GSM

Time limit : 1 sec

Memory limit : 128 M

Xiao Ming is traveling around several cities by train. And the time on the train is very boring, so Xiao Ming will use the mobile Internet. We all know that mobile phone receives the signal from base station and it will change the base station when moving on the train. Xiao Ming would like to know how many times the base station will change from city A to city B.

Now, the problem is simplified. We assume the route of train is straight, and the mobile phone will recive the signal from the nearest base station.

**Input**

Multiple cases.For each case, The first line: N(3<=N<=50) - the number of cities, M(2<=M<=50) - the number of base stations. Then there are N cities with coordinates of (x, y) and M base stations with coordinates of (x, y) - (0<=x<=1000, 0<=y<=1000, both x and y is integer).Then there is a number : K, the next, there are K queries, for each query, each line, there are two numbers: a, b.

**Output**

For each query, tell Xiao Ming how many times the base station will change from city a to city b.

**Sample Input**

4 4

0 2

1 3

1 0

2 0

1 2

1 1

2 2

2 1

4

1 2

1 3

1 4

3 4

**Sample Output**

0

1

2

1

**Hint**

The train way from a to b will not cross the point with the same distance from more than 2 base stations. (For the distance d1 and d2, if fabs(d1-d2)<1e-7, we think d1 == d2). And every city exactly receive signal from just one base station.