Fuchsia and Rats on the Tree

Fuchsia loves to chase rats and someday she sees a tree full of rats roaming on its branches. The positions which she can take on this tree are enumerated 1 to N. Of course, she can't resist the urge of hunt all of them down.

Fuchsia initially takes the position y, and her weight is equal to k. There are S rats on the tree. Fuchsia notices all of the rats in order i.e. S_1 to S_N. The S_i'th rat she notices roams between position a and b, and the weight of this rat is equal to f. Fuchsia can choose to hunt the S_i'th rat down or stay put on her current position which means Fuchsia can't hunt this rat down anymore.

In order to hunt the S_i'th rat, Fuchsia's weight k, has to be greater than the rat's weight, f_i. Also she has to choose a position h, such that the path formed between the positions a_i and b_i which S_i'th rat is roaming between, has to be fully inside of the path formed between Fuchsia's current position and the target position, h. If Fuchsia hunts the rat, her new position becomes h and her weight increases by d. If it's impossible to catch this S_i'th rat she stays put in her current position and she uses this moment to lick herself.

After noticing all of the rats, help Fuchsia to become the chubbiest (heaviest) cat on earth.

Input Format

First line contains three space separated integers: N, y and k.
Following $N-1$ lines contain two space separated integers: u and v which denotes there is a path between point u and v in the tree.
Next line contains the integer S.
Following S lines contain four space separated integers which specifies the attributes of S_i'th rat: a, b, f, d.

Constraints

$1 \leq N, S \leq 2 \cdot 10^5$
$1 \leq h, a, b, u, v, y \leq N$
$a \neq b$
$1 \leq k, d \leq 10^9$
$-10^3 \leq f \leq 10^3$
The graph described in the input is connected and acyclic.

Output Format

Print a single integer denoting the maximum weight of Fuchsia after noticing all of the rats.

Sample Input

```
7 1 4
1 2
1 3
3 7
1 4
4 5
5 6
4
2 4 3 5
3 7 2 4
2 3 4 -1
4 5 5 4
```

Sample Output

```
12
```

Explanation

After drawing the graph we can easily see that it's impossible to catch the first rat since we can't pick such a position h that will include that rat's path. However we can catch the second rat and our new position will be 7 and our new weight is $4 + 4 = 8$. Even though we can catch the third rat it will decrease the Fuchsia's weight so she won't want to catch that rat. However Fuchsia will catch the last rat increasing her weight to $8 + 4 = 12$.