The Problem

Given your location, and the location of each person who has COVID-19, sort the list by distance from you
from shortest to longest, breaking ties by x-coordinate (lower comes first), and then breaking those ties by y
coordinate (lower comes first).
After sorting, answer several queries about points in the coordinate plane. Specifically, determine if a query
point contains someone who is infected or not. If so, determine that person's ranking on the sorted list in
distance from you.

The Input
The first line of the input contains 5 integers separated by spaces. The first two of these values are x and y (|x|,
|y| ≤ 10000), representing your location. The third integer is n (2 ≤ n ≤ 106), representing the number of infected
people. The fourth integer is s (1 ≤ s ≤ 2x105), representing the number of points to search for. The last integer,
t (1 ≤ t ≤ 30), represents the threshold to be used for determining whether you run Merge Sort of Insertion Sort.
The next n lines of the input contain x and y coordinate values, respectively, separated by spaces, representing
the locations of infected people. Each of these values will be integers and the points will be distinct (and also
different from your location) and the absolute value of x and y for all of these coordinates will not exceed
10,000.
Then the next s lines of the file contain x and y coordinate values for searching. Both values on each line will be
integers with an absolute value less than or equal to 10,000.

The Output (to be printed to out.txt file)
The first n lines of output should contain the coordinates of the people infected, sorted as previously mentioned.
These lines should have the x-coordinate, followed by a space, followed by the y-coordinate.
The last s lines of output will contain the answers to each of the s queries in the input. The answer for a single
query will be on a line by itself. If the point queried contains an infected person, output a line with the following
format:
x y found at rank R

where (x, y) is the query point, and R is the one-based rank of that infected person in the sorted list. (Thus, R
will be 1 more than the array index in which (x, y) is located, after sorting.)
If the point queried does NOT contain an infected person, output a line with the following format:
x y not found