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 ($2 \le n \le 10^5$) — the number of nodes in the tree.

Each of the next $n-1$ lines contains two space-separated integers u and v ($1 \le u,v \le n$) 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 i^{th} of them will be the number written on the i^{th} edge (in the input order).

Examples

input Copy

```
3
1 2
1 3
```

output Copy

```
0
1
```

input Copy

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

output Copy

```
0
3
2
4
1
```

Note

The tree from the second sample: