

F. Minimum Maximum Distance

time limit per test: 2 seconds

memory limit per test: 256 megabytes

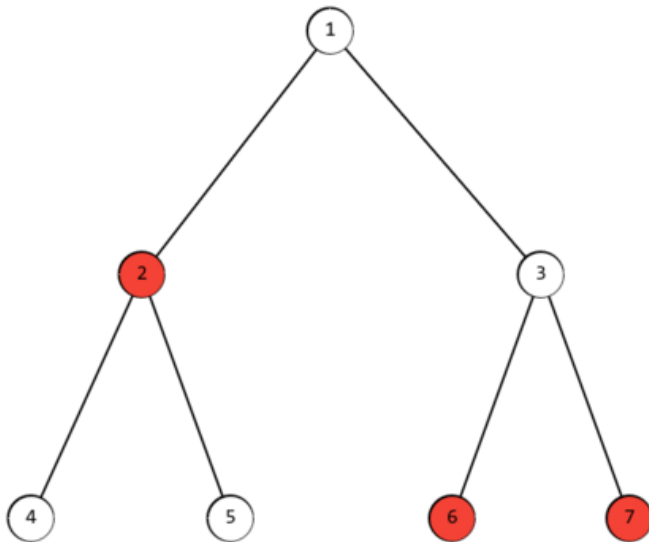
input: standard input

output: standard output

You have a tree with n vertices, some of which are marked. A tree is a connected undirected graph without cycles.

Let f_i denote the maximum distance from vertex i to any of the marked vertices.

Your task is to find the minimum value of f_i among all vertices.



For example, in the tree shown in the example, vertices 2, 6, and 7 are marked. Then the array $f(i) = [2, 3, 2, 4, 4, 3, 3]$. The minimum f_i is for vertices 1 and 3.

Input

The first line contains an integer t ($1 \leq t \leq 10^4$) — the number of test cases.

The first line of each test case contains two integers n and k ($1 \leq k \leq n \leq 2 \cdot 10^5$) — the number of vertices in the tree and the number of marked vertices, respectively.

The second line of each test case contains k integers a_i ($1 \leq a_i \leq n, a_{i-1} < a_i$) — the indices of the marked vertices.

The next $n - 1$ lines contain two integers u_i and v_i — the indices of vertices connected by the i -th edge.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output a single integer — the minimum value of f_i among all vertices.

Codeforces Round 903 (Div. 3)

Finished

Practice




→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

→ Submit?

 Language: GNU G++20 11.2.0 (64 bit, )



 Choose file: No file chosen

→ Problem tags

 dfs and similar
 shortest paths

No tag edit access

→ Contest materials

- Announcement 
- Tutorial 

Examples

input	Copy
6 7 3 2 6 7 1 2 1 3 2 4 2 5 3 6 3 7 4 4 1 2 3 4 1 2 2 3 3 4 5 1 1 1 2 1 3 1 4 1 5 5 2 4 5 1 2 2 3 1 4 4 5 10 8 1 2 3 4 5 8 9 10 2 10 10 5 5 3 3 1 1 7 7 4 4 9 8 9 6 1 10 9 1 2 4 5 6 7 8 9 10 1 3 3 9 9 4 4 10 10 6 6 7 7 2 2 5 5 8	
output	Copy
2 2 0 1 4 5	

input	Copy
3 6 1 3 1 2 1 3 3 4 3 5 2 6 5 3 1 2 5 1 2 1 3 2 4 3 5 7 1	

```
2
3 2
2 6
6 1
5 6
7 6
4 5
```

output[Copy](#)

```
0
2
0
```

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