Problem E

Fishermen

Input File: standard input
Output File: standard output
Time Limit: 0.5 seconds (C/C++)
Memory Limit: 256 megabytes

The ocean can be represented as the first quarter of the Cartesian plane. There are n fish in the ocean. Each fish has its own coordinates. There may be several fish at one point.

There are also m fishermen. Each fisherman has its own x-coordinate. The y-coordinate of each fisherman is equal to 0.

Each fisherman has a fishing rod of length l. Therefore, he can catch a fish at a distance less than or equal to l. The distance between a fisherman in position x and a fish in position (a, b) is $|a - x| + b$.

Find for each fisherman how many fish he can catch.

Input

The first line contains three integers n, m, and l $(1 \le n, m \le 2 \cdot 10^5, 1 \le l \le 10^9)$ — the number of fish, the number of fishermen, and the length of the fishing rod, respectively.

Each of the next n lines contains two integers x_i and y_i $(1 \le x_i, y_i, \le 10^9)$ — the fish coordinates.

Next line contains m integers a_i $(1 \le a_i \le 10^9)$ — the fishermen coordinates.

Output

For each fisherman, output the number of fish that he can catch, on a separate line.

Sample input	Sample output
8 4 4 7 2 3 3 4 5 5 1 2 2 1 4 8 4 9 4 6 1 4 9	2 2 3 2

Note

The picture illustrates for the above example the area on which the third fisherman can catch fish.

