Living Subgraph

In this problem, you are given a simple undirected graph $G = (V, E)$ of $|V| = N$ nodes and $|E| = M$ edges. An **induced** subgraph of G is defined as a subset of G's nodes together with any edges whose endpoints are both in the subset.

Let $W \subseteq V$ and $G[W]$ be an induced subgraph of G with W as its nodes. $G[W]$ is a **living** subgraph if and only if: (1) It contains at least 3 nodes; (2) It is connected; (3) $G[W \setminus u]$ is connected for all $u \in W$. A graph is *connected* if and only if all nodes are reachable from any node in the graph. $W \setminus u$ denotes a set in which u is removed from W.

Your task is to find a set W with the minimum cardinality such that $G[W]$ is a living subgraph; output only the number of nodes. If G does not contain any living subgraph, then output -1.

Input

Input begins with two integers: $N\ M$ ($1 \leq N \leq 20000; 0 \leq M \leq 20000$) representing the number of nodes and edges in the given graph, respectively. The next M lines, each contains two integers: $u\ v$ ($1 \leq u < v \leq N$) representing an edge connecting node u and v. You may safely assume that each edge appears at most once in the given list.

Output

Output in a line an integer representing the minimum number of nodes in which the induced subgraph is a living subgraph. Output -1 if the given graph contains no living subgraph.

Sample Input #1

```
5 6
1 2
1 3
1 5
2 3
3 4
4 5
```

Sample Output #1

```
3
```

Explanation for the sample input/output #1

The induced subgraph $G[W]$ with the set of nodes $W = \{1, 2, 3\}$ is a living subgraph, and it has the minimum number of nodes.

Sample Input #2

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

Sample Output #2

```
-1
```

Explanation for the sample input/output #2

The given graph does not contain any living subgraph.

Sample Input #3

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

Sample Output #3

```
4
```

Explanation for the sample input/output #3

The induced subgraph $G[W]$ with the set of nodes $W = \{2, 4, 5, 7\}$ is a living subgraph, and it has the minimum number of nodes.