Problem V. Chromatic Number

Time Limit	2000 ms
Mem Limit	262144 kB
Code Length Limit	10240 B

You are given a simple undirected connected with N nodes and M edges with positive costs. From all the paths between 1 and N we'll call those that have the minimum total cost /optimal/. You should /select/ K nodes such that the number of optimal paths that pass through all the K selected nodes is maximum.

Standard input

The first line contains 3 integers N, M and K.
Each of the next M lines contains 3 integers A, B and C, representing an edge between nodes A and B having cost C.

Standard output

Print a line containing two integers:

- The first integer is the maximum number of optimal paths that can pass through the K selected nodes
- The second integer represents the number of ways of selecting the K nodes such that the number of optimal paths passing through them is maximum. This value should be printed modulo $10^9 + 7$.

Constraints and notes

- $1 \leq N \leq 300$
- $N - 1 \leq M \leq \frac{N(N-1)}{2}$
- $1 \leq A, B \leq N$
- $1 \leq C \leq 10^9$
- $1 \leq K \leq N$
- It is guaranteed that the first value you need to output is strictly positive and that it fits in a 64 bit signed integer.

Example 1

Input	Output
4 5 3 1 3 2 1 2 1 2 3 1 2 4 2 3 4 1	2 2

The distance between 1 and 4 is 3.

There are 3 possible paths of minimum cost from the node 1 to node 4: $\{(1,2,4),(1,3,4),(1,2,3,4)\}$.

You can choose the 3 special nodes as $\{1,2,4\}$, then the 2 following optimal paths will pass through all of them: $\{(\mathbf{1},\mathbf{2},\mathbf{4}),(\mathbf{1},\mathbf{2},\mathbf{3},4)\}$.

You can also choose the 3 special nodes as $\{1,3,4\}$. In this case, the following 2 paths will pass through all of them: $\{(\mathbf{1},2,\mathbf{3},\mathbf{4}),(\mathbf{1},\mathbf{3},\mathbf{4})\}$.

Example 2

Input	Output
8 10 2 1 2 3 1 3 5 2 4 4 4 3 2 4 5 1 5 6 3 6 8 1 5 7 2 7 6 1 7 8 2	6 6

The distance from 1 to 8 is 12.

There are 6 paths of such cost:

1. $(1,2,4,5,7,8)$
2. $(1,3,4,5,7,8)$
3. $(1,2,4,5,7,6,8)$
4. $(1,3,4,5,7,6,8)$
5. $(1,2,4,5,6,8)$
6. $(1,3,4,5,6,8)$

   You can choose the following subsets of 2 nodes:
   $\{\{1,4\},\{1,5\},\{1,8\},\{4,5\},\{4,8\},\{5,8\}\}$.