Just Some Bad Memory

Input file: standard input
Output file: standard output

Time limit: 1 second

Memory limit: 1024 megabytes

Relax. Let me tell you in the fastest pace what you need to do.

Give you a *simple* graph G = (V, E) consisting of undirected edges. You need to tell me, what is the minimum number of edges should you add to the graph, resulting a simple graph containing at least one *odd cycle* and at least one *even cycle*.

A *simple* graph is a graph without multiple edges and self-loops, which means that each edge connects two different vertices and no two edges connect the same pair of vertices.

A cycle is a sequence of distinct vertices $\{v_1, v_2, \dots, v_k\}$, such that $(v_i, v_{i \mod k+1}) \in E$. The odd or even describes the parity of k. A smallest odd cycle is of length 3, and a smallest even cycle is of length 4.

Input

The first line contains two integers n, m $(1 \le n \le 10^5, 0 \le m \le \min\{2 \times 10^5, \binom{n}{2}\})$, denoting the number of vertices (|V|) and the number of edges (|E|).

In the next m lines, each line contains two integers u, v $(1 \le u, v \le n, u \ne v)$, denoting that there are edges connecting vertices u and v.

It's guaranteed that the input graph is a simple graph.

Output

Print one integer in a single line, denoting your answer. If the mission is impossible, print '-1' instead.

Examples

3 3 1 2 2 3 1 3 4 0 5 5 4 2 1 2 2 2 3 3 4 3 4 4 0 4 5 0 4 6 1 2 1 3 1 1 3 1 4 2 2 3 2 2 3 3 4 4 4 1 1 7 7 7 1 2 2 3 3 3 4 4 4 1 0 7 7 5 5 0	standard input	standard output
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1 3 4 0 5 5 4 2 1 2 2 2 3 3 4 4 4 5 0 4 6 1 2 1 3 1 4 2 3 1 4 4 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2	
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3 4 4 1 7 7 1 2 2 3 3 4 4 1 5 6 6 7	1 2	
3 4 4 1 7 7 1 2 2 3 3 4 4 1 5 6 6 7	2 3	
4 1 7 7 0 1 2 0 2 3 3 4 4 1 5 6 6 7 6		
1 2 2 3 3 4 4 1 5 6 6 7		
2 3 3 4 4 1 5 6 6 7	7 7	0
2 3 3 4 4 1 5 6 6 7	1 2	
3 4 4 1 5 6 6 7		
4 1 5 6 6 7		
5 6 6 7	4 1	
6 7		

Note

Here is one possible solution of sample 2. The contained odd cycles are $\{1, 2, 3\}$ and $\{1, 3, 4\}$, and the only even cycle is $\{1, 2, 3, 4\}$.

