

**Year 2**  
**Assignment****IT2030 – Object Oriented Programming** **Semester 1, 2020**

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In this Assignment you will redo the pre assignment you did in Java.

You are required to work on the assignment individually (**code should be in Java**) and submit your solutions on or before **10th of March 2020**.

You need to attempt both Question 1 and Question 2 for this assignment.

Please use the forum in the OOP page to ask any queries related to OOP or the Assignment.

Instructions on submitting the assignment:

- Copy only **the source files** (file with **.java** extension) in to a separate folder and rename it with your student id.
- Make the folder as zip file (when archiving, give the student id as the archive folder name)
- Upload to the course web.

**Any student answer which is not following the correct instructions when submitting, will not be assessed.**

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**Question 1**

Design a **Geometry** class with the following methods:

A method call **getAreaOfCircle** that accepts the radius of a circle and returns the area of the circle.

Use the following formula:

$$\text{Area} = \pi r^2$$

A method call **getAreaOfRectangle** that accepts the length and width of a rectangle and returns the area of the rectangle.

Use the following formula:

$$\text{Area} = \text{Length} \times \text{Width}$$

A method call **getAreaOfTriangle** that accepts the length of a triangle's base and the triangle's height.

The method should return the area of the triangle.

Use the following formula:

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$$\text{Area} = \text{Base} \times \text{Height} \times 0.5$$

The methods should display an error message if negative values are used for the circle's radius, the rectangle's length or width, or the triangle's base or height.

Next, write a program to test the class, which displays the following menu and responds to the user's selection:

Geometry Calculator

1. Calculate the Area of a Circle
2. Calculate the Area of a Rectangle
3. Calculate the Area of a Triangle
4. Quit

Enter your choice (1-4):

Display an error message if the user enters a number outside the range of 1 through 4 when selecting an item from the menu.

**Question 2**

Write a Lottery class that simulates a lottery.

The class should have an array of five integers named **lotteryNumbers**. The constructor should use the `random()` function to generate a random number in the range of 0 through 9 for each element in the array. The class should also have a function that accepts an array of five integers that represent a person's lottery picks.

The method is to compare the corresponding elements in the two arrays and return the number of digits that match.

For example, the following shows the `lotteryNumbers` array and the user's array with sample numbers stored in each.

There are two matching digits (elements 2 and 4)

lotteryNumbers array:

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7	4	9	1	3
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User's array:

4	2	9	7	3
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