Longest path in a tree

You are given an unweighted, undirected tree. Write a program to output the length of the longest path (from one node to another) in that tree. The length of a path in this case is number of edges we traverse from source to destination.

Input

The first line of the input file contains one integer N --- number of nodes in the tree ($0 < N <= 10000$). Next N-1 lines contain N-1 edges of that tree --- Each line contains a pair (u, v) means there is an edge between node u and node v ($1 <= u, v <= N$).

Output

Print the length of the longest path on one line.

Example

Input:
3
1 2
2 3

Output:
2