Problem E. Firework Vista

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	1024 mebibytes

In the enchanted land of Bubbleonia, the grand Bubble Cup is not only a competition for programmers but also an annual festival for all Bubbleonians. This year, the magical BubbleTree in the middle of the city is glowing brighter than ever. Legends say that the BubbleTree's glow is proportional to the happiness level of the people.

The BubbleTree is unique: it is an ethereal tree with N nodes, and each node has a height denoted in BubbleUnits (BU). During the festival, M Bubbleonians have decided to climb the tree to get a better view of the magical fireworks scheduled for the evening. The rule for climbing is simple: you can only move from a lower node to a strictly higher node. This is because moving uphill gives you a better vantage point for the fireworks. Each person can climb any number of times, provided that each move increases their height.

Bubbleonians are filled with joy but are also greedy for a better view. They want to strategize their climbing such that the minimum height of a node where any person is standing is maximized. They want to be as high as possible, but they also want to ensure everyone gets a good view!

Oh, did we forget to mention? The BubbleTree also has T magical teleporters stationed at various nodes. These teleporters are a gift from the Bubble Elders and can teleport any one person standing on them to any other node in the tree. The catch? Each teleporter can only be used once.

Can you help the Bubbleonians find the best way to climb the BubbleTree for a grand view of the fireworks?

Input

The first line contains three integers N, M, and T: the number of nodes in the BubbleTree, the number of people, and the number of teleporters ($1 \leq N, M, T \leq 10^5$).

The second line contains N integers $H_1, H_2, \ldots, H_N$: the height of each node in BubbleUnits ($1 \leq H_i \leq 10^5$).

Each of the next $N-1$ lines contains two integers U and V: two nodes connected by an edge ($1 \leq U, V \leq N$, $U \neq V$). The resulting graph will be a tree: connected and containing no cycles, loops, or duplicate edges.

The next line contains M integers $P_1, P_2, \ldots, P_M$: the initial nodes where the people are standing ($1 \leq P_i \leq N$).

The last line contains T integers $t_1, t_2, \ldots, t_T$: the nodes where the teleporters are located ($1 \leq t_i \leq N$).

Multiple people or teleporters **can** be located at the same node.

Output

Print a single integer: the maximum height that can be achieved such that every person is standing at that height or higher at the end of the moving process.

Examples

standard input	*standard output*
6 3 2 3 2 1 2 1 5 1 2 2 3 1 4 4 5 5 6 3 4 5 1 2	5
7 4 6 11 6 5 5 1 5 42 1 2 2 3 2 4 4 5 1 6 6 7 4 3 6 3 5 1 7 7 7 1	11

Note

In the first example:

- The person at node 5 can directly move to node 6, which has the highest height of 5.
- The person at node 4 can move to node 1 and then use the teleporter at that node to get to node 6.
- The person at node 3 can move to node 2 and then use the teleporter at that node to get to node 6.

In the second example, the 3 people at nodes 3 and 4 cannot reach node 7 (with height 42) without using teleporters. They can all reach node 1 that contains 2 teleporters, however this is not enough to transport all 3 of them to node 7. Since none of them can reach any other teleporters, it is not possible to reach height 42. Height 11 is possible without using any teleporters: people at nodes 3 and 4 can reach it, while the person at node 6 can choose if he wants to go to node 1 or 7.