Infection

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

A highly propagating bacterium infects a tree of n nodes (with $n-1$ edges, no cycles). These nodes are indexed from 1 to n.

Exactly one node will be infected at the beginning. Each node on the tree has an initial susceptibility weight a_i, which represents that node i has a probability of $\frac{a_i}{\sum_{i=1}^{n} a_i}$ to become the initial infected node of the tree.

In addition, each node has an infection probability p_i, which represents its probability of being infected by adjacent nodes.

Specifically, starting from the initial infected node, if a node is infected, the uninfected node x that is adjacent to it will have a probability of p_x to become a new infected node, and then x can continue to infect its adjacent nodes.

Now, your task is to calculate the probability that exactly k nodes are eventually infected. You need to output an answer for each $k = 1, \ldots, n$.

You need to output the answer modulo 10^9+7, which means if your answer is $\frac{a}{b}$ ($\gcd(a,b) = 1$), you need to output $a \cdot b^{-1} \bmod 10^9+7$, where $b \cdot b^{-1} \equiv 1 \pmod{10^9+7}$.

Input

The first line contains an integer n ($2 \le n \le 2\,000$), denoting the number of nodes of the tree.

The next $n-1$ lines, each line contains two positive integers u and v ($1 \le u, v \le n$), denoting that there is an edge (u, v) on the tree.

Next n lines, the i-th line contains three positive integers a_i, b_i, c_i, where a_i means as above and $p_i = \frac{b_i}{c_i}$.

It is guaranteed that $1 \le a_i, b_i, c_i \le 10^9, \sum_{i=1}^{n} a_i \le 10^9, b_i \le c_i, \gcd(b_i, c_i) = 1$.

Output

Output n lines, each line contains single integer. The integer on the i-th line should be the answer modulo 10^9+7 when $k = i$.

Example

standard input	standard output
5 2 1 5 2 3 2 4 3 2 1 5 3 1 2 2 1 1 2 1 1 3 1 2	208333335 166666668 166666668 950000007 508333337