

Problem A. Rectangle Query

Input file: *standard input*
Output file: *standard output*
Time limit: 10 seconds
Memory limit: 768 mebibytes

This is an interactive problem.

You are given n points on the plane with integer coordinates. You are to answer the following queries: “Consider all points inside or on the border of a rectangle given by $x_1 \leq x \leq x_2$ and $y_1 \leq y \leq y_2$. How many different x -coordinates and different y -coordinates are there among the chosen points?”

Note that this problem is interactive and you must answer all previous queries before the given one.

Input

The first line contains single integer n , the number of given points ($1 \leq n \leq 50\,000$).

The next n lines contain coordinates of the points x_i and y_i , one point per line ($0 \leq x_i, y_i \leq 500\,000$). It is guaranteed that all given points are different.

The following line contains the number of queries q ($1 \leq q \leq 50\,000$).

Each of the next q lines contains four integers x_1, y_1, x_2, y_2 : coordinates of the opposite corners of the rectangle ($0 \leq x_1 < x_2 \leq 500\,000, 0 \leq y_1 < y_2 \leq 500\,000$). Note that each query i ($i > 1$) will be available only after you answered query $(i - 1)$.

Output

Output q lines, one for each query. Each line must contain two integers separated by space: the numbers of different x and y coordinates respectively. Don't forget to flush the output after printing each answer.

Example

standard input	standard output
4	2 3
2 0	2 2
2 1	2 2
1 1	1 1
1 2	
4	
0 0 2 2	
1 1 2 2	
1 0 2 1	
0 0 1 1	