WXES1116 Programming I
Semester 1 2014/2015
Lab 9: Inheritance

1. Define a class Shape. The class has a name, perimeter and area. The class has the accessor method and mutator for perimeter and area. Besides, the class also has a display method to display the name of the shape, perimeter and area in two decimal points. Derived a class name Rectangle from Shape. The class has the extra side length variables. The class has a method to accept input for both side length and a method to compute the perimeter and area. Derived another class name Square from Shape. The class has the extra side length variable. The class has a method to accept input for side length and a method to compute the perimeter and area. Derived another class name Circle from Shape. The class has the extra diameter variable. The class has a method to accept input for diameter and a method to compute the perimeter and area. Create a Tester class to test the program.

2. Define a class PersonProfile. The class has a name, gender and date of birth. The class consists of a constructor and a display method. Derived a Student class from PersonProfile. The Student class has a list of course name and course code, semester, session, mark and a file name. The class consists of a constructor with student profile and file input name. All the information is retrieved from a text file named **course.txt**. (Please download the file from the Web site.). Create a getGrade method for the mark base on the table below:

Mark	Grade
>= 85	A
>=75	A-
>=70	B+
>=65	B
>=60	B-
>=55	C+
>=50	C
>=45	D
>=35	E
<35	F

   The Student object can display the student profile as well as course details and the result in grade. Create a Tester class to test the program.

3. Derived a class Lecturer from class PersonProfile. The class has a list of course name, course code, semester, session, credit hour and the number of students registered. All the information is retrieved from a text file named **lecturer.txt**. (Please download the file from the Web site.). Write a method to compute the credit hour. If the number of students is more than or equal to 150, multiply the credit hour by 3, if less than 150 and more than or equal to 100, multiply the credit hour by 2. If less than 100 and more than or equal to 50, multiply the credit hour by 1.5. Otherwise multiply the

credit hour by 1. The lecture object can display the lecturer profile as well as the course profile with the updated credit hour. Create a Tester class to test the program.

4. Create a Dice game. The first dice game allows the player to roll two dices each time. If both dice is equal, the player can roll again. The player score each time they roll the dices. Player that reaches 100 points or more wins the game. The second dice game allows the player to roll one dice each time. When the dice is 6, the player can roll one more time. However, if the player rolls 6 again in second attempt, the player won't have any score. Player that reaches 100 point wins the game. If the player scores more than 100, the last score is not counted and the player needs to roll again in next turn. Create a Tester class to test the program.