C. Ehab and Path-etic MEXs

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a tree consisting of n nodes. You want to write some labels on the tree's edges such that the following conditions hold:
• Every label is an integer between 0 and n - 2 inclusive.
• All the written labels are distinct.
• The largest value among MEX(u, v) over all pairs of nodes (u, v) is as small as possible.

Here, MEX(u, v) denotes the smallest non-negative integer that isn't written on any edge on the unique simple path from node u to node v.

Input
The first line contains the integer n ($2 \leq n \leq 10^5$) – the number of nodes in the tree.

Each of the next n - 1 lines contains two space-separated integers u and v ($1 \leq u, v \leq n$) that mean there's an edge between nodes u and v. It's guaranteed that the given graph is a tree.

Output

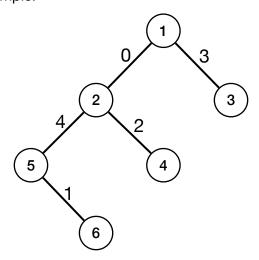Output n - 1 integers. The ith of them will be the number written on the ith edge (in the input order).

Examples

Input	Output
3 1 2 1 3	0 1
6 1 2 1 3 2 4 2 5 5 6	0 3 2 4 1

Note
The tree from the second sample: