



Figure 1: Cable with three wires and three switches

## Wires and Switches

In Figure 1, a cable with three wires connects side A to side B. On side A, the three wires are labeled 1, 2, and 3. On side B, wires 1 and 3 are connected to switch 3, and wire 2 is connected to switch 1.

In general, the cable contains  $m$  wires ( $1 \leq m \leq 90$ ), labeled 1 through  $m$  on side A, and there are  $m$  switches on side B, labeled 1 through  $m$ . Each wire is connected to exactly one of the switches. Each switch can be connected to zero or more wires.

## Measurements

Your program has to determine how the wires are connected to the switches by doing some measurements. Each switch can be made either conducting or non-conducting. Initially all switches are non-conducting. A wire can be tested on side A with probe  $P$ : Lamp  $L$  will light up if and only if the sensed wire is connected to a conducting switch.

Your program begins by reading one line with the number  $m$  from *standard input*. It then can give three kinds of commands by writing a line to *standard output*. Each command starts with a single uppercase letter: T (Test a wire), C (Change a switch), and D (Done). Command T is followed by a wire label, C by a switch label, and D by a list whose  $i$ -th element is the label of the switch to which wire  $i$  is connected.

After commands T and C, your program should read one line from *standard input*. Command T returns Y (Yes) when the wire's switch is conducting (the lamp lights up), otherwise it returns N (No). Command C returns Y if the new switch state is conducting, and N otherwise. The effect of command C is to change the state of the switch (if it was conducting then it will be non-conducting afterwards and vice versa); the result is returned just for feedback.

Your program may give commands T and C mixed in any order. Finally, it gives command D and terminates. Your program should give no more than nine hundred (900) commands in total.

## Example

Figure 2 presents an example conversation involving 8 commands relating to Figure 1.

Standard Output	Standard Input
	3
C 3	Y
T 1	Y
T 2	N
T 3	Y
C 3	N
C 2	Y
T 2	N
D 3 1 3	

Figure 2: Example conversation