E. Vasya and a Tree

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vasya has a tree consisting of n vertices with root in vertex 1. At first all vertices has 0 written on it.

Let $d(i, j)$ be the distance between vertices i and j, i.e. number of edges in the shortest path from i to j. Also, let's denote k-subtree of vertex x — set of vertices y such that next two conditions are met:

- x is the ancestor of y (each vertex is the ancestor of itself);
- $d(x, y) \le k$.

Vasya needs you to process m queries. The i-th query is a triple v_i, d_i and x_i. For each query Vasya adds value x_i to each vertex from d_i-subtree of v_i.

Report to Vasya all values, written on vertices of the tree after processing all queries.

Input

The first line contains single integer n ($1 \le n \le 3 \cdot 10^5$) — number of vertices in the tree.

Each of next $n - 1$ lines contains two integers x and y ($1 \le x, y \le n$) — edge between vertices x and y. It is guarantied that given graph is a tree.

Next line contains single integer m ($1 \le m \le 3 \cdot 10^5$) — number of queries.

Each of next m lines contains three integers v_i, d_i, x_i ($1 \le v_i \le n$, $0 \le d_i \le 10^9$, $1 \le x_i \le 10^9$) — description of the i-th query.

Output

Print n integers. The i-th integers is the value, written in the i-th vertex after processing all queries.

Examples

input Copy

```
5
1 2
1 3
2 4
2 5
3
1 1 1
2 0 10
4 10 100
```

output Copy

```
1 11 1 100 0
```

input Copy

```
5
2 3
2 1
```

```
5 4
3 4
5
2 0 4
3 10 1
1 2 3
2 3 10
1 1 7
```

output Copy

```
10 24 14 11 11
```

Note

In the first exapmle initial values in vertices are $0, 0, 0, 0, 0$. After the first query values will be equal to $1, 1, 1, 0, 0$. After the second query values will be equal to $1, 11, 1, 0, 0$. After the third query values will be equal to $1, 11, 1, 100, 0$.