

Plus and Minus Tree

Description

A *subtree* of a tree T is a tree with both vertices and edges as subsets of vertices and edges of T .

You're given a tree with n vertices. Additionally an integer is written on every vertex of this tree, the value of them are v_i . In one move you can apply the following operation:

Select the subtree of the given tree that includes the vertex with number 1, then increase (or decrease) by one all the integers which are written on the vertices of that subtree.

Please calculate the minimum number of operations that is required to make all the integers written on the vertices of the given tree equal to zero.

Input Format

The first line of the input contains n .

Then each of the next $n - 1$ lines contains two integers a_i, b_i , indicating there's an edge between vertices a_i and b_i . It's guaranteed that the input graph is a tree.

The last line of the input contains n integers $v_1, v_2 \dots v_n$.

Output Format

One integer, the minimum number of operations.

Sample

Sample Input

```
3
1 2
1 3
1 -1 1
```

Sample Output

```
3
```

Hint

For 50% testcases, $n \leq 1000$.

For 100% testcases, $n \leq 10^5$, $|v_i| \leq 10^9$.