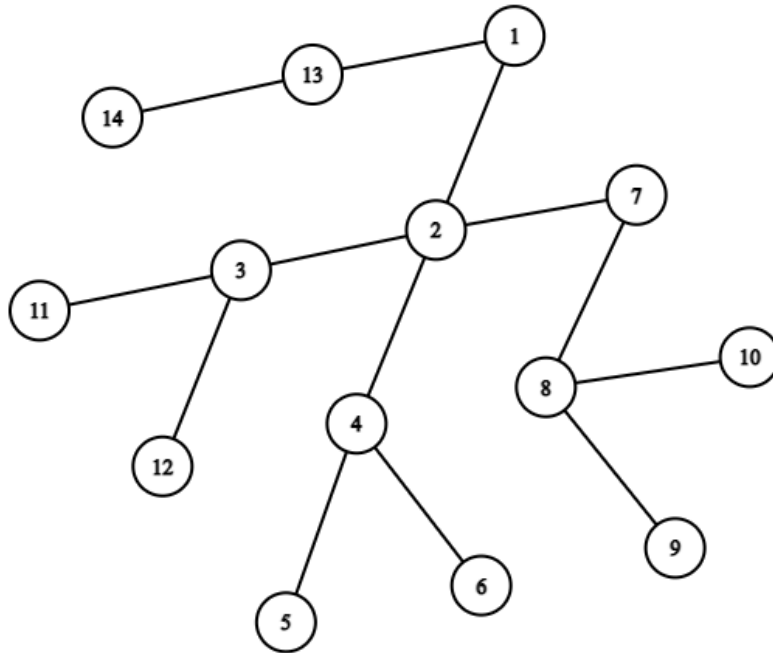


## E. Gardener and Tree

time limit per test: 4 seconds  
 memory limit per test: 256 megabytes

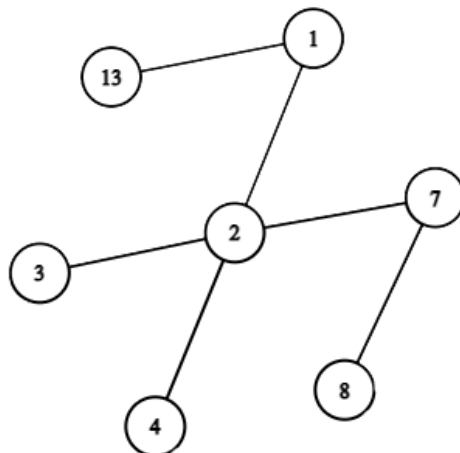
A tree is an undirected connected graph in which there are no cycles. This problem is about non-rooted trees. A leaf of a tree is a vertex that is connected to **at most one** vertex.

The gardener Vitaly grew a tree from  $n$  vertices. He decided to trim the tree. To do this, he performs a number of operations. In one operation, he removes **all** leaves of the tree.



Example of a tree.

For example, consider the tree shown in the figure above. The figure below shows the result of applying exactly one operation to the tree.



### Codeforces Round 748 (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.

Start virtual contest

#### → Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest



#### → Submit?

Language: GNU G++17 7.3.0

Choose file:  No file chosen

Submit

#### → Contest materials

- Announcement 
- Tutorial 

The result of applying the operation "remove all leaves" to the tree.

Note the special cases of the operation:

- applying an operation to an empty tree (of 0 vertices) does not change it;
- applying an operation to a tree of one vertex removes this vertex (this vertex is treated as a leaf);
- applying an operation to a tree of two vertices removes both vertices (both vertices are treated as leaves).

Vitaly applied  $k$  operations sequentially to the tree. How many vertices remain?

### Input

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

Each test case is preceded by an empty line.

Each test case consists of several lines. The first line of the test case contains two integers  $n$  and  $k$  ( $1 \leq n \leq 4 \cdot 10^5$ ,  $1 \leq k \leq 2 \cdot 10^5$ ) — the number of vertices in the tree and the number of operations, respectively. Then  $n - 1$  lines follow, each of them contains two integers  $u$  and  $v$  ( $1 \leq u, v \leq n$ ,  $u \neq v$ ) which describe a pair of vertices connected by an edge. It is guaranteed that the given graph is a tree and has no loops or multiple edges.

It is guaranteed that the sum of  $n$  from all test cases does not exceed  $4 \cdot 10^5$ .

### Output

For each test case output on a separate line a single integer — the number of vertices that remain in the tree after applying  $k$  operations.

### Example

input

Copy

```
6

14 1
1 2
2 3
2 4
4 5
4 6
2 7
7 8
8 9
8 10
3 11
3 12
1 13
13 14

2 200000
1 2

3 2
1 2
2 3

5 1
5 1
3 2
2 1
5 4

6 2
5 1
2 5
5 6
4 2
3 4

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

```
1 7
2 1
```

**output**

Copy

```
7
0
0
3
1
2
```

**Note**

The first test case is considered in the statement.

The second test case contains a tree of two vertices. 200000 operations are applied to it. The first one removes all two vertices, the other operations do not change the tree.

In the third test case, a tree of three vertices is given. As a result of the first operation, only 1 vertex remains in it (with the index 2), the second operation makes the tree empty.

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