Module Code & Module Title

CS4001NI Programming

Assessment Weightage & Type

40% Written Examination

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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

1. In a scenario of electricity bill, each customer has to pay a

minimum amount of

Rs.100 and 10 units are free of cost. After 10 units customer is

charged according to the

given rule:

a. 11 to 50 units: Rs 5 per unit.

b. 51 to 200 units: Rs 10 per unit.

c. 200 to 500 units: Rs 15 per unit.

d. >500 units: Rs 20 per unit.

Use if-else condition to find the amount charged from a customer. You need to take the number of units consumed as input from the keyboard. Use variables: min_charge for minimum charge, units for total number of electric units, amount for total amount charged from a customer

Solution to qs.1

```
import java.util.Scanner;



public class electricitybill
{

   public static void main(String[] args) {
      int min_charge;
      int units;
      int a;
      min_charge = 100;
      Scanner scan = new Scanner(System.in);
      System.out.print("Enter the units charged ");
      int num = scan.nextInt();
      scan.close();
      units = num;
```

```
        if (units < 11){
            System.out.println(min_charge);
        }
        else if (units >= 11 && units <= 50 ){
            units = units - 10;
            a = min_charge + (units * 5);
            System.out.println("Your bill is "+a);
        }
        else if (units >= 51 && units <= 200){
            units = units - 10;
            int b = units - 40;
            a = min_charge + (40 * 5) + (b * 10);
            System.out.println("Your bill is "+a);
        }
        else if (units >= 201 && units <= 500){
            units = units - 10;
            int b = units - 40 - 150;
            a = min_charge + (40 * 5) + (150 * 10) + (b * 15);
            System.out.println("Your bill is "+a);
        }
        else if (units > 500){
            units = units - 10;
            int b = units - 40 - 150 - 300;
            a = min_charge + (40 * 5) + (150 * 10)+ (300 * 15) + (b * 20);
            System.out.println("Your bill is "+a);
        }
    }
}
```

2. print the pattern using loop

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****

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Solution to qs.2

```
public class Pattern
{
public static void main(String args[])
{
//i for rows and j for columns
//row denotes the number of rows you want to print
int i, j, row=5;
//outer loop for rows
for(i=0; i<row; i++)
{
//inner loop for columns
for(j=0; j<=i; j++)
{
//prints stars
System.out.print("*");
}
//  new line after printing each line
System.out.println();
}
}
}
```

3. Create a class cylinder with attributes radius and height, each of which has a default value of 10. Provide a method that calculates the cylinder's volume, which is pi multiplied by the square of the radius and by the height. It has the set and get Methods for both radius and height. The set method should verify that radius and height are positive number. Write a program to test class cylinder.

Solution to qs. 3

```
public class Cylinder
{
   int height = 10;
   int radius = 10;

   public void volume()
   {
      double pi = 3.14;
      double volume = pi*radius*radius*height;
      {
         System.out.println("The volume of cylinder is "+volume);
      }
   }
   public void setHeight(int height)
   {
      if (height > 0)
      {
         this.height = height;
      }
      else
      {
         System.out.println("Input the valid number ");
      }
   }
```

```
    public void setRadius(int radius)
    {
        if (radius > 0)
        {
            this.radius = radius;
        }
        else
        {
            System.out.println("Input the valid number ");
        }
    }
    public int getHeight()
    {
        return
        this.height = height;
    }
    public int
    setRadius()
    {
        return
        this.radius = radius;
    }
}
```

4. An array is defined to be a Filter array if it meets the following conditions a. If it contains 9 then it also contains 11. b. If it contains 7 then it does not contain 13 So {1, 2, 3, 9, 6, 11} and {3, 4, 6, 7, 14, 16}, {1, 2, 3, 4, 10, 11, 13} and {3, 6, 5, 5, 13, 6, 13} are Filter arrays. The following arrays are not Filter arrays: {9, 6, 18} (contains 9 but no 11), {4, 7, 13} (contains both 7 and 13) Write a function named isFilter() that returns 1 if its array argument is a Filter array, otherwise it returns 0.

Solution to qs.4

```
public class arrayfilter {
   public static int isFilter(int[] a) {
      int result = 1;
      for (int i = 0; i < a.length; i++) {
         if (a[i] == 9) {
            for (int j = 0; j < a.length; j++) {
               if (a[j] == 11) {
                  result = 1;
                  break;
               } else {
                  result = 0;
               }
            }
         }
         if (a[i] == 7) {
            for (int j = 0; j < a.length; j++) {
               if (a[j] == 13) {
                  result = 0;
                  break;
               }
            }
         }
      }
```

```
        return result;
    }
}
```

We have to calculate the area of a rectangle, a square and a circle. Create an abstract class 'Shape' with three abstract methods namely 'RectangleArea' taking two parameters, 'SquareArea' and 'CircleArea' taking one parameter each. The parameters of 'RectangleArea' are its length and breadth, that of 'SquareArea' is its side and that of 'CircleArea' is its radius. Now create

another class 'Area' containing all the three methods 'RectangleArea', 'SquareArea' and 'CircleArea' for printing the area of rectangle, square and circle respectively. Create an object of class 'Area' and call all the three methods.

Solution to qs.5

Shape class

```
public abstract class Shape
{
public abstract int RectangleArea(int l, int b);
public abstract float CircleArea(float r);
public abstract int SquareArea(int s);
}
```

Area class

```
class Area extends Shape{
public int RectangleArea(int l, int b){
return l*b;
}
public float CircleArea(float r){
return 3.14f*r*r;
}
public int SquareArea(int s){
return s*s;
}
public static void main(String []args) {
Area area = new Area();
System.out.println(area.RectangleArea(5, 10));
```

```
System.out.println(area.CircleArea(10));
System.out.println(area.SquareArea(10));
}
}
```

Create a GUI form as given in the question

Solution to qs.6

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
import java.util.*;
import java.io.*;
import javax.swing.JOptionPane;
import javax.swing.*;
import javax.swing.ButtonGroup;


public class SampleGUI implements ActionListener
{
   //creating instance variables to be used in different methods. if declared in previous ways we couldnt use
   //in other methods as local variable is declared and used only inside the method in which it is declared.
   public static SampleGUI info = new SampleGUI();
   private JFrame f;private JPanel p;
   private JLabel fname,lname,gender,street1,street2,city,country,zipcodes;
   private JTextField fnametxt,lnametxt,street1txt,street2txt,citytxt,zipcodestxt;
   private JButton okbtn,cancelbtn,regbtn;
   private JComboBox item;
   private ButtonGroup bg;
   private JOptionPane msg1,msg2,msg3,msg4;
   public static void main(String[]args)
   {
      info.creategui();
   }

   public  void creategui(){
      Font SID = new Font("Times New Roman",Font.BOLD,16);
```

```
f = new JFrame("My Frame");

p = new JPanel();
p.setBounds(1, 1, 400,300);
p.setLayout(null);

p.setBorder(BorderFactory.createTitledBorder("User Information Form"));

fname=new JLabel("First Name ");
fname.setBounds(20,60,80,30);
p.add(fname);

fnametxt = new JTextField("FirstName");
fnametxt.setBounds(120,60,180,30);
p.add(fnametxt);

lname=new JLabel("Last Name ");
lname.setBounds(20,100,80,30);
p.add(lname);

lnametxt = new JTextField("Last Name");
lnametxt.setBounds(120,100,180,30);
p.add(lnametxt);

gender=new JLabel("Gender:");
gender.setBounds(20,140,80,20);
p.add(gender);

//JRadioButton---male
JRadioButton Mbutton=new JRadioButton("Male");
```

```
Mbutton.setBounds(120,140,80,20);

//Jradio female
JRadioButton Fbutton=new JRadioButton("Female");
Fbutton.setBounds(220,140,80,20);

//button group
ButtonGroup bg=new ButtonGroup();
bg.add(Mbutton);
bg.add(Fbutton);
p.add(Mbutton);
p.add(Fbutton);

street1=new JLabel("street 1");
street1.setBounds(20,180,80,30);
p.add(street1);

street1txt = new JTextField("Street1");
street1txt.setBounds(120,180,180,30);
p.add(street1txt);

street2=new JLabel("Street 2  ");
street2.setBounds(20,220,80,30);
p.add(street2);

street2txt = new JTextField("Street2");
street2txt.setBounds(120,220,180,30);
p.add(street2txt);

city=new JLabel("City ");
```

```
city.setBounds(20,260,80,20);
p.add(city);

citytxt = new JTextField("City");
citytxt.setBounds(120,260,180,30);
p.add(citytxt);

zipcodes=new JLabel("Zip Codes ");
zipcodes.setBounds(310,265,80,20);
p.add(zipcodes);

zipcodestxt = new JTextField("ZipCode");
zipcodestxt.setBounds(380,260,60,30);
p.add(zipcodestxt);

country=new JLabel("Country");
country.setBounds(20,300,180,20);
p.add(country);

String[] year ={"NEPAL","INDIA","CHINA","BHUTAN",};
JComboBox js = new JComboBox(year);
js.setBounds(120,300,180,30);
p.add(js);

okbtn= new JButton("OK");
okbtn.setBounds(140,380,60,30);
okbtn.addActionListener(this);
p.add(okbtn);

cancelbtn = new JButton("Cancel");
```

```
        cancelbtn.setBounds(210,380,90,30);
        cancelbtn.addActionListener(this);
        p.add(cancelbtn);

        regbtn = new JButton("Register me Later");
        regbtn.setBounds(310,380,160,30);
        regbtn.addActionListener(this);
        p.add(regbtn);



        f.add(p);
        f.setBounds(10, 10, 550, 500);
        f.setResizable(false);
        f.setVisible(true);
    }
    //implementing the action performed method
    public void actionPerformed(ActionEvent e)
    {

        if(e.getSource()== okbtn)
        {
            msg4=new JOptionPane();
            msg4.showMessageDialog(f,"The information is sucessfully
registered");

        }



        else if(e.getSource()== cancelbtn)
        {
            msg4=new JOptionPane();
```

```
            msg4.showMessageDialog(f,"You Cancelled");

        }

        else if(e.getSource()== regbtn)
        {
            msg4=new JOptionPane();
            msg4.showMessageDialog(f,"Your registration will be done later");

        }
    }
}
```