An-Najah National University	An-Najah N. University Faculty of Engineering & Information Technology Department of Computer Science Data Structures Assignment#2	

Student Name: _____

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Declare a class named **Shape** that stores the center coordinates for any geometric shape. The geometric shape could be a **Rectangle**, **Triangle**, or **Circle**. Each of those shapes has its own dimensions as follows:

- A circle has a radius (***r***)
- A rectangle has length and width (***l, w***)
- A triangle has a length and height. (***l, h***).

In addition, we need to calculate the area for each of those shapes as follows:

- Circle area equals to πr^2
- A rectangle area equals to ***l*w***
- A triangle area equals to ***(1/2)*l*h***

Furthermore, you have to allow summing the area of two shapes of the same type with properly overloading the + operator. For example, let ***R1*** and ***R2*** be two rectangles, then your program should allow:

double x=R1+R2;

Where x stores the summation of the areas for rectangles ***R1*** and ***R2***.

You have to:

1. Implement the class Shape with the member functions **getCoordinates**() to print the ***(x,y)*** coordinates for the shape and **getArea()** to calculate and return its area. Make sure that your implementation respects abstraction principles.
2. Implement the classes Rectangle, Triangle, and Circle with their own dimensions with proper functions.
3. Implement the operator overloading function for the + operator in the proper location in your code.

4. Implement a non-member function named **getShapeArea()** that takes an object of any shape as an argument and returns its area.

5. Write a main program to test your code. Make sure to set the (x,y) coordinates for any shape to the first and last digit of your university ID.

Best of luck