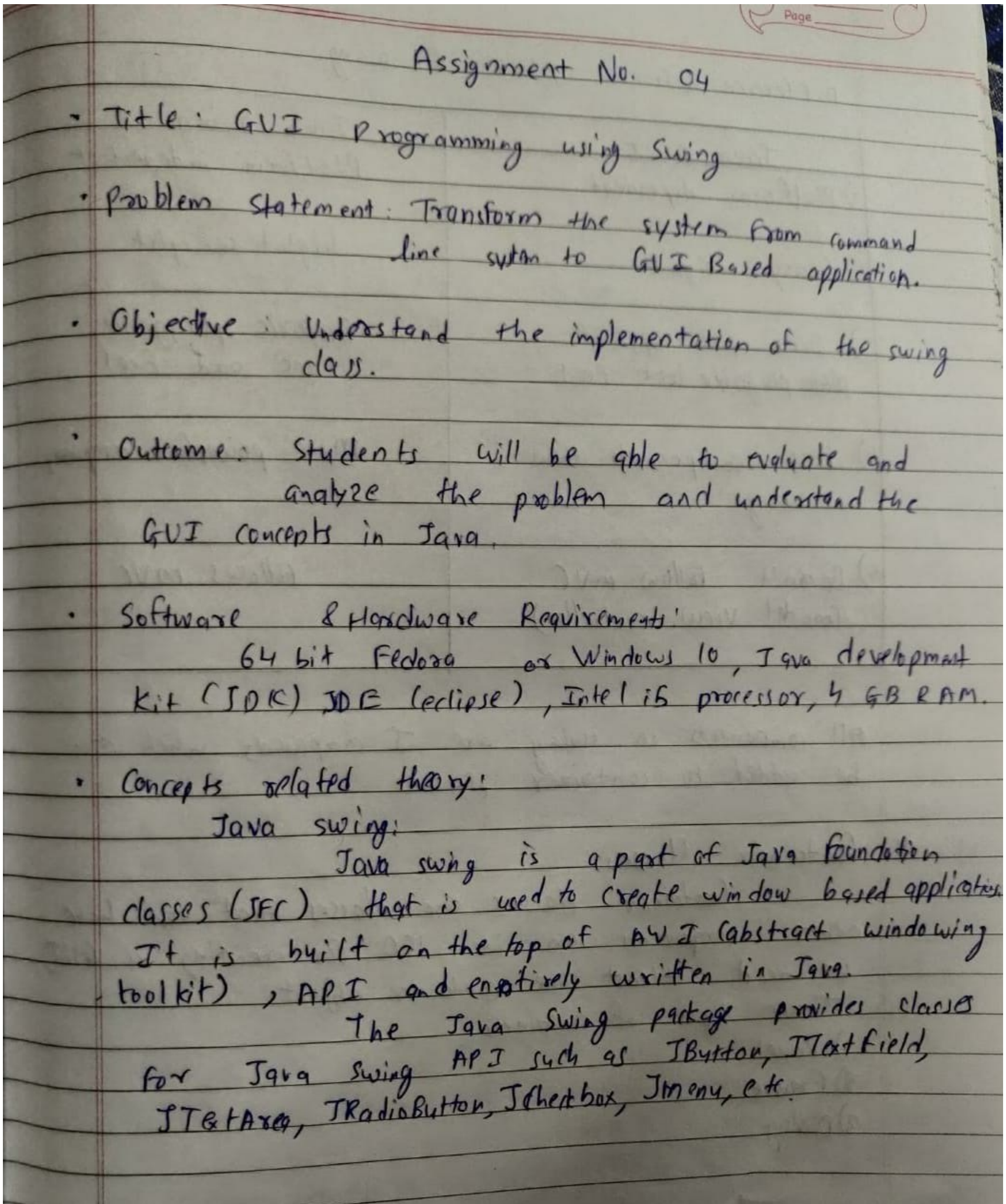
Write-up



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Assignment No. 04

- Title: GUI Programming using Swing
- Problem Statement: Transform the system from command line system to GUI Based application.
- Objective: Understand the implementation of the swing class.
- Outcome: Students will be able to evaluate and analyze the problem and understand the GUI concepts in Java.
- Software & Hardware Requirements: 64 bit Fedora or Windows 10, Java development kit (JDK) IDE (eclipse), Intel i5 processor, 4 GB RAM.
- Concepts related theory:

Java swing:

Java swing is a part of Java foundation classes (JFC) that is used to create window based applications. It is built on the top of AWT (abstract windowing toolkit), API and entirely written in Java.

The Java Swing package provides classes for Java Swing API such as JButton, JTextField, JTextArea, JRadioButton, JCheckbox, JMenu, etc.

Differance between AWT & swing

Java AWT	Java Swing
1) Platform dependent	Platform independent
2) Heavy weight	light weight
3) Does not support ~~playo~~ plugable look feel	supports pluggable look and feel
4) Less components than swing	More powerful components
5) Doesn't follow MVC (model view controller)	Follows MVC

All components in swing are J components which can be added to container classes.

* Container Classes:
Container classes are classes that can have other components on it. ISO for creating a GUI, we need atleast one container object.
Three types of containers:
1) Panel
2) Frame
3) Dialog

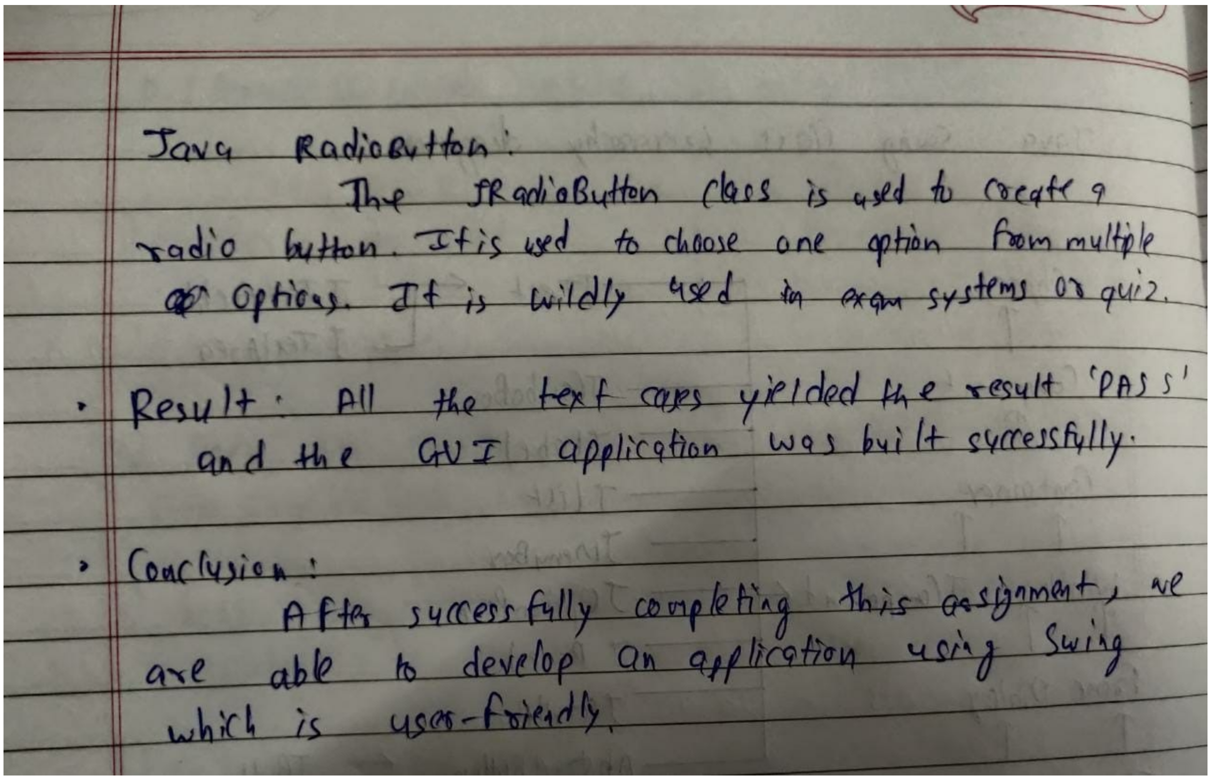
Java Swing class hierarchy diagram

$$\begin{tikzcd}
\text{Object} & & & \text{JText} \arrow[ddddl] & \text{J TextField} \arrow[l] \\
\text{Component} \arrow[u] & & & & \text{J TextArea} \arrow[ul] \\
\text{Container} \arrow[u] & & & \text{JComboBox} \arrow[ddl] & \\
 & & & \text{Jlabel} \arrow[dl] & \\
\text{Window} \arrow[uu] & & \text{JComponent} \arrow[uull] & \text{Jlist} \arrow[l] & \\
\text{Frame} \arrow[u] & \text{Dialog} \arrow[ul] & & \text{JMenuBar} \arrow[ul] & \\
\text{JFrame} \arrow[u] & \text{JDialog} \arrow[u] & & \text{JOptionPane} \arrow[uul] & \\
 & & & \text{J Panel} \arrow[uuul] & \\
 & & & \text{JScrollBar} \arrow[uuuul] & \\
 & & & \text{AbstractButton} \arrow[uuuuul] & \text{JButton} \arrow[l]
\end{tikzcd}$$

Java Jlabel: The object of Jlabel class is a component for a single text in a container. It is used to display a single line of read only text. The text can be changed by an application but a user cannot edit it.

Java JTextArea: The object of a JTextArea class is a mullti line region that displays text. It allows the editing of multiple line text. It inherits JText component class.

Java JCheck Box:
The JCheckBox class is used to create a checkbox. It is used to turn an option on or off (i.e. true or false). It inhaits JToggle Box class



Java RadioButton:
The JRadioButton class is used to create a radio button. It is used to choose one option from multiple options. It is wildly used in exam systems or quiz.

- Result: All the text cases yielded the result 'PASS' and the GUI application was built successfully.

- Conclusion:
After successfully completing this assignment, we are able to develop an application using Swing which is user-friendly.

Code

Server.java

```
package movierec;

import java.io.IOException;
import java.net.ServerSocket;
import java.net.Socket;
import java.sql.*;
import java.util.concurrent.ExecutorService;
import java.util.concurrent.Executors;

public class Server {
    private static final int PORT = 9169;
    private static final ExecutorService pool =
Executors.newFixedThreadPool(5);

    public static void main(String[] args) throws
IOException, SQLException, ClassNotFoundException {
        String name, pass, url;
        Connection con;
        Class.forName("com.mysql.cj.jdbc.Driver");
        url = "jdbc:mysql://localhost:3306/moviedb";
        name = "root";
        pass = "mysql";
        con = DriverManager.getConnection(url, name,
pass);
        ServerSocket listener = new ServerSocket(PORT);
        while(true){

            System.out.println("Waiting For Client");
            Socket client = listener.accept();
            System.out.println("Client Accepted");
            ClientHandler clientThread = new
ClientHandler(client,con);

            pool.execute(clientThread);

        }
    }
}
```

ClientHandler.java

```
package movierec;

import java.sql.*;
import java.io.*;
import java.net.Socket;
import java.util.ArrayList;
import java.util.Random;

public class ClientHandler implements Runnable {
    private Socket client;
    private BufferedReader in;
    private PrintWriter out;
    Connection con;
    ArrayList<String> usernames = new ArrayList<>();
    Statement stmt;
    ArrayList<String> movieswatched = new ArrayList<>();
    ArrayList<String> moviesnotwatched = new
ArrayList<>();
    boolean contain, passeq;

    public ClientHandler(Socket clientSocket, Connection
con) throws IOException, SQLException {
        this.client = clientSocket;
        this.con = con;
```

```java
        stmt = con.createStatement();
        in = new BufferedReader(new
InputStreamReader(client.getInputStream()));
        out = new PrintWriter(client.getOutputStream(),
true);
    }

    @Override
    public void run() {
        try {
            // Getting the usernames
            ResultSet rs = stmt.executeQuery("SELECT
username FROM users");
            while (rs.next()) {
                usernames.add(rs.getString(1));
            }
            while (true) {
                Statement stmt = con.createStatement();
                String request = in.readLine();
                // Checking for socket close case
                if (request.equals("911")) {
                    try {
                        in.close();
                        out.close();
                        client.close();
                    } catch (IOException e) {
                        e.printStackTrace();
                    }
                    break;
                }
                // Log In request
                if (request.equals("1")) {
                    while (true) {
                        String username = in.readLine();
                        String password = in.readLine();
                        // Check if username exists
                        contain =
usernames.contains(username);
                        if (contain) {
                            // Username existed. check
for password
                            out.println("1");
                            rs =
stmt.executeQuery("SELECT password FROM users WHERE
username=\"" + username + "\";");
                            rs.next();
                            passeq =
password.equals(rs.getString(1));
                            if (!passeq) {
                                // Password didn't match
                                out.println("0");
                            } else {
                                // Password matched
                                out.println("1");

                                while (true) {
                                    String clientresp;
                                    clientresp =
in.readLine();
                                    // Sign out case
                                    if
(clientresp.equals("3")) {
                                        break;
                                    } else if
(clientresp.equals("x")) { // Delete account case

stmt.executeUpdate("ALTER TABLE movietable drop column "
+ username + ";");

stmt.executeUpdate("delete from users where
username=\""+username+"\";");
                                        break;
                                    }
                                    // Rewatch Case
                                    else if
(clientresp.equals("2")) {
                                        rs =
stmt.executeQuery("SELECT MovieName FROM movietable WHERE
" + username + "=\"Y\";");
                                        while (rs.next())
{

movieswatched.add(rs.getString(1));
                                        }
                                        String
randomMovie;


                                        if
(movieswatched.isEmpty()) out.println("404");
                                        else {

out.println("1");
                                            int index =
new Random().nextInt(movieswatched.size());
                                                            randomMovie =
movieswatched.get(index);

out.println(randomMovie);

movieswatched.remove(index);
                                                        }
                                                  }
                                                  // New Recommendation
Case
                                                  else {
                                                        rs =
stmt.executeQuery("SELECT MovieName FROM movietable WHERE
" + username + "=\"N\";");
                                                        while (rs.next())
{

moviesnotwatched.add(rs.getString(1));
                                                        }
                                                        String
randomMovie = "";

                                                        if
(moviesnotwatched.isEmpty()) out.println("404");
                                                        else {

out.println("1");
                                                              int index =
new Random().nextInt(moviesnotwatched.size());
                                                              randomMovie =
moviesnotwatched.get(index);

out.println(randomMovie);


moviesnotwatched.remove(index);



stmt.executeUpdate("UPDATE movietable set " + username +
"=\"Y\" where MovieName=\"" + randomMovie + "\"");
                                                        }
                                                  }
                                            }
                                            break;
                                      }
```

```
                        }
                        // Username didn't match
                        else {
                            out.println("0");
                        }
                    }
                }
                // Sign Up Case
                if (request.equals("2")) {
                    while (true) {
                        String usernamesignup =
in.readLine();
                        String passwordsignup =
in.readLine();
                        if
(usernames.contains(usernamesignup)) {
                            // Username Already Exists
                            out.println("0");
                        } else {

usernames.add(usernamesignup);
                            stmt.executeUpdate("ALTER
TABLE movietable ADD " + usernamesignup + "
varchar(1);");
                            stmt.executeUpdate("UPDATE
movietable SET " + usernamesignup + "=\"N\"");
                            stmt.executeUpdate("INSERT
INTO users values(\"" + usernamesignup + "\",\"" +
passwordsignup + "\");");
                            out.println("1");
                            break;
                        }
                    }
                }
            }
        } catch (Exception e) {
            e.printStackTrace();
        } finally {
            try {
                in.close();
                out.close();
                client.close();
            } catch (IOException e) {
                e.printStackTrace();
            }

        }
```

```
    }
}
```

Client.java

```
package movierec;

import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.io.*;
import java.net.Socket;

import movierec.frames.*;

public class Client {
    JFrame homescreen, signuppage, loginpage,
recommendationpage;
    JButton signUp, login, exit, rewatchbutton,
newrecbutton, signout, deleteacc, loginbutton,
signupbutton;
    JLabel suerrormessage, lierrormessage,
newrecommendation, rewatchrecommendation;
    JTextArea suusernamefield, liusernamefield;
    JPasswordField supasswordfield, lipasswordfield;
    public ActionListener homescreensu, homescreenli,
actionListenersignup, actionListenerlogin, rewatchal,
newrecal, signoutal, deleteaccal;
    BufferedReader keyboard, reader;
    PrintWriter out;

    public Client() {
        try {
            Socket socket = new Socket("127.0.0.1",
9169);
            new frames();
            homescreen = frames.getHomescreen();
            signUp = frames.getSignUp();
            login = frames.getLogin();
            exit = frames.getExit();
            homescreen.setVisible(true);
            keyboard = new BufferedReader(new
InputStreamReader(System.in));
            reader = new BufferedReader(new
InputStreamReader(socket.getInputStream()));
            out = new
PrintWriter(socket.getOutputStream(), true);
            homescreensu = getHomescreensu();
            signUp.addActionListener(homescreensu);
            homescreenli = getHomescreenli();
            login.addActionListener(homescreenli);
            exit.addActionListener(new ActionListener() {
                @Override
                public void actionPerformed(ActionEvent
e) {
                    homescreen.dispose();
                    System.exit(0);
                }
            });
        } catch (Exception e) {
            e.printStackTrace();
        }
    }

    public static void main(String[] args) throws
IOException {
        new Client();

    }

    public ActionListener signup() {
        actionListenersignup = new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                String username =
suusernamefield.getText();
                String password =
supasswordfield.getText();
                out.println(username);
                out.println(password);

                try {
                    String serverresp =
reader.readLine();
                    if (serverresp.equals("0")) {
                        // Existing user condition
                        suerrormessage.setBounds(700,
200, 300, 30);
                        suerrormessage.setText("Username
Already Exists!");
                    } else {
                        // Account will be created
successfully here
                        signuppage.dispose();
                        homescreen.setVisible(true);
                    }
                } catch (Exception exception) {
                    exception.printStackTrace();
                }
            }
        };
        return actionListenersignup;
    }


    public ActionListener login() {

        actionListenerlogin = new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                String usernamelogin =
liusernamefield.getText();
                String passwordlogin =
lipasswordfield.getText();
                out.println(usernamelogin);
                out.println(passwordlogin);

                try {
                    String serverresplogin =
reader.readLine();
                    if (serverresplogin.equals("0")) {
                        lierrormessage.setText("Username
Doesn't Exist!");
                    } else {
                        String serverresplog =
reader.readLine();
                        if (serverresplog.equals("0")) {

lierrormessage.setText("Incorrect Password");
                        } else {
                            // Successful login
                            loginpage.setVisible(false);
                            recommendationpage =
getrecommendationframe();

recommendationpage.setVisible(true);
                        }
                    }
                } catch (IOException ioException) {
                    ioException.printStackTrace();
                }
            }
        };
        return actionListenerlogin;
    }

    public JFrame getrecommendationframe() {
        recommendationpage =
frames.getrecommendationframe();
        rewatchbutton = frames.getRewatchbutton();
        newrecbutton = frames.getNewrecbutton();
        signout = frames.getSignoutbutton();
        deleteacc = frames.getDeleteaccbutton();
        newrecommendation =
frames.getNewrecommendationlabel();
        rewatchrecommendation =
frames.getRewatchrecommendationlabel();
        rewatchal = rewatch();
        rewatchbutton.addActionListener(rewatchal);
        newrecal = newrecommend();
        newrecbutton.addActionListener(newrecal);
        signoutal = signout();
        signout.addActionListener(signoutal);
        deleteaccal = deleteacc();
        deleteacc.addActionListener(deleteaccal);
        return recommendationpage;
    }

    public ActionListener newrecommend() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println("1");
                try {
                    String statusrec = reader.readLine();
                    if (statusrec.equals("404")) {
                        newrecommendation.setText("We're
out of movies :(");
                    } else {
                        String movierec =
reader.readLine();

newrecommendation.setText(movierec);
                    }
                } catch (IOException ioException) {
                    ioException.printStackTrace();
                }
            }
        };
    }

    public ActionListener rewatch() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println("2");
                try {
                    String statusrew = reader.readLine();
                    if (statusrew.equals("404")) {

rewatchrecommendation.setText("You haven't watched
anything.");
                    } else {
                        String rewrec =
reader.readLine();

rewatchrecommendation.setText(rewrec);
                    }
                } catch (IOException ioException) {
                    ioException.printStackTrace();
                }
            }
        };
    }

    public ActionListener signout() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println("3");
                recommendationpage.dispose();
                System.exit(0);
            }
        };
    }

    public ActionListener deleteacc() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println("x");
                recommendationpage.dispose();
                System.exit(0);
            }
        };
    }

    public ActionListener getHomescreensu() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println(2);
                homescreen.dispose();
                signuppage = frames.getSignupframe();
                suusernamefield =
frames.getSuusernamefield();
                supasswordfield =
frames.getSupasswordfield();
                suerrormessage =
frames.getSuerrormessage();
                signupbutton = frames.getSignupbutton();
                ActionListener signupbuttonactionlistener
= signup();

signupbutton.addActionListener(signupbuttonactionlistener
);
                signuppage.setVisible(true);
            }
        };
    }

    public ActionListener getHomescreenli() {
        return new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                out.println(1);
                loginpage = frames.getLoginframe();
                homescreen.dispose();
                liusernamefield =
frames.getLiusernamefield();
                lipasswordfield =
frames.getLipasswordfield();
                lierrormessage =
frames.getLierrormessage();
                ActionListener loginbuttonactionlistener
= login();
                loginbutton = frames.getLoginbutton();
```

```
loginbutton.addActionListener(loginbuttonactionlistener);
                loginpage.setVisible(true);
            }
        };
    }
}
```

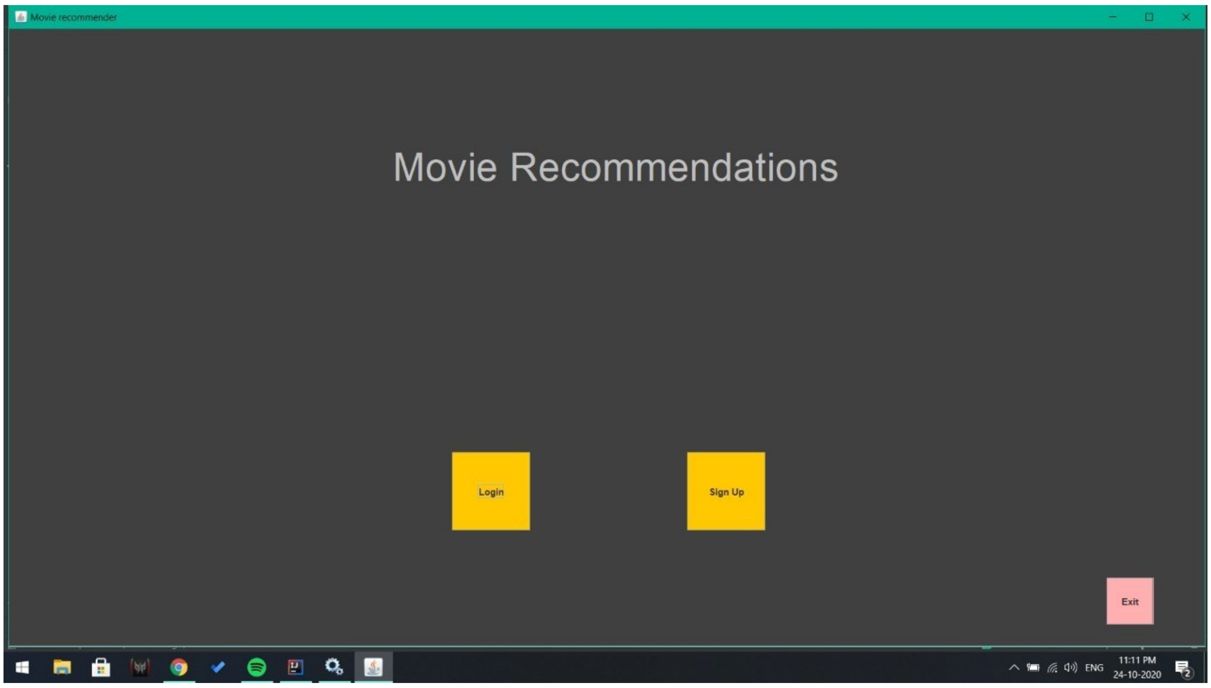
frames.java

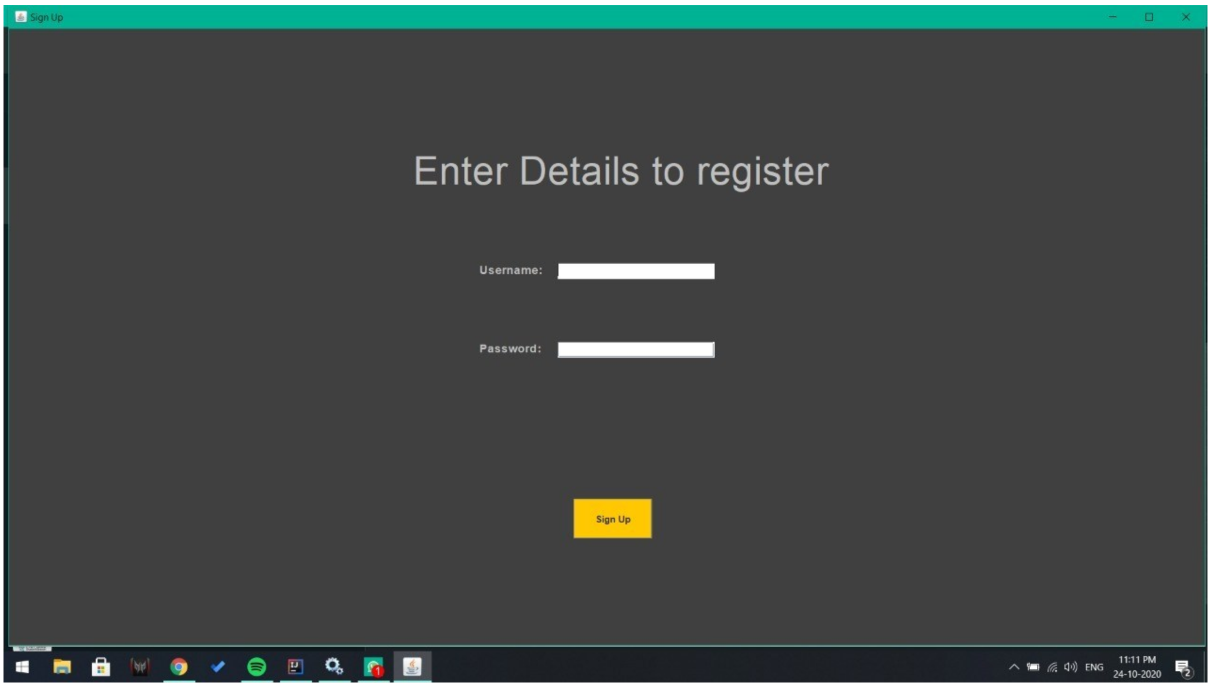
```
package movierec;

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

public class frames {
    static JFrame homescreen, recframe, loginframe,
signuppage;
    static JButton login, signUp, exit, newrecbutton,
rewatchbutton, signout, deleteacc, loginbutton,
signupbutton;
    static JLabel newrecommendation,
rewatchrecommendation, lierrormessage, suerrormessage;
    static JTextArea suusernamefield, liusernamefield;
    static JPasswordField supasswordfield,
lipasswordfield;

    public frames() {
        setuphomescreenframe();
        setupsignupframe();
        setuploginframe();
        setuprecommendationframe();
    }

    public static JButton getLogin() {
        return login;
    }

    public static JButton getExit() {
        return exit;
    }

    public static JButton getSignUp() {
        return signUp;
    }
    public static void setuphomescreenframe() {
        homescreen = new JFrame();
homescreen.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE)
;
        homescreen.setResizable(true);
        homescreen.setPreferredSize(new Dimension(1540,
825));
        homescreen.setTitle("Movie recommender");
//          backg = new JLabel(new
ImageIcon("D:\\SEMV\\SDL\\Assignment4\\assets\\moviegrid.
jpg"));
//          backg.setBounds(0,0,1920,1080);
        JPanel panel = new JPanel();
        panel.setLayout(null);
        panel.setBackground(Color.DARK_GRAY);
        signUp = new JButton("Sign Up");
        signUp.setBounds(865, 540, 100, 100);
        signUp.setBackground(Color.orange);
        login = new JButton("Login");
        login.setBounds(565, 540, 100, 100);
        login.setBackground(Color.orange);
        JLabel label1 = new JLabel("Movie
Recommendations");
        label1.setFont(new Font(Font.SANS_SERIF,
Font.PLAIN, 50));
        label1.setBounds(490, 150, 650, 50);
        label1.setForeground(Color.lightGray);
        exit = new JButton("Exit");
        exit.setBounds(1400, 700, 60, 60);
        exit.setBackground(Color.pink);
//          panel.add(backg);
        panel.add(login);
        panel.add(signUp);
        panel.add(exit);
        panel.add(label1);
        homescreen.add(panel);
        homescreen.pack();
    }

    public static void setuprecommendationframe() {
        recframe = new JFrame();
        recframe.setPreferredSize(new Dimension(1540,
825));

recframe.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
```

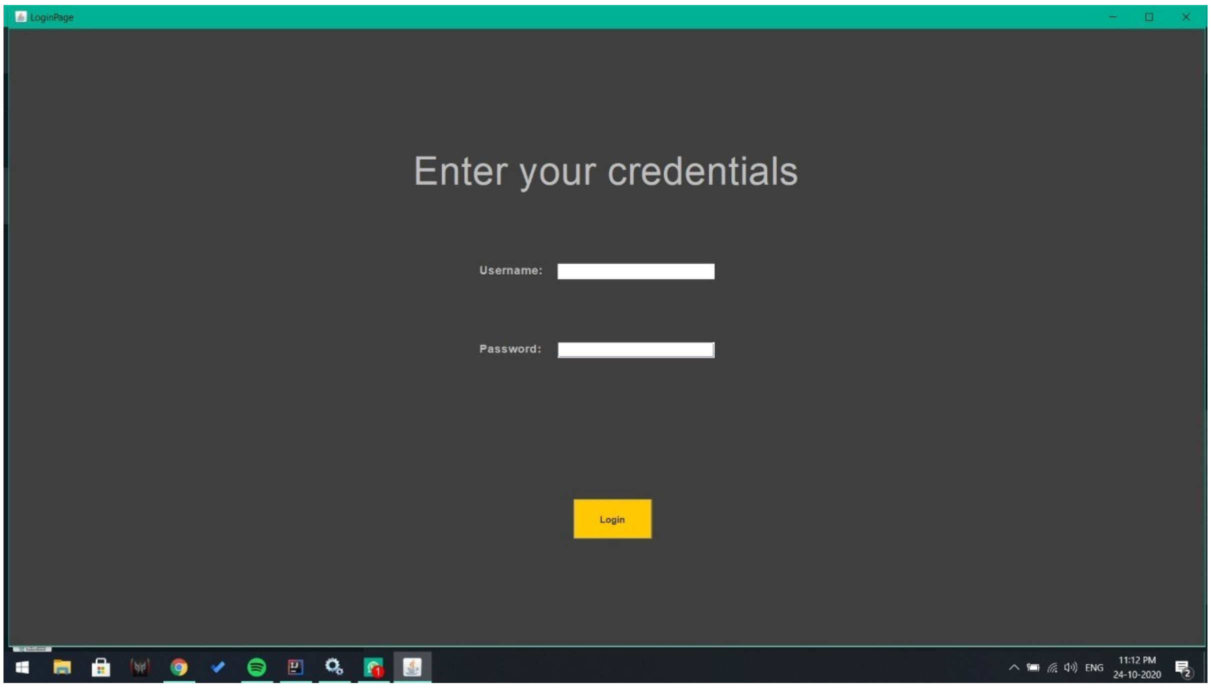
```java
        recframe.setResizable(true);
        recframe.setTitle("LoginPage");
        JPanel recpanel = new JPanel();
        recpanel.setLayout(null);
        recpanel.setBackground(Color.DARK_GRAY);
        JLabel title = new JLabel("Click on the desired
button");
        title.setBounds(600, 50, 900, 50);
        title.setFont(new Font("title", Font.ITALIC,
30));
        title.setForeground(Color.lightGray);
        newrecbutton = new JButton("New Recommendation");
        newrecbutton.setBounds(300, 200, 200, 50);
        newrecbutton.setBackground(Color.orange);
        newrecommendation = new JLabel("");
        newrecommendation.setFont(new Font("new reco.",
Font.BOLD, 15));
        newrecommendation.setBounds(600, 200, 700, 20);
        newrecommendation.setForeground(Color.lightGray);
        rewatchbutton = new JButton("Rewatch
recommendation");
        rewatchbutton.setBounds(300, 300, 200, 50);
        rewatchbutton.setBackground(Color.orange);
        rewatchrecommendation = new JLabel("");
        rewatchrecommendation.setFont(new Font("rewatch
reco.", Font.BOLD, 15));
        rewatchrecommendation.setBounds(600, 300, 700,
15);

rewatchrecommendation.setForeground(Color.lightGray);
        signout = new JButton("Sign Out");
        signout.setBounds(1300, 10, 200, 50);
        signout.setBackground(Color.WHITE);
        deleteacc = new JButton("Delete Account");
        deleteacc.setBounds(1300, 600, 200, 50);
        deleteacc.setBackground(Color.RED);
        recpanel.add(title);
        recpanel.add(newrecbutton);
        recpanel.add(signout);
        recpanel.add(rewatchrecommendation);
        recpanel.add(rewatchbutton);
        recpanel.add(newrecommendation);
        recpanel.add(deleteacc);
        recframe.add(recpanel);
        recframe.pack();
    }
    public static void setuploginframe() {
        loginframe = new JFrame();

loginframe.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE)
;
        loginframe.setResizable(true);
        loginframe.setPreferredSize(new Dimension(1540,
825));
        loginframe.setTitle("LoginPage");
        JPanel loginpanel = new JPanel();
        loginpanel.setLayout(null);
        loginpanel.setBackground(Color.DARK_GRAY);
        loginbutton = new JButton("Login");
        loginbutton.setBounds(720, 600, 100, 50);
        loginbutton.setBackground(Color.orange);
        JLabel liusername = new JLabel("Username:");
        liusername.setFont(new Font("username",
Font.BOLD, 15));
        liusername.setBounds(600, 300, 100, 15);
        liusername.setForeground(Color.lightGray);
        JLabel lipassword = new JLabel("Password:");
        lipassword.setFont(new Font("password",
Font.BOLD, 15));
        lipassword.setBounds(600, 400, 100, 15);
        lipassword.setForeground(Color.lightGray);
        JLabel log_in = new JLabel("Enter your
credentials");
        log_in.setFont(new Font("login", Font.PLAIN,
50));
        log_in.setBounds(515, 150, 650, 60);
        log_in.setForeground(Color.lightGray);
        lierrormessage = new JLabel("");
        lierrormessage.setForeground(Color.red);
        lierrormessage.setFont(new Font(Font.SANS_SERIF,
Font.PLAIN, 15));
        lierrormessage.setBounds(700, 200, 300, 30);
        liusernamefield = new JTextArea();
        lipasswordfield = new JPasswordField();
        liusernamefield.setBounds(700, 300, 200, 20);
        lipasswordfield.setBounds(700, 400, 200, 20);


        loginpanel.add(log_in);
        loginpanel.add(loginbutton);
        loginpanel.add(lierrormessage);
        loginpanel.add(liusername);
        loginpanel.add(lipassword);
        loginpanel.add(lipasswordfield);
        loginpanel.add(liusernamefield);
        loginframe.add(loginpanel);
        loginframe.pack();


    }

    public static void setupsignupframe() {
        signuppage = new JFrame();

signuppage.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE)
;
        signuppage.setResizable(true);
        signuppage.setPreferredSize(new Dimension(1540,
825));
        signuppage.setTitle("Sign Up");
        JPanel signuppanel = new JPanel();
        signuppanel.setLayout(null);
        signuppanel.setBackground(Color.DARK_GRAY);
        signupbutton = new JButton("Sign Up");
        signupbutton.setBounds(720, 600, 100, 50);
        signupbutton.setBackground(Color.orange);
        JLabel suusername = new JLabel("Username:");
        suusername.setFont(new Font("username",
Font.BOLD, 15));
        suusername.setBounds(600, 300, 100, 15);
        suusername.setForeground(Color.lightGray);
        JLabel supassword = new JLabel("Password:");
        supassword.setFont(new Font("password",
Font.BOLD, 15));
        supassword.setBounds(600, 400, 100, 15);
        supassword.setForeground(Color.lightGray);
        JLabel sign_up = new JLabel("Enter Details to
register");
        sign_up.setFont(new Font("signup", Font.PLAIN,
50));
        sign_up.setBounds(515, 150, 650, 60);
        sign_up.setForeground(Color.lightGray);
        suerrormessage = new JLabel("");
        suerrormessage.setForeground(Color.red);
        suerrormessage.setFont(new Font("Error Message",
Font.PLAIN, 15));
        suerrormessage.setBounds(700, 200, 300, 30);
        suusernamefield = new JTextArea();
        supasswordfield = new JPasswordField();
        suusernamefield.setBounds(700, 300, 200, 20);
```

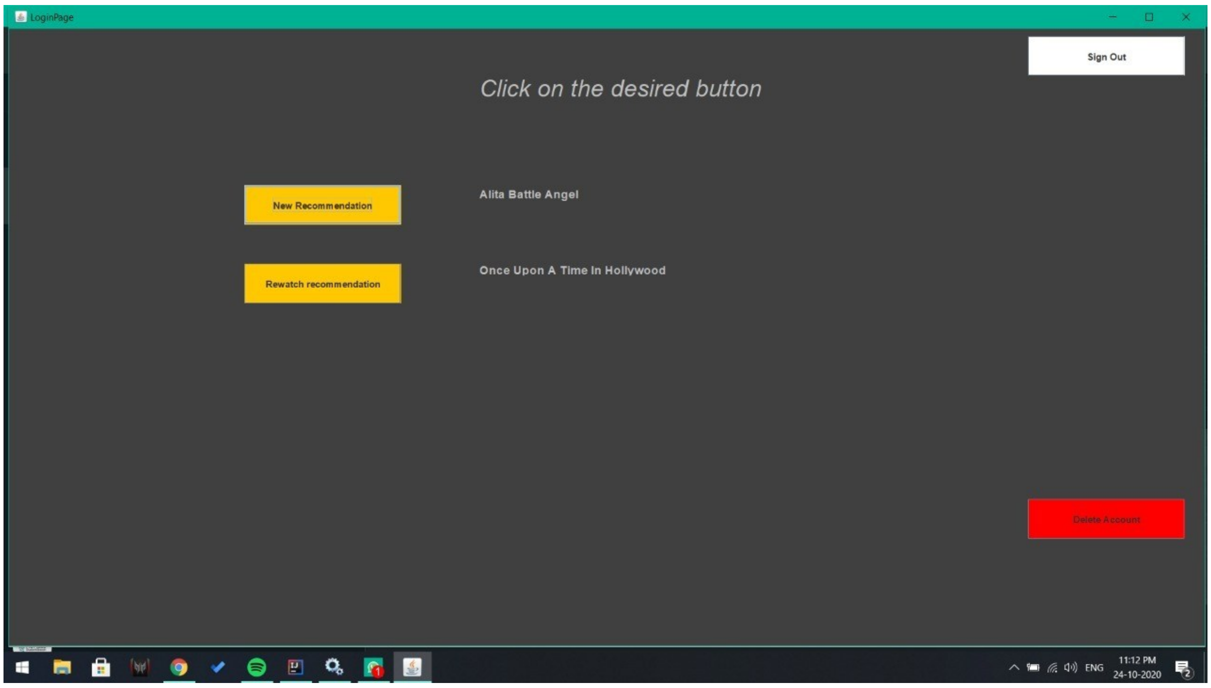
```java
        supasswordfield.setBounds(700, 400, 200, 20);


        signuppanel.add(sign_up);
        signuppanel.add(signupbutton);
        signuppanel.add(suerrormessage);
        signuppanel.add(suusername);
        signuppanel.add(supassword);
        signuppanel.add(supasswordfield);
        signuppanel.add(suusernamefield);
        signuppage.add(signuppanel);
        signuppage.pack();
    }

    public static JFrame getHomescreen() {
        return homescreen;
    }

    public static JFrame getLoginframe() {
        return loginframe;
    }

    public static JFrame getSignupframe() {
        return signuppage;
    }

    public static JFrame getrecommendationframe() {
        return recframe;
    }

    public static JLabel getNewrecommendationlabel() {
        return newrecommendation;
    }

    public static JLabel getRewatchrecommendationlabel()
{
        return rewatchrecommendation;
    }

    public static JButton getRewatchbutton() {
        return rewatchbutton;
    }

    public static JButton getDeleteaccbutton() {
        return deleteacc;
    }
    public static JButton getSignoutbutton() {
        return signout;
    }

    public static JButton getNewrecbutton() {
        return newrecbutton;
    }

    public static JButton getLoginbutton() {
        return loginbutton;
    }

    public static JButton getSignupbutton() {
        return signupbutton;
    }

    public static JPasswordField getLipasswordfield() {
        return lipasswordfield;
    }

    public static JPasswordField getSupasswordfield() {
        return supasswordfield;
    }

    public static JTextArea getLiusernamefield() {
        return liusernamefield;
    }

    public static JTextArea getSuusernamefield() {
        return suusernamefield;
    }

    public static JLabel getLierrormessage() {
        return lierrormessage;
    }

    public static JLabel getSuerrormessage() {
        return suerrormessage;
    }
}
```

Output


Movie recommender
Movie Recommendations
Login
Sign Up
Exit
ENG
11:11 PM
24-10-2020


Sign Up
Enter Details to register
Username:
Password:
Sign Up
ENG
11:11 PM
24-10-2020





Alita Battle Angel

Once Upon A Time In Hollywood