

You're designing a game console with a special board which can evaluate how balance people are. After the user stands on the board, it can record the movement of the user's "center of gravity".

Technically, the record is a sequence of n points on the 2D plane (the user's "center of gravity" projected to the game board), where the origin $(0,0)$ is the center of the game board. Samples are taken every 0.01 second, so if the user stands on it for one minute, your database gets 6000 sample points.

In order to know better about his balancing status, the user can ask the game console some questions. Each question (i, j) means: count how many pairs of sample points, chosen from the interval between the i -th sample and the j -th sample (inclusive), whose Manhattan distance is no more than d , where d is the preset balance threshold parameter in the system.

Your task is to write a program that can answer the questions. Note that you don't have to answer the questions one by one. **You can read all the questions first, and then answer them.**

Input

There are no more than 3 test cases. The first line contains three integers n, d, q ($1 \leq n \leq 200000$, $1 \leq d \leq 10^8$, $1 \leq q \leq 1000$), the number of points, the balance threshold and the number of queries. The next n lines contain the coordinates (x, y) ($|x|, |y| \leq 10^8$) of the sample points, in order. The points are numbered $1..n$. The next q lines contain the questions (i, j) ($1 \leq i \leq j \leq n$).

Output

For each test case, print the case number in the first line, then the answers of the questions, one on each line.

Sample Input

```
5 1 2
0 0
1 0
3 0
2 1
2 0
2 4
1 5
5 2 2
0 0
1 0
3 0
2 1
2 0
2 4
1 5
```

Sample Output

```
Case 1:
0
4
Case 2:
3
8
```