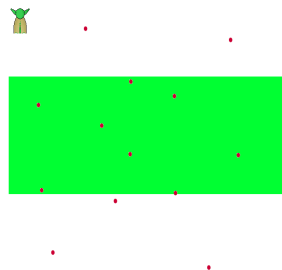


In a galaxy far away, there is a constant battle between the republic and the droid army. The droid army decided to launch their final attack on the republic. They have N space-fighters.

Initially the 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 i^{th} space-fighter broadcasts enemy information at a frequency 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 x_i , y_i , and f_i , denoting the x co-ordinate, y co-ordinate and the frequency at which the 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

$1 \leq N \leq 50000$

$1 \leq Q \leq 30000$

$1 \leq V \leq 10000$

$-10^9 \leq x_i \leq 10^9$

$-10^9 \leq y_i \leq 10^9$

$1 \leq f_i \leq 10^9$

$-10^9 \leq YU \leq 10^9$

$-10^9 \leq YD \leq 10^9$

$1 \leq T \leq 10000$

$YU \geq YD$

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.