DMPG '15 S5 - Black and White

Time Limit: 2.0s **Memory Limit:** 256M
Java 8: 4.0s

Ruby is playing with the board from a board game.

The board consists of $N \times N$ square cells of unit dimensions on a plane, with the topmost left tile defined as $(0, 0)$. Originally, all of these cells are colored black. Ruby will execute M commands of the form x, y, w, h, in which she'll flip the colors of the cells contained by a $w \times h$ rectangle whose top-left vertex is located at (x, y). That is, a cell colored black will become white, and a cell colored white will become black.

At the end of all her flip commands, she wants to know the area covered by white tiles on the board.

Constraints

Subtask 1 [10%]

- $10 \leq N \leq 1\,000$
- $1 \leq M \leq 100$

Subtask 2 [30%]

- $N = 1\,000$
- $1\,000 \leq M \leq 100\,000$

Subtask 3 [60%]

- $N = 10\,000$
- $1\,000 \leq M \leq 100\,000$

Input Specification

The first line of input will contain 2 space-separated integers N and M. The next M lines will each contain a flip command in the form of 4 space-separated integers x, y, w, h $(0 \leq x, y; 1 \leq x + w, y + h \leq N)$.

Output Specification

On one line, the integer number of cells that are colored white at the end of Ruby's game.

Sample Input 1

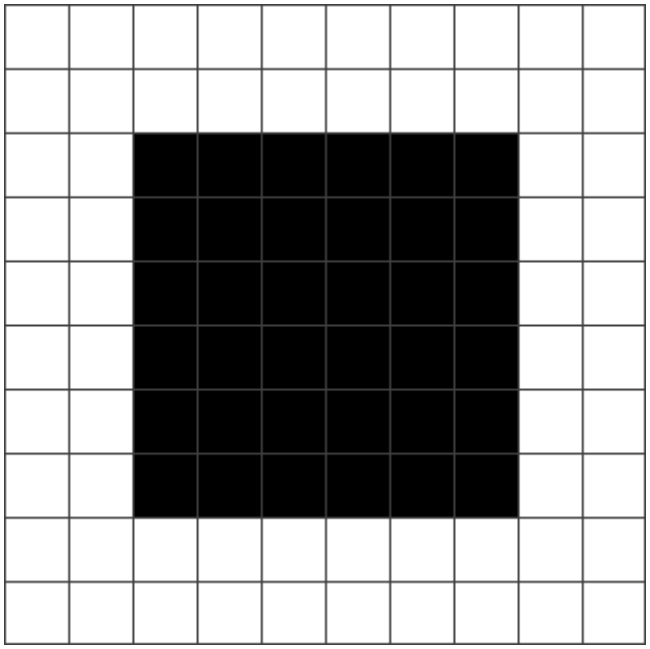
```
10 2
0 0 10 10
2 2 6 6
```

Sample Output 1

```
64
```

Explanation

The board after the 2 commands is shown below.



Sample Input 2

```
10 15
0 5 10 5
0 0 1 1
6 5 2 1
3 6 1 1
3 5 1 1
7 2 2 1
4 2 1 1
3 3 1 2
0 8 1 2
6 9 2 1
8 2 1 1
1 2 2 1
1 3 2 2
3 3 2 2
6 2 1 1
```

Sample Output 2

```
54
```

Explanation

The board after all 15 commands is shown below.