

Game of Thrones

Charlie and Alan Harper both love the HBO series, Game of Thrones. But being the eccentric brothers they are, they decided to play their own version of it. They are given an undirected tree of n vertices, rooted at vertex 1. Also, every leaf node has a value associated with it.

The game consists of turns, Charlie starts(at vertex 1). When its Charlie's turn, Charlie can go from the current vertex to any of its children. Similarly, when its Alan's turn, he too can go from the current vertex to any of its children. The game ends when someone reaches a leaf node, and the value at that node is pleasure Charlie gets.

Charlie wants to maximize his score, but Alan, being extremely jealous of him, wants to minimize it. If both players play optimally, what is the maximum pleasure that Charlie can get?

Input

There are T testcases. Each testcase starts with n , the number of vertices in the tree. It is followed by $n-1$ lines containing u and v , indicating that there is an edge from u to v . Then another line follows, containing n integers $val[1]...val[n]$. If i is a leaf node, $val[i]$ is the value it has, else $val[i]=-1$. It is guaranteed that $val[i]=-1$ for all non-leaf nodes.

Output

Output T lines, each containing an integer which is the answer to the problem.

Constraints

$1 \leq n \leq 200000$

$1 \leq u, v \leq n$

Either $1 \leq val[i] \leq 10^9$, or $val[i]=-1$

Sample Input

```
2
3
1 2
1 3
-1 5 7
7
1 2
1 3
2 4
2 5
3 6
3 7
-1 -1 -1 9 5 15 3
```

Sample Output

```
7
5
```