

Problem C - 2D Paper Play

Time Limit

Memory Limit

1 second ([See Below](#))

512 MB

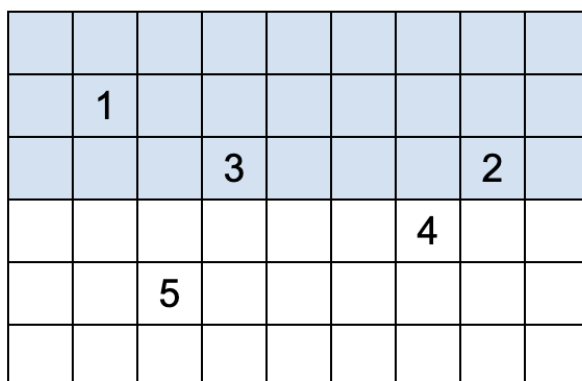
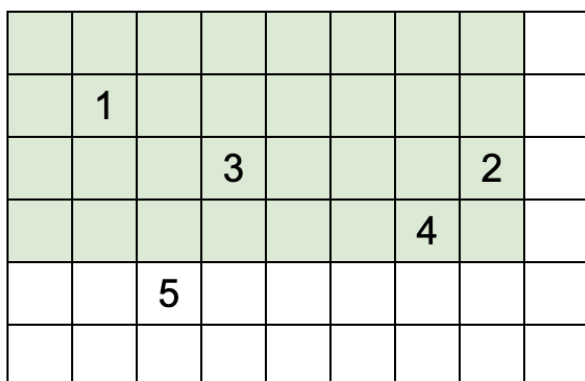
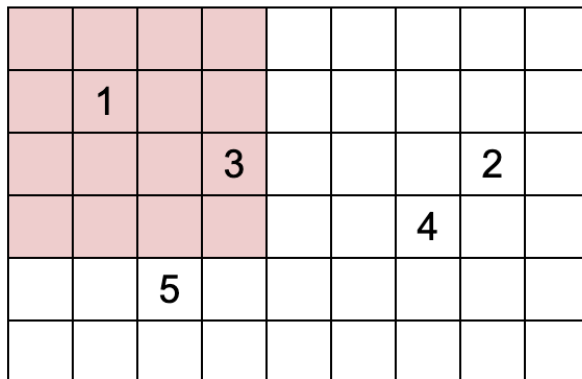
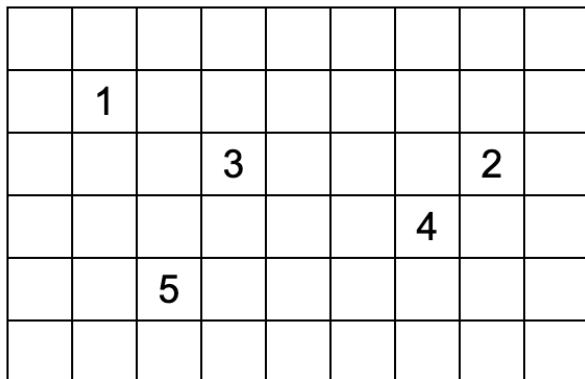
Description

Bob is playing with construction paper and blocks on a 2D grid.

Each block is of size 1×1 , and Bob can stack up multiple blocks on the same spot.

More specifically, suppose there are N blocks and let (x_i, y_i) be the position of the i -th block. In this problem, top-left corner is $(1,1)$ and the x -axis is the horizontal plane.

For instance, the top-left image below shows that block #1 is at $(2, 2)$ and #3 at $(4, 3)$.



Bob also has M sheets of construction paper, where the j -th sheet is w_j cells wide and h_j cells tall -- let us assume that construction paper cannot be rotated in this problem.

- In the image above, top-right figure shows that a sheet of size 4×4 can cover from $(1, 1)$ to $(4, 4)$ completely. In this case, block #1 and #3 can be placed on top of the sheet.
- The bottom-left figure shows that a sheet of size 8×4 can be used such that 4 blocks are placed on it.
- Lastly, the bottom-right figure shows that a sheet of size 9×3 can be used such that 3 blocks are placed on it.

While observing how Bob is playing with blocks and sheets, Alice suggested her little brother to consider the following problem.

- When the j -th sheet is placed to cover from $(1, 1)$ to (w_j, h_j) , if the i -th block is on the sheet (i.e. $x_i \leq w_j$ and $y_i \leq h_j$) then we say that the sheet can "contain" the i -th block.
- For each i , let us define C_i to be the number of sheets (among M sheets) that can "contain" the i -th block -- hence, $0 \leq C_i \leq M$.

Using this definition, Alice will ask Bob to answer Q questions where the k -th question is expressed with two integers L_k, U_k :

- k -th question: How many i 's satisfy $L_k \leq C_i \leq U_k$?

For instance, in the image above, we can say $N=5$, $x=[2,4,8,7,3]$, and $y=[2,3,3,4,5]$. Let the sizes of the $M=3$ sheets be $w=[4,8,9]$ and $h=[4,4,3]$.

- $C_1=3$ because all three sheets contain block #1.
- $C_2=2$ because only two sheets (second and third sheets) can contain block #2.
- $C_3=3$, $C_4=1$, and $C_5=0$.

If Alice wants to ask $Q=5$ questions with $L=[0,1,0,1,2]$ and $U=[2,3,3,1,3]$, then the answers are as follows.

- Because $0 \leq C_i \leq 2$ only if $i=2,4,5$, the answer to the first question is 3.
- Because $1 \leq C_i \leq 3$ only if $i=1,2,3,4$, the answer to the second question is 4.
- Similarly, the answers to the remaining questions are 5, 1, and 3.

Given N blocks' position, the size of M sheets, and Q questions from Alice, compute the correct answers to help Bob.

Input

The first line of the input will contain T , the number of test cases.

The first line of each test case will contain N, M, Q , separated by whitespace.

The next N lines will describe the position of each block, containing x_i and y_i separated by whitespace.

The next M lines will contain the size of each sheet, containing w_j and h_j separated by whitespace.

The next Q lines will describe the questions from Alice, containing L_k and U_k separated by whitespace.

Output

Output the answer for each test case in each line -- the line must contain Q integers separated by whitespace.

Limit

See the Subtask details

Subtask 1 (10 Points)

- $1 \leq T \leq 10$
- $1 \leq N, M \leq 2000$
- $1 \leq Q \leq 50000$
- For each i with $i=1,2,\dots,N$, $1 \leq x_i, y_i \leq 100000$
- For each j with $j=1,2,\dots,M$, $1 \leq w_j, h_j \leq 100000$
- For each k with $k=1,2,\dots,Q$, $0 \leq L_k \leq U_k \leq M$

Subtask 2 (20 Points)

- $1 \leq n \leq 10$
- $1 \leq x_1, x_2, x_3 \leq 50000$
- For each n with $n=1,2,\dots,10$, $1 \leq x_1, x_2, x_3 \leq 100000$
- For each n with $n=1,2,\dots,10$, $1 \leq x_1, x_2, h, x_3 \leq 100000$
- For each n with $n=1,2,\dots,10$, $0 \leq x_1, x_2 \leq x_3 \leq x_4$

Sample Input 1 Copy

```
2
5 3 5
2 2
8 3
4 3
7 4
3 5
4 4
8 4
9 3
0 2
1 3
0 3
1 1
2 3
5 3 3
```

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

Sample Output 1 Copy

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

Case 1: Discussed in the problem statement.

Case 2: There can be multiple blocks on the same cell.

Time Limit

- Java 8: 6 seconds
- PyPy3: 6.5 seconds