Tutorial 6

Please write all your answers in foolscap paper.

Question 1: Classes and objects

Create a class called Student. Add three private member variables. Add suitable getter and setter methods for the private member variables suggested. Create a method called display () to display all information about a student. Write appropriate codes to test the student class. Draw out the suitable UML class to represent the Student class.

Question 2: Inheritance

1. Create two classes called shape and rectangle. Ensure that the rectangle is the child class and the shape class is the parent class. The shape class has two member variables called width and height. Please set these two variables to protected. Create two methods called setWidth(int w) and setHeight(int h). Add a getArea() method for rectangle class. This method should calculate the area of the rectangle by multiplying the length and width.
   a. Explain what is the impact of indicating the width and height variable as protected.
   b. Explain whether it is ok to not have a constructor for class shape and rectangle.
   c. Adjust the code so that you can include a constructor. Make sure that the shape constructor method assigns both width and height to zero by default.
   Ensure that the constructor method for rectangle refers to the shape constructor method.
   d. Create appropriate codes to test the rectangle class.

Question 3: Polymorphism

Using the codes that you have developed in question 2. Add another class called Triangle. Make sure that the Triangle class is a subclass for the shape class. Add a method called getArea() but ensure it uses the right formula to calculate the area of the rectangle.