Problem I. Items and Heroes

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	1024 mebibytes

There is a rooted tree of N vertices. The vertices are numbered by integers from 1 to N, with vertex 1 as the root. The parent of vertex i ($2 \le i \le N$) is denoted as P_i.

Each vertex has a box with items. Also, there is a hero in each vertex.

In the beginning, the box in vertex i contains A_i items.

In each vertex i, the hero from that vertex has the quest to collect C_i items. The hero in vertex i can choose some vertices from the subtree rooted at vertex i and take as many items as she wants from each of the selected vertices. One item cannot be taken by more than one hero.

Determine if it is possible for the heroes to act in such a way that all N quests will be completed.

Additionally, Q queries are given. In the j-th query, the integers t_j, v_j, x_j are given, and the values are changed as follows:

- If $t_j = 1$, change the value of A_{v_j} to x_j.
- If $t_j = 2$, change the value of C_{v_j} to x_j.

The queries are applied sequentially. The changes made in each query **remain** for all the subsequent queries as well. After each query, determine if it is possible to complete all N quests.

Input

The first line of input contains one integer N ($1 \le N \le 10^5$).

The second line contains $N - 1$ integers $P_2, P_3, \ldots, P_N$: the parents of vertices $2, 3, \ldots, N$ ($1 \le P_i < i$).

The third line contains N integers $A_1, A_2, \ldots, A_N$ ($1 \le A_i \le 10^9$).

The fourth line contains N integers $C_1, C_2, \ldots, C_N$ ($1 \le C_i \le 10^9$).

The fifth line contains one integer Q ($1 \le Q \le 10^5$).

Each of the following Q lines contains one query described by three integers t_j, v_j and x_j ($1 \le t_i \le 2$, $1 \le v_i \le N$, $1 \le x_i \le 10^9$): the type of the query, the number of vertex and the new value for A_{v_i} (for the query of the first type) or C_{v_i} (for the query of the second type), respectively.

Output

On the first line, print "`Yes`" if it is possible to complete all N quests at once, or "`No`" otherwise.

On the following Q lines, print the answers for the queries in the same format, one per line.

Examples

standard input
3 1 1 2 1 3 3 1 2 2 1 1 1 2 3 1
standard output
Yes No Yes

standard input
5 1 2 1 3 1000000000 1000000000 1000000000 1000000000 1000000000 1 1 1 1 1 1 1 1 1
standard output
Yes Yes

standard input
5 1 2 2 2 109102235 645590056 708566822 497603443 131863700 50073184 441114664 164994352 304489019 158100373 8 1 5 692234112 1 3 610338520 2 4 818442884 2 4 164762830 2 4 923652447 2 4 197720766 1 1 779302743 1 1 222486377
standard output
No Yes Yes No Yes No Yes Yes Yes

Note

In Example 1, the hero from vertex 1 takes two items from the box at vertex 1 and one item from the box at vertex 3, the hero from vertex 2 takes an item from the box at vertex 2, and the hero from vertex 3 takes two items from the box at vertex 3. So, all three quests are completed.

The first query changes the number of items in the box at vertex 1 from two to one. In this case, there are not enough items to complete all three quests.

The second query changes the number of items to complete the quest for the hero at vertex 3 from two to one. In this case, the hero at vertex 1 takes one item from the box at vertex 1 and two items from the box at vertex 3, the hero at vertex 2 take one item from the box at vertex 2, the hero at vertex 3 takes one item from the box at vertex 3, and all three quests are again completed.