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

$1 \leq N \leq 10^5$

$1 \leq Q \leq 10^5$

$1 \leq t, a, b, x, y \leq N$

$x \neq y$

$-10^4 \leq value \leq 10^4$

Output Format

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

Sample Input

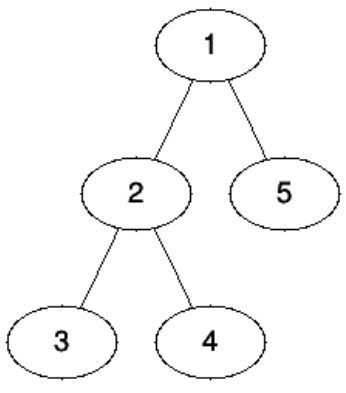
```
5
1 2
2 3
2 4
5 1
6
add 4 30
add 5 20
max 4 5
add 2 -20
max 4 5
max 3 4
```

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

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Max Score	120
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