Maximum Weighted Independent Set

Time Limit: 1 Second
Memory Limit: 256 MB

Given an undirected graph with n vertices and $n-1$ edges ($1 \leq n \leq 10^6$), where each vertex v is assigned a weight w_v, find the maximum weighted independent set of the graph.

An independent set of an undirected graph $G = (V, E)$ is a set $I \subseteq V$ such that $\forall u, v \in I$ such that $u \neq v$, $(u, v) \notin E$. A maximum weighted independent set is an independent set I such that $\sum_{v \in I} w_v$ is maximized.

Input

The first line contains a single integer n ($1 \leq n \leq 10^6$) - the number of vertices in n.

The following $n-1$ lines describe the edges in the graph. The i-th line contains two integers u_i and v_i ($1 \leq u_i, v_i \leq n$, $u_i \neq v_i$), denoting an undirected edge between u_i and v_i. It is guaranteed that the graph doens't contain self-loops or multiple edges.

The final line of input contains n integers $w_1, \ldots w_n$ ($1 \leq w_i \leq 10^4$) - the weight assigned to each vertex in the graph.

Output

Output a single integer denoting the sum of vertex weights of the maximum weighted independent set of the given graph.

Sample Inputs

```
5
1 2
1 3
2 4
2 5
1 2 3 4 5
```

Sample Outputs

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12
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