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Exercise Sheet ACM Week III

# Algorithms Lab

## Exercise 2 – *Longest Path*

If you don't know about the longest path problem, listen to this song `http://www.youtube.com/watch?v=a3ww0gwEszo`.

Finding the longest path in a general graph is notoriously difficult task. Does it become easier if we consider only trees instead?

**Input** The first line of the input contains $t \leq 10$, the number of testcases. Each test case starts with one line containing the number of vertices $1 \leq n \leq 100000$, followed by $n - 1$ lines, each containing two numbers – labels of vertices which are connected by an edge. Each vertex has a unique label from the interval $[0, n - 1]$ and it is guaranteed that a given graph is a tree.

**Output** For each test case you should output a line containing the length of the longest path, that is, the number of vertices in the longest path.

**Sample input**

```
2
8
1 4
3 4
5 4
4 2
2 7
6 0
0 7
8
0 6
6 5
5 2
2 4
4 3
3 1
1 7
```

**Sample output**

```
6
8
```

**Challenge** If you find this exercise too easy, write a nonrecursive DFS to make it slightly trickier.