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# White Falcon And Tree

Your submission will run against only preliminary test cases. Full test cases will run at the end of the day.

## Problem Statement

White Falcon has a tree with  $N$  nodes. Each node contains a linear function. Let's denote by  $f_u(x)$  the linear function contained in the node  $u$ .

Let's denote the path from node  $u$  to node  $v$  like this:  $p_1, p_2, p_3, \dots, p_k$ , where  $p_1 = u$  and  $p_k = v$ , and  $p_i$  and  $p_{i+1}$  are connected.

White Falcon also has  $Q$  queries. They are in the following format:

- 1  $u\ v\ a\ b$ . Assign  $ax + b$  as the function of all the nodes on the path from  $u$  to  $v$ , i.e.,  $f_{p_i}(x)$  is changed to  $ax + b$  where  $p_1, p_2, p_3, \dots, p_k$  is the path from  $u$  to  $v$ .
- 2  $u\ v\ x$ . Calculate  $f_{p_k}(f_{p_{k-1}}(f_{p_{k-2}}(\dots f_{p_1}(x))))$  modulo  $(10^9 + 7)$

## Input Format

The first line contains  $N$ , the number of nodes. The following  $N$  lines each contain two integers  $a$  and  $b$  that describe the function  $ax + b$ .

Following  $N - 1$  lines contain edges of the tree.

The next line contains  $Q$ , the number of queries. Each subsequent line contains one of the queries described above.

## Output Format

For every query of the second kind, print one line containing an integer, the answer for that query.

## Constraints

- $1 \leq N \leq 50000$  (Number of nodes)
- $1 \leq Q \leq 50000$  (Number of queries)
- $0 \leq a, b, x < 10^9 + 7$

## Sample Input

```
2
1 1
1 2
1 2
2
1 2 2 1 1
2 1 2 1
```

## Sample Output

**Explanation**

$$f_1(1) = 2$$

$$f_2(2) = 3$$