BSSPC '21 S2 - Hacker Soup

Time limit: 2.0s **Memory limit:** 256M

Soup has infiltrated Lakshy's top secret lab! Inside this lab are the secrets on how to survive the IB program. However, to get in Soup would need to bypass a sophisticated security lock. The security lock is an N by N matrix of cells. Soup has gained intel that the value of cell (i, j) (that is, the i^{th} row and j^{th} column) would be $(i-1) \times N + j$ by default. To pass the lock, Soup will need to answer Q queries, the k^{th} asking for the value of a particular cell (y_k, x_k). Unfortunately, Soup was also informed that the numbers on the grid have been scrambled in K successive rotation operations! In the k^{th} operation, Lakshy rotates the square with top left corner (t_k, l_k) and bottom right corner (b_k, r_k) by **90 degrees clockwise**. Overwhelmed by the difficulty, Soup cannot unlock the security lock, so he has come to you, his trusty accomplice, to help him!

Constraints

For all subtasks:

$1 \leq N \leq 10^9$

$1 \leq K, Q \leq 5 \times 10^3$

$1 \leq t_k \leq b_k \leq N$

$1 \leq l_k \leq r_k \leq N$

$b_k - t_k = r_k - l_k$

$1 \leq y_k, x_k \leq N$

Subtask 1 [20%]

$1 \leq N \leq 500$

$1 \leq K \leq 100$

Subtask 2 [80%]

No additional constraints.

Input Specification

The first line contains three integers, N, K, Q.

The next K lines each contain four integers, t_k, l_k, b_k, r_k.

The next Q lines each contain two integers, y_k, x_k.

Output Specification

For each of the Q queries, output on a separate line the value of cell (y_k, x_k).

Sample Input

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

Sample Output

```
3
4
```

Explanation

Before any rotations, the matrix looks like this:

```
1 2 3
4 5 6
7 8 9
```

After the first rotation, the matrix looks like this:

```
7 4 1
8 5 2
9 6 3
```

After the second rotation, the matrix looks like this:

```
7 4 1
8 6 5
9 3 2
```

Thus the cell at $(3, 2)$ is 3 and the cell at $(1, 2)$ is 4.