Lec 11

You are given a rooted tree of N nodes. Each node i contains a value a_i. Initially, all values of the node are 0, your task is to process Q queries of the following two types:

- $0\ v\ x$ for every node u in a subtree of v if $a_u < Y$ add x to a_u
- $1\ v$ print the value a_u

The tree is rooted at 1.

Input format

Each test contains multiple test cases.

- The first line contains t denoting the number of test cases.
- The first line of each test case contains two integers N, Q, and Y. These integers describe the size of the tree, the number of the queries, and the integer described in the statement respectively.
- The i^{th} of the next $n-1$ lines contains two integers u_i and v_i ($1 \leq u_i, v_i \leq n$, $u_i \neq v_i$) which means that there is an edge between nodes u_i and v_i.
- Each of the next Q lines contains a query of the following two types:
  - $0\ v\ x$
  - $1\ v$

Note

- It is guaranteed that the given graph is a tree.
- It is guaranteed that the sum of $N + Q$ over all test cases doesn't exceed $6 \cdot 10^5$.

Output format

For each query of type $1v$, print a_v.

Constraints

$(1 \leq t \leq 5 \cdot 10^5)$

$(1 \leq Q, N \leq 10^5)$

$(0 \leq Y \leq 100)$

$(1 \leq v \leq N)$

$(1 \leq x \leq 10^5)$

Test

<pre>1
3 2 10
1 2
1 3
0 1 1
1 2</pre>
	<pre>1</pre>

Task 2:

You are given an undirected weighted tree, in which 1 is the root node. Control value of each node denoted by c_i.

Let's take two nodes (V,U) such that V is the ancestor of U. V controls U if the distance between U and V is less than or equal to the control value of U

Find the number of vertices controlled by each node.

Task:

Print N integers — the i-th of these numbers should be equal to the number of vertices that the i-th vertex controls.

Note

- Assume 1-based indexing.

Example:

Assumptions

- $N = 3$
- $c = \{2,7,5\}$
- $p = \{1,1\}$
- w = {5,4}

Approach

- Node 1 controls 2 because distance between 1 and 2 is 5 which less than control value of 2, which is 7
- Node 1 controls 3 because distance between 1 and 3 is 4 which is less than control value of 3, which is 5

Thus, answer is {2,0,0}

Function Description :

Complete the *solve* function provided in the editor. This function takes the following *4* parameters and returns the required answer:-

- *N:* Integer denoting the number of nodes
- *c:* Integer array denoting control values of each node
- *p:* Parent array, where p_i denotes the parent of the (i+1)-th node in the tree
- *w:* Integer array, where w_i denotes weight of the edge between p_i and (i+1)

The function must return -

- array of *N* integers — the *i*-th integer equal to number of nodes that the *i*-th node controls.

Input format

Note: This is the input format that you must use to provide custom input (available above the **Compile and Test** button).

- The first line contains single integer *N*
- The second line contains *N* integers c_i — the control value of *i*-th node.
- The third line contains (N–1) integers. p_i — the parent of the (i+1)-th node in the tree
- The fourth line contains (N–1) integers. w_i — weight of the edge between *pi* and (i+1)

Output format

- Print *N* integers — the *i*-th of these integers equal to the number of nodes that the *i*-th node controls.

Constraints

$$1 \leq N \leq 2 * 10^5$$

$$1 \leq c_i \leq 10^9$$

$$1 \leq p_i \leq N$$

$$1 \leq w_i \leq 10^9$$

3 1 6 1 1 2 2 2	1 0 0

Explication

Given

- $N = 3$
- $c = \{1,6,1\}$
- $p = \{1,2\}$
- w = {2,2}

Approach

- Node 1 controls 2 because distance from 1 to 2 is 2 which is less than control value of 2, which is 6.

Thus, answer is {1,0,0}