**1.)Develop a static method distance () in class geometry which accepts x1,y1,x2,y2 representing the coordinates of two points of type double and then returns the distance between them and call the method from main() in Demo class. Assume 4 inputs command line. Draw the class diagram (Hint Distance =((x2-x1)2 (y2-y1)2))**

**Code:**

**package** N;

**import** java.util.Scanner;

**public** **class** Geometry {

**static** **double** *x1*;

**static** **double** *x2*;

**static** **double** *y1*;

**static** **double** *y2*;

**public** **static** **void** main(String[] args) {

**double** dis;

Scanner sc=**new** Scanner(System.***in***);

System.***out***.println("Enter x1 ");

*x1*=sc.nextDouble();

System.***out***.println("enter y1");

*y1*=sc.nextDouble();

System.***out***.println("enter x2");

*x2*=sc.nextDouble();

System.***out***.println("enter y2");

*y2*=sc.nextInt();

dis=Math.*sqrt*((*x2*-*x1*)\*(*x2*-*x1*) + (*y2*-*y1*)\*(*y2*-*y1*));

System.***out***.println("distance between two point is "+dis);

}

}

**2. )Draw the class diagram and code the class TwoDimensionalPoint with 2 attributes x and y. Also write a parameterized constructor.**

**package** I;

**public** **class** TwoDimensionalPoint {

**int** x;

**int** y;

TwoDimensionalPoint(**int** a,**int** b) {

x=a;

y=b;

}

**public** **static** **void** main(String[] args) {

TwoDimensionalPoint n=**new** TwoDimensionalPoint(5, 5);

System.***out***.println(n.x+"");

System.***out***.println(n.y+"");

}

}

**3.) Modularize to package level and draw the class diagram for the following-The class Course has the following private fields: courseCode, Course Title (both of type String) and credits (type int). It also contains accessors and mutators for each attribute Validate the following in mutators: 1. courseCode must have 6 characters (only digits and characters) 2. credits must be a positive value less than 6. Also code the toString method to display the data. Develop the Course Demo class with main() method and test capabilities of Course class.**

**package** R;

**public** **class** CourseClass {

**private** String CourseTitle,coursecode;

**private** **int** credit;

**public** **void** setT(String title)

{

CourseTitle=title;

}

**public** **void** setC(String code)

{

coursecode=code;

}

**public** **boolean** setD(**int** c)

{

**if**(c>0 && c<6)

{

credit=c;

**return** **true**;

}

**return** **false**;

}

**public** String getT()

{

**return** CourseTitle;

}

**public** String getC()

{

**return** coursecode;

}

**public** String getD()

{

**return** credit+" point";

}

**public** String toString()

{

String str=String.*format*("Course Title=%s%n Course code=%s%n Course credit=%s%n",getT(),getC(),getD());

**return** str;

}

}

**//Main class**

**package** R;

**import** java.util.Scanner;

**public** **class** CourseDemo {

**public** **static** **void** main(String[] args) {

CourseClass c=**new** CourseClass();

Scanner s=**new** Scanner(System.***in***);

System.***out***.println("Enter the Course Title=");

c.setT(s.next());

System.***out***.println("Enter the Course code=");

c.setC(s.next());

System.***out***.println("Enter the Course credit=");

c.setD(s.nextInt());

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

}

}

**4.) Create a class Complex Number with private attributesreal,imaginary Code the no-argument constructor that sets both to 0,and a parameterized constructor**

**package** A;

**import** I.TwoDimensionalPoint;

**public** **class** Complex\_Number {

**private** **int** real;

Complex\_Number()

{

}

Complex\_Number(**int** r)

{

real=r;

}

**public** **static** **void** main(String[] args) {

Complex\_Number n=**new** Complex\_Number(5);

System.***out***.println("Real number is "+n.real);

}

}

**5.)The census committee maintains data of states in India. The task is to develop the class State with name, capital, population and literacy as the private attributes. Code the accessors, mutators, toString() method. Develop the main() method to store data of 5 states in an array. (Input to be read from console)**

**//State class**

**package** NJ;

**public** **class** State {

**private** String name;

**private** String Capital;

**private** **long** Population;

**private** **int** Literacy;

**public** **void** setN(String N)

{

name=N;

}

**public** **void** setC(String C)

{

name=C;

}

**public** **void** setP(**long** p)

{

Population=p;

}

**public** **void** setL(**int** l)

{

Literacy=l;

}

**public** String getN()

{

**return** name;

}

**public** String getC()

{

**return** Capital;

}

**public** **long** getP()

{

**return** Population;

}

**public** **int** getL()

{

**return** Literacy;

}

**public** String toString()

{

String s=String.*format*("Name of State=%s%n Capital of State=%s%n Population=%d%n Literacy Rate=%d%n"+getN(),getC(),getP(),getL());

**return** s;

}

}

**//State Demo**

**package** NJ;

**import** java.util.Scanner;

**public** **class** StateDemo {

**public** **static** **void** main(String[] args) {

State s=**new** State();

Scanner sc=**new** Scanner(System.***in***);

String name[]=**new** String[5];

String Capital[]=**new** String[5];

**long** Population[]=**new** **long**[5];

**int** Literacy[]=**new** **int**[5];

**for**(**int** i=0;i<2;i++)

{

System.***out***.println("Enter the name");

name[i]=sc.nextLine();

System.***out***.println("Enter the Capital");

Capital[i]=sc.next();

System.***out***.println("Enter the Population");

Population[i]=sc.nextLong();

System.***out***.println("Enter the Literacy");

Literacy[i]=sc.nextInt();

}

**for**(**int** i=0;i<2;i++)

{

System.***out***.println(s.getN());

}

}

}

**6. Draw the class diagram and code the class Product with private members id, name, quantity and price. Code the getter and setters, the quantity and price must be positive If invalid values are specified to 0 and return false and code the toString() method. Also compute the total amount to be paid.**

**package** An;

**public** **class** Product {

**private** String id;

**private** String name;

**private** **int** Quantity;

**private** **int** price;

**public** **void** setN(String N)

{

id=N;

}

**public** **void** setC(String C)

{

name=C;

}

**public** **void** setP(**int** p)

{

Quantity=p;

}

**public** **boolean** setL(**int** l)

{

**if**(l>0)

{

price=l;

**return** **true**;

}

**return** **false**;

}

**public** String getN()

{

**return** id;

}

**public** String getC()

{

**return** name;

}

**public** String getP()

{

**return** Quantity+" kg";

}

**public** String getL()

{

**return** "Rs "+price;

}

**public** String toString()

{

String s=String.*format*("ID IS =%s%n NAME IS =%s%n Quantity =%s%n Price is =%s%n ",getN(),getC(),getP(),getL());

**return** s;

}

}

**//ProductDemo**

**package** An;

**import** java.util.Scanner;

**public** **class** ProductDemo {

**public** **static** **void** main(String[] args) {

Product p=**new** Product();

Scanner s=**new** Scanner(System.***in***);

System.***out***.println("Enter the customer id:");

p.setN(s.nextLine());

System.***out***.println("Enter the customer name:");

p.setC(s.nextLine());

System.***out***.println("Enter the Quantity:");

p.setP(s.nextInt());

System.***out***.println("Enter the Price:");

p.setL(s.nextInt());

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

}

}

**7.)Draw the class diagram and develop the code for the class Student with ID, name and mobile has private attributes. Also write the accessors, mutators for the attributes and method display data**

**//Student**

**class** Student {

**private** **long** id,num;

**private** String name;

**public** **void** setA(**long** i)

{

id=i;

}

**public** **void** setB(**long** mn)

{

num=mn;

}

**public** **void** setC(String fname)

{

name=fname;

}

**public** **long** getA()

{

**return** id;

}

**public** **long** getB()

{

**return** num;

}

**public** String getC()

{

**return** name;

}

**public** String toString()

{

String str=String.*format*("id:%s num:%s name:%s",getA(),getB(),getC());

**return** str;

}

}

//Student Demo

**import** java.util.Scanner;

**public** **class** StudentDemo {

**public** **static** **void** main(String[] args)

{

Student st =**new** Student();

Scanner s=**new** Scanner(System.***in***);

System.***out***.println("Enter the id number=");

st.setA(s.nextLong());

System.***out***.println("Enter the phone number=");

st.setB(s.nextLong());

System.***out***.println("Enter the name=");

st.setC(s.next());

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

}

}

**8.)Assume a class Book with the following attributes – ISBN (long), Title (String), Price(double), Year (integer). Write the parameterized constructor with 4 arguments and draw the class diagram.**

**package** p2;

**import** java.util.Scanner;

**public** **class** Book {

**private** **long** ISBN;

**private** String Title;

**private** **double** Price;

**private** **int** year;

Book(**long** i,String T,**double** P,**int** y)

{

ISBN=i;

Title=T;

Price=P;

year=y;

}

**public** String toString()

{

String str=String.*format*("ISBN Number=%d%n Title=%s%n Price=%s%n year=%d%n",ISBN,Title,Price,year);

**return** str;

}

**public** **static** **void** main(String[] args) {

Scanner s=**new** Scanner(System.***in***);

System.***out***.println("Enter the ISBN Number,Title,Price,Year=");

Book r=**new** Book(s.nextLong(),s.next(),s.nextDouble(),s.nextInt() );

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

}

}

**9.)The marks of students in a class are specified as command line arguments, the task is**

**finding the maximum and average of the marks. Write a program to perform the above**

**task.**

**package** p3;

**public** **class** Mark {

**public** **static** **void** main(String[] args) {

**int** sum=0,x,max=0;

**for**(**int** i=0;i<args.length;i++)

{

x=Integer.*parseInt*(args[i]);

**if**(x>max)

{

max=x;

}

sum=sum+x;

}

**int** avg=sum/args.length;

System.***out***.println("Total Marks="+sum);

System.***out***.println("Average Marks="+avg);

System.***out***.println("Max Marks="+max);

}

}

**15.)Develop a java class to read data of 10 students (With ID, name, gender, age as private instance members). Draw the class diagram and define the following methods**

**a) toString ()**

**b) setDetails ()**

**the main () method must create an array, store reference of 10 students. There must be menu with the following options:**

**1.New Student**

**2.Print all Students**

**3.Search based on ID**

**4.Exit**

**//Student Class**

**package** P4;

**public** **class** Student {

**private** String ID;

**private** String Name;

**private** String gender;

**private** String age;

Student(String id,String name,String gend,String a){

ID=id;

Name=name;

gender=gend;

age=a;

}

**public** String getID()

{

**return** ID;

}

**public** String getName()

{

**return** Name;

}

**public** String getG()

{

**return** gender;

}

**public** String getage()

{

**return** age;

}

**public** String toString()

{

String s=String.*format*("Student ID=%s%n Student Name=%s%n Gender=%s%n Age=%s%n",getID(),getName(),getG(),getage());

**return** s;

}

}

**//StudentDemo**

**package** P4;

**import** java.util.ArrayList;

**import** java.util.Scanner;

**public** **class** StudentDemo {

**private** **static** Scanner *s*;

**private** **static** ArrayList<Student> *stud*;

**private** **static** **void** initialize() {

*s*=**new** Scanner(System.***in***);

*stud*=**new** ArrayList<Student>();

}

**private** **static** **int** menuoption()

{

System.***out***.println(">>>>>>>>>>>>>>>>>>>>>>Main Menu>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>");

System.***out***.println("1.Add new Student");

System.***out***.println("2.Print all student");

System.***out***.println("4.Search based on ID");

System.***out***.println("5.Exit");

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

System.***out***.println("Enter the choice:");

**return** *s*.nextInt();

}

**public** **static** **void** main(String[] args) {

**int** ch;

*initialize*();

**while**(**true**)

{

ch=*menuoption*();

**switch**(ch)

{

**case** 1:

*stud*.add((Student) *getStudDetail*());

**break**;

**case** 2:

System.***out***.println(">>>>>>>All Student Detail>>>>>>>");

**for**(Student c: *stud*)

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

**break**;

**case** 3:

*searchBasedonID*();

**break**;

**case** 4:

System.*exit*(0);

}

}

}

**private** **static** **void** searchBasedonID() {

System.***out***.println("Enter ID to Search");

String search=*s*.nextLine();

**for**(Student sid:*stud*)

{

**if**(sid.getID()==search)

{

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

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

**return**;

}

System.***out***.println("ID not Found");

}

}

**private** **static** Object getStudDetail() {

System.***out***.println("Enter the following: (ID,Name,Gender<Male/female>,age) ");

**return** **new** Student(*s*.nextLine(),*s*.nextLine(),*s*.nextLine(),*s*.nextLine());

}

}

**16.** )Modularize the design to package level and develop the code. A Vehicle registration portal accepts the following data from Vehicle owners: a) Vehicle Number b)Wheeler(either 4 or 6)-validate in setter c) Owner name d) Mobile. The Vehicle class contains parameterised constructor, toString() methods. The vehicle demo class has a main() method which reads and stores data of 8 vehicles and displays the menu with following operations: a) Add data 2) Display data based on vehicle number.

**//Vehicle**

**package** p5;

**public** **class** Vehicle {

**private** String vnum;

**private** **int** vwheel;

**private** String vown;

**private** **long** vmob;

**public** Vehicle(String num, **int** wheel, String own, **long** mob) {

vnum=num;

vwheel=wheel;

vown=own;

vmob=mob;

}

**public** String getNum()

{

**return** vnum;

}

**public** **int** getWh()

{

**return** vwheel;

}

**public** String getName()

{

**return** vown;

}

**public** **long** getMob()

{

**return** vmob;

}

**public** String toString()

{

String s=String.*format*("Vehicle Number=%s%n Vehicle wheel =%d%n Owner Name=%s%n Mobile Number=%d%n",getNum(),getWh(),getName(),getMob());

**return** s;

}

}

**//VehicleDemo**

**package** p5Demo;

**import** java.util.ArrayList;

**import** java.util.Scanner;

**import** p5.Vehicle;

**public** **class** VechicleDemo {

**private** **static** Scanner *s*;

**private** **static** ArrayList<Vehicle> *vehi*;

**private** **static** **void** initialize() {

*s*=**new** Scanner(System.***in***);

*vehi*=**new** ArrayList<Vehicle>();

}

**private** **static** **int** menuoption()

{

System.***out***.println(">>>>>>>>>>>>>>>>>>>>>>Main Menu>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>");

System.***out***.println("1.Add new Vehicle");

System.***out***.println("2.Print all student");

System.***out***.println("4.Display based on ID");

System.***out***.println("5.Exit");

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

System.***out***.println("Enter the choice:");

**return** *s*.nextInt();

}

**public** **static** **void** main(String[] args) {

**int** ch;

*initialize*();

**while**(**true**)

{

ch=*menuoption*();

**switch**(ch)

{

**case** 1:

*vehi*.add((Vehicle) *getVehiDetail*());

**break**;

**case** 2:

System.***out***.println(">>>>>>>All Vehicle Detail>>>>>>>");

**for**(Vehicle v: *vehi*)

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

**break**;

**case** 3:

*DisplayBasedonNumber*();

**break**;

**case** 4:

System.*exit*(0);

}

}

}

**private** **static** **void** DisplayBasedonNumber() {

System.***out***.println("Enter Vehicle number to Search");

String search=*s*.nextLine();

**for**(Vehicle vid:*vehi*)

{

**if**(vid.getNum()==search)

{

System.***out***.println("Vehicle Number Found");

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

**return**;

}

System.***out***.println("Vehicle Number not Found");

}

}

**private** **static** Vehicle getVehiDetail() {

System.***out***.println("Enter the following: (Vehicle Number,Wheeler<2/4>,Name,Mobile NUMBER) ");

**return** **new** Vehicle(*s*.next(),*s*.nextInt(),*s*.next(),*s*.nextLong());

}

}