The highest tree

Given a tree N vertices, numbered from 0-to N-1. Find the vertex with the smallest index such that the height of the tree is greatest if the vertex with the smallest is root

Input

The first line is an integer N (1 <= N <= 10 ^ 5).

The next N - 1 lines contain 2 integers u v, the connecting edge between vertex u and vertex v.

Output

Print the vertex and maximum height

Example

Input:
3
0 1
1 2

Output:
0 2

Input:
4
0 1
0 2
2 3

Output:
1 3