Heavy Light 2 White Falcon



White Falcon was amazed by what she can do with heavy-light decomposition on trees. As a resut, she wants to improve her expertise on heavy-light decomposition. Her teacher gave her an another assignment which requires path updates. As always, White Falcon needs your help with the assignment.

You are given a tree with N nodes and each node's value val_i is initially 0.

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

The problem asks you to operate the following two types of queries on the tree:

- ullet "1 u v x" Add x to val_{p_1} , 2x to val_{p_2} , 3x to val_{p_3} , ..., kx to val_{p_k} .
- "2 u v" print the sum of the nodes' values on the path between $\,u$ and $\,v$ at modulo 10^9+7 .

Input Format

First line cosists of two integers N and Q seperated by a space.

Following N-1 lines contains two integers which denote the undirectional edges of the tree.

Following Q lines contains one of the query types described above.

Note: Nodes are numbered by using 0-based indexing.

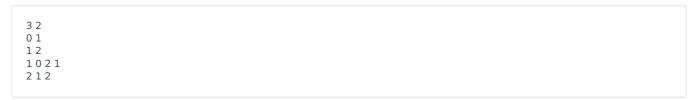
Constraints

 $1 \le N, Q \le 50000$ $0 \le x < 10^9 + 7$

Output Format

For every query of second type print a single integer.

Sample Input



Sample Output

5

Explanation

After the first type of query, $val_0=1, val_1=2, val_2=3$. Hence the answer of the second query is 2+3=5.