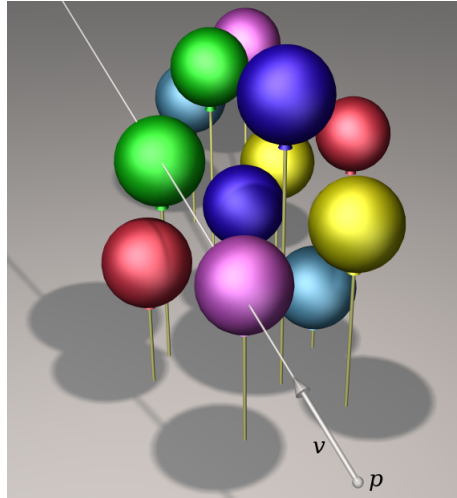


Pop!

A large number of helium balloons have been set up as part of a carnival game. Players shoot a pellet gun into the balloons and earn a point for every balloon they pop. Each balloon is spherical and is tied to a string at the bottom. Each string is taped to a table top at a particular location. Gunshots are described by giving a three-dimensional location, p , for the end of the barrel and a vector, v , describing the direction the barrel is pointing.



We will assume that the pellet is very small, it will travel in a perfectly straight line when fired and it will pop any balloon it passes through. You can assume that the strings tied the balloons are so thin that they will never be hit by the pellet.

Input

Input will contain several test cases. Each test case begins with a positive integer, n , giving the number of balloons. This is followed by n lines, each containing four floating point numbers, the radius of the balloon, the length of string it's tied to and the x , y location on the table top where the string is taped down. The balloon descriptions are followed by a positive integer m and m gunshot description. Each gunshot is described by six floating point numbers, the x , y , z location for p (where z is the height above the table) and the x , y and z coordinates for v . You can be assured that the tip of the barrel is not inside any balloon and that no balloons intersect. Also, no string from one balloon touches any other balloon and the direction vector for the gun always has positive length. The end of all test cases will be marked by a value of zero for n .

Output

For every test case, print the number of points earned each shot, each on a line by itself. Print a blank line after the output for each test case.

Sample Input

5
1.0 4.0 0.0 0.0
1.5 3.5 0.0 8.0
1.5 3.5 0.0 -8.0
1.5 3.5 8.0 0.0
1.5 3.5 -8.0 0.0
3
1.0 -10.0 4.5 0 1 0
0.8 -10.0 5.0 0 1 0
-10.0 0.0 5.0 1 0 0
2
1.0 5.0 0.0 10.0
1.0 3.0 0.0 -10.0
1
0.0 0.0 5.0 0.0 1.0 0.1
0

Sample Output

2
1
2

1
