Problem 7 - The Plot Thickens

Professor Plums wife likes to paint, but Professor Plum is more of a digital kind of guy. Imagine an 8-by-7 canvas of zeroes as shown in Figure (a). Imagine plotting a 5-by-4 rectangle of ones on it, with its top-left corner at $(2, 3)$, as shown in Figure (b).

00000000	00000000	00000000	00000000
00000000	00000000	11110000	11110000
00000000	00000000	11110000	11101000
00000000	00111110	11001110	11010110
00000000	00111110	11001110	11001110
00000000	00111110	11001110	11001110
00000000	00111110	00111110	00111110
(a) Blank canvas	**(b) First rectangle**	**(c) Second rectangle**	**(d) Third rectangle**

Imagine plotting a 4-by-5 rectangle of ones on the current canvas, with its top-left corner at $(0, 1)$. However, whenever the rectangle overlaps any other rectangle, the pixels cancel each other out, as shown in Figure (c). Suppose further that we plot a 2-by-2 rectangle at $(3, 2)$. The resulting canvas is shown in Figure (d).

After plotting a sequence of rectangles to a canvas in this manner, how many pixels are set to 1?

Input

The input consists of a number of cases followed by a line for each case. The first two numbers in each cases line are the width and height of the canvas. The third number is the number of rectangles plotted. The remaining numbers describe each rectangle and therefore appear in groups of 4. Within a group, the first two numbers are the xy-coordinates of a rectangles top-left corner, and the second two are the rectangles dimensions.

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

Output

For each case, print a case label and the number of 1-pixels in the canvas after all plotting. For the example input, the output is:

```
Case 1: 28
Case 2: 9
```