

## Build a Bridge (zoo)

The monkeys at the zoo of Pordenone have  $N$  trees (numbered from 0 to  $N - 1$ ) to play on, with  $M$  suspended bridges connecting some pairs of them. The bridges are numbered from 0 to  $M - 1$ , and bridge  $i$  connects trees  $U_i$  and  $V_i$  bidirectionally. There is at most one bridge between any pair of trees, and it is possible to get from tree 0 to every other tree by crossing bridges.

The **distance** between two trees is the minimum number of bridges one has to cross to get from one tree to the other (without touching the ground).

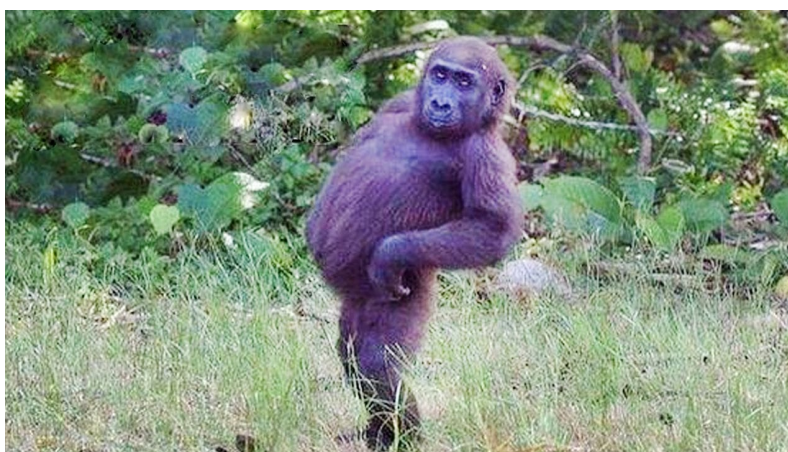



Figure 1: Orodeda, the coolest monkey in Pordenone.

Alessandro, the zookeeper, wants to add a new bridge to make the monkey area fancier. However, he is facing a problem: the monkey sitting on tree 0 and the one sitting on tree  $N - 1$  are sworn enemies, and if he were to make them fight he would be fired instantly. The monkeys would fight if, after installing the new bridge, the distance between tree 0 and  $N - 1$  was less than before. Also, Alessandro is not allowed to install a bridge between two trees that are already directly connected by a bridge.

How many possible choices are there for the new bridge that would not get Alessandro fired?

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

## Input

The input file consists of:

- a line containing integers  $N$ ,  $M$ .
- $M$  lines, the  $i$ -th of which consisting of integers  $U_i$ ,  $V_i$ .

## Output





The output file must contain a single line consisting of 64-bit integer  $C$ , the number of ways to choose the location of the new bridge.

## Constraints

- $1 \leq N \leq 100\,000$ .
- $1 \leq M \leq 300\,000$ .
- $0 \leq U_i \neq V_i < N$  for each  $i = 0 \dots M - 1$ .
- It is possible reach any other tree from tree 0 by crossing bridges.
- There is at most one bridge between any pair of trees.

## 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** (24 points)       $N \leq 100, M \leq 500$ .  

- **Subtask 3** (33 points)       $N \leq 5000$ .  

- **Subtask 4** (43 points)      No additional limitations.  


## Examples

| input   | output |
|---|--------|
| 5 5<br>0 1<br>1 2<br>0 2<br>2 3<br>3 4  | 1      |
| 10 12<br>5 7<br>5 0<br>2 1<br>6 7<br>9 8<br>1 8<br>3 4<br>6 5<br>1 3<br>9 0<br>0 1<br>5 9 | 33     |

## Explanation

In the **first sample case** there are 5 trees and 5 bridges. Initially, it is possible to reach tree 4 from tree 0 by crossing 3 bridges: 0—2—3—4.

- If Alessandro were to add a bridge between trees 0 and 4 it would be possible to reach tree 4 by crossing 1 bridge: 0—4.
- If he were to add a bridge between trees 0 and 3 it would be possible to reach tree 4 by crossing 2 bridges: 0—3—4.
- If he were to add a bridge between trees 1 and 4 it would be possible to reach tree 4 by crossing 2 bridges: 0—1—4.
- If he were to add a bridge between trees 1 and 3 it would not be possible to reach tree 4 by crossing fewer than 3 bridges.
- If he were to add a bridge between trees 2 and 4 it would be possible to reach tree 4 by crossing 2 bridges: 0—2—4.

The answer is therefore 1, since the only bridge that Alessandro could build without getting fired is 1—3.