Problem B. Bean Machine, Reinvented

Time limit:	2 seconds
Memory limit:	1024 mebibytes

Maria has constructed a modified Galton board to show kids some things about probability distributions.

Her board can be represented as a weighted tree rooted at vertex 1. Each time she throws a particle from vertex 1, it follows a random path down the tree to some leaf. Each time it passes through a vertex, it chooses a random edge going down from this vertex, and the probability of choosing an edge is proportional to its weight.

Maria is able to configure the board in any way she wants by changing the weights of the edges. She asked you to process the following queries.

- She changes the weight of some edge.
- She throws a particle from vertex 1 and asks you to calculate the probability of this particle reaching vertex v.

Help Maria with this task.

Input

The first line of input contains one integer n — the number of vertices in the tree ($2 \le n \le 10^5$). The next $n-1$ lines contain the description of the edges of the tree. The i-th of these lines contains the description of the i-th edge in the format "u v w", where u and v are the endpoints of the edge and w is the weight of the edge ($1 \le u, v \le n$, $1 \le w \le 10^4$). It is guaranteed that the edges indeed form a tree.

The next line contains one integer q — the number of queries ($1 \le q \le 2 \cdot 10^5$). Finally, the last q lines of input contain queries, one on each line. Each query is either "1 i w", standing for "change the weight of the i-th edge to w" ($1 \le i \le n-1$, $1 \le w \le 10^4$), or "2 v", meaning "calculate the probability of reaching the vertex v" ($1 \le v \le n$).

Output

For each query of the second type, print one integer, $ab^{-1} \bmod (10^9 + 7)$, where a/b is the irreducible fraction equal to the probability of a particle reaching the vertex v. It can be shown that one can always express this probability in that form.

Examples

standard input	standard output
4 1 2 1 2 3 1 2 4 1 3 2 3 1 2 2 2 3	500000004 666666672
7 1 2 1 1 3 1 2 4 1 2 5 1 3 6 1 3 7 1 3 2 1 2 2 2 4	1 500000004 250000002