E. Playing on Graph

Vova and Marina love offering puzzles to each other. Today Marina offered Vova to cope with the following task.

Vova has a non-directed graph consisting of n vertices and m edges without loops and multiple edges. Let's define the operation of *contraction* two vertices a and b that are **not connected by an edge**. As a result of this operation vertices a and b are deleted and instead of them a new vertex x is added into the graph, and also edges are drawn from it to all vertices that were connected with a or with b (specifically, if the vertex was connected with both a and b, then also exactly one edge is added from x to it). Thus, as a result of *contraction* again a non-directed graph is formed, it contains no loops nor multiple edges, and it contains $(n - 1)$ vertices.

Vova must perform the *contraction* an arbitrary number of times to transform the given graph into a *chain* of the maximum length. A *chain* of length k ($k \geq 0$) is a connected graph whose vertices can be numbered with integers from 1 to $k + 1$ so that the edges of the graph connect all pairs of vertices $(i, i + 1)$ $(1 \leq i \leq k)$ and only them. Specifically, the graph that consists of one vertex is a chain of length 0. The vertices that are formed as a result of the *contraction* are allowed to be used in the following operations of *contraction*.

The picture illustrates the contraction of two vertices marked by red.

Help Vova cope with his girlfriend's task. Find the maximum length of the chain that can be obtained from the resulting graph or else determine that it is impossible to obtain the chain.

Input

The first line contains two integers n, m ($1 \leq n \leq 1000$, $0 \leq m \leq 100\,000$) — the number of vertices and the number of edges in the original graph.

Next m lines contain the descriptions of edges in the format a_i, b_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$), which means that there is an edge between vertices a_i and b_i. It is guaranteed that there is at most one edge between each pair of vertexes.

Output

If it is impossible to obtain a chain from the given graph, print -1. Otherwise, print the maximum possible number of edges in the resulting chain.

Examples

input

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

output

```
3
```

input

```
4 6
1 2
2 3
1 3
3 4
2 4
1 4
```

output

```
-1
```

input
```
4 2
1 3
2 4
```

output
```
2
```

Note

In the first sample test you can contract vertices 4 and 5 and obtain a chain of length 3.

In the second sample test it is initially impossible to contract any pair of vertexes, so it is impossible to achieve the desired result.

In the third sample test you can contract vertices 1 and 2 and obtain a chain of length 2.