Category: Very Hard

Competitions: Not yet used in any competition

Question:

Gold mines were being discovered all around the world. It was found that these areas had gold which had arrived through meteorites. Hence amount of gold in any region was inversely proportional to its distance from the position of meteorite collision. When companies wanted to buy such regions for mining, it was decided to represent them as a grid. The grid is similar to what we see on a graph paper having 100\*100 small square regions in between. A company will query a region by passing a polygon having edges parallel to the x or y axis and the row and the column of the polygon’s corners will be entered. Find the amount of gold in that polygonal region.

Amount of gold in any square unit = 1000\*(Sum of (1 / (Di+1))) where Di represents distance from the collision point of ith meteorite. Use the mid-point of the square for distance.

(Note that x=0 is y axis and y=0 is x axis)

Example of gold distribution given that the meteorite crashed at the central square at (2.5, 2.5):

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 |
| x axis |  |  |  |  |  |  |
| 0 | 261 | 309 | 333 | 309 | 261 |  |
| 1 | 309 | 414 | 500 | 414 | 309 |  |
| 2 | 333 | 500 | 1000 | 500 | 333 |  |
| 3 | 309 | 414 | 500 | 414 | 309 |  |
| 4 | 261 | 309 | 333 | 309 | 261 |  |
| 5 |  |  |  |  |  | y axis |

If the polygon is: (1, 1), (4, 1), (4, 3), (1, 3)

Then amount of gold is: 414 + 500 + 414 + 500 + 1000 + 500 = 2828

Input:

Number of meteorite collision points

X and y coordinates of those positions

Number of queries

For each query (each query represents a polygonal region):

Number of vertices

Coordinates of vertices

Output:

Real number representing amount of gold

(Always round down amount of gold in every region)