6. STAZA

A bicycle race is being organized in a country. The transport network of the country consists of N cities numbered 1 through N, with M bidirectional roads connecting them. We will use the following terms:

- A **path** is a sequence of roads in which each road starts in the city the preceding road ended in.

- A **simple path** is a path which never visits a city more than once.

- A **ring** is a **simple** path ending in the same city it started in.

The network is such that there is **at least one path** between every pair of cities. Additionally, every **road** in the network is part of **at most one ring**.

Your task is to find the longest path for the race satisfying two constraints:

- The path may begin in any city, but must end in city 1.

- The path may visit a city more than once, but it must not contain any road more than once.

Input

The first line of input contains two integers N and M ($2 \leq N \leq 10\,000$, $1 \leq M \leq 2N-2$) – the numbers of cities and roads in the network.

Each of the following M lines contains two different integers A and B ($1 \leq A, B \leq N$). These numbers indicate that there is a bidirectional road between cities A and B. No two cities will be directly connected by more than one road.

Output

Output the length of the longest race path on a single line.

Sample test data

input	input	input
4 3	6 6	5 6
1 2	1 2	1 2
1 3	1 3	2 3
2 4	2 4	3 4
	3 4	4 5
output	3 5	5 3
	5 6	3 1
2		
	output	output
	5	6