

CS69011: Computing Lab-1

Test-1

August 02, 2023

===== Instructions =====

1. All Questions carry equal marks.
2. In case of user-input assume only valid values will be passed as input.
3. **Regarding Submission:** For each question create a separate C file. Create a zip file of all these C files in the name <RollNo>_T1.zip and submit it to moodle.

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Q. You can define a point in two-dimensional space using its x and y coordinate $P(x,y)$. You can also define a circle in two-dimensional space using coordinates of a center and its radius : $C[P(x,y), R]$.

1. Define a structure to store a point and a circle in 2-d space.
2. Given a point $P(a,b)$ check its relation with the circle $C[P(x,y),R]$.
 - a. Lies inside, outside or on the circle.
Hint: compute the value of euclidean distance between the center of the circle and the point $\rightarrow d$.
If $d < R$: point is inside circle
If $d=R$: point is on the circle
If $d > R$: point is outside the circle.
3. Given two circles $C_1[P(x_1,y_1),R_1]$ and $C_2[P(x_2,y_2),R_2]$ find the relationship among the circles.
 - a. C_1 lies inside C_2 or vice-versa, or [if euclidean distance between centers < difference of radius]
 - b. C_1 and C_2 intersect, or [if euclidean distance of centers < sum of radius]
 - c. C_1 and C_2 touch, or [if euclidean distance of centers == sum of radius]
 - d. C_1 and C_2 are disjoint [if euclidean distance of centers > sum of radius]

[Test Cases]

For Part 2.:

Input a point:

X-coordinate: 2

Y-coordinate: 3

Input point is: $P(2,3)$

Input the details of circle:

X-coordinate of center: 2

Y-coordinate of center: 5

Radius: 3

Input Circle is: $C[P[(2,5),3]$

Relation of point with circle is: Point lies inside the circle.

For Part 3:

Input the details of circle C1:

X-coordinate of center: 2

Y-coordinate of center: 5

Radius: 3

Input Circle C1 is: C[P[(2,5),3]

Input the details of circle C2:

X-coordinate of center: 1

Y-coordinate of center: 1

Radius: 2

Input Circle C2 is: C[P[(1,1),2]

The relation between two circles is: C1 and C2 intersect\

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