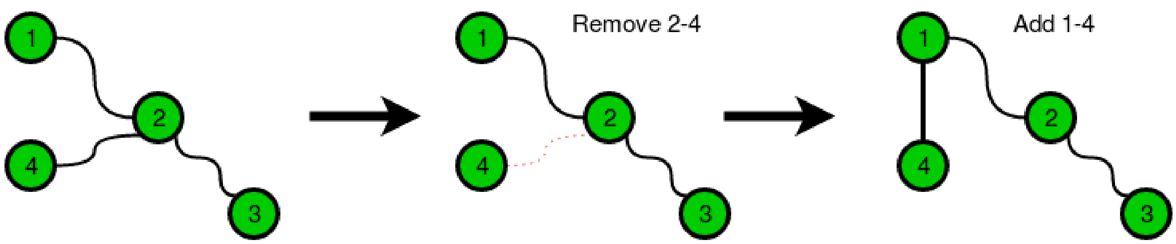
Maximal Tree Diameter

Consider an unrooted tree with n vertices numbered from 1 to n connected by $n-1$ edges of length 1. We define the *diameter* of a tree as the longest path between any two vertices of the tree.

We can modify the tree to maximize its diameter by performing the following moves exactly once:

- Remove one edge from the tree so that it splits into two smaller trees.
- Pick one vertex from each of the two trees and join them by adding an edge.

For example, the diameter of the initial tree in the diagram below is 2, but we can increase this to 3 by removing the edge between vertices 2 and 4 and adding an edge connecting vertices 1 and 4:



Given a tree, print the maximum possible diameter after modifying the tree.

Input Format

The first line contains an integer denoting n (the number of vertices).
Each of the $n-1$ subsequent lines contains two space-separated integers, u and v, defining an edge connecting vertex u and vertex v.

Constraints

- $2 \leq n \leq 5 \cdot 10^5$

Subtasks

- $2 \leq n \leq 3000$ for 30% of the maximum score.

Output Format

Print the maximum possible diameter after modifying the tree.

Sample Input 0

```
4
1 2
2 3
2 4
```

Sample Output 0

```
3
```

Explanation 0

The optimal solution for this tree is diagrammed in the *Problem Statement* above.