



United International University

Department of Computer Science and Engineering

CSI 212: Object Oriented Programming

Assignment-01

Section: B/D/G

Time: 1 Week

Total Marks: 25

1. Write a code in java to print the following pattern, [4]

Sample Input	Sample Output
n = 7	<pre> * * * * * * * * * * * * * * * * * * * * * * *</pre>
n = 5	<pre> * * * * * * * * * * *</pre>

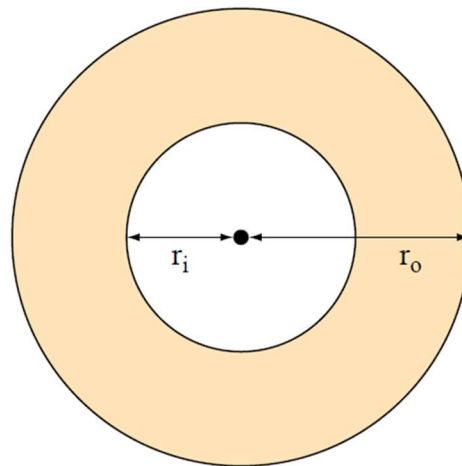
2. Suppose you have to develop a java class **Patient** for your client. Inside of the **src** package there is a package named **patients**. The **Patient** class is located inside of the **patients** package. The **Patient** class does have instance variables **pid**, **pname**, **history** and **medicines**. The **history** data field contains the patients' previous medical records. And the **medicines** data field contains the prescribed medicines provided by a doctor. Your client asked to keep **history** and **medicines** directly inaccessible from other classes. Those variables have to be accessed by some **String getter()** and **setter** methods. The **Patient** class also have two parameterized constructors [**Patient(int pid, String pname)**, **Patient(int pid, String pname, String history)**].

You also have to create a class named **Main** inside of the **src** package where you will be writing the **main method**. Inside of the main method create an array of object of **Patient** class. The number of objects will be user defined.

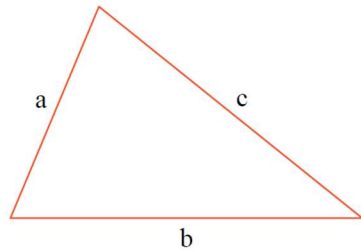
The **pid**, **pname**, **history** and **medicines** of each object will be also user defined as well. Take these information before creating each object and initialize the instance variables of the objects by calling the **Patient**(int pid, String pname, String history) constructor.

Also set all of the patients' prescribed medicines by calling a **setter** method of the **Patient** class. Finally print the **medicines** for all of the patients by using **getter** method of **Student** class. [5]

3. Write a program that computes the area of a circular region (the shaded area in the diagram), given the radius of the inner and the outer circles, r_i and r_o , respectively. We compute the area of the circular region by subtracting the area of the inner circle from the area of the outer circle. Define a Circle class that has method (printArea()) to compute the area and print the area. You set the circles' radius with the setRadius method or via a constructor. You have to also create an object of Circle class from the main method. Take the values of r_i and r_o from the users. Set the circles' radius with the setRadius method or via a constructor. Call printArea() to show the output. [2]



4. Write a Triangle class that has three instance variables a, b and c. There are also two methods printPerimeter and printArea to compute the perimeter and the area of the triangle and print the perimeter and area. You can set the instance variables of each triangle's object, a, b and c with the setInfo method or via a constructor. In addition, it will check if the input from the user is valid or not. If the input is valid, it will print perimeter and the area of each triangle object. You have to also create an object of Triangle class from the main method. Take the values of a, b and c from the user(s). Set the employee's a, b and c with the setInfo method or via a constructor. Call printPerimeter and printArea to show the output. [2]



$$\text{Perimeter} = a + b + c$$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = \frac{a + b + c}{2}$$

5. Write an Employee class that has two instance variables workingHours and basicWage. There is also a method printWage to compute the total wage of an employee and print the total wage. You can set an employee's workingHours and basicWage with the setInfo method or via a constructor. In addition, they will receive a commission on the sales they generate while tending the counter. The commission is based on the following formula: You have to also create an object of Employee class from the main method. Take the values of workingHours, basicWage and totalSales from the user(s). Set the employee's workingHours and basicWage with the setInfo method or via a constructor. Call printWage to show the output.

$$\text{Total wage} = (\text{commission rate} * \text{totalSales}) + (\text{workingHours} * \text{basicWage})$$

[2]

Sales Volume	Commission
\$1.00 to \$99.99	5% of total sales
\$100.00 to \$299.99	10% of total sales
≥ \$300.00	15% of total sales

6. .

MathV1	MathV2 (MathV2 extends MathV1)
<pre>//Instance variables private int var1; int var2; int var 3; MathV1(int var1, int var2, int var3){ //write your code here to initialize instance variables }</pre>	<pre>//Instance variables int var1; int var2; int var 3; MathV2(int var1, int var2, int var3, int var4, int var5, int var6){ //write your code here //Use var1, var2, va3 to initialize the instance variables of this class and rest of</pre>

<pre> void printSeries (){ //Write code to print even numbers between var1 and var2 } void power(int a, int b){ //Write code to print a^b } int factorial(){ //return the factorial of var3; } Void fibo(){ //write code to print Fibonacci series from var2 to var3 } </pre>	<pre> the variables to initialize the super class's instance variables } void printSeries (){ //Print odd numbers between var1 and var2 (Here var1 and var2 refer to the parent class's instance variables) } void power(int a, int b){ //Write code to print b^a } void secondSmallest(){ //write a code to print the 2nd smallest number between var1, var2 and var3 } </pre>
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Now, write another class named **Main** where you have to write the main function. Inside of the main function **create an object of MathV2** and utilize all of the methods of **MathV1** and **MathV2** classes.

[10]