

# Subtrees And Paths

Given a rooted tree of  $N$  nodes, where each node is uniquely numbered in between  $[1..N]$ . The node 1 is the root of the tree. Each node has an integer value which is initially 0.

You need to perform the following two kinds of queries on the tree:

- *add t value*: Add value to all nodes in subtree rooted at  $t$
- *max a b*: Report maximum value on the path from  $a$  to  $b$

## Input Format

First line contains  $N$ , number of nodes in the tree. Next  $N-1$  lines contain two space separated integers  $x$  and  $y$  which denote that there is an edge between node  $x$  and node  $y$ .

Next line contains  $Q$ , the number of queries to process.

Next  $Q$  lines follow with either *add* or *max* query per line.

## Constraints

$$\begin{aligned} 1 \leq N &\leq 10^5 \\ 1 \leq Q &\leq 10^5 \\ 1 \leq t, a, b, x, y &\leq N \\ x &\neq y \\ -10^4 \leq value &\leq 10^4 \end{aligned}$$

## Output Format

For each *max* query output the answer in a separate line.

## Sample Input

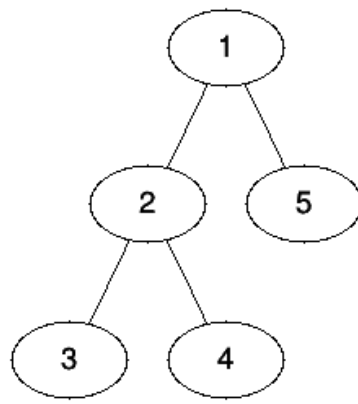
```
5
1 2
2 3
2 4
5 1
6
add 4 30
add 5 20
max 4 5
add 2 -20
max 4 5
max 3 4
```

## Sample Output

```
30
20
10
```

## Explanation

In the test case we have the following tree:



Initially all node values are zero.

Queries are performed in the following way:

**add 4 30** // add 30 to node 4

**add 5 20** // add 20 to node 5

**max 4 5** // maximum of nodes 4,2,1,5 is 30

**add 2 -20** // subtract 20 from nodes 2,3,4

**max 4 5** // maximum of nodes 4,2,1,5 is 20

**max 3 4** // maximum of nodes 3,2,4 is 10