Lab Exam-2

A) LIS on a rooted tree

You are given a rooted(at node 1), tree with N vertices. Every vertex has a number associated with it. Consider all paths from root to any leaf. For every such path you can write the sequence of numbers taken from vertices on this path. For every such sequence you can find the Longest (Strictly) Increasing Subsequence. Find the longest of all Longest (Strictly) Increasing Subsequences and print its length.

Note: You write down the values from root to leaf. Suppose the values are a,b,c,d from root to leaf and the longest increasing subsequence is a,b,d for this path, then $a < b < d$. It is not allowed to have $d < b < a$.

Input

First line contains one integer N.
Each of the next $N - 1$ lines contain two integers u and v which means there is an undirected edge between u and v.
Next line contains N integers where i^{th} integer is value associated with i^{th} node.

Output

Output an integer, which is maximum length of Longest (strictly) increasing subsequence.

Constraints

$1 \leq N \leq 5000$, number of nodes
$1 \leq u \leq N$
$1 \leq v \leq N$
$1 \leq val_i \leq 10^9$ (Value of a node)

Sample Input 1

```
4
1 2
2 3
2 4
10 5 12 4
```

Sample Output 1

```
2
```

Sample Explanation 1

Consider the path from 1 to 3. The sequence of numbers is 10,5,12. So, the LIS is 10,12. Hence, answer is 2.
Note: For path from 1 to 4, sequence of numbers of 10,5,4. Here, LIS is 1.

Sample Input 2

```
12
1 8
8 6
8 3
3 12
3 10
3 5
5 4
5 2
1 9
9 11
9 7
1 2 3 4 5 6 7 8 9 10 11 12
```

Sample Output 2

3

Sample Explanation 2

Consider the path 1,9,11, Here the sequence of numbers is 1,9,11. Hence, LIS is 3.

Limits

Time: 2 second

Memory: 256 MB