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
$$1 \le N \le 10^5$$
$$1 \le Q \le 10^5$$
$$1 \le t, a, b, x, y \le N$$
$$x \ne y$$
$$-10^4 \le value \le 10^4$$

Output Format

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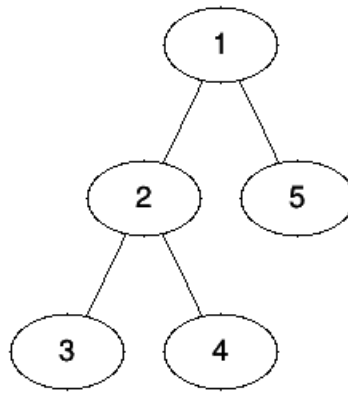
Sample Input

```
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