

7 Ye Olde Ren Faire

The arrival of Spring heralds the beginning of the Renaissance Fair. Alice is given the task of preparing the fairgrounds for the Ren fair. The fair has several “attractions” like the Dragon’s Lair, a giant Maze, archery and axe throwing, and booths selling food and merchandise. There are paths connecting some pairs of attractions.

Alice would like to put different pennants along each of these paths, but the fair only has one type in storage. Alice would have to purchase the other 2 types of pennants, and one type is nicer, but more expensive than the other. Thus, there are three types of pennants, costing \$0, \$1, and \$2, respectively. Alice would like her decoration to meet the following properties:

- For any pair of distinct paths adjacent to an attraction, let a and b be the costs of decorations along those paths. It must hold that $(a + b) \bmod 3 \neq 1$.
- The sum of costs along any cycle must be an odd number.

A cycle is a sequence of attractions connected by paths that form a loop. Each attraction may appear exactly once in the loop.

Alice would like to know the cheapest amount she can pay to decorate the fairgrounds the way she prefers.

7.1 Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs.

Each test case will begin with a line with two integers n and m ($1 \leq n, m \leq 10^5$), where n is the number of attractions and m is the number of paths. The attractions are numbered $1 \dots n$.

Each of the next m lines will each contain two integers a and b ($1 \leq a < b \leq n$), indicating that there is a path directly connecting attractions a and b . No two paths will connect the same two attractions. It may or may not be possible to get from every attraction to every other attraction along the paths.

7.2 Output

Output a single integer, which is the minimum cost of decorating the fairgrounds, or -1 if it isn’t possible to decorate the fairgrounds according to Alice’s preferences.

7.3 Sample Input/Output

SAMPLE INPUT AND OUTPUT ON NEXT PAGE

| Sample Input 1 | Sample Output 1 |
|---|-----------------|
| 5 8 1 4 4 5 1 5 1 2 1 3 2 3 3 5 2 5 | -1 |
| Sample Input 2 | Sample Output 2 |
| 6 5 2 4 3 5 1 5 3 6 1 6 | 5 |
| Sample Input 3 | Sample Output 3 |
| 10 10 5 8 2 6 3 9 1 4 9 10 4 6 5 9 7 8 7 10 2 3 | 5 |