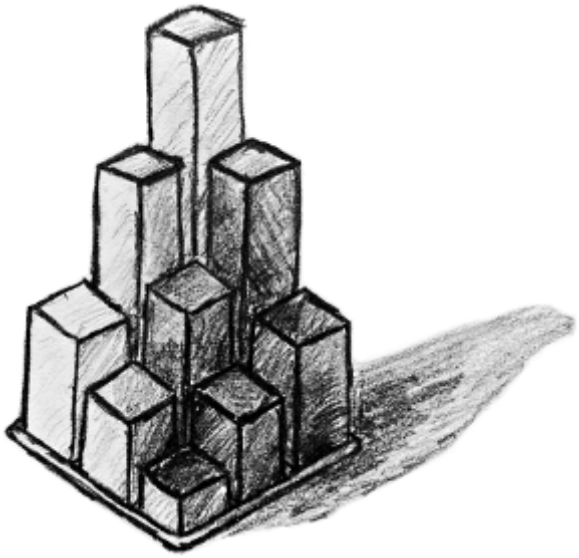
Back To School '16: Times Table

Time limit: 0.6s **Memory limit:** 256M

atarw has bought a number of times table sets in preparation for the difficult math in the upcoming school year. A times table set is a rectangular collection of columns, with respective heights of a times table which somehow helps **atarw** to visualize the math.



Consider a 4 by 4 times table.

$\times$	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16

These products are the heights of a set shown below.

```
1 2 3  4
2 4 6  8
3 6 9  12
4 8 12 16
```

He wants to stack them on top of each other M times within an originally empty C by R grid to form a cool 3D structure. When stacked, gravity takes effect on the individual columns causing them to drop down. The grid has a top-left corner at $(1, 1)$ and a bottom right corner at (C, R). He may put more than one set at the same time. This effectively multiplies all the numbers (heights) in the times table.

```
2 4  6  8
4 8  12 16
6 12 18 24
8 16 24 32
```

After stacking these sets together, **atarw** wants to take a finger walk in the grid starting at position (c, r). He wants to take the longest finger walk on a strictly increasing path. Output the largest sum of such a path. He may only finger walk to adjacent blocks (up, down, left, right).

Input Specification

The first line will contain three space separated integers, C R M, the number of columns and rows on the grid and the number of times that **atarw** will place multiplication table sets.

The next M lines will contain 5 integers, `x y w h n` where (x, y) is the top left corner of the multiplication table set(s). w is the width and h is the height of the set(s). n is the number of sets to be inserted. It is guaranteed that the whole rectangle is within the grid.

Finally, the last line of input will contain `c r`, (c, r) is the starting position of the finger walk. It is guaranteed that the coordinates are within the grid.

Constraints

Subtask 1 [20%]

$1 \leq C, R, M \leq 100$
$1 \leq n \leq 10$

Subtask 2 [80%]

$1 \leq C, R \leq 500$
$1 \leq M \leq 100\,000$
$1 \leq n \leq 100$

Output Specification

A single integer, the largest sum of the longest finger walk possible modulo $1\,000\,000\,007$.

Sample Input 1

```
5 4 3
1 1 3 3 1
3 3 3 2 2
2 4 2 1 4
2 1
```

Sample Output 1

```
35
```

Explanation for Sample Output 1

The structure is:

```
1 2 3  0 0
2 4 6  0 0
3 6 11 4 6
0 4 12 8 12
```

The longest path is: $2 \to 4 \to 6 \to 11 \to 12$.

Sample Input 2

```
5 5 1
1 1 5 5 1
2 2
```

Sample Output 2

```
92
```