

7332 Ice Igloos

A fishing village built on the surface of a frozen lake far north in the arctic is endangered by global warming — fractures are starting to form on the lake surface. The village consists of n igloos of spherical shape, each occupying a circular area of the surface.

An igloo can be represented as a circle in the coordinate plane: the center of the circle is a point with integer coordinates, while the radius is a positive floating-point number less than 1 with exactly one fractional digit.

Given the locations of possible ice fractures, the villagers would like to know how many igloos are affected by each. Formally, given q queries where each query is a straight line segment defined by the two endpoints, find the number of igloos each segment intersects. A segment intersects an igloo if it has at least one point in common with the interior of the circle.

Input

The input file contains several test cases, each of them as described below.

The first line contains an integer n ($1 \leq n \leq 100000$) — the number of igloos. Each of the following n lines contains three numbers x , y and r — the coordinates of the center and the radius of one igloo. The coordinates x and y are integers such that $1 \leq x, y \leq 500$, while r is a floating-point number with exactly one fractional digit such that $0 < r < 1$. No two igloos will intersect or touch.

The following line contains an integer q ($1 \leq q \leq 100000$) — the number of queries. Each of the following q lines contains four integers x_1, y_1, x_2, y_2 ($1 \leq x_1, y_1, x_2, y_2 \leq 500$) — the coordinates of the two endpoints of the segment. The two endpoints will be different. Endpoints may be inside igloos.

You may assume that, for every igloo i and the segment s , the square of the distance between s and the center of i is either less than $r^2 - 10^{-5}$ or greater than $r^2 + 10^{-5}$ where r is the radius of the igloo i .

Output

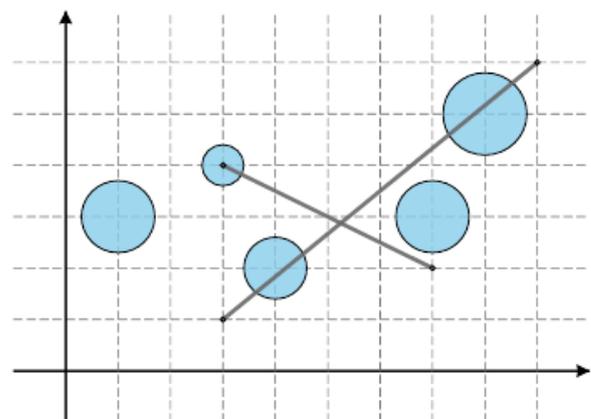
For each test case, output should consist of q lines. The k -th line should contain a single integer — the number of igloos that are intersected by the k -th segment.

Hint: The picture on the right illustrates the first sample below.

Sample Input

```

5
4 2 0.6
7 3 0.7
8 5 0.8
1 3 0.7
3 4 0.4
2
3 1 9 6
3 4 7 2
  
```



Sample Output

```

2
1
  
```