

Pondo Euler Tour

time limit per test: 2 seconds (5 seconds for Python)
memory limit per test: 500 megabytes
input: standard input
output: standard output
points: 100 · problem code: pondoeulertour

You are given a tree with n vertices, rooted at vertex 1. Output the Euler tour of this tree.

Start a depth-first search at 1. Record a vertex when you first enter it, visit all of its children, then record it again when you leave. If a vertex has several children, visit them in increasing label order.

You only need the first and last visit of each vertex, so the tour has length $2n$.

Input

The first line contains a single integer n .

Each of the next $n - 1$ lines contains two integers u and v , denoting an undirected edge between u and v .

Vertices are numbered 1 through n . The edges form a tree.

Output

Print a single line of $2n$ space-separated integers: the Euler tour, starting at 1.

Constraints

- $1 \leq n \leq 10^5$
- $1 \leq u, v \leq n$ and $u \neq v$

Example 1

Input

```
8
1 2
2 3
2 4
1 5
5 6
6 7
6 8
```

Output

```
1 2 3 3 4 4 2 5 6 7 7 8 8 6 5 1
```

Explanation

The tree, rooted at 1, looks like this:



The search enters 1, then visits child 2 before child 5. It records each vertex on entry and again on exit, which produces the tour above.

Example 2

Input

```
10
3 10
3 5
1 3
5 7
2 5
2 4
5 8
6 8
6 9
```

Output

```
1 3 5 2 4 4 2 7 7 8 6 9 9 6 8 5 10 10 3 1
```