
No story

Input file: **standard input**
Output file: **standard output**
Time limit: 2 seconds
Memory limit: 256 megabytes

We TAs know this Lab exam is very important for you guys. So we decided not to waste your time with fake stories and all. So we present the question directly.

You are given a tree with **N** nodes. Your task is simple for each edge output the number of distinct even and odd length paths passing through the vertex.

Input

First line contains one integers **N**.

Next N-1 line contains 2 integers u, v which denotes that there is an edge between u and v nodes.
where

$$1 \leq N \leq 100000$$

$$1 \leq u, v \leq N$$

Output

For each node output space separated 2 integer in a newline, Number of even length path passing through the vertex followed Number of odd length path passing through the vertex.

Example

| standard input | standard output |
|----------------|-----------------|
| 4 | 3 3 |
| 1 2 | 3 3 |
| 1 4 | 2 2 |
| 2 3 | 2 2 |

Note

Path A and B are considered distinct if either A or B contains some edge that other do not contain.

Empty paths are also valid paths