

## Problem F: K people travel on a tree

Time Limit: 1 Sec Memory Limit: 128 MB

Submit: 267 Solved: 62

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### Description

There are  $N$  cities numbered from 1 to  $N$  and  $N-1$  roads connecting these  $N$  cities, or consider it is a tree with  $N$  nodes. Each road takes 1 day to travel through. There are  $K$  people initially stays at different  $K$  cities. They decide to meet at the same city as soon as possible. Please find the minimal time needed.

### Input

The first line will be an integer  $T(1 \leq T \leq 10)$

, which is the number of test cases.

For each test data:

The first line contains two integers  $N(1 \leq N \leq 10^5)$

and  $K(1 \leq K \leq N)$

— the number of cities and the number of friends.

The next  $N - 1$  lines contain two integers  $A$  and  $B$ , which means there is a road between city  $A$  and city  $B$ .

Then the next one line contains  $K$  integers, the  $i$ -th integer  $p_i$

indicates the place they initially stay.

### Output

For each case, contains one line, print the minimal time.

### Sample Input

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

### Sample Output

```
1
```

### HINT

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