A   Attractive Grid

Mr. Naruto is a super programmer and he is working for a company named SSK(Screen Systems of Konoha). The company assigned him a task, which is he has to create a screen where each pixel of the screen can hold multiple colors simultaneously. Here are the properties of the screen:

- The screen is an **MxM** square grid where each **1x1** square is a pixel.
- The position of a pixel in the screen can be denoted by a **(row, column)** pair where **1 ≤ row, column ≤ M.**
- *Intensity level* of the pixel at position (**row, column**) is defined as the number of unique colors the pixel is colored with.

Mr. Naruto successfully completed the task of constructing the screen and now he wants to do an experiment on the screen.

- Each experiment can be denoted by four integers "**r c1 c2 c**".
- In each experiment, he selects a rectangular region consisting of pixels from row **1** to row **r** and from column **c1** to column **c2** of the screen.
- Now he uses a special pen to paint each of the pixels in the screen at position **(pr,pc)** where **1≤pr≤r and c1≤pc≤c2** with color **c**.

After doing **E** such experiments, he is wondering about the *intensity level* of the pixels. You have to find how many pixels in the screen have an *intensity level* of **at least L.**

Input

The first line of input will contain an integer **T**(**1≤T≤15**) which is the number of test cases. The first line of each test case contains three space separated integers **M**($1 \leq M \leq 2*10^9$), **E**($1 \leq E \leq 10^5$) and **L**($0 \leq L \leq 10^5$). Where **M** is the screen's side length, **E** is the number of experiments and **L** is the desired *intensity level*.

Then following **E** lines each describes an experiment. Each experiment is denoted by four integers "**r c1 c2 c**". Where **1 ≤ r ≤ M** and **1 ≤ c1 ≤ c2 ≤ M.** And **c** will be between **1** and 10^5 (inclusive). There is a blank line after each test case in the input.

Output

For each case, print the case number and then the number of pixels in the screen having *intensity level* at least **L**. See sample output for the format.

Sample Input	Output for Sample Input
2 10 4 1 3 2 6 1 4 2 5 1 5 4 8 2 3 7 10 3 10 4 2 3 2 6 1 4 2 5 1 5 4 8 2 3 7 10 3	Case 1: 39 Case 2: 17