OOP Assignment - 2

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Due on 20 Sept 2020

1 Play with Geometric Shapes in 2D Coordinate System

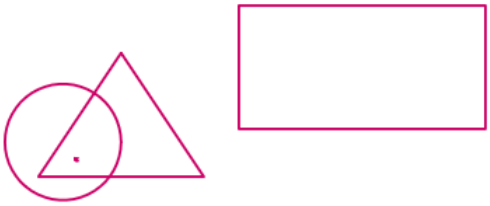
Given two sets of geometrical shapes each having a point, a circle, a triangle and a rectangle, find the following:

1. Is the point lie on the all closed geometric shapes in set-1?
2. Is the point lie on the all closed geometric shapes in set-2?
3. Are alike shapes in set-1 and set-2 intersect?
4. Are shapes in set-1 bigger than set-2?

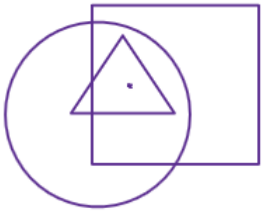
Illustration:

Individual display of set-1 and set-2 geometrical objects in 2D coordinate system:

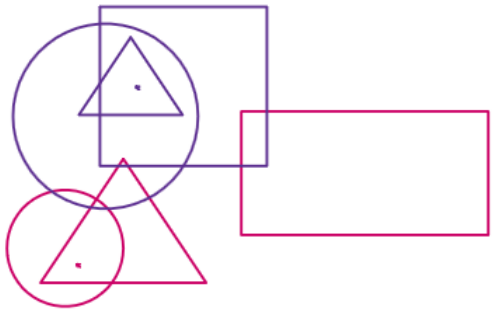
Set-1:



Set-2:



Display of both sets in one 2D coordinate plane:



Answers of the questions for this illustration:

1. false
2. true
3. true false true
4. false false false
   false true false
   true true true

In Detail:

1. In set-1 shapes, the point lie on only in circle and triangle but not in rectangle. **Answer: false.**
2. In set-2 shapes, the point lie on all the three shapes. **Answer: true.**
3. Alike shapes in sets : circle - circle, triangle - triangle, rectangle - rectangle.
   circle in set-1 intersecting with circle in set-2 so it is **true**.
   triangle in set-1 not intersecting with set-2 so it is **false**.
   rectangle in set-1 is intersecting with set-2 so it is **true**.
   Hence, final answer is a list of boolean as **true false true.**
   Note: Follow the same order when you code. (Circle, Triangle, Rectangle)

4. In the following table, set-1 shapes and set-2 shapes are mapped and showing the answers for quesition 4.

set-1\set-2	Circle	Triangle	Rectangle
Circle	false	false	false
Triangle	false	true	false
Rectangle	true	true	true

Programming Instructions/Hints:

- The following classes are required:

1. doubleList
2. boolList
3. boolMatrix
4. point
5. circle
6. triangle
7. rectangle
8. geometry

- Input is two copies a point, circle, triangle, rectangle for set-1 and set-2.
- A point is defined as P(x, y).
- A circle is defined as radius r and center point C(x1, y1).
- A triangle is defined as three non collinear points A(x2, y2), B(x3, y3) and C(x4, y4).
- A rectangle is defined as two points top left D(x5, y5) and bottom right E(x6, y6).
- Note: Assume that rectangle sides are parallel to coordinate axes.
- Input has to be given as double list of all the above parameters. Listing them gives: x,y,r,x1,y1,x2,y2,x3,y3,x4,y4,x5,y5,x6,y6.
- Create list as set1 and set2 for two copies by allowing user to take input from the keyboard.
- User has to input 30 double values from the keyboard to preserve input.
- Define above classes with data fields in private, constructors and member functions as public.
- You have to use classes and member functions to arrive results.
- A sample output for some data is

```
false
false
true    true    false
true    true    true
true    false   true
true    true    true


...Program finished with exit code 0
Press ENTER to exit console.
```

- The output is explained in the illustration above.
- **IMPORTANT:** Do NOT edit the code in main() function