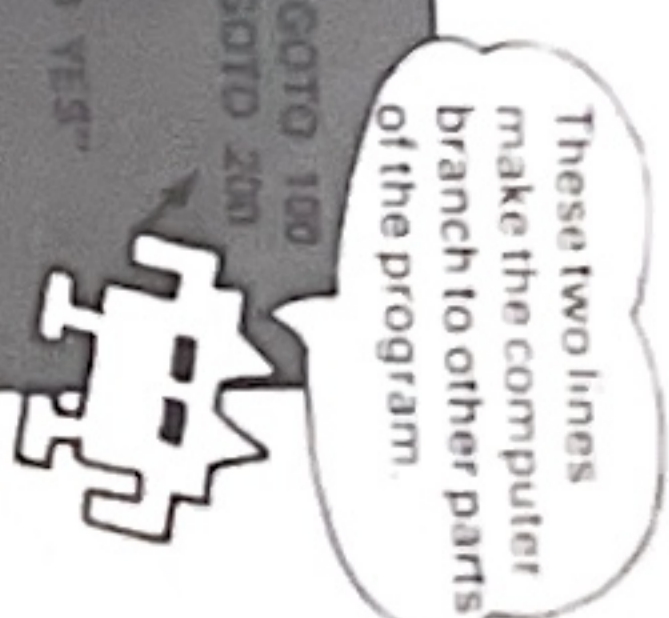
You can give the computer almost any instruction after the word THEN, as shown above. A useful instruction is to make it go to another line. (On most computers, but

2

```

10 INPUT KS
20 IF KS="YES" THEN GOTO 100
30 IF KS="NO" THEN GOTO 200
100 PRINT "YOU TYPED YES"
110 STOP
200 PRINT "YOU TYPED NO"
210 END
    
```

not the ZX81, you can leave out the word GOTO.) You usually need a STOP instruction in programs with GOTO, or the computer will go on repeating the program endlessly.



Maths program

```

10 PRINT "TYPE IN A NUMBER"
20 INPUT A
30 PRINT "TYPE IN ANOTHER NUMBER"
40 INPUT B
50 PRINT "DO YOU WANT TO"
60 PRINT "ADD, SUBTRACT, MULTIPLY"
65 PRINT "DIVIDE OR STOP"
70 INPUT CS
80 IF CS="ADD" THEN PRINT A+B
90 IF CS="SUBTRACT" THEN PRINT A-B
100 IF CS="MULTIPLY" THEN PRINT A*B
110 IF CS="DIVIDE" THEN PRINT A/B
120 IF CS="STOP" THEN STOP
130 GOTO 10
    
```

THE PROGRAM WILL ONLY STOP WHEN YOU INPUT THE WORD STOP

```

RUN
TYPE IN A NUMBER
717
TYPE IN ANOTHER NUMBER
7184
DO YOU WANT TO
ADD, SUBTRACT, MULTIPLY
DIVIDE OR STOP
7ADD
201
TYPE IN A NUMBER
answer
?
    
```

In this program the numbers you type in are stored in A and B and your instructions are stored in CS. At lines 80 to 120 the computer compares CS with five different words, and when it finds the right word, it carries out the instruction. It passes over all the lines which are not true.

Age guessing program

1

```

10 PRINT "GUESS MY AGE"
20 INPUT G
30 IF G=14 THEN PRINT "TRY AGAIN"
40 IF G=16 THEN GOTO 20
50 PRINT "CORRECT"
60 END
    
```

2

```

RUN
GUESS MY AGE
715
TRY AGAIN
714
CORRECT
    
```

3

```

GUESS MY AGE
716
YOUNGER THAN THAT
713
OLDER THAN THAT
714
CORRECT
    
```

CAN YOU WRITE THE PROGRAM FOR THIS?

This program will go on repeating itself until G=14. When G=14 the computer will pass over lines 30 and 40 and print

"correct". Can you alter the program so that it gives you some clues, as shown in the picture on the right?