DMOPC '19 Contest 1 P3 - Simple Math

Time limit: 2.5s **Memory limit:** 128M

In math class, Bob is currently studying systems of linear equations. Being bored of his teacher's lectures, he decides to make a problem for himself. In his problem, he is trying to solve for the N variables, $x_1, x_2, \ldots, x_N$. He then writes M equations, the i-th of which being the equation $x_{a_i} + x_{b_i} = c_i$ where $a_i \neq b_i$. Believing that simply finding a solution to this problem would be too easy, he instead wants to find how many solutions of $(x_1, x_2, \ldots, x_N)$ exist if he constrains each of the x_i to be a positive integer less than or equal to K. Since this number might be very large, he would be satisfied with this number modulo $10^9 + 7$.

Constraints

In all subtasks,
$2 \leq N \leq 300\,000$
$1 \leq M \leq 500\,000$
$1 \leq K \leq 10^9$
$1 \leq a_i, b_i \leq N$, $a_i \neq b_i$
$2 \leq c_i \leq 2K$

Subtask 1 [10%]

$1 \leq K \leq 5$
$1 \leq N \leq 10$
$1 \leq M \leq 20$

Subtask 2 [20%]

There is at most 1 solution.

Subtask 3 [70%]

No additional constraints.

Input Specification

The first line contains three space-separated integers, N, M, and K.
M lines follow, the i-th of which contains three space-separated integers, a_i, b_i, and c_i.

Output Specification

Output one line containing one integer, the number of solutions $(x_1, x_2, \ldots, x_N)$ to the system modulo $10^9 + 7$.

Sample Input 1

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

Sample Output 1

```
2
```

Explanation for Sample Output 1

The two solutions are $(3, 1, 2, 3)$ and $(4, 2, 1, 2)$.

Sample Input 2

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

Sample Output 2

```
0
```

Explanation for Sample Output 2

There are no solutions to this system of equations.