

Subtree nodes

Given a tree of n nodes in which node 0 is root. Your task is to print out the number of nodes in all subtrees.

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

For each node V in the tree in ascending order, output the number of nodes in subtree in which V is the root.

Example

https://drive.google.com/file/d/1X6H7qsDtMpeeb0OoSIZoLIRZt3qnGc_O/view?usp=sharing

Input:

```
6
0 1
0 2
2 3
2 4
1 5
```

Output:

```
0 6
1 2
2 3
3 1
4 1
5 1
```