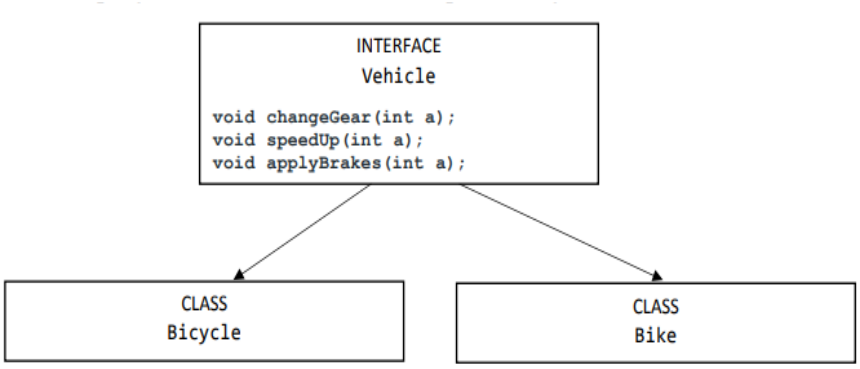
Ex No 6

Write a program to demonstrate use of implementing interfaces.




```
import java.io.*;

interface Vehicle {

    // all are the abstract methods.
    void changeGear(int a);
    void speedUp(int a);
    void applyBrakes(int a);
}

class Bicycle implements Vehicle{

    int speed;
    int gear;

    // to change gear
    @Override
    public void changeGear(int newGear){

        gear = newGear;
    }

    // to increase speed
    @Override
    public void speedUp(int increment){
```

```
            speed = speed + increment;
        }

        // to decrease speed
        @Override
        public void applyBrakes(int decrement){

            speed = speed - decrement;
        }

        public void printStates() {
            System.out.println("speed: " + speed
                + " gear: " + gear);
        }
}

class Bike implements Vehicle {

        int speed;
        int gear;

        // to change gear
        @Override
        public void changeGear(int newGear){

            gear = newGear;
        }

        // to increase speed
        @Override
        public void speedUp(int increment){

            speed = speed + increment;
        }

        // to decrease speed
        @Override
        public void applyBrakes(int decrement){
```

```
            speed = speed - decrement;
        }

        public void printStates() {
            System.out.println("speed: " + speed
                + " gear: " + gear);
        }

}
public class InterfaceDemo {

        public static void main (String[] args) {

            // creating an inatance of Bicycle
            // doing some operations
            Bicycle bicycle = new Bicycle();
            bicycle.changeGear(2);
            bicycle.speedUp(3);
            bicycle.applyBrakes(1);

            System.out.println("Bicycle present state :");
            bicycle.printStates();

            // creating instance of the bike.
            Bike bike = new Bike();
            bike.changeGear(1);
            bike.speedUp(4);
            bike.applyBrakes(3);

            System.out.println("Bike present state :");
            bike.printStates();
        }
}
```

Ex No 7

Write a program to implement interfaces for all string operations.

```
package ExNo1;

//Java code to illustrate different constructors and
methods
//String class.

import java.io.*;
import java.util.*;
public class StringDemo
{
     public static void main (String[] args)
     {
          String s= "Sairam Institute of Technology -
Department of IT";


          // Returns the number of characters in the
String.
          System.out.println("String length = " +
s.length());

          // Returns the character at ith index.
          System.out.println("Character at 3rd position = "
                             + s.charAt(3));

          // Return the substring from the ith index
character
          // to end of string
          System.out.println("Substring " +
s.substring(3));

          // Returns the substring from i to j-1 index.
          System.out.println("Substring = " +
s.substring(2,5));

          // Concatenates string2 to the end of string1.
          String s1 = "Sairam";
```

```
        String s2 = "II IT B";
        System.out.println("Concatenated string = " +
                                    s1.concat(s2));

        // Returns the index within the string
        // of the first occurrence of the specified
string.
        String s4 = "Learn Share Learn";
        System.out.println("Index of Share " +
                                s4.indexOf("Share"));

        // Returns the index within the string of the
        // first occurrence of the specified string,
        // starting at the specified index.
        System.out.println("Index of a = " +
                                s4.indexOf('a',3));

        // Checking equality of Strings
        Boolean out = "Sairam".equals("Sairam");
        System.out.println("Checking Equality " + out);
        out = "sairam".equals("Sairam");
        System.out.println("Checking Equality " + out);

        out = "saiRaM".equalsIgnoreCase("sairam");
        System.out.println("Checking Equality " + out);

        //If ASCII difference is zero then the two
strings are similar
        int out1 = s1.compareTo(s2);
        System.out.println("the difference between ASCII
value is="+out1);
        // Converting cases
        String word1 = "IT B II Year";
        System.out.println("Changing to lower Case " +
                                    word1.toLowerCase());

        // Converting cases
        String word2 = "II Year it B";
        System.out.println("Changing to UPPER Case " +
                                    word2.toUpperCase());
```

```
        // Trimming the word
        String word4 = " Learn Share Learn ";
        System.out.println("Trim the word " +
word4.trim());

        // Replacing characters
        String str1 = "Sairam IT Dept";
        System.out.println("Original String " + str1);
        String str2 = "Sairam IT Dept".replace('I' ,'C')
;
        System.out.println("Replaced I with C -> " +
str2);
    }
}
```

DEPARTMENT OF INFORMATION TECHNOLOGY
20CSPL301 – Object Oriented Programming Lab

Ex No 8

Write a program to create student report using applet, read the input using Text boxes and display the output using buttons

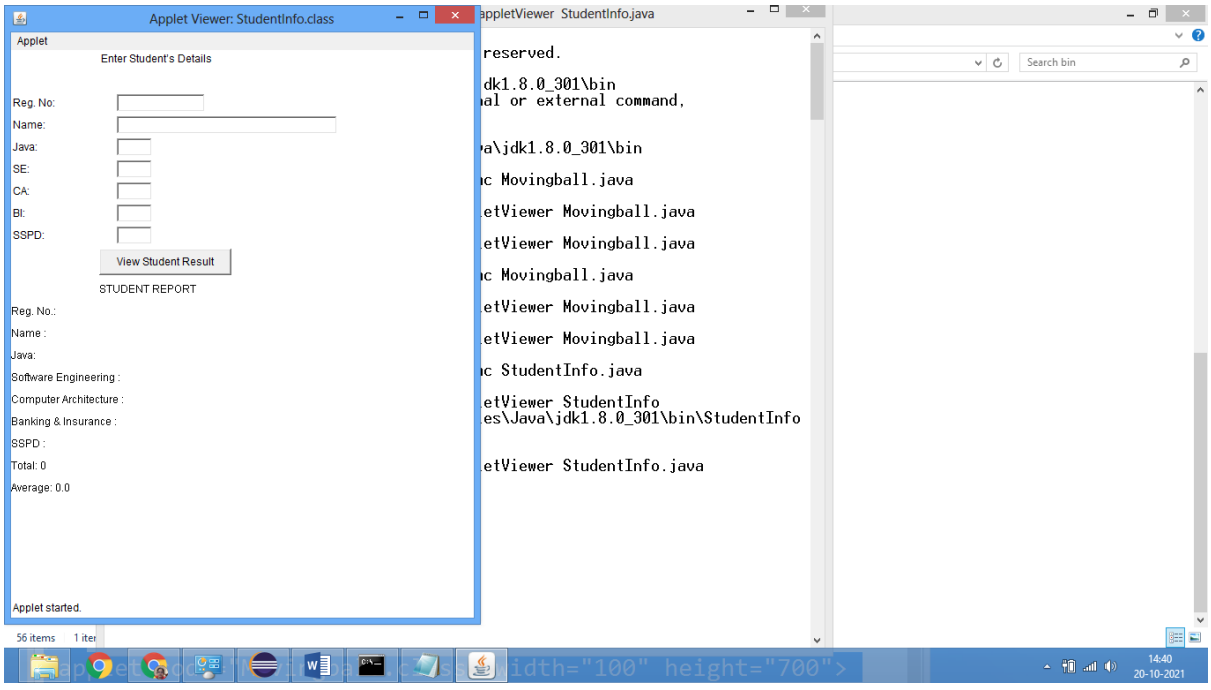
Install JDK 8 from

https://www.oracle.com/in/java/technologies/javase/javase8-archive-downloads.html

To run the Applet Program

C:\appletViewer classname.java

Output




```
import java.awt.*;
import java.applet.*;
import java.awt.event.*;
@SuppressWarnings("deprecation")
public class StudentInfo extends Applet implements
ActionListener
{
    Label
lblTitle,lblRegNo,lblName,lblJava,lblSE,lblCA,lblBI,lblSSP
D;
```

```
    TextField
txtRegNo,txtName,txtJava,txtSE,txtCA,txtBI,txtSSPD;
      Button cmdReport;
      int total;
      float avg;

      public void init()
      {
            setLayout(null);
            lblTitle=new Label("Enter Student's Details");
            lblRegNo=new Label("Reg. No:");
            lblName=new Label("Name:");
            lblJava=new Label("Java:");
            lblSE=new Label("SE:");
            lblCA=new Label("CA:");
            lblBI=new Label("BI:");
            lblSSPD=new Label("SSPD:");
        txtRegNo=new TextField(10);
            txtName=new TextField(25);
            txtJava=new TextField(3);
            txtSE=new TextField(3);
            txtCA=new TextField(3);
            txtBI=new TextField(3);
            txtSSPD=new TextField(3);
        cmdReport=new Button("View Student Result");
        lblTitle.setBounds(100,0,200,20);
        lblRegNo.setBounds(0,50,100,20);
            txtRegNo.setBounds(120,50,100,20);
        lblName.setBounds(0,75,100,20);
         txtName.setBounds(120,75,250,20);
        lblJava.setBounds(0,100,100,20);
            txtJava.setBounds(120,100,40,20);
        lblSE.setBounds(0,125,100,20);
            txtSE.setBounds(120,125,40,20);
        lblCA.setBounds(0,150,100,20);
        txtCA.setBounds(120,150,40,20);
        lblBI.setBounds(0,175,100,20);
        txtBI.setBounds(120,175,40,20);
        lblSSPD.setBounds(0,200,100,20);
        txtSSPD.setBounds(120,200,40,20);
```

```
        cmdReport.setBounds(100,225,150,30);
        add(lblTitle);
            add(lblRegNo);add(txtRegNo);
            add(lblName);add(txtName);
            add(lblJava);add(txtJava);
            add(lblSE);add(txtSE);
            add(lblCA);add(txtCA);
            add(lblBI);add(txtBI);
            add(lblSSPD);add(txtSSPD);
            add(cmdReport);
        cmdReport.addActionListener(this);
    }
public void actionPerformed(ActionEvent ae)
{
        try
        {
                int
java=Integer.parseInt(txtJava.getText());
                int se=Integer.parseInt(txtSE.getText());
                int ca=Integer.parseInt(txtCA.getText());
                int bi=Integer.parseInt(txtBI.getText());
                int
sspd=Integer.parseInt(txtSSPD.getText());
        total=(java+se+ca+bi+sspd);
        avg=total/5;
        }
        catch(NumberFormatException e)
        {
        }
        repaint();
}
public void paint(Graphics g)
    {
            g.drawString("STUDENT REPORT",100,275);
            g.drawString("Reg. No.:
"+txtRegNo.getText(),0,300);
            g.drawString("Name :
"+txtName.getText(),0,325);
            g.drawString("Java:
"+txtJava.getText(),0,350);
```

```
            g.drawString("Software Engineering :
"+txtSE.getText(),0,375);
            g.drawString("Computer Architecture :
"+txtCA.getText(),0,400);
            g.drawString("Banking & Insurance :
"+txtBI.getText(),0,425);
            g.drawString("SSPD :
"+txtSSPD.getText(),0,450);
            g.drawString("Total: "+total,0,475);
            g.drawString("Average: "+avg,0,500);
      }
}

/*
<applet code="StudentInfo.class" width="600" height="600">
</applet>
*/
```

Ex No 9

Write a program to implement thread priorities

```
//Java Program to Illustrate Priorities in Multithreading
//via help of getPriority() and setPriority() method

//Importing required classes
import java.lang.*;

//Main class
public class ThreadDemo extends Thread {

    // Method 1
    // run() method for the thread that is called
    // as soon as start() is invoked for thread in main()
    public void run()
    {
        // Print statement
        System.out.println("Inside run method");
    }
```

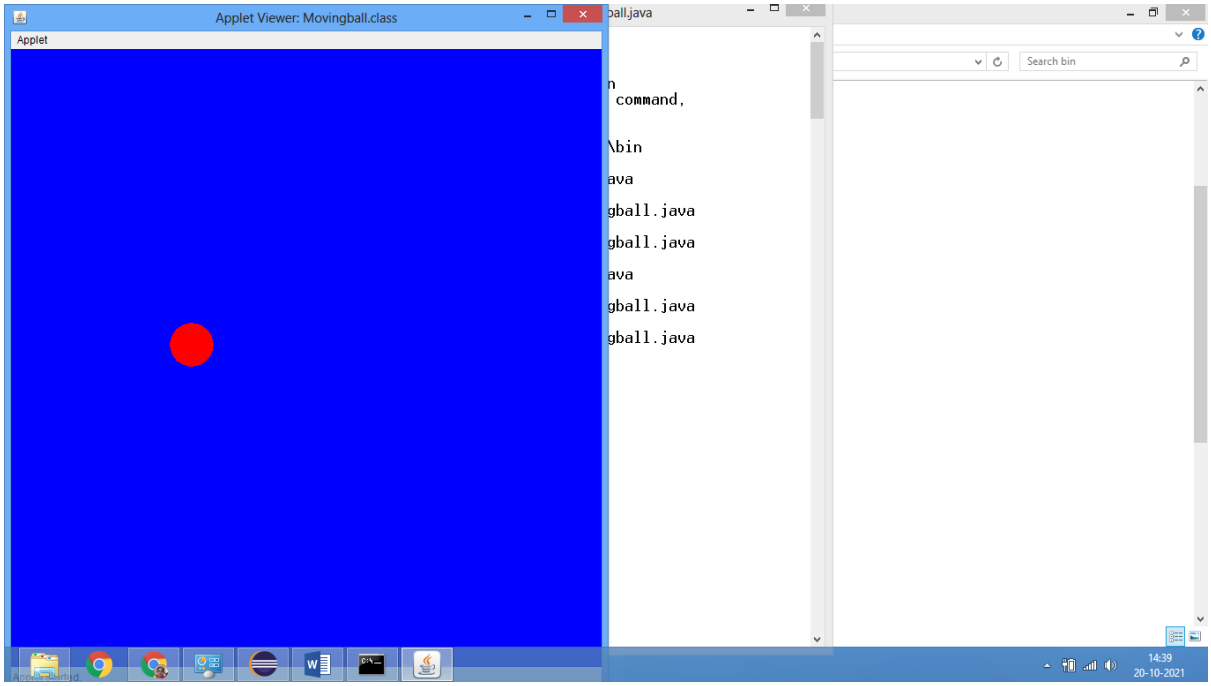
```
// Main driver method
public static void main(String[] args)
{
    // Creating random threads
    // with the help of above class
    ThreadDemo t1 = new ThreadDemo();
    ThreadDemo t2 = new ThreadDemo();
    ThreadDemo t3 = new ThreadDemo();

    // Thread 1
    // Display the priority of above thread
    // using getPriority() method
    System.out.println("t1 thread priority : "
                       + t1.getPriority());

    // Thread 1
    // Display the priority of above thread
    System.out.println("t2 thread priority : "
                       + t2.getPriority());

    // Thread 3
    System.out.println("t3 thread priority : "
                       + t3.getPriority());

    // Setting priorities of above threads by
    // passing integer arguments
    t1.setPriority(2);
    t2.setPriority(5);
    t3.setPriority(8);

    // t3.setPriority(21); will throw
    // IllegalArgumentException

    // 2
    System.out.println("t1 thread priority : "
                       + t1.getPriority());

    // 5
    System.out.println("t2 thread priority : "
                       + t2.getPriority());
```

```
            // 8
            System.out.println("t3 thread priority : "
                               + t3.getPriority());

            // Main thread

            // Displays the name of
            // currently executing Thread
            System.out.println(
                 "Currently Executing Thread : "
                 + Thread.currentThread().getName());

            System.out.println(
                 "Main thread priority : "
                 + Thread.currentThread().getPriority());

            // Main thread priority is set to 10
            Thread.currentThread().setPriority(10);

            System.out.println(
                 "Main thread priority : "
                 + Thread.currentThread().getPriority());
        }
}
```

Ex No 10

Write a program to implement thread, applets and graphics to animate ball movement.

Output:




```
package ExNo1;

import java.awt.*;
import java.applet.*;
public class Movingball extends Applet implements Runnable
{
    int x,y,dx,dy;
    Thread t;
    boolean flag;
    public void init()
    {
        setBackground(Color.blue);
        x=100;
        y=10;
        dx=10;
        dy=10;
```

```
    }
    public void start()
    {
        flag=true;
        t=new Thread(this);
        t.start();
    }
    public void paint(Graphics g)
    {
        g.setColor(Color.red);
        g.fillOval(x,y,50,50);
    }
    public void run()
    {
        while(flag)
        {
            Rectangle r=getBounds();
            if((x+dx<=0)||(x+dx>=r.width))
                dx=-dx;
            if((y+dy<=0)||(y+dy>=r.height))
                dy=-dy;
            x+=dx;
            y+=dy;
            repaint();
            try
            {
                Thread.sleep(300);
            }
            catch(InterruptedException e)
            {}
        }
    }
    public void stop()
    {
        t=null;
        flag=false;
    }
}

/*
```

```
<applet code="Movingball.class" width="100" height="700">
</applet>
*/
```