Problem D. Tree Diameter

Time limit   1000 ms
Mem limit   524288 kB

You are given a tree consisting of n nodes.

The *diameter* of a tree is the maximum distance between two nodes. Your task is to determine the diameter of the tree.

Input

The first input line contains an integer n: the number of nodes. The nodes are numbered $1, 2, \ldots, n$.

Then there are $n - 1$ lines describing the edges. Each line contains two integers a and b: there is an edge between nodes a and b.

Output

Print one integer: the diameter of the tree.

Constraints

- $1 \leq n \leq 2 \cdot 10^5$
- $1 \leq a, b \leq n$

Explanation: The diameter corresponds to the path $2 \rightarrow 1 \rightarrow 3 \rightarrow 5$.

Sample

Input	Output
5 1 2 1 3 3 4 3 5	3