

We Work In The Dark, To Serve The Light

Problem ID: weworkinthedark

You are Ezio Auditore, famous leader of the Assassin's Creed. Your newest mission has brought you to Rome, where you have learned that a high ranking member of the templar order is hiding. You enter the city, determined to assassinate him before he can carry out his nefarious plan. However, when you arrive at your destination your target is nowhere to be found. Instead the place is crawling with Templar guards, looking for you. Realizing, you have been led into a trap, you quickly dive into the shadows before they are able to spot you. You are hopelessly outnumbered, so stealth is the only option. Luckily you have "eagle vision", a special ability that grants you an enhanced view of your surroundings and immediately alerts you to how many guards are in close proximity to you. Unfortunately, it has a limited range, but it might make you able to sneak around the guards and take them out one by one.



Ezio Auditore

Input

The first line of input contains three integers X , Y ($1 \leq X, Y \leq 1000$) and N ($1 \leq N \leq 100000$). X and Y represent the dimensions of the area you are in. After that follows N lines containing three integers: coordinates x , y and the number of guards that should be added to that position. The coordinates are zero-indexed.

The next line of input contains an integer M ($1 \leq M \leq 100000$). Each of the next M lines contains a query. A query can be either of the following three types:

- "k x y": This query represents Ezio killing targets at a specific coordinate. The value of the cell at that coordinate should be set to zero
- "e x y r": This query represents Ezio using his eagle vision ability to locate enemies around him within a certain range. x and y represent the coordinates of Ezio's current location, and r represents the range of his eagle vision. The program should output the number of enemies that are within range of Ezio's eagle vision. The range extends horizontally left-right and vertically up-down, and can extend the bounds of the arena. However there are never any templars outside the arena.
- "r x y n": This query represents a number of guards arriving in the area. x y represents their coordinate and n represents their numbers. Their numbers should be added to the existing number of guards at the specified.

Output

- For each "e" query, output a single integer on a new line, representing the number of enemies that are within range of Ezio's eagle vision.
- There should be no output for "k" queries or "r" queries.

Sample Input 1

```
5 5 4
1 1 2
2 2 1
3 3 4
4 4 1
3
k 2 2
e 2 2 2
r 0 0 3
```

Sample Output 1

```
7
```

Sample Input 2

```
10 10 3
5 5 5
0 0 1
9 9 1
3
e 5 5 5
k 5 5
e 5 5 5
```

Sample Output 2

```
7
2
```