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Algorithms Lab

Exercise – *Bistro*

Sunbunny is a chain of bistros that provide among the finest snacks available in the country of Sealand. These places have become so popular that at lunch and dinner prime time one can regularly find long queues of people waiting to be served. Due to the continuing success the head office started to evaluate possible locations where to open another restaurant. One important selection criterion is that the new location must not be too close to an existing Sunbunny restaurant...

Input The input contains several test cases. Each of them begins with a line containing one integer n ($1 \leq n \leq 110'000$), denoting the number of existing restaurants. The next n lines describe the location x_i y_i of these restaurants (x_i, y_i integers, $|x_i|, |y_i| < 2^{24}$). It follows the number m ($1 \leq m \leq 110'000$) of possible locations for the new restaurant, and on the next m lines the coordinates of these locations, in the same format as for the existing restaurants. The input is terminated by a line containing a single number 0.

Output For each possible location for the new restaurant, write on a single line the squared (Euclidean) distance to the closest existing restaurant.

Sample Input

```
4
0 0
0 100
100 0
200 200
2
100 100
300 300
0
```

Sample Output

```
10000
20000
```