A. Communicating between Mountains

time limit per test: 2 s.
memory limit per test: 512 MB

The Himalayas form the highest mountain range in the world (with mountains as high as 7,200 meters). Located in Asia, this mountain system has parts in the Bhutan, China, India, Nepal, and Pakistan. In China, the Tibet is a region delimited by the Himalayas.

The Tibet, which is the highest region on Earth, is an autonomous region inside the People's Republic of China. In this region there are Buddhist temples with Tibetan monks, which are visited every year by many people from the whole world. To facilitate communication, the Central Tibetan Administration (ACT, in Portuguese) wishes to install some radio-frequency antennas around the Tibet. The ACT considered the N most important temples where they wish to install these antennas. The World Communication Association (ACM, in Portuguese) was hired to setup and configure these antennas at the temples. ACM charged their star engineer Aggrovector with this job.

After reading about the history and customs of Tibetan monks, Aggrovector found a curious fact: the Tibetans have a particular fixation for the number K. By studying the map with the location of the N temples, Aggrovector noticed that if he walks through distinct temples until he returns to the starting one, the number of temples he goes through (including the first) never has the form $mK + 1$ for any nonnegative integer m. He was fascinated with his discovery, and realized the importance of the number K for Tibetans. Aggrovector knows that, when setting up the antennas, neighboring temples should receive distinct frequencies to avoid interference. Having this constraint in mind and knowing the importance of the number K for the Tibetans, Aggrovector wishes to find an assignment of frequencies to antennas that uses at most K distinct frequencies, or determine that this assignment is impossible.

Aggrovector had an idea to solve this problem and has already started coding it. Can you beat him to it?

Input

The first line has three integers, N, M, and K, the number of temples, the number of paths that join neighboring temples and the special number revered by the Tibetan people, respectively. The temples are represented by numbers from 1 to N.

The next M lines contain two distinct integers each. Each pair of integers represents two neighboring temples. No two lines among these M lines contain the same pair of integers.

- $1 \leq N \leq 5 \cdot 10^4$
- $0 \leq M \leq 5 \cdot 10^5$
- $1 \leq K \leq N$
- $1 \leq f_i \leq K$

Output

If there is no possible frequency assignment to the temples, print a line containing "-1" (without the double quotes). Otherwise, print N lines. The i-th line must contain a single integer, f_i, the frequency assigned to temple i, where $1 \leq f_i \leq K$. If there is more than one solution, any one will do.

Examples

input	Copy
4 0 1	

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→ About Group
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→ Group Contests
- Line Sweep - Homework (Extra Credit)
- Convex Hull - Preclass
- Number Theory I - Homework
- Line Sweep - Preclass
- Number Theory II - Homework
- Combinatorics - Homework
- Geometry - Preclass
- Geometry - Homework
- Convex Hull - Homework (Extra Credit)
- Rabin Karp - Homework
- Number Theory II - Preclass
- Combinatorics - Preclass
- DP TSP - Homework
- KMP - Homework
- DP Tree - Homework
- Number Theory I - Preclass
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- DP Palindromes - Homework
- Rabin Karp - Preclass
- DP Edit Distance - Homework
- DP Knapsack - Homework
- DP TSP - Preclass
- DP Longest Increasing Subsequence - Homework
- DP Intro - Homework
- DP Tree - Preclass
- Greedy - Homework
- Fenwick Tree - Homework

output Copy

```
1
1
1
1
```

input Copy

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

output Copy

```
1
2
3
```

input Copy

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

output Copy

```
-1
```


- DP Knapsack - Preclass
- DP Edit Distance - Preclass
- Segment Tree - Homework
- DP Palindromes - Preclass
- Lazy Segment Tree - Homework
- LCA and Binary Lifting - Homework
- DP intro - Preclass
- Square Root Decomposition - Homework
- DP Longest Increasing Subsequence - Preclass
- Greedy - Preclass
- Fenwick Tree - Preclass
- Bit Manipulation - Homework
- Square Root Decomposition - Preclass
- Fast Exponentiation - Homework
- MST - Homework
- Lazy Segment Tree - Preclass
- LCA and Binary Lifting - Preclass
- Segment Tree - Preclass
- Bit Manipulation - Preclass
- Fast Exponentiation - Preclass
- MST - Preclass
- Graph Traversal 2 - Homework
- Graph Traversal 2 - In Class
- All Pairs Shortest Path - Homework
- All Pairs Shortest Path - In Class
- Single Source Shortest Path - Homework
- Single Source Shortest Path - In Class
- Graph Traversal 1 - Homework
- Graph Traversal 1 - In Class
- Binary Search Tree - Homework
- Binary Search Tree - In Class
- Disjoint Sets - Homework
- Disjoint Sets - In Class
- Divide and Conquer - Homework
- Divide and Conquer - In Class
- Complete Search - Homework
- Complete Search - In Class
- STL - Homework
- STL - In Class
- IO Problems - Preclass
- Test Contest