Query on a tree IV

You are given a tree (an acyclic undirected connected graph) with N nodes, and nodes numbered 1,2,3...,N. Each edge has an integer value assigned to it(note that the value can be negative). Each node has a color, white or black. We define dist(a, b) as the sum of the value of the edges on the path from node a to node b.

All the nodes are white initially.

We will ask you to perfrom some instructions of the following form:

- **C a** : change the color of node a.(from black to white or from white to black)
- **A** : ask for the maximum dist(a, b), both of node a and node b must be white(a can be equal to b). Obviously, as long as there is a white node, the result will alway be non negative.

Input

- In the first line there is an integer N (N <= 100000)
- In the next N-1 lines, the i-th line describes the i-th edge: a line with three integers a b c denotes an edge between a, b of value c (-1000 <= c <= 1000)
- In the next line, there is an integer Q denotes the number of instructions (Q <= 100000)
- In the next Q lines, each line contains an instruction "C a" or "A"

Output

For each "A" operation, write one integer representing its result. If there is no white node in the tree, you should write "They have disappeared.".

Example

Input:
3
1 2 1
1 3 1
7
A
C 1
A
C 2
A
C 3
A

Output:
2
2
0
They have disappeared.

Some new test data cases were added on Apr.29.2008, all the solutions have been rejudged.