

Cute Matrix - Small

Assignment 4 Data Structures and Algorithms

Problem Statement: Cute matrices are such matrices which obey :

- A Cute matrix can only be of dimensions $N * M$, where $N, M \geq 2$.
- The xor of the of 4 corner cell elements equals 0.
- A matrix is Cute only if it's all sub-matrices of dimensions $p * q$ ($2 \leq p \leq N, 2 \leq q \leq M$) are all Cute.

Given a matrix of dimensions $N * M$ with only K cells filled . You are required to fill rest of the cells . You know that matrix can take in values only in the range $(0, 2^{30} - 1)$. Figure out how many different ways can you fill in the matrix completely to make the matrix a Cute one.

Input

First line contains three integers N, M and K .

Next K lines contains description of cells.

i - th of the next K lines contains 3 integers i, j, v . which means cell (i, j) contains value v .

Output

Print the number of ways can you fill in the matrix completely to make the matrix a Cute one. Answer modulo $1e9 + 7$.

Constraints

$$1 \leq N, M \leq 10^3$$

$$1 \leq K < N * M$$

$$0 \leq v < 2^{30}$$

$$1 \leq i \leq N$$

$$1 \leq j \leq M$$

Time Limit: 2 seconds

Memory Limit: 256 MB

Sample Test Case

Input	Output
2 2 3 1 2 4 2 2 7 2 1 3	1

Input	Output
3 3 2 1 3 4 2 3 4	560523804

Input	Output
3 3 4 1 1 5 1 3 7 2 2 4 2 3 6	73741817

Explanation

The 3 cells in the matrix in 1st sample above cause the only remaining cell (1,1) to be filled in one way to have a Cute matrix , i.e., value 3 xor 4 xor 7 = 0.