

# Nomnomnom

## 1 Statement

Rui Yuan the zookeeper is running the Dec course 2020 Zoo!!!!

Recently, hedgehog and snake have been fighting over who gets to eat rabbit. Angrily, Rui Yuan the zookeeper has set out to find all the possible pairs of organisms that eat each other.

The pairs can be modelled as a food web, with  $N$  nodes and  $E$  directed edges. The edge  $a \rightarrow b$  means that organism  $a$  is consumed by organism  $b$ . There can be double edges, for example snakes really like eating sheep.

Organisms will fight if they are in a cycle, for example hedgehogs and snakes both can eat each other. Help Rui Yuan find which organism is the most obedient and will be inside the fewest cycles.

## 2 Limits

Subtask 1:  $N \leq 10$

Subtask 2:  $N \leq 10^6, E \leq 10^6$

Subtask 3: Same as subtask 2, but memory is small

## 3 Input Format

The first line of input contains 2 integers,  $N$  and  $E$ .

The next  $E$  lines of input contain  $a$  and  $b$ , representing a directed edge  $a \rightarrow b$

## 4 Output Format

Output 2 integers.

The first integer is the organism in the fewest cycles.

The second integer is the number of cycles that organism is inside.

## 5 Sample Input

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

## 6 Sample Output

```
4 0
There is 1 cycle 1 → 3 → 2
```