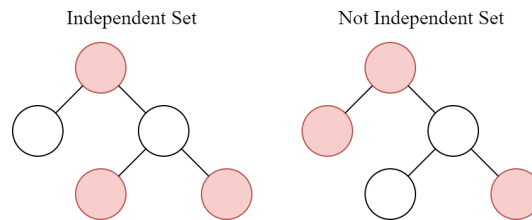


## Problem C

### Independent Set (Max)

You are given a tree of  $N$  nodes (numbered from 1 to  $N$ ). The edges are numbered from 1 to  $N - 1$ ; edge  $i$  connects node  $U_i$  and  $V_i$ .

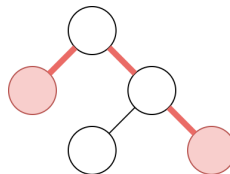
A non-empty set of nodes is *independent* if none of the nodes in the set are adjacent to each other. The following illustration provides an example of sets which are independent, and sets which are not. The nodes colored in red are the members of the set.



The *score* of an independent set can be calculated as the product of:

- the number of nodes in the set, and
- the minimum number of edges such that all nodes in the set are still connected.

The following illustration provides an example for calculating the score of an independent set. There are 2 nodes in the set. The minimum number of edges to connect all nodes in the set is 3, as shown by the edges colored in red. The score of this set is  $2 \cdot 3 = 6$ .



Note that the score of an independent set consisting of only 1 node is 0.

Determine the **maximum** score over all non-empty independent sets within the tree.

#### Input

The first line consists of an integer  $N$  ( $2 \leq N \leq 100\,000$ ).

Each of the next  $N - 1$  lines consists two integers  $U_i V_i$  ( $1 \leq U_i, V_i \leq N$ ). The input edges form a tree.

#### Output

Output a single integer representing the **maximum** score over all non-empty independent sets within the tree.

### Sample Input #1

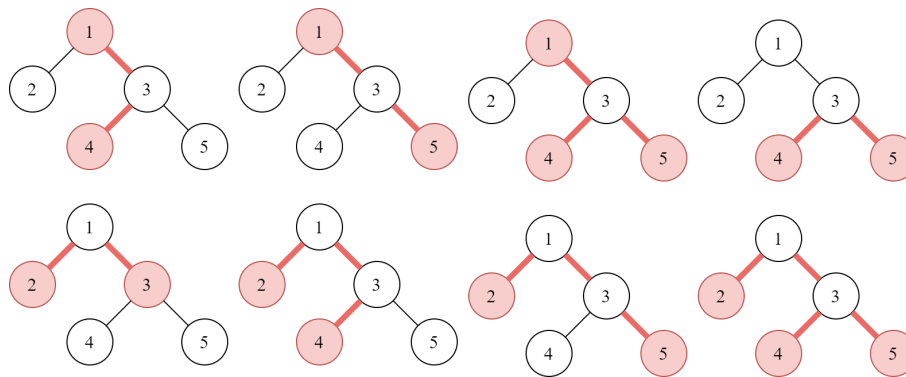
```
5
1 2
1 3
3 4
3 5
```

### Sample Output #1

```
12
```

#### Explanation for the sample input/output #1

The following illustration shows all independent sets with scores larger than 0. The nodes colored in red are members of the independent set. The edges colored in red connect all nodes in the set.



The set with the largest score is illustrated by the bottom-right-most tree. The set consists of 3 nodes and it requires all edges to connect those nodes. The score of this set is  $3 \cdot 4 = 12$ , which can be shown is the maximum score.

### Sample Input #2

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

### Sample Output #2

```
28
```