Program: 1

```
/*Observe the interactions involved in the process of booking a railway ticket. Identify the various
objects involved and the interactions between the objects in order to solve a problem of booking a
railway ticket.*/
//Date :- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name: Railway_Main

import java.io.*;//This package is used for the user to accept the input.
import java.util.Calendar;// This package is used for the current date to print on the screen.
import java.text.SimpleDateFormat;// This package is used for the specific date format for the
date.

class Railway//varous Railway Details
{
        int p_id,t_amt,t_seat,total,ch;
        //p_id for the store passenger_id.
        //t_amt for the store total amount of the seat.
        //t_seat for the store total seat of the passenger has booked.
        //total for the store all t_amt * t_seat .
        //ch for the choice when the user is continue or not.
        String p_nm,p_src,p_dest;
        //p_nm for the store passenger name.
        //p_src for the store passenger source station.
        // p_dest for the store passenger destination station.
        Railway()//Constructor
        {
                p_id=0;
                t_amt=0;
                t_seat=0;
                total=0;
        }
        void accept()throws Exception//It is for input from the user to enter the passenger details.
        {
                System.out.println("====================================");
                System.out.println("======ENTER PASSENGER DETAILS======");
                System.out.println("====================================");
                do
                {
                System.out.print("Enter the Passenger Id :=");
                DataInputStream in=new DataInputStream(System.in);
                p_id=Integer.parseInt(in.readLine());
                System.out.print("Enter the Passenger Name :=");
                p_nm=in.readLine();
                System.out.print("Enter the Passenger Source Station :=");
```

```
                    p_src=in.readLine();
                    System.out.print("Enter the Passenger Destination Station :=");
                    p_dest=in.readLine();
                    System.out.print("Enter the Passenger Total Seat :=");
                    t_seat=Integer.parseInt(in.readLine());
                    System.out.print("Enter the One Seat Amount :=");
                    t_amt=Integer.parseInt(in.readLine());
                    calculate();
                    display();
                    System.out.println("=====================================");
                    System.out.print("Do U Want To Continue............[1(For Y) Or 0( For N)] :  ");
                    ch=Integer.parseInt(in.readLine());
                    System.out.println("=====================================");
                    }
                    while(ch==1);
                    System.out.println("=====================================");
          }
          void calculate()//Calculate Total Number of the seats entered by the user.
          {
                    total=(t_seat*t_amt);
          }
          void display()//It is to display from the user to enter the passenger details.
          {
                    System.out.println();
                    System.out.println("=====================================");
                    System.out.println("======DISPLAY PASSENGER DETAILS======");
                    System.out.println("=====================================");

                    Calendar currentDate = Calendar.getInstance();
                    SimpleDateFormat formatter= new SimpleDateFormat("yyyy/MMM/dd");
                    String dateNow = formatter.format(currentDate.getTime());
                    System.out.println("DATE :=>  " + dateNow);

                    System.out.println("Passenger Id is:= " + p_id);
                    System.out.println("Passenger Name is:= " + p_nm);
                    System.out.println("Passenger Source Station is:= " + p_src);
                    System.out.println("Passenger Destination Station is:=" + p_dest);
                    System.out.println("Passenger Total Seat is:= " + t_seat);
                    System.out.println("Passenger One Seat Amount is:= " + t_amt);
                    System.out.println("Passenger Total Amount is:= " + total);
                    System.out.println("=====================================");
          }
}
class Railway_Main// This is the Main funcation class
{
    public static void main(String a[])throws Exception
    {
        Railway r=new Railway();
        r.accept();
    }
}
```

Program: =2

```
/*Write a simple java application to print a pyramid with 5 lines.The first line has one character,
2nd line has two characters and so on.The character to be used in the pyramid is taken as a
command line argument*/
//Date:- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name: Pyramid_Run

class Pyramid_Run
{
    public static void main(String a[])
    {
        for(int i=1;i<=5;i++)        {
            for(int j=1;j<=i;j++)
            {
                System.out.print(a[0]);// it will take the first argument as command Line.
            }
            System.out.println();
        }
    }
}
```

Program: =3

```
/*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.*/
//Date:- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name:Command_line

class Command_line
{
    public static void main(String a[])
    {
```

```
                String str[]={"First","Second","Third","Four","Five","Six","Seven","Eight","Nine","Ten"};
                for(int i=0;i<a.length;i++)//This loop is continue from 0 to the length of the user entered at run time.
                {
                        System.out.println(str[i]+" Student Name is = "+a[i]);
                }
        }
}
```

Program: =4

```
/* Write a class, with main method, which declares floating point variables and observe the output of dividing the floating point values by a 0, also observe the effect of assigning a high integer value (8 digits and above) to a float and casting it back to int and printing.*/
//Date:- 06-Aug-2008
//Author:Mayur Vyas
//Main Class Name: Floating_Point

class Floating_Point
{
  public static void main(String args[])
  {
    float f=123.45f;
    int i;
    System.out.println("Float Value: " + f);
    System.out.println("Float Value divide By 0: " + f/0);
    f=12345678;
    System.out.println("Int Value in Float Variable: " + f);
    i=(int)f;//This  is the type Casting from int to Float.
    System.out.println("Float Value in Int Variable: " + i);
  }
}
```

Program: =5

```
/*Write a class called Statistics, which has a static method called average, which takes a one-dimensional array for double type, as parameter, and prints the average for the values in the array. Now write a class with the main method, which creates a two-dimensional array for the four weeks of a month, containing minimum temperatures for the days of the week(an array of 4 by 7), and uses the average method of the Statistics class to compute and print the average temperatues for the four weeks. */
//Date:- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name:Statistics_Main

import java.io.BufferedReader;
import java.io.InputStreamReader;//This package is used for the input the data at runtime.
import java.io.IOException;//This package is used for the exception purpose.
```

```
    class Statistics//This class contains the details of all the statics related method like average().
    {
      public static void average(double d[])//This is the static Method of Class Stastics
      {
        double avg=0,month_avg=0;
        int i;
        for(i=0;i<7;i++)
         {
           avg = avg + d[i];
         }
         System.out.println("Average Tempreture = " + avg/7);
         month_avg+=avg/4;
         System.out.println("Average Tempreture = " + month_avg);
      }
    }
    class Statistics_Main extends Statistics//This is the Inherits from the Stastics class
    {
      public static void main(String args[])
      {
         BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
         double tempr[][]=new double[4][7];//Declaration of an 2D array to store the row , column
wise details of the
                                          temperature.
         double wk[]=new double[7]; //Declaration of an 1D array to store the details of the weeks.
         int i,j;
         String s;
         try{
           for(i=0;i<4;i++)
           {
             for(j=0;j<7;j++)
             {
               System.out.println("Enter the tempreture of " + (i+1) +" Week " + (j+1) +" Day");
               s=br.readLine();
               tempr[i][j]=Double.parseDouble(s);
             }
           }
          }
         catch(IOException e)//If any exception occur at runtime then this block is executed.
         {
           System.out.printf("Error occur while Reading from Console");
         }
         for(i=0;i<4;i++)
         {
           for(j=0;j<7;j++)
             wk[j]=tempr[i][j];
           switch(i)//Switch case technique is used.
           {
           case 0:
             System.out.printf("First Week: ");
             average(wk);
             break;
           case 1:
             System.out.printf("Second Week: ");
             average(wk);
             break;
           case 2:
             System.out.printf("Third Week: ");
             average(wk);
              break;
           case 3:
             System.out.printf("Fourth Week: ");
             average(wk);
           }
         }
      }
   }
```

Program: =6

```
/*
Define a class called Product, each product has a name, a product code and manufacturer name.
Define variables, methods and constructors, for the Product class. Write a class called Test
Product, with the main method to test the methods and constructors of the Product class.
*/
//Date:- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name:TestProduct_Main

import java.io.BufferedReader;
import java.io.InputStreamReader; //This package is used for the input the data at runtime.
import java.io.IOException;//This package is used for the exception purpose.

class TestProduct//This class contains default constructor,constructore with argument,getDeail(),Display().
{
   int Pid,ch;
   String Pname,Mname;
   BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
   public TestProduct()//Default constructor.
   {
      this.Pid = 0;
      this.Pname = null;
```

```
       this.Mname = null;
    }
    public TestProduct(int i,String s1,String s2) //Constructor with two argument.
    {
       this.Pid = i;
       this.Pname = s1;
       this.Mname = s2;
    }
    public void getDetail() throws IOException
    {
       String t;
        do
      {
       System.out.println("----------------------------------------------");
       System.out.printf("Enter Product ID: ");
       t = br.readLine();
       System.out.println("----------------------------------------------");
       this.Pid=Integer.parseInt(t);
       System.out.printf("Enter Product Name: ");
       this.Pname = br.readLine();
       System.out.println("----------------------------------------------");
       System.out.printf("Enter Manufacturer Name: ");
       this.Mname = br.readLine();
       System.out.println("----------------------------------------------");
       Display();
       System.out.println("=================================================");
       System.out.print("Do U Want To Continue............[1(For Y) Or 0( For N)] :  ");
       ch=Integer.parseInt(br.readLine());
       System.out.println("=================================================");
       }
      while(ch==1);
       System.out.println("=================================================");

    }
    public void Display()
    {
       System.out.println("----------------------------------------------");
       System.out.println("----------------------------------------------");
       System.out.println("----------DISPLAY THE PRODUCT DETAILS-----------");
       System.out.println("----------------------------------------------");
       System.out.println("----------------------------------------------\n");
       System.out.println("----------------------------------------------");
       System.out.println("Product ID: " + this.Pid);
       System.out.println("Product Name: " + this.Pname);
       System.out.println("Manufacturer Name: " + this.Mname);
       System.out.println("---------------------------------------------");
    }
 }
 class Product_Main extends TestProduct
 {
    public static void main(String args[])
    {
       TestProduct p = new TestProduct();
       try{
          p.getDetail();
       }
       catch(IOException e)//If any exception occur at run time then this block is executed.
       {
          System.out.println("Error occured while Reading from console");
       }
       p.Display();
    }
 }
```

Program: =7

```
/*
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
*/
//Date:- 06-Aug-2008
//Author: Mayur Vyas
//Main Class Name: CartesianPoint_Main

import java.io.BufferedReader;
import java.io.InputStreamReader; //This package is used for the input the data at runtime.
import java.io.IOException;//This package is used for the exception purpose.

class TestCartesianPoint//This class contains the Constructor with one argument,Constructor with
two
                                    argument,getX(),getY().
{
   private int x,y;
   public TestCartesianPoint(int a)//Constructor with one argument.
   {
      x=y=a;
```

```
    }
    public TestCartesianPoint(int a,int b) //Constructor with two arguments.
    {
        x=a;
        y=b;
    }
    public int getX()
    {
        return x;
    }
    public int getY()
    {
        return y;
    }
    public void move(int a,int b)//Move() method has two argument.
    {
        x=a;
        y=b;
    }
    public void move(int a) //Move() method has one argument (overloading).
    {
        x=y=a;
    }
    public void Display()
    {
        System.out.printf("(" + x + "," + y + ")");
    }
}

class CartesianPoint_Main
{
    public static void main(String args[])
    {
        BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
        TestCartesianPoint c=new TestCartesianPoint(10,20);
        int ch=5,a=0,b=0;
        do
        {
            do
            {
                System.out.println("\n1. Get value of X");
                System.out.println("2. Get value of Y");
                System.out.println("3. Change value of X and Y");
                System.out.println("4. Display the Point");
                System.out.println("5. Exit");
                System.out.println("Enter Your Chopice: ");
                try {
                    ch = Integer.parseInt(br.readLine());
                    }
                catch(IOException e) //If any exception occur at run time then this block is executed.
                {
                    System.out.println("Error occurs while taking Input");
                }
            }while(ch<1 || ch>5);
            switch(ch)//Switch technique is used.
            {
            case 1:
                System.out.println("Value of X is " + c.getX());
                break;
            case 2:
                System.out.println("Value of Y is " + c.getY());
                break;
            case 3:
                System.out.println("Enter 2 Points");
                try {
                    a = Integer.parseInt(br.readLine());
                    b = Integer.parseInt(br.readLine());
                    }
                catch(IOException e)
                {
                    System.out.println("Error occurs while taking Input");
                    break;
                }
                if(a == b)
                    c.move(a);
                else
                    c.move(a,b);
                System.out.println("Value of X and Y Point is changed...");
                break;
            case 4:
                System.out.printf("Point is ");
                c.Display();
            }
        }while(ch != 5);
    }
}
```

Program: 8

Write a program to find the average of n numbers.

```
import java.io.*;
class Average
{
        public static void main(String args[])throws Exception
        {
                int n,sum=0;
                float avg=0.0f;
                System.out.print("Enter the Limit :=");
                DataInputStream in=new DataInputStream(System.in);
                n=Integer.parseInt(in.readLine());
                int a[]=new int[n];
                for(int i=0;i<n;i++)
                {
                        System.out.print("The index is "+i+": = ");
                        a[i]=Integer.parseInt(in.readLine());
                        sum+=a[i];
                }
                avg=(sum/n);
                System.out.println("The Total sum is = " + sum);
                System.out.println("The Total number is = " + n);
                System.out.println("The Average of total sum is = " + avg);
        }
}
```

Program: 9

Write a program to check the entered no is palindrome or not.

```
import java.io.*;
class Palindrome
{
        public static void main(String args[])throws Exception
        {
                int n,m,rem=0,rev=0;
                System.out.print("Enter the Limit :=");
                DataInputStream in=new DataInputStream(System.in);
                n=Integer.parseInt(in.readLine());
                m=n;
                while(n>0)
                {
                        rem=n%10;
```

```
                    rev=(rev*10)+rem;
                    n=n/10;
                }
                if(m==rev)
                {
                    System.out.println(m +" No is palindrome");
                }
                else
                {
                    System.out.println(m+" No is not palindrome");
                }
        }
}
```

Program: 10

Write a program to sort n number in ascending and descending order based on the option .

```
import java.io.*;
class Sorting
{
        public static void main(String args[])throws Exception
        {
                int n,temp=0,ch=0,j=0,k=0,l=0;
                System.out.print("Enter the Limit :=");
                DataInputStream in=new DataInputStream(System.in);
                n=Integer.parseInt(in.readLine());
                int a[]=new int[n];

                for(int i=0;i<n;i++)
                {
                    System.out.print("The index is "+i+": = ");
                    a[i]=Integer.parseInt(in.readLine());
                }
                while(true)
                {
                    System.out.println("Enter the Choice...........");
                    System.out.print("0. For Ascending : \n1. For Descending : \nOther Than 0 &
1 For Exit : );
                    ch=Integer.parseInt(in.readLine());

                if(ch==0)
                {
                    for(j=0;j<n;j++)
                    {
                        for(k=j;k<n;k++)
                        {
                            if(a[j]>a[k])
                            {
                                temp=a[j];
                                a[j]=a[k];
                                a[k]=temp;
                            }
                        }
                    }
                    System.out.println("==========================================");
                    System.out.println("======DISPLAY IN ASCENDING ORDER==========");
                    System.out.println("==========================================");
                    for(l=0;l<n;l++)
                    {
                        System.out.println(a[l] + " ");
                    }
                }
                else if(ch==1)
                {
                    for(j=0;j<n;j++)
                    {
                        for(k=j;k<n;k++)
                        {
                            if(a[j]<a[k])
                            {
                                temp=a[j];
                                a[j]=a[k];
                                a[k]=temp;
                            }
                        }
                    }
                    System.out.println("==========================================");
                    System.out.println("======DISPLAY IN DESCENDING ORDER=========");
                    System.out.println("==========================================");
                    for(l=0;l<n;l++)
                    {
                        System.out.println(a[l] + " ");
                    }
                }
                else
                {
                    break;
                }
            }
        }
```

```
}
```

Program: 11

Write a program to merge two arrays of n numbers.

```
import java.io.*;
class Merge
{
        static void sort(int a[],int n)
        {
                int i,j,temp;
                for(i=0;i<n;i++)
                {
                        for(j=i+1;j<n;j++)
                        {
                                if(a[i]>a[j])
                                {
                                    temp=a[i];
                                    a[i]=a[j];
                                    a[j]=temp;
                                }
                        }
                 }
        }
        public static void main(String args[])throws Exception
        {
                int temp=0,n,n1,i,j,k,l;
                DataInputStream in=new DataInputStream(System.in);
                System.out.print("Enter the 1st Limit :=");
                n=Integer.parseInt(in.readLine());
                System.out.println("Enter 1 array data");
                int a[]=new int[n];
                for(i=0;i<n;i++)
                {
                        System.out.print("The index is "+i+": = ");
                        a[i]=Integer.parseInt(in.readLine());
                }
                Merge.sort(a,n);
                System.out.print("Enter the 2 Limit :=");
                n1=Integer.parseInt(in.readLine());
                System.out.println("Enter 2 array data");
                int b[]=new int[n1];
                for(i=0;i<n1;i++)
                {
```

```
                System.out.print("The index is "+i+": = ");
                b[i]=Integer.parseInt(in.readLine());
        }
        Merge.sort(b,n1);
        int c[]=new int[n+n1];
        i=0;
        j=0;
        k=0;
        while((i<n)&&(j<n1))
        {
                if(a[i]<b[j])
                {
                        c[k]=a[i];
                        i++;
                        k++;
                }
                else if(a[i]>b[j])
                {
                        c[k]=b[j];
                        j++;
                        k++;
                }
                else
                {
                        c[k]=a[i];
                        i++;
                        j++;
                        k++;
                }
        }
        if(i<n)
        {
                for(l=i;l<n;l++)
                {
                        c[k]=a[i];
                        i++;
                        k++;
                }
        }
        else if(j<n1)
        {
                for(l=j;l<n1;l++)
                {
                        c[k]=b[j];
                        j++;
                k++;
            }
        }
        System.out.println("==========================================");
        System.out.println("======DISPLAY IN ASCENDING ORDER==========");
        System.out.println("==========================================");
        for(i=0;i<k;i++)
        {
            System.out.println("The index is "+ i +" :=" +c[i] + " ");
        }
    }
}
```

Program: 12

Write a program to remove a duplicate number from an array which is n numbers array.

```
import java.io.*;
class DuplicateIndex
{
    public static void main(String args[])throws Exception
    {
        int n,flag=0,i=0,j=0,k=0;
        DataInputStream in=new DataInputStream(System.in);
        System.out.println("==========================================");
        System.out.print("Enter the Limit :=");
        n=Integer.parseInt(in.readLine());
        System.out.println("==========================================");
        int a[]=new int[n];
        for(i=0;i<n;i++)
        {
            System.out.print("The index is "+ i +": = ");
            a[i]=Integer.parseInt(in.readLine());

        }
        System.out.println("==========================================");
        System.out.println("===============DISPLAY DATA===============");
        System.out.println("==========================================");
        for(i=0;i<n;i++)
        {
            if(i!=0)
            {
                for(j=0;j<k;j++)
                {
                    if(a[i]==a[j])
                    {
                        flag=1;
                        break;
                    }
                }
                if(flag==0)
                {
                    System.out.println(a[i] + " ");
                }
                k++;
                flag=0;
            }
            else
            {
                System.out.println(a[i] + " ");
                k++;
            }
        }
        System.out.println("==============================================");

    }
}
```

<u>Program: 13</u>
Find sum of all the elements of matrix using Java

```
import java.io.*;
class Matrix_Sum
{
    public static void main(String... args)throws Exception
    {
        int n,row,col=0,i=0,j=0,sum=0;
        DataInputStream in=new DataInputStream(System.in);
        System.out.print("Enter the Row Limit :=");
        row=Integer.parseInt(in.readLine());
        System.out.print("Enter the Column Limit :=");
        col=Integer.parseInt(in.readLine());
        int a[][]=new int[row][col];
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                System.out.print("The index is ["+ i +"] [ " + j + "]:= ");
                a[i][j]=Integer.parseInt(in.readLine());
                sum+=a[i][j];
            }
				}
				System.out.println("==========================================");
				System.out.println("===============DISPLAY DATA===============");
				System.out.println("==========================================");
				for(i=0;i<row;i++)
				{
					for(j=0;j<col;j++)
					{
						System.out.print(a[i][j] +"\t");
					}
					System.out.println();
				}
				System.out.println("==========================================");
				System.out.println("The sum of all elements of matrix is = "+sum);
				System.out.println("==========================================");
		}
}
```

Program: 14

Define a Student class (roll number, name, percentage). Define a default and parameterized constructor. Override the toString method. Keep a count objects created. Create objects using parameterized constructor and display the object count after each object is created. (Use static member and method). Also display the contents of each object.

```
import java.io.*;

class Student
{
		static int count=0;
		int rno;
		String name;
		float per;
		Student()
		{
				rno=0;
				name=null;
				per=0.0f;
		}
		static void getcount()
		{
				System.out.println("==========================================");
				System.out.println("Object Counter is = "+count);
				System.out.println("==========================================");
		}
```

```
	void display()
	{
		System.out.println("==========================================");
		System.out.println("===========DISPLAY STUDENT DATA===========");
		System.out.println("==========================================");
		System.out.println("Student Roll no = "+rno);
		System.out.println("Student Name = "+name);
		System.out.println("Student Percentage = "+per);
	}
	public String toString()
	{
		display();
		return "";
	}
	Student(int num)throws Exception
	{
		count++;
		rno=num;
		DataInputStream in=new DataInputStream(System.in);
		System.out.print("Enter the Student Name :=");
		name=in.readLine();
		System.out.print("Enter the Student Percentage :=");
		per=Float.parseFloat(in.readLine());
		//this(num,nm,per);
	}
}
class Student_Main extends Student
{
	public static void main(String... args)throws Exception
	{
		int no=0,ch=0;
		while(ch==0)
		{
			DataInputStream in=new DataInputStream(System.in);
			System.out.print("Enter the Student Rollno :=");
			no=Integer.parseInt(in.readLine());
			Student s=new Student(no);
			s.toString();
			s.getcount();
			System.out.println("==========================================");
			System.out.println("Press 0 for continue \nPress 1 for exit");
			System.out.print("Enter the Choice...........");
			ch=Integer.parseInt(in.readLine());
			System.out.println("==========================================");
		}
```

```
        }
}
```

Program: 15

Write a java program to create n objects of the Student class. Assign roll numbers in the ascending order. Accept name and percentage from the user for each object. Define a static method “sortStudent” which sorts the array on the basis of percentage.

```
import java.io.*;
class StudentAuto
{
        static int auto_rollno=1;
        int rno[]=new int[10];
        float s_per[]=new float[10];
        String s_name[]=new String[10];
        static int Autoid()
        {
                return auto_rollno++;
        }
        void sortStudent(float per[],int n)
        {
                int i,j,temp1;
                float temp;
                String temp2;
                for(i=0;i<n-1;i++)
                {
                        for(j=i+1;j<n-1;j++)
                        {
                                if(per[i]>per[j])
                                {
                                        temp=s_per[i];
                                        s_per[i]=s_per[j];
                                        s_per[j]=temp;

                                        temp1=rno[i];
                                        rno[i]=rno[j];
                                        rno[j]=temp1;

                                        temp2=s_name[i];
                                        s_name[i]=s_name[j];
                                        s_name[j]=temp2;

                                }
                        }
                 }
        }
}
class StudentAutoMain extends StudentAuto
{
        public static void main(String... args)throws Exception
        {
                int no=0,ch=0,i=0;
                StudentAuto s=new StudentAuto();
                while(ch==0)
                {
                        System.out.println("==========================================");
                        System.out.println("======INSERT THE STUDENT RECORD==========");
                        System.out.println("==========================================");
                        s.rno[i]=s.Autoid();
                        System.out.print("The Student rollno :="+s.rno[i]);
                        System.out.println();
                        DataInputStream in=new DataInputStream(System.in);
                        System.out.print("Enter the Student name :=");
                        s.s_name[i]=in.readLine();
                        System.out.print("Enter the Student percentage :=");
                        s.s_per[i]=Float.parseFloat(in.readLine());
                        i++;
                        System.out.println("==========================================");
                        System.out.println("Press 0 for continue \nPress 1 for exit");
                        System.out.print("Enter the Choice...........");
                        ch=Integer.parseInt(in.readLine());
                        System.out.println("==========================================");
                }
                s.sortStudent(s.s_per,s.auto_rollno);
                System.out.println("==========================================");
                System.out.println("==DISPLAY STUDENT RECORD ASCENDING ORDER==");
                System.out.println("==========================================");
                for(int j=0;j<i;j++)
                {
                        System.out.println("Student id :="+s.rno[j]);
                        System.out.println("Student name :="+s.s_name[j]);
                        System.out.println("Student percentage :="+s.s_per[j]);
                        System.out.println("==========================================");
                }

        }
}
```

Program: 16

Define a class Employee having private members – id, name, department, salary. Define default and parameterized constructors. Create a subclass called "Manager" with private member bonus. Define methods accept and display in both the classes. Create n objects of the Manager class and display the details of the manager having the maximum total salary (salary+bonus)

```
import java.io.*;
class Employee
{
	static int auto_id=2;
	int i=0;
	int j=0;
	protected int eid[]=new int[10];
	protected String ename[]=new String[20];
	protected String edept[]=new String[20];
	protected float esalary[]=new float[10];
	static int Autoid()
	{
		return auto_id++;
	}
	Employee()
	{

	}
	Employee(int num)throws Exception
	{
		eid[0]=num;
	}
	void Accept()throws Exception
	{
		int ch=0;
		while(ch==0)
		{
			DataInputStream in=new DataInputStream(System.in);
			if(j!=0)
			{
				eid[i]=Autoid();
				System.out.println("Enter the Employee id := "+eid[i]);
			}
			System.out.print("Enter the Employee Name :=");
			ename[i]=in.readLine();
			System.out.print("Enter the Employee Department :=");
			edept[i]=in.readLine();
			System.out.print("Enter the Employee Salary :=");
			esalary[i]=Float.parseFloat(in.readLine());
```

```
                    i++;
                    j++;
                    System.out.println("==========================================");
                    System.out.println("Press 0 for continue \nPress 1 for exit");
                    System.out.print("Enter the Choice...........");
                    ch=Integer.parseInt(in.readLine());
                    System.out.println("==========================================");
            }
            MaxEmpSal(esalary,auto_id);
        }
        void Display()
        {
            System.out.println("==========================================");
            System.out.println("===========DISPLAY EMPLOYEE DATA===========");
            System.out.println("==========================================");
            for(int j=0;j<i;j++)
            {
                    System.out.println("Employee Id = "+eid[j]);
                    System.out.println("Employee Name = "+ename[j]);
                    System.out.println("Employee Department = "+edept[j]);
                    System.out.println("Employee Salary = "+esalary[j]);
                    System.out.println("==========================================");
            }
        }
        void MaxEmpSal(float esalary[],int n)
        {
            float max=0.0f;
            max=esalary[0];
            for(int i=0;i<n;i++)
            {
                    if(max<esalary[i])
                    {
                            max=esalary[i];
                    }
            }
            System.out.println("==========================================");
            System.out.println("Maximum Salary of the employee/manager : "+max);

            System.out.println("==========================================");
        }
}
class Manager extends Employee
{
        static int auto_id=1;
        private float ebonus[]=new float[10];
        private float etotal[]=new float[10];
        int i=0;
        Manager()
        {

        }
        static int Autoid()
        {
            return auto_id++;
        }
        void Accept()throws Exception
        {
            DataInputStream in=new DataInputStream(System.in);
            int ch=0;
            while(ch==0)
            {
                    eid[i]=Autoid();
                    System.out.println("Enter the Manager id := "+eid[i]);
                    System.out.print("Enter the Manager Name :=");
                    ename[i]=in.readLine();
                    System.out.print("Enter the Manager Department :=");
                    edept[i]=in.readLine();
                    System.out.print("Enter the Manager Salary :=");
                    esalary[i]=Float.parseFloat(in.readLine());
                    System.out.print("Enter the Manager Bonus :=");
                    ebonus[i]=Float.parseFloat(in.readLine());
                    etotal[i]=esalary[i]+ebonus[i];
                    i++;
                    System.out.println("===========================================");
                    System.out.println("Press 0 for continue \nPress 1 for exit");
                    System.out.print("Enter the Choice...........");
                    ch=Integer.parseInt(in.readLine());
                    System.out.println("===========================================");
            }
            MaxEmpSal(etotal,auto_id);
        }
        void Display()
        {
            System.out.println("==========================================");
            System.out.println("===========DISPLAY MANAGER DATA===========");
            System.out.println("==========================================");
            for(int j=0;j<i;j++)
            {
                    System.out.println("Employee Id = "+eid[j]);
                    System.out.println("Employee Name = "+ename[j]);
```

```
            System.out.println("Employee Bonus = "+ebonus[j]);
            System.out.println("Employee Total Salary = "+etotal[j]);
            System.out.println("==========================================");
        }
    }
}
class EmployeeMain
{
    public static void main(String... args)throws Exception
    {
        int empid,ch=0,ch1=0;
        Employee e;
        DataInputStream in=new DataInputStream(System.in);
        do
        {
            System.out.println("==========================================");
            System.out.println("1. Employee");
            System.out.println("==========================================");
            System.out.println("2. Manager");
            System.out.println("==========================================");
            System.out.println("3. Exit");
            System.out.println("==========================================");
            System.out.print("Enter the Choice...........");
            ch1=Integer.parseInt(in.readLine());
            if(ch1==1)
            {

    System.out.println("==========================================");
                System.out.println("===========ENTER                    EMPLOYEE
DATA===========");

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

                System.out.print("Enter the Employee id :=");
                empid=Integer.parseInt(in.readLine());
                e=new Employee(empid);
                e.Accept();
                e.Display();

    System.out.println("==========================================");
            }
            else if(ch1==2)
            {
                e=new Manager();
                e.Accept();
```

```
                                e.Display();
                        }
                        else if(ch1==3)
                        {
                                break;
                        }
                        System.out.println("=============================================");
                        System.out.println("Press 0 for continue \nPress 1 for exit");
                        System.out.print("Enter the Choice...........");
                        ch=Integer.parseInt(in.readLine());
                        System.out.println("=============================================");
                }
                while(ch==0);
        }
}
```

Program: 17

Define an interface “IntOperations” with methods to check whether an integer is positive, negative, even, odd, prime and operations like factorial and sum of digits. Define a class MyNumber having one private int data member. Write a default constructor to initialize it to 0 and another constructor to initialize it to a value passed from main function. Implement the above interface. Create an object in main. Useoperations using a menu.

```
import java.io.*;
interface IntOperations
{
        void PosNeg();
        void Prime();
        void EvenOdd();
        void Factorial();
        void Sod();
}
class MyNumber implements IntOperations
{
        private int no;
        int i=0;
        MyNumber()
        {
                no=0;
        }
        MyNumber(int num)
        {
                no=num;
        }
        public void PosNeg()
```

```
	{
		System.out.println("==============================================");
		if(no<0)
		{
			System.out.println(no+" No is negative");
		}
		else if(no>0)
		{
			System.out.println(no+" No is positive");
		}
		else
		{
			System.out.println(no+" No is positive");
		}
		System.out.println("==============================================");

	}
	public void Prime()
	{
		int flag=0;
		for(i=2;i<no;i++)
		{
			if(no%i==0)
			{
				flag=1;
			}
		}
		System.out.println("==============================================");

		if(flag==1)
		{
			System.out.println(no+" No is not prime");
		}
		else
		{
			System.out.println(no+" No is prime");
		}
		System.out.println("==============================================");

	}
	public void EvenOdd()
	{
		System.out.println("==============================================");

		if(no%2==0)
```

```
				{
					System.out.println(no+" No is even");
				}
				else
				{
					System.out.println(no+" No is odd");
				}
				System.out.println("===============================================");

		}
		public void Factorial()
		{
				int fact=1;
				for(i=1;i<=no;i++)
				{
					fact=fact*i;
				}
				System.out.println("===============================================");

				System.out.println("Factorial of "+ no +" is = "+fact);
				System.out.println("===============================================");

		}
		public void Sod()
		{
				int sum=0,rem=0,n=0;
				while(no>0)
				{
					rem=no%10;
					sum=sum+rem;
					no=no/10;
				}
				System.out.println("===============================================");

				System.out.println("Sum of  digits = "+sum);
				System.out.println("===============================================");


		}

	}
	class Operation
	{
		public static void main(String... args)throws Exception
		{
```

```
DataInputStream in=new DataInputStream(System.in);
int no1,ch,ch1;
MyNumber m;
System.out.print("Enter the Number :=");
no1=Integer.parseInt(in.readLine());
m=new MyNumber(no1);
do
{
System.out.println("===============================================");
System.out.println("1. Odd/Even");
System.out.println("===============================================");
System.out.println("2. Prime/NotPrime");
System.out.println("===============================================");
System.out.println("3. Positive/Negative");
System.out.println("===============================================");
System.out.println("4. Factorial");
System.out.println("===============================================");
System.out.println("5. Sum of digits");
System.out.println("===============================================");
System.out.println("6. Exit");
System.out.println("===============================================");
System.out.print("Enter the Choice :=");
ch=Integer.parseInt(in.readLine());
/*void PosNeg();
void Prime();
void EvenOdd();
void Factorial();
void Sod();*/
if(ch==1)
{
        m.EvenOdd();
}
else if(ch==2)
{
        m.Prime();
}
else if(ch==3)
{
       m.PosNeg();
}
else if(ch==4)
{
        m.Factorial();
}
else if(ch==5)
```

```
        {
            m.Sod();
        }
        else if(ch==6)
        {
            break;
        }
        System.out.println("==========================================");
        System.out.println("Press 0 for continue \nPress 1 for exit");
        System.out.print("Enter the Choice...........");
        ch1=Integer.parseInt(in.readLine());
        System.out.println("==========================================");
        }
        while(ch1==0);

    }
}
```

<u>Program: 18</u>

Develop a Java Application as one of the archetypal example of encapsulation: the stack. A stack stores data using first-in, last-out ordering. That is, a stack is like a stack of plates on a table—the first plate put down on the table is the last plate to be used. Stacks are controlled through two operations traditionally called push and pop. To put an item on top of the stack, you will use push. To take an item off the stack, you will use pop.

```
import java.io.*;
class Stack
{
    private int tos;
    private int stk[];

    Stack(int size)
    {
        tos=-1;
        stk=new int[size];
    }

    void push(int item)
    {
        if(tos==stk.length-1)
            System.out.println("Stack is Full");
        else
        {
            stk[++tos]=item;
            System.out.println(stk[tos]);
```

```
                }
        }

        int pop()
        {
                if(tos<0)
                {
                        System.out.println("Stack Underflow");
                        return 0;
                }
                else
                        return stk[tos--];
        }

        void display()
        {
                System.out.println("==================");
                System.out.println("Display Stack Item");
                System.out.println("==================");
                for(int i=0;i<=tos;i++)
                {
                        System.out.println(" " + stk[i] + " ");
                }

        }

}

class StackDemo
{
        public static void main(String[] args)throws Exception
        {
                int ch,ch1,length,data;
                Stack s1;
                DataInputStream in=new DataInputStream(System.in);

                System.out.println("Enter Length For Stack: ");
                length=Integer.parseInt(in.readLine());
                s1 = new Stack(length);

                do
                {

                        System.out.println("==================");
                        System.out.println("1. PUSH");
```

```
                    System.out.println("2. POP");
                    System.out.println("3. Display");
                    System.out.println("4. Exit");
                    System.out.println("=================");
                    System.out.print("Enter Choice: ");
                    ch=Integer.parseInt(in.readLine());

                    switch(ch)
                    {
                        case 1:
                            System.out.println("Enter Element: ");
                            data=Integer.parseInt(in.readLine());
                            s1.push(data);
                            break;

                        case 2:
                            System.out.println("\nData Popped is : " + s1.pop());
                            break;

                        case 3:
                            s1.display();
                            break;

                        case 4:
                            System.exit(0);
                    }
                    System.out.println(" Press 1 ( For Continue) / Press Other than 1 (for Break)
:= ");
                    ch1=Integer.parseInt(in.readLine());
                }
                while(ch1==1);

        }
}
```

Program: 19

Develop a code to compute the factorial of a number(any whole numbers between 1 and N) using recursive Java programming.

```
import java.io.*;
class Recursive
{
        int f=0;
        int fact(int no)
        {
                if(no==0)
                        return 1;
                else
                {
                        f=no*fact(no-1);
                        return f;
                }

        }
}
class Factorial
{

        public static void main(String... a) throws Exception
        {
                int no;
                Recursive r=new Recursive();
                DataInputStream in=new DataInputStream(System.in);
                System.out.print("Enter the Number :=");
                no=Integer.parseInt(in.readLine());
                int ans=r.fact(no);
                System.out.print("Factorial of " + no + " Number is :=" + ans );

        }


}
```

Program: 20

Write a Java program demonstrates the difference between public and private access specifiers.

```
import java.io.*;
class PublicPrivate
{
        public int i;
        private int j;

        PublicPrivate(int n1)
        {
                j=n1;
        }
        void display()
        {
                System.out.println("Private No Vlaue is :" +j);
                System.out.println("Public No Vlaue is :" +i);
        }
}
class PublicPrivateDemo
{
        public static void main(String... args)
        {
                PublicPrivate pp=new PublicPrivate(5);
                pp.i=10;
                pp.display();
        }
}
```

Program: 21

Write a Java Program to demonstrate static variables, methods, and blocks.

```
class StaticDemo
{
        static    int i=0;

        static void display()
        {
                System.out.println("Satic Value of I :" +i);
        }

        static void count()
        {
                i++;
        }

        public static void main(String... a)
        {
                for(int i=0;i<3;i++)
                {
                        count();
                        display();
                }
        }
}
```

Program: 22

Develop a Java Application to illustrate Inheritance, Create a Box class with three properties width, height, depth. Create another class BoxWeight extended to include a fourth component called weight. Thus, the new class will contain width, height, depth, and weight.BoxWeight provides constructors for the various ways that a box can be constructed. In each case, super( ) is called using the appropriate arguments. Notice that width, height, and depth have been made

private within Box class.Furthur subclass BoxWeight is used as a superclass to create the subclass called Shipment.Shipment inherits all of the traits of BoxWeight and Box, and adds a field called cost, which holds the cost of shipping such a parcel.

```
import java.io.*;
class Box
{
        private int width;
        private int height;
        private int depth;

        Box() {   }
        Box(int a,int b,int c)
        {
                width=a;
                height=b;
                depth=c;
        }
        void displayBox()
        {
                System.out.println("The Value of Width : " + width);
                System.out.println("The Value of Height : " + height);
                System.out.println("The Value of Depth : " + depth);
        }
}
class BoxWeight extends Box
{
        public int weight;

        BoxWeight() {    }
        BoxWeight(int a,int b,int c,int d)
        {
                super(a,b,c);
                weight=d;
        }
        void displayBoxWeight()
        {
                System.out.println("The Value of Weight : " + weight);
        }
}

class Shipment extends BoxWeight
{
        int cost;
```

```
    Shipment(int e)
    {
        cost=e;
    }
    void displayShipment()
    {
        System.out.println("The Value of Cost : " + cost);
    }
}
class MainBoxClass
{
    public static void main(String... aa)
    {
        BoxWeight bw=new BoxWeight(1,2,3,4);
        Shipment s=new Shipment(10);
        s.displayBox();
        s.displayBoxWeight();
        s.displayShipment();

    }
}
```

Program: 23

WAP to demonstrate the following methods in StringBuffer:

I) length() and capacity()

II) ensureCapacity() ,setLength()

III) chatAt() and setCharAt()

IV) getChars() , append( ),insert( ), reverse( ), delete()

V) replace( ) and Substring( )

```
import java.io.*;
public class stringBuffer
{
    public static void main(String[] args) throws Exception
    {
      BufferedReader in = new BufferedReader(new InputStreamReader(System.in));
      String str;
      try
     {
        System.out.print("Enter your name: ");
        str = in.readLine();
        str += "";

         StringBuffer strbuf = new StringBuffer();
         strbuf.append(str);
```

```
                    System.out.println(strbuf);
                    strbuf.delete(0,str.length());

                    strbuf.append("Hello");
                    strbuf.append("World");

                    System.out.println(strbuf);
                    strbuf.insert(5,"_Java ");
                    System.out.println(strbuf);
                    strbuf.reverse();
                    System.out.print("Reversed string : ");
                    System.out.println(strbuf);
                    strbuf.reverse();
                    System.out.println(strbuf);
                    strbuf.setCharAt(5,' ');
                    System.out.println(strbuf);
                    System.out.println(strbuf.charAt(6));
                    System.out.print("Substring from position 3 to 6 : ");
                    System.out.println(strbuf.substring(3,7));
                    strbuf.deleteCharAt(3);
                    System.out.println(strbuf);
                    System.out.print("Capacity of StringBuffer object : ");
                    System.out.println(strbuf.capacity());

                    strbuf.delete(6,strbuf.length());
                    System.out.println(strbuf);
            }
            catch(StringIndexOutOfBoundsException e)
            {
                    System.out.println(e.getMessage());
            }
      }
}
```

<u>Program: 24</u>

Write a program to implement Multi-Level inheritance and Demonstrate the sequence of call of constructors in multilevel inheritance.

```
Import java.io.*;
class Box
{
        private int width;
        private int height;
        private int depth;
        Box() {  }
        Box(int a,int b,int c)
        {
                width=a;
                height=b;
                depth=c;
        }
        void displayBox()
        {
                System.out.println("The Value of Width : " + width);
                System.out.println("The Value of Height : " + height);
                System.out.println("The Value of Depth : " + depth);
        }
}
class BoxWeight extends Box
{
        public int weight;

        BoxWeight() {   }
        BoxWeight(int a,int b,int c,int d)
        {
                super(a,b,c);
                weight=d;
        }
        void displayBoxWeight()
        {
                System.out.println("The Value of Weight : " + weight);
        }
}
class Shipment extends BoxWeight
{
        int cost;

        Shipment(int e)
        {
                cost=e;
        }
        void displayShipment()
        {
                System.out.println("The Value of Cost : " + cost);
        }
}
class MainBoxClass
{
        public static void main(String... aa)
        {
                BoxWeight bw=new BoxWeight(1,2,3,4);
                Shipment s=new Shipment(10);
                s.displayBox();
                s.displayBoxWeight();
                s.displayShipment();

        }
}
```

Program: 25

Write a program to demonstrate Access protection (private, default modifier, protected, public) as it applies to classes, subclasses and packages in java.

```
package p2;
class ABC
{
        public int i=1;
        protected int j=2;
        private int k=3;
        int l=4;
}
package p2;
import p2.ABC;
class DEF
{
        public static void main(String... a)
        {
                ABC aa=new ABC();
                System.out.println("====================");
                System.out.println("Public ="+aa.i);
                System.out.println("Protected ="+aa.j);
                System.out.println("Default ="+aa.l);
                System.out.println("Private can't inherited ");
                System.out.println("====================");
        }
}
```

Program: 26

Write a program to implement a stack using interfaces.

```
interface Stack1
{
        public void push(int s);
        public int pop();
```

```
}
class Stack implements Stack1
{
        private int tos;
        private int stk[];
        Stack(int size)
        {
                tos=-1;
                stk=new int[size];
        }
        public void push(int item)
        {
                if(tos==stk.length-1)
                        System.out.println("Stack is Full");
                else
                {
                        stk[++tos]=item;
                        System.out.println(stk[tos]);
                }
        }
        public int pop()
        {
                if(tos<0)
                {
                        System.out.println("Stack Underflow");
                        return 0;
                }
                else
                        return stk[tos--];
        }

}
class StackDemo
{
        public static void main(String[] args)
        {
                Stack s1 = new Stack(5);

                System.out.println("Data Pushed is : ");
                for(int i=0; i<5; i++)
                        s1.push(i);

                System.out.println("\nData Popped is : ");
                for(int i=0; i<5; i++)
                System.out.println(s1.pop());
        }
}
```

FILE

<u>Program: 27</u>

Read & Write the data from the file using object out stream.

```
import java.io.*;
class File1 implements Serializable
{
        public int sno;
        public String snm;
}
class FileOperation
{
        public static void main(String... a)
        {
                try
                {
                        FileOperation f=new FileOperation();

                        DataInputStream dis=new DataInputStream(System.in);
                        while(true)
                        {
                        System.out.println("1. Insert Data ");
                        System.out.println("2. Display Data ");
                        System.out.println("3. Exit ");
                        System.out.println("Enter Choice : ");
                        int ch=Integer.parseInt(dis.readLine());
                        if(ch==1)
                           f.SetData();
                        else if(ch==2)
                                f.GetData();
                        else if(ch==3)
                                break;
                        else
                                System.out.println("Wrong Choice");
                        }

                }
                catch(Exception e)
                {
                        System.out.println(" "+e);
                }
        }
```

```
    public void SetData()
    {
        try
        {
            DataInputStream dis=new DataInputStream(System.in);
            ObjectOutputStream op=new ObjectOutputStream(new
            FileOutputStream("a1.txt"));
            File1 ff=new File1();
            System.out.println("Enter Student NO :");
            ff.sno=Integer.parseInt(dis.readLine());
            System.out.println("Enter Student Name :");
            ff.snm=dis.readLine();
            op.writeObject(ff);

            op.close();
        }
        catch(Exception e)
        {
            System.out.println(e.toString());
        }
    }
    public void GetData()
    {
        try
        {
            ObjectInputStream oi=new ObjectInputStream(new
            FileInputStream("a1.txt"));
            File1 f=(File1)oi.readObject();
            System.out.println("No. :" + f.sno);
            System.out.println("Name. :" + f.snm);
            oi.close();
        }
        catch(Exception e)
        {
            System.out.println(e.toString());
        }

    }
}
```

Program: 28

Read the data from the given particular file and generate the marksheet.

```
import java.io.*;
class FIS
```

```
{
        public static void main(String args[])throws IOException
        {
                        FileInputStream in=new FileInputStream("mv1.txt");
                        BufferedInputStream d=new BufferedInputStream(in);
                        BufferedReader b=new BufferedReader(new InputStreamReader(d));
                        String s=null;
                        int tot;
                        float per=0.00f;
                        try
                        {

        System.out.println("No#\tName\t\tJava\tO.S.\tS.M.\tTotal\tPercentage");
                                while((s=b.readLine())!=null)
                                {
                                        String m[]=s.split(" ");
                                        for(int i=1;i<2;i++)
                                        {

        tot=Integer.parseInt(m[2].toString())+Integer.parseInt(m[3].toString())+Integer.parseInt(m[4]
.toString());                                                                   per=tot/3;

        System.out.println(m[0].toString()+"\t"+m[1].toString()+"\t"+m[2].toString()+"\t"+m[3].toStr
ing()+"\t"+m[4].toString()+"\t"+tot+"\t"+per);
                                        }
                                }
                                d.close();
                                in.close();
                                b.close();
                        }
                        catch(Exception e)
                        {
                                        System.out.println(e.toString());
                        }
        }
}
```

APPLET

Program: 29

Write a code for the applet that draw the smile face and sad face with thread and button.

```
import java.applet.*;
import java.awt.*;
import java.awt.event.*;
import java.io.*;
```

```
/*
<applet code="AppletSmile" height=200 width=500>
</applet>
*/
public class AppletSmile extends Applet implements Runnable,ActionListener
{
	Button b1,b2;
	int i=0;
	Thread t;
	public void init()
	{
		i=0;
		b1=new Button("START");
		b2=new Button("STOP");
		add(b1);
		add(b2);
		b1.addActionListener(this);
		b2.addActionListener(this);
	}
	public void actionPerformed(ActionEvent ae)
	{
		if(ae.getSource()==b1)
		{
			t=new Thread(this);
			t.start();
		}
		else
		{
			t.stop();
		}
	}
	public void run()
	{
		try
		{
			while(true)
			{
				repaint();
				t.sleep(500);
			}
		}
		catch(Exception e)
		{
			System.out.println(e.toString());
		}
	}
	public void paint(Graphics g)
	{
		g.drawOval(40,40,120,150);
		g.drawOval(57,75,30,20);
		g.drawOval(110,75,30,20);
		g.fillOval(68,81,10,10);
		g.fillOval(121,81,10,10);
		g.drawOval(82,100,30,30);
		g.drawOval(25,92,15,30);
		g.drawOval(160,92,15,30);
		if(i==0)
		{
			g.drawArc(70,140,50,40,0,180);
			g.drawString("<-----SAD FACE",200,110);
		}
		if(i==1)
		{
			g.drawArc(70,120,50,40,180,180);
			g.drawString("<-----SMILE FACE",200,110);
		}
		i++;
		if(i>1)
			i=0;
	}
}
```

Program: 30

Write a code for the applet that draw the different shape and user given coordinates.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
<applet code="TextFieldDemo.class" height=200 width=200>
</applet>
*/
public class TextFieldDemo extends Applet implements ItemListener,ActionListener
{
	Font f=new Font("TimesNewRoman",Font.BOLD,28);
	Choice shape,fill;
	TextField x,y;
	Label lx,ly;
	String msg=" ";
	Button b1;
```

```
public void init()
{
		setBackground(Color.pink);
		setForeground(Color.blue);
		lx=new Label("X : ",Label.RIGHT);
		ly=new Label("Y : ",Label.RIGHT);
		x=new TextField(3);
		y=new TextField(3);
		b1=new Button("Submit");
		add(lx);
		add(x);
		add(ly);
		add(y);
		add(b1);
		x.addActionListener(this);
		y.addActionListener(this);
		b1.addActionListener(this);
		shape=new Choice();
		shape.add("Rectangle");
		shape.add("Round Rectangle");
		shape.add("Oval");
		shape.add("Arc");
		add(shape);
		shape.addItemListener(this);

		fill=new Choice();
		fill.add("Draw Shape");
		fill.add("Fill Shape");
		add(fill);
		fill.addItemListener(this);
}
public void actionPerformed(ActionEvent ae)
{
		repaint();
}
public void itemStateChanged(ItemEvent ie)
{
		repaint();
}
public void paint(Graphics g)
{
		g.setFont(f);
		int a=Integer.parseInt(x.getText());
		int b=Integer.parseInt(y.getText());
		if((shape.getSelectedItem()=="Rectangle")&(fill.getSelectedItem()=="Draw Shape"))
```

```
                {
                        g.drawRect(50,100,a,b);
                }
                if((shape.getSelectedItem()=="Rectangle")&(fill.getSelectedItem()=="Fill Shape"))
                {
                        g.fillRect(50,100,a,b);
                }
                if((shape.getSelectedItem()=="Round Rectangle")&(fill.getSelectedItem()=="Draw
Shape"))
                {
                        g.drawRoundRect(50,100,a,b,15,15);
                }
                if((shape.getSelectedItem()=="Round Rectangle")&(fill.getSelectedItem()=="Fill
Shape"))
                {
                        g.fillRoundRect(50,100,a,b,15,15);
                }
                if((shape.getSelectedItem()=="Oval")&(fill.getSelectedItem()=="Draw Shape"))
                {
                        g.drawOval(50,100,a,b);
                }
                if((shape.getSelectedItem()=="Oval")&(fill.getSelectedItem()=="Fill Shape"))
                {
                        g.fillOval(50,100,a,b);
                }
                if((shape.getSelectedItem()=="Arc")&(fill.getSelectedItem()=="Draw Shape"))
                {
                        g.drawArc(50,100,a,b,0,180);
                }
                if((shape.getSelectedItem()=="Arc")&(fill.getSelectedItem()=="Fill Shape"))
                {
                        g.fillArc(50,100,a,b,0,180);
                }
        }
}
```

Program: 31

Write a code for the applet to make arithmetic operation using swing component.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
import javax.swing.*;

/*
```

```
 *<applet code=ARIT width=1000 height=1000>
 *</applet>
 */
public class ARIT extends Applet implements ActionListener,FocusListener
{
                        JLabel l1,l2,l3;
                        JTextField t1,t2,t3;
                        JButton bt1,bt2,bt3,bt4;
                        public void init()
                        {
                                                l1=new JLabel("ENTER A NO.");
                                                l2=new JLabel("ENTER B NO.");
                                                l3=new JLabel("IS's ANSWER IS =");
                                                t1=new JTextField(5);
                                                t2=new JTextField(5);
                                                t3=new JTextField(5);
                                                t1.addFocusListener(this);
                                                t2.addFocusListener(this);
                                                t3.addFocusListener(this);
                                                bt1=new JButton("+");
                                                bt2=new JButton("-");
                                                bt3=new JButton("*");
                                                bt4=new JButton("/");

                                                add(l1);
                                                add(t1);
                                                add(l2);
                                                add(t2);
                                                add(l3);
                                                add(t3);
                                                add(bt1);
                                                add(bt2);
                                                add(bt3);
                                                add(bt4);

                                                t3.setEditable(false);
                                                bt1.addActionListener(this);
                                                bt2.addActionListener(this);
                                                bt3.addActionListener(this);
                                                bt4.addActionListener(this);
                        }
                        public void focusGained(FocusEvent e)
                        {
                                    t1.setBackground(Color.pink);
                                    t2.setBackground(Color.pink);
                        //l.setText("Text Field has got the focus");
                }
                public void focusLost(FocusEvent e)
                {
                        t1.setBackground(Color.orange);
                        t2.setBackground(Color.orange);
                }
                public void actionPerformed(ActionEvent ae)
                {
                                int num=Integer.parseInt(t1.getText());
                                int num1=Integer.parseInt(t2.getText());
                                int add;
                                if(ae.getSource()==bt1)
                                {
                                                add=num+num1;
                                                t3.setText(String.valueOf(add));
                                }

                                if(ae.getSource()==bt2)
                                {
                                                add=num-num1;
                                                t3.setText(String.valueOf(add));
                                }

                                if(ae.getSource()==bt3)
                                {
                                                add=num*num1;
                                                t3.setText(String.valueOf(add));
                                }

                                if(ae.getSource()==bt4)
                                {
                                                add=num/num1;
                                                t3.setText(String.valueOf(add));
                                }
                }
}
```

Program: 32

Write a code for the applet select only one option at a time using CheckboxGroup component.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
```

```
<applet code="CheckBoxGroupDemo.class" height=150 width=250>
</applet>
*/
public class CheckBoxGroupDemo extends Applet implements ItemListener
{
        Font f=new Font("TimesNewRoman",Font.BOLD,28);
        String msg=" ";
        Checkbox winXP,winVista,solaris,mac;
        CheckboxGroup cbg;
        public void init()
        {
                setBackground(Color.pink);
                cbg=new CheckboxGroup();
                winXP=new Checkbox("Windows XP",cbg,true);
                winVista=new Checkbox("Windows Vista",cbg,false);
                solaris=new Checkbox("Solaris",cbg,false);
                mac=new Checkbox("Mac OS",cbg,false);
                add(winXP);
                add(winVista);
                add(solaris);
                add(mac);

                winXP.addItemListener(this);
                winVista.addItemListener(this);
                solaris.addItemListener(this);
                mac.addItemListener(this);
        }
        public void itemStateChanged(ItemEvent ie)
        {
                repaint();
        }
        public void paint(Graphics g)
        {
                g.setFont(f);
                msg=" Current Selection : ";
                msg+=cbg.getSelectedCheckbox().getLabel();
                g.drawString(msg,6,120);
        }
}
```

Program: 33

Write a code for the applet display the image from the given option.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
<applet code="CheckBoxImg.class" height=150 width=250>
<param name="img1" value="Image 1.jpg">
</param>
<param name="img2" value="Image 2.jpg">
</param>
<param name="img3" value="Image 5.gif">
</param>
</applet>
*/
public class CheckBoxImg extends Applet implements ItemListener
{
        Image i,i1,i2;
        CheckboxGroup cbg;
        Checkbox r1,r2,r3;
        public void init()
        {
                setBackground(Color.pink);
                cbg=new CheckboxGroup();
                r1=new Checkbox("Image 1",cbg,true);
                r2=new Checkbox("Image 2",cbg,false);
                r3=new Checkbox("Image 3",cbg,false);

                String inm=getParameter("img1");
                i=getImage(getCodeBase(),inm);

                String inm1=getParameter("img2");
                i1=getImage(getCodeBase(),inm1);

                String inm2=getParameter("img3");
                i2=getImage(getCodeBase(),inm2);

                add(r1);
                add(r2);
                add(r3);

                r1.addItemListener(this);
                r2.addItemListener(this);
                r3.addItemListener(this);
        }
        public void itemStateChanged(ItemEvent ie)
        {
                repaint();
        }
```

```
		public void paint(Graphics g)
		{
			if(cbg.getSelectedCheckbox().getLabel()=="Image 1")
			{
				g.drawImage(i,10,50,this);
			}
			if(cbg.getSelectedCheckbox().getLabel()=="Image 2")
			{
				g.drawImage(i1,10,50,this);
			}
			if(cbg.getSelectedCheckbox().getLabel()=="Image 3")
			{
				g.drawImage(i2,10,50,this);
			}
		}
	}
```

Program: 34

Write a code for the applet to calculate the intrest like (P*R*N)/100.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
<applet code="TextFieldDemo2.class" height=200 width=200>
</applet>
*/
public class TextFieldDemo2 extends Applet implements ActionListener
{
	Font f=new Font("TimesNewRoman",Font.BOLD,28);
	TextField p,r,n,ans;
	Label lp,lr,ln,lc,la;
	Button b1;
	String msg=" ";
	public void init()
	{
		setBackground(Color.pink);
		setForeground(Color.blue);
		lp=new Label("P : ",Label.RIGHT);
		lr=new Label("R : ",Label.RIGHT);
		ln=new Label("N : ",Label.RIGHT);
		la=new Label("ANS : ",Label.RIGHT);
		p=new TextField(3);
		r=new TextField(3);
		n=new TextField(3);
```

```
				ans=new TextField(6);
				b1=new Button("Calculate");
				add(lp);
				add(p);
				add(lr);
				add(r);
				add(ln);
				add(n);
				add(b1);
				add(la);
				add(ans);
				p.addActionListener(this);
				r.addActionListener(this);
				n.addActionListener(this);
				ans.setEditable(false);
				b1.addActionListener(this);
		}
		public void actionPerformed(ActionEvent ae)
		{
				repaint();
		}
		public void paint(Graphics g)
		{
				int a=Integer.parseInt(p.getText());
				int b=Integer.parseInt(r.getText());
				int c=Integer.parseInt(n.getText());
				int d=((a*b*c)/100);
				ans.setText(String.valueOf(d));
		}
}
```

Program: 35

Write a code for the applet to move the list item to another list one by one and all item from the one list.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
/*
<applet code="TextFieldList1.class" height=200 width=200>
</applet>
*/
public class TextFieldList1 extends Applet implements ActionListener
{
		Font f=new Font("TimesNewRoman",Font.BOLD,28);
```

```
Panel pn=new Panel();
Panel ps=new Panel();
Panel pe=new Panel();
Panel pw=new Panel();
Panel pc=new Panel();
List os,os1;
Label lx,ly;
TextField tx,ty;
Button b1,b3,b5,b6,b7,b8;
String msg=" ";
public void init()
{
        setBackground(Color.pink);
        setForeground(Color.blue);
        setLayout(new BorderLayout());
        add(BorderLayout.NORTH,pn);
        lx=new Label("Enter item to list  1 : ",Label.RIGHT);
        tx=new TextField(10);
        ly=new Label("Enter item to list  2 : ",Label.RIGHT);
        ty=new TextField(10);
        b1=new Button("Submit");
        b3=new Button("Submit");
        pn.add(lx);
        pn.add(tx);
        pn.add(b1);
        pn.add(ly);
        pn.add(ty);
        pn.add(b3);
        add(BorderLayout.WEST,pw);
        os=new List(10,true);
        pw.add(os);
        add(BorderLayout.EAST,pe);
        os1=new List(10,true);
        pe.add(os1);
        add(BorderLayout.SOUTH,new Button("SOUTH"));
        add(BorderLayout.CENTER,pc);
        b5=new Button(">");
        b6=new Button(">>");
        b7=new Button("<");
        b8=new Button("<<");
        pc.add(b5);
        pc.add(b6);
        pc.add(b7);
        pc.add(b8);
```

```
		b1.addActionListener(this);
		b3.addActionListener(this);
		b5.addActionListener(this);
		b6.addActionListener(this);
		b7.addActionListener(this);
		b8.addActionListener(this);
		os.addActionListener(this);
		os1.addActionListener(this);
	}
	public void actionPerformed(ActionEvent ae)
	{
		if(ae.getSource()==b1)
		{
			os.add(tx.getText());
			tx.setText("");
		}
		if(ae.getSource()==b3)
		{
			os1.add(ty.getText());
			ty.setText("");
		}
		if(ae.getSource()==b5)
		{
			os1.add(os.getSelectedItem());
			os.remove(os.getSelectedItem());
		}
		if(ae.getSource()==b6)
		{
			int idx[];
			idx=os.getSelectedIndexes();
			for(int i=0;i<idx.length;i++)
				os1.add(os.getItem(idx[i]));
			os.removeAll();
		}
		if(ae.getSource()==b7)
		{
			os.add(os1.getSelectedItem());
			os1.remove(os1.getSelectedItem());

		}
		if(ae.getSource()==b8)
		{
			int idx[];
			idx=os1.getSelectedIndexes();
			for(int i=0;i<idx.length;i++)
```

```
                                        os.add(os1.getItem(idx[i]));
                                os1.removeAll();
                        }
                }
                public void paint(Graphics g)
                {
                }
        }
```