

Problem K. Vasya and a Tree

Time limit 2000 ms

Mem limit 262144 kB

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);
- $d(x, y) \leq k$.

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 ($1 \leq n \leq 3 \cdot 10^5$) — number of vertices in the tree.

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

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

Each of next m lines contains three integers v_i, d_i, x_i ($1 \leq v_i \leq n, 0 \leq d_i \leq 10^9, 1 \leq x_i \leq 10^9$) — 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.

Sample 1

Input	Output
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Input	Output
5 1 2 1 3 2 4 2 5 3 1 1 1 2 0 10 4 10 100	1 11 1 100 0

Sample 2

Input	Output
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	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.