D. Happy Tree Party

time limit per test: 3 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Bogdan has a birthday today and mom gave him a tree consisting of n vertecies. For every edge of the tree i, some number x_i was written on it. In case you forget, a tree is a connected non-directed graph without cycles. After the present was granted, m guests consecutively come to Bogdan's party. When the i-th guest comes, he performs exactly one of the two possible operations:

1. Chooses some number y_i, and two vertecies a_i and b_i. After that, he moves along the edges of the tree from vertex a_i to vertex b_i using the shortest path (of course, such a path is unique in the tree). Every time he moves along some edge j, he replaces his current number y_i by , that is, by the result of integer division y_i div x_j.
2. Chooses some edge p_i and replaces the value written in it x_{p_i} by some positive integer $c_i < x_{p_i}$.

As Bogdan cares about his guests, he decided to ease the process. Write a program that performs all the operations requested by guests and outputs the resulting value y_i for each i of the first type.

Input

The first line of the input contains integers, n and m $(2 \leq n \leq 200\,000,\ 1 \leq m \leq 200\,000)$ — the number of vertecies in the tree granted to Bogdan by his mom and the number of guests that came to the party respectively.

Next $n - 1$ lines contain the description of the edges. The i-th of these lines contains three integers u_i, v_i and x_i $(1 \leq u_i, v_i \leq n,\ u_i \neq v_i,\ 1 \leq x_i \leq 10^{18})$, denoting an edge that connects vertecies u_i and v_i, with the number x_i initially written on it.

The following m lines describe operations, requested by Bogdan's guests. Each description contains three or four integers and has one of the two possible forms:

- $1\ a_i\ b_i\ y_i$ corresponds to a guest, who chooses the operation of the first type.
- $2\ p_i\ c_i$ corresponds to a guests, who chooses the operation of the second type.

It is guaranteed that all the queries are correct, namely $1 \leq a_i, b_i \leq n$, $1 \leq p_i \leq n - 1$, $1 \leq y_i \leq 10^{18}$ and $1 \leq c_i < x_{p_i}$, where x_{p_i} represents a number written on edge p_i at this particular moment of time that is not necessarily equal to the initial value x_{p_i}, as some decreases may have already been applied to it. The edges are numbered from 1 to $n - 1$ in the order they appear in the input.

Output

For each guest who chooses the operation of the first type, print the result of processing the value y_i through the path from a_i to b_i.

Examples

input

```
6 6
1 2 1
1 3 7
1 4 4
2 5 5
2 6 2
1 4 6 17
2 3 2
1 4 6 17
1 5 5 20
2 4 1
1 5 1 3
```

output

```
2
4
20
3
```

input

```
5 4
1 2 7
1 3 3
3 4 2
3 5 5
1 4 2 100
1 5 4 1
2 2 2
1 1 3 4
```

output

```
2
0
2
```

Note

Initially the tree looks like this:

The response to the first query is: = 2

After the third edge is changed, the tree looks like this:

The response to the second query is: = 4

In the third query the initial and final vertex coincide, that is, the answer will be the initial number 20.

After the change in the fourth edge the tree looks like this:

In the last query the answer will be: = 3