**Experiment – 3**

Q1) Write a Java application which takes several command line arguments, which are supposed to be names of students and prints output as given below: (Suppose we enter 3 names then output should be as follows):

Number of arguments = 3

1: First Student Name is =Tom

2: Second Student Name is =Dick

3: Third Student Name is =Harry

(Hint: An array may be used for converting from numeric values from 1 to 20 into String.)

Ans:

**Program:**

public class First {

    public static void main(String[] args) {

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

            System.out.println("Student name: "+args[i]);

        }

    }

}

**Output:**

A black screen with white text

AI-generated content may be incorrect.

Q2) Design a class named Rectangle to represent a rectangle. The class contains: Two double data fields named width and height that specify the width and height of the rectangle. The default values are 1 for both width and height.

A no-arg constructor that creates a default rectangle.

A constructor that creates a rectangle with the specified width and height.

A method named getArea() that returns the area of this rectangle.

A method named getPerimeter() that returns the perimeter.

Write a test program that creates two Rectangle objects—one with width 4 and height 40 and the other with width 3.5 and height 35.9. Display the width, height, area, and perimeter of each rectangle in this order.

Ans:

**Program:**

// exp\_2

public class Rectangle {

    double width;

    double height;

    Rectangle(){

        width = 1;

        height = 1;

    }

    Rectangle(double width,double height){

        this.width = width;

        this.height = height;

    }

    public double getArea(){

        return this.height \* this.width;

    }

    public double getPerimeter(){

        return 2 \* (this.height + this.width);

    }

    public static void main(String[] args){

        Rectangle rec1 = new Rectangle(4,40);

        Rectangle rec2 = new Rectangle(3.5,35.9);

        System.out.println("Rectangle 1:-");

        System.out.println("Width: " + rec1.width);

        System.out.println("Height: " + rec1.height);

        System.out.println("Perimeter: " + rec1.getPerimeter());

        System.out.println("Area: " + rec1.getArea());

        System.out.println("\n");

        System.out.println("Rectangle 2:-");

        System.out.println("Width: " + rec2.width);

        System.out.println("Height: " + rec2.height);

        System.out.println("Perimeter: " + rec2.getPerimeter());

        System.out.println("Area: " + rec2.getArea());

    }

}

**Output:**

A computer screen shot of a program

AI-generated content may be incorrect.

Q3) Define a class called Cartesian Point, which has two instance variables, x and y. Provide the methods get X() and get Y() to return the values of the x and y values respectively, a method called move() which would take two integers as parameters and change the values of x and y respectively, a method called display() which would display the current values of x and y. Now overload the method move() to work with single parameter, which would set both x and y to the same values,provide constructors with two parameters and overload to work with one parameter as well. Now define a class called Test Cartesian Point, with the main method to test the various methods in the Cartesian Point class.

Ans:

**Program:**

class CartesianPoint{

    int x;

    int y;

    public CartesianPoint(){}

    public CartesianPoint(int x, int y){

        this.x = x;

        this.y = y;

    }

    public CartesianPoint(int a){

        this.x = a;

        this.y = a;

    }

    public void setX(int x){

        this.x = x;

    }

    public int getX(){

        return x;

    }

    public void setY(int y){

        this.y = y;

    }

    public int getY(){

        return y;

    }

    public void move(int x,int y){

        this.x = x;

        this.y = y;

    }

    public void display(){

        System.out.println("Coordinates: ("+x+","+y+")");

    }

    public void move(int a){

        this.x = a;

        this.y = a;

    }

}

class TestCartesianPoint{

    public static void main(String[] args) {

        CartesianPoint obj1 = new CartesianPoint(5);

        CartesianPoint obj2 = new CartesianPoint(10,15);

        CartesianPoint obj3 = new CartesianPoint();

        obj1.display();

        obj2.display();

        obj1.move(25);

        obj1.display();

        obj1.move(30,50);

        obj1.display();

        obj3.setX(100);

        obj3.setY(400);

        obj3.display();

    }

}

**Output:**

A computer screen with white text

AI-generated content may be incorrect.

Q4) Create a class Employee which has two private data members name and salary and it has two public member functions named as getData() and putData() where getData() gets name and salary from the user putData() displays name and salary for any user.

Ans:

**Program:**

// exp-4

import java.util.Scanner;

public class Employee {

    Scanner sc = new Scanner(System.in);

    private String name;

    private double salary;

    public void getData(){

        System.out.println("Enter name of employee: ");

        this.name = sc.next();

        System.out.println("Enter salary of employee: ");

        this.salary = sc.nextDouble();

        System.out.println("Successfully added data");

    }

    public void putData(){

        System.out.println("Name: "+this.name);

        System.out.println("Salary: "+this.salary);

    }

    public static void main(String[] args) {

        Employee emp1 = new Employee();

        Employee emp2 = new Employee();

        emp1.getData();

        emp1.putData();

        emp2.getData();

        emp2.putData();

    }

}

**Output:**

A computer screen shot of a black screen

AI-generated content may be incorrect.

Q5) Define a class Time with hours and minutes astwo data members, add necessary member functions to initialize and display data of class. Do not use constructors in a class. Define a member function sum () which adds two Time objects. (Use the statements like T3.sum (T1, T2)).

Ans:

**Program:**

import java.util.Scanner;

// exp-5

public class Time {

    Scanner sc = new Scanner(System.in);

    int hours;

    int minutes;

    public void getTime(){

        System.out.print("Enter time (hours,minutes): ");

        this.hours = sc.nextInt();

        this.minutes = sc.nextInt();

        System.out.println("Successfully added data!");

    }

    public void printTime(){

        System.out.print("Time is: " + this.hours + ":" + this.minutes);

    }

    public Time addTime(Time T1, Time T2){

        Time T3 = new Time();

        T3.hours = T1.hours + T2.hours;

        T3.minutes = T1.minutes + T2.minutes;

        if(T3.minutes>=60){

            T3.hours += T3.minutes/60;

            T3.minutes %= 60;

        }

        return T3;

    }

    public static void main(String[] args) {

        Time T1 = new Time();

        Time T2 = new Time();

        T1.getTime();

        T1.printTime();

        System.out.println("\n");

        T2.getTime();

        T2.printTime();

        System.out.println("\n");

        Time T3 = new Time();

        T3 = T3.addTime(T1, T2);

        System.out.print("After adding times, ");

        T3.printTime();

    }

}

**Output:**

A computer screen with white text

AI-generated content may be incorrect.

Q6) Define Class named Point which represents 2-D Point, i.e P (x, y). Define Default constructor to initialize both data member value 5, Parameterized constructor to initialize member according to value supplied by user and Copy Constructor. Define Necessary Function and Write a program to test class Point.

Ans:

**Program:**

// exp 6

public class Point {

    int x;

    int y;

    Point(){

        x = 5;

        y = 5;

    }

    Point(int x,int y){

        this.x = x;

        this.y = y;

    }

    Point(Point p){

        this.x = p.x;

        this.y = p.y;

    }

    public void display(){

        System.out.println("Point is: (" + this.x + "," + this.y + ")");

    }

    public static void main(String[] args) {

        Point p1 = new Point();

        Point p2 = new Point(4,5);

        Point p3 = new Point(p2);

        p1.display();

        p2.display();

        p3.display();

    }

}

**Output:**

A computer screen with white text

AI-generated content may be incorrect.

Q7) Create a class Account. It has three data member account id, name and balance. Define function to assign value and display value. Define function that search account number given by the user. If account number exists, print detail of that account. Write a program using array of object. Declare at least 5 account and print details.

Ans:

**Program:**

import java.util.Scanner;

// exp 7

public class Account {

    private String accountNo;

    private String name;

    private double balance;

    Account(String accountNo,String name,double balance){

        this.accountNo = accountNo;

        this.name = name;

        this.balance = balance;

    }

    public  void displayData(){

        System.out.println("Account number: " + this.accountNo);

        System.out.println("Name of account holder: " + this.name);

        System.out.println("Bank balance: " + this.balance);

    }

    public String getAccountNo(){

        return this.accountNo;

    }

    public static void searchAccount(String inputAccNo, Account[] acc){

        int n = acc.length;

        for(int i=0;i<n;i++){

            if(inputAccNo.equals(acc[i].getAccountNo())){

                acc[i].displayData();

                return;

            }

        }

        System.out.println("Account not found");

    }

    public static void main(String[] args) {

        Account acc1 = new Account("1","AAA",1000);

        Account acc2 = new Account("2","BBB",1000);

        Account acc3 = new Account("3","CCC",1000);

        Account acc4 = new Account("4","DDD",1000);

        Account acc5 = new Account("5","EEE",1000);

        Scanner sc = new Scanner(System.in);

        Account[] arr = {acc1,acc2,acc3,acc4,acc5};

        System.out.print("Enter account number to search: ");

        String inputAccNo = sc.next();

        searchAccount(inputAccNo, arr);

        sc.close();

    }

}

**Output:**

A computer screen shot of white text

AI-generated content may be incorrect.