Task 2: `Tree Cutting`

Lugh Tuatha Dé is the world's finest assasin, whom is in love with *Dia Viekone*. *Lugh* is eager to flex his financial muscle in a bid to win over *Dia's* heart. *Lugh* plans to buy an entire acre of land, carve out the shape of a **tree** with N vertices, and propose to *Dia* in front of it.

There is one problem. *Lugh* has one particular request, that **exactly** 1 edge of the tree be removed and 1 new edge added such that the **longest** path is maximised. Can you help *Lugh* impress the love of his life?

Input

Your Program must read from standard input.

The first line contains an integer, N, the number of vertices.

In the next $N-1$ lines, each line contains 2 distinct integers u and v, representing an edge in the tree.

Output

Your program must print to standard output.

The output should contain a single integer on a single line, the new longest path.

Subtasks

The maximum execution time on each instance is 1.0s. For all testcases, the input will satisfy the following bounds:

- $1 \leq N \leq 300\,000$
- $1 \leq u, v \leq N$

Your program will be tested on input instances that satisfy the following restrictions:

Subtask	Marks	Additional Constraints
1	5	$N \leq 10$
2	10	$N \leq 100$
3	10	$N \leq 3000$
4	20	$N \leq 300\,000$, there is at most one vertex with degree ≥ 3
5	55	-

Sample Testcase 1

This testcase is valid for all subtasks.

Input	Output
4 1 2 1 3 3 4	3

Sample Testcase 1 Explanation

No matter which edge we choose to remove, we cannot increase the longest path on the tree beyond 3.

Sample Testcase 2

This testcase is valid for all subtasks

Input	Output
6 1 2 2 3 2 5 4 5 5 6	5

Sample Testcase 2 Explanation

We can remove edge $2 - 5$, this splits the tree into 2 components containing:

1. Vertices $1, 2$ and 3
2. Vertices $4, 5$ and 6

Next, we can add a new edge $3 - 4$, the longest path will now be $1 - 2 - 3 - 4 - 5 - 6$ with a length of 5.