Longest paths

Given a tree of n nodes. Your task is to find the longest paths, then print out the smallest vertex in the paths and their length.

Input

The first line contains an integer ($0 < n \leq 10^5$).

Each of the next n-1 lines contains two integers a, b representing an edge that connects vertex a and vertex b ($0 \leq a, b < n$).

Output

The smallest vertex and the length of the longest paths.

** There are 2 longest paths: (3 – 4 – 2 – 6 – 1 – 5), (3 – 4 – 2 – 6 – 7 – 8)*

Example

https://drive.google.com/file/d/1X8C5RjabX7cef0YqRn6m79kVTQ81m5AP/view?usp=sharing

Input:
9
6 1
6 2
4 3
2 4
1 5
0 2
6 7
7 8

Output:

1 5