Task: NAD
Transmitters

Olimpiada Informatyczna

XXIII OI, Stage I. Source file `nad.*` Available memory: 256 MB. *19.10–16.11.2015*

Byteasar has become the new head of a historic salt mine near Bytown. To increase its popularity with the tourists, he has decided to have wireless Internet set up in the mine's corridors.

The mine consists of n chambers connected by $n-1$ corridors. Each chamber can be reached from every other using the corridors. Byteasar wants to have the wi-fi transmitters installed in the chambers so that Internet is available in every corridor of the mine. The signal in the corridor linking chambers a and b will be sufficiently strong if at least one of the following conditions holds:

- there is a transmitter in chamber a or chamber b, or
- inside the chambers that can be reached from chamber a or b using at most one corridor, there is a total of at least two transmitters.

Byteasar wonders how many wi-fi transmitters are required to provide sufficiently strong signal in all the corridors. Each chamber can have an arbitrary number of transmitters installed.

Input

The first line of the standard input contains a positive integer n that specifies the number of chambers in the mine. These chambers are numbered from 1 to n.

The following $n-1$ lines describe the mine's corridors. Each such line contains two integers a and b ($1 \leq a, b \leq n$, $a \neq b$), separated by a single space, which indicate that the chambers no. a and b are directly linked by a corridor.

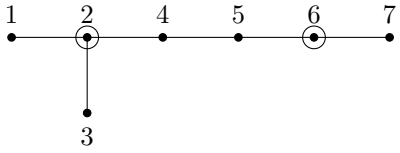
Output

The first and only line of the standard output should contain a single integer: the minimum number of transmitters that Byteasar has to deploy.

Example

For the input data:

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

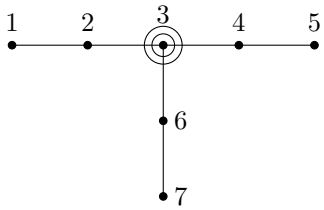


the correct result is:

```
2
```

whereas for the following input data

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



the correct result is:

```
2
```

Explanation of the example: In the first example, it is sufficient to install one transmitter in each of the chambers no. 2 and 6, whereas in the second one it is sufficient to install two transmitters in the chamber no. 3.

Sample Grading Tests:

`1ocen:` $n = 16$. Chamber no. i is linked with chamber no. $\lfloor i/2 \rfloor$ for $2 \leq i \leq n$.

`2ocen:` $n = 303$. Chamber no. 2 is linked with chambers no. 1 and 3. Each of the chambers no. 1, 2, 3 is also linked with a hundred additional chambers. The optimal solution is installing two transmitters in chamber no. 2.

`3ocen:` $n = 200\,000$. The chamber no. i and $i + 1$ are linked by a corridor for $1 \leq i \leq n - 1$.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several test groups.

Subset	Property	Score
1	$n \leq 10$	15
2	$n \leq 500$	20
3	$n \leq 200\,000$, at most three corridors are incident on each chamber	25
4	$n \leq 200\,000$	40