AMITY INSTITUTE OF INFORMATION TECHNOLOGY

PRACTICAL FILE

Of

CORE JAVA

AMITY UNIVERSITY, NOIDA

SUBMITTED TO:

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ENROLMENT NO. A010145023046

MCA – 1 (A)

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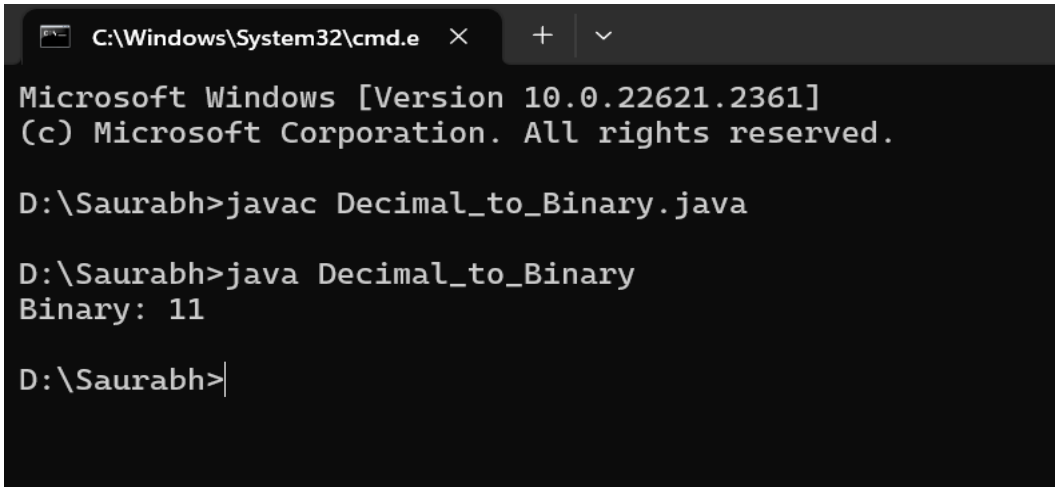
1.WAP from Decimal to Binary

```
public class Decimal_to_Binary {
    public static void main(String[] args) {
        int decimalNumber = 3;
        // Create an array to store binary digits
        int[] binaryArray = new int[32];
        int index = 0
        // Convert decimal to binary
        while (decimalNumber > 0) {
            binaryArray[index++] = decimalNumber % 2;
            decimalNumber = decimalNumber / 2;
        }
        // Print binary representation in reverse order
        System.out.print("Binary: ");
        for (int i = index - 1; i >= 0; i--) {
            System.out.print(binaryArray[i]);
        }
        System.out.println(); // Print a newline
    }
}
```

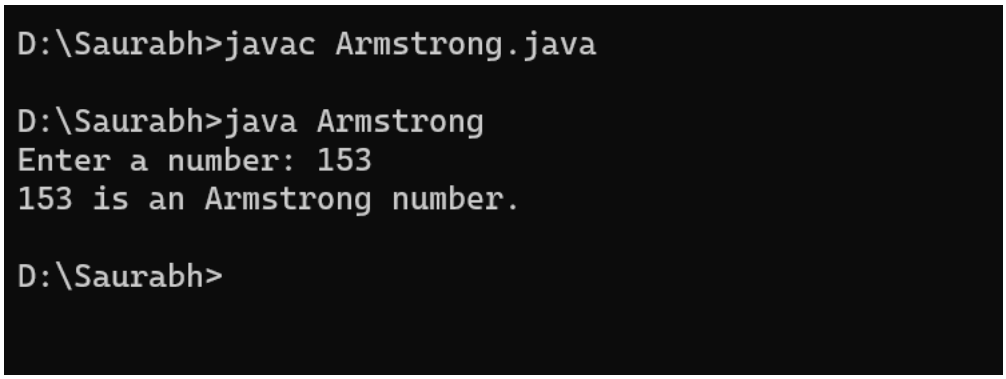
OUTPUT :



2.WAP to cheak Whether a Number is Armstrong or Not

```
import java.util.Scanner;
public class Armstrong {
    public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter a number: ");
      int number = scanner.nextInt();
      scanner.close();

      if (isArmstrong(number)) {
         System.out.println(number + " is an Armstrong number.");
      } else {
         System.out.println(number + " is not an Armstrong number.");
      }
   }

   public static boolean isArmstrong(int number) {
      int originalNumber = number;
      int numberOfDigits = countDigits(number);
      int sum = 0;

      while (number > 0) {
         int digit = number % 10;
         sum += Math.pow(digit, numberOfDigits);
         number /= 10;
      }

      return sum == originalNumber;
   }

   public static int countDigits(int number) {
      int count = 0;
      while (number != 0) {
         number /= 10;
         count++;
      }
      return count;
   }
}
```

OUTPUT:



3.WAP from Binary to Decimal

```
public class Binary_To_Decimal {
   public static void main(String[] args) {
      String binaryString = "101010";
      int decimalNumber = binaryToDecimal(binaryString);
      System.out.println("Binary: " + binaryString);
      System.out.println("Decimal: " + decimalNumber);
   }
 public static int binaryToDecimal(String binaryString) {
      int decimalNumber = 0;
      int power = 0;
      for (int i = binaryString.length() - 1; i >= 0; i--) {
         char digitChar = binaryString.charAt(i);
         if (digitChar == '0') {
            decimalNumber += 0;
         } else if (digitChar == '1') {
            decimalNumber += Math.pow(2, power);
         } else {
            System.err.println("Invalid binary character: " + digitChar);
            return -1; // Return an error value
         }
  power++;
      }
      return decimalNumber;
   }
}
```

OUTPUT :

```
D:\Saurabh>javac Binary_To_Decimal.java

D:\Saurabh>java Binary_To_Decimal
Binary: 101010
Decimal: 42

D:\Saurabh>
```

4.WAP to Sort an array using Bubble sort

```
public class bubblesort {

    public static void printArray(int arr[]) {
       for (int i = 0; i < arr.length; i++) {
          System.out.print(arr[i] + " ");
       }
       System.out.println();
    }

    public static void main(String[] args) {
       int arr[] = { 88, 87, 86, 85, 84 };

       for (int i = 0; i < arr.length - 1; i++) {
          System.out.println("Pass Number: " + " " + i + "-------->");

          for (int j = 0; j < arr.length - 1; j++) {
             if (arr[j] > arr[j + 1]) {

                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;
                 printArray(arr);
             }
          }
       }
    }

}
```

OUTPUT:

```
D:\Saurabh>javac bubbleShort.java

D:\Saurabh>java bubbleShort
Pass Number:  0-------->
87 88 86 85 84
87 86 88 85 84
87 86 85 88 84
87 86 85 84 88
Pass Number:  1-------->
86 87 85 84 88
86 85 87 84 88
86 85 84 87 88
Pass Number:  2-------->
85 86 84 87 88
85 84 86 87 88
Pass Number:  3-------->
84 85 86 87 88
```

5.WAP to sort an array using Heap Sort

```
public class heapShort {
    public static void main(String[] args) {
        int[] arr = {64, 34, 25, 12, 22, 11, 90};
        System.out.println("Original Array:");
        printArray(arr);
        heapSort(arr);
        System.out.println("Sorted Array (Ascending Order):");
        printArray(arr);
    }
    public static void heapSort(int[] arr) {
        int n = arr.length;
        for (int i = n / 2 - 1; i >= 0; i--) {
            heapify(arr, n, i);
        }
        for (int i = n - 1; i >= 0; i--) {
            int temp = arr[0];
            arr[0] = arr[i];
            arr[i] = temp;
            heapify(arr, i, 0);
        }
    }
    public static void heapify(int[] arr, int n, int i) {
        int largest = i;
        int leftChild = 2 * i + 1;
        int rightChild = 2 * i + 2;
        if (leftChild < n && arr[leftChild] > arr[largest]) {
            largest = leftChild;
        }
        if (rightChild < n && arr[rightChild] > arr[largest]) {
            largest = rightChild;
```

```
        }
        if (largest != i) {
            int swap = arr[i];
            arr[i] = arr[largest];
            arr[largest] = swap;
            heapify(arr, n, largest);
        }
    }

    public static void printArray(int[] arr) {
        for (int value : arr) {
            System.out.print(value + " ");
        }
        System.out.println();
    }
}
```

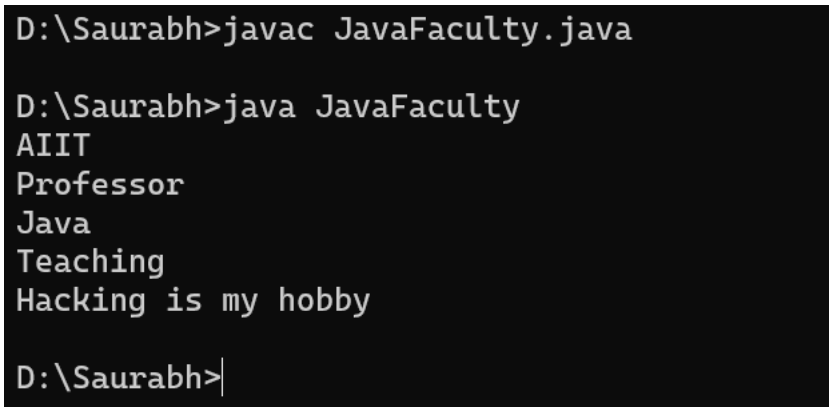
OUTPUT :

```
D:\Saurabh>javac heapShort.java

D:\Saurabh>java heapShort
Original Array:
64 34 25 12 22 11 90
Sorted Array (Ascending Order):
11 12 22 25 34 64 90

D:\Saurabh>
```

6.WAP To Show Inheritance

```
class Faculty{
   String designation = "Professor";
    String CollegeName = "AIIT";
    void does()
    {
       System.out.println("Teaching");
    }
   }
 class JavaFaculty extends Faculty{
   String mainSubject = "Java";
   void hacking()
   {
      System.out.println("Hacking is my hobby");
   }
   public static void main ( String []args){
      JavaFaculty obj = new JavaFaculty();
      System.out.println(obj.CollegeName);
      System.out.println(obj.designation);
      System.out.println(obj.mainSubject);
      obj.does();
      obj.hacking();
   }}
```

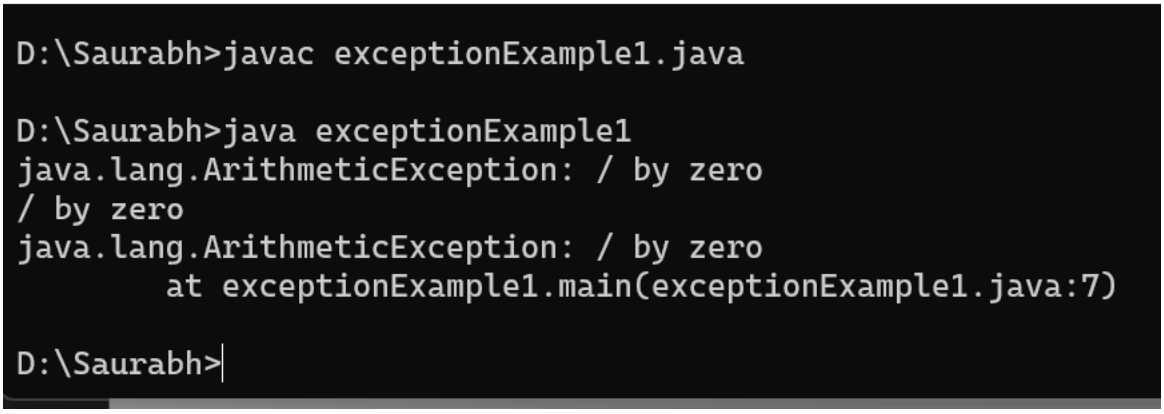
OUTPUT :



7.WAP of ExceptionExample1(Handle an Exception)

```
class exceptionExample1
  {
        public static void main(String args[])
        {
         try
         {
         System.out.println(9/0);
         }
        catch(ArithmeticException jay)
        {
                System.out.println(jay);
                System.out.println(jay.getMessage());
                jay.printStackTrace();
        }
        }
  }
```

OUTPUT :



8. WAP of ExceptionExample 2(Interruption)

```
class exceptionExample2
{
        public static void main(String args[])
        {
        Thread.sleep(1000);
         {
                System.out.println(9/2);
         }
   }
}
```

OUTPUT :

```
Microsoft Windows [Version 10.0.22621.2361]
(c) Microsoft Corporation. All rights reserved.

D:\Saurabh>javac exceptionExample2.java
exceptionExample2.java:5: error: unreported exception InterruptedException; must be caught or declared to be thrown
       Thread.sleep(1000);
                   ^
1 error
```

9. WAP to ExceptionExample 3 (Arithmetic)

```
import java.util.Random;

public class ExceptionExample3 {
   public static void main(String[] args) {
      int a = 0, b = 0, c = 0;
      Random r = new Random();

      for (int i = 0; i < 3200; i++) {
         try {
            b = r.nextInt();
            c = r.nextInt();
            a = 12345 / (b / c);
         } catch (ArithmeticException e) { // Corrected "Catch" to "catch" and "newint" to "nextInt"
            System.out.println("Division by Zero");
            a = 0; // Set 'a' to zero and continue
         }
         System.out.println("a: " + a);
      }
   }
}
```

OUTPUT :

10. WAP to Handle an Exception and use its methods. (Example 4)

```
class ExceptionExample4 {

   public static void main(String args[]){

      try {

          System.out.println(9/0);    //abnormally terminate

      }

      catch (Exception e) {

         // TODO: handle exception

         System.out.println(e);

         System.out.println(e.getMessage());

         e.printStackTrace(); //always try to use this only , it will get full details.


      }


      System.out.println("Hello World");

}

}
```

OUTPUT :

```
D:\Saurabh>javac ExceptionExample4.java

D:\Saurabh>java ExceptionExample4
java.lang.ArithmeticException: / by zero
/ by zero
java.lang.ArithmeticException: / by zero
        at ExceptionExample4.main(ExceptionExample4.java:4)
Hello World

D:\Saurabh>
```

11. WAP of Exception using MultipleCatches

```
class Exception4MultipleCatches {
   public static void main(String args[]) {
      try {
         int a = args.length;
         System.out.println("a= " + a);
         int b = 42 / a;
         int c[] = { 1 };
         c[42] = 99;
      } catch (ArithmeticException e) {
         System.out.println("Divide by 0: " + e);
      } catch (ArrayIndexOutOfBoundsException e) {
         System.out.println("Array index out of bounds: " + e);
      }
      System.out.println("After try/catch block.");
   }
}
```

OUTPUT :

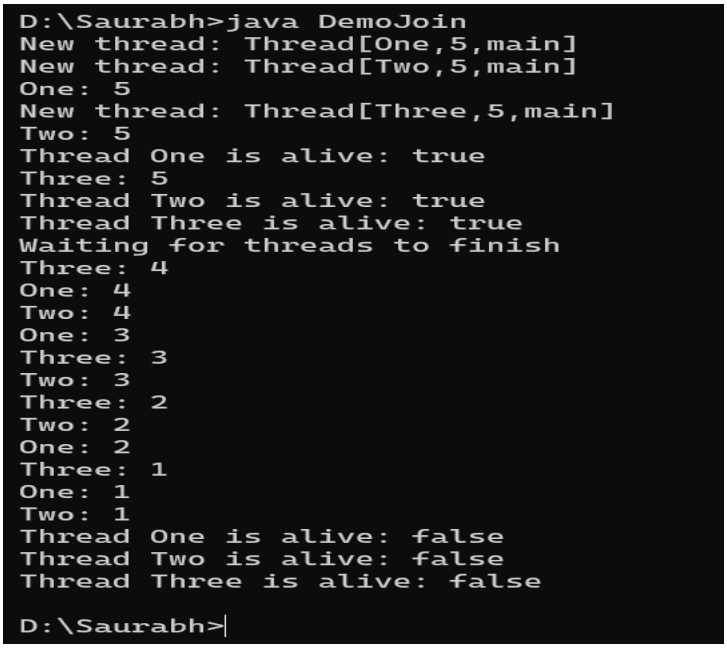
```
D:\Saurabh>javac Exception4MultipleCatches.java

D:\Saurabh>java Exception4MultipleCatches
a= 0
Divide by 0: java.lang.ArithmeticException: / by zero
After try/catch block.

D:\Saurabh>
```

12.WAP to do Demo Join(Thread Runnable)

```
class NewThread implements Runnable {
String name; // name of Thread
Thread t;

NewThread(String threadName) {
   name = threadName;
   t = new Thread(this, name);
   System.out.println("New thread: " + t);
   t.start(); // Start the thread
}
// This is the entry point for the thread.
public void run() {
   try {
      for (int i = 5; i > 0; i--) {
         System.out.println(name + ": " + i);
         Thread.sleep(1000);
      }
   } catch (InterruptedException e) {
      System.out.println(name + " exiting.");
   }
   }
}
class DemoJoin {
public static void main(String[] args) {
   NewThread ob1 = new NewThread("One");
   NewThread ob2 = new NewThread("Two");
   NewThread ob3 = new NewThread("Three");
```

```
        System.out.println("Thread One is alive: " + ob1.t.isAlive());
        System.out.println("Thread Two is alive: " + ob2.t.isAlive());
        System.out.println("Thread Three is alive: " + ob3.t.isAlive());
        // Wait for threads to finish
        try {
            System.out.println("Waiting for threads to finish");
            ob1.t.join();
            ob2.t.join();
            ob3.t.join();
        } catch (InterruptedException e) {
            System.out.println("Main thread interrupted.");
        }

        System.out.println("Thread One is alive: " + ob1.t.isAlive());
        System.out.println("Thread Two is alive: " + ob2.t.isAlive());
        System.out.println("Thread Three is alive: " + ob3.t.isAlive());
    }
}
```

OUTPUT:



13.WAP of Handle Exception Using NestedTry

```
public class ExceptionNextTry {
   public static void main(String[] args) {
      try {
         int a = args.length;
         int b = 42 / a;
         System.out.println("a = " + a);

         try { // nested try block
            if (a == 1) {
               a = a / (a - a); // This will cause a divide by zero exception
            }
            /* If two command line args are used, then generate an
              ArrayIndexOutOfBoundsException.
            */
            if (a == 2) {
               int c[] = {1};
               c[42] = 99; // This will generate an ArrayIndexOutOfBoundsException.
            }
         } catch (ArrayIndexOutOfBoundsException e) {
            System.out.println("Array index out of bounds: " + e);
         } catch (ArithmeticException e) {
            System.out.println("Divide by zero: " + e);
         }
      } catch (ArithmeticException e) {
         System.out.println("Outer divide by zero: " + e);
      }
   }
}
```

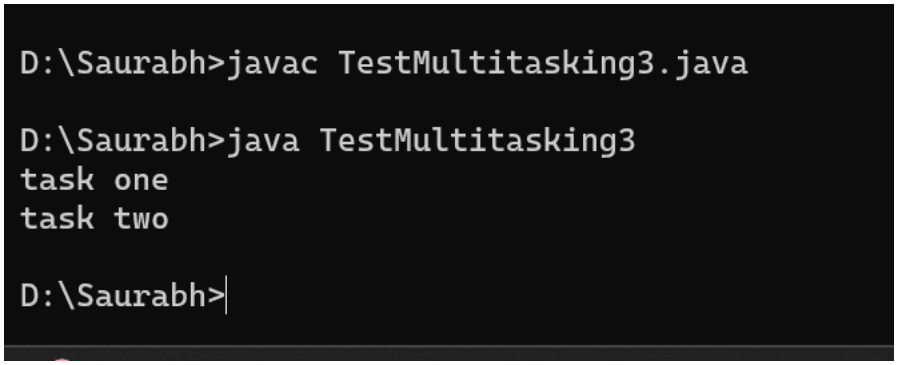
OUTPUT :

```
D:\Saurabh>javac ExceptionNextTry.java

D:\Saurabh>java ExceptionNextTry
Outer divide by zero: java.lang.ArithmeticException: / by zero

D:\Saurabh>
```

14 .WAP of use multiple thread for multiple tasks.

```
// multiple task multiple thread
class Simple1 extends Thread{
 public void run(){
   System.out.println("task one");
 }
}

class Simple2 extends Thread{
 public void run(){
   System.out.println("task two");
 }
}
 class TestMultitasking3{
 public static void main(String args[]){
  Simple1 t1=new Simple1();
  Simple2 t2=new Simple2();

  t1.start();
  t2.start();
 } }
```

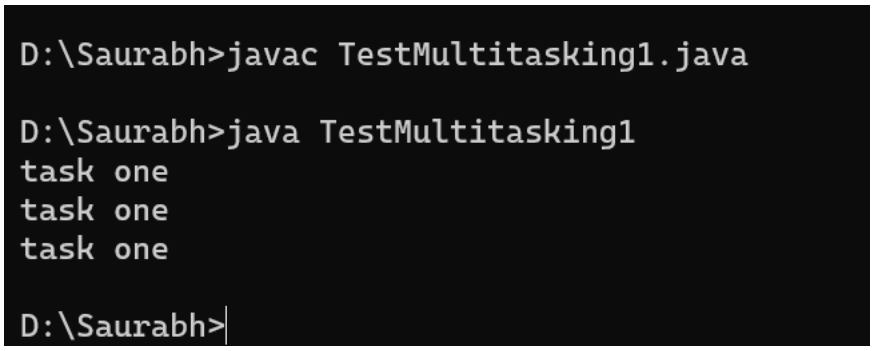
OUTPUT:



15. WAP of Create MultipleThread for Singletask .

```
// single task multiple thread
class  TestMultitasking1 extends Thread{
        public void run()
        {
                System.out.println("task one");
        }
        public static void main(String args[])
        {
                TestMultitasking1 t1 =new TestMultitasking1();
                TestMultitasking1 t2 =new TestMultitasking1();
                TestMultitasking1 t3 =new TestMultitasking1();

                t1.start();
                t2.start();
                t3.start();
        }
}
```

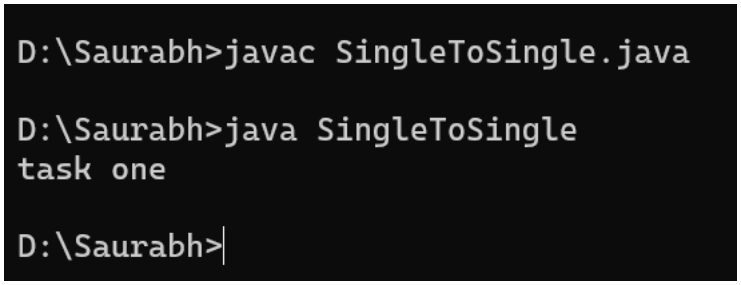
OUTPUT:



16 .WAP of use single thread for single .

```
 class SingleThread extends Thread {
  public void run() {
    System.out.println("task one");
  }
}

class SingleToSingle {
  public static void main(String args[]) {
    SingleThread t1 = new SingleThread();
    t1.start();
  }
}
```

OUTPUT:



17. WAP to create a Thread and use the setName , getName , activeCount , setPriority & getPriority method.

```
public class MyThread extends Thread {
   @Override
   public void run() {
      for (int i = 0; i < 10; i++) {
         try {
            Thread.sleep(1000);
         } catch (Exception e) {
            System.out.println(e);
         }
         System.out.println(i);
      }
   }

   public static void main(String[] args) {
      MyThread mt = new MyThread();
      // mt.run();
      mt.start();
      mt.setName("Saurabh");       // rename thread
      System.out.println(mt.getName());   // print name of thread
      System.out.println(Thread.activeCount());   // count threads
      mt.setPriority(4);
      System.out.println(mt.getPriority());
   }
}
```

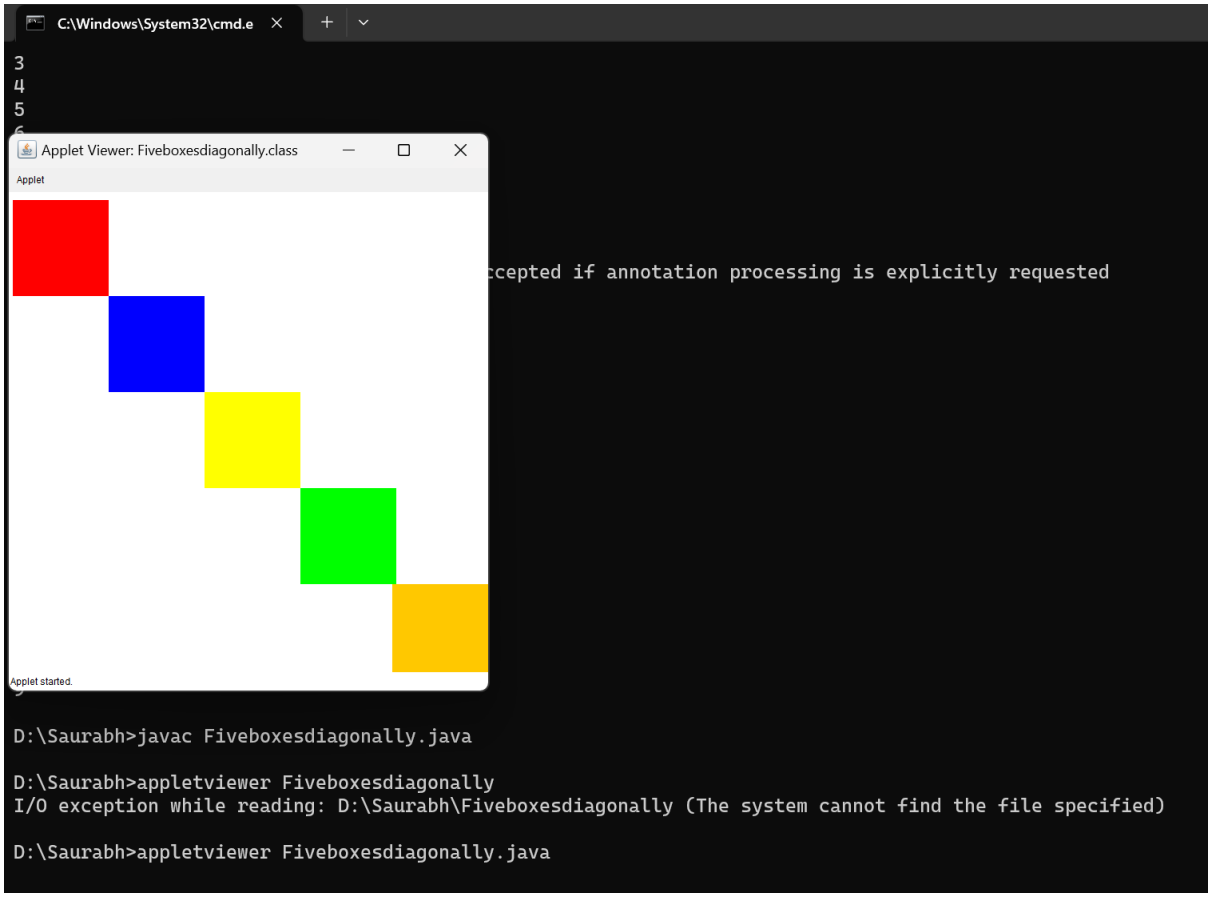
OUTPUT:


D:\Saurabh>javac MyThread.java
D:\Saurabh>java MyThread
Saurabh
2
4
0
1
2
3
4
5
6
7
8
9
D:\Saurabh>

18. WAP to make 5 different coloured boxes & display diagonally.

```
import java.applet.Applet;
import java.awt.*;
public class Fiveboxesdiagonally extends Applet {
    public void paint(Graphics g) {
        g.setColor(Color.red);
        g.fillRect(5, 10, 120, 120);
        g.setColor(Color.blue);
        g.fillRect(125, 130, 120, 120);
       g.setColor(Color.yellow);
        g.fillRect(245, 250, 120, 120);
        g.setColor(Color.green);
        g.fillRect(365, 370, 120, 120);
        g.setColor(Color.orange);
        g.fillRect(480, 490, 120, 120);
}
}
/*
 * <applet code="Fiveboxesdiagonally.class" width=600 height=600>
 *  </applet>
 */
```

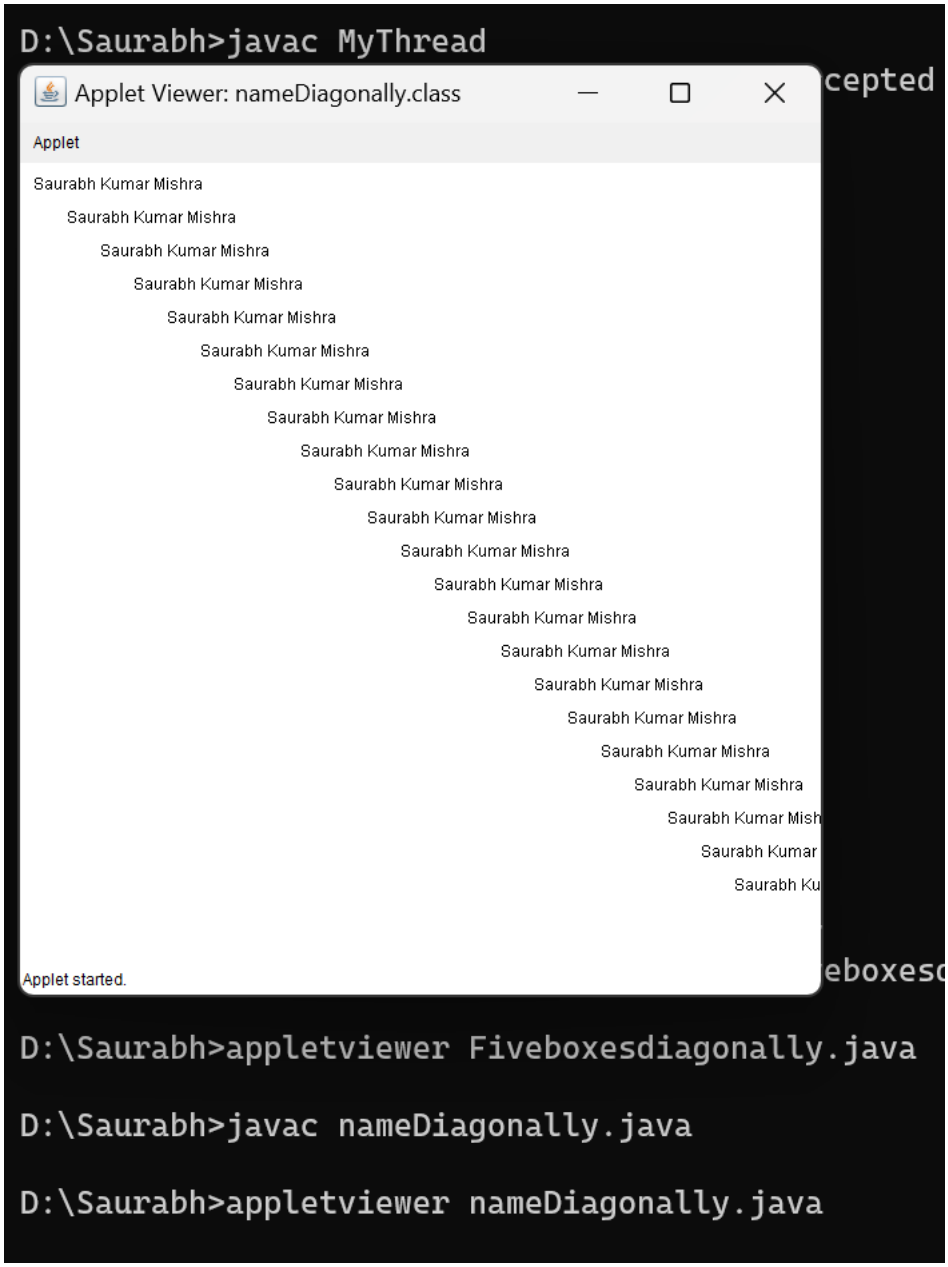
OUTPUT:


C:\Windows\System32\cmd.e
3
4
5
Applet Viewer: Fiveboxesdiagonally.class
Applet
Applet started.
ccepted if annotation processing is explicitly requested
D:\Saurabh>javac Fiveboxesdiagonally.java
D:\Saurabh>appletviewer Fiveboxesdiagonally
I/O exception while reading: D:\Saurabh\Fiveboxesdiagonally (The system cannot find the file specified)
D:\Saurabh>appletviewer Fiveboxesdiagonally.java

19. WAP to print multiple hello world diagonally in a java applet.

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

public class nameDiagonally  extends Applet {
   public void paint(Graphics g) {
      for (int i = 10; i <= 557; i = i++) {
         int x = 0, y = 10;
         g.drawString("Saurabh Kumar Mishra", x + i, y + i);
         i = i + 25;
      }
   }

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

OUTPUT:


D:\Saurabh>javac MyThread
cepted
Applet Viewer: nameDiagonally.class
Applet
Saurabh Kumar Mishra
Saurabh Kumar Mishra
Saurabh Kumar Mishra
Saurabh Kumar Mishra
Saurabh Kumar Mishra
Saurabh Kumar Mishra
Saurabh Kumar Mishra
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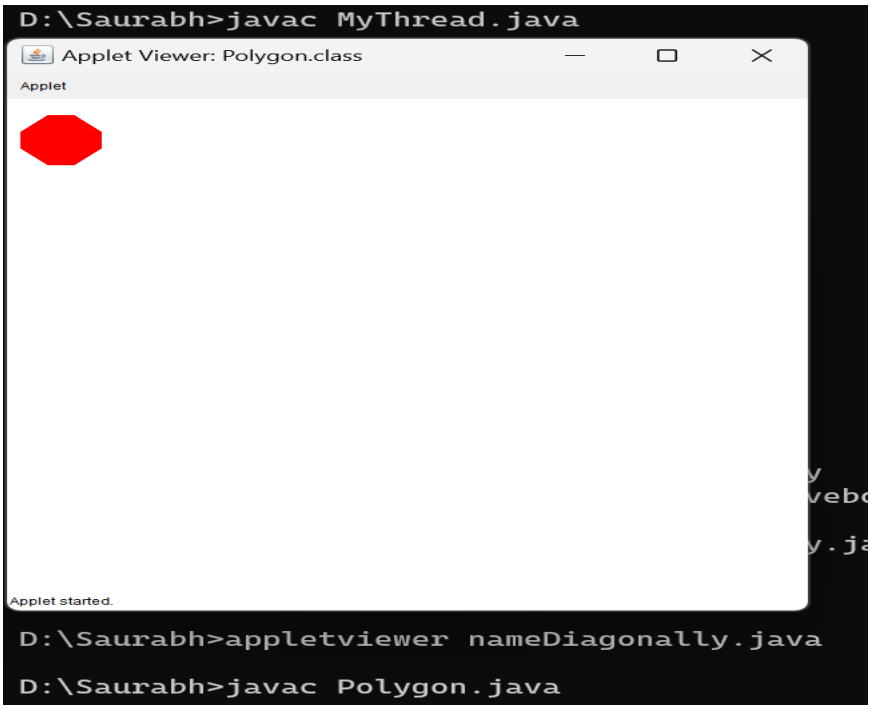
Saurabh Ku
Applet started.
eboxesd
D:\Saurabh>appletviewer Fiveboxesdiagonally.java
D:\Saurabh>javac nameDiagonally.java
D:\Saurabh>appletviewer nameDiagonally.java

20.WAP to display a Octagon (Polygon).

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


public class Polygon extends Applet {


    public void paint(Graphics g) {
        int x[] = { 10, 10, 30, 50, 70, 70, 50, 30 };
        int y[] = { 40, 60, 80, 80, 60, 40, 20, 20 };
        int n = 8;
         g.setColor(Color.red);
         g.fillPolygon(x, y, n);
        g.drawPolygon(x, y, n);


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

OUTPUT:

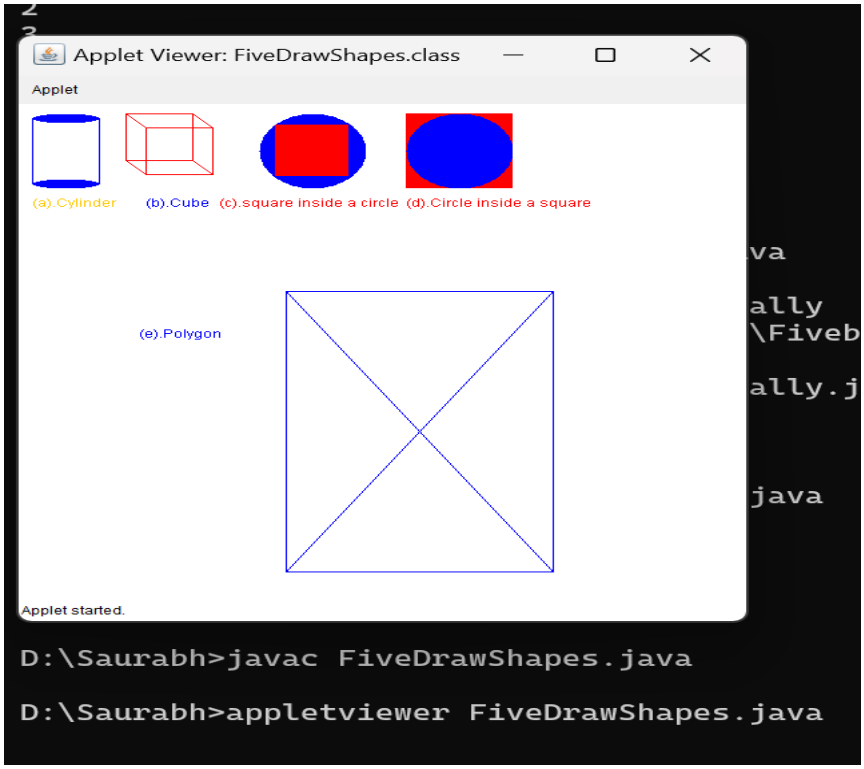


21. WAP to display a Cylinder, Cube , Square in circle , Circle in Square, Polygon

```
import java.applet.Applet;
import java.awt.*;

public class FiveDrawShapes extends Applet {

   public void init() {

   setBackground(Color.white);

   setForeground(Color.orange);

   }

   public void paint(Graphics g) {

   //Drawing Cylinder//

   g.drawString("(a).Cylinder",10,110);

   g.setColor(Color.blue);

   g.fillOval(10,10,50,10);

   g.setColor(Color.blue);

   g.fillOval(10,80,50,10);

   g.drawLine(10,15,10,85);

   g.drawLine(60,15,60,85);

   //Drawing Cube//

    g.drawString("(b).Cube",95,110);

    g.setColor(Color.red);

    g.drawRect(80,10,50,50);

    g.drawRect(95,25,50,50);

    g.drawLine(80,10,95,25);

    g.drawLine(130,10,145,25);

    g.drawLine(80,60,95,75);

    g.drawLine(130,60,145,75);

   //Drawing Square inside a circle.//

   g.drawString("(c).square inside a circle",150,110);

   g.setColor(Color.blue);
```

```
    g.fillOval(180,10,80,80);
    g.setColor(Color.red);
    g.fillRect(192,22,55,55);
   //Drawing circle inside a square//
    g.drawString("(d).Circle inside a square",290,110);
    g.setColor(Color.red);
    g.fillRect(290,10,80,80);
    g.setColor(Color.blue);
    g.fillOval(290,10,80,80);
   //Drawing Polygon//
    g.drawString("(e).Polygon",90,250);
    g.drawLine(200,200,200,500);
    g.drawLine(400,200,400,500);
    int a[] = {200,400,200,400};
    int b[] = {200,500,500,200};
    g.drawPolygon(a,b,4);
    }
}
/* <applet code = "FiveDrawShapes.class" width = "900" height = "900">
  </applet>
*/
```

OUTPUT:


Applet Viewer: FiveDrawShapes.class
Applet
(a).Cylinder
(b).Cube
(c).square inside a circle
(d).Circle inside a square
(e).Polygon
Applet started.
D:\Saurabh>javac FiveDrawShapes.java
D:\Saurabh>appletviewer FiveDrawShapes.java

22.WAP to use MyMouseEvents

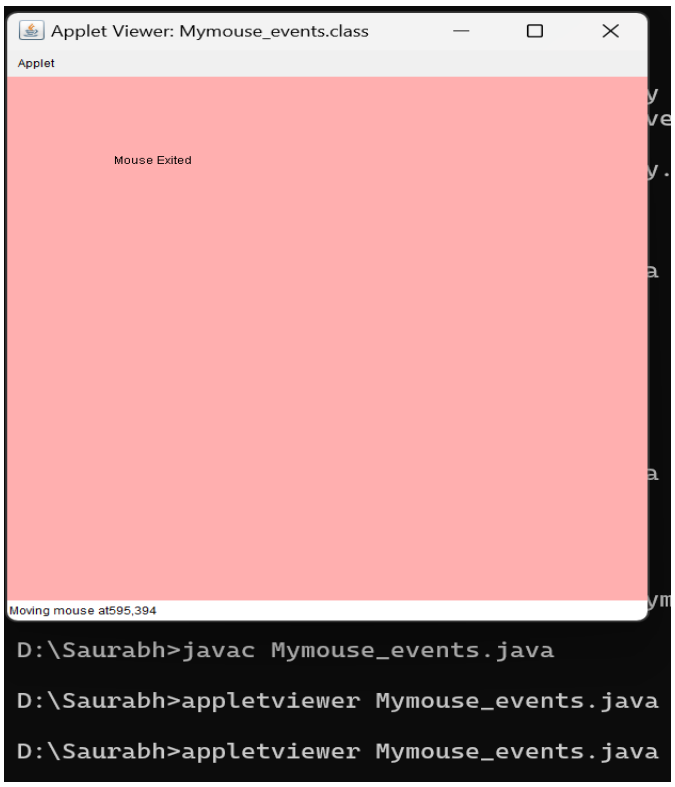
```
import java.awt.*;
import java.applet.*;
import java.awt.event.*;

public class Mymouse_events extends Applet implements MouseListener,
MouseMotionListener {
   int x = 0, y = 0;
   String msg = "";

   public void init() {
      setBackground(Color.magenta);
      addMouseListener(this);
      addMouseMotionListener(this);
   }

   // handle mouse Entered
   public void mouseEntered(MouseEvent me) {
      setBackground(Color.red);
      x = 100;
      y = 100;
      msg = "Mouse Entered ";
      repaint();

   }

   // handle mouse clicked
   public void mouseClicked(MouseEvent me) {
      setBackground(Color.darkGray);
      x = 100;
```

```
    y = 100;
    msg = "Mouse Clicked";
    repaint();
}
//handle mouse Exited
public void mouseExited(MouseEvent me) {
    setBackground(Color.pink);
    x = 100;
    y = 100;
    msg = "Mouse Exited";
    repaint();
}

// handle mouse pressed
public void mousePressed(MouseEvent me) {
    setBackground(Color.cyan);
    x = me.getX();
    y = me.getY();
    msg = "Mouse Pressed";
    repaint();
}

// handle mouse released
public void mouseReleased(MouseEvent me) {
    setBackground(Color.green);
    x = me.getX();
    y = me.getY();
    msg = "Mouse Released";
    repaint();
```

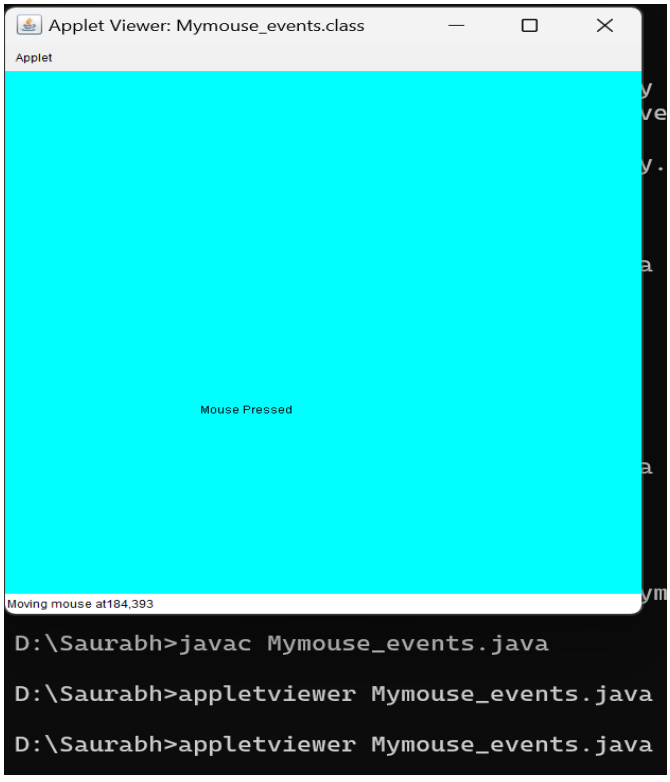
```
    }

    // handle mouse moved
    public void mouseMoved(MouseEvent me) {
        setBackground(Color.orange);
        x = me.getX();
        y = me.getY();
        msg = "Mouse Moved";
        showStatus("Moving mouse at" + x + "," + y);
        repaint();
    }

    // handle mouse dragged
    public void mouseDragged(MouseEvent me) {
        setBackground(Color.yellow);
        x = me.getX();
        y = me.getY();
        msg = "Mouse Dragged";
        showStatus("Dragging mouse at" + x + "," + y);
        repaint();
    }

    // display msg in the window
    public void paint(Graphics g) {
        g.drawString(msg, x, y);
    }
}
// <applet code="Mymouse_events.class" height="600" width="600">
// </applet>
```

OUTPUT:

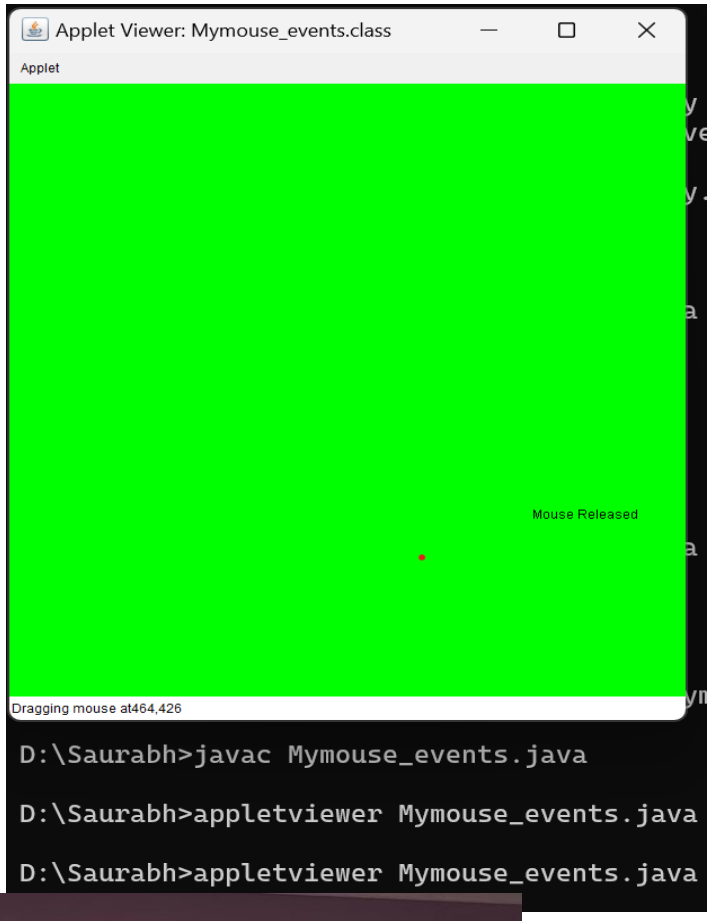

Applet Viewer: Mymouse_events.class
Applet
Mouse Moved
Moving mouse at341,77
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java

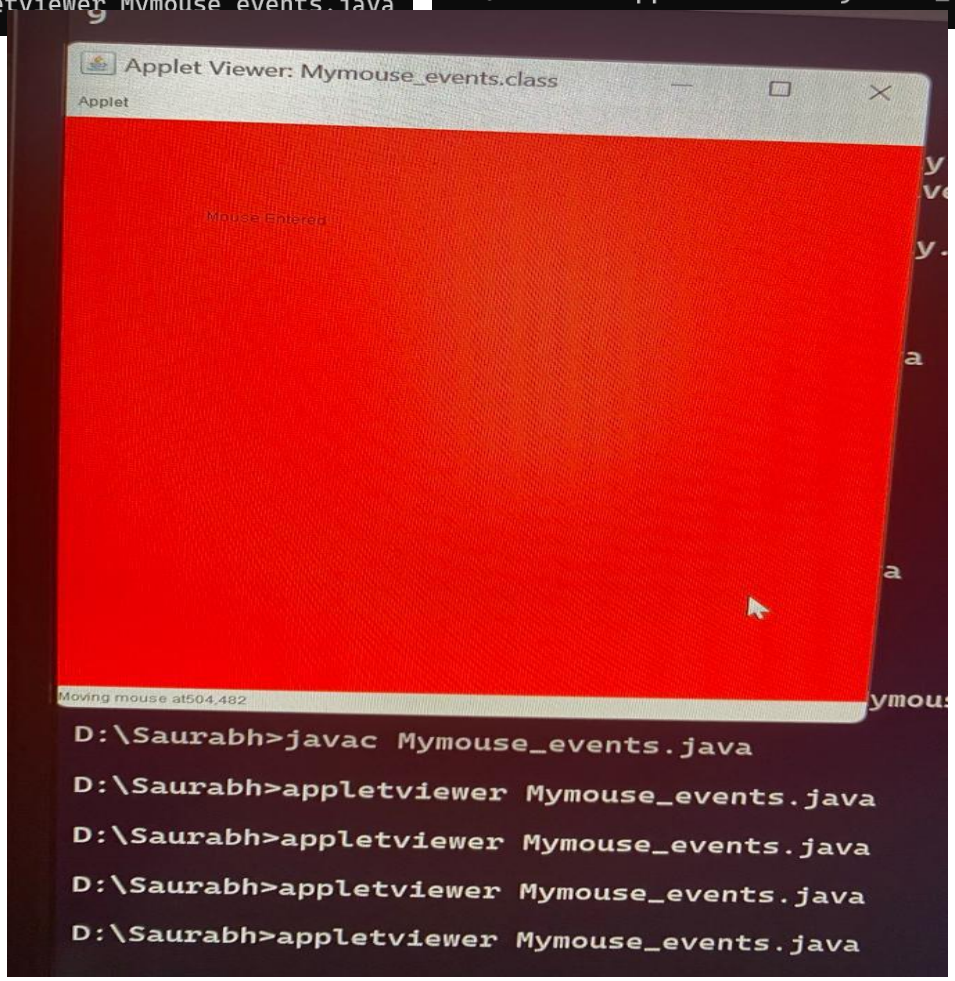

Applet Viewer: Mymouse_events.class
Applet
Mouse Exited
Moving mouse at595,394
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java


Applet Viewer: Mymouse_events.class
Applet
Mouse Dragged
Dragging mouse at379,411
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java


Applet Viewer: Mymouse_events.class
Applet
Mouse Pressed
Moving mouse at184,393
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java


Applet Viewer: Mymouse_events.class
Applet
Mouse Clicked
Moving mouse at254,290
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java


Applet Viewer: Mymouse_events.class
Applet
Mouse Released
Dragging mouse at464,426
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java

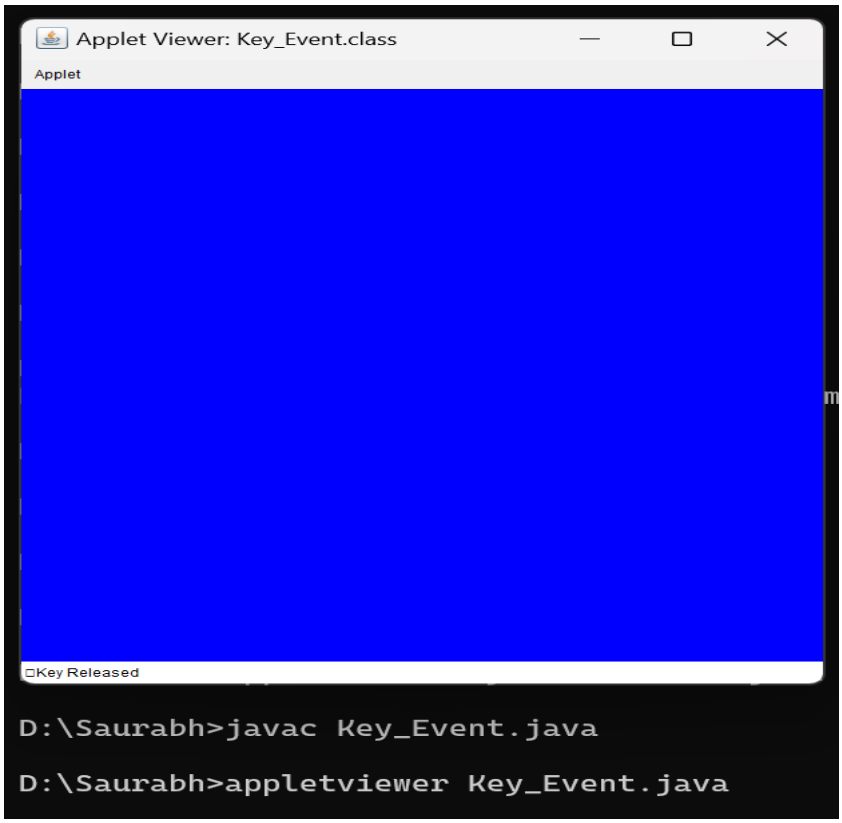

Applet Viewer: Mymouse_events.class
Applet
Mouse Entered
Moving mouse at504,482
D:\Saurabh>javac Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java
D:\Saurabh>appletviewer Mymouse_events.java

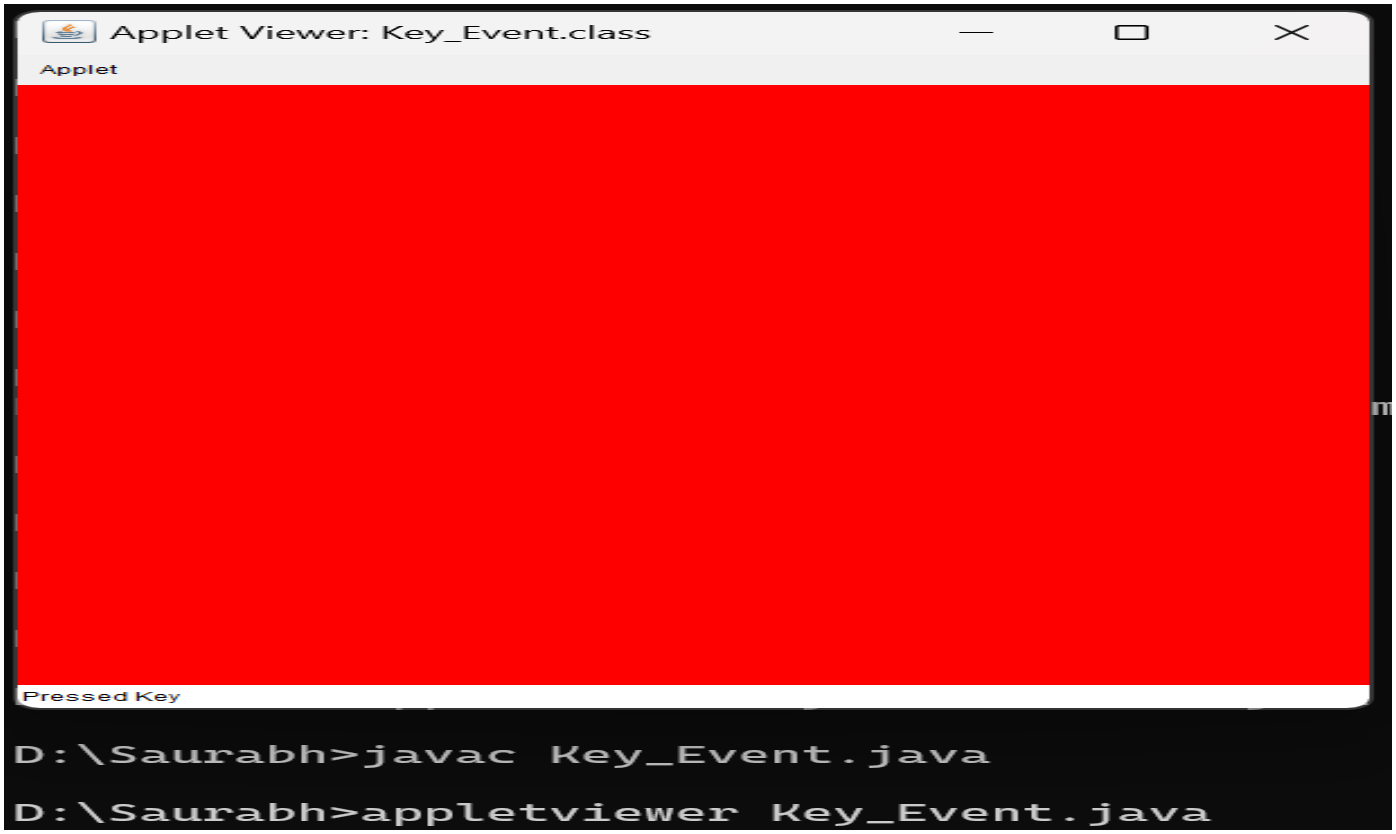
23.WAP to use KeyEvent

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

public class Key_Event extends Applet implements KeyListener {
   int x = 150, y = 150;
   String msg = "";

   public void init() {
      setBackground(Color.magenta);
      setForeground(Color.white);
      addKeyListener(this);
      requestFocus();
   }

   public void keyPressed(KeyEvent ke) {
      showStatus("Pressed Key");
      setBackground(Color.red);
      setForeground(Color.white);
      repaint();
   }

   public void keyReleased(KeyEvent ke) {
      showStatus(ke.getKeyChar() + "Key Released");
      setBackground(Color.blue);
      setForeground(Color.darkGray);
      repaint();
   }
```

```
    public void keyTyped(KeyEvent ke) {
        showStatus(ke.getKeyChar() + "Key Typed");
        setBackground(Color.green);
        setForeground(Color.yellow);
        repaint();
    }

    public void paint(Graphics g) {
        g.drawString(msg, x, y);
    }
}
// <applet code="Key_Event.class" height="600" width="600">
// </applet>
```

OUTPUT:




Applet Viewer: Key_Event.class
Applet
Pressed Key
D:\Saurabh>javac Key_Event.java
D:\Saurabh>appletviewer Key_Event.java

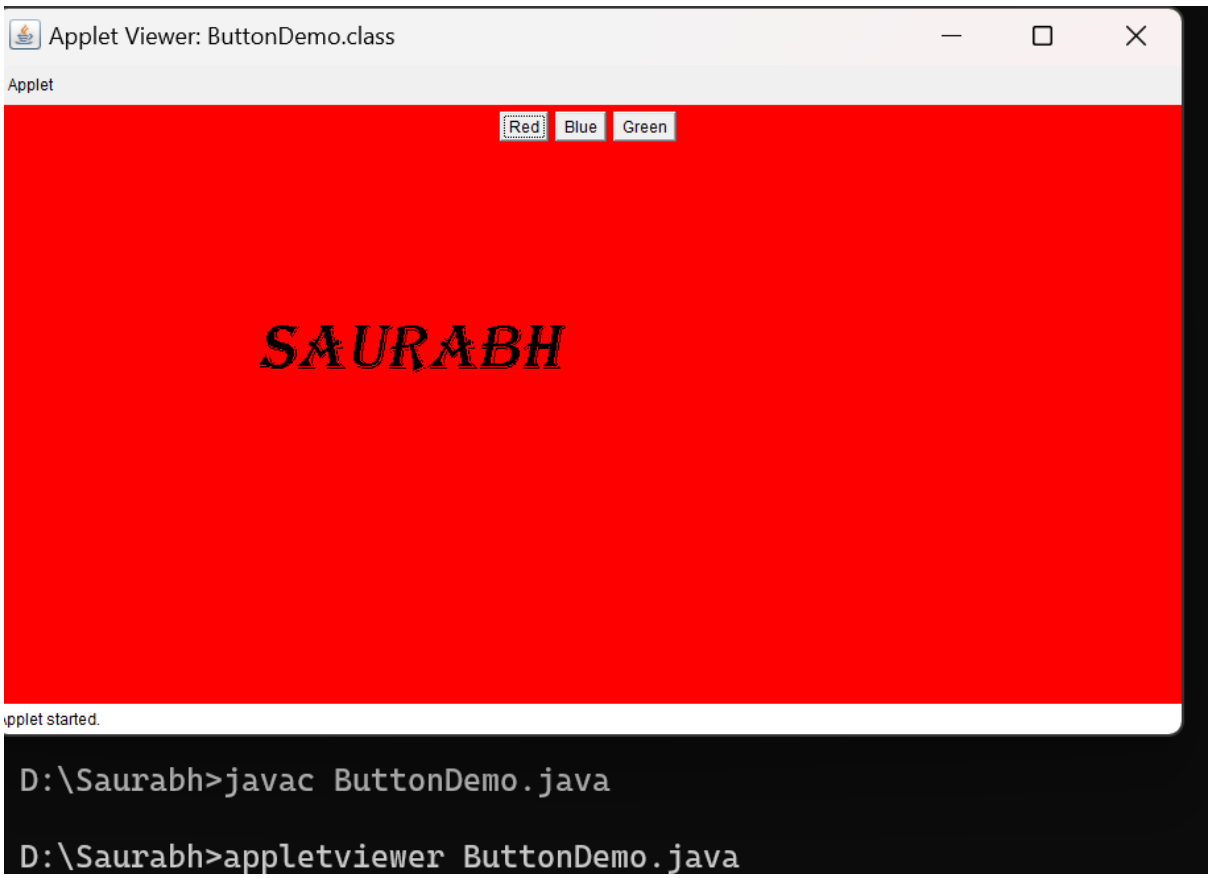

Applet Viewer: Key_Event.class
Applet
cKey Typed
D:\Saurabh>javac Key_Event.java
D:\Saurabh>appletviewer Key_Event.java

24.WAP to use ButtonDemo

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


public class ButtonDemo extends Applet implements ActionListener
{
	public void init()
	{
		Button b1=new Button("Red");
		Button b2=new Button("Blue");
		Button b3=new Button("Green");

		add(b1);
		add(b2);
		add(b3);

		b1.addActionListener(this);
		b2.addActionListener(this);
		b3.addActionListener(this);
	}
		public void paint(Graphics g)
	  {
		Font f =new Font("Algerian",2,50);
		g.setFont(f);
			g.drawString("Saurabh",200,200);
	  }
		public void actionPerformed(ActionEvent ae)
		{
			String str = ae.getActionCommand();
```

```
                    if(str.equals("Red"))
                    setBackground(Color.red);
                    else if(str.equals("Blue"))
                    setBackground(Color.blue);
                    else
                    setBackground(Color.green);

                }

}
/* <applet code = "ButtonDemo.class" width = "900" height = "900">
  </applet>
*/
```

OUTPUT:




Applet Viewer: ButtonDemo.class
Applet
Red
Blue
Green
SAURABH
pplet started.
D:\Saurabh>javac ButtonDemo.java
D:\Saurabh>appletviewer ButtonDemo.java


Applet Viewer: ButtonDemo.class
Applet
Red
Blue
Green
SAURABH
pplet started.
D:\Saurabh>javac ButtonDemo.java
D:\Saurabh>appletviewer ButtonDemo.java

25.WAP to use ButtonDemoText

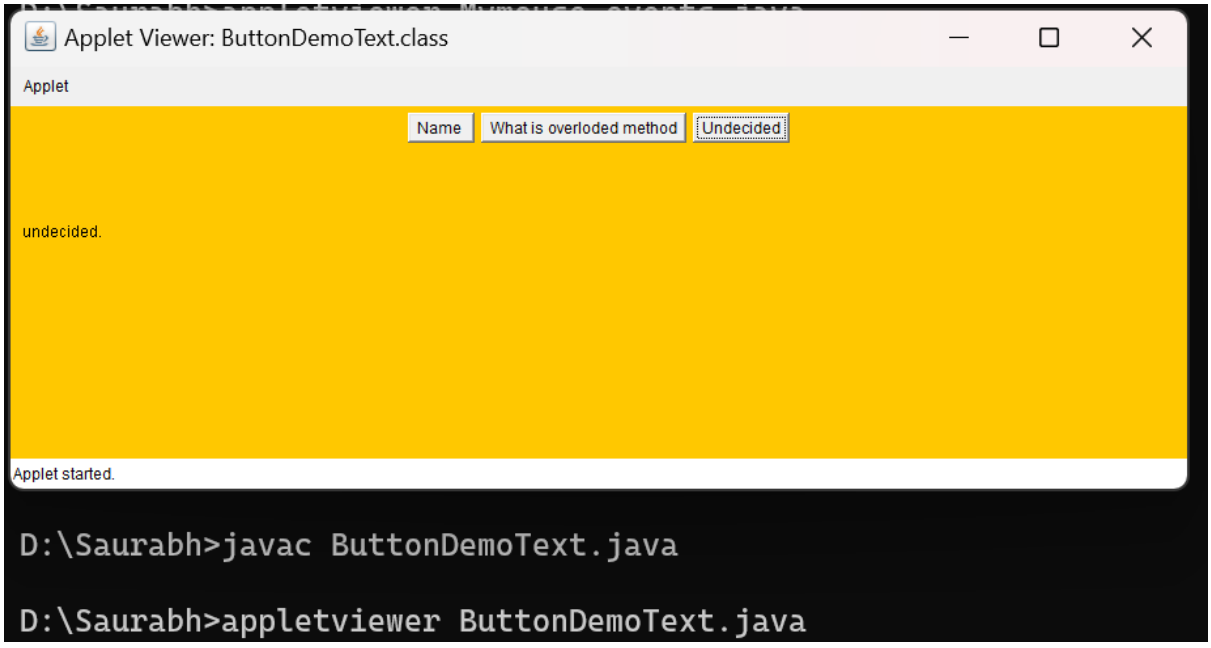
```
import java.awt.*;
import java.applet.Applet;
import java.awt.event.*;


public class ButtonDemoText extends Applet implements ActionListener
{
	String msg= " ";
	Button yes,no,maybe;

	public void init()
	{
		yes = new Button("Name ");
		no = new Button("What is overloded method");
		maybe = new Button("Undecided");

		add(yes);
		add(no);
		add(maybe);

		yes.addActionListener(this);
		no.addActionListener(this);
		maybe.addActionListener(this);
	}
	 public void actionPerformed(ActionEvent ae)
	 {
		String str=ae.getActionCommand();
		if(str.equals("Name "))
		{
			setBackground(Color.yellow);
```

```
                msg="Saurabh Mishra ";
            }
            else if(str.equals("What is overloded method"))
            {
                setBackground(Color.orange);
                msg="Two Method is said to be overloded if and only if both method having same name but different argument type .";
            }
            else{
                msg=" undecided.";
            }
            repaint();
        }
        public void paint(Graphics g)
        {
            g.drawString(msg,6,100);
        }
}
/* <applet code = "ButtonDemoText.class" width = "900" height = "900">
  </applet>
*/
```

OUTPUT:


Applet Viewer: ButtonDemoText.class
Applet
Name
What is overloded method
Undecided
Saurabh Mishra
Applet started.
D:\Saurabh>javac ButtonDemoText.java
D:\Saurabh>appletviewer ButtonDemoText.java


Applet Viewer: ButtonDemoText.class
Applet
Name
What is overloded method
Undecided
Two Method is said to be overloded if and only if both method having same name but different argument type .
Applet started.
D:\Saurabh>javac ButtonDemoText.java
D:\Saurabh>appletviewer ButtonDemoText.java


Applet Viewer: ButtonDemoText.class
Applet
Name
What is overloded method
Undecided
undecided.
Applet started.
D:\Saurabh>javac ButtonDemoText.java
D:\Saurabh>appletviewer ButtonDemoText.java

26.WAP to make SpiralMatrix

```
import java.io.*;
import java.util.*;


class SpiralMatrix {


        static int R = 5;
          static int C = 8;


                  static void counterClockspiralPrint(int m,int n,int arr[][])
          {
             int i, k = 0, l = 0;



             int cnt = 0;



             int total = m * n;


             while (k < m && l < n)
             {
                if (cnt == total)
                   break;



                for (i = k; i < m; ++i)
                {
                   System.out.print(arr[i][l] + " ");
                   cnt++;
                }
```

```
l++;

if (cnt == total)
   break;


for (i = l; i < n; ++i)
{
   System.out.print(arr[m - 1][i] + " ");
   cnt++;
}
m--;

if (cnt == total)
   break;

if (k < m)
{
   for (i = m - 1; i >= k; --i)
   {
      System.out.print(arr[i][n - 1] + " ");
      cnt++;
   }
   n--;
}

if (cnt == total)
   break;
```

```
            if (l < n)
            {
               for (i = n - 1; i >= l; --i)
               {
                  System.out.print(arr[k][i] + " ");
                  cnt++;
               }
               k++;
            }
         }
      }

   public static void main(String[] args) {
         // TODO Auto-generated method stub
         int arr[][]= {{1,2,3,4,5,6,7,8},
                              {9,10,11,12,13,14,15,16},
                  {17,18,19,20,21,22,23,24},
                  {25,26,27,28,29,30,31,32,},
                  {33,34,35,36,37,38,39,40}};
         counterClockspiralPrint(R, C,arr);
   }
}
```

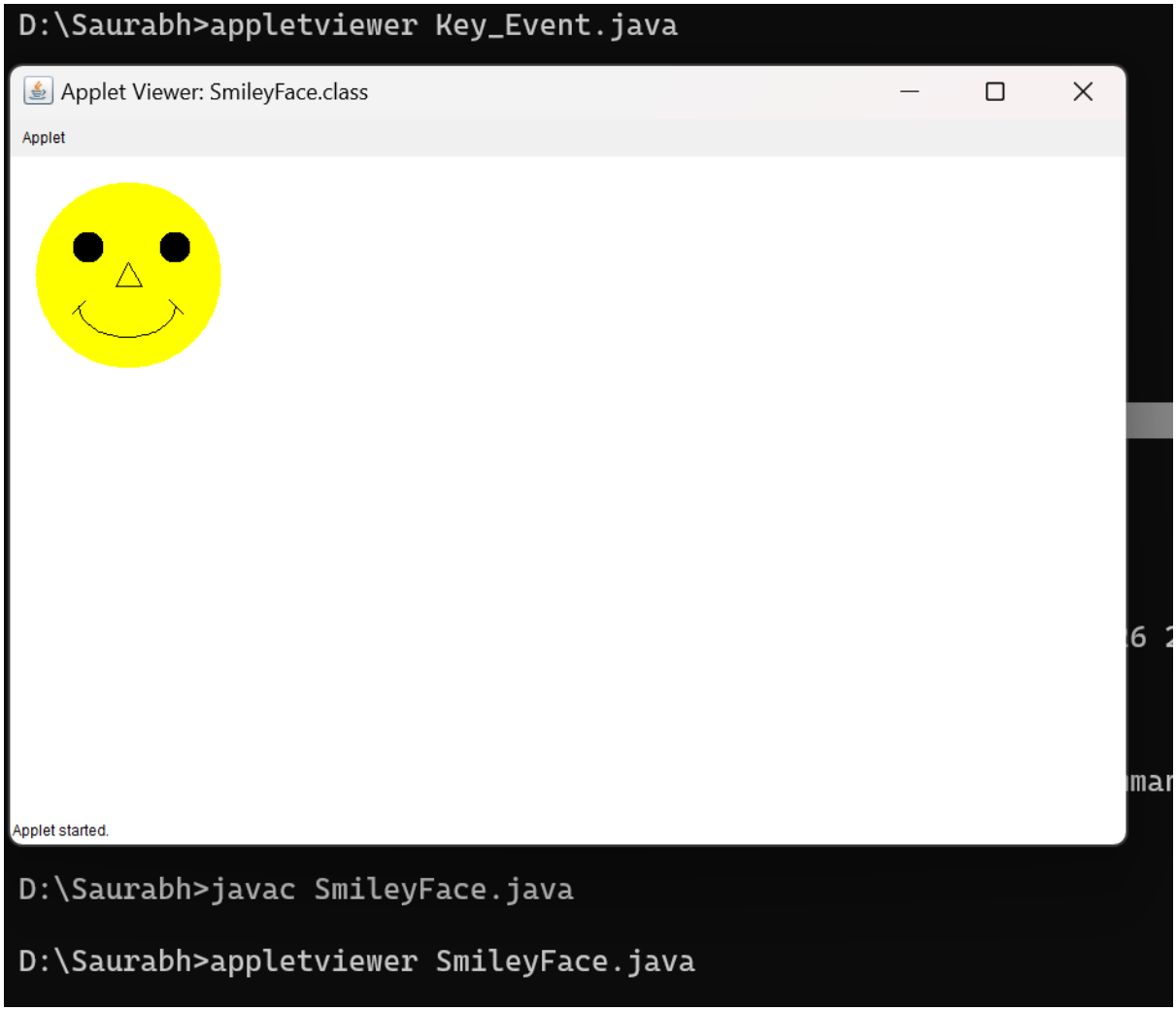
OUTPUT:

```
D:\Saurabh>javac SpiralMatrix.java

D:\Saurabh>java SpiralMatrix
1 9 17 25 33 34 35 36 37 38 39 40 32 24 16 8 7 6 5 4 3 2 10 18 26 27 28 29 30 31 23 15 14 13 12 11 19 20 21 22
D:\Saurabh>
```

27. WAP to make SmileyFace

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


public class SmileyFace extends Applet {
	public void paint(Graphics g)
	{
		g.setColor(Color.yellow);
		g.fillOval(20,20,150,150);
		g.setColor(Color.black);
		g.fillOval(50,60,25,25);
		g.fillOval(120,60,25,25);

		int x[]={95,85,106,95};
		int y[]={85,104,104,85};

		g.drawPolygon(x,y,4);
		g.drawArc(55,95,78,50,0,-180);
		g.drawLine(50,126,60,116);
		g.drawLine(128,115,139,126);
	}
}
/* <applet code = "SmileyFace.class" width = "900" height = "900">
  </applet>
  */
```

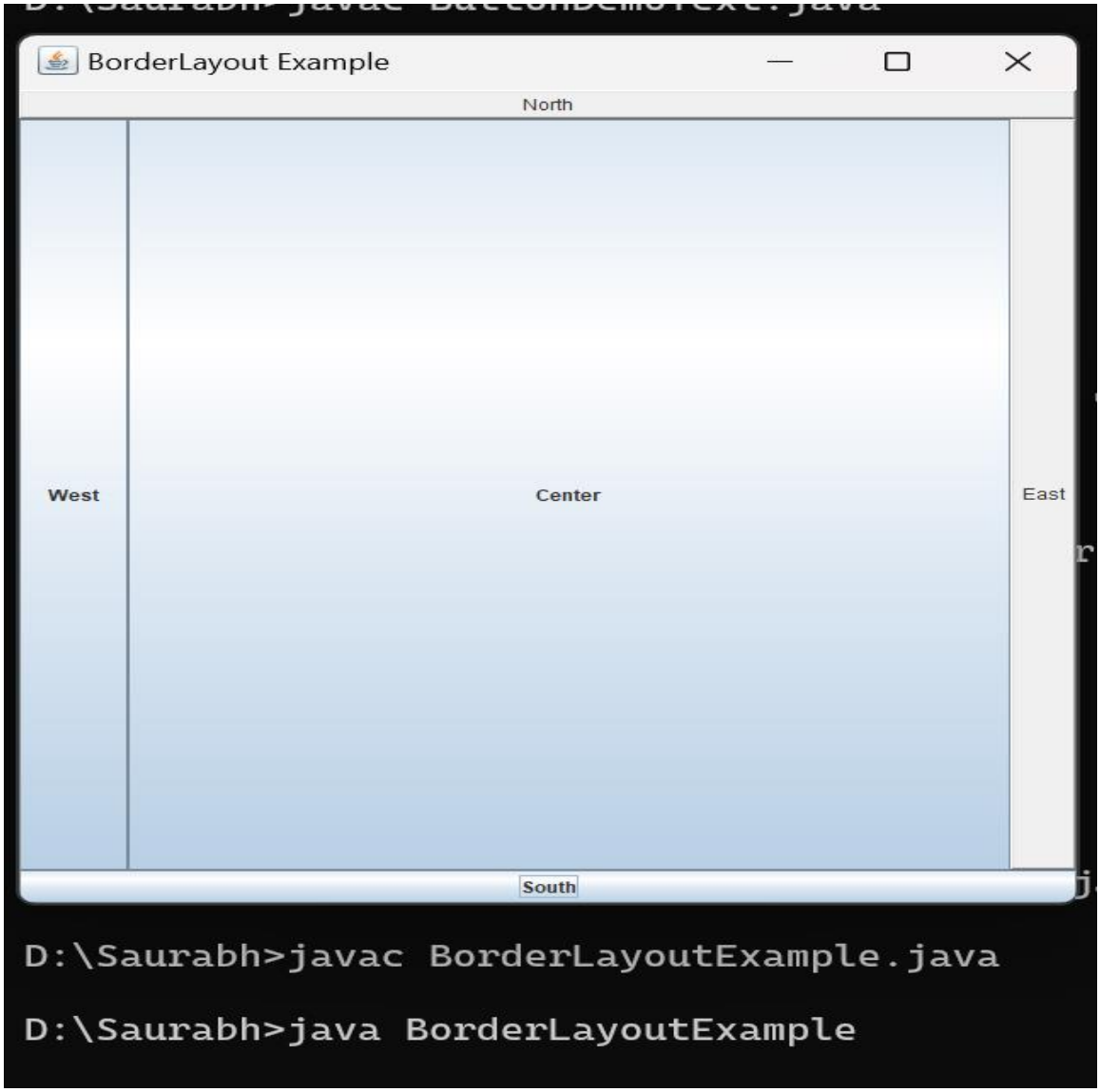
OUTPUT:


D:\Saurabh>appletviewer Key_Event.java
Applet Viewer: SmileyFace.class
Applet
Applet started.
D:\Saurabh>javac SmileyFace.java
D:\Saurabh>appletviewer SmileyFace.java

28.WAP to make BorderLayout

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

public class BorderLayoutExample {

   public static void main(String[] args) {

      JFrame frame = new JFrame("BorderLayout Example");

      frame.setSize(550, 550);

      JPanel panel = new JPanel();

      panel.setLayout(new BorderLayout()); // create a border layout

      // add buttons to the panel in different regions

      panel.add(new Button("North"), BorderLayout.NORTH);

      panel.add(new JButton("South"), BorderLayout.SOUTH);

     panel.add(new JButton("West"), BorderLayout.WEST);
      panel.add(new Button("East"), BorderLayout.EAST);

      panel.add(new JButton("Center"), BorderLayout.CENTER);


      frame.add(panel); // add the panel to the frame


      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

      frame.pack(); // adjust the size of the frame to fit the components

      frame.setVisible(true); // show the frame


   }

}
```

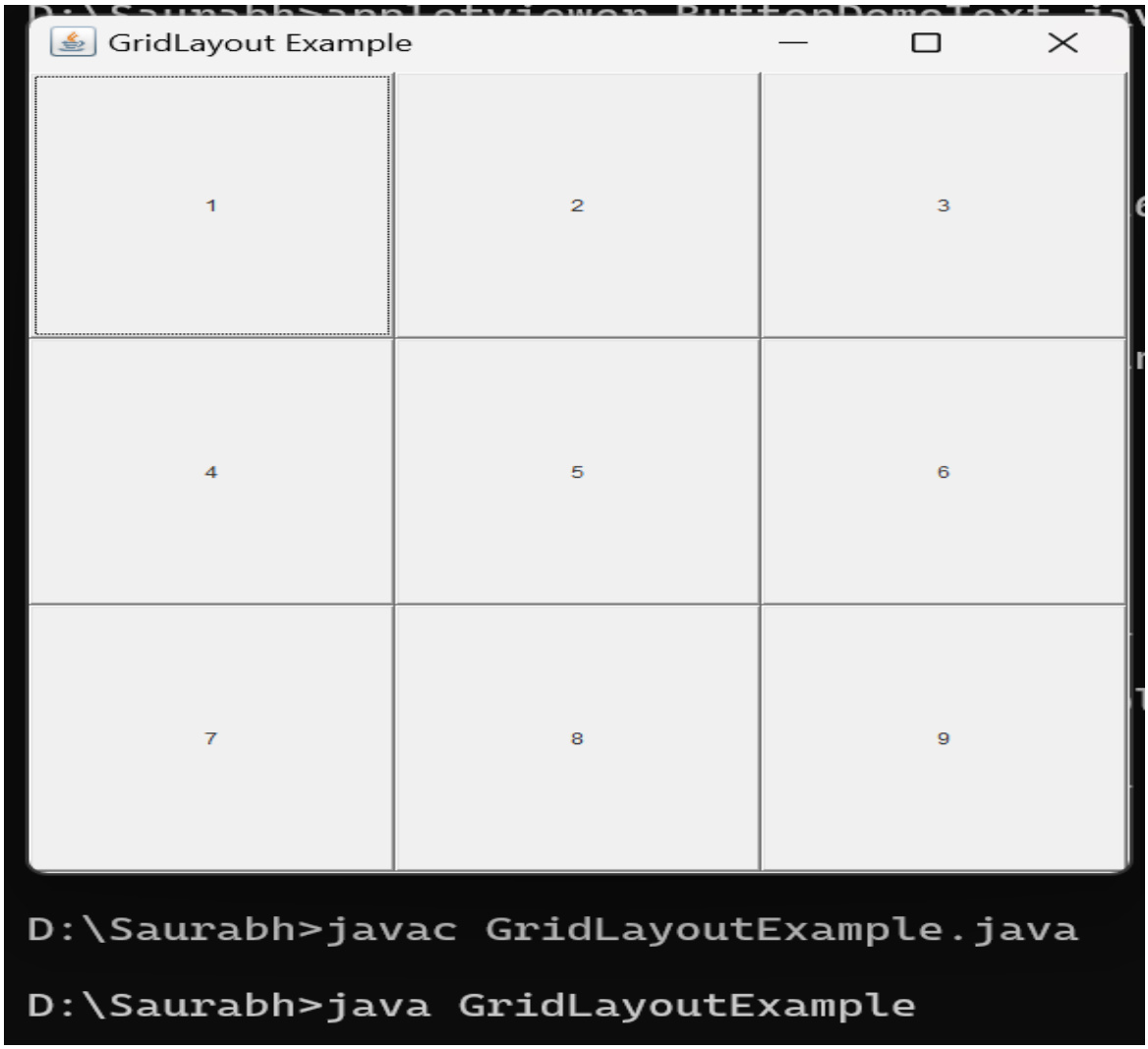
OUTPUT:


BorderLayout Example
North
West
Center
East
South
D:\Saurabh>javac BorderLayoutExample.java
D:\Saurabh>java BorderLayoutExample

29 .WAP to make GridLayout

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


public class GridLayoutExample {
   public static void main(String[] args) {
      JFrame frame = new JFrame("GridLayout Example");
      frame.setSize(550, 550);
      JPanel panel = new JPanel();
      panel.setLayout(new GridLayout(3, 3)); // create a grid layout
      // add buttons to the panel in different regions
      panel.add(new Button("1"));
      panel.add(new Button("2"));
      panel.add(new Button("3"));
      panel.add(new Button("4"));
      panel.add(new Button("5"));
      panel.add(new Button("6"));
      panel.add(new Button("7"));
      panel.add(new Button("8"));
      panel.add(new Button("9"));


      frame.add(panel); // add the panel to the frame


      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.pack(); // adjust the size of the frame to fit the components
      frame.setVisible(true); // show the frame


   }
}
```

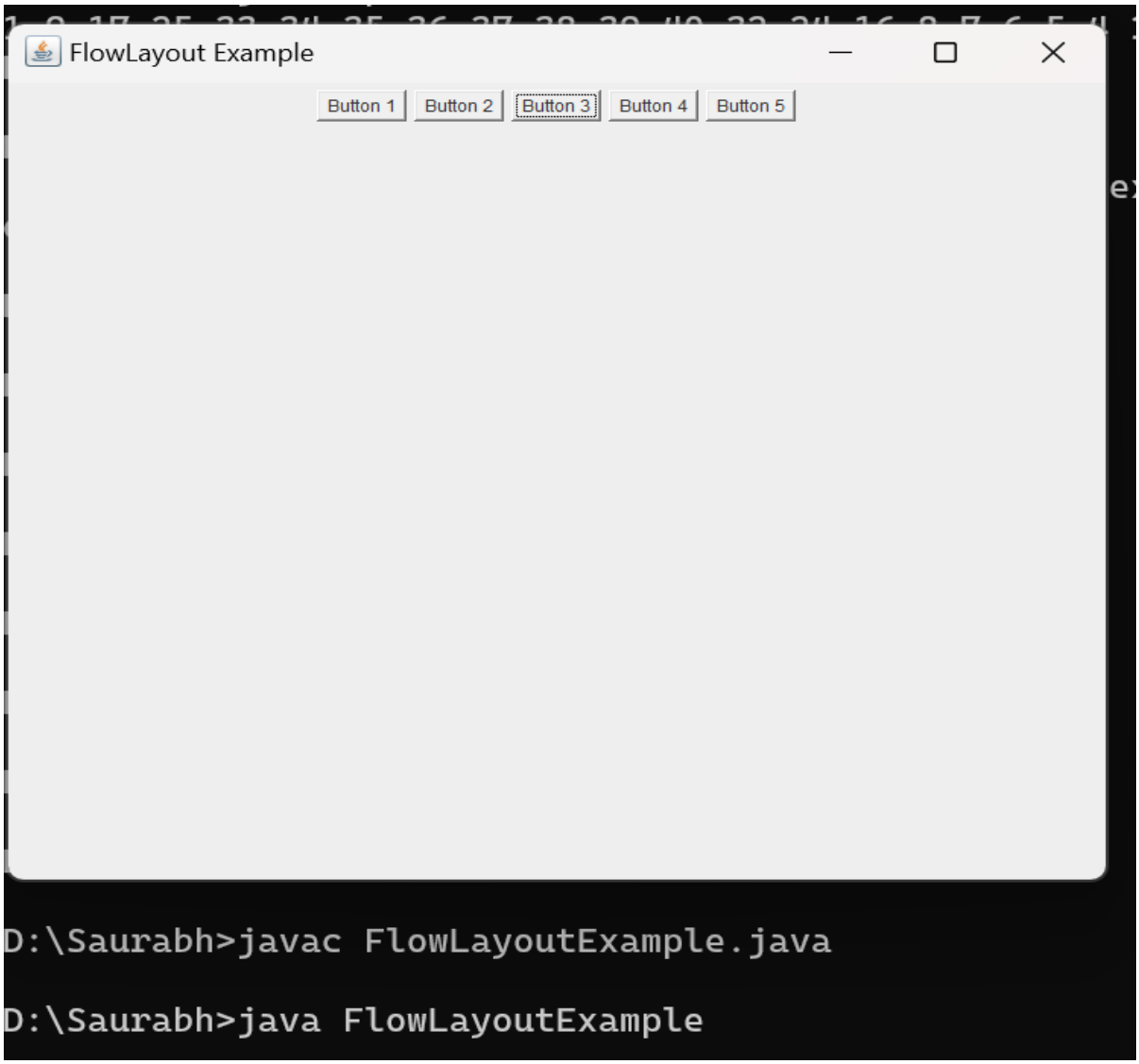
OUTPUT:


GridLayout Example
1
2
3
4
5
6
7
8
9
D:\Saurabh>javac GridLayoutExample.java
D:\Saurabh>java GridLayoutExample

30.WAP to make FlowLayout

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


public class FlowLayoutExample {
   public static void main(String[] args) {
      JFrame frame = new JFrame("FlowLayout Example");
      frame.setSize(550, 550);
      JPanel panel = new JPanel();
      panel.setLayout(new FlowLayout()); // create a flow layout
      // add buttons to the panel in different regions
      panel.add(new Button("Button 1"));
      panel.add(new Button("Button 2"));
      panel.add(new Button("Button 3"));
      panel.add(new Button("Button 4"));
      panel.add(new Button("Button 5"));

      frame.add(panel); // add the panel to the frame

      frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
      frame.pack(); // adjust the size of the frame to fit the components
      frame.setVisible(true); // show the frame

   }
}
```

OUTPUT:


FlowLayout Example
Button 1
Button 2
Button 3
Button 4
Button 5
D:\Saurabh>javac FlowLayoutExample.java
D:\Saurabh>java FlowLayoutExample

31.WAP to run a Calculator

```
import javax.swing.*;
    import java.awt.*;
    import java.awt.event.ActionEvent;
    import java.awt.event.ActionListener;


    public class Calculator implements ActionListener {
      JFrame frame;
      JTextField textfield;
      JButton[] numberButtons = new JButton[10];
      JButton[] functionButtons = new JButton[9];
      JButton addButton, subButton, mulButton, divButton;
      JButton decButton, equButton, delButton, clrButton, negButton;
      JPanel panel;

      Font myFont = new Font("Ink Free", Font.BOLD, 38);

      double num1 = 0, num2 = 0, result = 0;

      char operator;

      Calculator() {
        frame = new JFrame("Calculator");
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.setSize(420, 550);
        frame.setLayout(null);

        textfield = new JTextField();
        textfield.setBounds(50, 25, 300, 50);
        textfield.setFont(myFont);
```

```
textfield.setEditable(false);

addButton = new JButton("+");
subButton = new JButton("-");
mulButton = new JButton("*");
divButton = new JButton("/");
decButton = new JButton(".");
equButton = new JButton("=");
delButton = new JButton("Del");
clrButton = new JButton("Clr");
negButton = new JButton("(-)");

functionButtons[0] = addButton;
functionButtons[1] = subButton;
functionButtons[2] = mulButton;
functionButtons[3] = divButton;
functionButtons[4] = decButton;
functionButtons[5] = equButton;
functionButtons[6] = delButton;
functionButtons[7] = clrButton;
functionButtons[8] = negButton;

for (int i = 0; i < 9; i++) {
   functionButtons[i].addActionListener(this);
   functionButtons[i].setFont(myFont);
   functionButtons[i].setFocusable(false);
}

for (int i = 0; i < 10; i++) {
```

```
    numberButtons[i] = new JButton(String.valueOf(i));
    numberButtons[i].addActionListener(this);
    numberButtons[i].setFont(myFont);
    numberButtons[i].setFocusable(false);
}

negButton.setBounds(50, 430, 100, 50);
delButton.setBounds(150, 430, 100, 50);
clrButton.setBounds(250, 430, 100, 50);

panel = new JPanel();
panel.setBounds(50, 100, 300, 300);
panel.setLayout(new GridLayout(4, 4, 10, 10));

// Add buttons to the panel
panel.add(numberButtons[1]);
panel.add(numberButtons[2]);
panel.add(numberButtons[3]);
panel.add(addButton);
panel.add(numberButtons[4]);
panel.add(numberButtons[5]);
panel.add(numberButtons[6]);
panel.add(subButton);
panel.add(numberButtons[7]);
panel.add(numberButtons[8]);
panel.add(numberButtons[9]);
panel.add(mulButton);
panel.add(decButton);
panel.add(numberButtons[0]);
```

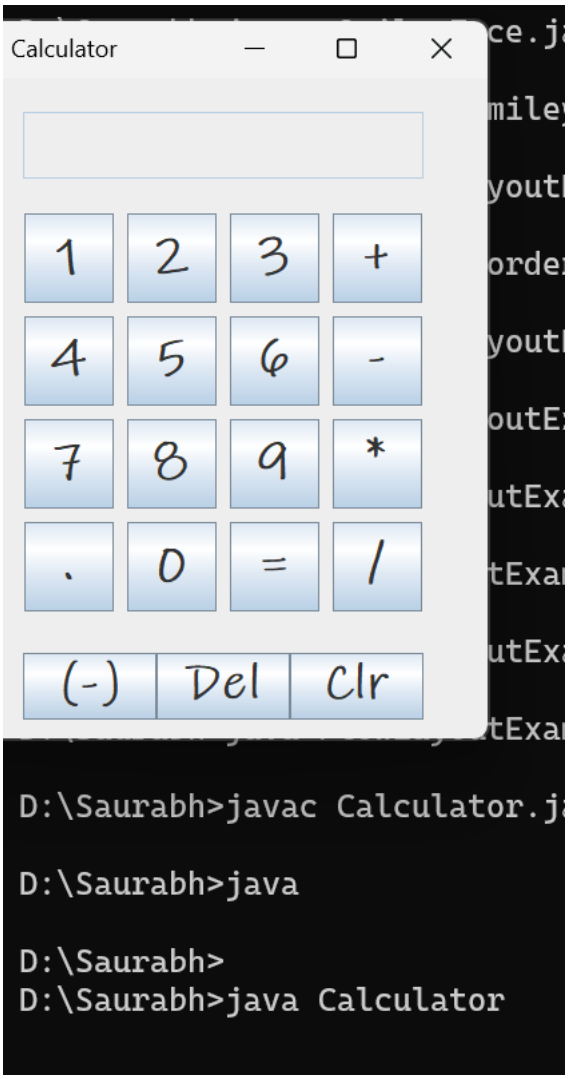
```
    panel.add(equButton);
    panel.add(divButton);

    frame.add(panel);
    frame.add(negButton);
    frame.add(delButton);
    frame.add(clrButton);
    frame.add(textfield);

    frame.setVisible(true);
    frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}

@Override
public void actionPerformed(ActionEvent e) {
    for (int i = 0; i < 10; i++) {
        if (e.getSource() == numberButtons[i]) {
            textfield.setText(textfield.getText() + i);
        }
    }

    if (e.getSource() == decButton) {
        if (!textfield.getText().contains(".")) {
            textfield.setText(textfield.getText() + ".");
        }
    }

    if (e.getSource() == addButton) {
        num1 = Double.parseDouble(textfield.getText());
```

```
    operator = '+';
    textfield.setText("");
}

if (e.getSource() == subButton) {
    num1 = Double.parseDouble(textfield.getText());
    operator = '-';
    textfield.setText("");
}

if (e.getSource() == mulButton) {
    num1 = Double.parseDouble(textfield.getText());
    operator = '*';
    textfield.setText("");
}

if (e.getSource() == divButton) {
    num1 = Double.parseDouble(textfield.getText());
    operator = '/';
    textfield.setText("");
}

if (e.getSource() == equButton) {
    num2 = Double.parseDouble(textfield.getText());

    switch (operator) {
        case '+':
            result = num1 + num2;
            break;
```

```
            case '-':
                result = num1 - num2;
                break;
            case '*':
                result = num1 * num2;
                break;
            case '/':
                if (num2 != 0) {
                    result = num1 / num2;
                } else {
                    textfield.setText("Error");
                    return;
                }
                break;
        }

        textfield.setText(String.valueOf(result));
        num1 = result;
    }

    if (e.getSource() == clrButton) {
        textfield.setText("");
    }

    if (e.getSource() == delButton) {
        String currentText = textfield.getText();
        if (!currentText.isEmpty()) {
            textfield.setText(currentText.substring(0, currentText.length() - 1));
        }
```

```
        }

        if (e.getSource() == negButton) {
            double currentValue = Double.parseDouble(textfield.getText());
            textfield.setText(String.valueOf(-currentValue));
        }
    }

    public static void main(String[] args) {
        new Calculator();
    }
}

/*
    <applet code = "AppletDec" width=500  height= 500></applet>
 */
```

OUTPUT:


Calculator
1
2
3
+
4
5
6
-
7
8
9
*
.
0
=
/
(-)
Del
Clr
D:\Saurabh>javac Calculator.j
D:\Saurabh>java
D:\Saurabh>
D:\Saurabh>java Calculator