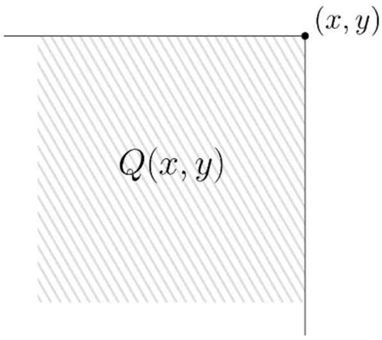
Problem F
Perfect Quadrants
Time Limit: 4 Seconds

Consider the plane and any point (x, y) in the plane. Now, you draw two half-lines starting from point (x, y), one downwards vertically and the other leftwards horizontally. The (infinite) region below the horizontal half-line and to the left of the vertical half-line is called a *quadrant*, denoted by $Q(x, y)$. Note that the two half-lines of $Q(x, y)$ form its boundary, while its interior excludes the boundary. See below.



Let L be a natural number and S be the set of points (x, y) in the plane with $x, y \in \{0,1,2, \dots, L\}$. So, S consists of $(L+1)^2$ points. For some $k \geq 1$, you are given k finite subsets $P_1, P_2, \dots, P_k \subseteq S$ of S and k nonnegative integers $c_1, c_2, \dots, c_k$. We say that a quadrant Q is $(c_1, c_2, \dots, c_k)$-*perfect* when the following condition is satisfied for all $i = 1, 2, \dots, k$:

No points in P_i lie on the boundary of Q and $|P_i \cap Q| = c_i$.

Write a computer program that computes and prints out the number of points $(x, y) \in S$ such that $Q(x, y)$ is $(c_1, c_2, \dots, c_k)$-perfect.

Input
Your program is to read from standard input. The input starts with a line consisting of two integers, L and k ($1 \leq L \leq 10^9$, $1 \leq k \leq 100{,}000$). The second line of the input consists of k nonnegative integers $c_1, c_2, \dots, c_k$ ($0 \leq c_1, c_2, \dots, c_k \leq 1{,}000{,}000$). The third line consists of a single integer N ($1 \leq N \leq 1{,}000{,}000$), where N denotes the total number of input points, that is, $N = |P_1| + |P_2| + \cdots + |P_k|$. In each of the following N lines, three integers x, y, and i ($0 \leq x, y \leq L$, $1 \leq i \leq k$) are given, meaning that the point (x, y) is a member of the set P_i. You can assume that no axis-parallel line passes through two of the N input points.

Output
Your program is to write to standard output. Print exactly one line. The line should consist of a single integer, representing the number of points $(x, y) \in S$ such that $Q(x, y)$ is $(c_1, c_2, \dots, c_k)$-perfect.

The following shows sample input and output for three test cases.

Sample Input 1	**Output for the Sample Input 1**
10 1 1 9 0 3 1 8 0 1 4 1 1 6 2 1 7 7 1 2 5 1 3 6 1 1 8 1 5 4 1	7

Sample Input 2	**Output for the Sample Input 2**
10 1 2 9 0 3 1 8 0 1 4 1 1 6 2 1 7 7 1 2 5 1 3 6 1 1 8 1 5 4 1	0

Sample Input 3	**Output for the Sample Input 3**
10 2 1 1 8 1 4 1 2 7 2 4 6 1 5 3 2 6 5 1 7 2 2 8 1 1 9 9 2	3