Problem Connected

Input file	stdin
Output file	stdout

You are given an **undirected tree** with N vertices, numbered from 1 to N (a tree is an undirected connected graph in which there are no cycles) and a permutation P of its nodes (a sequence of length N, arranged in any order and no node number appears twice in the sequence).

You are asked to compute the number of **contiguous** subsequences $[l, r]$ ($1 \le l \le r \le N$) of P such that the nodes $P_l, P_{l+1}, \ldots, P_r$ form a **connected undirected** graph.

Input data

The first line contains an integer N.

The next $N - 1$ lines contain 2 integers u_i, v_i, denoting an edge of the tree.

The last line of the input contains the N numbers $P_1, P_2, \ldots, P_N$, representing the permutation P.

Output data

You need to write a single line with an integer: the number of **contiguous** subsequences $[l, r]$ ($1 \le l \le r \le N$) of P such that the nodes $P_l, P_{l+1}, \ldots, P_r$ form a **connected undirected** graph.

Restrictions

- $1 \le N \le 2 \cdot 10^5$.
- $1 \le u_i, v_i \le N$.

#	Points	Restrictions
1	10	$N \le 200$
2	20	$N \le 2000$.
3	30	The given tree is just a simple chain.
4	40	No further restrictions.

Examples

Input file	Output file
5 1 2 1 3 2 4 2 5 1 2 4 3 5	10

Explanations

In the **sample case**, one example of a **contiguous** subsequence of nodes which forms a connected region is the one formed by the first 4 elements of P. One example of a subrange of nodes from P which does not form a connected region is 2, 4, 3.