



A Day in Olbia (aliga)

In the last months, Alessandro and Carlo became tired of working day and night for *IHOT* rounds and decided to ditch the Final Round and go on a trip to Olbia.

As they enjoyed their time on the stunning beaches of Sardinia, they stumbled upon a large heap of *aliga*¹: that eyesore could only have been the doing of Valerio, a native Sicilian, who is actively trying to lure tourists from Sardinia to his homeland.

Alessandro and Carlo would love to mind their own business, yet driven by a sense of duty (and certainly not by the smell of all that *aliga*), they agreed that Valerio has to be stopped!



Figure 1: Olbia comes from the Greek word *ólbios*, which means *happy*.

The *aliga* is placed in a very distinctive way: every bag is marked with labels from 0 to $N - 1$ and the rubbish bags' arrangement forms a tree with N nodes (where the edges are the trails Valerio left as he placed the bags).

Despite his role as a villain, Valerio remains a man of honor. Moved by the fact that Alessandro and Carlo would interrupt their beautiful trip to Sardinia to clean the *aliga*, he decided to give them a chance: Valerio will remove all the *munnizza*² from the Sardinian beaches if they can count how many *removable* pairs of bags there are. A pair of bags (u, v) with indices $0 \leq u < v \leq N - 1$ is called *removable* if their distance in the tree $dist(u, v)$ is a multiple of $u + v$.

Alessandro and Carlo cannot refuse to take the challenge, but they are still tired from the previous days of work and they need your help to solve the problem.

Help Alessandro and Carlo solve Valerio's problem in order to preserve the beauty of Sardinian beaches!

Among the attachments of this task you may find a template file `aliga.*` with a sample incomplete implementation.

¹*Aliga* means rubbish in Sardinian dialect.

²*Munnizza* also means rubbish, but in Sicilian dialect.

Input

The input file consists of:

- a line containing integer N .
- $N - 1$ lines, the i -th of which consisting of two integers u and v , representing an edge between node u and node v in the tree.

Output






The output file must contain a single line consisting of a 64-bit integer: the number of *removable* pairs of bags.

Constraints

- $1 \leq N \leq 100\,000$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

- **Subtask 1** (0 points) Examples.

- **Subtask 2** (16 points) $N \leq 100$.

- **Subtask 3** (16 points) $N \leq 1000$.

- **Subtask 4** (16 points) The distance between two nodes is at most 20.

- **Subtask 5** (52 points) No additional limitations.


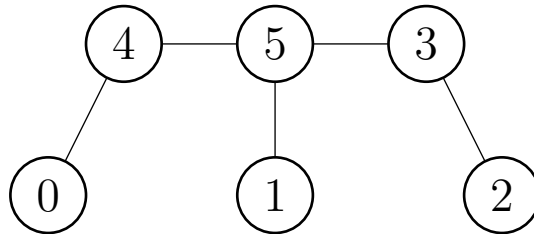
Examples

| input | output |
|--------------------------------------|--------|
| 6 4 5 3 5 4 0 3 2 5 1 | 4 |
| 6 0 1 1 2 2 3 3 4 4 5 | 5 |

Explanation

In the **first sample case** there are 4 removable pairs of bags:

- (0, 1) with distance 3;
- (0, 2) with distance 4;
- (0, 3) with distance 3;
- (1, 2) with distance 3.



In the **second sample case** there are 5 removable pairs of bags:

- (0, 1) with distance 1;
- (0, 2) with distance 2;
- (0, 3) with distance 3;
- (0, 4) with distance 4;
- (0, 5) with distance 5.

