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CERTIFICATE

This is to certify that Mr. **Shalmon N Anandas** of M.Sc. Part I Bioinformatics has satisfactorily completed the practical semester II course prescribed by the university of Mumbai during the academic year 2021-2022

TEACHER IN CHARGE **HEAD OF DEPARTMENT**

INDEX

PRACTICAL 1
CLASSES AND CONSTRUCTORS IN JAVA

Classes:

A class is a user defined blueprint or prototype from which objects are created. It represents the set of properties or methods that are common to all objects of one type. In general, class declarations can include these components, in order:

1. Modifiers: A class can be public or has default access (Refer this for details).
2. class keyword: class keyword is used to create a class.
3. Class name: The name should begin with an initial letter (capitalized by convention).
4. Superclass(if any): The name of the class's parent (superclass), if any, preceded by the keyword extends. A class can only extend (subclass) one parent.
5. Interfaces(if any): A comma-separated list of interfaces implemented by the class, if any, preceded by the keyword implements. A class can implement more than one interface.
6. Body: The class body surrounded by braces, { }.

The basic syntax is

```
public class <classname> {
   public static void main(String []args) {
      <code>
   }
}
```

Constructors:

Java constructors is a terminology been used to construct something in our programs. A constructor in Java is a special method that is used to initialize objects. The constructor is called when an object of a class is created. It can be used to set initial values for object attributes.

In Java, a constructor is a block of codes similar to the method. It is called when an instance of the class is created. At the time of calling the constructor, memory for the object is allocated in the memory. It is a special type of method which is used to initialize the object. Every time an object is created using the new() keyword, at least one constructor is called. Constructors are different from methods in these ways:

1. Constructors must have the same name as the class within which it is defined while it is not necessary for the method in Java.
2. Constructors do not return any type while method(s) have the return type or void if does not return any value.
3. Constructors are called only once at the time of Object creation while method(s) can be called any number of times.

The syntax is:

```
public class <classname> {
  public <classname>() {
    <code>
  }

  public static void main(String[] args) {
    <classname> <objname> = new <classname>();
    <code>
  }
}
```

Q1. Write a java program to Create a class named Calculate and find area and perimeter a rectangle

```
package practical1;

public class calculate {
    public void area()
    {
    int l,b,area;
    l = 4;
    b = 6;
    area = l * b;
    System.out.println("The area of a rectange is " + area);
    }

    public void peri()
    {
    int l,b,peri;
    l = 4;
    b = 6;
    peri = (2*l) + (2*b);
    System.out.println("The area of a perimeter is " + peri);
    }

    public static void main(String[] args) {
        calculate c1=new calculate();
        c1.area();
        c1.peri();
    }

}
```

```
run:
The area of a rectange is 24
The perimeter of a rectangle is 20
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q2. Create a class named "Student" with String variable "name" and integer variable "roll_no". Assign the value of roll_no as "2" and that of name as "John" by creating an object of the class Student.

```
package practical1;

public class Student {
    int roll_no;
    String name;

    public static void main(String[] args){
        Student s1=new Student();
        s1.roll_no = 2;
        s1.name = "John";
        System.out.println("Name of student is " + s1.name);
        System.out.println("Roll no of student is " + s1.roll_no);
    }
}
```

```
run:
Name of student is John
Roll no of student is 2
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q3. Write a program to print the area of two rectangles having sides (4,5) and (5,8) respectively by creating a class named "Rectangle" with a method named "Area" which returns the area and length and breadth passed as parameters to its constructor.

```
package practical1;

public class Rectangle{
    public void Area(int length, int breadth){
        int a;
        a = length * breadth;
        System.out.println("The area of the rectangle is " + a);
    }

    public static void main(String[] args){
        Rectangle a1=new Rectangle();
        a1.Area(4, 5);
        a1.Area(5, 8);
    }
}
```

```
run:
The area of the rectangle is 20
The area of the rectangle is 40
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q4. Print the average of three numbers entered by user by creating a class named "Average" having a method to calculate and print the average.

```
package practical1;
import java.util.Scanner;

public class Average {
    public void calculate(int a, int b, int c){
        int avg = (a + b + c ) / 3;
        System.out.println("The average of entered numbers is:" +
avg);
    }

    public static void main(String[] args){
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter the first number: ");
        int num1 = scan.nextInt();
        System.out.print("Enter the second number: ");
        int num2 = scan.nextInt();
        System.out.print("Enter the third number: ");
        int num3 = scan.nextInt();
        scan.close();

        Average a1=new Average();
        a1.calculate(num1,num2,num3);
    }
}
```

```
run:
Enter the first number: 10
Enter the second number: 20
Enter the third number: 30
The average of entered numbers is:20
BUILD SUCCESSFUL (total time: 7 seconds)
```

Q5. Write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named "Employee" The output should be as follows:

Name	Year of joining	Address
Robert	1994	64C- WallsStreat
Sam	2000	68D- WallsStreat
John	1999	26B- WallsStreat

```
package practical1;

public class Employee {
    public void showData(String name, int yearofjoining, int salary,
String add){
        System.out.println(name + "\t" + yearofjoining + "\t\t    "
+ salary + "\t" + add);
    }

    public static void main(String[] args){
        System.out.println("Name      Year  of  joining       Salary
Address");
        Employee e1=new Employee();
        e1.showData("Robert", 1994, 50000, "64C-WallStreet");
        e1.showData("Sam", 2000, 30000, "68D-WallStreet");
        e1.showData("John", 1999, 40000, "26B-WallStreet");
    }
}
```

```
run:
Name    Year of joining     Salary      Address
Robert  1994                50000       64C-WallStreet
Sam     2000                30000       68D-WallStreet
John    1999                40000       26B-WallStreet
BUILD SUCCESSFUL (total time: 0 seconds)
```

PRACTICAL 2
INHERITANCE AND POLYMORPHISM

INHERITANCE:

- ➔ Inheritance is an important pillar of OOP (Object-Oriented Programming). It is the mechanism in java by which one class is allowed to inherit the features (fields and methods) of another class.
- ➔ Important terminology:
  - **Super Class**: The class whose features are inherited is known as superclass (or a base class or a parent class).
  - **Sub Class**: The class that inherits the other class is known as a subclass (or a derived class, extended class, or child class). The subclass can add its own fields and methods in addition to the superclass fields and methods.
  - **Reusability**: Inheritance supports the concept of "reusability", i.e., when we want to create a new class and there is already a class that includes some of the code that we want, we can derive our new class from the existing class. By doing this, we are reusing the fields and methods of the existing class.
- ➔ Types on inheritance:
  - Single
    - When a class inherits another class, it is known as a single inheritance. In the example given below, Dog class inherits the Animal class, so there is the single inheritance.
  - Multilevel
    - When there is a chain of inheritance, it is known as multilevel inheritance. As you can see in the example given below, BabyDog class inherits the Dog class which again inherits the Animal class, so there is a multilevel inheritance.
  - Hierarchical
    - When two or more classes inherits a single class, it is known as hierarchical inheritance. In the example given below, Dog and Cat classes inherits the Animal class, so there is hierarchical inheritance.
  - Multiple
    - To reduce the complexity and simplify the language, multiple inheritance is not supported in java.
    - To fill this gap we have interface
    - The interface in Java is a mechanism to achieve abstraction. There can be only abstract methods in the Java interface, not method body. It is used to achieve abstraction and multiple inheritance in Java.

```
interface <interface_name>{

    // declare constant fields
    // declare methods that abstract
    // by default.
}
```

  - Hybrid

        - Hybrid inheritance in Java is a combination of two or more types of inheritances. The purpose of using hybrid inheritance in Java is to modularize the codebase into well-defined classes and provide code reusability.
        -

➔ **Syntax**:

- class derived-class extends base-class
- {
- //methods and fields
- }

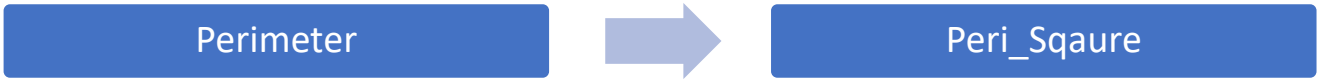
POLYMORPHISM

➔ The word polymorphism means having many forms. In simple words, we can define polymorphism as the ability of a message to be displayed in more than one form.

➔ In Java polymorphism is mainly divided into two types:

- Compile time polymorphism
    - It is also known as static polymorphism. This type of polymorphism is achieved by function overloading or operator overloading.
- Runtime polymorphism
    - It is also known as Dynamic Method Dispatch. It is a process in which a function call to the overridden method is resolved at Runtime. This type of polymorphism is achieved by Method Overriding.

Q1.




```
package practical2;

class Perimeter{

    public void Perimeter(){
        System.out.println("Perimeters will be printed: ");
    }
}

public class Peri_Square extends Perimeter{

    public void Peri_Square(){
        int a = 5;
        int peri_sq = a*4;
        System.out.println("Perimeter of the square is " +
peri_sq);
    }

    public static void main(String[] args) {
        Peri_Square p1=new Peri_Square();
        p1.Perimeter();
        p1.Peri_Square();
    }

}
```

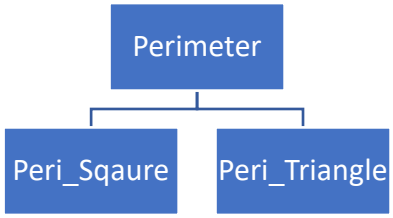
```
run:
Perimeters will be printed:
Perimeter of the square is 20
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q2.


```
package practical2;

class Perimeter{
    public void Perimeter(){
        System.out.println("Perimeters will be printed: ");
    }
}

class Peri_Triangle extends Perimeter{
    public void Peri_Triangle(){
        int a = 5, b = 5, c = 6;
        int peri_tri = a + b + c;
        System.out.println("Perimeter of the triangle is " +
peri_tri);
    }
}

public class Peri_Square extends Peri_Triangle {
    public void Peri_Square_2(){
        int a = 5;
        int peri_sq = a*4;
        System.out.println("Perimeter of the square is " +
peri_sq);
    }

    public static void main(String[] args){
        Peri_Square p1 = new Peri_Square();
        p1.Perimeter();
        p1.Peri_Triangle();
        p1.Peri_Square();
    }
}
```

```
run:
Perimeters will be printed:
Perimeter of the triangle is 16
Perimeter of the square is 20
BUILD SUCCESSFUL (total time: 0 seconds)
```

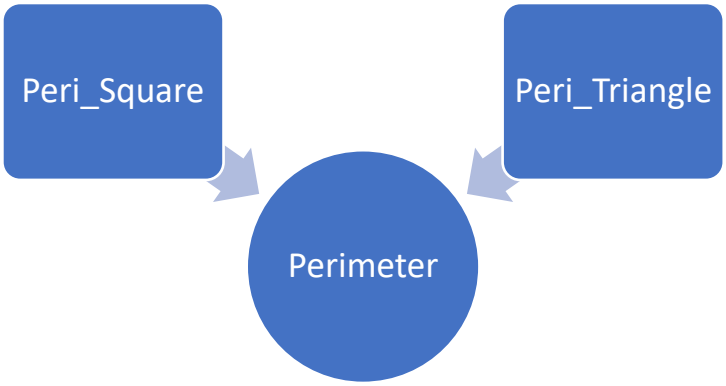
Q3.




```
package practical2;

class Perimeter{
    public void Perimeter(){
        System.out.println("Perimeters will be printed: ");
    }
}

class Peri_Triangle extends Perimeter{
    public void Peri_Triangle(){
        int a = 5, b = 5, c = 6;
        int peri_tri = a + b + c;
        System.out.println("Perimeter of the triangle is " +
peri_tri);
    }
}

public class Peri_Square extends Perimeter {
    public void Peri_Square_3(){
        int a = 5;
        int peri_sq = a*4;
        System.out.println("Perimeter of the square is " +
peri_sq);
    }

    public static void main(String[] args){
        Peri_Square ps = new Peri_Square();
        Peri_Triangle pt = new Peri_Triangle();

        ps.Perimeter();
        ps.Peri_Square();

        pt.Perimeter();
        pt.Peri_Triangle();
    }
}
```

```
run:
Perimeters will be printed:
Perimeter of the square is 20
Perimeters will be printed:
Perimeter of the triangle is 16
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q4.




```
package practical2;

interface Peri_Square{
    default void Peri_Square(){
        int a = 5;
        int peri_sq = a*4;
        System.out.println("Perimeter of the square is " +
peri_sq);
    }
}

interface Peri_Triangle{
    default void Peri_Triangle(){
        int a = 5, b = 5, c = 6;
        int peri_tri = a + b + c;
        System.out.println("Perimeter of the triangle is " +
peri_tri);
    }
}

public class Perimeter implements Peri_Square, Peri_Triangle{
    public void PeriMeter(){
    System.out.println("Perimeters will be printed: ");
    Peri_Square.super.Peri_Square();
    Peri_Triangle.super.Peri_Triangle();
    }

    public static void main(String[] args){
        Perimeter p = new Perimeter();
        p.PeriMeter();
    }
}
```

```
run:
Perimeters will be printed:
Perimeter of the square is 20
Perimeter of the triangle is 16
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q5. Write a java program to create class Area and method named as calarea() to find area of a square and rectangle using method overloading.

```
package practical2;

public class Area {
    void calarea(int a){
        int area = a*a;
        System.out.println("Area of Square is: " + area);
    }

    void calarea(int a, int b){
        int area = a*b;
        System.out.println("Area of Rectangle is: " + area);
    }

    public static void main(String[] args){
        Area a1 = new Area();
        a1.calarea(5);
        a1.calarea(4, 5);
    }
}
```

```
run:
Area of Square is: 25
Area of Rectangle is: 20
BUILD SUCCESSFUL (total time: 0 seconds)
```

Q6. Write a java program to create class Calculator and method named as add()-two number and create another class Addition who inherit class Calculator and method named as add()-three number using overriding.

```
package practical2;

class Calculator{
    void add(){
        int a, b, sum;
        a = 5;
        b = 5;
        sum = a+b;
        System.out.println("Addition of two numbers is: " + sum);
    }
}

public class Addition extends Calculator {
    void add(){
        int a, b, c, sum;
        a = 5;
        b = 5;
        c = 5;
        sum = a + b + c;
        System.out.println("Addition of three numbers is: " +
sum);
    }

    public static void main(String[] args){
        Calculator c1 = new Calculator();
        c1.add();
        c1 = new Addition();
        c1.add();
    }
}
```

```
run:
Addition of two numbers is: 10
Addition of three numbers is: 15
BUILD SUCCESSFUL (total time: 0 seconds)
```

PRACTICAL 3
ARRAYS AND LOOPS AND CONDITIONAL STATEMENTS

ARRAYS:

- ➔ An array in Java is a group of like-typed variables referred to by a common name. Arrays in Java work differently than they do in C/C++. Following are some important points about Java arrays.
- ➔ In Java, all arrays are dynamically allocated.
- ➔ Since arrays are objects in Java, we can find their length using the object property length. This is different from C/C++, where we find length using sizeof.
- ➔ Since arrays are objects in Java, we can find their length using the object property length. This is different from C/C++, where we find length using sizeof.
- ➔ The variables in the array are ordered, and each has an index beginning from 0.
- ➔ Java array can be also be used as a static field, a local variable, or a method parameter.
- ➔ The size of an array must be specified by int or short value and not long.
- ➔ The direct superclass of an array type is Object.
- ➔ An array can contain primitives (int, char, etc.) and object (or non-primitive) references of a class depending on the definition of the array. In the case of primitive data types, the actual values are stored in contiguous memory locations. In the case of class objects, the actual objects are stored in a heap segment.

LOOPS:

- ➔ The Java for loop is used to iterate a part of the program several times. If the number of iterations is fixed, it is recommended to use for loop.
- ➔ There are three types of loop in java:
    - o For loop: The java for loop is used to iterate a part of the program several times. If the number of iterations is fixed, it is recommended to use for loop.
        - for(initialization; condition; increment/decrement){
        - //statement or code to be executed
        - }
    - o While loop: The Java while loop is used to iterate a part of the program several times. If the number of iterations is not fixed it is recommended to use while loop.
        - while (condition) {
        - // code block to be executed
        - }
    - o Do-while loop: The Java do-while loop is to iterate a part of the program several times. Use it if the number of iterations is not fixed and you must have to execute the loop at least once.
        - do{
        - //code to be executed / loop body
        - //update statement
        - }while (condition);

CONDITIONAL STATEMENTS:

- ➔ Java supports the usual logical conditions.
- ➔ Java has the following conditional statements:
  - Use if to specify a block of code to be executed, if a specified condition is true
    - if (condition) {
    - // block of code to be executed if the condition is true
    - }
  - Use else to specify a block of code to be executed, if the same condition is false
    - if (condition) {
    - // block of code to be executed if the condition is true
    - } else {
    - // block of code to be executed if the condition is false
    - }
  - Use else if to specify a new condition to test, if the first condition is false
    - if (condition1) {
    - // block of code to be executed if condition1 is true
    - } else if (condition2) {
    - // block of code to be executed if the condition1 is false and condition2 is true
    - } else {
    - // block of code to be executed if the condition1 is false and condition2 is false
    - }

Q1. Write a java program to Calculate the sum of all elements of an array.

```
package practical3;

import java.util.Scanner;

public class sum_of_all {
    public static void main(String[] args) {
        // take input for array
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter 10 numbers: ");
        int[] arr = new int[10];
        for (int i = 0; i < 10; i++) {
            arr[i] = scan.nextInt();
        }

        // calculate sum
        int sum = 0;
        for (int i = 0; i < 10; i++) {
            sum = sum + arr[i];
        }

        // print sum
        System.out.println("Sum of all the entered number is " +
sum);
    }
}
```

```
run:
Enter 10 numbers: 2 3 4 5 2 3 7 6 5 8
Sum of all the entered number is 45
BUILD SUCCESSFUL (total time: 14 seconds)
```

Q2. Write a program in java that takes a number as input and prints its multiplication table upto 10.

```
package practical3;

import java.util.Scanner;

public class mul_table {
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.println("Which multiplication table do you
want: ");
        int multiplicand = scan.nextInt();
        for (int multiplier = 0; multiplier <= 10; multiplier++) {
            System.out.println(multiplicand + " x " + multiplier +
" = " + (multiplicand * multiplier));
        }
    }
}
```

```
run:
Which multiplication table do you want:
5
5 x 0 = 0
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
BUILD SUCCESSFUL (total time: 3 seconds)
```

Q3. Write a java program to accept angles of a triangle and display equilateral, isosceles and scalene.

```
package practical3;

import java.util.Scanner;

public class display_traingle_type {
    public static void main(String[] args) {
        Scanner scan = new Scanner(System.in);
        System.out.print("Enter lengths of side of a triangle: ");
        int a = scan.nextInt();
        int b = scan.nextInt();
        int c = scan.nextInt();

        if (a == b && b == c)
            System.out.println("It is an equilateral triangle");
        else if (a == b || b == c || a == c)
            System.out.println("It is an isoceles triangle");
        else
            System.out.println("it is a scalene triangle");
    }
}
```

```
run:
Enter lengths of side of a triangle: 4 5 6
it is a scalene triangle
BUILD SUCCESSFUL (total time: 3 seconds)
```

```
run:
Enter lengths of side of a triangle: 4 4 5
It is an isoceles triangle
BUILD SUCCESSFUL (total time: 2 seconds)
```

```
run:
Enter lengths of side of a triangle: 4 4 4
It is an equilateral triangle
BUILD SUCCESSFUL (total time: 2 seconds)
```

Q4. Write a java program to count the number of occurrences of given number in an array of integers.

```
package practical3;

import java.util.Scanner;

public class occur_in_array {
    public static void main(String[] args) {
        int arr[] = { 1, 2, 3, 4, 4, 5, 2, 2, 3, 7, 6, 5, 4, 4, 3,
2, 2, 1, 1, 4, 5, 3, 8, 8, 9, 6, 7, 2 };
        int arr_len = arr.length;
        Scanner scan = new Scanner(System.in);
        System.out.println("Which number do you want to count: ");
        int arr_find = scan.nextInt();

        int count = 0;
        for (int i = 0; i < arr_len; i++)
            if (arr_find == arr[i])
                count++;

        System.out.println("The number occurs " + count + "
times");
    }
}
```

```
run:
Which number do you want to count:
2
The number occurs 6 times
BUILD SUCCESSFUL (total time: 3 seconds)
```

Q5. Write a java program to accept 3x3 matrix and display the transpose of a given matrix.

```
package practical3;

public class transpose_of_matrix {
    public static void main(String[] args) {
        int matrix[][] = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8,
9 } };
        int transpose[][] = new int[3][3];

        // printing original matrix
        System.out.println("The matrix is: ");
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.print(matrix[i][j] + " ");
            }
            System.out.println();
        }

        // print transpose of matrix
        System.out.println("The transpose of the matrix is: ");
        for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 3; j++) {
                System.out.print(matrix[j][i] + " ");
            }
            System.out.println();
        }
    }
}
```

```
run:
The matrix is:
1 2 3
4 5 6
7 8 9
The transpose of the matrix is:
1 4 7
2 5 8
3 6 9
BUILD SUCCESSFUL (total time: 0 seconds)
```

PRACTICAL 4
AWT

Introduction:

1. Java AWT is an API to develop Graphical User Interface (GUI) or windows-based applications in JAVA
2. Java AWT components are platform-dependent, i.e., Components are displayed according to the view of operation system. Which means the components will have a different look depending on the platform it is run on like Windows, MacOS, Linux, etx.
3. AWT is heavyweight because its components used the resources of the underlying operation system.
4. In short AWT applications will look like a Windows application in Windows whereas it will look like a Mac application in MacOS.
5. The java.aet package provides classes for AWT API components such as TextField, Label, TextArea, RadioButton, CheckBox, Choice, List, etc

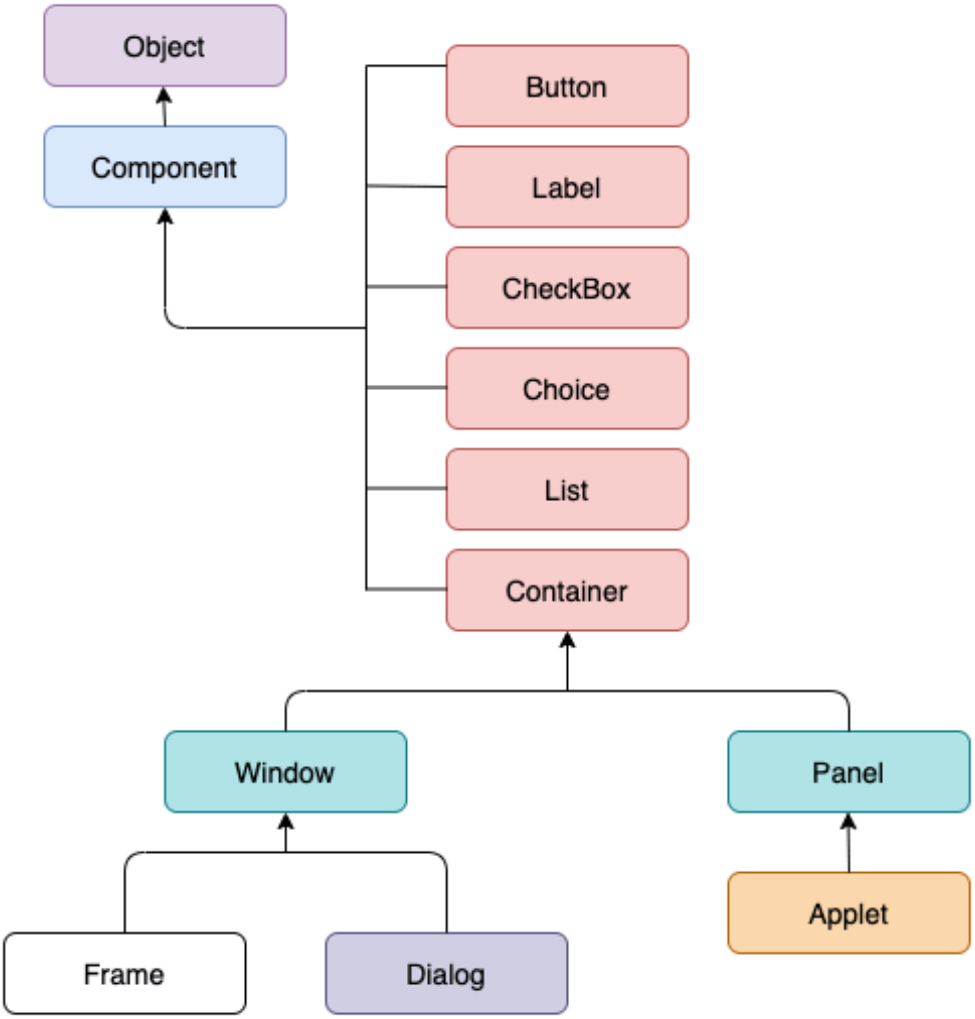


Figure 1: Hierarchy of Container and component classes in AWT

6. **Components**: All the elements like **button, text fields, scroll bars, etc**, are all called components. In AWT each component has a class. To add a component to the application we need to add them to a **container**

7. **Containers:**
    a. The container is a components that can contain other components like **buttons, textfields, etc.**
    b. Types of containers:
        i. Window
            1. This container has no borders and menu bars.
            2. You must use frame or dialogue to make use of window container
            3. We need to create an instance of Window class to create this container
        ii. Panel
            1. This container doesn't have title bar, border or menu bar
            2. It is a generic container for holding components like button, textfield, etc.
            3. An instance of Panel class creates a container, in which we can add components.
        iii. Frame
            1. Frame is a container that has title bar, border and menu bars.
            2. It can hold other components like button, textfield, scrollbar, etc.
            3. This is the most widely use container while developing an AWT application
        iv. Dialog
            1. The dialog control represents a top-level window with a border and a title used to take some form of input from the user.
            2. This container inherits the window class.
            3. Unlike the Frame container, it doesn't have maximize and minimize buttons

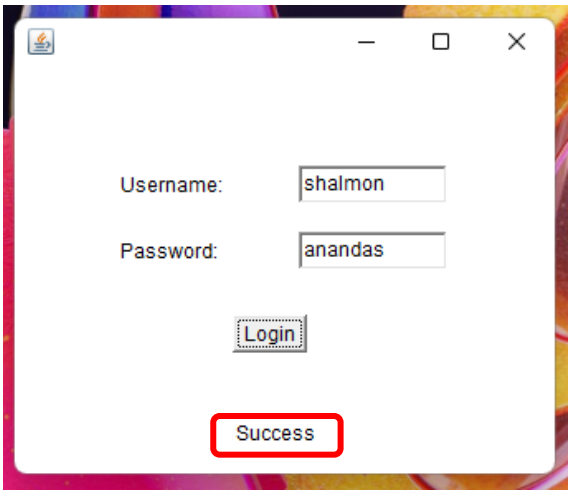
Q1. Write a program to create an AWT GUI and handle event
CODE:

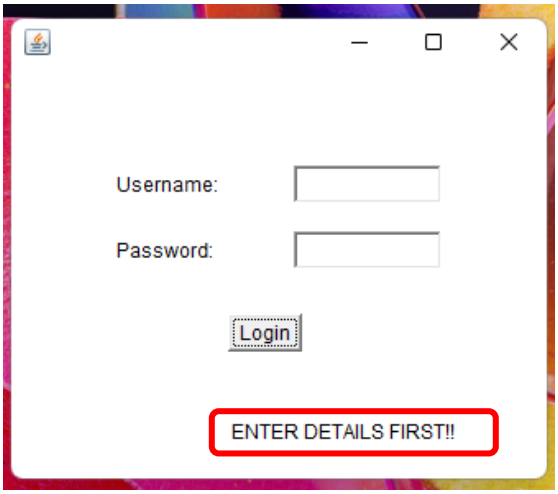
```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_4;

/**
 *
 * @author shalmon
 */
public class question_1 extends java.awt.Frame {

    /**
     * Creates new form question_1
     */
    public question_1() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        label1 = new java.awt.Label();
        label2 = new java.awt.Label();
        textField1 = new java.awt.TextField();
        textField2 = new java.awt.TextField();
        button1 = new java.awt.Button();
        label3 = new java.awt.Label();
        label4 = new java.awt.Label();

        setCursor(new
java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));
        setMinimumSize(new java.awt.Dimension(400, 350));
        addWindowListener(new java.awt.event.WindowAdapter() {
```

```
            public  void  windowClosing(java.awt.event.WindowEvent
evt) {
                exitForm(evt);
            }
        });
        setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        label1.setText("Username:");
        add(label1,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(70, 90, -1, -1));

        label2.setText("Password:");
        add(label2,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(70, 130, -1, -1));
        add(textField1,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(180, 90, 90, -1));
        add(textField2,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(180, 130, 90, -1));

        button1.setLabel("Login");
        button1.setName(""); // NOI18N
        button1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button1ActionPerformed(evt);
            }
        });
        add(button1,                                             new
org.netbeans.lib.awtextra.AbsoluteConstraints(140, 180, -1, -1));

        label3.setText("Success");
        label3.setVisible(false);
        add(label3,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(140, 240, -1, -1));

        label4.setText("ENTER DETAILS FIRST!!");
        label4.setVisible(false);
        add(label4,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(140, 240, -1, -1));

        pack();
    }// </editor-fold>

    /**
     * Exit the Application
```

```
     */
    private void exitForm(java.awt.event.WindowEvent evt) {
        System.exit(0);
    }

    private void button1ActionPerformed(java.awt.event.ActionEvent
evt) {
        if(textField1.getText().length()       >       0       &&
textField2.getText().length() > 0){
            label4.setVisible(false);
            label3.setVisible(true);
        }
        else{
            label3.setVisible(false);
            label4.setVisible(true);
        }
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_1().setVisible(true);
            }
        });
    }


    // Variables declaration - do not modify
    private java.awt.Button button1;
    private java.awt.Label label1;
    private java.awt.Label label2;
    private java.awt.Label label3;
    private java.awt.Label label4;
    private java.awt.TextField textField1;
    private java.awt.TextField textField2;
    // End of variables declaration
}
```

OUTPUT:


Username:
shalmon
Password:
anandas
Login
Success


Username:
Password:
Login
ENTER DETAILS FIRST!!

Q2. Write a program to create an AWT GUI and perform the following operation

CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_4;

/**
 *
 * @author shalmon
 */
public class question_2 extends java.awt.Frame {

    /**
     * Creates new form question_2
     */
    public question_2() {
        initComponents();
    }

    /**
     *  This  method  is  called  from  within  the  constructor  to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        label1 = new java.awt.Label();
        label2 = new java.awt.Label();
        label3 = new java.awt.Label();
        textField1 = new java.awt.TextField();
        textField2 = new java.awt.TextField();
        button1 = new java.awt.Button();
        button2 = new java.awt.Button();
        button3 = new java.awt.Button();
        button4 = new java.awt.Button();
        button5 = new java.awt.Button();
        label4 = new java.awt.Label();
```

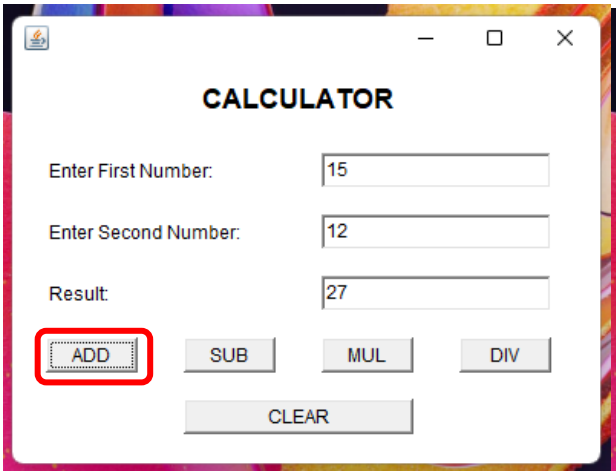
```
        textField3 = new java.awt.TextField();

        setPreferredSize(new java.awt.Dimension(400, 300));
        addWindowListener(new java.awt.event.WindowAdapter() {
            public  void  windowClosing(java.awt.event.WindowEvent
evt) {
                exitForm(evt);
            }
        });
        setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        label1.setFont(new  java.awt.Font("Dialog",  1,  18));  //
NOI18N
        label1.setName(""); // NOI18N
        label1.setText("CALCULATOR");
        add(label1,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(130, 40, -1, -1));

        label2.setText("Enter First Number:");
        add(label2,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(30, 90, -1, -1));

        label3.setText("Enter Second Number:");
        add(label3,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(30, 130, -1, -1));
        add(textField1,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(210, 90, 150, -1));
        add(textField2,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(210, 130, 150, -1));

        button1.setLabel("ADD");
        button1.setName(""); // NOI18N
        button1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button1ActionPerformed(evt);
            }
        });
        add(button1,                                             new
org.netbeans.lib.awtextra.AbsoluteConstraints(30, 210, 60, -1));

        button2.setLabel("SUB");
        button2.addActionListener(new
java.awt.event.ActionListener() {
```

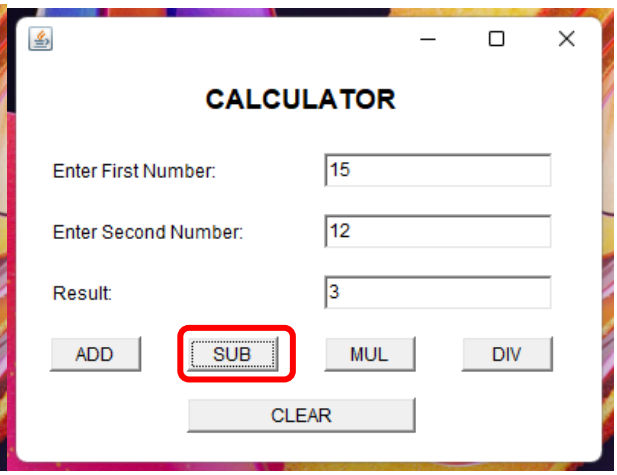
```
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button2ActionPerformed(evt);
            }
        });
        add(button2,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(120, 210, 60, -1));

        button3.setLabel("MUL");
        button3.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button3ActionPerformed(evt);
            }
        });
        add(button3,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(210, 210, 60, -1));

        button4.setLabel("DIV");
        button4.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button4ActionPerformed(evt);
            }
        });
        add(button4,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(300, 210, 60, -1));

        button5.setLabel("CLEAR");
        button5.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button5ActionPerformed(evt);
            }
        });
        add(button5,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(120, 250, 150, -1));

        label4.setText("Result:");
        add(label4,                                               new
org.netbeans.lib.awtextra.AbsoluteConstraints(30, 170, -1, -1));
        add(textField3,                                           new
org.netbeans.lib.awtextra.AbsoluteConstraints(210, 170, 150, -1));
```

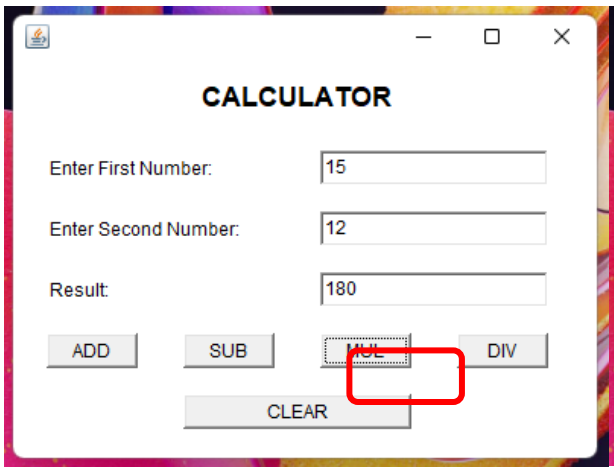
```
        pack();
    }// </editor-fold>

    /**
     * Exit the Application
     */
    private void exitForm(java.awt.event.WindowEvent evt) {
        System.exit(0);
    }

    private void button3ActionPerformed(java.awt.event.ActionEvent
evt) {
        int a = Integer.parseInt(textField1.getText());
        int b = Integer.parseInt(textField2.getText());
        int c = a * b;
        textField3.setText(String.valueOf(c));
    }

    private void button1ActionPerformed(java.awt.event.ActionEvent
evt) {
        int a = Integer.parseInt(textField1.getText());
        int b = Integer.parseInt(textField2.getText());
        int c = a + b;
        textField3.setText(String.valueOf(c));
    }

    private void button2ActionPerformed(java.awt.event.ActionEvent
evt) {
        int a = Integer.parseInt(textField1.getText());
        int b = Integer.parseInt(textField2.getText());
        int c = a - b;
        textField3.setText(String.valueOf(c));
    }

    private void button4ActionPerformed(java.awt.event.ActionEvent
evt) {
        int a = Integer.parseInt(textField1.getText());
        int b = Integer.parseInt(textField2.getText());
        int c = a / b;
        textField3.setText(String.valueOf(c));
    }

    private void button5ActionPerformed(java.awt.event.ActionEvent
evt) {
        textField1.setText("");
```

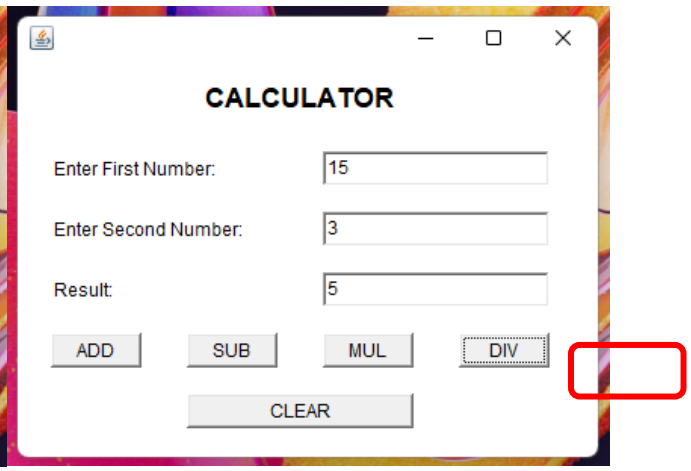
```
        textField2.setText("");
        textField3.setText("");
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_2().setVisible(true);
            }
        });
    }


    // Variables declaration - do not modify
    private java.awt.Button button1;
    private java.awt.Button button2;
    private java.awt.Button button3;
    private java.awt.Button button4;
    private java.awt.Button button5;
    private java.awt.Label label1;
    private java.awt.Label label2;
    private java.awt.Label label3;
    private java.awt.Label label4;
    private java.awt.TextField textField1;
    private java.awt.TextField textField2;
    private java.awt.TextField textField3;
    // End of variables declaration
}
```

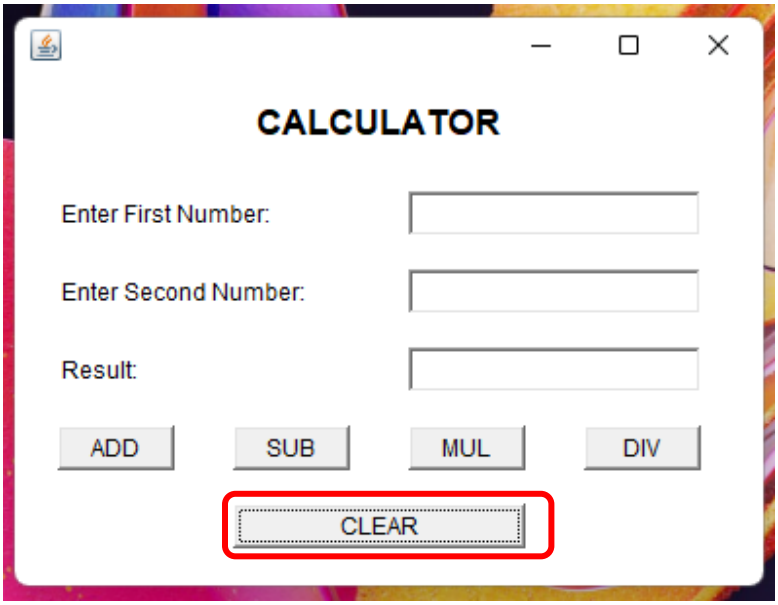
OUTPUT:


CALCULATOR
Enter First Number:
15
Enter Second Number:
12
Result:
27
ADD
SUB
MUL
DIV
CLEAR


CALCULATOR
Enter First Number:
15
Enter Second Number:
12
Result:
3
ADD
SUB
MUL
DIV
CLEAR


CALCULATOR
Enter First Number:
15
Enter Second Number:
12
Result:
180
ADD
SUB
MUL
DIV
CLEAR


CALCULATOR
Enter First Number:
15
Enter Second Number:
3
Result:
5
ADD
SUB
MUL
DIV
CLEAR


CALCULATOR
Enter First Number:
Enter Second Number:
Result:
ADD
SUB
MUL
DIV
CLEAR

Q3. Write a program to create an AWT GUI
CODE:

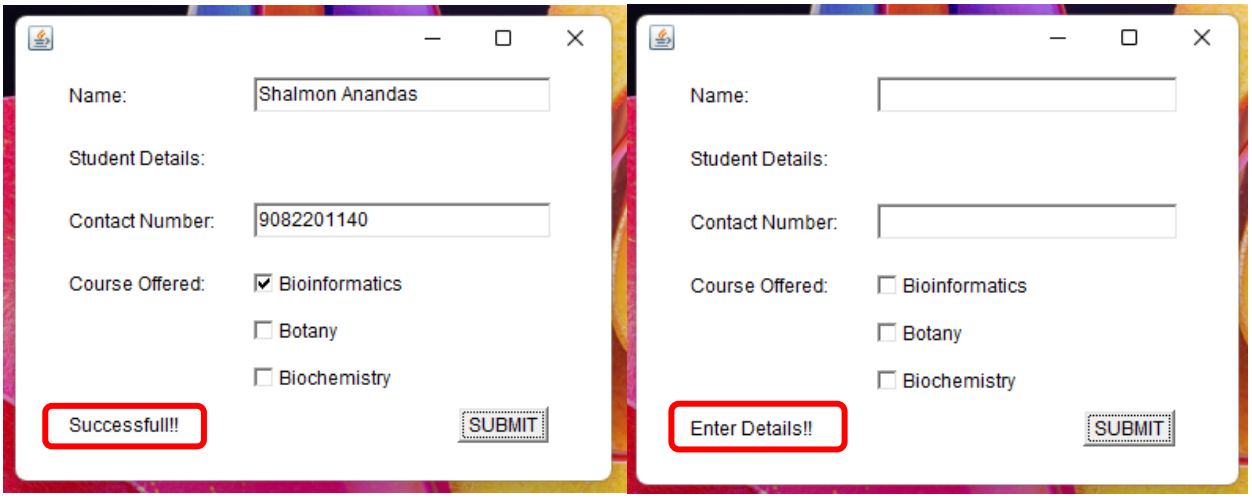
```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_4;

/**
 *
 * @author shalmon
 */
public class question_3 extends java.awt.Frame {

    /**
     * Creates new form question_3
     */
    public question_3() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        label1 = new java.awt.Label();
        textField1 = new java.awt.TextField();
        label2 = new java.awt.Label();
        label3 = new java.awt.Label();
        textField2 = new java.awt.TextField();
        label4 = new java.awt.Label();
        checkbox1 = new java.awt.Checkbox();
        checkbox2 = new java.awt.Checkbox();
        checkbox3 = new java.awt.Checkbox();
        button1 = new java.awt.Button();
        label5 = new java.awt.Label();
```

```
        addWindowListener(new java.awt.event.WindowAdapter() {
            public  void  windowClosing(java.awt.event.WindowEvent
evt) {
                exitForm(evt);
            }
        });
        setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());

        label1.setName(""); // NOI18N
        label1.setText("Name:");
        add(label1,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(40, 40, -1, -1));

        textField1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                textField1ActionPerformed(evt);
            }
        });
        add(textField1,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(160, 40, 190, -1));

        label2.setText("Student Details:");
        add(label2,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(40, 80, -1, -1));

        label3.setText("Contact Number:");
        add(label3,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(40, 120, -1, -1));
        add(textField2,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(160, 120, 190, -1));

        label4.setText("Course Offered:");
        add(label4,                                              new
org.netbeans.lib.awtextra.AbsoluteConstraints(40, 160, -1, -1));

        checkbox1.setLabel("Bioinformatics");
        add(checkbox1,                                           new
org.netbeans.lib.awtextra.AbsoluteConstraints(160, 160, -1, -1));

        checkbox2.setLabel("Botany");
        add(checkbox2,                                           new
org.netbeans.lib.awtextra.AbsoluteConstraints(160, 190, -1, -1));

        checkbox3.setLabel("Biochemistry");
```

```
        add(checkbox3,                                          new
org.netbeans.lib.awtextra.AbsoluteConstraints(160, 220, -1, -1));

        button1.setLabel("SUBMIT");
        button1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                button1ActionPerformed(evt);
            }
        });
        add(button1,                                            new
org.netbeans.lib.awtextra.AbsoluteConstraints(290, 250, -1, -1));

        label5.setText("Successfull!!!");
        label5.setVisible(false);
        add(label5,                                             new
org.netbeans.lib.awtextra.AbsoluteConstraints(40, 250, 80, -1));

        pack();
    }// </editor-fold>

    /**
     * Exit the Application
     */
    private void exitForm(java.awt.event.WindowEvent evt) {
        System.exit(0);
    }

    private                                                    void
textField1ActionPerformed(java.awt.event.ActionEvent evt) {
        // TODO add your handling code here:
    }

    private void button1ActionPerformed(java.awt.event.ActionEvent
evt) {
        if(textField1.getText().length()       >       0       &&
textField2.getText().length() > 0){
            label5.setText("Successfull!!");
            label5.setVisible(true);
        }
        else{
            label5.setText("Enter Details!!");
            label5.setVisible(true);
        }
    }
```

```
    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_3().setVisible(true);
            }
        });
    }


    // Variables declaration - do not modify
    private java.awt.Button button1;
    private java.awt.Checkbox checkbox1;
    private java.awt.Checkbox checkbox2;
    private java.awt.Checkbox checkbox3;
    private java.awt.Label label1;
    private java.awt.Label label2;
    private java.awt.Label label3;
    private java.awt.Label label4;
    private java.awt.Label label5;
    private java.awt.TextField textField1;
    private java.awt.TextField textField2;
    // End of variables declaration
}
```

OUTPUT:



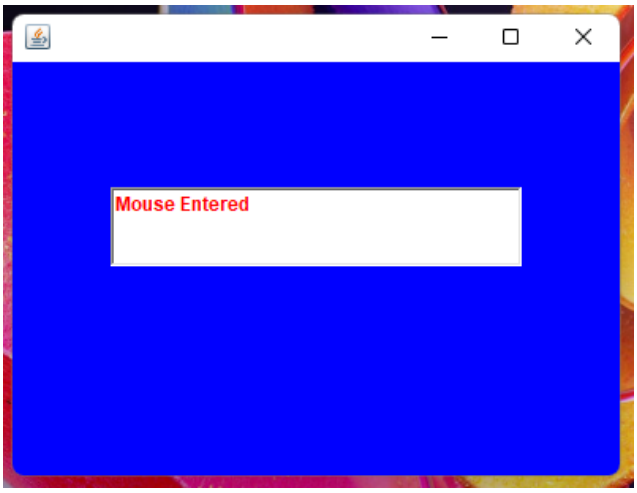
Q4. Write a program to create a GUI and add MouseListener
CODE:

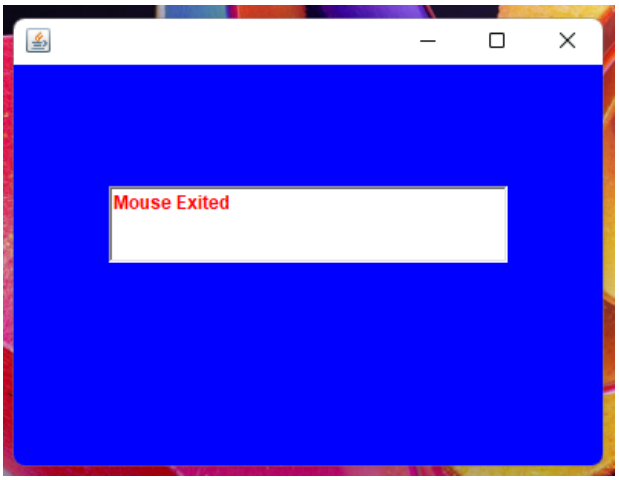
```
/*
 * To change this license header, choose License Headers in
Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_4;

/**
 *
 * @author shalmon
 */
public class question_4 extends java.awt.Frame {

    /**
     * Creates new form question_4
     */
    public question_4() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this
method is always
     * regenerated by the Form Editor.
     */
    // <editor-fold defaultstate="collapsed" desc="Generated
Code">
    private void initComponents() {

        textField1 = new java.awt.TextField();

        setBackground(java.awt.Color.blue);
        setMinimumSize(new java.awt.Dimension(400, 300));
        addWindowListener(new java.awt.event.WindowAdapter() {
            public void windowClosing(java.awt.event.WindowEvent
evt) {
                exitForm(evt);
            }
        });
        setLayout(new org.netbeans.lib.awtextra.AbsoluteLayout());
```

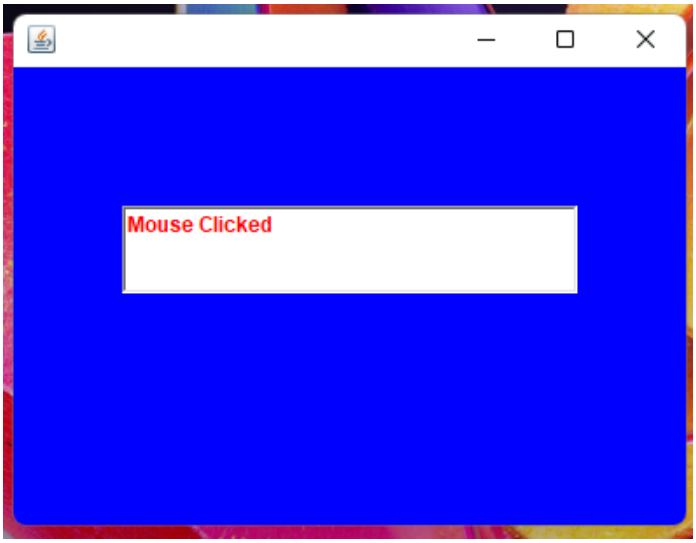
```
        textField1.setFont(new java.awt.Font("Dialog", 1, 12)); //
NOI18N
        textField1.setForeground(new java.awt.Color(255, 0, 0));
        textField1.addMouseListener(new
java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent
evt) {
                textField1MouseClicked(evt);
            }
            public void mouseEntered(java.awt.event.MouseEvent
evt) {
                textField1MouseEntered(evt);
            }
            public void mouseExited(java.awt.event.MouseEvent evt)
{
                textField1MouseExited(evt);
            }
        });
        add(textField1, new
org.netbeans.lib.awtextra.AbsoluteConstraints(70, 110, 260, 50));

        pack();
    }// </editor-fold>

    /**
     * Exit the Application
     */
    private void exitForm(java.awt.event.WindowEvent evt) {
        System.exit(0);
    }

    private void textField1MouseEntered(java.awt.event.MouseEvent
evt) {
        textField1.setText("Mouse Entered");
    }

    private void textField1MouseExited(java.awt.event.MouseEvent
evt) {
        textField1.setText("Mouse Exited");
    }

    private void textField1MouseClicked(java.awt.event.MouseEvent
evt) {
        textField1.setText("Mouse Clicked");
    }
```

```
    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_4().setVisible(true);
            }
        });
    }


    // Variables declaration - do not modify
    private java.awt.TextField textField1;
    // End of variables declaration
}
```

OUTPUT:







PRACTICAL 5
SWING

Introduction:

1. Swing API is a set of extensible GUI components to ease the life of developers in creating Java based Front end/GUI applications
2. It is built on top of AWT API and acts as a replacement for AWT API, since it has every control corresponding to AWT controls
3. Swing components follow a Model-View-Controller (MVC) architecture to fulfil the following criteria:
    a. A single API is to be sufficient to support multiple look and feel
    b. API is to be model driven so that the highest level API is not required to have data.
4. MVC architecture:
    a. Model represents component's data
    b. View represents visual presentation of the component's data
    c. Controller acts as an interface between model and view
5. Swing has **Model** as a separate element, **View** and **Controller** are clubbed in the **User Interface elements**.
6. Due to this approach, Swing has a pluggable look-and-feel architecture
7. Features of Swing include:
    a. Light Weight:
        i. Swing is independent of the native Operation System and is run using pure Java code, unlike AWT which uses Operating System calls
    b. Rich controls
        i. It has a rich set of advanced controls like:
            1. T:ree
            2. TabbedPane
            3. Slider
            4. Colorpicker
            5. Table controls
    c. Highly Customizable:
        i. The controls can be easily customized because the look of the components is independent of the operating system
    d. Pluggable look-and-feel
        i. SWING GUI application's look and feel can be changed at run-time

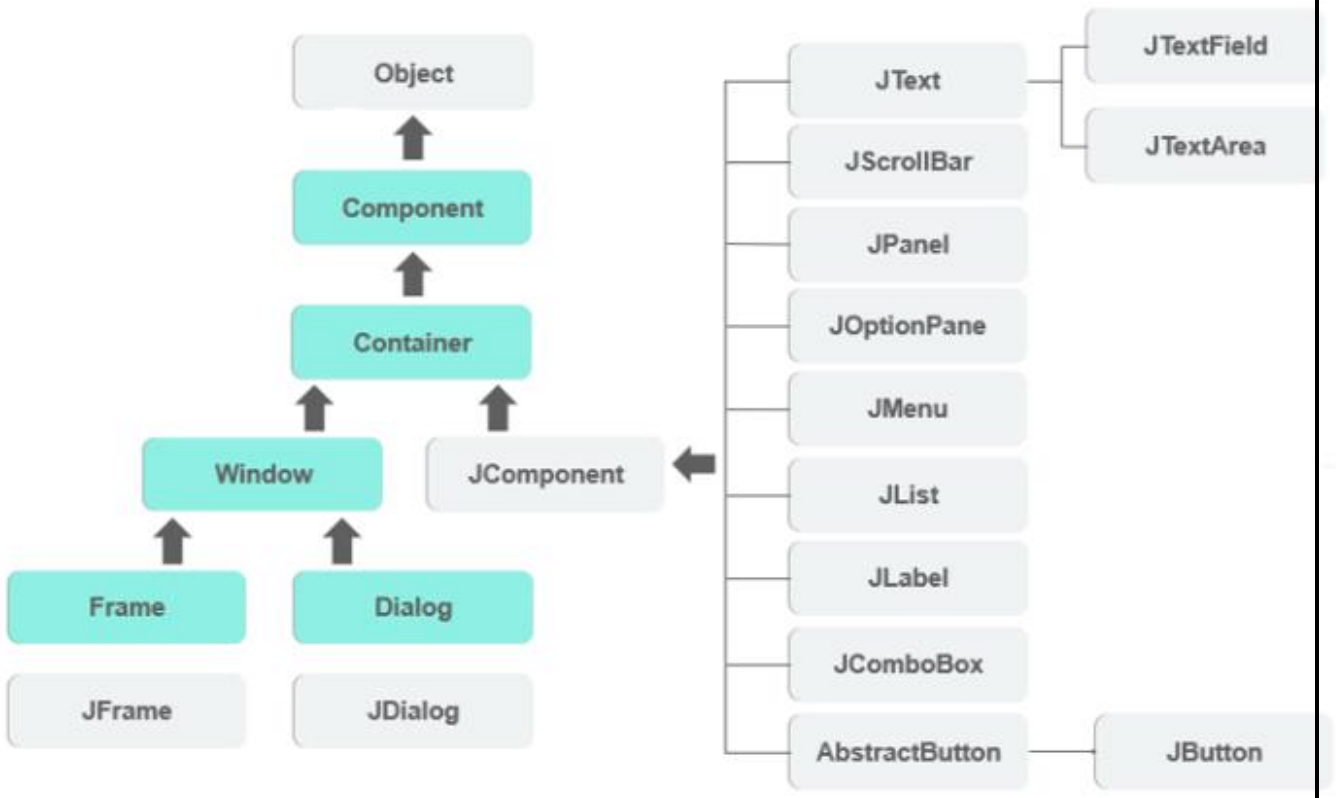


Figure: Class hierarchy of Swing components

Q1. Write a program to create a Swing GUI and handle event display the dialog box when item selected

CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

import javax.swing.JOptionPane;

/**
 *
 * @author shalmon
 */
public class question_1 extends javax.swing.JFrame {

    /**
     * Creates new form question_1
     */
    public question_1() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jComboBox1 = new javax.swing.JComboBox<>();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);

        jLabel1.setText("SELECT YOUR COUNTRY:");
```

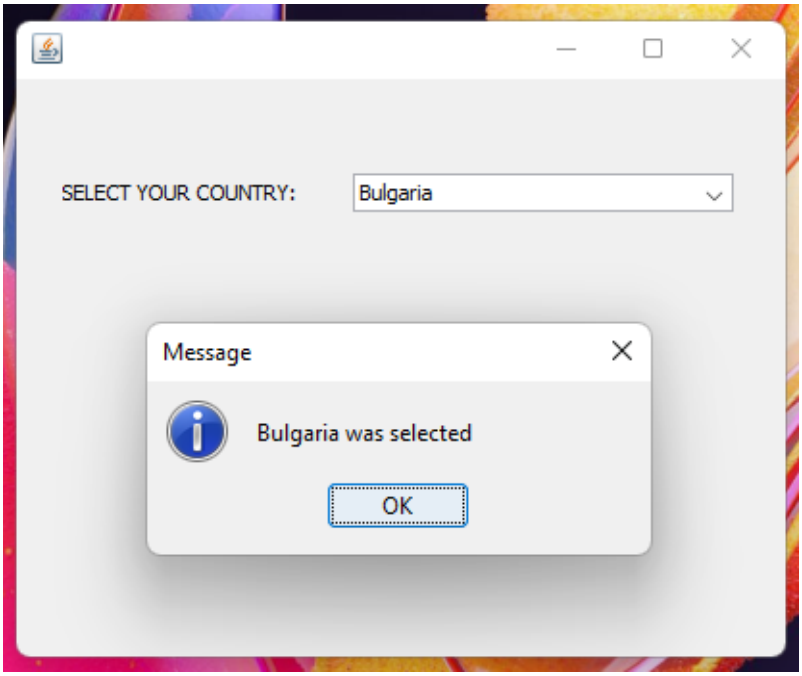
```
        jComboBox1.setModel(new
javax.swing.DefaultComboBoxModel<>(new String[] { "Afghanistan",
"Albania", "Algeria", "Andorra", "Angola", "Antigua and Barbuda",
"Argentina", "Armenia", "Australia", "Austria", "Azerbaijan",
"Bahamas", "Bahrain", "Bangladesh", "Barbados", "Belarus",
"Belgium", "Belize", "Benin", "Bhutan", "Bolivia", "Bosnia and
Herzegovina", "Botswana", "Brazil", "Brunei", "Bulgaria", "Burkina
Faso", "Burundi", "Cabo Verde", "Cambodia", "Cameroon", "Canada",
"Central African Republic (CAR)", "Chad", "Chile", "China",
"Colombia", "Comoros", "Congo, Democratic Republic of the", "Congo,
Republic of the", "Costa Rica", "Cote d'Ivoire", "Croatia", "Cuba",
"Cyprus", "Czechia", "Denmark", "Djibouti", "Dominica", "Dominican
Republic", "Ecuador", "Egypt", "El Salvador", "Equatorial Guinea",
"Eritrea", "Estonia", "Eswatini", "Ethiopia", "Fiji", "Finland",
"France", "Gabon", "Gambia", "Georgia", "Germany", "Ghana",
"Greece", "Grenada", "Guatemala", "Guinea", "Guinea-Bissau",
"Guyana", "Haiti", "Honduras", "Hungary", "Iceland", "India",
"Indonesia", "Iran", "Iraq", "Ireland", "Israel", "Italy",
"Jamaica", "Japan", "Jordan", "Kazakhstan", "Kenya", "Kiribati",
"Kosovo", "Kuwait", "Kyrgyzstan", "Laos", "Latvia", "Lebanon",
"Lesotho", "Liberia", "Libya", "Liechtenstein", "Lithuania",
"Luxembourg", "Madagascar", "Malawi", "Malaysia", "Maldives",
"Mali", "Malta", "Marshall Islands", "Mauritania", "Mauritius",
"Mexico", "Micronesia", "Moldova", "Monaco", "Mongolia",
"Montenegro", "Morocco", "Mozambique", "Myanmar", "Namibia",
"Nauru", "Nepal", "Netherlands", "New Zealand", "Nicaragua",
"Niger", "Nigeria", "North Korea", "North Macedonia", "Norway",
"Oman", "Pakistan", "Palau", "Palestine", "Panama", "Papua New
Guinea", "Paraguay", "Peru", "Philippines", "Poland", "Portugal",
"Qatar", "Romania", "Russia", "Rwanda", "Saint Kitts and Nevis",
"Saint Lucia", "Saint Vincent and the Grenadines", "Samoa", "San
Marino", "Sao Tome and Principe", "Saudi Arabia", "Senegal",
"Serbia", "Seychelles", "Sierra Leone", "Singapore", "Slovakia",
"Slovenia", "Solomon Islands", "Somalia", "South Africa", "South
Korea", "South Sudan", "Spain", "Sri Lanka", "Sudan", "Suriname",
"Sweden", "Switzerland", "Syria", "Taiwan", "Tajikistan",
"Tanzania", "Thailand", "Timor-Leste", "Togo", "Tonga", "Trinidad
and Tobago", "Tunisia", "Turkey", "Turkmenistan", "Tuvalu",
"Uganda", "Ukraine", "United Arab Emirates (UAE)", "United Kingdom
(UK)", "United States of America (USA)", "Uruguay", "Uzbekistan",
"Vanuatu", "Vatican City (Holy See)", "Venezuela", "Vietnam",
"Yemen", "Zambia", "Zimbabwe" }));
        jComboBox1.addActionListener(new
java.awt.event.ActionListener() {
```

```
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                jComboBox1ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(24, 24, 24)
                .addComponent(jLabel1)
                .addGap(29, 29, 29)
                .addComponent(jComboBox1,
javax.swing.GroupLayout.PREFERRED_SIZE,                        198,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(27, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(49, 49, 49)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel1,
javax.swing.GroupLayout.PREFERRED_SIZE,                         20,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(jComboBox1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addContainerGap(231, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>

    private                                                    void
jComboBox1ActionPerformed(java.awt.event.ActionEvent evt) {
```

```
        JOptionPane.showMessageDialog(jComboBox1,
jComboBox1.getSelectedItem()+" was selected");
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold  defaultstate="collapsed"  desc="  Look  and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         *               For               details               see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
            for   (javax.swing.UIManager.LookAndFeelInfo   info   :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_1.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(question_1.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_1.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_1.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
```

```
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_1().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JComboBox<String> jComboBox1;
    private javax.swing.JLabel jLabel1;
    // End of variables declaration
}
```

OUTPUT:



Q2. Write a program to create a Swing GUI and handle event when the item is selected

CODE:

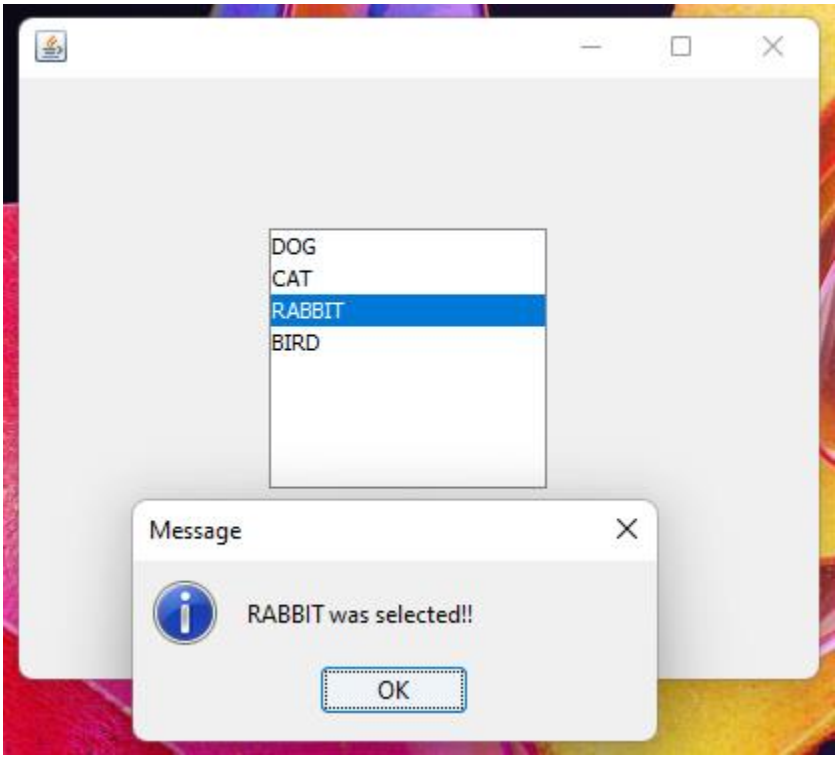
```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

/**
 *
 * @author shalmon
 */
import javax.swing.JOptionPane;
public class question_2 extends javax.swing.JFrame {
    /**
     * Creates new form question_2
     */
    public question_2() {
        initComponents();
    }

    /**
     *  This  method  is  called  from  within  the  constructor  to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jScrollPane1 = new javax.swing.JScrollPane();
        jList1 = new javax.swing.JList<>();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);

        jList1.setModel(new
javax.swing.AbstractListModel<String>() {
            String[] strings = { "DOG", "CAT", "RABBIT", "BIRD" };
```

```
            public int getSize() { return strings.length; }
            public String getElementAt(int i) { return strings[i]; }
        });

jList1.setSelectionMode(javax.swing.ListSelectionModel.SINGLE_SELE
CTION);
        jList1.setName(""); // NOI18N
        jList1.addMouseListener(new java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt)
{
                jList1MouseClicked(evt);
            }
        });
        jScrollPane1.setViewportView(jList1);

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(125, 125, 125)
                .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE,                        139,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(136, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(75, 75, 75)
                .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addContainerGap(95, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>
```

```
    private void jList1MouseClicked(java.awt.event.MouseEvent evt)
{
        JOptionPane.showMessageDialog(jList1,
jList1.getSelectedValue()+" was selected!!");
    }
    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold  defaultstate="collapsed"  desc="  Look  and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         *               For              details              see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
            for   (javax.swing.UIManager.LookAndFeelInfo   info   :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_2.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(question_2.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_2.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_2.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>
        /* Create and display the form */
```

```
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_2().setVisible(true);
            }
        });
    }
    // Variables declaration - do not modify
    private javax.swing.JList<String> jList1;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration
}
```

OUTPUT:



Q3. Write a program to create a Swing GUI and handle event when the item is selected

CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

import javax.swing.JOptionPane;

/**
 *
 * @author shalmon
 */
public class question_3 extends javax.swing.JFrame {

    /**
     * Creates new form question_3
     */
    public question_3() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        buttonGroup1 = new javax.swing.ButtonGroup();
        jRadioButton1 = new javax.swing.JRadioButton();
        jRadioButton2 = new javax.swing.JRadioButton();
        jRadioButton3 = new javax.swing.JRadioButton();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);
```

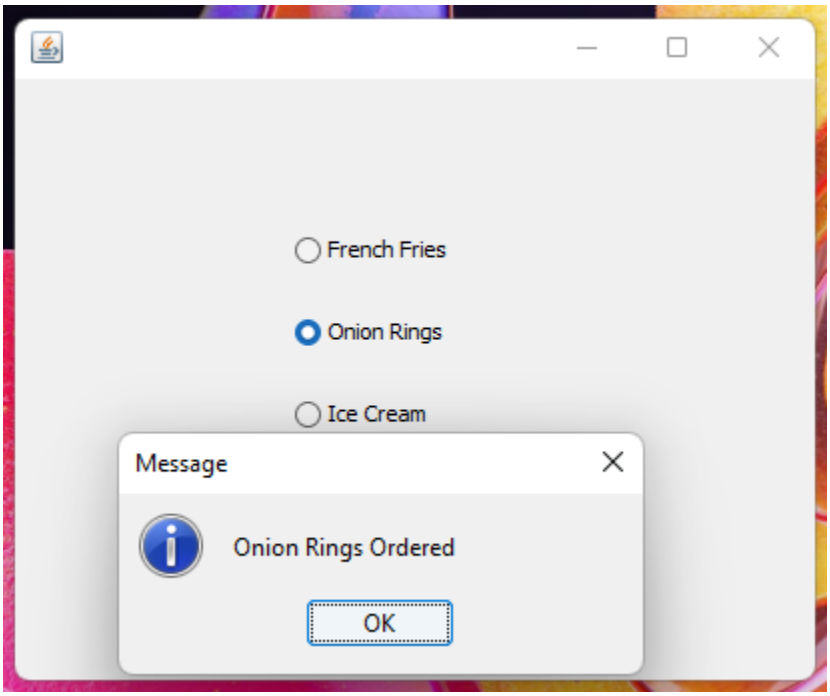
```
        buttonGroup1.add(jRadioButton1);
        jRadioButton1.setText("French Fries");
        jRadioButton1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                jRadioButton1ActionPerformed(evt);
            }
        });

        buttonGroup1.add(jRadioButton2);
        jRadioButton2.setText("Onion Rings");
        jRadioButton2.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                jRadioButton2ActionPerformed(evt);
            }
        });

        buttonGroup1.add(jRadioButton3);
        jRadioButton3.setText("Ice Cream");
        jRadioButton3.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                jRadioButton3ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(136, 136, 136)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.TRAILING, false)
                    .addComponent(jRadioButton1,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
```

```
                    .addComponent(jRadioButton2,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                    .addComponent(jRadioButton3,
javax.swing.GroupLayout.Alignment.LEADING,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                .addContainerGap(179, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(74, 74, 74)
                .addComponent(jRadioButton1)
                .addGap(18, 18, 18)
                .addComponent(jRadioButton2)
                .addGap(18, 18, 18)
                .addComponent(jRadioButton3)
                .addContainerGap(121, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>

    private                                                 void
jRadioButton2ActionPerformed(java.awt.event.ActionEvent evt) {
        JOptionPane.showMessageDialog(jRadioButton2,  "Onion  Rings
Ordered");
    }

    private                                                 void
jRadioButton1ActionPerformed(java.awt.event.ActionEvent evt) {
        JOptionPane.showMessageDialog(jRadioButton2, "French Fries
Ordered");
    }

    private                                                 void
jRadioButton3ActionPerformed(java.awt.event.ActionEvent evt) {
        JOptionPane.showMessageDialog(jRadioButton2,   "Ice   Cream
Ordered");
    }

    /**
```

```
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         * For details see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_3.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(question_3.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_3.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_3.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_3().setVisible(true);
            }
        });
```

```
    }

    // Variables declaration - do not modify
    private javax.swing.ButtonGroup buttonGroup1;
    private javax.swing.JRadioButton jRadioButton1;
    private javax.swing.JRadioButton jRadioButton2;
    private javax.swing.JRadioButton jRadioButton3;
    // End of variables declaration
}
```

OUTPUT:



Q4. Write a program to create a Swing GUI and handle event.
CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

import java.awt.Color;
import javax.swing.JOptionPane;

/**
 *
 * @author shalmon
 */
public class question_4 extends javax.swing.JFrame {

    /**
     * Creates new form question_4
     */
    public question_4() {
        initComponents();
    }

    /**
     *  This  method  is  called  from  within  the  constructor  to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jTextField1 = new javax.swing.JTextField();
        jTextField2 = new javax.swing.JTextField();
        jButton1 = new javax.swing.JButton();
```

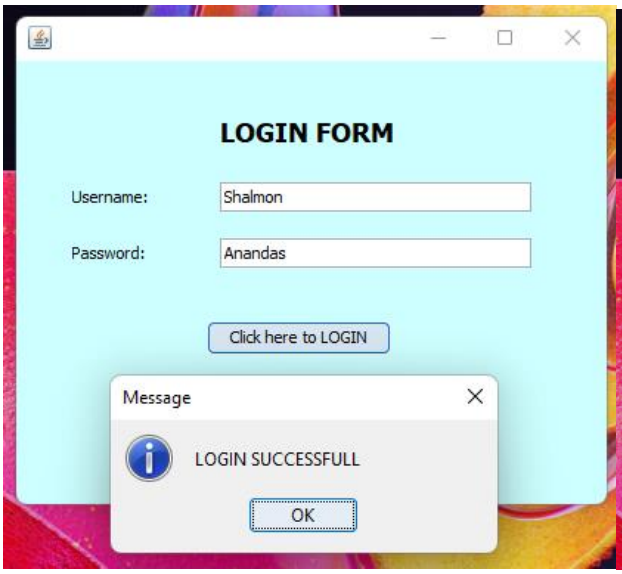
```
setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);
        setBackground(new java.awt.Color(102, 255, 204));
        addComponentListener(new  java.awt.event.ComponentAdapter()
{
            public                                                  void
componentShown(java.awt.event.ComponentEvent evt) {
                formComponentShown(evt);
            }
        });

        jLabel1.setFont(new  java.awt.Font("Tahoma",  1,  18));  //
NOI18N
        jLabel1.setText("LOGIN FORM");

        jLabel2.setText("Username:");

        jLabel3.setText("Password:");

        jButton1.setText("Click here to LOGIN");
        jButton1.addActionListener(new
java.awt.event.ActionListener() {
            public  void  actionPerformed(java.awt.event.ActionEvent
evt) {
                jButton1ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(38, 38, 38)
                        .addGroup(layout.createParallelGroup(javax
.swing.GroupLayout.Alignment.LEADING)
                            .addComponent(jLabel3)
```

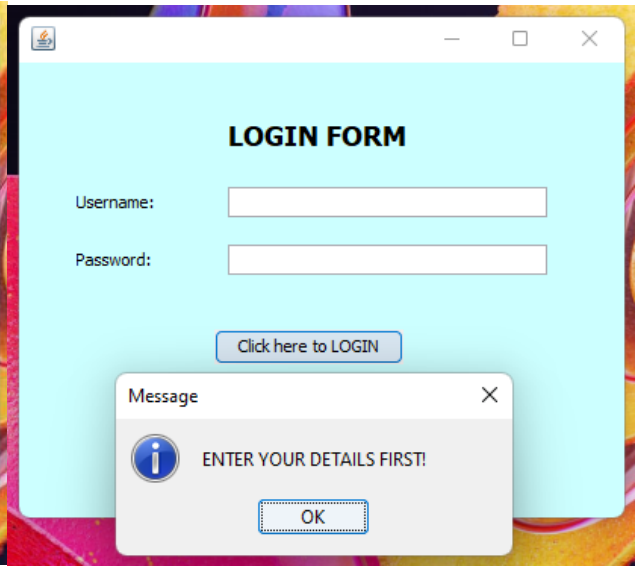
```
                            .addComponent(jLabel2,
javax.swing.GroupLayout.PREFERRED_SIZE,                          78,
javax.swing.GroupLayout.PREFERRED_SIZE))
                        .addGap(22, 22, 22)
                        .addGroup(layout.createParallelGroup(javax
.swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jLabel1)
                            .addComponent(jTextField1)
                            .addComponent(jTextField2,
javax.swing.GroupLayout.DEFAULT_SIZE, 211, Short.MAX_VALUE)))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(129, 129, 129)
                        .addComponent(jButton1)))
                .addContainerGap(51, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(37, 37, 37)
                .addComponent(jLabel1)
                .addGap(23, 23, 23)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel2)
                    .addComponent(jTextField1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel3)
                    .addComponent(jTextField2,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(36, 36, 36)
                .addComponent(jButton1)
                .addContainerGap(101, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>
```

```
    private void jButton1ActionPerformed(java.awt.event.ActionEvent
evt) {
        if(jTextField1.getText().length()       >       0       &&
jTextField2.getText().length() > 0){
            JOptionPane.showMessageDialog(jButton1,         "LOGIN
SUCCESSFULL");
        }
        else{
            JOptionPane.showMessageDialog(jButton1,   "ENTER   YOUR
DETAILS FIRST!");
        }
    }

    private  void  formComponentShown(java.awt.event.ComponentEvent
evt) {
        question_4.this.getContentPane().setBackground(new
java.awt.Color(204,255,255));
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold  defaultstate="collapsed"  desc="  Look  and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         *               For               details               see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
            for   (javax.swing.UIManager.LookAndFeelInfo   info   :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_4.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
```

```
java.util.logging.Logger.getLogger(question_4.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_4.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_4.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_4().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton jButton1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JTextField jTextField1;
    private javax.swing.JTextField jTextField2;
    // End of variables declaration
}
```

OUTPUT:


LOGIN FORM
Username:
Shalmon
Password:
Anandas
Click here to LOGIN
Message
LOGIN SUCCESSFULL
OK


LOGIN FORM
Username:
Password:
Click here to LOGIN
Message
ENTER YOUR DETAILS FIRST!
OK

Q5. Create the following Swing GUI Component in Java, insert an image and after registration it should go to login page which we have already created.

CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

import javax.swing.JOptionPane;

/**
 *
 * @author shalmon
 */
public class question_5 extends javax.swing.JFrame {

    /**
     * Creates new form question_5
     */
    public question_5() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        buttonGroup1 = new javax.swing.ButtonGroup();
        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jTextField1 = new javax.swing.JTextField();
        jLabel4 = new javax.swing.JLabel();
        jTextField2 = new javax.swing.JTextField();
        jLabel5 = new javax.swing.JLabel();
```

```
        jTextField3 = new javax.swing.JTextField();
        jLabel6 = new javax.swing.JLabel();
        jRadioButton1 = new javax.swing.JRadioButton();
        jRadioButton2 = new javax.swing.JRadioButton();
        jButton1 = new javax.swing.JButton();


setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);
        addComponentListener(new  java.awt.event.ComponentAdapter()
{
            public                                              void
componentShown(java.awt.event.ComponentEvent evt) {
                formComponentShown(evt);
            }
        });

        jLabel1.setIcon(new
javax.swing.ImageIcon("D:\\Sem2_msc_notes\\rani_maam\\Practical_5\
\resources\\gnkhalsalogo.png")); // NOI18N
        jLabel1.setToolTipText("");

jLabel1.setBorder(javax.swing.BorderFactory.createLineBorder(new
java.awt.Color(0, 0, 0), 2));

        jLabel2.setFont(new  java.awt.Font("Tahoma",  1,  18));  //
NOI18N
        jLabel2.setText("REGISTRATION FORM");
        jLabel2.setToolTipText("");

        jLabel3.setText("Enrollment Number:");
        jLabel3.setCursor(new
java.awt.Cursor(java.awt.Cursor.DEFAULT_CURSOR));

        jLabel4.setText("Name:");

        jLabel5.setText("Course:");

        jLabel6.setText("Gender:");

        buttonGroup1.add(jRadioButton1);
        jRadioButton1.setText("Male");

        buttonGroup1.add(jRadioButton2);
        jRadioButton2.setText("Female");
```

```
        jButton1.setText("REGISTER");
        jButton1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
                jButton1ActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(113, 113, 113)
                        .addComponent(jLabel2))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(19, 19, 19)
                        .addGroup(layout.createParallelGroup(javax
.swing.GroupLayout.Alignment.LEADING, false)
                            .addComponent(jLabel1)
                            .addGroup(layout.createSequentialGroup
()
                                .addGroup(layout.createParallelGro
up(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jLabel3)
                                    .addComponent(jLabel4)
                                    .addComponent(jLabel5)
                                    .addComponent(jLabel6))
                                .addGap(44, 44, 44)
                                .addGroup(layout.createParallelGro
up(javax.swing.GroupLayout.Alignment.LEADING)
                                    .addComponent(jTextField1)
                                    .addComponent(jTextField2)
                                    .addComponent(jTextField3)
                                    .addGroup(layout.createSequent
ialGroup()
                                        .addComponent(jRadioButton
1)
```

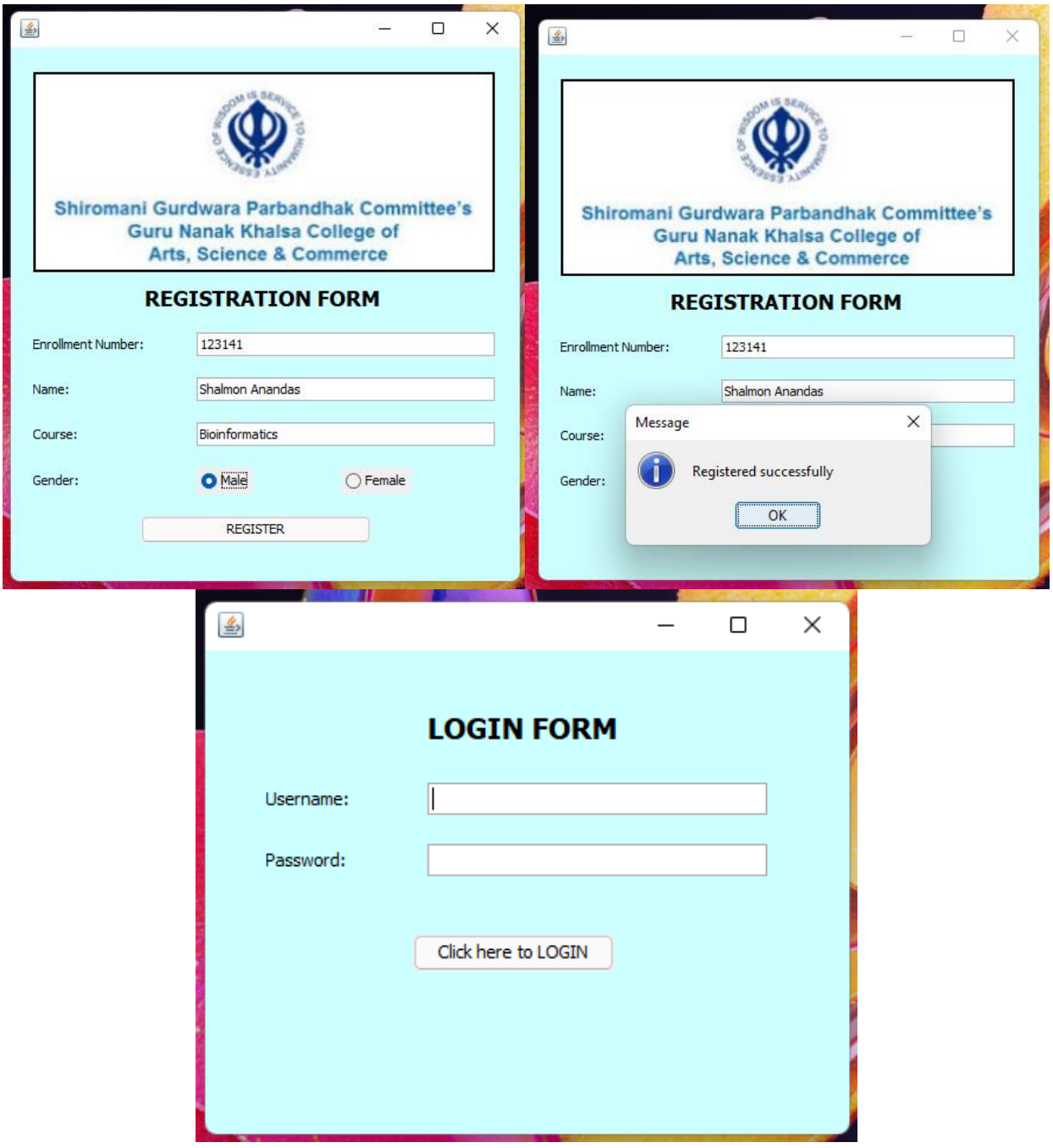
```
                                        .addPreferredGap(javax.swi
ng.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                                        .addComponent(jRadioButton
2)
                                        .addGap(71, 71, 71))))))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(110, 110, 110)
                        .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE,                          194,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(21, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(21, 21, 21)
                .addComponent(jLabel1)
                .addPreferredGap(javax.swing.LayoutStyle.Component
Placement.UNRELATED)
                .addComponent(jLabel2)
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel3)
                    .addComponent(jTextField1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel4)
                    .addComponent(jTextField2,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel5)
                    .addComponent(jTextField3,
javax.swing.GroupLayout.PREFERRED_SIZE,
```

```
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.BASELINE)
                    .addComponent(jLabel6)
                    .addComponent(jRadioButton1)
                    .addComponent(jRadioButton2))
                .addGap(18, 18, 18)
                .addComponent(jButton1)
                .addContainerGap(32, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>

    private void jButton1ActionPerformed(java.awt.event.ActionEvent
evt) {
        new question_4().setVisible(true);
        JOptionPane.showMessageDialog(jButton1,        "Registered
successfully");
        question_5.this.setVisible(false);

    }

    private  void  formComponentShown(java.awt.event.ComponentEvent
evt) {
        question_5.this.getContentPane().setBackground(new
java.awt.Color(204,255,255));
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold  defaultstate="collapsed"  desc="  Look  and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         *               For               details               see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
```

```
            for   (javax.swing.UIManager.LookAndFeelInfo   info   :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_5.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(question_5.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_5.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_5.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_5().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.ButtonGroup buttonGroup1;
    private javax.swing.JButton jButton1;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JLabel jLabel6;
    private javax.swing.JRadioButton jRadioButton1;
    private javax.swing.JRadioButton jRadioButton2;
```

```
    private javax.swing.JTextField jTextField1;
    private javax.swing.JTextField jTextField2;
    private javax.swing.JTextField jTextField3;
    // End of variables declaration
}
```

OUTPUT:



Q6. Create a Swing GUI
CODE:

```
/*
 * To change this license header, choose License Headers in Project
Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */
package practical_5;

/**
 *
 * @author shalmon
 */
public class question_6 extends javax.swing.JFrame {

    /**
     * Creates new form question_6
     */
    public question_6() {
        initComponents();
    }

    /**
     * This method is called from within the constructor to
initialize the form.
     * WARNING: Do NOT modify this code. The content of this method
is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
    // <editor-fold defaultstate="collapsed" desc="Generated Code">
    private void initComponents() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();
        jCheckBox1 = new javax.swing.JCheckBox();
        jTextField1 = new javax.swing.JTextField();
        jTextField2 = new javax.swing.JTextField();
        jCheckBox2 = new javax.swing.JCheckBox();
        jCheckBox3 = new javax.swing.JCheckBox();
        jButton1 = new javax.swing.JButton();
        jLabel5 = new javax.swing.JLabel();
```

```
setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE
);
        setBackground(new java.awt.Color(102, 255, 204));
        addComponentListener(new  java.awt.event.ComponentAdapter()
{
            public                                              void
componentShown(java.awt.event.ComponentEvent evt) {
                formComponentShown(evt);
            }
        });

        jLabel1.setFont(new  java.awt.Font("Tahoma",  1,  18));  //
NOI18N
        jLabel1.setText("Student Details:");

        jLabel2.setFont(new  java.awt.Font("Tahoma",  0,  14));  //
NOI18N
        jLabel2.setText("Name:");

        jLabel3.setFont(new  java.awt.Font("Tahoma",  0,  14));  //
NOI18N
        jLabel3.setText("Contact Number:");

        jLabel4.setFont(new  java.awt.Font("Tahoma",  0,  14));  //
NOI18N
        jLabel4.setText("Course Opted:");

        jCheckBox1.setFont(new java.awt.Font("Tahoma", 0, 14)); //
NOI18N
        jCheckBox1.setText("Bioinformatics");

        jCheckBox2.setFont(new java.awt.Font("Tahoma", 0, 14)); //
NOI18N
        jCheckBox2.setText("Botany");

        jCheckBox3.setFont(new java.awt.Font("Tahoma", 0, 14)); //
NOI18N
        jCheckBox3.setText("Biochemistry");

        jButton1.setText("Submit");
        jButton1.addActionListener(new
java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent
evt) {
```

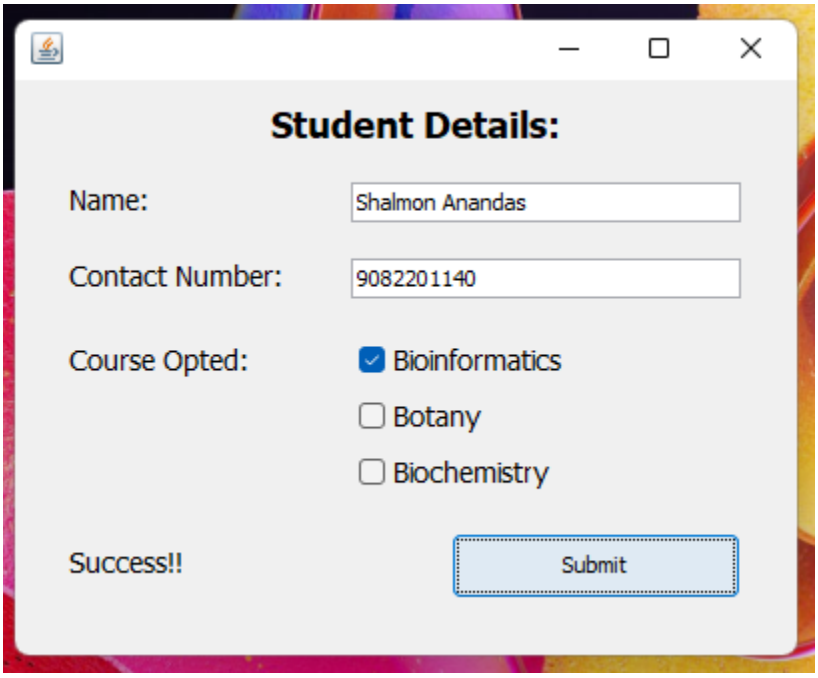
```
                jButton1ActionPerformed(evt);
            }
        });

        jLabel5.setFont(new  java.awt.Font("Tahoma",  0,  14));  //
NOI18N
        jLabel5.setText("Success!!");
        jLabel5.setToolTipText("");

        javax.swing.GroupLayout        layout        =        new
javax.swing.GroupLayout(getContentPane());
        getContentPane().setLayout(layout);
        layout.setHorizontalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(128, 128, 128)
                        .addComponent(jLabel1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(27, 27, 27)
                        .addComponent(jLabel2)
                        .addGap(101, 101, 101)
                        .addComponent(jTextField1,
javax.swing.GroupLayout.PREFERRED_SIZE,                         195,
javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(27, 27, 27)
                        .addComponent(jLabel3)
                        .addGap(34, 34, 34)
                        .addComponent(jTextField2,
javax.swing.GroupLayout.PREFERRED_SIZE,                         195,
javax.swing.GroupLayout.PREFERRED_SIZE))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(27, 27, 27)
                        .addComponent(jLabel4)
                        .addGap(51, 51, 51)
                        .addComponent(jCheckBox1))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(168, 168, 168)
                        .addComponent(jCheckBox2))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(168, 168, 168)
```

```
                        .addComponent(jCheckBox3))
                    .addGroup(layout.createSequentialGroup()
                        .addGap(27, 27, 27)
                        .addComponent(jLabel5)
                        .addGap(134, 134, 134)
                        .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE,                          145,
javax.swing.GroupLayout.PREFERRED_SIZE)))
                .addContainerGap(28, Short.MAX_VALUE))
        );
        layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
            .addGroup(layout.createSequentialGroup()
                .addGap(11, 11, 11)
                .addComponent(jLabel1)
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addComponent(jLabel2)
                    .addComponent(jTextField1,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addComponent(jLabel3)
                    .addComponent(jTextField2,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGap(18, 18, 18)
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(4, 4, 4)
                        .addComponent(jLabel4))
                    .addComponent(jCheckBox1))
                .addGap(3, 3, 3)
                .addComponent(jCheckBox2)
                .addGap(3, 3, 3)
                .addComponent(jCheckBox3)
                .addGap(18, 18, 18)
```

```
                .addGroup(layout.createParallelGroup(javax.swing.G
roupLayout.Alignment.LEADING)
                    .addGroup(layout.createSequentialGroup()
                        .addGap(6, 6, 6)
                        .addComponent(jLabel5))
                    .addComponent(jButton1,
javax.swing.GroupLayout.PREFERRED_SIZE,                          33,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addContainerGap(28, Short.MAX_VALUE))
        );

        pack();
    }// </editor-fold>

    private void jButton1ActionPerformed(java.awt.event.ActionEvent
evt) {
        jLabel5.setVisible(true);
    }

    private  void  formComponentShown(java.awt.event.ComponentEvent
evt) {
        jLabel5.setVisible(false);
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        //<editor-fold  defaultstate="collapsed"  desc="  Look  and
feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available,
stay with the default look and feel.
         *               For              details              see
http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/pla
f.html
         */
        try {
            for   (javax.swing.UIManager.LookAndFeelInfo   info   :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Windows".equals(info.getName())) {

javax.swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
```

```
        } catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(question_6.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(question_6.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(question_6.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(question_6.class.getName()).log
(java.util.logging.Level.SEVERE, null, ex);
        }
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
                new question_6().setVisible(true);
            }
        });
    }

    // Variables declaration - do not modify
    private javax.swing.JButton jButton1;
    private javax.swing.JCheckBox jCheckBox1;
    private javax.swing.JCheckBox jCheckBox2;
    private javax.swing.JCheckBox jCheckBox3;
    private javax.swing.JLabel jLabel1;
    private javax.swing.JLabel jLabel2;
    private javax.swing.JLabel jLabel3;
    private javax.swing.JLabel jLabel4;
    private javax.swing.JLabel jLabel5;
    private javax.swing.JTextField jTextField1;
    private javax.swing.JTextField jTextField2;
    // End of variables declaration
}
```

OUTPUT:


Student Details:
Name:
Shalmon Anandas
Contact Number:
9082201140
Course Opted:
Bioinformatics
Botany
Biochemistry
Success!!
Submit