Cutting Wafer

Time Limit: 3 second

You are planning to cut a silicon wafer whose width is **W** units and whose length is **L** units into smaller pieces. However, there are **P** defects on the wafer. You would like to utilize the wafer as much as possible, but you do not want any defects on the pieces. Luckily each defect is extremely small; therefore, we can treat each defect as a point.

You put the wafer on a special cutter with 4 corner blades, which can cut the pieces **out of any 4 corners of the wafer**. Due to the chemical process you used to mark the defects that causes the wafer at the defect point to be thicker than the other area of the wafer, the cutter corner blades **cannot move beyond** any defect points. The pieces that can be cut out from the wafer by this cutter can be utilized, **no matter how small** they are.

Your task is to find the area of the wafer that can be utilized.

Figure 1 below shows a wafer with 6 defects on the cutting machine. In this example, **W = 10**, **L = 6**, and **P = 6**. Note that while the defects are shown as circles for clarity, they are point defects. Suppose that the bottom-left of the wafer is at co-ordinate (0,0). If we use the corner blade at the top-right corner to cut the wafer so that the corner of the blade is at co-ordinate (6,3), the wafer is cut as shown in Figure 2 (a).

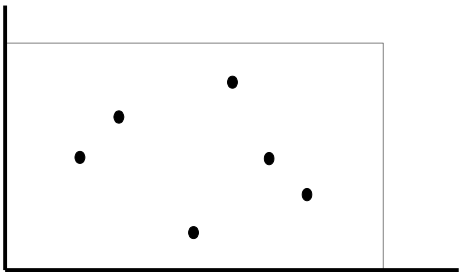
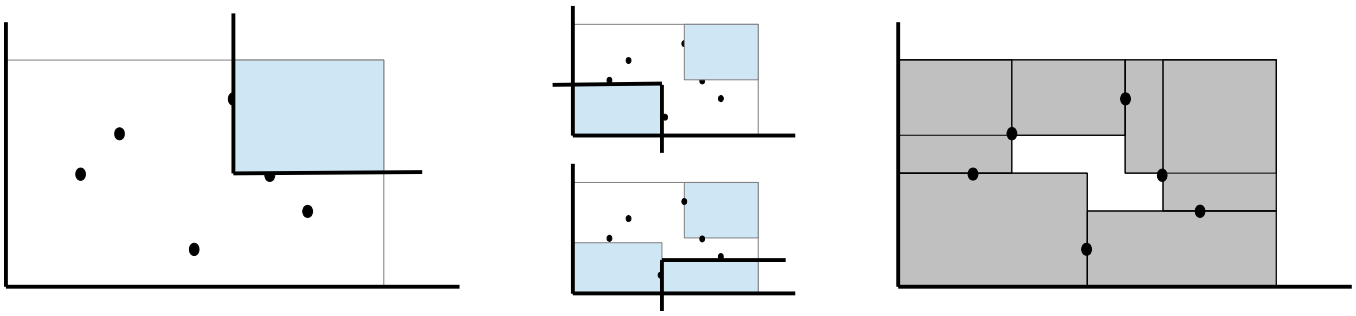


Figure 1. This is a wafer on the cutting machine. There are 6 defects.

Note that there is a defect point at co-ordinate (6,5); therefore the corner blade at the top-right corner **cannot** cut the wafer so that the corner of the blade is at co-ordinate (5,4), because this blade cannot move beyond the defect point.



(a) (b) (c)

Figure 2. (a) The cutter can cut the wafer from any corners; this example only shows how the cutter cuts out the top-right corner. (b) Another 2 cuts, from the bottom-left corner and from the bottom-right corner. (c) The shade area can be utilized by cutting them into many pieces. The white area cannot be utilize because the cutter cannot cut a piece out of that area of the wafer without having to include the defects.

In this example, at the end the area of the wafer that can be utilized is shown in shade in Figure 2(c). The usable area is 55 unit^2 (out of the total area of 60 unit^2).

Input

The first line contains an integer **T**, the number of test cases to follow (**1 <= T <= 10**).

Each test case is in the following format. The first line contains three integers **W L P** (**1 <= W <= 1,000,000; 1 <= L <= 1,000,000; 1 <= P <= 100,000**). The wafer can be put on the plane where the bottom-left corner is at co-ordinate (**0,0**) and the top-right corner is at co-ordinate (**W,L**).

The next **P** lines provide the co-ordinate of the defects. Each line contains two integers **X** and **Y** meaning that there is a defect at co-ordinate (**X,Y**) (**0 <= X <= W; 0 <= Y <= L**).

It is guaranteed that no two defects are at the same co-ordinate.

Output

For each test case, your program should output an integer **A** which is the area that can be utilized in the wafer.

Example

Input	**Output**
3 10 6 6 5 1 2 3 7 3 8 1 3 4 6 5 3 2 4 1 0 2 1 2 0 1 1 3 3 4 0 0 1 1 2 2 3 3	55 5 9