Practical No:1

```
import java.util.Scanner;
class Fibonacciseries
{
   public static void main(String[] args)
   {
      Scanner sc=new Scanner(System.in);
      System.out.print("Enter Number=");
      int count=sc.nextInt();
      int n1=0;
      int n2=1;
      System.out.println(n1);
      System.out.println(n2);
      for(int i=2;i<count;i++)
      {
         int temp=n1;
         n1 = n2;
         n2=temp + n2;
         System.out.println(n2);
      }
   }
}
```

Output:-

```
Enter Number=5
0
1
1
2
3

Process finished with exit code 0
```

Practical No:2

```
import java.util.Scanner;
public class FactorialProgram
{
public  static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter Number=");
    int n = sc.nextInt();
    int fact = 1;
    for (int i = 1; i <= n; i++) {
        fact = fact * i;
    }
    System.out.println(fact);
}
}
```

Output:-

```
Enter Number=
6
720

Process finished with exit code 0
```

Practical No:3

```
public class Command
{
	public static void main(String[] args)
	{
		System.out.println("Below are arguments pass to program");
		for(String a:args)
		{
			System.out.println(a);

		}
	}
}
```

Output:-

```
Microsoft Windows [Version 10.0.22621.1702]
(c) Microsoft Corporation. All rights reserved.

C:\Users\vaish\Desktop\vaishu>javac Command.java

C:\Users\vaish\Desktop\vaishu>java Command
Below are arguments pass to program

C:\Users\vaish\Desktop\vaishu>
```

Practical No:4

```
import java.util.Scanner;
public class StudentArrayExample
{
   public static class Student
   {
      public String name;
      public String dob;
      public int rollno;
   }
   public static void main(String[] args)
   {
      Scanner sc=new Scanner(System.in);
      System.out.print("Enter number of Student=");
      int n=sc.nextInt();
      Student[] studentsArr =new Student[n];

      for(int i=0; i<n; i++)
      {
         System.out.println("****"+(i+1)+"****");
         Student s = new Student();
         System.out.print("Enter Student Roll Number=");
         s.rollno=sc.nextInt();
         System.out.print("Enter Student name=");
         s.name=sc.next();
         System.out.print("Enter Student DOB=");
         s.dob=sc.next();

         studentsArr[i]=s;
      }
      System.out.println("\n**********Show all Students*******");
      for(Student s:studentsArr)
      {
         System.out.println("Roll Number  ="+s.rollno);
         System.out.println("Student Name ="+s.name);
         System.out.println("Student DOB  ="+s.dob);
         System.out.println("");
      }
   }
}
```

Output:-

```
Enter number of Student=2
```

```
****1****
Enter Student Roll Number=1
Enter Student name=vaishu
Enter Student DOB=26102004
****2****
Enter Student Roll Number=2
Enter Student name=riyaa
Enter Student DOB=16012004

**********Show all Students*******
Roll Number  =1
Student Name =vaishu
Student DOB  =26102004

Roll Number  =2
Student Name =riyaa
Student DOB  =16012004


Process finished with exit code 0
```

Practical No:5

E_PackageDemo.java :

```
package command.line.apps;
import friends.info.Friend;
import java.time.LocalDate;
public class E_PackageDemo {
 public static void main(String[] args) {
 Friend Iyer = new Friend("Tushar N Chaudhari", LocalDate.of(2003,12,21), true);
 Iyer.displayInfo();
 }
}
```

Friend.java :

```
package friends.info;
import java.time.LocalDate;
import java.time.Period;
import java.time.format.DateTimeFormatter;
public class Friend {
 private String friendName;
 private LocalDate dob;
 private boolean isBestFriend;
 private String age;
 private String timeUntilNextBirthday;
 public Friend(String friendName, LocalDate dob, boolean isBestFriend){
 this.friendName = friendName;
 this.dob = dob;
 this.isBestFriend = isBestFriend;
 }
public String calculateAge() {
 LocalDate currentDate = LocalDate.now();
 Period period = Period.between(dob, currentDate);
 int years = period.getYears();
 int months = period.getMonths();
 int days = period.getDays();
 LocalDate nextBirthday = dob.plusYears(years + 1);
 Period untilNextBirthday = Period.between(currentDate, nextBirthday);
 timeUntilNextBirthday = untilNextBirthday.getMonths() + " months & " +
untilNextBirthday.getDays() + " days.";
```

```
age = years + " years, " + months + " months, and " + days + " days" + ".";
return age;
}
public String getName(){
return friendName;
}
public LocalDate getDOB(){
return dob;
}
public String getAge(){
calculateAge();
return age;
}
public String getTimeUntilNextBirthday(){
calculateAge();
return timeUntilNextBirthday;
}
public String getBestFriendStatus(){
if(isBestFriend){
return "Yes.";
} else {
return "No.";
}
}
public void displayInfo() {
calculateAge();
DateTimeFormatter formatter = DateTimeFormatter.ofPattern("dd-MM-yyyy");
String formattedDob = dob.format(formatter);
```

```
        System.out.println("Friend's Name: " + friendName);
        System.out.println("Friend's Date of Birth: " + formattedDob);
        System.out.println("Friend's Age today: " + age);
        System.out.println("Time until next birthday: " + timeUntilNextBirthday);
        System.out.println("Is best friend? -> " + getBestFriendStatus());
    }
}
```

B] O/P:

```
Friend's Name: Tushar N Chaudhari
Friend's Date of Birth: 21-12-2003
Friend's Age today: 20 years, 2 months, and 27 days.
Time until next birthday: 9 months & 2 days.
Is best friend? → Yes.
```

Practical No:6

```
public class Constructor
{
   public String name;
   public String mobile;
   public String email;
   public int age;

   public Constructor()
   {
      this.name="";
      this.mobile="";
      this.email="";
      this.age=0;

   }
   public Constructor(String name,String mobile,String email,int age)
   {
      this.name=name;
      this.mobile=mobile;
      this.email=email;
      this.age=age;
   }
   public Constructor(Constructor c)    {
      this.name=c.name;
      this.mobile=c.mobile;
      this.email=c.email;
      this.age=c.age;
   }

   public void show()
   {
      System.out.println("\nName="+this.name);
      System.out.println("Mobile="+this.mobile);
      System.out.println("Email="+this.email);
      System.out.println("Age="+this.age);
   }
   public static void main(String[] args)
   {
      Constructor c = new Constructor();
      c.show();
```

```
        Constructor c1 = new Constructor("Vaishnavi","5647283453","vaishnavi@gmail.com",20);
//using Parameter constructor
        c1.show();

        Constructor c2 = new Constructor(c1);
        c2.show();
    }
}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\lib\idea_rt.jar=53762:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish Constructor

Name=
Mobile=
Email=
Age=0

Name=Vaishnavi
Mobile=5647283453
Email=vaishnavi@gmail.com
Age=20

Name=Vaishnavi
Mobile=5647283453
Email=vaishnavi@gmail.com
Age=20

Process finished with exit code 0
```

Practical No:7

```
public class Stringfun
{
   public static void main(String[] args)
   {
      String name ="Test";
      System.out.println("Length function="+name.length());
      String msg ="ssbt college of engineering";
      String[] strArray=msg.split("");
      for(String s: strArray)
      {
         System.out.println(s);
      }
      String cityNames = "Jalgaon,Dhule,Pune,Kalyan";
      System.out.println("\nBefore split="+cityNames);
      String[] cityArray =cityNames.split("");
      System.out.println("\nAfter split=");
      for(String s:cityArray)
      {
         System.out.println(s);
      }
      String str1="Java programming";
      String str2="Java programming";
      String str3="Java programming";
      System.out.println(str1.compareTo(str2));
      System.out.println(str1.compareTo(str3));
      System.out.println(str3.compareTo(str1));
      System.out.println("\n3.replace()");
      String msg1 = "Happy wednesday";
      System.out.println("before replace="+msg1);
      System.out.println("after replace="+msg1.replace( "wednesday","Thursday"));
      System.out.println("\n4.substring()");
      String msg2 = msg1.substring(0,5);
      System.out.println(msg2);
      System.out.println("\n5.indexOf()");
      System.out.println("IndexOf w in msg1="+msg1.indexOf("w"));
      System.out.println("\n6.contain() ");
      System.out.println("msg1 contain Happy="+ msg1.contains("Happy"));
      System.out.println("\n7.charAt()");
      System.out.println("charAt index 4="+msg1.charAt(4));
      System.out.println("\n8.trim()");
      String msg4 = "Good Morning everyone";
      System.out.println("trim all spaces="+msg4.trim());
```

```
    }

}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\lib\idea_rt.jar=53785:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish Stringfun
Length function=4
s
s
b
t

c
o
l
l
e
g
e

o
f

e
n
g
i
n
e
e
r
i
n
g
Before split=Jalgaon,Dhule,Pune,Kalyan
After split=
J
A
L
```

g
a
o
n
,
D
h
u
l
e
,
P
u
n
E
,
K
a
l
y
a
n
0
0
0

3.replace()
before replace=Happy wednesday
after replace=Happy Thursday
4.substring()
Happy
5.indexOf()
IndexOf w in msg1=6
6.contain()
msg1 contain Happy=true
7.charAt()
charAt index 4=y
8.trim()trim all spaces=Good Morning everyone
Process finished with exit code 0

Practical No:13

```
package command.line.apps;
import java.io.BufferedWriter;
import java.io.FileWriter;
import java.io.IOException;
import java.util.Scanner;
public class M_TextStreamObject {
    public static void main(String[] args) {
        // Create a Scanner to take input from the user
        Scanner scanner = new Scanner(System.in);
        // Prompt the user for input
        System.out.print("Enter text to write to the file: ");
        String userInput = scanner.nextLine();
        // Specify the file path
        String filePath = "output.txt";
        // Use BufferedWriter to write the user input to the text file
        try (BufferedWriter writer = new BufferedWriter(new FileWriter(filePath))) {
            // Write the user input to the file
            writer.write(userInput);
            System.out.println("Text has been written to the file successfully.");
        } catch (IOException e) {
            System.err.println("An error occurred while writing to the file: " + e.getMessage());
        } finally {
            // Close the scanner
            scanner.close();
        }
    }
}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ
IDEA Community Edition 2023.3.2\lib\idea_rt.jar=61381:C:\Program Files\JetBrains\IntelliJ IDEA
Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8
-Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish
command.line.apps.M_TextStreamObject
Enter text to write to the file: My name is vaishnavi
```

Practical No:8

```
package command.line.apps;
public class WrapperClass {
    public static void main(String[] args) {

        Integer intObj = Integer.valueOf(42);
        Double doubleObj = Double.valueOf(3.14);
        Character charObj = Character.valueOf('A');
        Boolean boolObj = Boolean.valueOf(true);

        Integer autoboxedInt = 100;

        int unboxedInt = autoboxedInt;

        System.out.println("Integer Object: " + intObj);
        System.out.println("Double Object: " + doubleObj);
        System.out.println("Character Object: " + charObj);
        System.out.println("Boolean Object: " + boolObj);
        System.out.println("Autoboxed Integer: " + autoboxedInt);
        System.out.println("Unboxed Integer: " + unboxedInt);

        String numStr = "123";
        int parsedInt = Integer.parseInt(numStr);
        System.out.println("Parsed Integer: " + parsedInt);
        String intStr = Integer.toString(456);
        System.out.println("Converted Integer to String: " + intStr);
    }
}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ
IDEA Community Edition 2023.3.2\lib\idea_rt.jar=61268:C:\Program Files\JetBrains\IntelliJ IDEA
Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8
-Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish
command.line.apps.WrapperClass
Integer Object: 42
Double Object: 3.14
Character Object: A
Boolean Object: true
Autoboxed Integer: 100
Unboxed Integer: 100
Parsed Integer: 123
Converted Integer to String: 456
Process finished with exit code 0
```

Practical No:9

```
 class Animal {
    String name;
    public void eat()
    {System.out.println("I can eat");}
}
class Dog extends Animal {
    public void display(){
        System.out.println("My name is " + name);
    }
}
class Inheritance {
    public static void main(String[] args) {
        Dog labrador = new Dog();
        labrador.name = "Rohu";
        labrador.display();
        labrador.eat();
    }
}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\lib\idea_rt.jar=53816:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8 -Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish Inheritance
My name is Rohu
I can eat

Process finished with exit code 0
```

Practical No:10

```
package exceptionhandling;
import java.util.Scanner;
public class ExceptionHandling{
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter number for Division:");
        Integer n = sc.nextInt();
        Integer div = 0;
        try {
            div = 100 / n;
        } catch (ArithmeticException e) {
            System.out.println("the number" + n + "cannot divisible by 100");
            e.printStackTrace();
        }
        finally {
            System.out.println("divisions=" + div);
        }
    }
}
```

Output:-

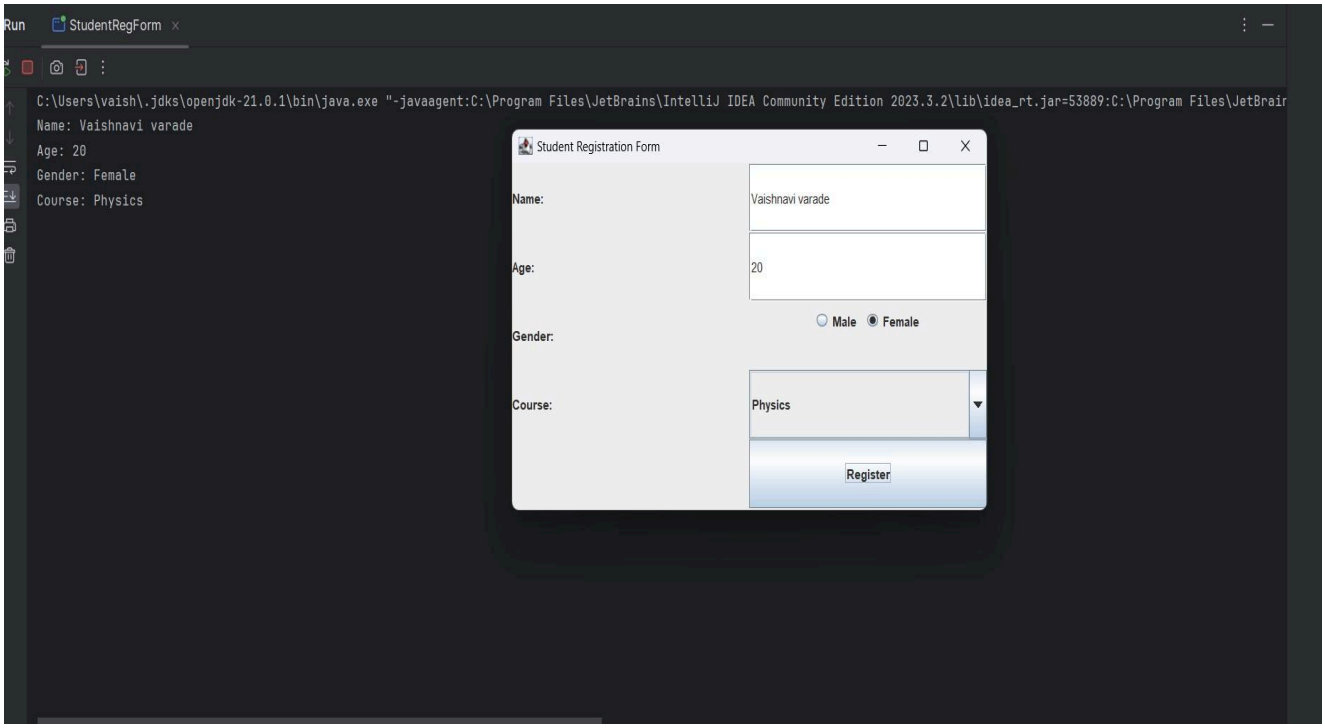
```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ
IDEA Community Edition 2023.3.2\lib\idea_rt.jar=53841:C:\Program Files\JetBrains\IntelliJ IDEA
Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8
-Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish
exceptionhandling.ExceptionHandling
Enter number for Division:
5
divisions=20

Process finished with exit code 0
```

Practical No:11

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

public class StudentRegForm extends JFrame {

    private JLabel nameLabel = new JLabel("Name:");
    private JLabel ageLabel = new JLabel("Age:");
    private JLabel genderLabel = new JLabel("Gender:");
    private JLabel courseLabel = new JLabel("Course:");


    private JTextField nameField = new JTextField(20);
    private JTextField ageField = new JTextField(5);


    private JRadioButton maleRadioButton = new JRadioButton("Male");
    private JRadioButton femaleRadioButton = new JRadioButton("Female");
    private ButtonGroup genderGroup = new ButtonGroup();


    private String[] courses = {"Mathematics", "Physics", "Chemistry", "Biology"};
    private JComboBox<String> courseComboBox = new JComboBox<>(courses);


    private JButton registerButton = new JButton("Register");

    public StudentRegForm() {
        setTitle("Student Registration Form");
        setSize(300, 200);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLocationRelativeTo(null);

        JPanel panel = new JPanel(new GridLayout(5, 2));

        panel.add(nameLabel);
        panel.add(nameField);
        panel.add(ageLabel);
        panel.add(ageField);
        panel.add(genderLabel);
        genderGroup.add(maleRadioButton);
```

```
        genderGroup.add(femaleRadioButton);
        JPanel genderPanel = new JPanel();
        genderPanel.add(maleRadioButton);
        genderPanel.add(femaleRadioButton);
        panel.add(genderPanel);
        panel.add(courseLabel);
        panel.add(courseComboBox);
        panel.add(new JLabel());
        panel.add(registerButton);

        registerButton.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                String name = nameField.getText();
                int age = Integer.parseInt(ageField.getText());
                String gender = maleRadioButton.isSelected() ? "Male" : "Female";
                String course = (String) courseComboBox.getSelectedItem();


                System.out.println("Name: " + name);
                System.out.println("Age: " + age);
                System.out.println("Gender: " + gender);
                System.out.println("Course: " + course);
            }
        });

        add(panel);
        setVisible(true);
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(new Runnable() {
            public void run() {
                new StudentRegForm();
            }
        });
    }
}
```

Output:-

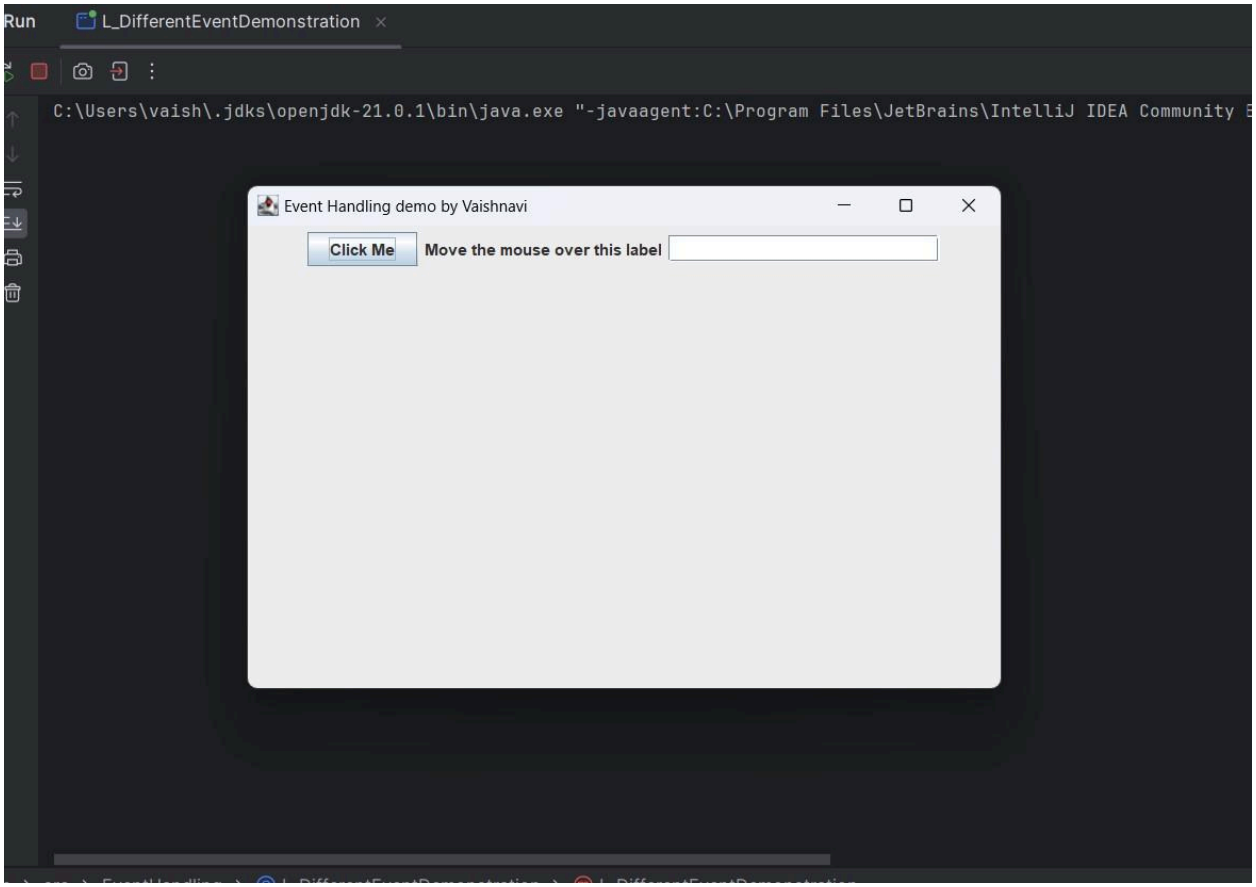

Run
StudentRegForm
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2023.3.2\lib\idea_rt.jar=53889:C:\Program Files\JetBrair
Name: Vaishnavi varade
Age: 20
Gender: Female
Course: Physics
Student Registration Form
Name:
Vaishnavi varade
Age:
20
Gender:
Male
Female
Course:
Physics
Register

Practical No:12

```
package graphical.ui.apps;
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.awt.event.MouseAdapter;
import java.awt.event.MouseEvent;
import java.awt.event.KeyAdapter;
import java.awt.event.KeyEvent;
public class L_DifferentEventDemonstration extends JFrame{
    private JButton cliclButton;
    private JLabel mouseLabel;
    private JTextField keyTextField;
    public L_DifferentEventDemonstration(){
        setTitle("Event Handling demo by Vaishnavi");
        setSize(400,200);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        setLayout(new FlowLayout());
// Button for button click event
        cliclButton = new JButton("Click Me");
        cliclButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                JOptionPane.showMessageDialog(L_DifferentEventDemonstration.this, "Button
Clicked!");
            }
        });
// Label for mouse events
        mouseLabel = new JLabel("Move the mouse over this label");
        mouseLabel.addMouseListener(new MouseAdapter() {
            @Override
            public void mouseClicked(MouseEvent e) {

super.mouseClicked(e);JOptionPane.showMessageDialog(L_DifferentEventDemonstration.this,"
mouse clicked");


            }
        });
// Text field for key events
        keyTextField = new JTextField(20);
        keyTextField.addKeyListener(new KeyAdapter() {
            @Override
```

```
            public void keyTyped(KeyEvent e) {
                char typedChar = e.getKeyChar();
                JOptionPane.showMessageDialog(L_DifferentEventDemonstration.this, "Key
Typed!");
            }
        });
// Add components to the frame
        add(cliclButton);
        add(mouseLabel);
        add(keyTextField);
        setVisible(true);
    }
    public static void main(String[] args) {
        SwingUtilities.invokeLater(() -> new L_DifferentEventDemonstration());
    }
}
```

Output:-

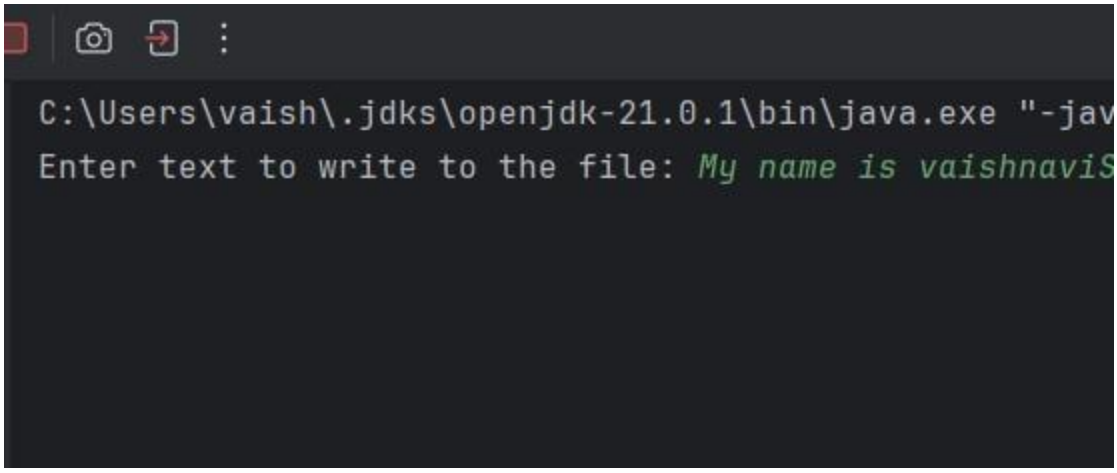


Practical No:13

```
package command.line.apps;
import java.io.BufferedWriter;
import java.io.FileWriter;
import java.io.IOException;
import java.util.Scanner;
public class M_TextStreamObject {
    public static void main(String[] args) {
        // Create a Scanner to take input from the user
        Scanner scanner = new Scanner(System.in);
        // Prompt the user for input
        System.out.print("Enter text to write to the file: ");
        String userInput = scanner.nextLine();
        // Specify the file path
        String filePath = "output.txt";
        // Use BufferedWriter to write the user input to the text file
        try (BufferedWriter writer = new BufferedWriter(new FileWriter(filePath))) {
            // Write the user input to the file
            writer.write(userInput);
            System.out.println("Text has been written to the file successfully.");
        } catch (IOException e) {
            System.err.println("An error occurred while writing to the file: " + e.getMessage());
        } finally {
            // Close the scanner
            scanner.close();
        }
    }
}
```

Output:-

```
C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ
IDEA Community Edition 2023.3.2\lib\idea_rt.jar=61381:C:\Program Files\JetBrains\IntelliJ IDEA
Community Edition 2023.3.2\bin" -Dfile.encoding=UTF-8 -Dsun.stdout.encoding=UTF-8
-Dsun.stderr.encoding=UTF-8 -classpath C:\Users\vaish\IdeaProjects\vaish\out\production\vaish
command.line.apps.M_TextStreamObject
Enter text to write to the file: My name is vaishnavi
```


C:\Users\vaish\.jdks\openjdk-21.0.1\bin\java.exe "-jav
Enter text to write to the file: My name is vaishnaviS