**1. Exercise:Create a package called shapes. Create some classes in the package representing some common geometric shapes like Square, Triangle, Circle and so on.**

**Create a class called TestShapes and create objects for all the shapes and print corresponding messages.Execute the TestShapes class.**

Circle.java

package Shapes;

public class Circle {

final double pi=3.14;

int radius;

Circle(int radius)

{

this.radius=radius;

}

public void areaOfCircle()

{

System.out.println("Area of Circle is: "+(pi\*radius\*radius));

}

public void perimeterOfCircle()

{

System.out.println("Perimeter of the Circle is: "+(2\*pi\*radius));

}

}

Rectangle.java

package Shapes;

public class Rectangle {

int length,breadth;

public void perimeterOfRectangle(int length,int breadth)

{

System.out.println("Perimeter of Rectangle is: "+(2\*(length+breadth)));

}

public void areaOfRectangle(int length,int breadth)

{

System.out.println("Area of the Rectangle is: "+(length\*breadth));

}

}

Square.java

package Shapes;

public class Square {

int length;

Square(int length)

{

this.length=length;

}

public void areaOfSquare()

{

System.out.println("Area of Square is: "+(length\*length));

}

public void perimeterOfSquare()

{

System.out.println("Perimeter of the Square is: "+(4\*length));

}

}

TestClass.java //main class

package Shapes;

import java.util.Scanner;

public class TestClass {

public static void main(String[] args) {

Scanner sc=new Scanner(System.in);

System.out.println("Enter the length/Radius:");

int length=sc.nextInt();

System.out.println("Enter the breadth:");

int breadth=sc.nextInt();

Circle circle=new Circle(length);

Square square=new Square(length);

Rectangle rectangle=new Rectangle();

circle.areaOfCircle();

circle.perimeterOfCircle();

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

square.areaOfSquare();

square.perimeterOfSquare();

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

rectangle.areaOfRectangle(length, breadth);

rectangle.perimeterOfRectangle(length, breadth);

}

}

**Output:**

Enter the length/Radius:

10

Enter the breadth:

15

Area of Circle is: 314.0

Perimeter of the Circle is: 62.800000000000004

Area of Square is: 100

Perimeter of the Square is: 40

Area of the Rectangle is: 150

Perimeter of Rectangle is: 50

**2. Exercise: Create a class called shape with the following methods**

**1. area**

**2. perimeter**

**Overload the area and perimeter method to calculate for both square and rectangle.**

**Create a main class and invoke the area method to calculate the area of the square and rectangle.**

**Also invoke the perimeter method to calculate the perimeter of the square and rectangle.**

package Assignment;

import java.util.Scanner;

class Square{

public void area(int length)

{

System.out.println("Area of Square is: "+(length\*length));

}

public void perimeter(int length)

{

System.out.println("Perimeter of the Square is: "+(4\*length));

}

}

class Rectangle extends Square{

public void perimeter(int length,int breadth)

{

System.out.println("Perimeter of Rectangle is: "+(2\*(length+breadth)));

}

public void area(int length,int breadth)

{

System.out.println("Area of the Rectangle is: "+(length\*breadth));

}

}

public class Shape {

public static void main(String[] args) {

// TODO Auto-generated method stub

Scanner sc=new Scanner(System.in);

System.out.println("Enter the length:");

int length=sc.nextInt();

System.out.println("Enter the breadth:");

int breadth=sc.nextInt();

Rectangle rect=new Rectangle();

rect.area(length);

rect.area(length,breadth);

rect.perimeter(length);

rect.perimeter(length, breadth);

}

}

**Output:**

Enter the length:

10

Enter the breadth:

8

Area of Square is: 100

Area of the Rectangle is: 80

Perimeter of the Square is: 40

Perimeter of Rectangle is: 36

**3. :Create a class called Calculator which has 4 different methods add, diff, mul and div which accepts two numbers as parameters.**

**Overload the methods such that the parameters can be of the following pattern.**

**1. Both are of int data type.**

**2. Both are of double data type.**

**3. First parameter is of int data type and second parameter is of double data type.**

**4. First parameter is of double data type and second parameter is of int data type.**

**Create anobject to access these methods and invoke these methods with different type of numbers and display the result in the corresponding methods.**

package Assignment;

class Operations{

public void add(int number1,int number2)

{

System.out.println("The Addition of 2 numbers is: "+(number1+number2));

}

public void add(double number1,double number2)

{

System.out.println("The Addition of 2 numbers is: "+(number1+number2));

}

public void add(double number1,int number2)

{

System.out.println("The Addition of 2 numbers is: "+(number1+number2));

}

public void add(int number1,double number2)

{

System.out.println("The Addition of 2 numbers is: "+(number1+number2));

}

public void sub(int number1,int number2)

{

System.out.println("The Subtraction of 2 numbers is: "+(number1-number2));

}

public void sub(double number1,double number2)

{

System.out.println("The Subtraction of 2 numbers is: "+(number1-number2));

}

public void sub(double number1,int number2)

{

System.out.println("The Subtraction of 2 numbers is: "+(number1-number2));

}

public void sub(int number1,double number2)

{

System.out.println("The Subtraction of 2 numbers is: "+(number1-number2));

}

public void mul(int number1,int number2)

{

System.out.println("The Multiplication of 2 numbers is: "+(number1\*number2));

}

public void mul(double number1,double number2)

{

System.out.println("The Multiplication of 2 numbers is: "+(number1\*number2));

}

public void mul(double number1,int number2)

{

System.out.println("The Multiplication of 2 numbers is: "+(number1\*number2));

}

public void mul(int number1,double number2)

{

System.out.println("The Multiplication of 2 numbers is: "+(number1\*number2));

}

public void div(int number1,int number2)

{

System.out.println("The Division of 2 numbers is: "+(number1/number2));

}

public void div(double number1,double number2)

{

System.out.println("The Division of 2 numbers is: "+(number1/number2));

}

public void div(double number1,int number2)

{

System.out.println("The Division of 2 numbers is: "+(number1/number2));

}

public void div(int number1,double number2)

{

System.out.println("The Division of 2 numbers is: "+(number1/number2));

}

}

public class Calculator {

public static void main(String[] args) {

Operations op=new Operations();

op.add(5,3);

op.add(56.1, 3);

op.add(50,31.5);

op.add(56.5, 17.8);

op.sub(5,3);

op.sub(56.1, 3);

op.sub(50,31.5);

op.sub(56.5, 17.8);

op.mul(5,3);

op.mul(56.1, 3);

op.mul(50,31.5);

op.mul(56.5, 17.8);

op.div(5,3);

op.div(56.1, 3);

op.div(50,31.5);

op.div(56.5, 17.8);

}

}

**Output:**

The Addition of 2 numbers is: 8

The Addition of 2 numbers is: 59.1

The Addition of 2 numbers is: 81.5

The Addition of 2 numbers is: 74.3

The Subtraction of 2 numbers is: 2

The Subtraction of 2 numbers is: 53.1

The Subtraction of 2 numbers is: 18.5

The Subtraction of 2 numbers is: 38.7

The Multiplication of 2 numbers is: 15

The Multiplication of 2 numbers is: 168.3

The Multiplication of 2 numbers is: 1575.0

The Multiplication of 2 numbers is: 1005.7

The Division of 2 numbers is: 1

The Division of 2 numbers is: 18.7

The Division of 2 numbers is: 1.5873015873015872

The Division of 2 numbers is: 3.1741573033707864

**4. Exercise: Create a class called Vehicle. Create subclasses like Truck, Bus, Car etc. Add common methods in the base class and specific methods in the corresponding class. Create a class called Road.and create objects for the Truck, Car, Bus etc and display the appropriate message**

package Assignmet;

class Vechicle{

String name;

String number;

String color;

Vechicle(String name, String number, String color)

{

this.name=name;

this.number=number;

this.color=color;

System.out.println("Name of the Vechicle:"+name+"\nNumber of the Vechicle: "+number+"\nColour of the Vechicle: "+color);

}

}

class Truck extends Vechicle{

String name;

String number;

String color;

Truck(String name, String number, String color)

{

super(name, number, color);

}

public void VarietyOfTrucks()

{

System.out.println("Sand\_Load");

System.out.println("Grains\_Load");

System.out.println("Vechiles\_Load");

System.out.println("Stone\_Load");

System.out.println("Parcel\_Services");

}

}

class Bus extends Vechicle{

String name,number,color;

Bus(String name, String number, String color)

{

super(name,number,color);

}

public void LocationToTravel()

{

System.out.println("Salem To Hyderbad" +" "+ " Hyderbad to Salem");

System.out.println("Salem To Chennai" +" "+ " Chennai to Salem");

System.out.println("Chennai To Hyderbad" +" "+ " Hyderbad to Chennai");

System.out.println("Banglore To Chennai" +" "+ " Chennai to Banglore");

}

}

class Car extends Vechicle{

String name,number,color;

Car(String name,String number,String color)

{

super(name,number,color);

}

public void varietyOfSeaters()

{

System.out.println("2 Seaters");

System.out.println("4 Seaters");

System.out.println("5 Seaters");

System.out.println("7 Seaters");

}

}

class Bike extends Vechicle{

Bike(String name, String number, String color) {

super(name, number, color);

}

public void varientOfBikes()

{

System.out.println("v2");

System.out.println("v3");

System.out.println("v4");

}

}

public class Road {

public static void main(String[] args) {

Truck obj=new Truck("Saro","TN54A5543","Red");

obj.VarietyOfTrucks();

Bus obj1=new Bus("JTS","TN54A2345","Merron");

System.out.print(obj1.color);

obj1.LocationToTravel();

Car obj2=new Car("NANO","TN54Q8473","Black");

obj2.varietyOfSeaters();

Bike obj3=new Bike("R15","TN54U8473","Silver");

obj3.varientOfBikes();

}

}

**Output:**

Name of the Vechicle:Saro

Number of the Vechicle: TN54A5543

Colour of the Vechicle: Red

Sand\_Load

Grains\_Load

Vechiles\_Load

Stone\_Load

Parcel\_Services

Name of the Vechicle:JTS

Number of the Vechicle: TN54A2345

Colour of the Vechicle: Merron

Salem To Hyderbad Hyderbad to Salem

Salem To Chennai Chennai to Salem

Chennai To Hyderbad Hyderbad to Chennai

Banglore To Chennai Chennai to Banglore

Name of the Vechicle:NANO

Number of the Vechicle: TN54Q8473

Colour of the Vechicle: Black

2 Seaters

4 Seaters

5 Seaters

7 Seaters

Name of the Vechicle:R15

Number of the Vechicle: TN54U8473

Colour of the Vechicle: Silver

v2

v3

v4