Problem A: The d-Neighbor Search

Input file: *testdata.in*
Time Limit: 1 seconds

Problem Description

The proliferation of mobile devices and highly advanced positioning techniques has sparked intensive interest in location-based services (LBSs). One of popular location-based services is to search for gas stations, restaurants, or shops near to a query point. The searched data points (e.g., gas stations) are termed Point of Interest (*POI*, for short). The problem of d-neighbor queries is of a particular interest in Geographic Information Systems (GIS). Informally, a d-neighbor query retrieves a set of neighbors from a set of static *POIs* that are within a distance d for a query point. The definition of a d-neighbor query is also described as follows:

Definition: a d-neighbor query:
Given a query q and a *POI* set $P = \{p_1, p_2, ..., p_n\}$, the operator returns a result set of a d-neighbor query $= \{o_1, o_2, ..., o_k\}$, where $dist(o_i, q) \leq d$, $o_i \in P$.

The $dist(a, b)$ function returns the distance (e.g., Euclidean distance) between points a and b. Given P and t query sets of $\mathbb{Q} = \{Q_1, Q_2, ..., Q_t\}$, where each query set $Q_j \in \mathbb{Q}$ contains at least one query q and each Q_j is associated with a distance d. The objective is to rapidly find the total number of d-neighbors for each query set Q_j.

Input Format

The input file starts with a set of *POIs* (*i.e.,* P) followed by several query sets (*i.e.,* $\mathbb{Q}$). The first line of the input file contains an integer n indicating the total number of *POIs* and there are at most 1,000,000 *POIs*. It is

possible that two POI have the same coordinate. In the following n lines, each line contains the x-coordinate and y-coordinate of a POI. Followed the information of *POIs*, there are several query sets. The first line of a query set contains two non-negative integers m and d, in which m is the number of query points and $d \leq 600$ is the distance restriction of this query set. In the next m lines, each line contains the x-coordinate and y-coordinate of a query point.

Please note that all the coordinates are non-negative integers less than 60,000. A query set with $m = d = 0$ indicates the end of the input and you do not need to process this query set.

Output Format

For each query set $Q_j \in \mathbb{Q}$, output in one line the total number of d-neighbors of all the query points in Q_j. Note that a *POI* will be counted more than once if it is a d-neighbor of more than one query point in Q_j.

Sample Input

```
10
0 0
100 100
200 200
300 300
400 400
500 500
600 600
600 600
700 700
59999 59999
3 150
0 0
150 150
500 650
2 300
100 10000
10000 100
```

```
2 600
500 500
500 500
0 0
```

Sample Output

```
7
0
16
```