

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 i^{th} of them will be the number written on the i^{th} edge (in the input order).

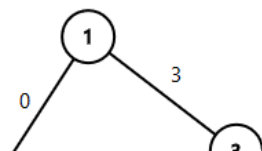
Examples

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:



Codeforces Round #628 (Div. 2)

[Finished](#)
[Practice](#)


→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

[Start virtual contest](#)

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

[Clone Contest](#)

→ Submit?

Language: PyPy 3.6 (7.2.0)

Choose file: [Browse...](#) No file selected.

Be careful: there is 50 points penalty for submission which fails the pretests or resubmission (except failure on the first test, denial of judgement or similar verdicts). "Passed pretests" submission verdict doesn't guarantee that the solution is absolutely correct and it will pass system tests.

[Submit](#)



→ Problem tags

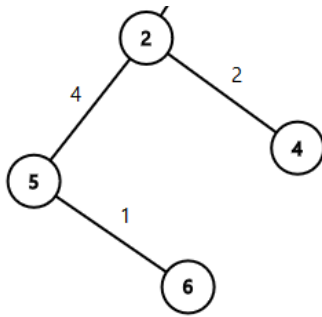
[constructive algorithms](#) [dfs and similar](#)

[greedy](#) [trees](#)

No tag edit access

→ Contest materials

- [Announcement \(en\)](#) 
- [Tutorial \(en\)](#) 



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