01 Matrix

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

There are 2^{NM} matrices $A = (A_{i,j})$ $(1 \leq i \leq N,\ 1 \leq j \leq M)$ of size N rows and M columns consisting only of 0 and 1. Among them, find the number of matrices that satisfy the following condition, and output the result modulo 998244353.

- For all $k = 1, 2, \ldots, K$, both of the following hold:
  - $\sum_{i=1}^{x_k} \sum_{j=1}^{y_k} A_{i,j}$ is odd.
  - $\sum_{i=x_k+1}^{N} \sum_{j=y_k+1}^{M} A_{i,j}$ is odd.

Input

The input is given in the following format:

$N\ M$
K
$x_1\ y_1$
$x_2\ y_2$
$\vdots$
$x_K\ y_K$

- $2 \leq N, M \leq 10^9$
- $1 \leq K \leq 3 \times 10^5$
- $1 \leq x_i < N$ $(1 \leq i \leq K)$
- $1 \leq y_i < M$ $(1 \leq i \leq K)$
- $(x_i, y_i) \neq (x_j, y_j)$ $(i \neq j)$
- All input values are integers.

Output

Print the answer.

Examples

standard input	standard output
3 4 2 2 2 1 3	256
76 38 4 7 6 3 8 20 26 3 28	361562686

Note

For the first sample input, the matrix above the figure satisfies the condition. However, the matrix below does not satisfy the condition because $\sum_{i=1}^{x_1}\sum_{j=1}^{y_1} A_{i,j}$ is even.

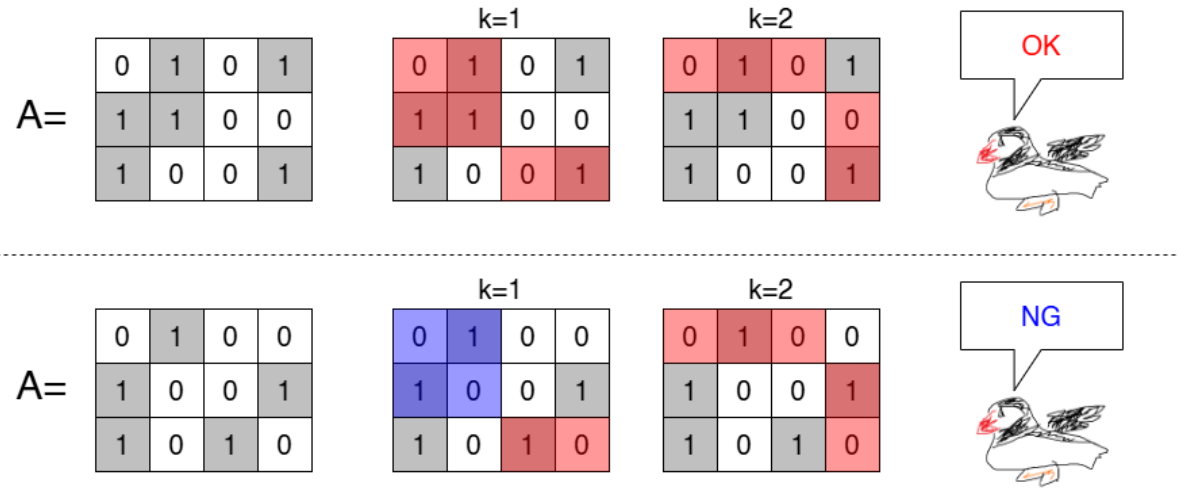

Рис. 1: Explanation for the first example.

For the second example, do not forget to output the answer modulo 998244353.