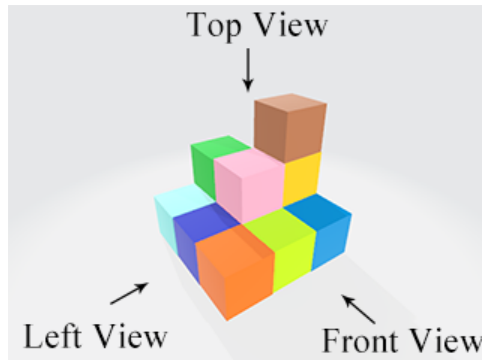

Building Blocks

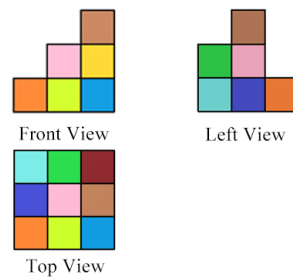
Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **256 megabytes**

As we know, for a three-dimensional object, we can draw its three views — front view, top view, and left view. We can regard these views as the projections of the object onto different planes.

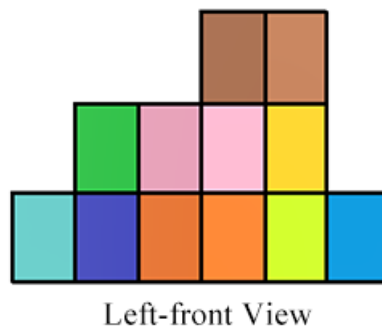
For example, consider some blocks like this:



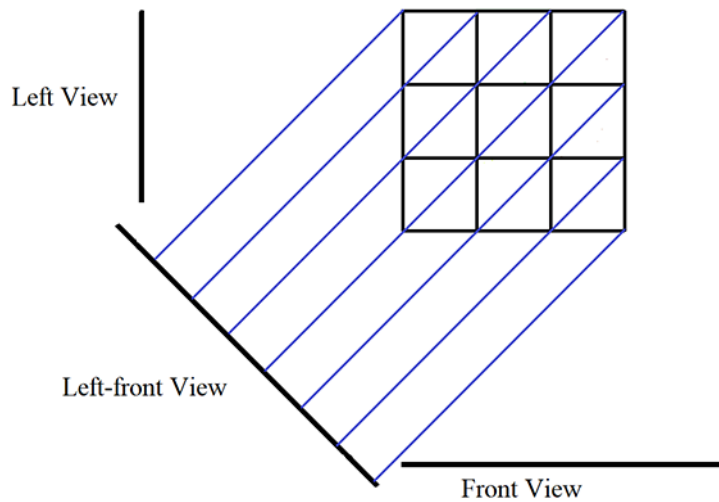
The three views can be drawn as follows:



But Little Rabbit thinks these views are too boring. He wants to observe these blocks in a quite special view — left-front view. Still consider the blocks given above. The left-front view can be drawn as follow:



The left-front view can also be regarded as a projection onto a plane, while the plane is at an angle of 45° to the left view's plane and the front view's plane. The following picture shows how it projects in a top view.



Therefore, if we regard the top view as a grid with n rows and m columns, the left-front view should have $n + m$ columns.

Now, Little Rabbit wants to build some blocks to meet the following conditions:

- The top view is a grid with n rows and m columns. Each square should place at least one block.
- Each column of the left-front view has a height of a_1, a_2, \dots, a_{n+m} from left to right.
- The x_i -th row and the y_i -th column of the top view has exactly h_i blocks. There are k such conditions.

Little Rabbit wonders how many different methods there are to meet all the conditions. Since the answer can be very large, please tell him the answer modulo $10^9 + 7$.

Input

The first line of the input contains an integer T ($1 \leq T \leq 10^5$) — the number of test cases.

The first line of each test case contains three integers n, m, k ($1 \leq n, m, k \leq 10^5$) — the number of rows and columns of the top view, and the number of conditions. The sum of n , the sum of m , and the sum of k will not exceed 10^5 .

The second line contains $n + m$ integers a_1, a_2, \dots, a_{n+m} ($1 \leq a_1, a_2, \dots, a_{n+m} \leq 10^9$) — the heights of the left-front view from left to right.

Then in the next k lines, the i -th line contains three integers x_i, y_i, h_i ($1 \leq x_i \leq n, 1 \leq y_i \leq m, 1 \leq h_i \leq 10^9$), which means the x_i -th row and the y_i -th column of the top view has exactly h_i blocks. It's guaranteed that all (x_i, y_i) are distinct.

Output

For the x -th test case, if the answer modulo $10^9 + 7$ is y , output *Case #x: y* in a single line.

Example

standard input	standard output
2	Case #1: 72
3 3 1	Case #2: 2
1 2 2 3 3 1	
2 3 3	
2 2 1	
2 2 2 2	
1 2 2	