D. Sloth

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sloth is bad, mkay? So we decided to prepare a problem to punish lazy guys.

You are given a tree, you should count the number of ways to remove an edge from it and then add an edge to it such that the final graph is a tree and has a perfect matching. Two ways of this operation are considered different if their removed edges or their added edges aren't the same. The removed edge and the added edge can be equal.

A perfect matching is a subset of edges such that each vertex is an endpoint of exactly one of these edges.

Input

The first line contains n ($2 \le n \le 5 \cdot 10^5$) — the number of vertices.

Each of the next $n - 1$ lines contains two integers a and b ($1 \le a, b \le n$) — the endpoints of one edge. It's guaranteed that the graph is a tree.

Output

Output a single integer — the answer to the problem.

Examples

input
4 1 2 2 3 3 4

output
8

input
5 1 2 2 3 3 4 3 5

output
0

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

output
22

Note

In first sample, there are 8 ways:

- edge between 2 and 3 turns to edge between 1 and 3,
- edge between 2 and 3 turns to edge between 1 and 4,
- edge between 2 and 3 turns to edge between 2 and 3,
- edge between 2 and 3 turns to edge between 2 and 4,
- edge between 1 and 2 turns to edge between 1 and 2,
- edge between 1 and 2 turns to edge between 1 and 4,
- edge between 3 and 4 turns to edge between 1 and 4,
- edge between 3 and 4 turns to edge between 3 and 4.