

## Problem E. Elegance in moves

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          2 seconds  
Memory limit:       256 megabytes

Given a board of size  $n \times m$  cells, you have to find the number of different pairs of cells between which the chess queen can walk in a single move and without crossing any of the given rectangles. Additionally, it is known that each cell belongs to no more than one rectangle. Recall that in a single move the queen can move any number of squares in a straight line — vertically, horizontally or diagonally.

Since the answer can be large, print it modulo  $10^9 + 7$ .

### Input

The first line contains three integers  $n \ m \ k$  — field size and the number of rectangles, respectively. The next  $k$  lines contain four integers  $r1_i \ c1_i \ r2_i \ c2_i$  — the coordinates of the  $i$ -th rectangle. No two different rectangles share a common cell.

$$1 \leq n, m \leq 10^9$$

$$0 \leq k \leq 10^5$$

$$1 \leq r1_i \leq r2_i \leq n$$

$$1 \leq c1_i \leq c2_i \leq m$$

### Output

Print a single integer, denoting the number of pairs of cells between which the chess queen can walk in a single move outside of the rectangles modulo  $10^9 + 7$ .

### Examples

| standard input                                               | standard output |
|--------------------------------------------------------------|-----------------|
| 1 6 1<br>1 3 1 3                                             | 4               |
| 3 3 1<br>2 2 2 3                                             | 11              |
| 6 9 5<br>1 6 4 8<br>3 2 6 2<br>2 1 6 1<br>1 3 5 5<br>3 9 4 9 | 42              |