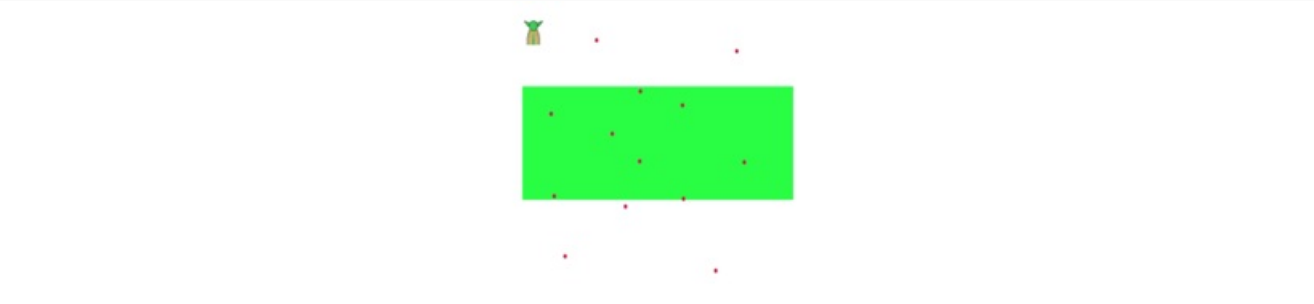
In a galaxy far away, there is a constant battle between the republic and the droid army. The droid army decided to launch their final attack on the republic. They have **N** space-fighters.

Initially the $\mathbf{i}^{th}$ fighter is located at (x_i, y_i). All of the space-fighters move with constant velocity **V** units/sec in the positive **X** direction. i.e., fighter at (x_i, y_i) moves to (x_i+V, y_i) in 1 second. The $\mathbf{i}^{th}$ space-fighter broadcasts enemy information at a frequency $\mathbf{f_i}$.

The republic is not scared of the artificially intelligent droid force as they have *Yoda*. *Yoda* has a special power, at any time **T** he can choose a region of the droid army and block one specific frequency **F**. This power has one constraint; it can be applied only in the form of a two sided unbounded axis parallel rectangular box open towards the both the directions across **X** axis (refer image below for clarity). If a frequency (**F**) is blocked all the space-fighters in the region having the frequency **F** can't communicate.



Given the initial positions of the space-fighters, and their velocity, you are to answer queries of the following form:

YU YD T

where **YU**, **YD** are the bounds on y-axis inside which YODA can block a frequency at time **T**. In the region described by the query, after a time **T** seconds from the start, if *Yoda* can chose one frequency (**F**) he wishes to, what is the maximum number of communications he can block?

Input Format
Each test case is described as follows; the first line contains **3** space separated integers **N** - the number of space-fighters, **Q** - the number of queries you have to answer, and **V** - the velocity of the space-fighters separated by a single space.

N lines follow, each containing **3** space separated integers $\mathbf{x_i}$, $\mathbf{y_i}$, and $\mathbf{f_i}$, denoting the x co-ordinate, y co-ordinate and the frequency at which the $\mathbf{i}^{th}$ ship broadcasts respectively. Each of the next **Q** lines contain **3** space separated integers representing **YU, YD, T** respectively. Refer the figure for more clarity

Note: Points on the boundaries should be counted as well.

Output Format
For each query you are to output a single integer denoting the result.

Constraints
$1 <= N <= 50000$
$1 <= Q <= 30000$
$1 <= V <= 10000$
$-10^9 <= x_i <= 10^9$
$-10^9 <= y_i <= 10^9$
$1 <= f_i <= 10^9$
$-10^9 <= YU <= 10^9$
$-10^9 <= YD <= 10^9$
$1 <= T <= 10000$
$YU >= YD$

Sample Input

```
5 5 82
-4 1 4
-3 -2 2
-3 5 1
0 -5 2
1 -1 2
1 -1 57
-2 -5 11
5 -5 40
-1 -5 16
5 -1 93
```

Sample Output

```
1
2
3
3
1
```

Explanation Consider the points ships in the Y-range 1 to -1, they are the (-4, 1) and (1, -1), and both operate on different frequencies, hence the most times a frequency is repeated is once.