

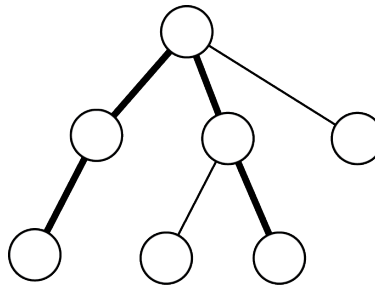
Tree Diameter

Problem Code: DIAMETER

Design Challenge

Task Description

The diameter of a tree is defined as the length of the longest simple path between any two nodes of the tree. For example, the tree illustrated below has diameter 4. The longest path is illustrated in bold. Note that there can be multiple longest paths.



For a given tree with n nodes, compute its diameter.

The nodes of the given tree is numbered from 1 to n . An edge list E that contains $n - 1$ edges is given to define the graph.

Constraints

$n \geq 1$. It is guaranteed that the given graph is a tree.

Examples

Case 1: $n = 7$, $E = [(1, 2), (1, 3), (1, 4), (2, 5), (3, 6), (3, 7)]$

Answer: 4

As illustrated above.

Case 2: $n = 5$, $E = [(1, 2), (1, 3), (1, 4), (1, 5)]$

Answer: 2

Case 3: $n = 4$, $E = [(1, 2), (2, 3), (3, 4)]$

Answer: 3

Requirements

Time: $O(n)$ **Space:** $O(n)$