

C. Painting

Fluffy the Squirrel has decided to learn abstract art! To save money, he has decided to take up ink-and-water painting classes, which are cheap because only one colour is needed - grey.

Fluffy's teacher gave him a piece of white grid paper with N rows and M columns and a list of instructions to draw multiple straight lines of two kinds:

0 R x y : draw a horizontal line in row R from column x to column y

1 C x y : draw a vertical line in column C from row x to row y

Initially the *shade of grey* value for each cell is **0**. When a straight line is drawn past a cell, the cell's *shade of grey* value increases by **1**.

To make his painting classes self-sustaining, Fluffy will follow his teacher's instructions, and then secretly sell the painting to an art gallery. According to the gallery rules, the value of a painting is the maximum *shade of grey* value found in the painting multiplied by the number of cells that has that *shade of grey* value. Your task is to help Fluffy find the value of the painting he makes.

Input Format

- The first line contains three integers N , M and Q denoting the number of rows, the number of columns and the number of lines to draw, respectively.
- The next Q lines are either of the format **0 R x y** or **1 C x y** as described in the problem statement.

Output Format

An integer denoting the value of Fluffy's painting.

Constraints

For all test cases, $1 \leq N, M \leq 2,000$ and $1 \leq Q \leq 1,000,000$

Subtask 1 (20 points) : $1 \leq N, M \leq 100$ and $1 \leq Q \leq 10,000$

Subtask 2 (30 points) : $N = 1$ and all lines are horizontal

Subtask 3 (30 points) : All lines are horizontal

Subtask 4 (40 points) : No additional constraints apply

Sample Input 1

```
3 4 3
0 1 2 4
1 3 1 3
0 3 1 4
```

Sample Output 1

4

Explanation 1

After the first line is painted, the paper grid looks like this

```
0 1 1 1
0 0 0 0
0 0 0 0
```

After the second line is painted, the paper grid looks like this

```
0 1 2 1
0 0 1 0
0 0 1 0
```

After the third line is painted, the paper grid looks like this

```
0 1 2 1
0 0 1 0
1 1 2 1
```

The highest *shade of grey* value found is 2 and there are 2 cells $\{(3,3), (1,3)\}$ which have that *shade of grey* value of 2. Hence the answer is $2 \times 2 = 4$.

Sample Input 2

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

Sample Output 2

```
6
```

Explanation 2

After the first line is painted, the paper grid looks like this:

```
0 0 1 0
0 0 1 0
0 0 1 0
```

After the second line is painted, the paper grid looks like this:

```
0 0 2 0
0 0 2 0
0 0 2 0
```

The highest *shade of grey* value found is 2 and there are 3 cells $\{(1,3), (2,3), (3,3)\}$ which have that *shade of grey* value of 2. Hence the answer is $2 \times 3 = 6$.