

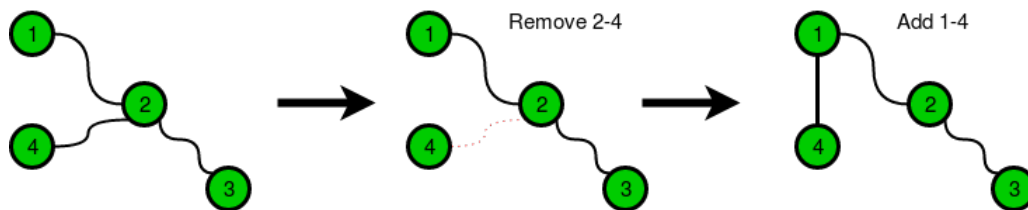
Maximal Tree Diameter

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.