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Question 1

Inside the function first separate the points (point1, point2, point3, point4) and the distances (dist1,dist2,dist3,dist4). Then check the number of unique points; based on the number of points and special cases either solve for the point or throw the relevant error.

In the first case all four points are unique; use the standard trilateration algorithm used in 2D. Reduce the number of variables in equations using trilateration algorithms. Reduce the possible points from a sphere(with one point and one distance) to a circle(2 points and distance) to 2 points(3 points and distance) to finally one unique point(with 4 points and distance). With three unique points, there is a special case where we can solve for the unique point.

With two unique points (say point1 and point2) with distances dist1 and dist, it is only possible to find the unique point when the minimum distance between point one and point 2=dist1+dist2(i.e bo the sample spheres touch at a unique point).

If we have only one unique point, we check if the dist1 equals zero, then we return the point itself; else we throw an error.