Competitive Programming SS24

Submit until end of contest

Problem: Parcel Paradox (1 second timelimit)

In the charming village of Parcelton, there is a network of packet stations, connected via roads. *There are exactly enough roads to ensure that each packet station is reachable from all the other packet stations.* The mailman of Parcelton navigates through the network of packet stations to deliver packets in a timely manner. However, he has a magic tool "delivery-compression operation" which allows him to be much faster.

In one delivery-compression operation, the mailman can do the following:

1. Choose two packet stations, A and B.

2. Compress all the stations on the path from A to B into one station. In other words, all the stations on the path from A to B (including A and B) will be removed from the network and a new station C will be created. Then, every station W that was connected to some station on the path from A to B via a road, will now be connected to station C via a new road.

If the mailman can compress all the stations into one station, then he can deliver all packets in a blink of an eye. The bad news is, performing a delivery-compression operation is not cheap, so the mailman prefers to use his magic tool as few times as possible. Help the mailman find the minimum number of delivery-compression operations he needs to perform for the network to have only one station.

Input   The first line contains a single integer n ($2 \leq n \leq 10^5$), the number of packet stations. Each of the next $n-1$ lines contains two different integers a and b ($1 \leq a, b \leq n$), denoting that there is a road between packet station a and b in the current network.

Output   Output a single integer, the minimum number of delivery-compression operations.

Sample Input 1

```
4
1 2
2 3
4 2
```

Sample Output 1

```
2
```

Sample Input 2

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

Sample Output 2

```
3
```