

D: Grapes

Memory limit: **128 MB**

Hansel received a bunch of grapes from his mother. He is supposed to share it with Gretel, who likes grapes very much. She is rather predictable, so Hansel knows that as soon as he breaks one twig of the bunch, she will insist that, because she is a girl, she should be allowed to choose one of the two obtained parts. Of course she will take the one with the larger number of berries. Hence Hansel would like to choose the twig as to guarantee that the other part (which he gets to keep) has as many berries as possible. Help him to determine how many berries he can guarantee for himself.

Hansel is using a rather peculiar terminology when talking about a bunch of grapes. Any such bunch has a tree structure: it consists of *grapes* and *twigs*, and every twig directly connects two different grapes. Any two grapes are connected with a uniquely determined sequence of twigs. One grape is distinguished and called the *root*. Grapes different than the root such that there is exactly one twig connecting them to other grapes are called the *berries*, and all other grapes are called the *joints*.

Input

The first line of input contains one integer n ($2 \leq n \leq 1\,000\,000$) denoting the number of grapes in the bunch. Grapes are numbered from 1 to n , where the root has number 1. The next $n - 1$ lines describe the twigs, each in a separate line. Each of these lines contains two integers a and b ($a \neq b$, $1 \leq a, b \leq n$) denoting that grapes with the corresponding numbers are directly connected with a twig.

Output

The first and only line of output should contain the maximum number of berries that Hansel can guarantee for himself by choosing the twig appropriately.

Example

Input	Output
9 1 2 1 3 2 4 4 5 4 6 3 7 3 8 3 9	2

The following figure shows the bunch from the example. Each berry is represented by a circle, and all other grapes (that is joints) are represented by squares. Segments connecting circles and squares represent twigs. Johnny can guarantee getting berries with numbers 5 and 6 by breaking any of the twigs represented by bold segments. The remaining berries with numbers 7, 8, 9 go to Gretel.

