

Yet Another Geometry Problem

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 256 megabytes

There is a 2-dimensional plane described as $\{(x, y) | 0 \leq x \leq M, 0 \leq y \leq M\}$. We also have another N points $P(x_i, y_i)$. Different points may share the same coordinates.

We define a good space as a square(in the given plane) with no point strictly inside it. Endpoints of the square should be on integers coordinates.

In each query, given (u, v) , please calculate the largest area of a good space which (u, v) is strictly inside.

Notice that the border of a legal space has to be parallel to x-axis or y-axis and it should not cross the border of the plane.

Input

There are multiple test cases. The first line of the input contains an integer $T(T \leq 10)$, indicating the number of test cases. For each test case:

The first line contains two integers $M(2 \leq M \leq 10^9)$ and $N(0 \leq N \leq 5000)$.

In the following N lines, each line contains two integers $X_i, Y_i(0 \leq X_i, Y_i \leq M)$, which denotes the Euclidean coordinate of $P(x_i, y_i)$.

Then the next line contains one integer $Q(1 \leq Q \leq 5000)$, which denotes the number of queries.

In the following Q lines, each line contains two integers $u, v(0 \leq u, v \leq M)$.

Output

For each query, please output an integer as the answer in one line.

Specially, if there is no legal good space, please output 0 instead.

Example

standard input	standard output
1	4
5 5	9
1 4	4
2 1	
3 2	
4 1	
4 4	
3	
3 1	
2 3	
4 3	