

```
/******
```

Solution of Handout-4 (a)

Problem#1

```
*****/
```

```
class Point
```

```
{
    private double x; // instance variable
    private double y; // instance variable

    public Point (double xValue, double yValue) // constructor
    {
        x=xValue;
        y=yValue;
    }

    public double distanceToOrigin() // method to find distance of point from origin (0,0)
    {
        return Math.sqrt((x*x)+(y*y));
    }

    public double distanceToPoint(Point p) // method to find distance b/w two points
    {
        return Math.sqrt((x-p.x)*(x-p.x)+(y-p.y)*(y-p.y));
    }

    public double getX() // method to get the value of x (accessor or get method)
    {
        return x;
    }

    public double getY() // method to get the value of y (accessor or get method)
    {
        return y;
    }

    public void translate(double dx,double dy) // added translate method
    {
        x=x+dx;
        y=y+dy;
    }
}
```

```
public class Demo
```

```
{
    public static void main (String args[])
    {
        Point p1 = new Point (10,20); // creating object using constructor
        Point p2 = new Point (20,20);

        System.out.println("Co-ordinates of two points p1(p1x,p1y) and p2(p2x,p2y) are :\n");
        System.out.println("p1x= "+p1.getX());
        System.out.println("p1y= "+p1.getY());
        System.out.println("\n");
    }
}
```

```

System.out.println("p2x= "+p2.getX());
System.out.println("p2y= "+p2.getY());
System.out.println("\n");

double d1=p1.distanceToOrigin();
System.out.println("Distance of point p1 from origin(0,0) is = "+d1);

System.out.println("*****");

double d21=p2.distanceToPoint(p1);
System.out.println("\nDistance between p2 and p1 is = "+d21);

System.out.println("*****");
System.out.print("\np1 before translation is x=" +p1.getX());
System.out.println(" , " + "y= "+p1.getY());

p1.translate(5,-5);
System.out.print("\np1 after translation is x=" +p1.getX());
System.out.println(" , " + "y= "+p1.getY());
System.out.println("*****");
System.out.println("\n");

}
}

```

OUTPUT:

```

java
Auto
Co-ordinates of two points p1(p1x,p1y) and p2(p2x,p2y) are :
p1x= 10.0
p1y= 20.0
p2x= 20.0
p2y= 20.0
Distance of point p1 from origin(0,0) is = 22.360679774997898
*****
Distance between p2 and p1 is = 10.0
*****
p1 before translation is x=10.0 , y= 20.0
p1 after translation is x=15.0 , y= 15.0
*****
Press any key to continue...

```

```

/*****

```

Solution of Problem#2

```

*****/

```

```

import java.io.*;

```

```

class Person

```

```

{
    private String name; //instance variable

```

```

private double annualIncome; //instance variable
private double annualExpense; //instance variable
private double annualZakat; // instance variable

public Person(String n, double ai, double ae) // constructor
{
    name=n;
    annualIncome=ai;
    annualExpense=ae;
}

public double findZakat() // method to compute zakat
{
    return ((annualIncome-annualExpense)*2.5/100);
}

public void displayRecord() // method to display record
{
    System.out.println("\n*****");
    System.out.println("Mr.: "+name);
    System.out.println("Annual Income: "+annualIncome+" SR");
    System.out.println("Annual Expense: "+annualExpense+" SR");

    annualZakat=findZakat(); // call of method

    System.out.println("*****");
    System.out.println("\nYour's Due Annual Zakat is = " +annualZakat+" SR");

    System.out.println("\n*****");
    System.out.println("\n");
}
}

```

```

public class Demo
{
    public static void main(String[] args) throws IOException
    {
        InputStreamReader reader = new InputStreamReader(System.in);
        BufferedReader stdin = new BufferedReader (reader);

        System.out.print("Enter Name of person: ");
        String yourName = stdin.readLine();

        System.out.print("Enter Annual Income: ");
        double yearlyIncome = Double.parseDouble(stdin.readLine());

        System.out.print("Enter Annual Expenses: ");
        double yearlyExpense = Double.parseDouble(stdin.readLine());
        Person p1 = new Person (yourName, yearlyIncome, yearlyExpense);
        p1.displayRecord(); //call of method
    }
}

```

OUT PUT :



The screenshot shows a Java application window titled 'java'. The window contains a text area with the following text:
Enter Name of person: Rafiqul Zaman Khan
Enter Annual Income: 100000
Enter Annual Expenses: 50000

Mr.: Rafiqul Zaman Khan
Annual Income: 100000.0 SR
Annual Expense: 50000.0 SR

Your's Due Annual Zakat is = 1250.0 SR

Press any key to continue...

```
/*  
*****  
Solution of Problem#3  
*****  
*/
```

```
import java.io.*;  
  
class Circle // circle class  
{  
private double radius; //instance variable  
  
Circle(double r) // constructor  
{  
radius = r;  
}  
  
public double getArea() // method for computing area  
{  
return Math.PI * Math.pow(radius, 2);  
}  
  
public double getCircumference() // method for computing circumference  
{  
return 2 * Math.PI * radius;  
}  
} // end of circle class  
  
public class Demo // class Demo in which main method is defined  
{  
public static void main(String[] args)  
{
```

```

    Circle circle = new Circle(5); //creating object

    System.out.println("The circle just constructed has an area= "
        + circle.getArea() + ", \nand a circumference= "
        + circle.getCircumference()); // these all must be in the same line
    } //end of main
} // end of class Demo in which main method is defined

```

OUTPUT:

```

java
Auto
The circle just constructed has an area= 78.53981633974483,
and a circumference= 31.41592653589793
Press any key to continue...

```

```

/*****
    OR (another solution of Problem#3)
*****/
import java.io.*;

class Circle // circle class
{
    private double radius; //instance variable

    Circle(double r) // constructor
    {
        radius = r;
    }

    public double getArea() // method for computing area
    {
        return Math.PI * Math.pow(radius, 2);
    }

    public double getCircumference() // method for computing circumference
    {
        return 2 * Math.PI * radius;
    }
} // end of circle class

public class Demo // class Demo in which main method is defined
{
    public static void main(String[] args) throws IOException

```

```

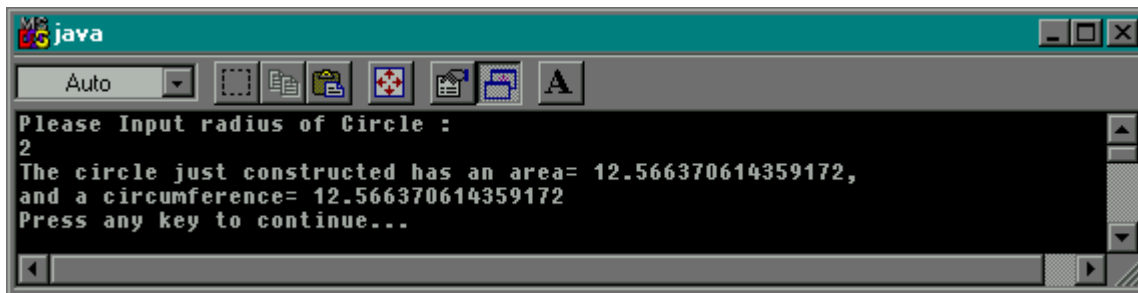
{
    InputStreamReader reader = new InputStreamReader(System.in);
    BufferedReader stdin = new BufferedReader(reader);
    System.out.println("Please Input radius of Circle : ");
    String radi = stdin.readLine();
    double radius = Double.parseDouble(radi);

    Circle circle = new Circle(radius); //creating object

    System.out.println("The circle just constructed has an area= "
        + circle.getArea() + ", \nand a circumference= "
        + circle.getCircumference()); // these all must be in the same line
} //end of main
} // end of class Demo in which main method is defined

```

OUT PUT:



```

java
Auto
Please Input radius of Circle :
2
The circle just constructed has an area= 12.566370614359172,
and a circumference= 12.566370614359172
Press any key to continue...

```