

Alice and Her Lost Cat

Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **256 megabytes**

Alice wants to find her lost cat in the park.

The park is a rooted tree consisting of n vertices. The vertices are numbered from 1 to n , and the root is vertex 1.

Alice is now at vertex 1. She knows that the cat has run from vertex 1 to some leaf of the tree, and no vertex is visited more than once. A leaf is a vertex without children.

There is a monitor on each vertex. The monitor on vertex i can observe whether cat has visited vertex i and which vertex the cat has gone to (if vertex i is not a leaf). It takes a_i seconds for Alice to check the data of the i -th monitor.

Alice can also search some leaves by herself. It takes t_i seconds to search i leaves. Note that i is the count of vertices instead of the label of a vertex.

Help Alice to determine which monitors to be checked and which leaves to be searched so that the location of the cat can be uniquely determined, and the total time needed is minimum possible. Note that the monitors to be checked and the leaves to be searched should be decided at the beginning, and should not change after that.

Find the minimum time.

Input

Each test contains multiple test cases.

The first line contains one single integer T ($1 \leq T \leq 10$) denoting the number of test cases. The description of the T test cases follows.

The first line of each test case contains an integer n ($1 \leq n \leq 2000$) — the size of the tree.

The second line of each test case contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq 10^9$).

The third line of each test case contains n integers t_1, t_2, \dots, t_n ($1 \leq t_i \leq 10^9, t_i \leq t_{i+1}$).

Then $n - 1$ lines follow, each containing two integers x and y ($1 \leq x, y \leq n, x \neq y$) denoting an edge connecting vertex x with vertex y . It is guaranteed that these edges form a tree.

Output

For each test case, output an integer in one line — the minimum time needed to determine the cat's location.

Example

standard input	standard output
2	4
8	3
4 2 5 2 4 2 3 2	
5 5 6 7 8 9 10 13	
1 2	
2 3	
1 4	
1 5	
4 6	
3 7	
5 8	
8	
4 2 3 3 2 4 4 3	
4 6 8 8 9 9 14 17	
1 2	
2 3	
3 4	
3 5	
4 6	
3 7	
3 8	