Name - Akriti Choudhary
Roll number- 2005776
Section- cse25
Date - 15/2/2022
WT LAB5

1) Write a program in Java to define a class Rectangle having data member: length and breadth; to calculate the area and perimeter of the rectangle. Use constructors and member functions to read, calculate and display.

```
import java.util.*;

class findRectangle {
   public static void main(String arg[]) {
      Scanner sc = new Scanner(System.in);

      System.out.println("Enter Length of the rectangle:");
      int l = sc.nextInt();
      System.out.println("Enter breadth of the rectangle:");
      int b = sc.nextInt();
      Rectangle rect = new Rectangle(l, b);

      System.out.println("Length = " + rect.length);
      System.out.println("Breadth = " + rect.breadth);
      System.out.println("Area = " + rect.getArea());
      System.out.println("Perimeter = " + rect.getPerimeter());

   }
}

class Rectangle {
   int length;
   int breadth;

   Rectangle(int length, int breadth) {
      this.length = length;
      this.breadth = breadth;
   }

   double getArea() {
      return length * breadth;
   }

   double getPerimeter() {
      return 2 * (length + breadth);
   }
}
```

```
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> javac findRectangle.java
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> java findRectangle
Enter Length of the rectangle:
4
Enter breadth of the rectangle:
2
Length = 4
Breadth = 2
Area = 8.0
Perimeter = 12.0
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6>
```

2)Write a program which will overload the area () method and display the area of a circle, triangle and square as per user choice and user entered dimensions.

```
import java.util.Scanner;

public class area {
   public static void main(String args[]) {

      Scanner sc = new Scanner(System.in);
      System.out.println("Enter the radius of circle: ");
      double r = sc.nextDouble();
      double ca = Ar(r);
      System.out.println("Area of circle = " + ca);

      System.out.print("Enter the side of square: ");
      int side = sc.nextInt();
      int sa = Ar(side);
      System.out.println("Area of square = " + sa);

      System.out.print("Enter the base and height of triangle: ");
      int b = sc.nextInt();
      int h = sc.nextInt();
      double a = Ar(b, h);
      System.out.println("Area of triangle = " + a);
   }

   public static double Ar(double r) {
      double ca = (22 / 7.0) * r * r;
      return ca;

   }

   public static int Ar(int side) {
      int sa = side * side;
      return sa;

   }

   public static double Ar(int b, int h) {
      double sa = 0.5 * b * h;
      return sa;
   }
}
```

```
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> javac area.java
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> java area
Enter the radius of circle:
2
Area of circle = 12.571428571428571
Enter the side of square: 4
Area of square = 16
Enter the base and height of triangle: 3 6
Area of triangle = 9.0
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6>
```

3) A plastic manufacturer sells plastic in different shapes like 2D sheet and 3D box. The cost of sheet is Rs 40/ per square ft. and the cost of box is Rs 60/ per cubic ft. Implement it in Java to calculate the cost of plastic as per the dimensions given by the user where 3D inherits from 2D.

```
import java.util.*;

public class q3 {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the side of cube");
        int cb = sc.nextInt();
        System.out.println("Enter the side of square");
        int sq = sc.nextInt();
        Shape3D obj = new Shape3D(sq, cb);
        obj.displayCube();
        obj.displaySquare();
    }
}

class Shape2D {
    int cost_square = 40;
    int tot;
    int sqa;

    Shape2D(int sq) {
        sqa = sq;
    }

    void displaySquare() {
        tot = (int) sqa * sqa * cost_square;
        System.out.println("Cost of square plastic = " + tot);

    }
}

class Shape3D extends Shape2D {
    int cost_box = 60;
    int cub;

    Shape3D(int sq, int cb) {
        super(sq);
        cub = cb;
    }

    void displayCube() {
        tot = (int) cub * cub * cub * cost_box;
        System.out.println("Cost of square plastic = " + tot);

    }
}
```

```
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> javac q3.java
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> java q3
Enter the side of cube
3
Enter the side of square
4
Cost of square plastic = 1620
Cost of square plastic = 640
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6>
```

4)Write a program in java to define a class Shape which has data member “area” and a member function showArea(). Derive two classes Circle and Rectangle from Shape class. Add appropriate data members and member functions to calculate and display the area of Circle and Rectangle.

```
import java.util.*;

class Shape {
   int area;

   void showArea() {
      System.out.println("Area = " + area);
   }

}

class circle extends Shape {
   int r;

   circle(int radius) {
      r = radius;
      area = (int) (22 / 7.0) * r * r;

   }

}

class rectangle extends Shape {
   int length;
   int width;

   rectangle(int l, int b) {
      length = l;
      width = b;
      area = l * b;
   }

}

public class test {
```

```
  public static void main(String args[]) {
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter length and width of the recatngle");
    int l = sc.nextInt();
    int b = sc.nextInt();

    rectangle ob1 = new rectangle(l, b);
    ob1.showArea();

    System.out.println("Enter radius of the circle");
    int r = sc.nextInt();
    circle ob2 = new circle(r);
    ob2.showArea();

  }
}
```

```
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> javac test.java
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> java test
Enter length and width of the recatngle
4 2
Area = 8
Enter radius of the circle
2
Area = 12
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6>
```

5)Write a program in java using inheritance to show how to call the base class parameterized constructors from the derived class using super. Consider the base class is “Shape2D” for rectangle and define subclass “Shape3D” for cube.

```
import java.util.*;

public class q5 {
   public static void main(String args[]) {
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter the side of cube");
      int side = sc.nextInt();
      Shape3D obj = new Shape3D(side);
   }
}

class Shape2D {
   int len, wid;

   Shape2D() {
```

```
        len = 0;
        wid = 0;
    }

    Shape2D(int l, int b) {
        len = l;
        wid = b;
        System.out.println("Area of rectangle = " + (l * b));
    }
}

class Shape3D extends Shape2D {
    int s;

    Shape3D() {
        s = 0;
    }

    Shape3D(int side) {
        super(4, 2);
        s = side;
        System.out.println("volume of cube = " + (side * side * side));

    }
}
```

```
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> javac q5.java
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6> java q5
Enter the side of cube
3
Area of rectangle = 8
volume of cube = 27
PS D:\KIIT_NOTES\2nd year sem_4\WT LAB\Day6>
```