IOI Training Camp 2018 Practice Test 1

Lost Graph

Mike is given an undirected graph G of N vertices and M edges. A non-negative integer X_i is assigned to the i'th vertex of G, for $1 \leq i \leq N$.

Mike was asked to assign labels to each edge of the graph (j-th edge should get label Y_j) so that the following condition is satisfied:

Let's suppose that the j'th edge of G connects vertices U_j and V_j. Then, the non-negative integer Y_j equals to X_{U_j} xor X_{V_j}.

This challenge was too easy for Mike and he solved it quickly.

The next day, Mike started to worry that he had solved the problem too quickly and had made a lot of mistakes, so he decided to double-check his answers. To his horror, Mike discovered that all the values of X_i had been lost!

Mike is a very meticulous person and he doesn't like making mistakes, so he decided to create his own values of X_i that still produce the same values of Y_j.

Your task is to determine whether it is possible to do so. If it is, you should output the K-th lexicographically valid sequence $(X_1, X_2, ..., X_N)$ that satisfies the above conditions, knowing the structure of G and all the values Y_j.

Input

The first line of the input contains the integers N, M and K.

The next M lines describe the edges of G; the j'th line contains three integers U_j, V_j and Y_j.

It's guaranteed that G doesn't contain multiple edges and loops.

Output

If there is no valid labelling, or less than K valid labellings, the only line of the output should contain -1. Otherwise, the only line of the output should contain N non-negative integers, denoting the K-th lexicographically valid sequence $(X_1, X_2, ..., X_N)$.

It's guaranteed that in the correct sequence all of the values of X_i won't exceed the 32-bit signed integer limit.

General Constraints

- $1 \leq N \leq 200000$
- $0 \leq M \leq 300000$
- $1 \leq K \leq 10^9$
- $1 \leq U_j \neq V_j \leq N$
- $0 \leq Y_j \leq 2^{31}$

Subtasks

Subtask 1 (100 Points):

- No further constraints

Sample Input 1

```
5 4 2
1 2 5
1 3 9
2 4 0
2 5 1
```

Sample Output 1

```
1 4 8 4 5
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Explanation

The first lexicographically valid sequence is equal to (0, 5, 9, 5, 4);
The second lexicographically valid sequence is equal to (1, 4, 8, 4, 5) - that's the one that should be printed out as the answer.

Limits

Time: 2 seconds

Memory: 512 MB