AIR UNIVERSITY

Project Code

(CodePro Certification System)

Submitted By:

Muhammad Danish (225151)

Huzaifa Shahab (225147)

BSCS – II

Submitted To:
Sir Kamran

Table of Contents

Main Class:..3

Connection Class: 3

Login Class: 3

User Class: 16

Quiz Class:..23

Result Class:...46

Admin Class: 49

AdminPortal Class:..61

Main Class:

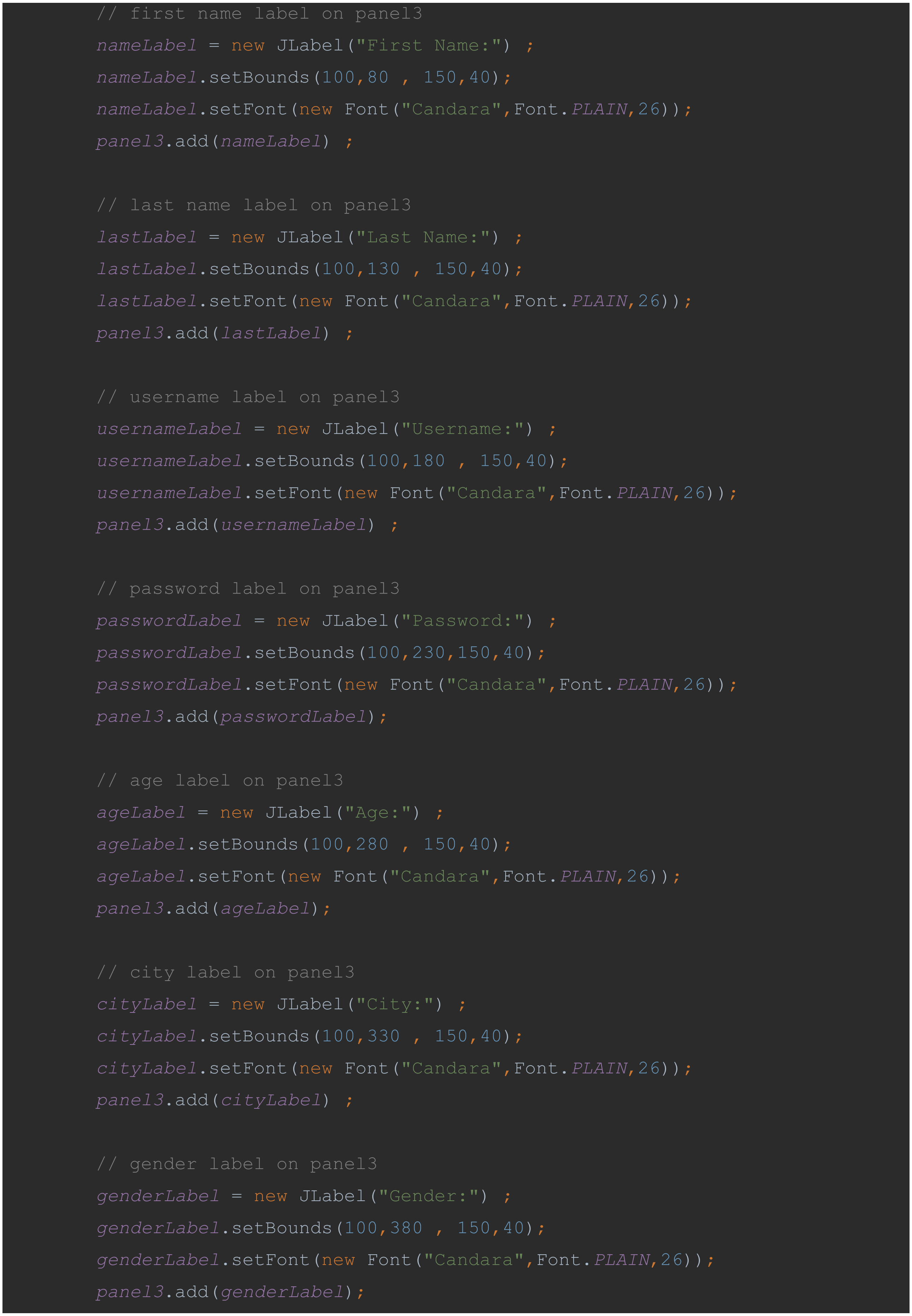
```
public class Main {
    public static void main(String[] args) {
        new Login();
    }
}
```

Connection Class:

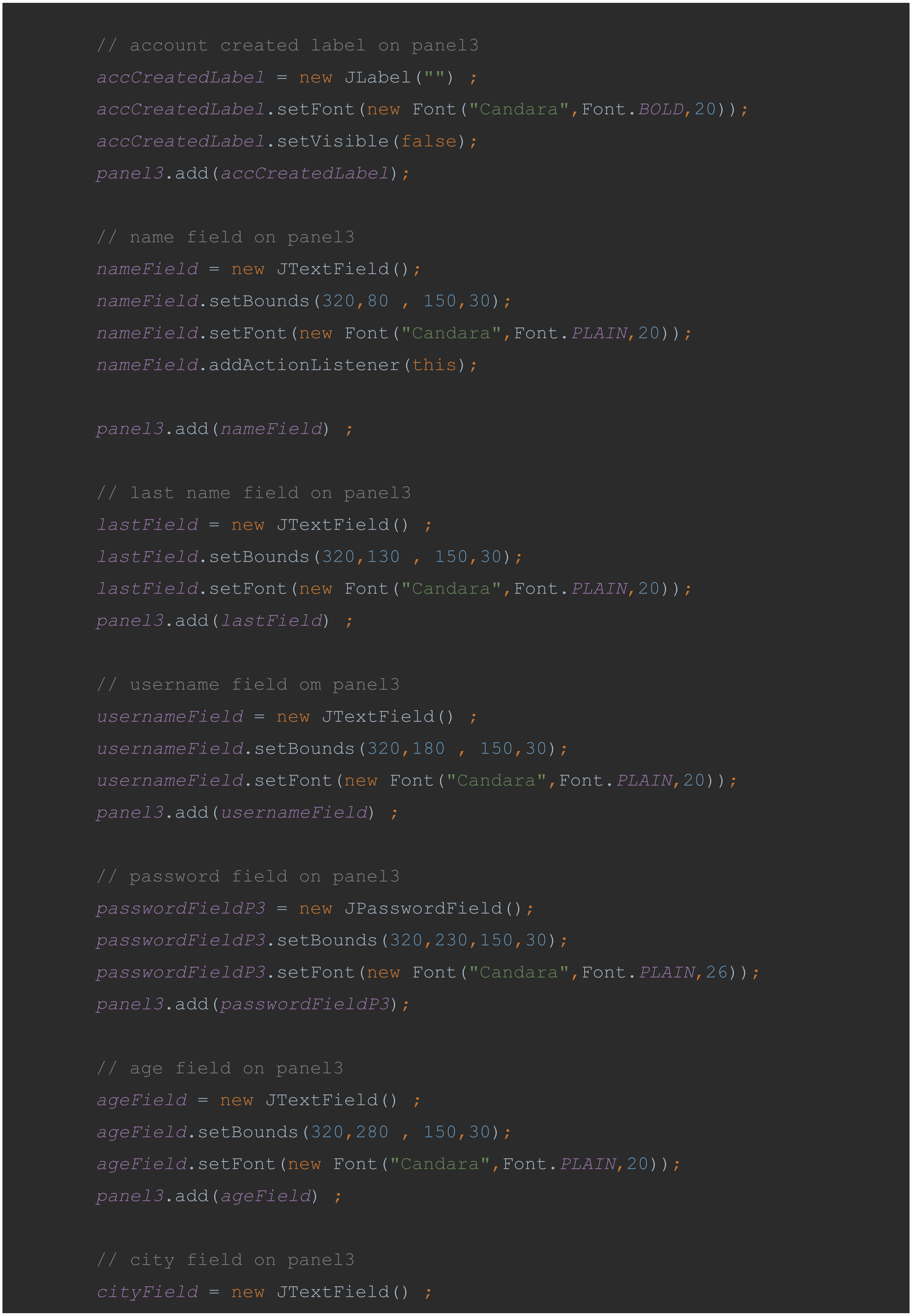
```
import java.sql.Connection;
import java.sql.DriverManager;

public class connection {
    static Connection connect;

    public static Connection create() {
        try {
            // For loading of DRIVERS
            Class.forName("com.mysql.cj.jdbc.Driver");

            // URL of schema's we have created at MySQL
            String url = "jdbc:mysql://localhost:3306/codepro_system";
            String user = "root";
            String pass = "1234";

            // For communication with the databases
            connect = DriverManager.getConnection(url, user, pass);
        } catch (Exception e) {
            e.printStackTrace();
        }
        return connect;
    }
}
```

Login Class:

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
public class Login extends JFrame implements ActionListener {
    // all the panels
    static JPanel panel1, panel2, panel3, panel4;
    //panel1 components
    static JButton userbutton , adminbutton;
    static JLabel userCheck;
    //panel2 components
    static JButton createAccP2, signIn, backP2;
    static JLabel accountCheck;
    // panel3 Components
    static JButton backP3, createAccP3;
    static JLabel nameLabel, lastLabel, ageLabel, genderLabel, cityLabel,
registrationLabel, usernameLabel,passwordLabel, accCreatedLabel;
    static JPasswordField passwordFieldP3;
    static JTextField nameField, lastField, ageField, cityField ,
usernameField;
    static JComboBox genderBox;
    // panel4 components
    static JLabel usernameLabelP4, passwordLabelP4, usernameError;
    static JTextField usernameFieldP4;
    JPasswordField passwordFieldP4;

    JButton backP4, signInP4;
    String userName;

    Login() {
        // frame properties
        setSize(600, 600);
        setTitle("CodePro Certification System");
        setLocation(400,50);
        setLayout(null);
        getContentPane().setBackground(Color.WHITE);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(true);

        // -------------------------- panel 1 ---------------------------------
-
        panel1 = new JPanel();
        panel1.setLayout(null);
        panel1.setBounds(0,180,600,600);
        panel1.setOpaque(false);
        add(panel1);

        // Label on panel1
        userCheck = new JLabel();
        userCheck.setText("Are you a user or an admin?");
        userCheck.setFont(new Font("Candara", Font.PLAIN, 35));
        userCheck.setBounds(50,30, 500, 50);
        userCheck.setHorizontalAlignment(JLabel.CENTER);
        panel1.add(userCheck);

        // user button on panel1
        userbutton = new JButton();
        userbutton.setText("User");
        userbutton.setBounds(180,100,100,40);
        userbutton.setFont(new Font("Candara", Font.BOLD, 20));
        panel1.add(userbutton);

        // admin button on panel1
        adminbutton = new JButton();
        adminbutton.setText("Admin");
        adminbutton.setBounds(300,100,100,40);
        adminbutton.setFont(new Font("Candara", Font.BOLD, 20));
        panel1.add(adminbutton);

        // action listeners for user and admin button on panel1
        userbutton.addActionListener(this);
        adminbutton.addActionListener(this);


        // ------------------------- panel 2 --------------------------------
-

        panel2 = new JPanel();
        panel2.setBounds(0,0,600,600);
        panel2.setOpaque(false);
        panel2.setLayout(null);
        add(panel2);

        // label on panel2
        accountCheck = new JLabel();
        accountCheck.setText("Already have an account?");
        accountCheck.setBounds(140,250, 500, 50);
        accountCheck.setFont(new Font("Candara", Font.PLAIN, 26));
        panel2.add(accountCheck);
        // createAcc button on panel2
        createAccP2 = new JButton();
        createAccP2.setText("Create an account");
        createAccP2.setBounds(180,180,200,36);
        createAccP2.setFont(new Font("Candara", Font.BOLD, 20));
        createAccP2.addActionListener(this);
        panel2.add(createAccP2);

        // signIN button on panel2
        signIn = new JButton();
        signIn.setText("Sign in");
        signIn.setBounds(230,320,100,30);
        signIn.setFont(new Font("Candara", Font.BOLD, 20));
        signIn.addActionListener(this);
        panel2.add(signIn);

        // back button on panel2
        backP2 = new JButton();
        backP2.setText("Back");
        backP2.setBounds(450,500,100,32);
        backP2.setFont(new Font("Candara", Font.BOLD, 20));
        backP2.addActionListener(this);
        panel2.add(backP2);
        panel2.setVisible(false);

        // -------------------------- panel 3 ---------------------------------
-


        // panel3 properties
        panel3 = new JPanel();
        panel3.setBounds(0, 0, 600, 600);
        panel3.setOpaque(false);
        panel3.setLayout(null);
        add(panel3);

        // registration label on panel3
        registrationLabel = new JLabel("Registration") ;
        registrationLabel.setBounds(200,20 , 250,40);
        registrationLabel.setFont(new Font("Candara",Font.BOLD,35));
        panel3.add(registrationLabel) ;
```

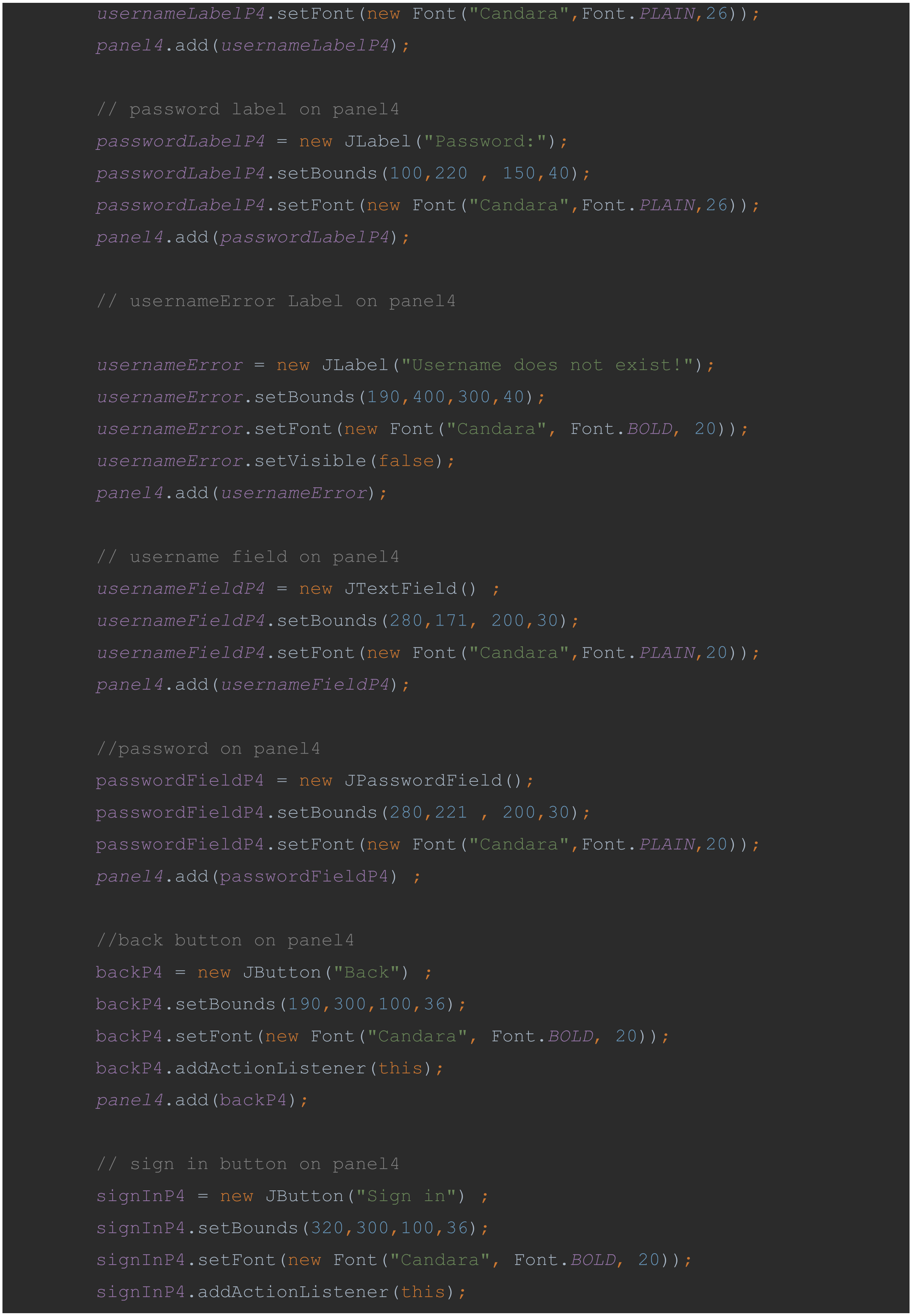


```
        // first name label on panel3
        nameLabel = new JLabel("First Name:") ;
        nameLabel.setBounds(100,80 , 150,40);
        nameLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(nameLabel) ;

        // last name label on panel3
        lastLabel = new JLabel("Last Name:") ;
        lastLabel.setBounds(100,130 , 150,40);
        lastLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(lastLabel) ;

        // username label on panel3
        usernameLabel = new JLabel("Username:") ;
        usernameLabel.setBounds(100,180 , 150,40);
        usernameLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(usernameLabel) ;

        // password label on panel3
        passwordLabel = new JLabel("Password:") ;
        passwordLabel.setBounds(100,230,150,40);
        passwordLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(passwordLabel);

        // age label on panel3
        ageLabel = new JLabel("Age:") ;
        ageLabel.setBounds(100,280 , 150,40);
        ageLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(ageLabel);

        // city label on panel3
        cityLabel = new JLabel("City:") ;
        cityLabel.setBounds(100,330 , 150,40);
        cityLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(cityLabel) ;

        // gender label on panel3
        genderLabel = new JLabel("Gender:") ;
        genderLabel.setBounds(100,380 , 150,40);
        genderLabel.setFont(new Font("Candara",Font.PLAIN,26));
        panel3.add(genderLabel);
```

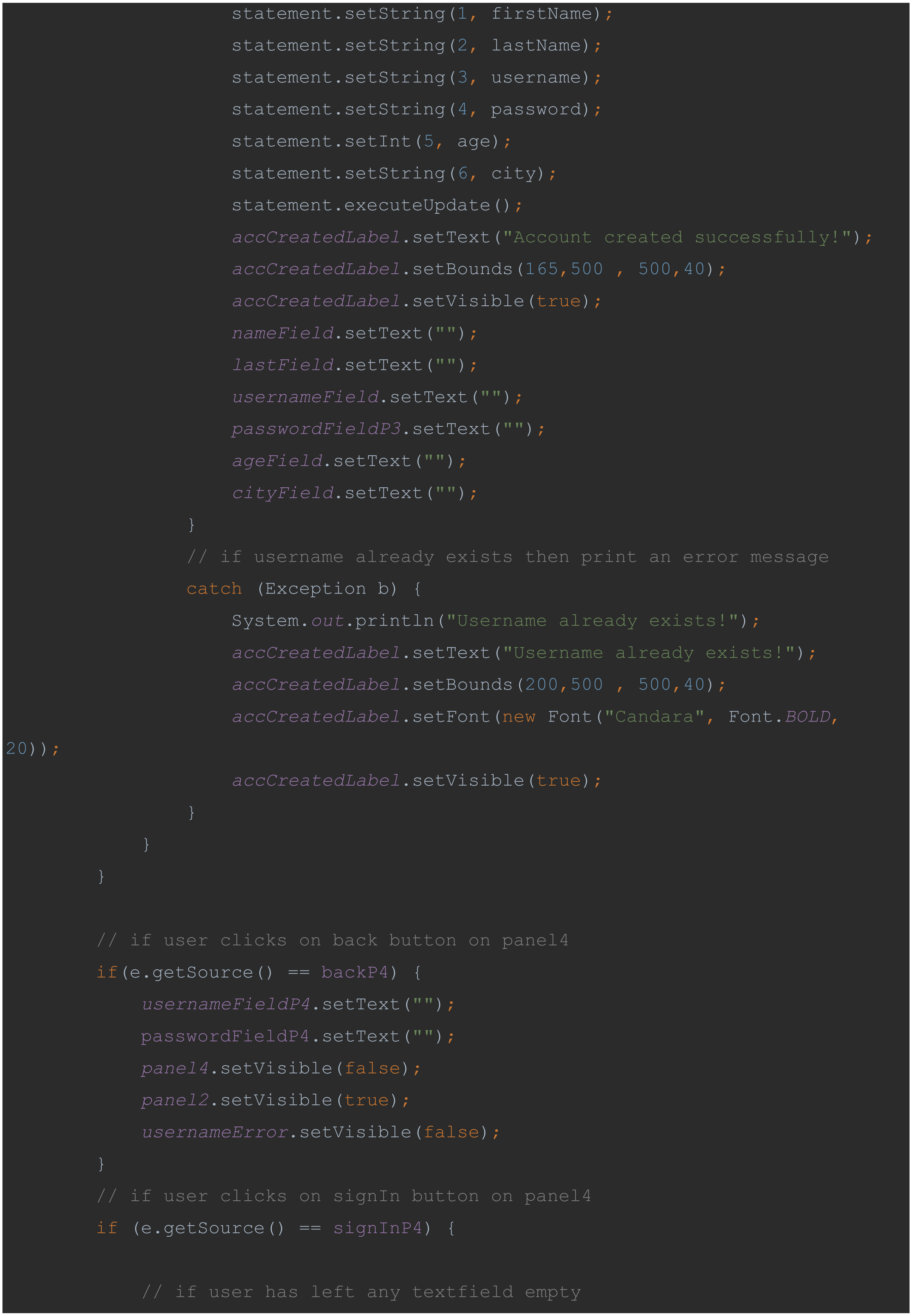


```
// account created label on panel3
accCreatedLabel = new JLabel("") ;
accCreatedLabel.setFont(new Font("Candara",Font.BOLD,20));
accCreatedLabel.setVisible(false);
panel3.add(accCreatedLabel);

// name field on panel3
nameField = new JTextField();
nameField.setBounds(320,80 , 150,30);
nameField.setFont(new Font("Candara",Font.PLAIN,20));
nameField.addActionListener(this);

panel3.add(nameField) ;

// last name field on panel3
lastField = new JTextField() ;
lastField.setBounds(320,130 , 150,30);
lastField.setFont(new Font("Candara",Font.PLAIN,20));
panel3.add(lastField) ;

// username field om panel3
usernameField = new JTextField() ;
usernameField.setBounds(320,180 , 150,30);
usernameField.setFont(new Font("Candara",Font.PLAIN,20));
panel3.add(usernameField) ;

// password field on panel3
passwordFieldP3 = new JPasswordField();
passwordFieldP3.setBounds(320,230,150,30);
passwordFieldP3.setFont(new Font("Candara",Font.PLAIN,26));
panel3.add(passwordFieldP3);

// age field on panel3
ageField = new JTextField() ;
ageField.setBounds(320,280 , 150,30);
ageField.setFont(new Font("Candara",Font.PLAIN,20));
panel3.add(ageField) ;

// city field on panel3
cityField = new JTextField() ;
```

```
        cityField.setBounds(320,330 , 150,30);
        cityField.setFont(new Font("Candara",Font.PLAIN,20));
        panel3.add(cityField) ;

        // Combo box on panel3
        genderBox = new JComboBox();
        genderBox.addItem("Male");
        genderBox.addItem("Female");
        genderBox.setSelectedItem("Male");
        genderBox.setBounds(320,380 , 150,30);
        genderBox.setFont(new Font("Candara",Font.BOLD,20));
        genderBox.setBackground(new Color(227,223,182,255));
        panel3.add(genderBox) ;

        // back button on panel3
        backP3 = new JButton("Back") ;
        backP3.setBounds(130,450,100,36);
        backP3.setFont(new Font("Candara", Font.BOLD, 20));
        backP3.addActionListener(this);
        panel3.add(backP3);

        // create account button on panel3
        createAccP3 = new JButton("Create Account") ;
        createAccP3.setBounds(260,450,200,36);
        createAccP3.setFont(new Font("Candara", Font.BOLD, 20));
        createAccP3.addActionListener(this);
        panel3.add(createAccP3);
        panel3.setVisible(false);

        // -------------------------------- Panel 4 ---------------------------
------

        panel4 = new JPanel();
        panel4.setBounds(0, 0, 600, 600);
        panel4.setOpaque(false);
        panel4.setLayout(null);
        panel4.setVisible(false);
        add(panel4);

        // username label on panel4
        usernameLabelP4 = new JLabel("Username:") ;
        usernameLabelP4.setBounds(100,170 , 150,40);
```



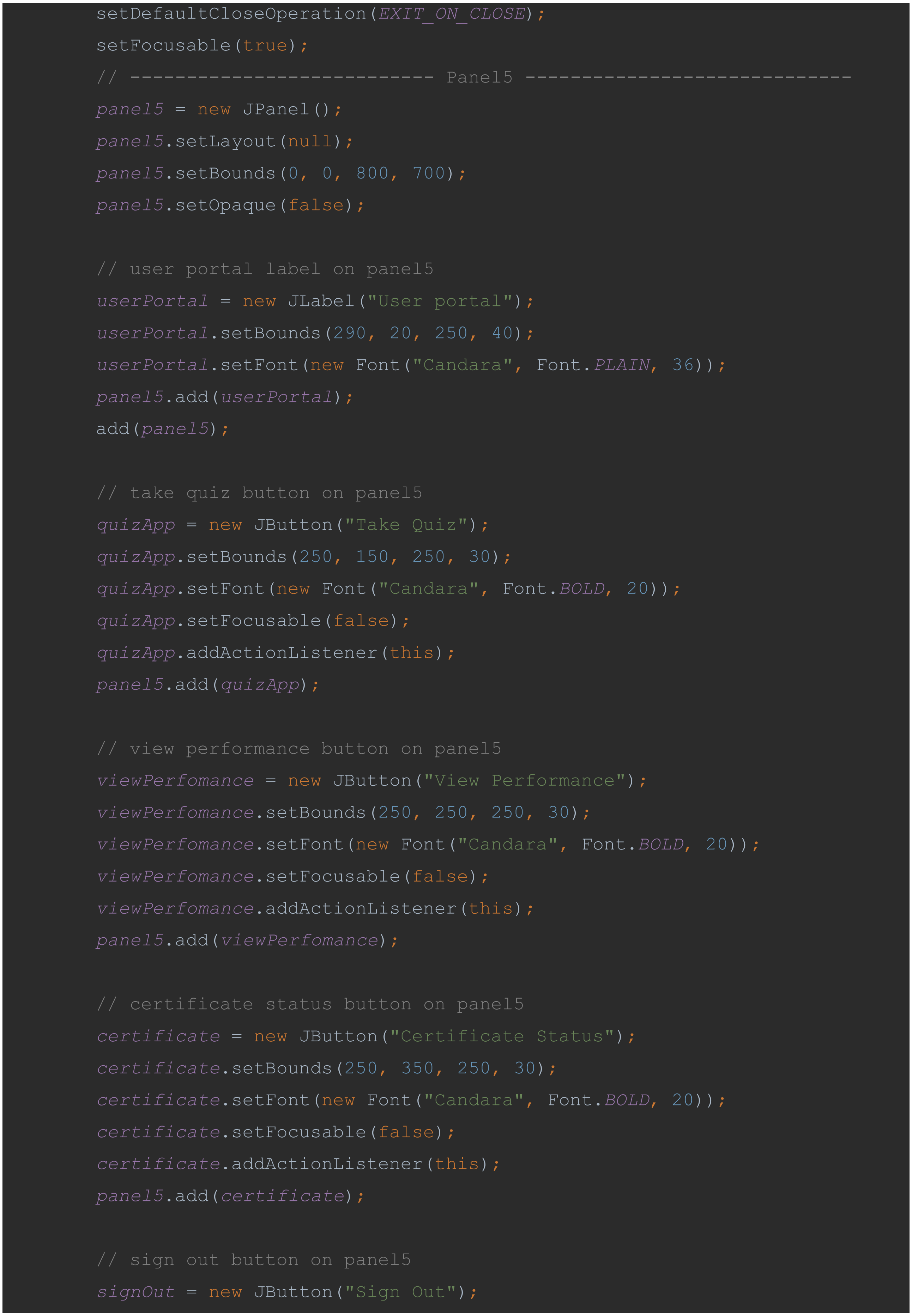
```
        usernameLabelP4.setFont(new Font("Candara",Font.PLAIN,26));
        panel4.add(usernameLabelP4);

        // password label on panel4
        passwordLabelP4 = new JLabel("Password:");
        passwordLabelP4.setBounds(100,220 , 150,40);
        passwordLabelP4.setFont(new Font("Candara",Font.PLAIN,26));
        panel4.add(passwordLabelP4);

        // usernameError Label on panel4

        usernameError = new JLabel("Username does not exist!");
        usernameError.setBounds(190,400,300,40);
        usernameError.setFont(new Font("Candara", Font.BOLD, 20));
        usernameError.setVisible(false);
        panel4.add(usernameError);

        // username field on panel4
        usernameFieldP4 = new JTextField() ;
        usernameFieldP4.setBounds(280,171, 200,30);
        usernameFieldP4.setFont(new Font("Candara",Font.PLAIN,20));
        panel4.add(usernameFieldP4);

        //password on panel4
        passwordFieldP4 = new JPasswordField();
        passwordFieldP4.setBounds(280,221 , 200,30);
        passwordFieldP4.setFont(new Font("Candara",Font.PLAIN,20));
        panel4.add(passwordFieldP4) ;

        //back button on panel4
        backP4 = new JButton("Back") ;
        backP4.setBounds(190,300,100,36);
        backP4.setFont(new Font("Candara", Font.BOLD, 20));
        backP4.addActionListener(this);
        panel4.add(backP4);

        // sign in button on panel4
        signInP4 = new JButton("Sign in") ;
        signInP4.setBounds(320,300,100,36);
        signInP4.setFont(new Font("Candara", Font.BOLD, 20));
        signInP4.addActionListener(this);
        panel4.add(signInP4);

        // show the Jframe on screen
        setResizable(false);
        setVisible(true);

    }

    public void actionPerformed (ActionEvent e) {
        // if user clicks on user button on panel1
        if (e.getSource() == userbutton ) {
            panel1.setVisible(false);
            panel2.setVisible(true);
        }

        // if user clicks on admin button on panel1
        if (e.getSource() == adminbutton ) {
            setVisible(false);
            new Admin();
        }

        // if user clicks back button panel2
        if (e.getSource() == backP2) {
            panel2.setVisible(false);
            panel1.setVisible(true);
        }
        // if user clicks on create account button on panel2
        if (e.getSource() == createAccP2) {
            panel2.setVisible(false);
            panel3.setVisible(true);
        }

        // if user clicks on sign in button on panel2
        if(e.getSource() == signIn) {
            panel2.setVisible(false);
            panel4.setVisible(true);
        }

        // if user clicks on back button on panel3
        if (e.getSource() == backP3) {
            // reset all textfields on panel3
            accCreatedLabel.setVisible(false);
            nameField.setText("");
            lastField.setText("");
            usernameField.setText("");
            passwordFieldP3.setText("");
            ageField.setText("");
            cityField.setText("");

            panel3.setVisible(false);
            panel2.setVisible(true);
        }

        // if user clicks on create account button on panel3
        if (e.getSource() == createAccP3) {

            // if user has left any textfield empty
            if(nameField.getText().equals("") || lastField.getText().equals("")
|| ageField.getText().equals("") || usernameField.getText().equals("") ||
passwordFieldP3.getText().equals("") || cityField.getText().equals("")) {
                accCreatedLabel.setText("Please make sure all fields are
entered properly.");
                accCreatedLabel.setBounds(105,500 , 500,40);
                accCreatedLabel.setVisible(true);
            } else {
                // store user entered values into variables
                String firstName = nameField.getText();
                String lastName = lastField.getText();
                String username = usernameField.getText();
                String password = passwordFieldP3.getText();
                int age = Integer.parseInt(ageField.getText());
                String city = cityField.getText();

                // insert user entered values into database if username is not
matched with any other username in database
                try {
                    Connection connect = connection.create();
                    String query = "insert into userdata (firstname, lastname,
username, password, age, city) values(?,?,?,?,?,?)";
                    PreparedStatement statement =
connect.prepareStatement(query);
```



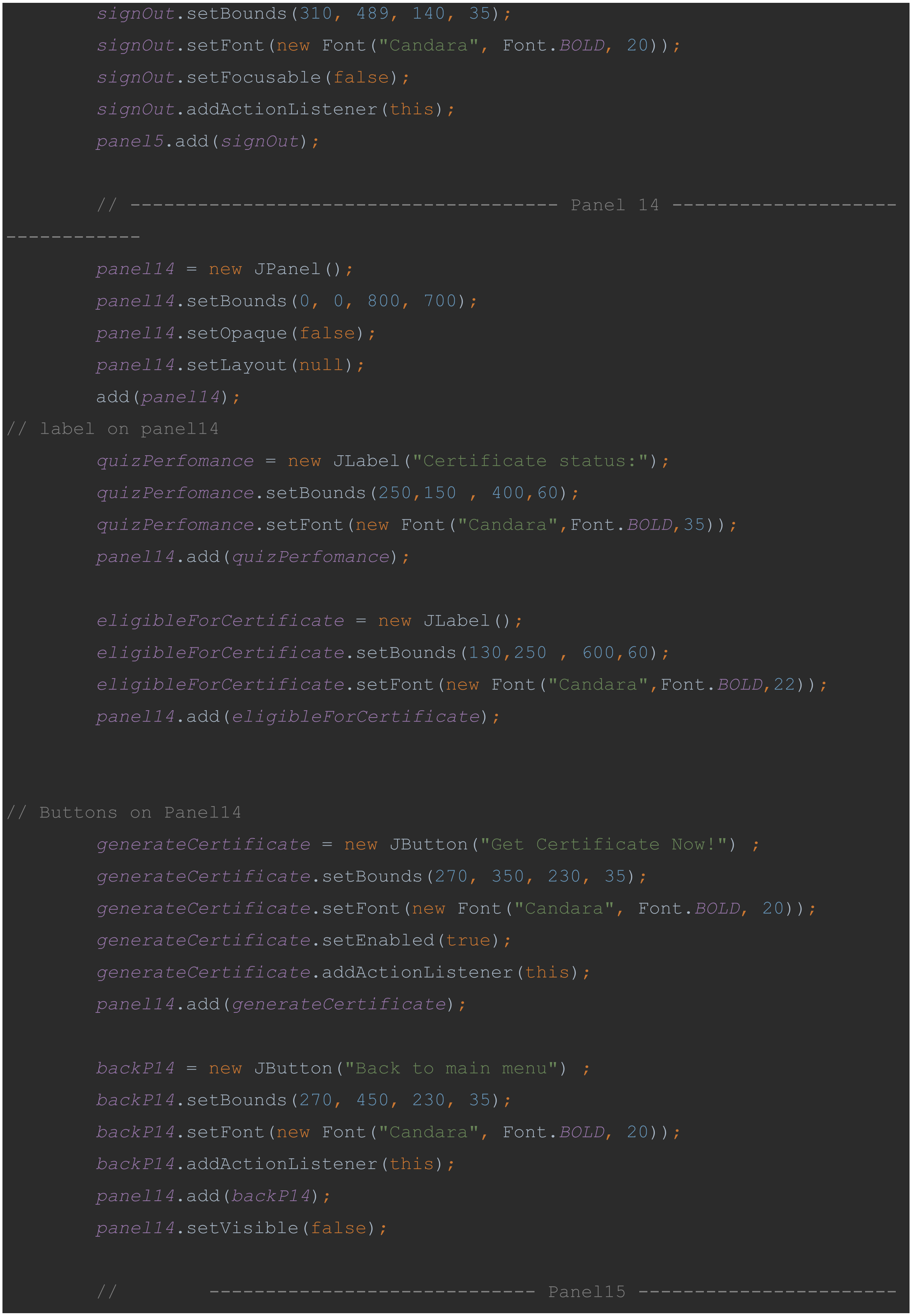
```
                    statement.setString(1, firstName);
                    statement.setString(2, lastName);
                    statement.setString(3, username);
                    statement.setString(4, password);
                    statement.setInt(5, age);
                    statement.setString(6, city);
                    statement.executeUpdate();
                    accCreatedLabel.setText("Account created successfully!");
                    accCreatedLabel.setBounds(165,500 , 500,40);
                    accCreatedLabel.setVisible(true);
                    nameField.setText("");
                    lastField.setText("");
                    usernameField.setText("");
                    passwordFieldP3.setText("");
                    ageField.setText("");
                    cityField.setText("");
                }
                // if username already exists then print an error message
                catch (Exception b) {
                    System.out.println("Username already exists!");
                    accCreatedLabel.setText("Username already exists!");
                    accCreatedLabel.setBounds(200,500 , 500,40);
                    accCreatedLabel.setFont(new Font("Candara", Font.BOLD,
20));

                    accCreatedLabel.setVisible(true);
                }
            }
        }

        // if user clicks on back button on panel4
        if(e.getSource() == backP4) {
            usernameFieldP4.setText("");
            passwordFieldP4.setText("");
            panel4.setVisible(false);
            panel2.setVisible(true);
            usernameError.setVisible(false);
        }
        // if user clicks on signIn button on panel4
        if (e.getSource() == signInP4) {

            // if user has left any textfield empty
            if(usernameFieldP4.getText().equals("") ||
passwordFieldP4.getText().equals("") ) {
                usernameError.setText("Please make sure all fields are entered
properly.");
                usernameError.setBounds(90, 400, 500, 40);
                usernameError.setVisible(true);
            }
            // if user has entered all fields properly
            else {
                // store the user-entered username and password into variables
                userName = usernameFieldP4.getText();
                String password = passwordFieldP4.getText();

                // see if username matches with the username in the database
                try {
                    Connection connect = connection.create();
                    String query = "select * from userdata where username = '"
+ userName + "'";
                    PreparedStatement statement =
connect.prepareStatement(query);
                    ResultSet rs = statement.executeQuery(query);
                    String check = "";
                    while (rs.next()) {
                        check = rs.getString("username");
                    }
                    // if yes
                    if (check.equals(userName)) {
                        try {
                            // see if password matches with the corresponding
password
                            Connection conn = connection.create();
                            String query2 = "select password from userdata
where username = '" + userName + "'";
                            PreparedStatement ps =
conn.prepareStatement(query2);
                            ResultSet resultSet = ps.executeQuery(query2);
                            String check2 = "";
                            while (resultSet.next()) {
                                check2 = resultSet.getString("password");
                            }
                            // if yes, make an object of user class
                            if (check2.equals(password)) {
                                setVisible(false);
                                usernameFieldP4.setText("");
                                passwordFieldP4.setText("");
                                new User(userName);
                                // otherwise, print an error message saying
'wrong password'
                            } else {
                                System.out.println("Wrong password!");
                                usernameError.setText("Wrong password!");
                                usernameError.setBounds(220, 400, 500, 40);
                                usernameError.setVisible(true);
                            }
                            //  print an error if the password-matching query
is not executed properly
                        } catch (Exception a) {
                            a.printStackTrace();
                        }
                    }
                    // if the username does not match with any username in
database, print an error message
                    else {
                        System.out.println("Username does not exist!");
                        usernameError.setText("Username does not exist! ");
                        usernameError.setBounds(200, 400, 500, 40);
                        usernameError.setVisible(true);
                    }
                }
                // if the username-matching query is not executed properly,
print an error.
                catch (Exception a) {
                    a.printStackTrace();
                }
            }
        }
    }
}
```

User Class:

```
import javax.swing.*;
import javax.swing.table.DefaultTableModel;
import javax.swing.table.JTableHeader;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;

public class User extends JFrame implements ActionListener {
    //panel5 components
    public static JPanel panel5 ;
    public static JLabel userPortal;
    public static JButton quizApp , viewPerfomance, certificate, signOut;

    // panel14 components
    static JPanel panel14;
    static JLabel eligibleForCertificate,quizPerfomance;
    static JButton generateCertificate, backP14;

    // panel15 components
    public static JButton backP15;
    public static JLabel achiever , acheiverName ;
    public static JPanel panel15;

    String userName;
    User(String userName) {

        this.userName = userName;

        // frame properties
        setSize(800, 700);
        setTitle("CodePro Certification System");
        setLocation(320, 10);
        setLayout(null);
        getContentPane().setBackground(Color.WHITE);
```



```
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(true);
        // --------------------------- Panel5 -----------------------------
        panel5 = new JPanel();
        panel5.setLayout(null);
        panel5.setBounds(0, 0, 800, 700);
        panel5.setOpaque(false);

        // user portal label on panel5
        userPortal = new JLabel("User portal");
        userPortal.setBounds(290, 20, 250, 40);
        userPortal.setFont(new Font("Candara", Font.PLAIN, 36));
        panel5.add(userPortal);
        add(panel5);

        // take quiz button on panel5
        quizApp = new JButton("Take Quiz");
        quizApp.setBounds(250, 150, 250, 30);
        quizApp.setFont(new Font("Candara", Font.BOLD, 20));
        quizApp.setFocusable(false);
        quizApp.addActionListener(this);
        panel5.add(quizApp);

        // view performance button on panel5
        viewPerfomance = new JButton("View Performance");
        viewPerfomance.setBounds(250, 250, 250, 30);
        viewPerfomance.setFont(new Font("Candara", Font.BOLD, 20));
        viewPerfomance.setFocusable(false);
        viewPerfomance.addActionListener(this);
        panel5.add(viewPerfomance);

        // certificate status button on panel5
        certificate = new JButton("Certificate Status");
        certificate.setBounds(250, 350, 250, 30);
        certificate.setFont(new Font("Candara", Font.BOLD, 20));
        certificate.setFocusable(false);
        certificate.addActionListener(this);
        panel5.add(certificate);

        // sign out button on panel5
        signOut = new JButton("Sign Out");
```

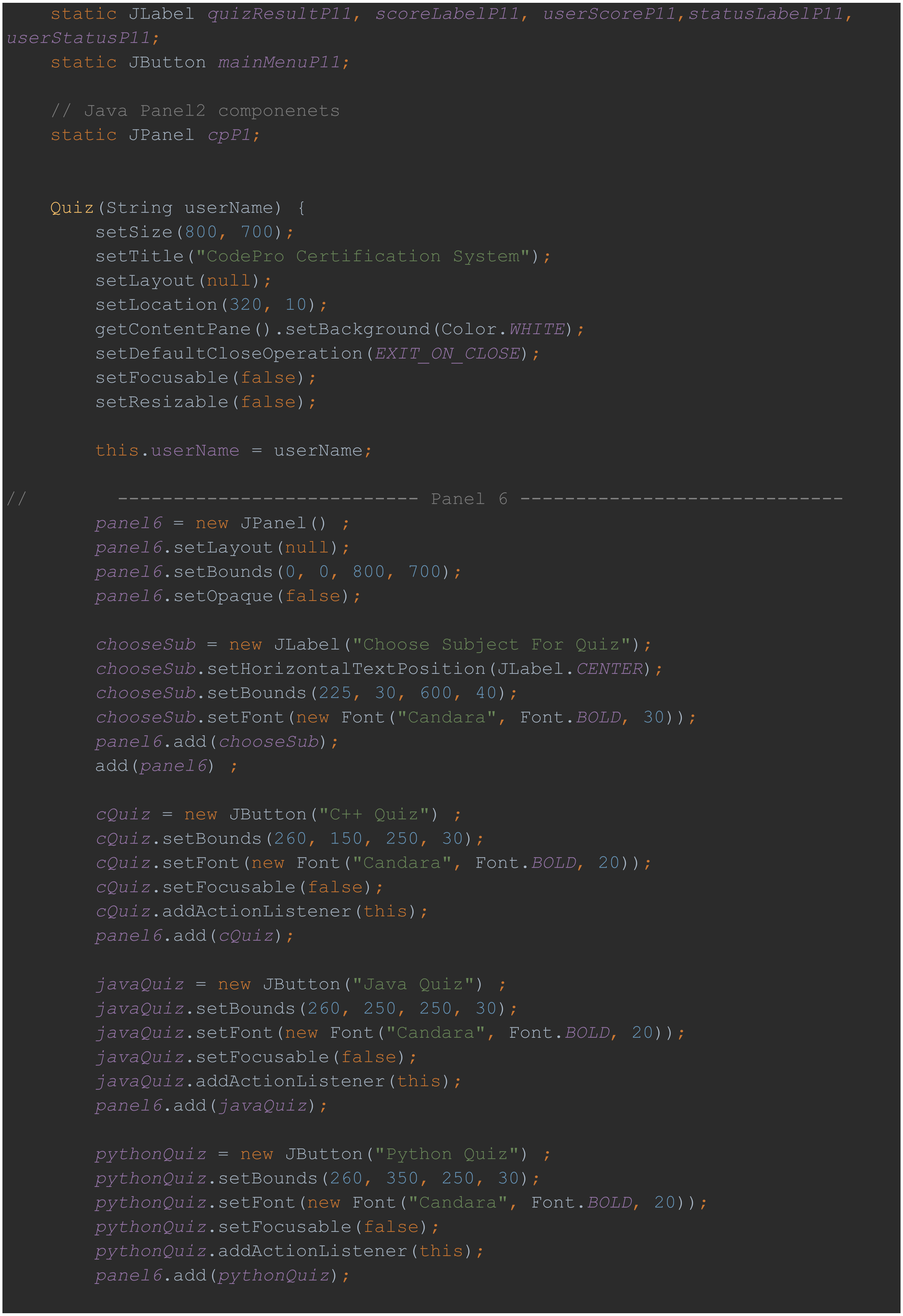


```
        signOut.setBounds(310, 489, 140, 35);
        signOut.setFont(new Font("Candara", Font.BOLD, 20));
        signOut.setFocusable(false);
        signOut.addActionListener(this);
        panel5.add(signOut);

        // -------------------------------------- Panel 14 --------------------
------------
        panel14 = new JPanel();
        panel14.setBounds(0, 0, 800, 700);
        panel14.setOpaque(false);
        panel14.setLayout(null);
        add(panel14);
// label on panel14
        quizPerfomance = new JLabel("Certificate status:");
        quizPerfomance.setBounds(250,150 , 400,60);
        quizPerfomance.setFont(new Font("Candara",Font.BOLD,35));
        panel14.add(quizPerfomance);

        eligibleForCertificate = new JLabel();
        eligibleForCertificate.setBounds(130,250 , 600,60);
        eligibleForCertificate.setFont(new Font("Candara",Font.BOLD,22));
        panel14.add(eligibleForCertificate);



// Buttons on Panel14
        generateCertificate = new JButton("Get Certificate Now!") ;
        generateCertificate.setBounds(270, 350, 230, 35);
        generateCertificate.setFont(new Font("Candara", Font.BOLD, 20));
        generateCertificate.setEnabled(true);
        generateCertificate.addActionListener(this);
        panel14.add(generateCertificate);

        backP14 = new JButton("Back to main menu") ;
        backP14.setBounds(270, 450, 230, 35);
        backP14.setFont(new Font("Candara", Font.BOLD, 20));
        backP14.addActionListener(this);
        panel14.add(backP14);
        panel14.setVisible(false);

        //        ----------------------------- Panel15 -----------------------
```

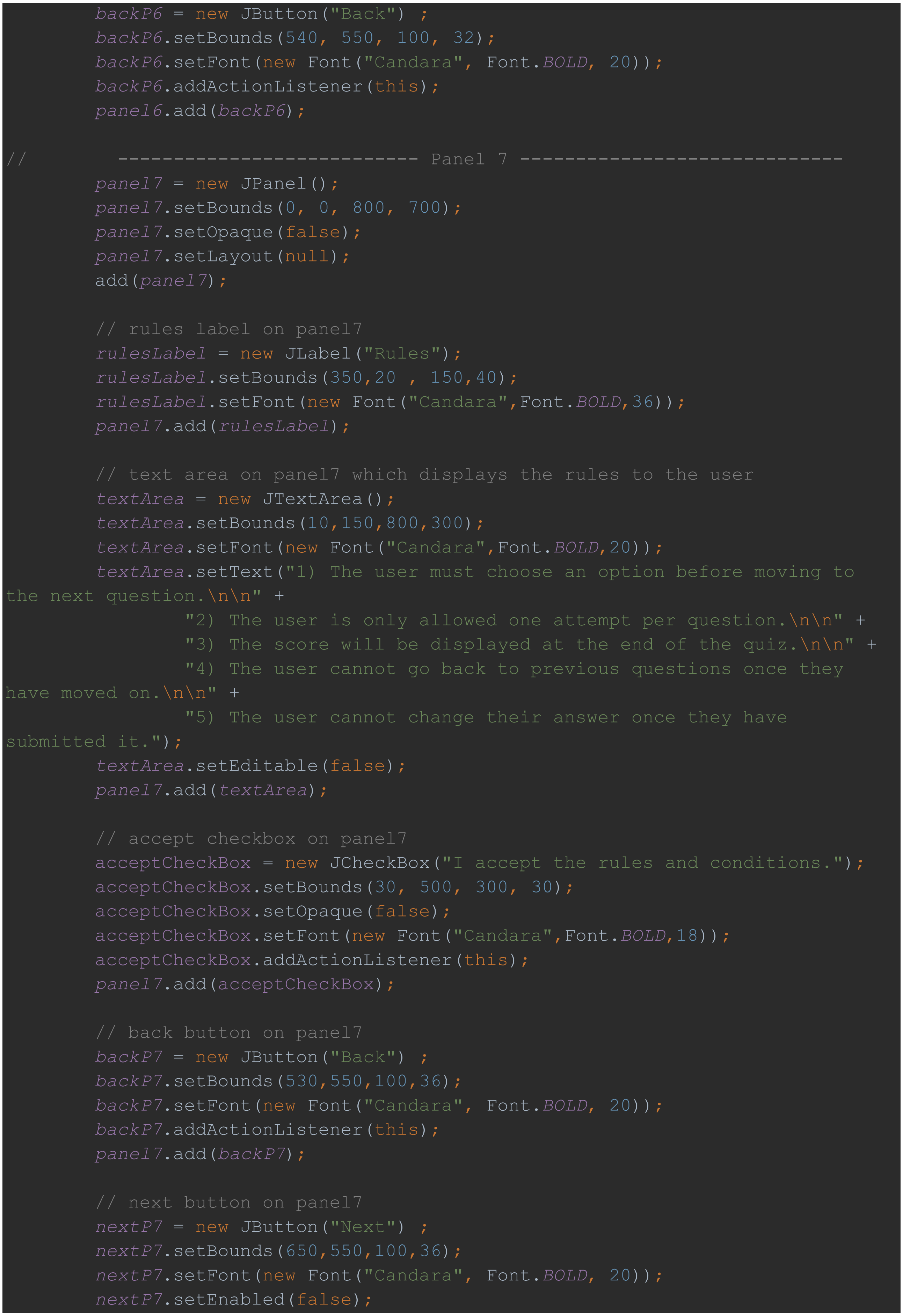
```
------
        panel15 = new JPanel() ;
        panel15.setLayout(null);
        panel15.setSize(800, 700);
        panel15.setOpaque(false);
        add(panel15);


        acheiverName = new JLabel() ;
        acheiverName.setBounds(280,280,480,30);
        acheiverName.setFont(new Font("Monospaced",Font.PLAIN,28));
        panel15.add(acheiverName) ;

        achiever = new JLabel() ;
        ImageIcon certificateP15 = new
ImageIcon("C:\\Users\\Danish\\Desktop\\Main\\logoCer.jpg");
        achiever.setIcon(certificateP15);
        achiever.setBounds(20,0,750,550);
        achiever.setLayout(null);
        panel15.add(achiever);

        backP15 = new JButton("Back To Main Menu") ;
        backP15.setBounds(280,580,250,50);
        backP15.setFont(new Font("Candara", Font.BOLD, 20));
        backP15.addActionListener(this);
        panel15.add(backP15) ;
        panel15.setVisible(false);

        setResizable(false);
        setVisible(true);

    }

    private boolean checkCertificateEligibility() {
        // Perform the database query to check the eligibility for the
certificate
        String query = "SELECT COUNT(DISTINCT subject) AS count FROM
quizperformances WHERE username = ? AND status = 'Pass'";
        try {
            Connection connect = connection.create();
            PreparedStatement statement = connect.prepareStatement(query);
            statement.setString(1, userName);
            ResultSet resultSet = statement.executeQuery();
            if (resultSet.next()) {
                int count = resultSet.getInt("count");
                return count >= 3; // Assuming there are three subjects: C++,
Java, Python
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return false;
    }

    public void actionPerformed (ActionEvent e) {

        // if user clicks on take quiz on panel5
        if(e.getSource() == quizApp) {
            setVisible(false);
            new Quiz(userName);
        }

        // if user clicks on view performance on panel5
        if(e.getSource() == viewPerfomance) {
            setVisible(false);
            new Result(userName);
        }



        // if user clicks on show certificate status on panel5
        if(e.getSource() == certificate) {
            boolean isEligibleForCertificate = checkCertificateEligibility();
            generateCertificate.setEnabled(isEligibleForCertificate);
            if(isEligibleForCertificate == false) {
                eligibleForCertificate.setText("You are not eligible to get the
certificate yet.");
                eligibleForCertificate.setForeground(Color.RED);
                eligibleForCertificate.setBounds(160,250 , 600,60);
            } else {
                eligibleForCertificate.setText("Congratulations! You are
eligible to get the certificate.");
                eligibleForCertificate.setForeground(Color.GREEN);
            }
            panel5.setVisible(false);
            panel14.setVisible(true);
        }

        // if user clicks on sign out on panel5
        if(e.getSource() == signOut) {
            setVisible(false);
            new Login();
        }

        // if user clicks on back button on panel14
        if(e.getSource() == backP14) {
            panel14.setVisible(false);
            panel5.setVisible(true);
        }

        // if user clicks on generate certificate button on panel14
        if(e.getSource() == generateCertificate) {

            String fullName = "";
            String query = "SELECT firstname, lastname FROM userdata WHERE username = ?";
            try {
                Connection connect = connection.create();
                PreparedStatement statement = connect.prepareStatement(query);
                statement.setString(1, userName);
                ResultSet resultSet = statement.executeQuery();
                if (resultSet.next()) {
                    String firstName = resultSet.getString("firstname");
                    String lastName = resultSet.getString("lastname");
                    fullName = firstName + " " + lastName;
                }
            } catch (SQLException a) {
                a.printStackTrace();
            }
            acheiverName.setText(fullName);
            panel14.setVisible(false);
            panel15.setVisible(true);
        }
        // if user clicks on back button on panel15
        if(e.getSource() == backP15) {
            setVisible(false);
            new User(userName);
        }
    }

}
```

Quiz Class:

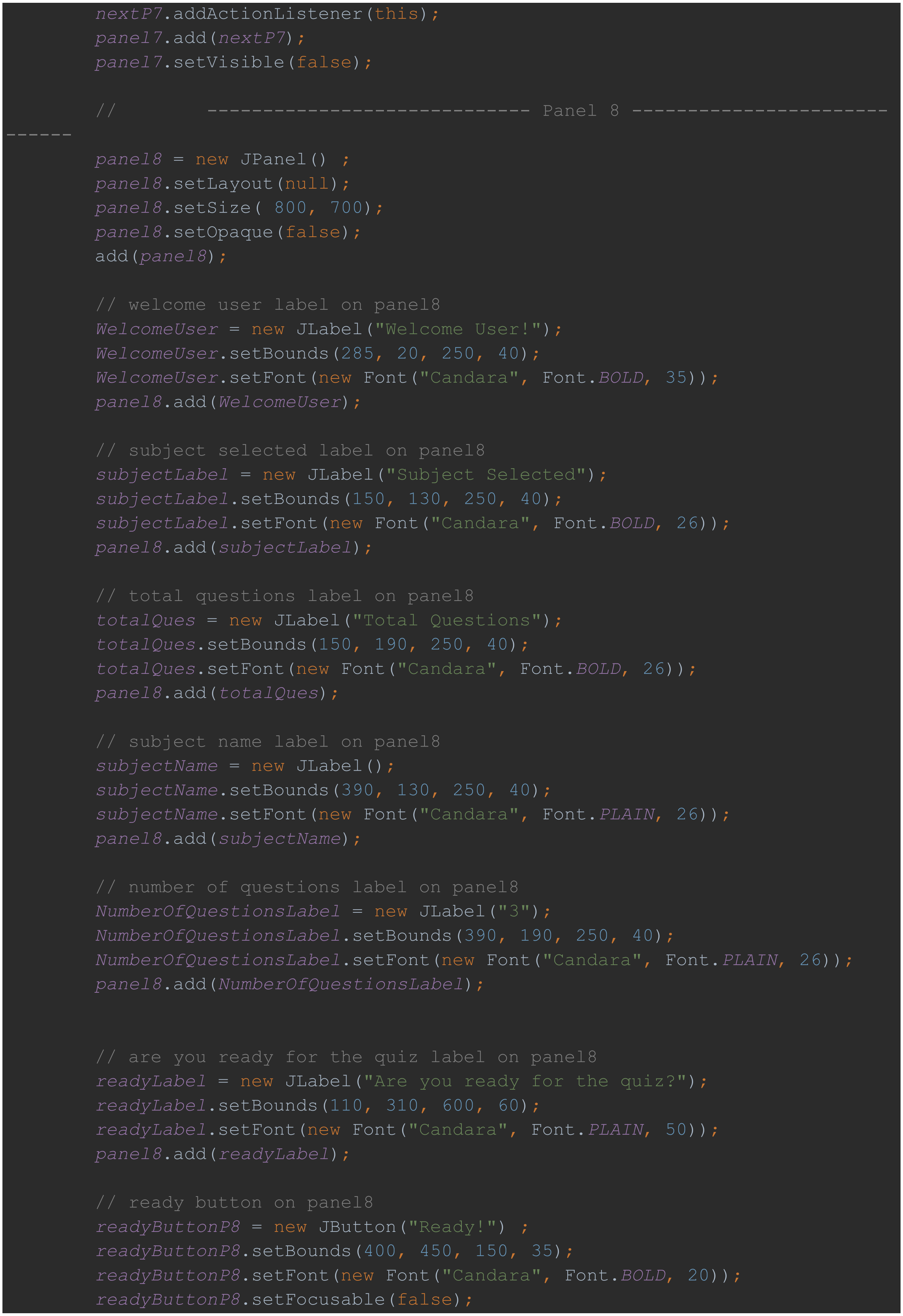
```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.PreparedStatement;

public class Quiz extends JFrame implements ActionListener {

    String userName;

    // panel6 components
    public static JButton cQuiz, javaQuiz, pythonQuiz , backP6;
    public static JLabel chooseSub ;
    public static JPanel panel6;

    // panel7 components
    static JPanel panel7;
    static JLabel rulesLabel;
    static JTextArea textArea;
    JCheckBox acceptCheckBox;
    static JButton backP7,nextP7;

    // panel8 components
    public static JButton readyButtonP8,backP8;
    public static JLabel WelcomeUser ,subjectLabel, totalQues,  subjectName,
NumberOfQuestionsLabel, readyLabel;
    public static JPanel panel8;

    // cpp panel1 components
    public static JButton cppQuizNextP1;
    public static JRadioButton cppQuizOption1P1, cppQuizOption2P1,
cppQuizOption3P1, cppQuizOption4P1;
    public static ButtonGroup cppQuizGroupRadio1P1;
    public static JLabel cppQuizQuesP1, cppQuizTitleP1;
    public static JPanel cppQuizP1;
    public static int cppQuizScore = 0;

    // cpp panel2 components
    public static JButton cppQuizNextP2;
    public static JRadioButton cppQuizOption1P2, cppQuizOption2P2,
cppQuizOption3P2, cppQuizOption4P2;
    public static ButtonGroup cppQuizGroupRadio1P2;
    public static JLabel cppQuizQuesP2, cppQuizTitleP2;
    public static JPanel cppQuizP2;
    // cpp panel3 components
    public static JButton cppQuizSubmitP3;
    public static JRadioButton cppQuizOption1P3, cppQuizOption2P3,
cppQuizOption3P3, cppQuizOption4P3;
    public static ButtonGroup cppQuizGroupRadio1P3;
    public static JLabel cppQuizQuesP3, cppQuizTitleP3;
    public static JPanel cppQuizP3;

    // Java panel1 components
    public static JButton javaQuizNextP1;
    public static JRadioButton javaQuizOption1P1, javaQuizOption2P1,
javaQuizOption3P1, javaQuizOption4P1;
    public static ButtonGroup javaQuizGroupRadio1P1;
    public static JLabel javaQuizQuesP1, javaQuizTitleP1;
    public static JPanel javaQuizP1;
    public static int javaQuizScore = 0;

    // Java panel2 components
    public static JButton javaQuizNextP2;
    public static JRadioButton javaQuizOption1P2, javaQuizOption2P2,
javaQuizOption3P2, javaQuizOption4P2;
    public static ButtonGroup javaQuizGroupRadio1P2;
    public static JLabel javaQuizQuesP2, javaQuizTitleP2;
    public static JPanel javaQuizP2;

    // Java panel3 components
    public static JButton javaQuizSubmitP3;
    public static JRadioButton javaQuizOption1P3, javaQuizOption2P3,
javaQuizOption3P3, javaQuizOption4P3;
    public static ButtonGroup javaQuizGroupRadio1P3;
    public static JLabel javaQuizQuesP3, javaQuizTitleP3;
    public static JPanel javaQuizP3;

    // Python panel1 components
    public static JButton pythonQuizNextP1;
    public static JRadioButton pythonQuizOption1P1, pythonQuizOption2P1,
pythonQuizOption3P1, pythonQuizOption4P1;
    public static ButtonGroup pythonQuizGroupRadio1P1;
    public static JLabel pythonQuizQuesP1, pythonQuizTitleP1;
    public static JPanel pythonQuizP1;
    public static int pythonQuizScore = 0;

    // Python panel2 components
    public static JButton pythonQuizNextP2;
    public static JRadioButton pythonQuizOption1P2, pythonQuizOption2P2,
pythonQuizOption3P2, pythonQuizOption4P2;
    public static ButtonGroup pythonQuizGroupRadio1P2;
    public static JLabel pythonQuizQuesP2, pythonQuizTitleP2;
    public static JPanel pythonQuizP2;

    // Python panel3 components
    public static JButton pythonQuizSubmitP3;
    public static JRadioButton pythonQuizOption1P3, pythonQuizOption2P3,
pythonQuizOption3P3, pythonQuizOption4P3;
    public static ButtonGroup pythonQuizGroupRadio1P3;
    public static JLabel pythonQuizQuesP3, pythonQuizTitleP3;
    public static JPanel pythonQuizP3;

    // panel11 components
    static JPanel panel11;
```



```
    static JLabel quizResultP11, scoreLabelP11, userScoreP11,statusLabelP11,
userStatusP11;
    static JButton mainMenuP11;

    // Java Panel2 componenets
    static JPanel cpP1;


    Quiz(String userName) {
        setSize(800, 700);
        setTitle("CodePro Certification System");
        setLayout(null);
        setLocation(320, 10);
        getContentPane().setBackground(Color.WHITE);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(false);
        setResizable(false);

        this.userName = userName;

//        --------------------------- Panel 6 -----------------------------
        panel6 = new JPanel() ;
        panel6.setLayout(null);
        panel6.setBounds(0, 0, 800, 700);
        panel6.setOpaque(false);

        chooseSub = new JLabel("Choose Subject For Quiz");
        chooseSub.setHorizontalTextPosition(JLabel.CENTER);
        chooseSub.setBounds(225, 30, 600, 40);
        chooseSub.setFont(new Font("Candara", Font.BOLD, 30));
        panel6.add(chooseSub);
        add(panel6) ;

        cQuiz = new JButton("C++ Quiz") ;
        cQuiz.setBounds(260, 150, 250, 30);
        cQuiz.setFont(new Font("Candara", Font.BOLD, 20));
        cQuiz.setFocusable(false);
        cQuiz.addActionListener(this);
        panel6.add(cQuiz);

        javaQuiz = new JButton("Java Quiz") ;
        javaQuiz.setBounds(260, 250, 250, 30);
        javaQuiz.setFont(new Font("Candara", Font.BOLD, 20));
        javaQuiz.setFocusable(false);
        javaQuiz.addActionListener(this);
        panel6.add(javaQuiz);

        pythonQuiz = new JButton("Python Quiz") ;
        pythonQuiz.setBounds(260, 350, 250, 30);
        pythonQuiz.setFont(new Font("Candara", Font.BOLD, 20));
        pythonQuiz.setFocusable(false);
        pythonQuiz.addActionListener(this);
        panel6.add(pythonQuiz);
```

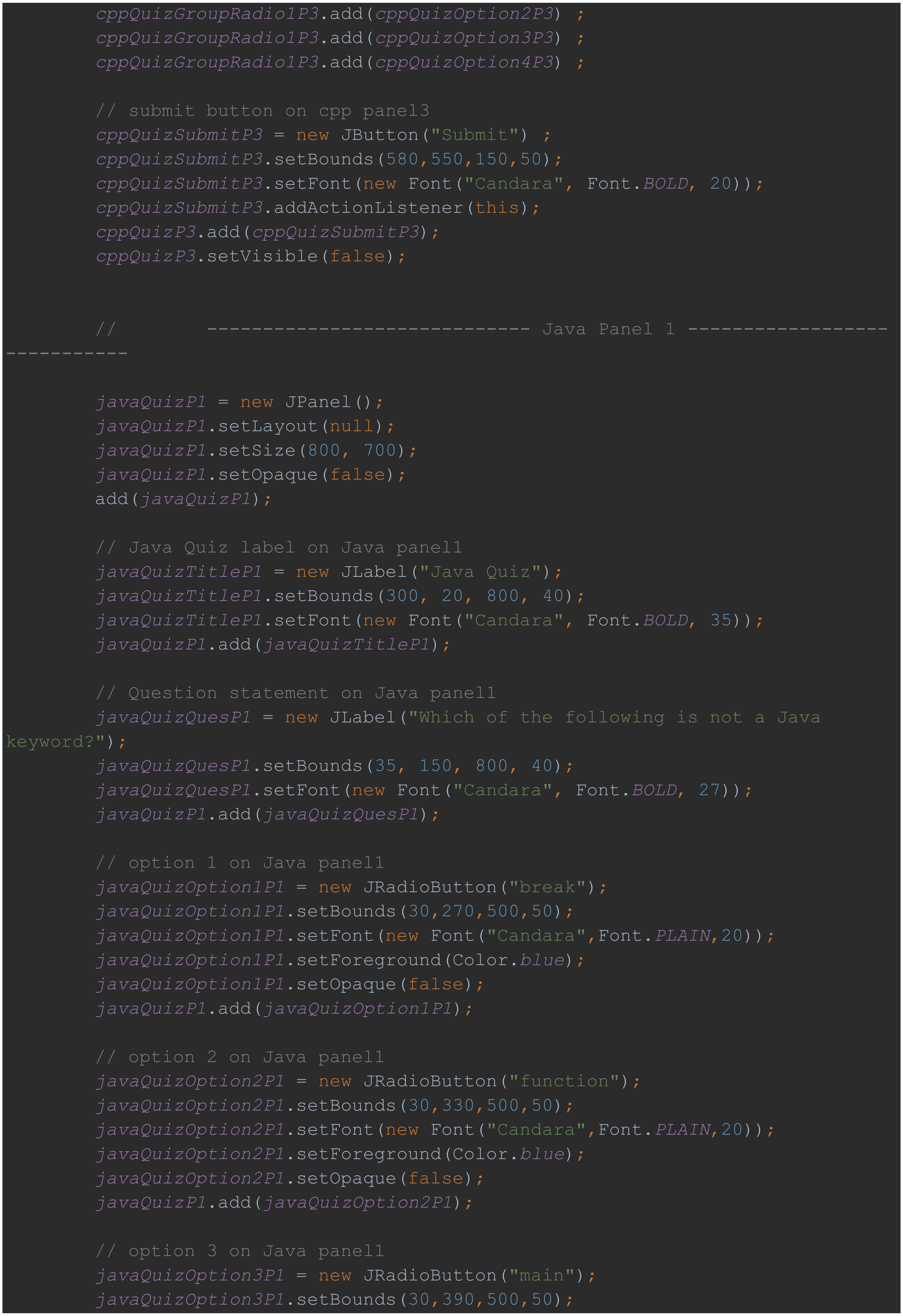


```
        backP6 = new JButton("Back") ;
        backP6.setBounds(540, 550, 100, 32);
        backP6.setFont(new Font("Candara", Font.BOLD, 20));
        backP6.addActionListener(this);
        panel6.add(backP6);

//        --------------------------- Panel 7 -----------------------------
        panel7 = new JPanel();
        panel7.setBounds(0, 0, 800, 700);
        panel7.setOpaque(false);
        panel7.setLayout(null);
        add(panel7);

        // rules label on panel7
        rulesLabel = new JLabel("Rules");
        rulesLabel.setBounds(350,20 , 150,40);
        rulesLabel.setFont(new Font("Candara",Font.BOLD,36));
        panel7.add(rulesLabel);

        // text area on panel7 which displays the rules to the user
        textArea = new JTextArea();
        textArea.setBounds(10,150,800,300);
        textArea.setFont(new Font("Candara",Font.BOLD,20));
        textArea.setText("1) The user must choose an option before moving to
the next question.\n\n" +
                "2) The user is only allowed one attempt per question.\n\n" +
                "3) The score will be displayed at the end of the quiz.\n\n" +
                "4) The user cannot go back to previous questions once they
have moved on.\n\n" +
                "5) The user cannot change their answer once they have
submitted it.");
        textArea.setEditable(false);
        panel7.add(textArea);

        // accept checkbox on panel7
        acceptCheckBox = new JCheckBox("I accept the rules and conditions.");
        acceptCheckBox.setBounds(30, 500, 300, 30);
        acceptCheckBox.setOpaque(false);
        acceptCheckBox.setFont(new Font("Candara",Font.BOLD,18));
        acceptCheckBox.addActionListener(this);
        panel7.add(acceptCheckBox);

        // back button on panel7
        backP7 = new JButton("Back") ;
        backP7.setBounds(530,550,100,36);
        backP7.setFont(new Font("Candara", Font.BOLD, 20));
        backP7.addActionListener(this);
        panel7.add(backP7);

        // next button on panel7
        nextP7 = new JButton("Next") ;
        nextP7.setBounds(650,550,100,36);
        nextP7.setFont(new Font("Candara", Font.BOLD, 20));
        nextP7.setEnabled(false);
```

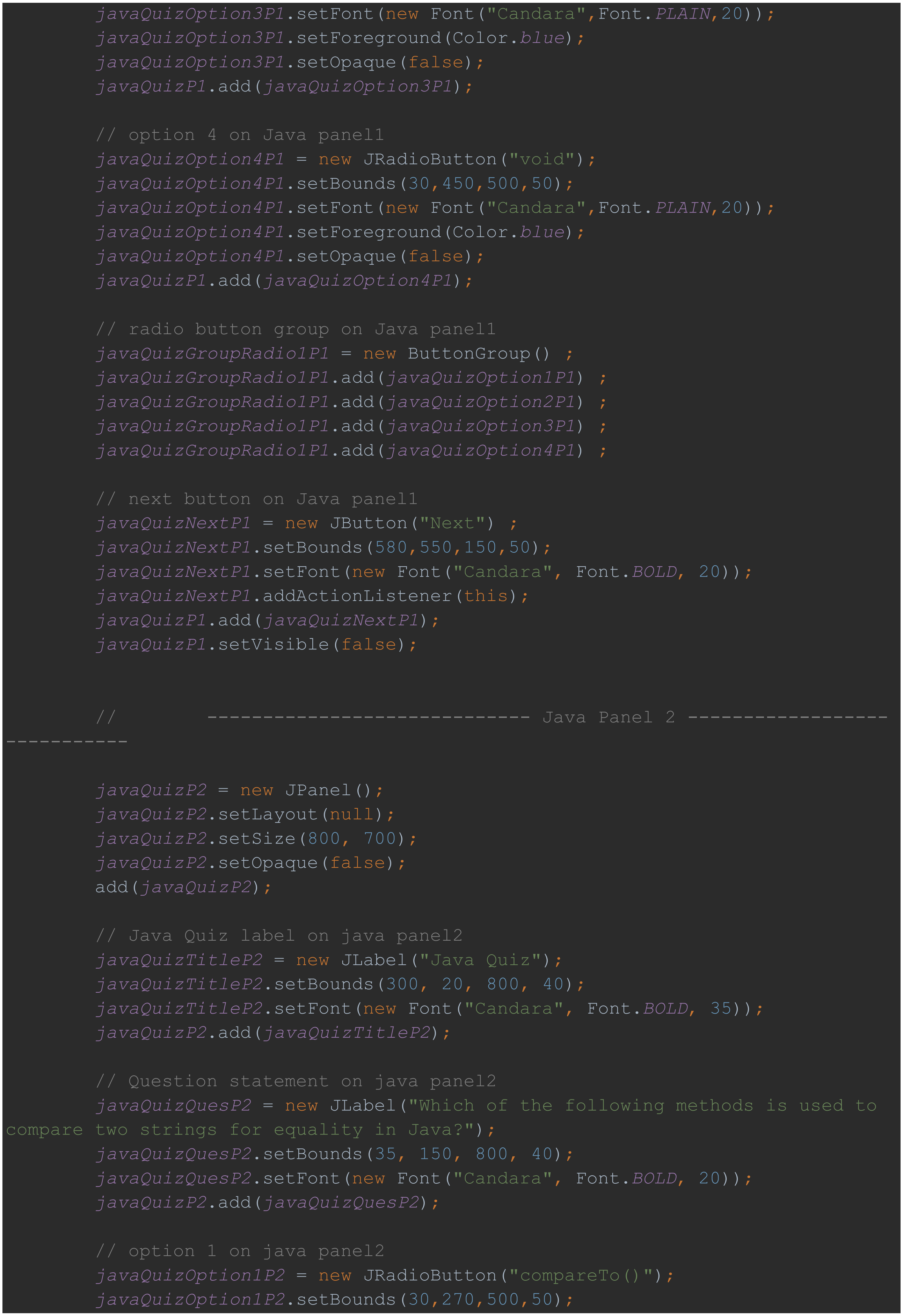


```
        nextP7.addActionListener(this);
        panel7.add(nextP7);
        panel7.setVisible(false);

        //        ----------------------------- Panel 8 -----------------------
------
        panel8 = new JPanel() ;
        panel8.setLayout(null);
        panel8.setSize( 800, 700);
        panel8.setOpaque(false);
        add(panel8);

        // welcome user label on panel8
        WelcomeUser = new JLabel("Welcome User!");
        WelcomeUser.setBounds(285, 20, 250, 40);
        WelcomeUser.setFont(new Font("Candara", Font.BOLD, 35));
        panel8.add(WelcomeUser);

        // subject selected label on panel8
        subjectLabel = new JLabel("Subject Selected");
        subjectLabel.setBounds(150, 130, 250, 40);
        subjectLabel.setFont(new Font("Candara", Font.BOLD, 26));
        panel8.add(subjectLabel);

        // total questions label on panel8
        totalQues = new JLabel("Total Questions");
        totalQues.setBounds(150, 190, 250, 40);
        totalQues.setFont(new Font("Candara", Font.BOLD, 26));
        panel8.add(totalQues);

        // subject name label on panel8
        subjectName = new JLabel();
        subjectName.setBounds(390, 130, 250, 40);
        subjectName.setFont(new Font("Candara", Font.PLAIN, 26));
        panel8.add(subjectName);

        // number of questions label on panel8
        NumberOfQuestionsLabel = new JLabel("3");
        NumberOfQuestionsLabel.setBounds(390, 190, 250, 40);
        NumberOfQuestionsLabel.setFont(new Font("Candara", Font.PLAIN, 26));
        panel8.add(NumberOfQuestionsLabel);


        // are you ready for the quiz label on panel8
        readyLabel = new JLabel("Are you ready for the quiz?");
        readyLabel.setBounds(110, 310, 600, 60);
        readyLabel.setFont(new Font("Candara", Font.PLAIN, 50));
        panel8.add(readyLabel);

        // ready button on panel8
        readyButtonP8 = new JButton("Ready!") ;
        readyButtonP8.setBounds(400, 450, 150, 35);
        readyButtonP8.setFont(new Font("Candara", Font.BOLD, 20));
        readyButtonP8.setFocusable(false);
        readyButtonP8.addActionListener(this);
        panel8.add(readyButtonP8);

        // back button on panel8
        backP8 = new JButton("Back") ;
        backP8.setBounds(180, 450, 150, 35);
        backP8.setFont(new Font("Candara", Font.BOLD, 20));
        backP8.addActionListener(this);
        panel8.add(backP8);
        panel8.setVisible(false);

        //        ----------------------------- Cpp Panel 1 -------------------
----------

        cppQuizP1 = new JPanel();
        cppQuizP1.setLayout(null);
        cppQuizP1.setSize(800, 700);
        cppQuizP1.setOpaque(false);
        add(cppQuizP1);

        // C++ Quiz label on cpp panel1
        cppQuizTitleP1 = new JLabel("C++ Quiz");
        cppQuizTitleP1.setBounds(300, 20, 800, 40);
        cppQuizTitleP1.setFont(new Font("Candara", Font.BOLD, 35));
        cppQuizP1.add(cppQuizTitleP1);

        // Question statement on cpp panel1
        cppQuizQuesP1 = new JLabel("What is the purpose of keyword 'const' in
C++?");
        cppQuizQuesP1.setBounds(35, 150, 800, 40);
        cppQuizQuesP1.setFont(new Font("Candara", Font.BOLD, 27));
        cppQuizP1.add(cppQuizQuesP1);

        // option 1 on cpp panel1
        cppQuizOption1P1 = new JRadioButton("Declares a variable that can be
modified");
        cppQuizOption1P1.setBounds(30,270,500,50);
        cppQuizOption1P1.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption1P1.setForeground(Color.blue);
        cppQuizOption1P1.setOpaque(false);
        cppQuizP1.add(cppQuizOption1P1);

        // option 2 on cpp panel1
        cppQuizOption2P1 = new JRadioButton("Declares a variable that cannot be
modified");
        cppQuizOption2P1.setBounds(30,330,500,50);
        cppQuizOption2P1.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption2P1.setForeground(Color.blue);
        cppQuizOption2P1.setOpaque(false);
        cppQuizP1.add(cppQuizOption2P1);

        // option 3 on cpp panel1
        cppQuizOption3P1 = new JRadioButton("Used to declare an overridden
function");
```

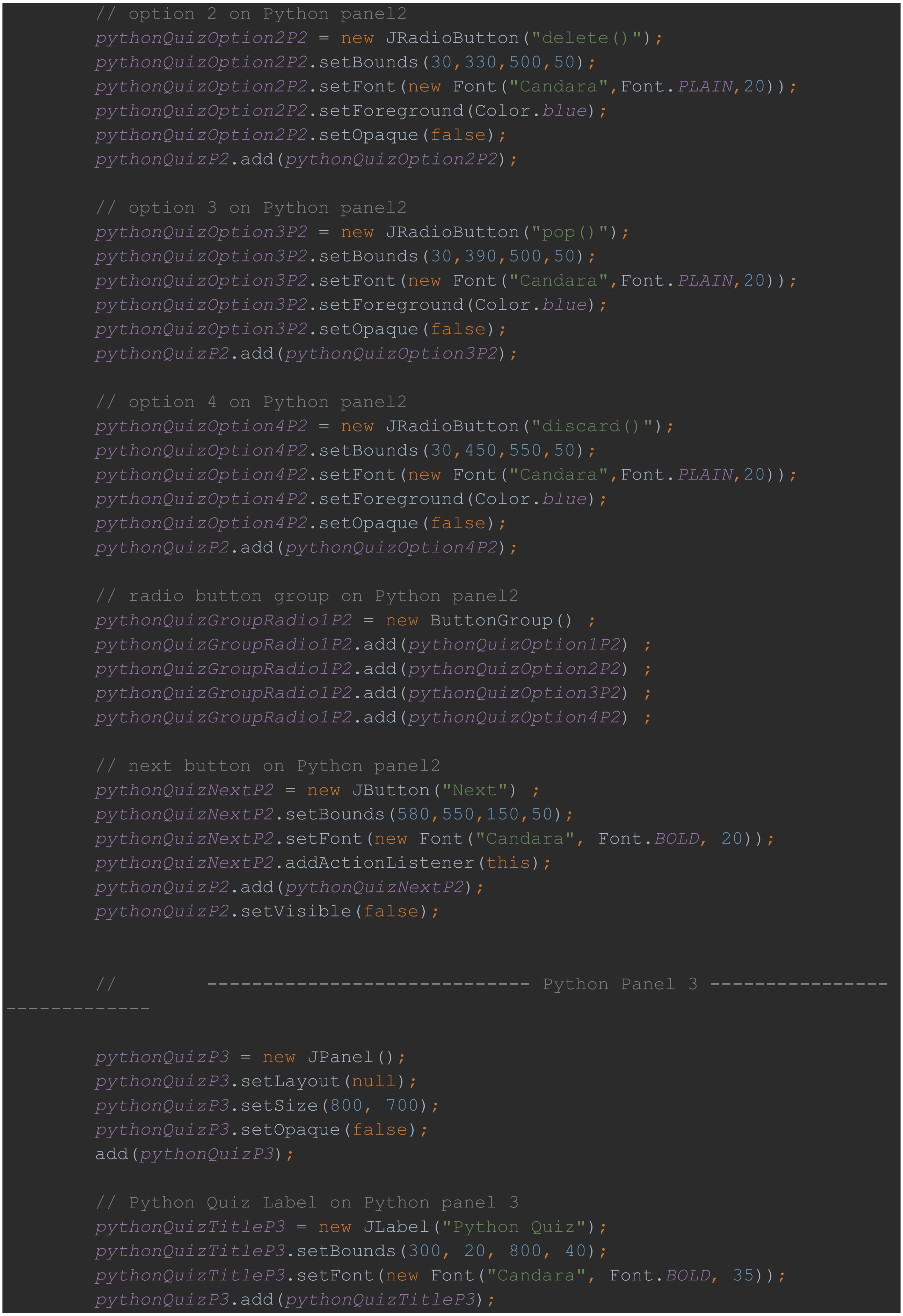
```
        cppQuizOption3P1.setBounds(30,390,500,50);
        cppQuizOption3P1.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption3P1.setForeground(Color.blue);
        cppQuizOption3P1.setOpaque(false);
        cppQuizP1.add(cppQuizOption3P1);

        // option 4 on cpp panel1
        cppQuizOption4P1 = new JRadioButton("Declares a variable that can be
accessed from anywhere");
        cppQuizOption4P1.setBounds(30,450,500,50);
        cppQuizOption4P1.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption4P1.setForeground(Color.blue);
        cppQuizOption4P1.setOpaque(false);
        cppQuizP1.add(cppQuizOption4P1);

        // radio button group on cpp panel1
        cppQuizGroupRadio1P1 = new ButtonGroup() ;
        cppQuizGroupRadio1P1.add(cppQuizOption1P1) ;
        cppQuizGroupRadio1P1.add(cppQuizOption2P1) ;
        cppQuizGroupRadio1P1.add(cppQuizOption3P1) ;
        cppQuizGroupRadio1P1.add(cppQuizOption4P1) ;

        // next button on cpp panel1
        cppQuizNextP1 = new JButton("Next") ;
        cppQuizNextP1.setBounds(580,550,150,50);
        cppQuizNextP1.setFont(new Font("Candara", Font.BOLD, 20));
        cppQuizNextP1.addActionListener(this);
        cppQuizP1.add(cppQuizNextP1);
        cppQuizP1.setVisible(false);

        //       ----------------------------- Cpp Panel 2 -------------------
----------

        cppQuizP2 = new JPanel();
        cppQuizP2.setLayout(null);
        cppQuizP2.setSize(800, 700);
        cppQuizP2.setOpaque(false);
        add(cppQuizP2);

        // C++ Quiz label on cpp panel2
        cppQuizTitleP2 = new JLabel("C++ Quiz");
        cppQuizTitleP2.setBounds(300, 20, 800, 40);
        cppQuizTitleP2.setFont(new Font("Candara", Font.BOLD, 35));
        cppQuizP2.add(cppQuizTitleP2);

        // Question statement on cpp panel2
        cppQuizQuesP2 = new JLabel("What is the purpose of 'virtual' keyword in
C++?");
        cppQuizQuesP2.setBounds(35, 150, 800, 40);
        cppQuizQuesP2.setFont(new Font("Candara", Font.BOLD, 27));
        cppQuizP2.add(cppQuizQuesP2);

        // option 1 on cpp panel2
        cppQuizOption1P2 = new JRadioButton("Declares a variable that can be
overriden");
        cppQuizOption1P2.setBounds(30,270,500,50);
        cppQuizOption1P2.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption1P2.setForeground(Color.blue);
        cppQuizOption1P2.setOpaque(false);
        cppQuizP2.add(cppQuizOption1P2);

        // option 2 on cpp panel2
        cppQuizOption2P2 = new JRadioButton("Declares a function that can be
overloaded");
        cppQuizOption2P2.setBounds(30,330,500,50);
        cppQuizOption2P2.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption2P2.setForeground(Color.blue);
        cppQuizOption2P2.setOpaque(false);
        cppQuizP2.add(cppQuizOption2P2);

        // option 3 on cpp panel2
        cppQuizOption3P2 = new JRadioButton("Declares a function that can be
overridden in a derived class");
        cppQuizOption3P2.setBounds(30,390,500,50);
        cppQuizOption3P2.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption3P2.setForeground(Color.blue);
        cppQuizOption3P2.setOpaque(false);
        cppQuizP2.add(cppQuizOption3P2);

        // option 4 on cpp panel2
        cppQuizOption4P2 = new JRadioButton("Declares a class that can be
inherited");
        cppQuizOption4P2.setBounds(30,450,550,50);
        cppQuizOption4P2.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption4P2.setForeground(Color.blue);
        cppQuizOption4P2.setOpaque(false);
        cppQuizP2.add(cppQuizOption4P2);

        // radio button group on cpp panel2
        cppQuizGroupRadio1P2 = new ButtonGroup() ;
        cppQuizGroupRadio1P2.add(cppQuizOption1P2) ;
        cppQuizGroupRadio1P2.add(cppQuizOption2P2) ;
        cppQuizGroupRadio1P2.add(cppQuizOption3P2) ;
        cppQuizGroupRadio1P2.add(cppQuizOption4P2) ;

        // next button on cpp panel2
        cppQuizNextP2 = new JButton("Next") ;
        cppQuizNextP2.setBounds(580,550,150,50);
        cppQuizNextP2.setFont(new Font("Candara", Font.BOLD, 20));
        cppQuizNextP2.addActionListener(this);
        cppQuizP2.add(cppQuizNextP2);
        cppQuizP2.setVisible(false);

        //        ----------------------------- Cpp Panel 3 -------------------
----------

        cppQuizP3 = new JPanel();
        cppQuizP3.setLayout(null);
        cppQuizP3.setSize(800, 700);
        cppQuizP3.setOpaque(false);
        add(cppQuizP3);

        // C++ Quiz Label on cpp panel3
        cppQuizTitleP3 = new JLabel("C++ Quiz");
        cppQuizTitleP3.setBounds(300, 20, 800, 40);
        cppQuizTitleP3.setFont(new Font("Candara", Font.BOLD, 35));
        cppQuizP3.add(cppQuizTitleP3);

        // Question statement on cpp panel3
        cppQuizQuesP3 = new JLabel("How is memory allocated for dynamically
created objects in C++?");
        cppQuizQuesP3.setBounds(35, 150, 800, 40);
        cppQuizQuesP3.setFont(new Font("Candara", Font.BOLD, 27));
        cppQuizP3.add(cppQuizQuesP3);

        // option 1 on cpp panel3
        cppQuizOption1P3 = new JRadioButton("By using the 'malloc' function");
        cppQuizOption1P3.setBounds(30,270,500,50);
        cppQuizOption1P3.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption1P3.setForeground(Color.blue);
        cppQuizOption1P3.setOpaque(false);
        cppQuizP3.add(cppQuizOption1P3);

        // option 2 on cpp panel3
        cppQuizOption2P3 = new JRadioButton("By declaring them as global
variables");
        cppQuizOption2P3.setBounds(30,330,500,50);
        cppQuizOption2P3.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption2P3.setForeground(Color.blue);
        cppQuizOption2P3.setOpaque(false);
        cppQuizP3.add(cppQuizOption2P3);

        // option 3 on cpp panel3
        cppQuizOption3P3 = new JRadioButton("By declaring them as static
variables");
        cppQuizOption3P3.setBounds(30,390,500,50);
        cppQuizOption3P3.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption3P3.setForeground(Color.blue);
        cppQuizOption3P3.setOpaque(false);
        cppQuizP3.add(cppQuizOption3P3);

        // option 4 on cpp panel3
        cppQuizOption4P3 = new JRadioButton("By using the 'new' operator");
        cppQuizOption4P3.setBounds(30,450,500,50);
        cppQuizOption4P3.setFont(new Font("Candara",Font.PLAIN,20));
        cppQuizOption4P3.setForeground(Color.blue);
        cppQuizOption4P3.setOpaque(false);
        cppQuizP3.add(cppQuizOption4P3);

        // radio button group on cpp panel3
        cppQuizGroupRadio1P3 = new ButtonGroup() ;
        cppQuizGroupRadio1P3.add(cppQuizOption1P3) ;
```



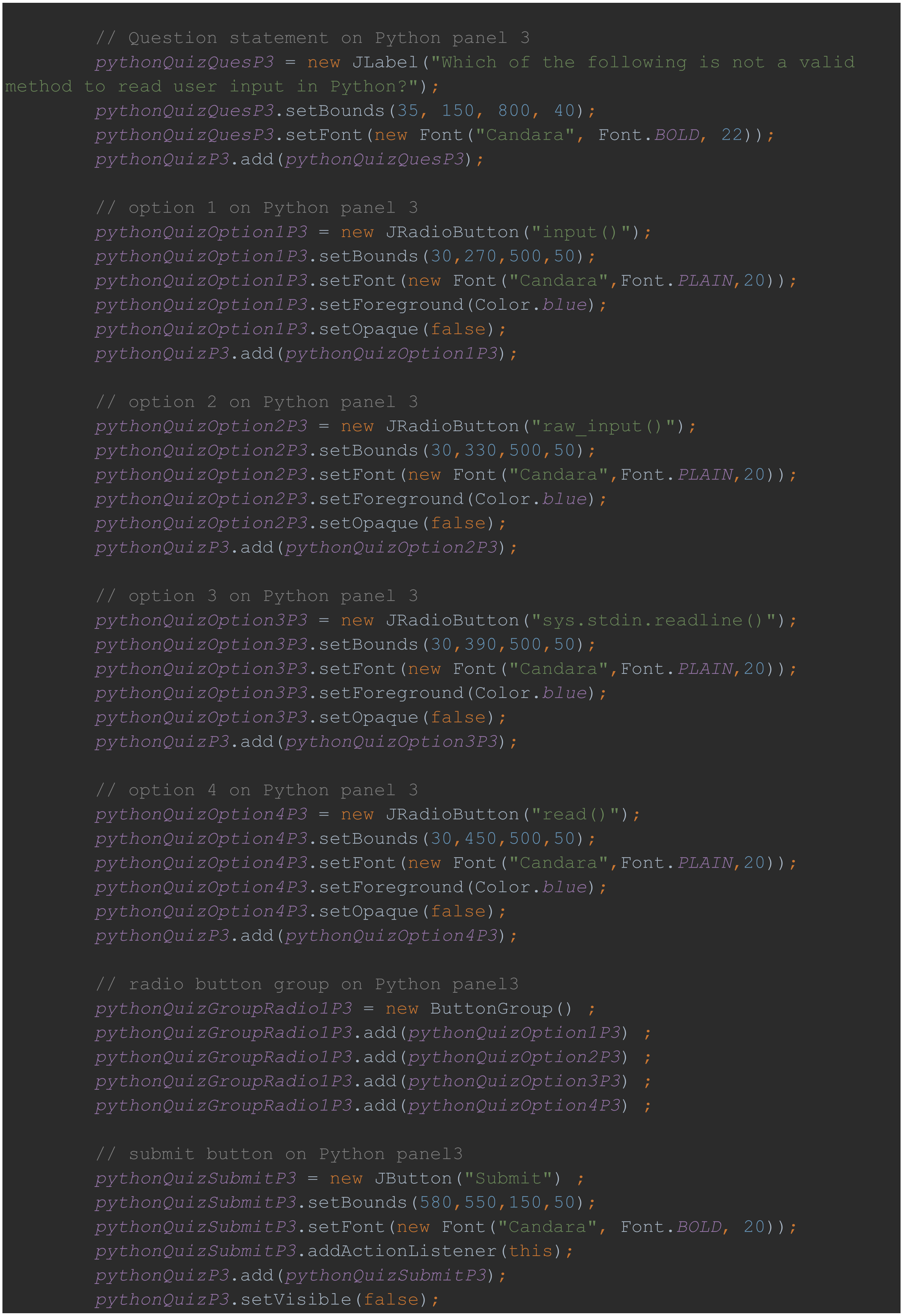
```
        cppQuizGroupRadio1P3.add(cppQuizOption2P3) ;
        cppQuizGroupRadio1P3.add(cppQuizOption3P3) ;
        cppQuizGroupRadio1P3.add(cppQuizOption4P3) ;

        // submit button on cpp panel3
        cppQuizSubmitP3 = new JButton("Submit") ;
        cppQuizSubmitP3.setBounds(580,550,150,50);
        cppQuizSubmitP3.setFont(new Font("Candara", Font.BOLD, 20));
        cppQuizSubmitP3.addActionListener(this);
        cppQuizP3.add(cppQuizSubmitP3);
        cppQuizP3.setVisible(false);


        //        ----------------------------- Java Panel 1 ------------------
-----------

        javaQuizP1 = new JPanel();
        javaQuizP1.setLayout(null);
        javaQuizP1.setSize(800, 700);
        javaQuizP1.setOpaque(false);
        add(javaQuizP1);

        // Java Quiz label on Java panel1
        javaQuizTitleP1 = new JLabel("Java Quiz");
        javaQuizTitleP1.setBounds(300, 20, 800, 40);
        javaQuizTitleP1.setFont(new Font("Candara", Font.BOLD, 35));
        javaQuizP1.add(javaQuizTitleP1);

        // Question statement on Java panel1
        javaQuizQuesP1 = new JLabel("Which of the following is not a Java
keyword?");
        javaQuizQuesP1.setBounds(35, 150, 800, 40);
        javaQuizQuesP1.setFont(new Font("Candara", Font.BOLD, 27));
        javaQuizP1.add(javaQuizQuesP1);

        // option 1 on Java panel1
        javaQuizOption1P1 = new JRadioButton("break");
        javaQuizOption1P1.setBounds(30,270,500,50);
        javaQuizOption1P1.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption1P1.setForeground(Color.blue);
        javaQuizOption1P1.setOpaque(false);
        javaQuizP1.add(javaQuizOption1P1);

        // option 2 on Java panel1
        javaQuizOption2P1 = new JRadioButton("function");
        javaQuizOption2P1.setBounds(30,330,500,50);
        javaQuizOption2P1.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption2P1.setForeground(Color.blue);
        javaQuizOption2P1.setOpaque(false);
        javaQuizP1.add(javaQuizOption2P1);

        // option 3 on Java panel1
        javaQuizOption3P1 = new JRadioButton("main");
        javaQuizOption3P1.setBounds(30,390,500,50);
```



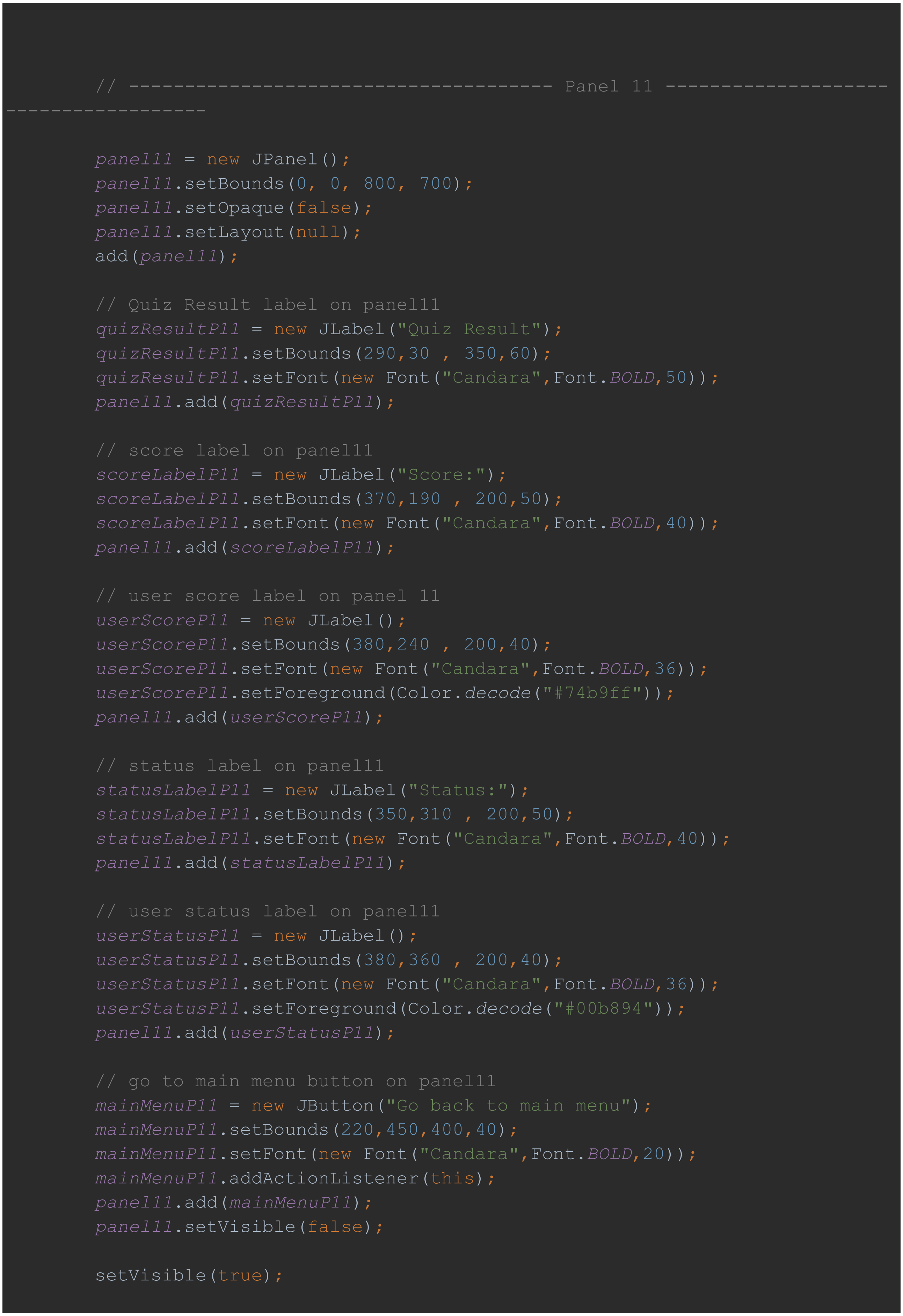
```
        javaQuizOption3P1.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption3P1.setForeground(Color.blue);
        javaQuizOption3P1.setOpaque(false);
        javaQuizP1.add(javaQuizOption3P1);

        // option 4 on Java panel1
        javaQuizOption4P1 = new JRadioButton("void");
        javaQuizOption4P1.setBounds(30,450,500,50);
        javaQuizOption4P1.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption4P1.setForeground(Color.blue);
        javaQuizOption4P1.setOpaque(false);
        javaQuizP1.add(javaQuizOption4P1);

        // radio button group on Java panel1
        javaQuizGroupRadio1P1 = new ButtonGroup() ;
        javaQuizGroupRadio1P1.add(javaQuizOption1P1) ;
        javaQuizGroupRadio1P1.add(javaQuizOption2P1) ;
        javaQuizGroupRadio1P1.add(javaQuizOption3P1) ;
        javaQuizGroupRadio1P1.add(javaQuizOption4P1) ;

        // next button on Java panel1
        javaQuizNextP1 = new JButton("Next") ;
        javaQuizNextP1.setBounds(580,550,150,50);
        javaQuizNextP1.setFont(new Font("Candara", Font.BOLD, 20));
        javaQuizNextP1.addActionListener(this);
        javaQuizP1.add(javaQuizNextP1);
        javaQuizP1.setVisible(false);


        //        ----------------------------- Java Panel 2 ------------------
-----------

        javaQuizP2 = new JPanel();
        javaQuizP2.setLayout(null);
        javaQuizP2.setSize(800, 700);
        javaQuizP2.setOpaque(false);
        add(javaQuizP2);

        // Java Quiz label on java panel2
        javaQuizTitleP2 = new JLabel("Java Quiz");
        javaQuizTitleP2.setBounds(300, 20, 800, 40);
        javaQuizTitleP2.setFont(new Font("Candara", Font.BOLD, 35));
        javaQuizP2.add(javaQuizTitleP2);

        // Question statement on java panel2
        javaQuizQuesP2 = new JLabel("Which of the following methods is used to
compare two strings for equality in Java?");
        javaQuizQuesP2.setBounds(35, 150, 800, 40);
        javaQuizQuesP2.setFont(new Font("Candara", Font.BOLD, 20));
        javaQuizP2.add(javaQuizQuesP2);

        // option 1 on java panel2
        javaQuizOption1P2 = new JRadioButton("compareTo()");
        javaQuizOption1P2.setBounds(30,270,500,50);
        javaQuizOption1P2.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption1P2.setForeground(Color.blue);
        javaQuizOption1P2.setOpaque(false);
        javaQuizP2.add(javaQuizOption1P2);

        // option 2 on java panel2
        javaQuizOption2P2 = new JRadioButton("compare()");
        javaQuizOption2P2.setBounds(30,330,500,50);
        javaQuizOption2P2.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption2P2.setForeground(Color.blue);
        javaQuizOption2P2.setOpaque(false);
        javaQuizP2.add(javaQuizOption2P2);

        // option 3 on java panel2
        javaQuizOption3P2 = new JRadioButton("equals()");
        javaQuizOption3P2.setBounds(30,390,500,50);
        javaQuizOption3P2.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption3P2.setForeground(Color.blue);
        javaQuizOption3P2.setOpaque(false);
        javaQuizP2.add(javaQuizOption3P2);

        // option 4 on java panel2
        javaQuizOption4P2 = new JRadioButton("equalsIgnoreCase()");
        javaQuizOption4P2.setBounds(30,450,550,50);
        javaQuizOption4P2.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption4P2.setForeground(Color.blue);
        javaQuizOption4P2.setOpaque(false);
        javaQuizP2.add(javaQuizOption4P2);

        // radio button group on java panel2
        javaQuizGroupRadio1P2 = new ButtonGroup() ;
        javaQuizGroupRadio1P2.add(javaQuizOption1P2) ;
        javaQuizGroupRadio1P2.add(javaQuizOption2P2) ;
        javaQuizGroupRadio1P2.add(javaQuizOption3P2) ;
        javaQuizGroupRadio1P2.add(javaQuizOption4P2) ;

        // next button on java panel2
        javaQuizNextP2 = new JButton("Next") ;
        javaQuizNextP2.setBounds(580,550,150,50);
        javaQuizNextP2.setFont(new Font("Candara", Font.BOLD, 20));
        javaQuizNextP2.addActionListener(this);
        javaQuizP2.add(javaQuizNextP2);
        javaQuizP2.setVisible(false);


        //        ----------------------------- Java Panel 3 ------------------
-----------

        javaQuizP3 = new JPanel();
        javaQuizP3.setLayout(null);
        javaQuizP3.setSize(800, 700);
        javaQuizP3.setOpaque(false);
        add(javaQuizP3);
        // Java Quiz Label on java panel3
        javaQuizTitleP3 = new JLabel("Java Quiz");
        javaQuizTitleP3.setBounds(300, 20, 800, 40);
        javaQuizTitleP3.setFont(new Font("Candara", Font.BOLD, 35));
        javaQuizP3.add(javaQuizTitleP3);

        // Question statement on java panel3
        javaQuizQuesP3 = new JLabel("Which of the following is used to handle exceptions in Java?");
        javaQuizQuesP3.setBounds(35, 150, 800, 40);
        javaQuizQuesP3.setFont(new Font("Candara", Font.BOLD, 27));
        javaQuizP3.add(javaQuizQuesP3);

        // option 1 on java panel3
        javaQuizOption1P3 = new JRadioButton("switch-case");
        javaQuizOption1P3.setBounds(30,270,500,50);
        javaQuizOption1P3.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption1P3.setForeground(Color.blue);
        javaQuizOption1P3.setOpaque(false);
        javaQuizP3.add(javaQuizOption1P3);

        // option 2 on java panel3
        javaQuizOption2P3 = new JRadioButton("for loop");
        javaQuizOption2P3.setBounds(30,330,500,50);
        javaQuizOption2P3.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption2P3.setForeground(Color.blue);
        javaQuizOption2P3.setOpaque(false);
        javaQuizP3.add(javaQuizOption2P3);

        // option 3 on java panel3
        javaQuizOption3P3 = new JRadioButton("if-else");
        javaQuizOption3P3.setBounds(30,390,500,50);
        javaQuizOption3P3.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption3P3.setForeground(Color.blue);
        javaQuizOption3P3.setOpaque(false);
        javaQuizP3.add(javaQuizOption3P3);

        // option 4 on java panel3
        javaQuizOption4P3 = new JRadioButton("try-catch");
        javaQuizOption4P3.setBounds(30,450,500,50);
        javaQuizOption4P3.setFont(new Font("Candara",Font.PLAIN,20));
        javaQuizOption4P3.setForeground(Color.blue);
        javaQuizOption4P3.setOpaque(false);
        javaQuizP3.add(javaQuizOption4P3);

        // radio button group on java panel3
        javaQuizGroupRadio1P3 = new ButtonGroup() ;
        javaQuizGroupRadio1P3.add(javaQuizOption1P3) ;
        javaQuizGroupRadio1P3.add(javaQuizOption2P3) ;
        javaQuizGroupRadio1P3.add(javaQuizOption3P3) ;
        javaQuizGroupRadio1P3.add(javaQuizOption4P3) ;

        // submit button on java panel3
        javaQuizSubmitP3 = new JButton("Submit") ;
        javaQuizSubmitP3.setBounds(580,550,150,50);
        javaQuizSubmitP3.setFont(new Font("Candara", Font.BOLD, 20));
        javaQuizSubmitP3.addActionListener(this);
        javaQuizP3.add(javaQuizSubmitP3);
        javaQuizP3.setVisible(false);



        //        ----------------------------- Python Panel 1 ----------------
-------------

        pythonQuizP1 = new JPanel();
        pythonQuizP1.setLayout(null);
        pythonQuizP1.setSize(800, 700);
        pythonQuizP1.setOpaque(false);
        add(pythonQuizP1);

        // Python Quiz label on Python panel1
        pythonQuizTitleP1 = new JLabel("Python Quiz");
        pythonQuizTitleP1.setBounds(300, 20, 800, 40);
        pythonQuizTitleP1.setFont(new Font("Candara", Font.BOLD, 35));
        pythonQuizP1.add(pythonQuizTitleP1);

        // Question statement on Python panel1
        pythonQuizQuesP1 = new JLabel("What is the correct way to check the
length of a list in Python?");
        pythonQuizQuesP1.setBounds(35, 150, 800, 40);
        pythonQuizQuesP1.setFont(new Font("Candara", Font.BOLD, 27));
        pythonQuizP1.add(pythonQuizQuesP1);

        // option 1 on Python panel1
        pythonQuizOption1P1 = new JRadioButton("length(list)");
        pythonQuizOption1P1.setBounds(30,270,500,50);
        pythonQuizOption1P1.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption1P1.setForeground(Color.blue);
        pythonQuizOption1P1.setOpaque(false);
        pythonQuizP1.add(pythonQuizOption1P1);

        // option 2 on Python panel1
        pythonQuizOption2P1 = new JRadioButton("len(list)");
        pythonQuizOption2P1.setBounds(30,330,500,50);
        pythonQuizOption2P1.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption2P1.setForeground(Color.blue);
        pythonQuizOption2P1.setOpaque(false);
        pythonQuizP1.add(pythonQuizOption2P1);

        // option 3 on Python panel1
        pythonQuizOption3P1 = new JRadioButton("list.len()");
        pythonQuizOption3P1.setBounds(30,390,500,50);
        pythonQuizOption3P1.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption3P1.setForeground(Color.blue);
        pythonQuizOption3P1.setOpaque(false);
        pythonQuizP1.add(pythonQuizOption3P1);
        // option 4 on Python panel1
        pythonQuizOption4P1 = new JRadioButton("list.length()");
        pythonQuizOption4P1.setBounds(30,450,500,50);
        pythonQuizOption4P1.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption4P1.setForeground(Color.blue);
        pythonQuizOption4P1.setOpaque(false);
        pythonQuizP1.add(pythonQuizOption4P1);

        // radio button group on Python panel1
        pythonQuizGroupRadio1P1 = new ButtonGroup() ;
        pythonQuizGroupRadio1P1.add(pythonQuizOption1P1) ;
        pythonQuizGroupRadio1P1.add(pythonQuizOption2P1) ;
        pythonQuizGroupRadio1P1.add(pythonQuizOption3P1) ;
        pythonQuizGroupRadio1P1.add(pythonQuizOption4P1) ;

        // next button on Python panel1
        pythonQuizNextP1 = new JButton("Next") ;
        pythonQuizNextP1.setBounds(580,550,150,50);
        pythonQuizNextP1.setFont(new Font("Candara", Font.BOLD, 20));
        pythonQuizNextP1.addActionListener(this);
        pythonQuizP1.add(pythonQuizNextP1);
        pythonQuizP1.setVisible(false);


        //        ----------------------------- Python Panel 2 ----------------
-------------

        pythonQuizP2 = new JPanel();
        pythonQuizP2.setLayout(null);
        pythonQuizP2.setSize(800, 700);
        pythonQuizP2.setOpaque(false);
        add(pythonQuizP2);

        // Python Quiz label on Python panel2
        pythonQuizTitleP2 = new JLabel("Python Quiz");
        pythonQuizTitleP2.setBounds(300, 20, 800, 40);
        pythonQuizTitleP2.setFont(new Font("Candara", Font.BOLD, 35));
        pythonQuizP2.add(pythonQuizTitleP2);

        // Question statement on Python panel2
        pythonQuizQuesP2 = new JLabel("Which of the following is used to remove
an item from a list in Python?");
        pythonQuizQuesP2.setBounds(35, 150, 800, 40);
        pythonQuizQuesP2.setFont(new Font("Candara", Font.BOLD, 22));
        pythonQuizP2.add(pythonQuizQuesP2);

        // option 1 on Python panel2
        pythonQuizOption1P2 = new JRadioButton("remove()");
        pythonQuizOption1P2.setBounds(30,270,500,50);
        pythonQuizOption1P2.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption1P2.setForeground(Color.blue);
        pythonQuizOption1P2.setOpaque(false);
        pythonQuizP2.add(pythonQuizOption1P2);
```



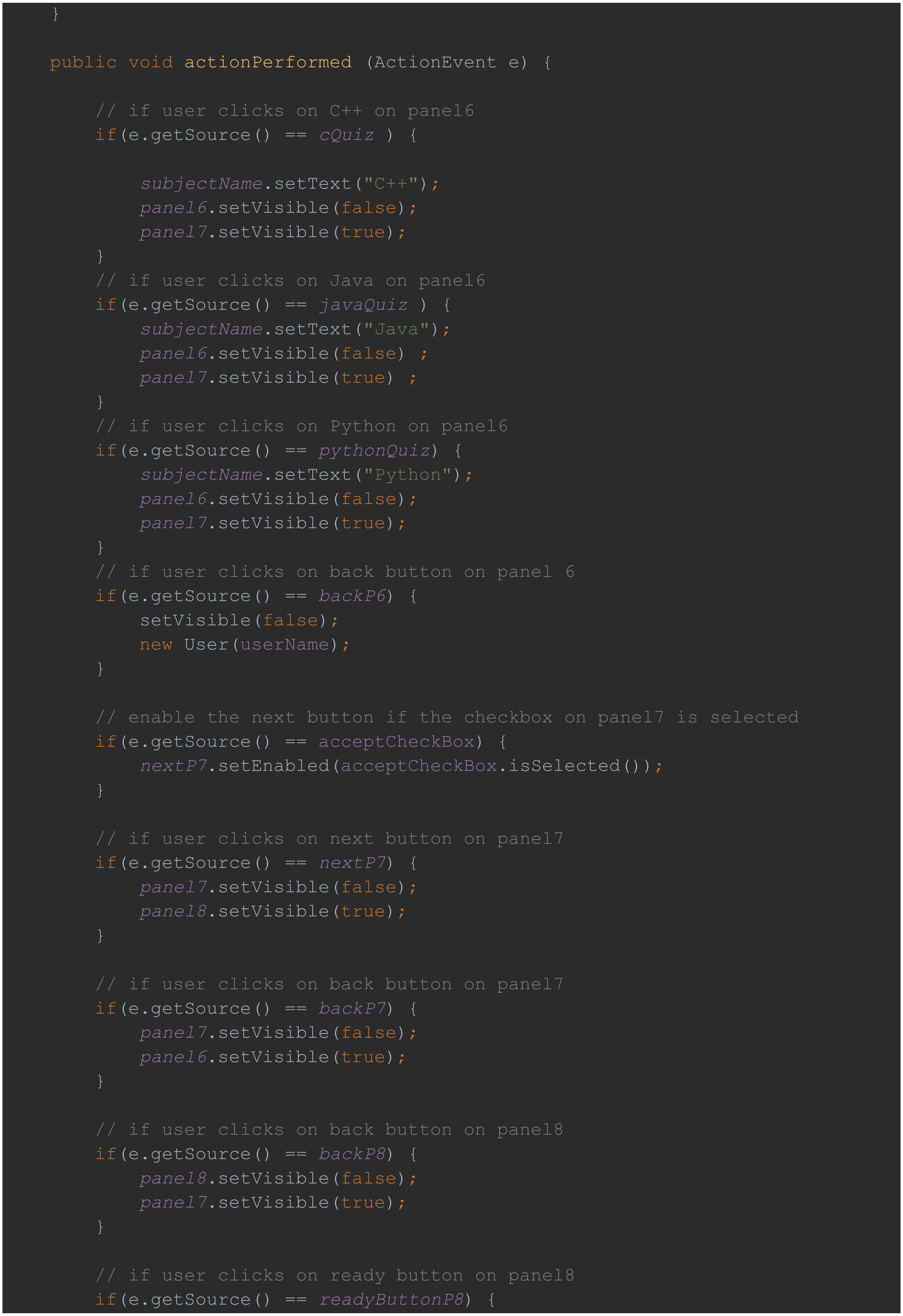
```
        // option 2 on Python panel2
        pythonQuizOption2P2 = new JRadioButton("delete()");
        pythonQuizOption2P2.setBounds(30,330,500,50);
        pythonQuizOption2P2.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption2P2.setForeground(Color.blue);
        pythonQuizOption2P2.setOpaque(false);
        pythonQuizP2.add(pythonQuizOption2P2);

        // option 3 on Python panel2
        pythonQuizOption3P2 = new JRadioButton("pop()");
        pythonQuizOption3P2.setBounds(30,390,500,50);
        pythonQuizOption3P2.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption3P2.setForeground(Color.blue);
        pythonQuizOption3P2.setOpaque(false);
        pythonQuizP2.add(pythonQuizOption3P2);

        // option 4 on Python panel2
        pythonQuizOption4P2 = new JRadioButton("discard()");
        pythonQuizOption4P2.setBounds(30,450,550,50);
        pythonQuizOption4P2.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption4P2.setForeground(Color.blue);
        pythonQuizOption4P2.setOpaque(false);
        pythonQuizP2.add(pythonQuizOption4P2);

        // radio button group on Python panel2
        pythonQuizGroupRadio1P2 = new ButtonGroup() ;
        pythonQuizGroupRadio1P2.add(pythonQuizOption1P2) ;
        pythonQuizGroupRadio1P2.add(pythonQuizOption2P2) ;
        pythonQuizGroupRadio1P2.add(pythonQuizOption3P2) ;
        pythonQuizGroupRadio1P2.add(pythonQuizOption4P2) ;

        // next button on Python panel2
        pythonQuizNextP2 = new JButton("Next") ;
        pythonQuizNextP2.setBounds(580,550,150,50);
        pythonQuizNextP2.setFont(new Font("Candara", Font.BOLD, 20));
        pythonQuizNextP2.addActionListener(this);
        pythonQuizP2.add(pythonQuizNextP2);
        pythonQuizP2.setVisible(false);


        //        ----------------------------- Python Panel 3 ----------------
-------------

        pythonQuizP3 = new JPanel();
        pythonQuizP3.setLayout(null);
        pythonQuizP3.setSize(800, 700);
        pythonQuizP3.setOpaque(false);
        add(pythonQuizP3);

        // Python Quiz Label on Python panel 3
        pythonQuizTitleP3 = new JLabel("Python Quiz");
        pythonQuizTitleP3.setBounds(300, 20, 800, 40);
        pythonQuizTitleP3.setFont(new Font("Candara", Font.BOLD, 35));
        pythonQuizP3.add(pythonQuizTitleP3);
```



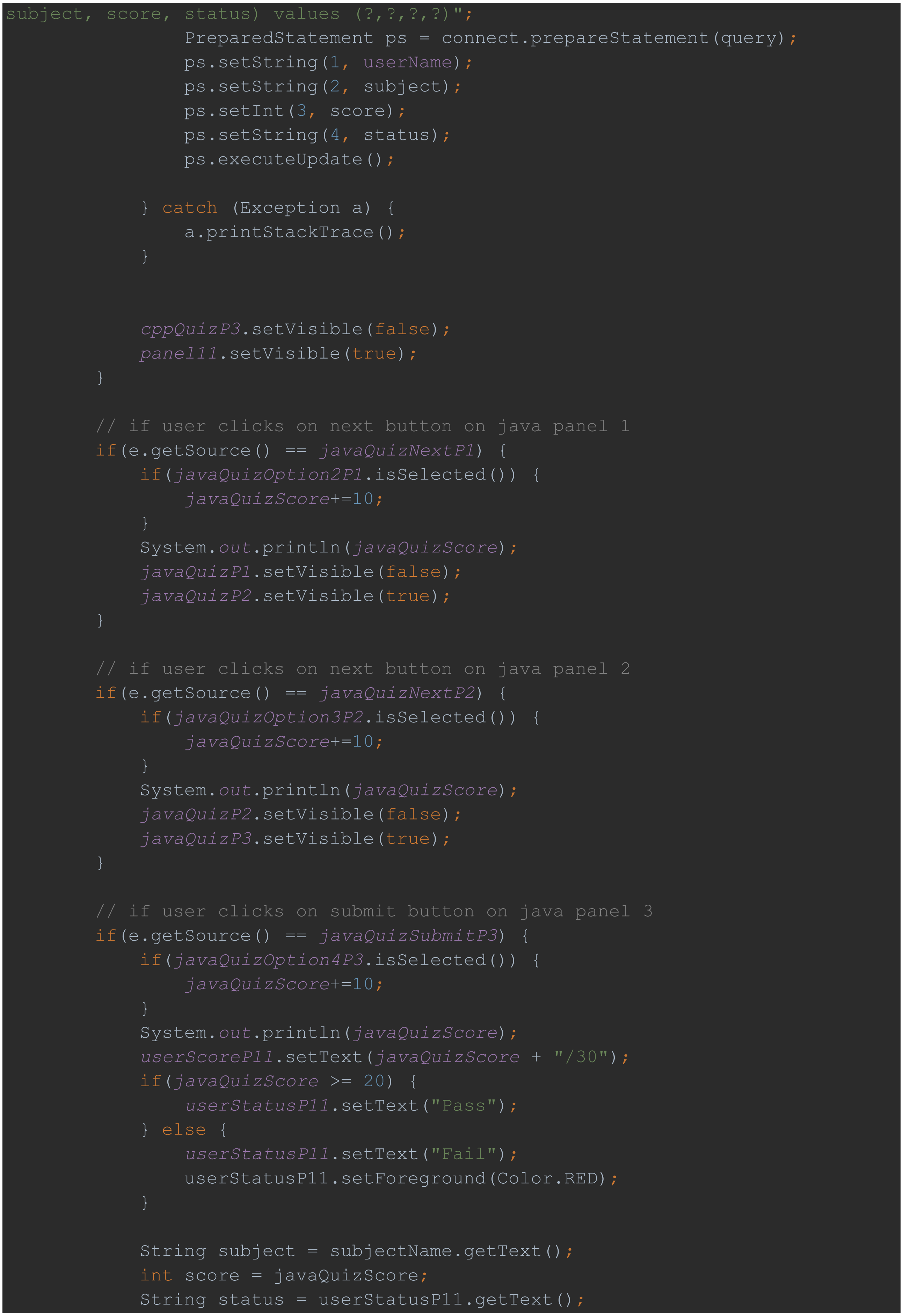
```
        // Question statement on Python panel 3
        pythonQuizQuesP3 = new JLabel("Which of the following is not a valid
method to read user input in Python?");
        pythonQuizQuesP3.setBounds(35, 150, 800, 40);
        pythonQuizQuesP3.setFont(new Font("Candara", Font.BOLD, 22));
        pythonQuizP3.add(pythonQuizQuesP3);

        // option 1 on Python panel 3
        pythonQuizOption1P3 = new JRadioButton("input()");
        pythonQuizOption1P3.setBounds(30,270,500,50);
        pythonQuizOption1P3.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption1P3.setForeground(Color.blue);
        pythonQuizOption1P3.setOpaque(false);
        pythonQuizP3.add(pythonQuizOption1P3);

        // option 2 on Python panel 3
        pythonQuizOption2P3 = new JRadioButton("raw_input()");
        pythonQuizOption2P3.setBounds(30,330,500,50);
        pythonQuizOption2P3.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption2P3.setForeground(Color.blue);
        pythonQuizOption2P3.setOpaque(false);
        pythonQuizP3.add(pythonQuizOption2P3);

        // option 3 on Python panel 3
        pythonQuizOption3P3 = new JRadioButton("sys.stdin.readline()");
        pythonQuizOption3P3.setBounds(30,390,500,50);
        pythonQuizOption3P3.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption3P3.setForeground(Color.blue);
        pythonQuizOption3P3.setOpaque(false);
        pythonQuizP3.add(pythonQuizOption3P3);

        // option 4 on Python panel 3
        pythonQuizOption4P3 = new JRadioButton("read()");
        pythonQuizOption4P3.setBounds(30,450,500,50);
        pythonQuizOption4P3.setFont(new Font("Candara",Font.PLAIN,20));
        pythonQuizOption4P3.setForeground(Color.blue);
        pythonQuizOption4P3.setOpaque(false);
        pythonQuizP3.add(pythonQuizOption4P3);

        // radio button group on Python panel3
        pythonQuizGroupRadio1P3 = new ButtonGroup() ;
        pythonQuizGroupRadio1P3.add(pythonQuizOption1P3) ;
        pythonQuizGroupRadio1P3.add(pythonQuizOption2P3) ;
        pythonQuizGroupRadio1P3.add(pythonQuizOption3P3) ;
        pythonQuizGroupRadio1P3.add(pythonQuizOption4P3) ;

        // submit button on Python panel3
        pythonQuizSubmitP3 = new JButton("Submit") ;
        pythonQuizSubmitP3.setBounds(580,550,150,50);
        pythonQuizSubmitP3.setFont(new Font("Candara", Font.BOLD, 20));
        pythonQuizSubmitP3.addActionListener(this);
        pythonQuizP3.add(pythonQuizSubmitP3);
        pythonQuizP3.setVisible(false);
```



```
        // -------------------------------------- Panel 11 --------------------
------------------

        panel11 = new JPanel();
        panel11.setBounds(0, 0, 800, 700);
        panel11.setOpaque(false);
        panel11.setLayout(null);
        add(panel11);

        // Quiz Result label on panel11
        quizResultP11 = new JLabel("Quiz Result");
        quizResultP11.setBounds(290,30 , 350,60);
        quizResultP11.setFont(new Font("Candara",Font.BOLD,50));
        panel11.add(quizResultP11);

        // score label on panel11
        scoreLabelP11 = new JLabel("Score:");
        scoreLabelP11.setBounds(370,190 , 200,50);
        scoreLabelP11.setFont(new Font("Candara",Font.BOLD,40));
        panel11.add(scoreLabelP11);

        // user score label on panel 11
        userScoreP11 = new JLabel();
        userScoreP11.setBounds(380,240 , 200,40);
        userScoreP11.setFont(new Font("Candara",Font.BOLD,36));
        userScoreP11.setForeground(Color.decode("#74b9ff"));
        panel11.add(userScoreP11);

        // status label on panel11
        statusLabelP11 = new JLabel("Status:");
        statusLabelP11.setBounds(350,310 , 200,50);
        statusLabelP11.setFont(new Font("Candara",Font.BOLD,40));
        panel11.add(statusLabelP11);

        // user status label on panel11
        userStatusP11 = new JLabel();
        userStatusP11.setBounds(380,360 , 200,40);
        userStatusP11.setFont(new Font("Candara",Font.BOLD,36));
        userStatusP11.setForeground(Color.decode("#00b894"));
        panel11.add(userStatusP11);

        // go to main menu button on panel11
        mainMenuP11 = new JButton("Go back to main menu");
        mainMenuP11.setBounds(220,450,400,40);
        mainMenuP11.setFont(new Font("Candara",Font.BOLD,20));
        mainMenuP11.addActionListener(this);
        panel11.add(mainMenuP11);
        panel11.setVisible(false);

        setVisible(true);
```



```
    }

    public void actionPerformed (ActionEvent e) {

        // if user clicks on C++ on panel6
        if(e.getSource() == cQuiz ) {

            subjectName.setText("C++");
            panel6.setVisible(false);
            panel7.setVisible(true);
        }
        // if user clicks on Java on panel6
        if(e.getSource() == javaQuiz ) {
            subjectName.setText("Java");
            panel6.setVisible(false) ;
            panel7.setVisible(true) ;
        }
        // if user clicks on Python on panel6
        if(e.getSource() == pythonQuiz) {
            subjectName.setText("Python");
            panel6.setVisible(false);
            panel7.setVisible(true);
        }
        // if user clicks on back button on panel 6
        if(e.getSource() == backP6) {
            setVisible(false);
            new User(userName);
        }

        // enable the next button if the checkbox on panel7 is selected
        if(e.getSource() == acceptCheckBox) {
            nextP7.setEnabled(acceptCheckBox.isSelected());
        }

        // if user clicks on next button on panel7
        if(e.getSource() == nextP7) {
            panel7.setVisible(false);
            panel8.setVisible(true);
        }

        // if user clicks on back button on panel7
        if(e.getSource() == backP7) {
            panel7.setVisible(false);
            panel6.setVisible(true);
        }

        // if user clicks on back button on panel8
        if(e.getSource() == backP8) {
            panel8.setVisible(false);
            panel7.setVisible(true);
        }

        // if user clicks on ready button on panel8
        if(e.getSource() == readyButtonP8) {
            if(subjectName.getText().equals("C++")) {
                panel8.setVisible(false);
                cppQuizP1.setVisible(true);
            }
            if(subjectName.getText().equals("Java")) {
                panel8.setVisible(false);
                javaQuizP1.setVisible(true);
            }
            if(subjectName.getText().equals("Python")) {
                panel8.setVisible(false);
                pythonQuizP1.setVisible(true);
            }
        }

        // if user clicks on next button on cpp panel 1
        if(e.getSource() == cppQuizNextP1) {
            if(cppQuizOption2P1.isSelected()) {
                cppQuizScore+=10;
            }
            System.out.println(cppQuizScore);
            cppQuizP1.setVisible(false);
            cppQuizP2.setVisible(true);
        }

        // if user clicks on next button on cpp panel 2
        if(e.getSource() == cppQuizNextP2) {
            if(cppQuizOption3P2.isSelected()) {
                cppQuizScore+=10;
            }
            System.out.println(cppQuizScore);
            cppQuizP2.setVisible(false);
            cppQuizP3.setVisible(true);
        }

        // if user clicks on submit button on cpp panel 3
        if(e.getSource() == cppQuizSubmitP3) {
            if(cppQuizOption4P3.isSelected()) {
                cppQuizScore+=10;
            }
            System.out.println(cppQuizScore);
            userScoreP11.setText(cppQuizScore + "/30");
            if(cppQuizScore >= 20) {
                userStatusP11.setText("Pass");
            } else {
                userStatusP11.setText("Fail");
                userStatusP11.setForeground(Color.RED);
            }

            String subject = subjectName.getText();
            int score = cppQuizScore;
            String status = userStatusP11.getText();
            try {
                Connection connect = connection.create();
                String query = "insert into quizperformances (username,
```



```java
subject, score, status) values (?,?,?,?)";
                PreparedStatement ps = connect.prepareStatement(query);
                ps.setString(1, userName);
                ps.setString(2, subject);
                ps.setInt(3, score);
                ps.setString(4, status);
                ps.executeUpdate();

            } catch (Exception a) {
                a.printStackTrace();
            }


            cppQuizP3.setVisible(false);
            panel11.setVisible(true);
        }

        // if user clicks on next button on java panel 1
        if(e.getSource() == javaQuizNextP1) {
            if(javaQuizOption2P1.isSelected()) {
                javaQuizScore+=10;
            }
            System.out.println(javaQuizScore);
            javaQuizP1.setVisible(false);
            javaQuizP2.setVisible(true);
        }

        // if user clicks on next button on java panel 2
        if(e.getSource() == javaQuizNextP2) {
            if(javaQuizOption3P2.isSelected()) {
                javaQuizScore+=10;
            }
            System.out.println(javaQuizScore);
            javaQuizP2.setVisible(false);
            javaQuizP3.setVisible(true);
        }

        // if user clicks on submit button on java panel 3
        if(e.getSource() == javaQuizSubmitP3) {
            if(javaQuizOption4P3.isSelected()) {
                javaQuizScore+=10;
            }
            System.out.println(javaQuizScore);
            userScoreP11.setText(javaQuizScore + "/30");
            if(javaQuizScore >= 20) {
                userStatusP11.setText("Pass");
            } else {
                userStatusP11.setText("Fail");
                userStatusP11.setForeground(Color.RED);
            }

            String subject = subjectName.getText();
            int score = javaQuizScore;
            String status = userStatusP11.getText();
            try {
                Connection connect = connection.create();
                String query = "insert into quizperformances (username,
subject, score, status) values (?,?,?,?)";
                PreparedStatement ps = connect.prepareStatement(query);
                ps.setString(1, userName);
                ps.setString(2, subject);
                ps.setInt(3, score);
                ps.setString(4, status);
                ps.executeUpdate();

            } catch (Exception a) {
                a.printStackTrace();
            }

            javaQuizP3.setVisible(false);
            panel11.setVisible(true);
        }

        // if user clicks on next button on Python panel 1
        if(e.getSource() == pythonQuizNextP1) {
            if(pythonQuizOption2P1.isSelected()) {
                pythonQuizScore+=10;
            }
            System.out.println(pythonQuizScore);
            pythonQuizP1.setVisible(false);
            pythonQuizP2.setVisible(true);
        }

        // if user clicks on next button on Python panel 2
        if(e.getSource() == pythonQuizNextP2) {
            if(pythonQuizOption3P2.isSelected()) {
                pythonQuizScore+=10;
            }
            System.out.println(pythonQuizScore);
            pythonQuizP2.setVisible(false);
            pythonQuizP3.setVisible(true);
        }

        // if user clicks on submit button on Python panel 3
        if(e.getSource() == pythonQuizSubmitP3) {
            if(pythonQuizOption4P3.isSelected()) {
                pythonQuizScore+=10;
            }
            System.out.println(pythonQuizScore);
            userScoreP11.setText(pythonQuizScore + "/30");
            if(pythonQuizScore >= 20) {
                userStatusP11.setText("Pass");
            } else {
                userStatusP11.setText("Fail");
                userStatusP11.setForeground(Color.RED);
            }

            String subject = subjectName.getText();
            int score = pythonQuizScore;
            String status = userStatusP11.getText();
            try {
                Connection connect = connection.create();
                String query = "insert into quizperformances (username,
subject, score, status) values (?,?,?,?)";
                PreparedStatement ps = connect.prepareStatement(query);
                ps.setString(1, userName);
                ps.setString(2, subject);
                ps.setInt(3, score);
                ps.setString(4, status);
                ps.executeUpdate();

            } catch (Exception a) {
                a.printStackTrace();
            }

            pythonQuizP3.setVisible(false);
            panel11.setVisible(true);
        }


        // if user clicks on go back to main menu on panel11
        if(e.getSource() == mainMenuP11) {
            cppQuizScore = 0;
            javaQuizScore = 0;
            pythonQuizScore = 0;
            setVisible(false);
            new User(userName);
        }

    }
}
```

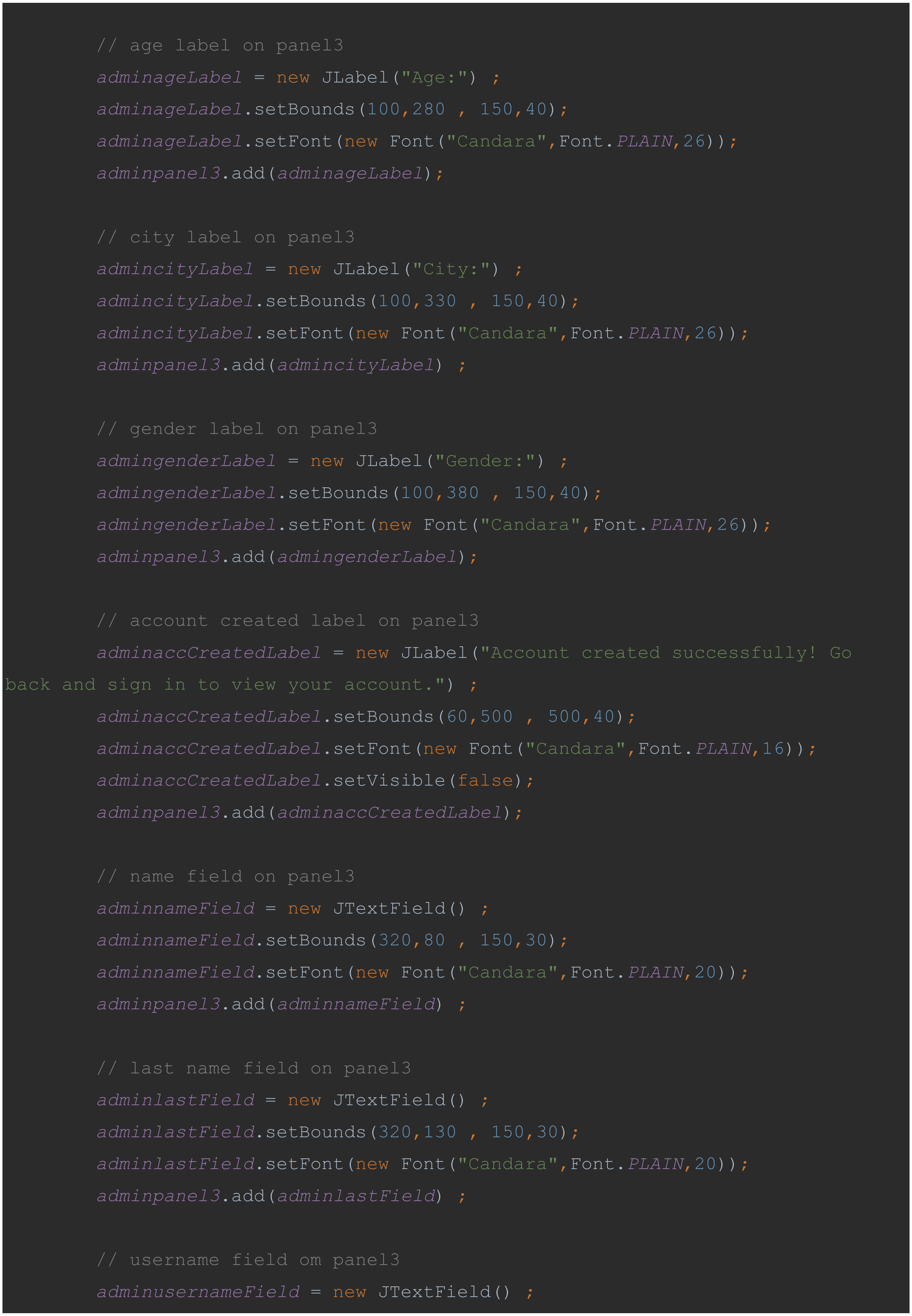
Result Class:

```
import javax.swing.*;
import javax.swing.table.DefaultTableModel;
import javax.swing.table.JTableHeader;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.*;

public class Result extends JFrame implements ActionListener {


    // panel13 components
    static JPanel panel13;
    static JButton backP13;
    static JTable table;
    static JScrollPane scrollPane;

    String userName;



    Result(String userName){
        setSize(800, 700);
        setTitle("CodePro Certification System");
        setLayout(null);
        setLocation(320, 10);
        getContentPane().setBackground(Color.WHITE);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(false);
        setResizable(false);

        this.userName = userName;


        // ---------------------------- Panel 13 ------------------------------
---------
        panel13 = new JPanel();
        panel13.setBounds(0, 0, 800, 700);
        panel13.setOpaque(false);
        panel13.setLayout(null);
        add(panel13);


        table = new JTable();
        scrollPane = new JScrollPane(table);
        scrollPane.setBounds(1,1,800,400);
        panel13.add(scrollPane);
        try {
            Connection connect = connection.create();
            String query = "select * from quizperformances where username =
'"+userName+"'";
```

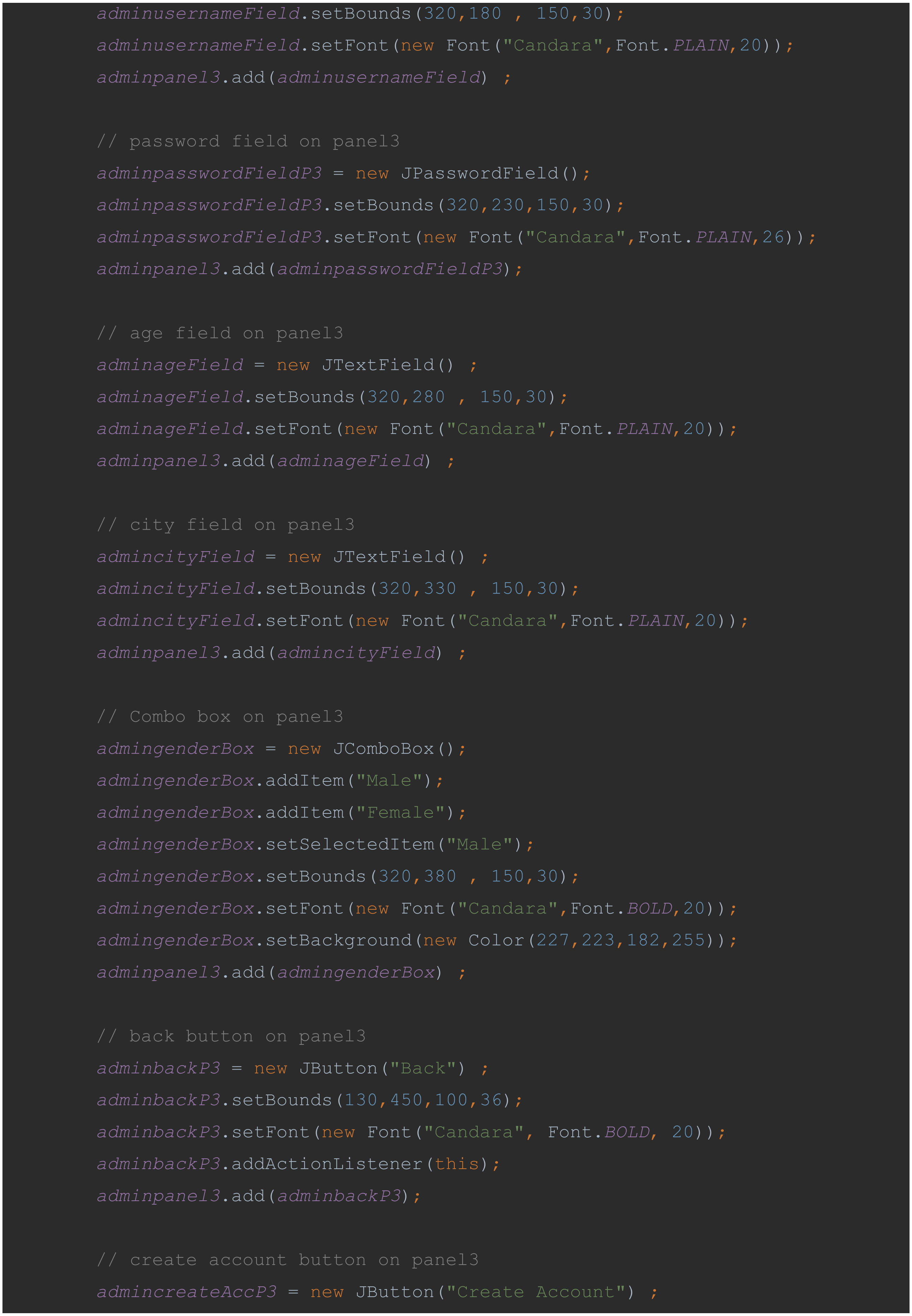
```
            PreparedStatement statement = connect.prepareStatement(query);
            ResultSet resultSet = statement.executeQuery();
            // Create a table model and populate it with the result set
            DefaultTableModel tableModel = new DefaultTableModel();
            ResultSetMetaData metaData = resultSet.getMetaData();

            // Get column count
            int columnCount = metaData.getColumnCount();

            // Add columns to the table model
            for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                tableModel.addColumn(metaData.getColumnName(columnIndex));
            }

            // Add rows to the table model
            while (resultSet.next()) {
                Object[] rowData = new Object[columnCount];
                for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                    rowData[columnIndex - 1] =
resultSet.getObject(columnIndex);
                }
                tableModel.addRow(rowData);
            }

            // Set the table model to the JTable
            table.setModel(tableModel);

            // Close the result set, statement, and connection
            resultSet.close();
            statement.close();
            connect.close();

        } catch (SQLException e) {
            e.printStackTrace();
        }


        // back button on panel13
        backP13 = new JButton("Back to main menu");
        backP13.setBounds(300,450,200,40);
        backP13.setFont(new Font("Candara",Font.BOLD,20));
        backP13.addActionListener(this);
        panel13.add(backP13);

        setVisible(true);
    }
    public void actionPerformed(ActionEvent e) {


        // if user clicks on back button on panel13
        if(e.getSource() == backP13) {
            setVisible(false);
            new User(userName);
        }

    }
}
```

Admin Class:

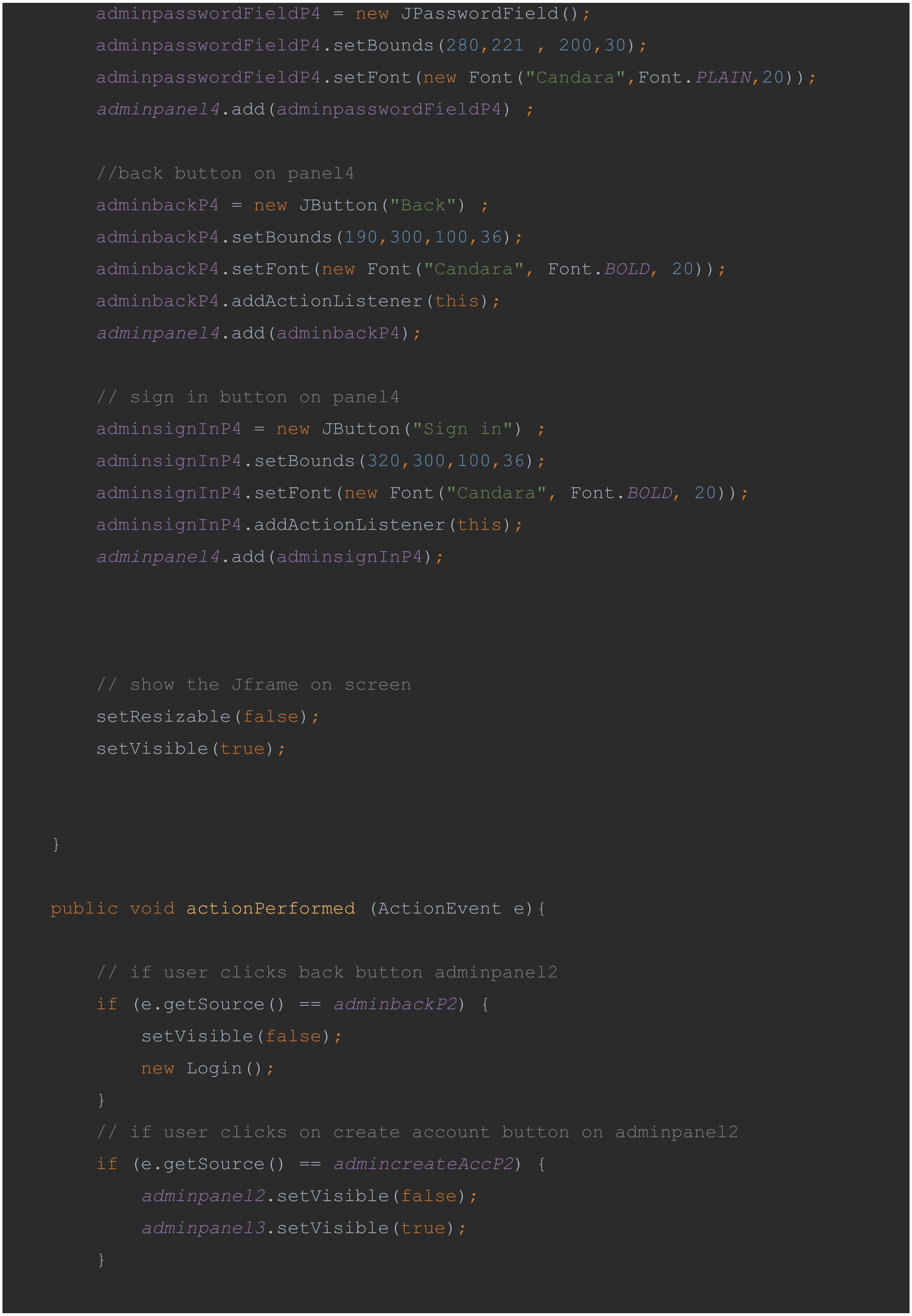
```
import javax.swing.*;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;

public class Admin extends JFrame implements ActionListener {
    static JPanel adminpanel2, adminpanel3, adminpanel4;

    //panel2 components
    static JButton admincreateAccP2, adminsignIn, adminbackP2;
    static JLabel adminaccountCheck;
    // panel3 components
    static JButton adminbackP3, admincreateAccP3;
    static JLabel adminnameLabel, adminlastLabel, adminageLabel,
admingenderLabel, admincityLabel, adminregistrationLabel, adminusernameLabel,
adminpasswordLabel, adminaccCreatedLabel;
    static JPasswordField adminpasswordFieldP3;
    static JTextField adminnameField, adminlastField, adminageField,
admincityField, adminusernameField;
    static JComboBox admingenderBox;
    // panel4 components
    static JLabel adminusernameLabelP4, adminpasswordLabelP4, usernameError;
    static JTextField adminusernameFieldP4;
    JPasswordField adminpasswordFieldP4;

    JButton adminbackP4, adminsignInP4;

    Admin() {

        // frame properties
        setSize(600, 600);
        setTitle("CodePro Certification System");
        setLocation(400,50);
        setLayout(null);
        getContentPane().setBackground(Color.WHITE);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(true);



        // -------------------------- panel 2 ---------------------------------
-

        adminpanel2 = new JPanel();
        adminpanel2.setBounds(0,0,600,600);
        adminpanel2.setOpaque(false);
        adminpanel2.setLayout(null);
        add(adminpanel2);

        // label on panel2
        adminaccountCheck = new JLabel();
        adminaccountCheck.setText("Already have an account?");
        adminaccountCheck.setBounds(140,250, 500, 50);
        adminaccountCheck.setFont(new Font("Candara", Font.PLAIN, 26));
        adminpanel2.add(adminaccountCheck);

        // createAcc button on panel2
        admincreateAccP2 = new JButton();
        admincreateAccP2.setText("Create an account");
        admincreateAccP2.setBounds(180,180,200,36);
        admincreateAccP2.setFont(new Font("Candara", Font.BOLD, 20));
        admincreateAccP2.addActionListener(this);
        adminpanel2.add(admincreateAccP2);

        // signIN button on panel2
        adminsignIn = new JButton();
        adminsignIn.setText("Sign in");
        adminsignIn.setBounds(230,300,100,30);
        adminsignIn.setFont(new Font("Candara", Font.BOLD, 20));
        adminsignIn.addActionListener(this);
        adminpanel2.add(adminsignIn);

        // back button on panel2
        adminbackP2 = new JButton();
        adminbackP2.setText("Back");
        adminbackP2.setBounds(450,500,100,32);
        adminbackP2.setFont(new Font("Candara", Font.BOLD, 20));
        adminbackP2.addActionListener(this);
        adminpanel2.add(adminbackP2);

        // -------------------------- panel 3 ----------------------------------

        // panel3 properties
        adminpanel3 = new JPanel();
        adminpanel3.setBounds(0, 0, 600, 600);
        adminpanel3.setOpaque(false);
        adminpanel3.setLayout(null);
        add(adminpanel3);

        // registration label on panel3
        adminregistrationLabel = new JLabel("Registration") ;
        adminregistrationLabel.setBounds(10,20 , 250,40);
        adminregistrationLabel.setFont(new Font("Candara",Font.BOLD,35));
        adminpanel3.add(adminregistrationLabel) ;

        // first name label on panel3
        adminnameLabel = new JLabel("First Name:") ;
        adminnameLabel.setBounds(100,80 , 150,40);
        adminnameLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminnameLabel) ;

        // last name label on panel3
        adminlastLabel = new JLabel("Last Name:") ;
        adminlastLabel.setBounds(100,130 , 150,40);
        adminlastLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminlastLabel) ;

        // username label on panel3
        adminusernameLabel = new JLabel("Username:") ;
        adminusernameLabel.setBounds(100,180 , 150,40);
        adminusernameLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminusernameLabel) ;

        // password label on panel3
        adminpasswordLabel = new JLabel("Password:") ;
        adminpasswordLabel.setBounds(100,230,150,40);
        adminpasswordLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminpasswordLabel);
```



```
        // age label on panel3
        adminageLabel = new JLabel("Age:") ;
        adminageLabel.setBounds(100,280 , 150,40);
        adminageLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminageLabel);

        // city label on panel3
        admincityLabel = new JLabel("City:") ;
        admincityLabel.setBounds(100,330 , 150,40);
        admincityLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(admincityLabel) ;

        // gender label on panel3
        admingenderLabel = new JLabel("Gender:") ;
        admingenderLabel.setBounds(100,380 , 150,40);
        admingenderLabel.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(admingenderLabel);

        // account created label on panel3
        adminaccCreatedLabel = new JLabel("Account created successfully! Go
back and sign in to view your account.") ;
        adminaccCreatedLabel.setBounds(60,500 , 500,40);
        adminaccCreatedLabel.setFont(new Font("Candara",Font.PLAIN,16));
        adminaccCreatedLabel.setVisible(false);
        adminpanel3.add(adminaccCreatedLabel);

        // name field on panel3
        adminnameField = new JTextField() ;
        adminnameField.setBounds(320,80 , 150,30);
        adminnameField.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel3.add(adminnameField) ;

        // last name field on panel3
        adminlastField = new JTextField() ;
        adminlastField.setBounds(320,130 , 150,30);
        adminlastField.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel3.add(adminlastField) ;

        // username field om panel3
        adminusernameField = new JTextField() ;
```



```
        adminusernameField.setBounds(320,180 , 150,30);
        adminusernameField.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel3.add(adminusernameField) ;

        // password field on panel3
        adminpasswordFieldP3 = new JPasswordField();
        adminpasswordFieldP3.setBounds(320,230,150,30);
        adminpasswordFieldP3.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel3.add(adminpasswordFieldP3);

        // age field on panel3
        adminageField = new JTextField() ;
        adminageField.setBounds(320,280 , 150,30);
        adminageField.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel3.add(adminageField) ;

        // city field on panel3
        admincityField = new JTextField() ;
        admincityField.setBounds(320,330 , 150,30);
        admincityField.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel3.add(admincityField) ;

        // Combo box on panel3
        admingenderBox = new JComboBox();
        admingenderBox.addItem("Male");
        admingenderBox.addItem("Female");
        admingenderBox.setSelectedItem("Male");
        admingenderBox.setBounds(320,380 , 150,30);
        admingenderBox.setFont(new Font("Candara",Font.BOLD,20));
        admingenderBox.setBackground(new Color(227,223,182,255));
        adminpanel3.add(admingenderBox) ;

        // back button on panel3
        adminbackP3 = new JButton("Back") ;
        adminbackP3.setBounds(130,450,100,36);
        adminbackP3.setFont(new Font("Candara", Font.BOLD, 20));
        adminbackP3.addActionListener(this);
        adminpanel3.add(adminbackP3);

        // create account button on panel3
        admincreateAccP3 = new JButton("Create Account") ;
        admincreateAccP3.setBounds(260,450,200,36);
        admincreateAccP3.setFont(new Font("Candara", Font.BOLD, 20));
        admincreateAccP3.addActionListener(this);
        adminpanel3.add(admincreateAccP3);
        adminpanel3.setVisible(false);

        // -------------------------------- Panel 4 ---------------------------
------

        adminpanel4 = new JPanel();
        adminpanel4.setBounds(0, 0, 600, 600);
        adminpanel4.setOpaque(false);
        adminpanel4.setLayout(null);
        adminpanel4.setVisible(false);
        add(adminpanel4);

        // username label on panel4
        adminusernameLabelP4 = new JLabel("Username:") ;
        adminusernameLabelP4.setBounds(100,170 , 150,40);
        adminusernameLabelP4.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel4.add(adminusernameLabelP4);

        // password label on panel4
        adminpasswordLabelP4 = new JLabel("Password:");
        adminpasswordLabelP4.setBounds(100,220 , 150,40);
        adminpasswordLabelP4.setFont(new Font("Candara",Font.PLAIN,26));
        adminpanel4.add(adminpasswordLabelP4);

        // Admin Name error on panel 4
        usernameError = new JLabel("Username does not exist!");
        usernameError.setBounds(190,400,300,40);
        usernameError.setFont(new Font("Candara", Font.BOLD, 20));
        usernameError.setVisible(false);
        adminpanel4.add(usernameError);

        // username field on panel4
        adminusernameFieldP4 = new JTextField() ;
        adminusernameFieldP4.setBounds(280,171, 200,30);
        adminusernameFieldP4.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel4.add(adminusernameFieldP4);

        //password on panel4
```

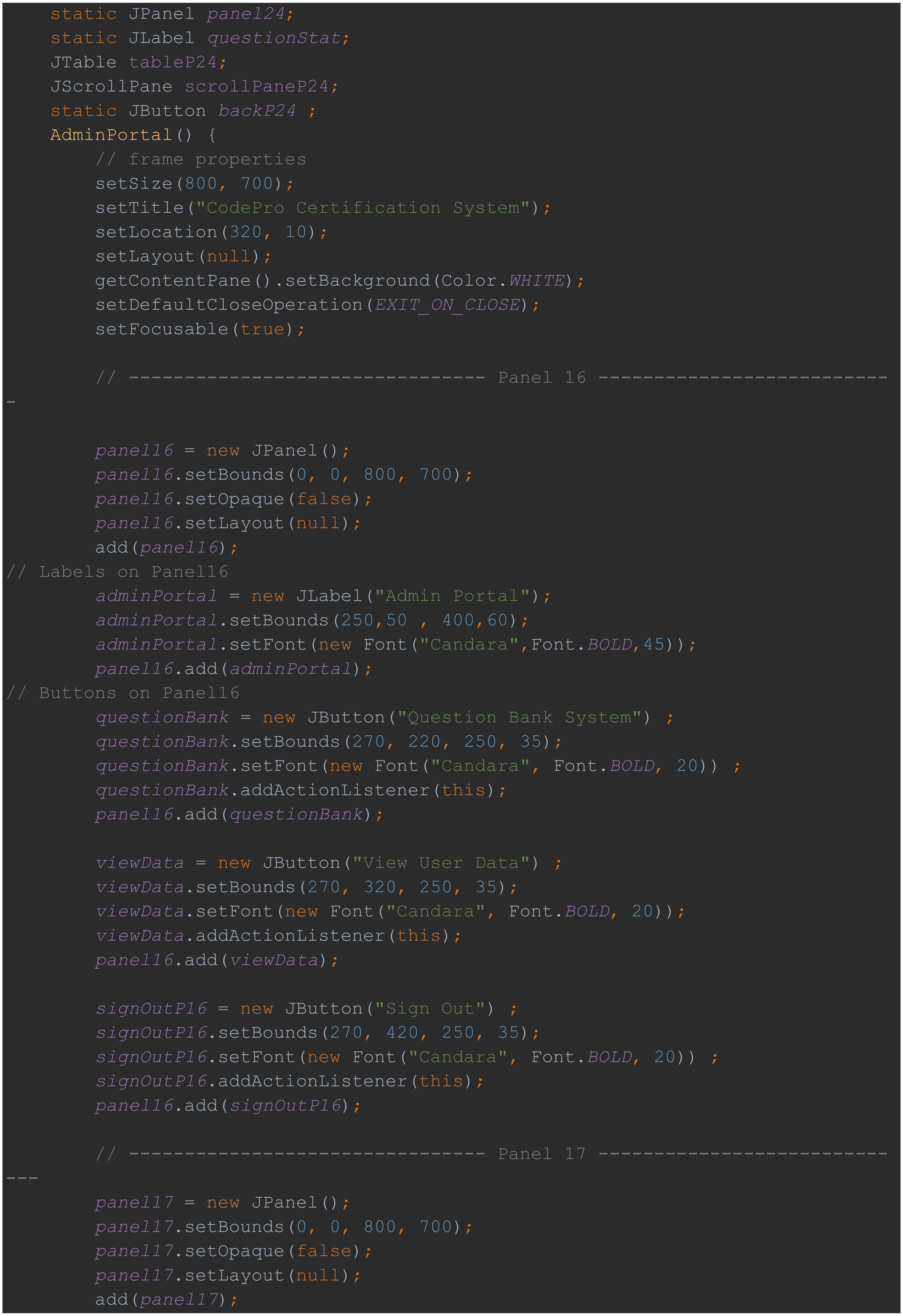


```
        adminpasswordFieldP4 = new JPasswordField();
        adminpasswordFieldP4.setBounds(280,221 , 200,30);
        adminpasswordFieldP4.setFont(new Font("Candara",Font.PLAIN,20));
        adminpanel4.add(adminpasswordFieldP4) ;

        //back button on panel4
        adminbackP4 = new JButton("Back") ;
        adminbackP4.setBounds(190,300,100,36);
        adminbackP4.setFont(new Font("Candara", Font.BOLD, 20));
        adminbackP4.addActionListener(this);
        adminpanel4.add(adminbackP4);

        // sign in button on panel4
        adminsignInP4 = new JButton("Sign in") ;
        adminsignInP4.setBounds(320,300,100,36);
        adminsignInP4.setFont(new Font("Candara", Font.BOLD, 20));
        adminsignInP4.addActionListener(this);
        adminpanel4.add(adminsignInP4);



        // show the Jframe on screen
        setResizable(false);
        setVisible(true);


    }

    public void actionPerformed (ActionEvent e){

        // if user clicks back button adminpanel2
        if (e.getSource() == adminbackP2) {
            setVisible(false);
            new Login();
        }
        // if user clicks on create account button on adminpanel2
        if (e.getSource() == admincreateAccP2) {
            adminpanel2.setVisible(false);
            adminpanel3.setVisible(true);
        }
        // if user clicks on sign in button on adminpanel2
        if(e.getSource() == adminsignIn) {
            adminpanel2.setVisible(false);
            adminpanel4.setVisible(true);
        }

        // if user clicks on back button on adminpanel3
        if (e.getSource() == adminbackP3) {
            adminaccCreatedLabel.setVisible(false);
            adminpanel3.setVisible(false);
            adminpanel2.setVisible(true);
        }

        // if user clicks on create account button on adminpanel3
        if (e.getSource() == admincreateAccP3) {

            // if user has left any textfield empty
            if(adminnameField.getText().equals("") ||
adminlastField.getText().equals("") || adminageField.getText().equals("") ||
adminusernameField.getText().equals("") ||
adminpasswordFieldP3.getText().equals("") ||
admincityField.getText().equals("")) {
                adminaccCreatedLabel.setText("Please make sure all fields are
entered properly.");
                adminaccCreatedLabel.setFont(new Font("Candara", Font.BOLD,
20));
                adminaccCreatedLabel.setBounds(105,500 , 500,40);
                adminaccCreatedLabel.setVisible(true);
            } else {
                // store user entered values into variables
                String firstName = adminnameField.getText();
                String lastName = adminlastField.getText();
                String username = adminusernameField.getText();
                String password = adminpasswordFieldP3.getText();
                int age = Integer.parseInt(adminageField.getText());
                String city = admincityField.getText();

                // insert user entered values into database if username is not
matched with any other username in database
                try {
                    Connection connect = connection.create();
                    String query = "insert into admindata (firstname, lastname,
username, password, age, city) values(?,?,?,?,?,?)";
                    PreparedStatement statement =
connect.prepareStatement(query);
                    statement.setString(1, firstName);
                    statement.setString(2, lastName);
                    statement.setString(3, username);
                    statement.setString(4, password);
                    statement.setInt(5, age);
                    statement.setString(6, city);
                    statement.executeUpdate();
                    adminaccCreatedLabel.setText("Account created
successfully!");
                    adminaccCreatedLabel.setBounds(165,500 , 500,40);
                    adminaccCreatedLabel.setFont(new Font("Candara", Font.BOLD,
20));
                    adminaccCreatedLabel.setVisible(true);
                    adminnameField.setText("");
                    adminlastField.setText("");
                    adminusernameField.setText("");
                    adminpasswordFieldP4.setText("");
                    adminageField.setText("");
                    admincityField.setText("");
                }
                // if username already exists then print an error message
                catch (Exception b) {
                    System.out.println("Username already exists!");
                    adminaccCreatedLabel.setText("Username already exists!");
                    adminaccCreatedLabel.setBounds(200,500 , 500,40);
                    adminaccCreatedLabel.setFont(new Font("Candara", Font.BOLD,
20));
                    adminaccCreatedLabel.setVisible(true);
                }
            }
        }

        // if user clicks on back button on adminpanel4
        if(e.getSource() == adminbackP4) {
            adminusernameFieldP4.setText("");
            adminpasswordFieldP4.setText("");
            adminpanel4.setVisible(false);
            adminpanel2.setVisible(true);
            usernameError.setVisible(false);
        }

        // if user clicks on sign in button on adminpanel4
        if (e.getSource() == adminsignInP4) {
            // if user has left any textfield empty
            if(adminusernameFieldP4.getText().equals("") ||
adminpasswordFieldP4.getText().equals("") ) {
                usernameError.setText("Please make sure all fields are entered
properly.");
                usernameError.setBounds(90, 400, 500, 40);
                usernameError.setVisible(true);
            }
            // if user has entered all fields properly
            else {
                // store the user-entered username and password into variables
                String userName = adminusernameFieldP4.getText();
                String password = adminpasswordFieldP4.getText();

                // see if username matches with the username in the database
                try {
                    Connection connect = connection.create();
                    String query = "select * from admindata where username = '"
+ userName + "'";
                    PreparedStatement statement =
connect.prepareStatement(query);
                    ResultSet rs = statement.executeQuery(query);
                    String check = "";
                    while (rs.next()) {
                        check = rs.getString("username");
                    }
                    // if yes
                    if (check.equals(userName)) {
                        try {
                            // see if password matches with the corresponding
password
                            Connection conn = connection.create();
                            String query2 = "select password from admindata
where username = '" + userName + "'";
                            PreparedStatement ps =
conn.prepareStatement(query2);
                            ResultSet resultSet = ps.executeQuery(query2);
                            String check2 = "";
                            while (resultSet.next()) {
                                check2 = resultSet.getString("password");
                            }
                            // if yes, make an object of user class
                            if (check2.equals(password)) {
                                setVisible(false);
                                adminusernameFieldP4.setText("");
                                adminpasswordFieldP4.setText("");
                                new AdminPortal();
                                // otherwise, print an error message saying
'wrong password'
                            } else {
                                System.out.println("Wrong password!");
                                usernameError.setText("Wrong password!");
                                usernameError.setBounds(220, 400, 500, 40);
                                usernameError.setVisible(true);
                            }
                            //  print an error if the password-matching query
is not executed properly
                        } catch (Exception a) {
                            a.printStackTrace();
                        }
                    }
                    // if the username does not match with any username in
database, print an error message
                    else {
                        System.out.println("Username does not exist!");
                        usernameError.setText("Username does not exist! ");
                        usernameError.setBounds(200, 400, 500, 40);
                        usernameError.setVisible(true);
                    }
                }
                // if the username-matching query is not executed properly,
print an error.
                catch (Exception a) {
                    a.printStackTrace();
                }
            }
```

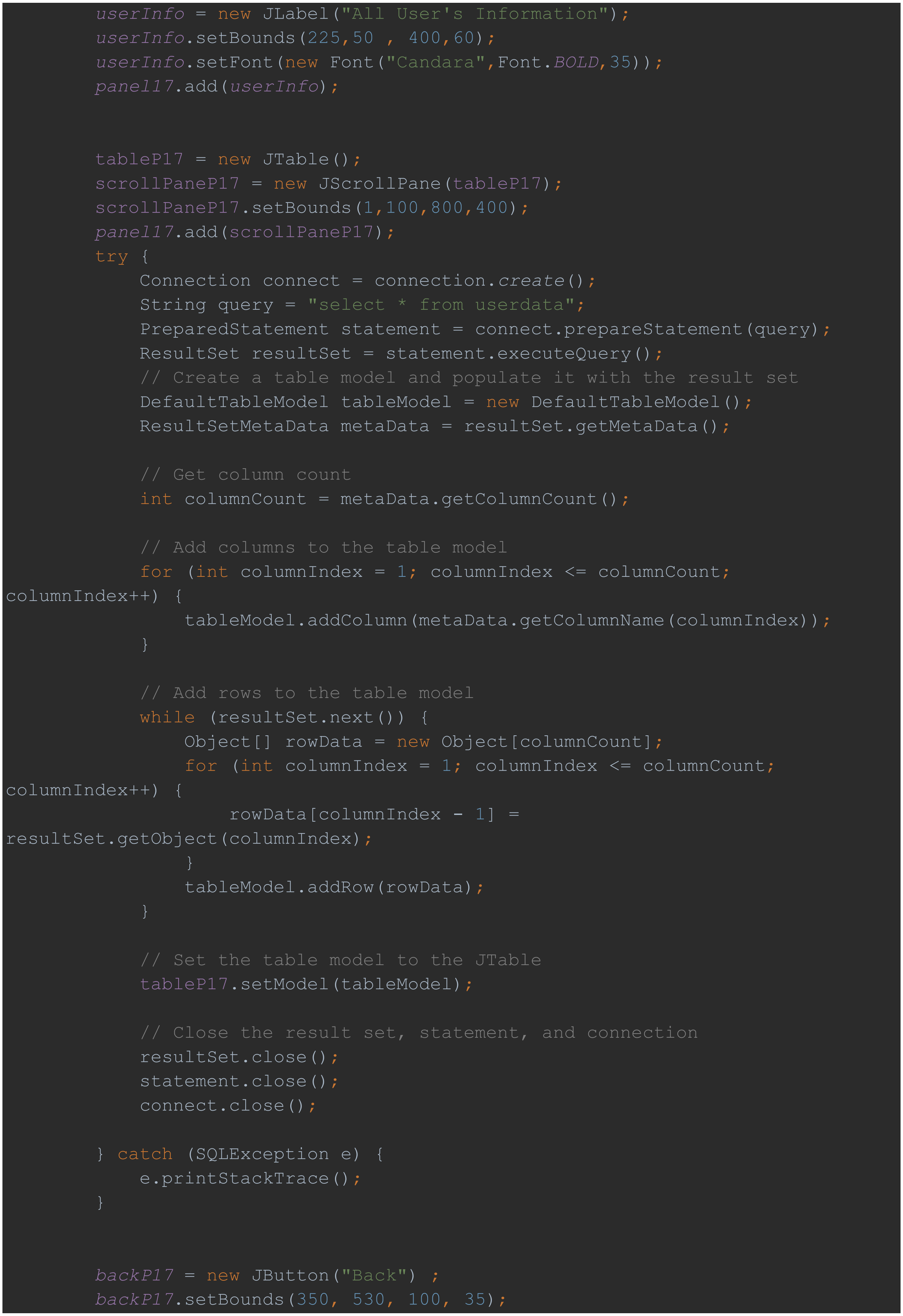
```
        }

    }
}
```

AdminPortal Class:

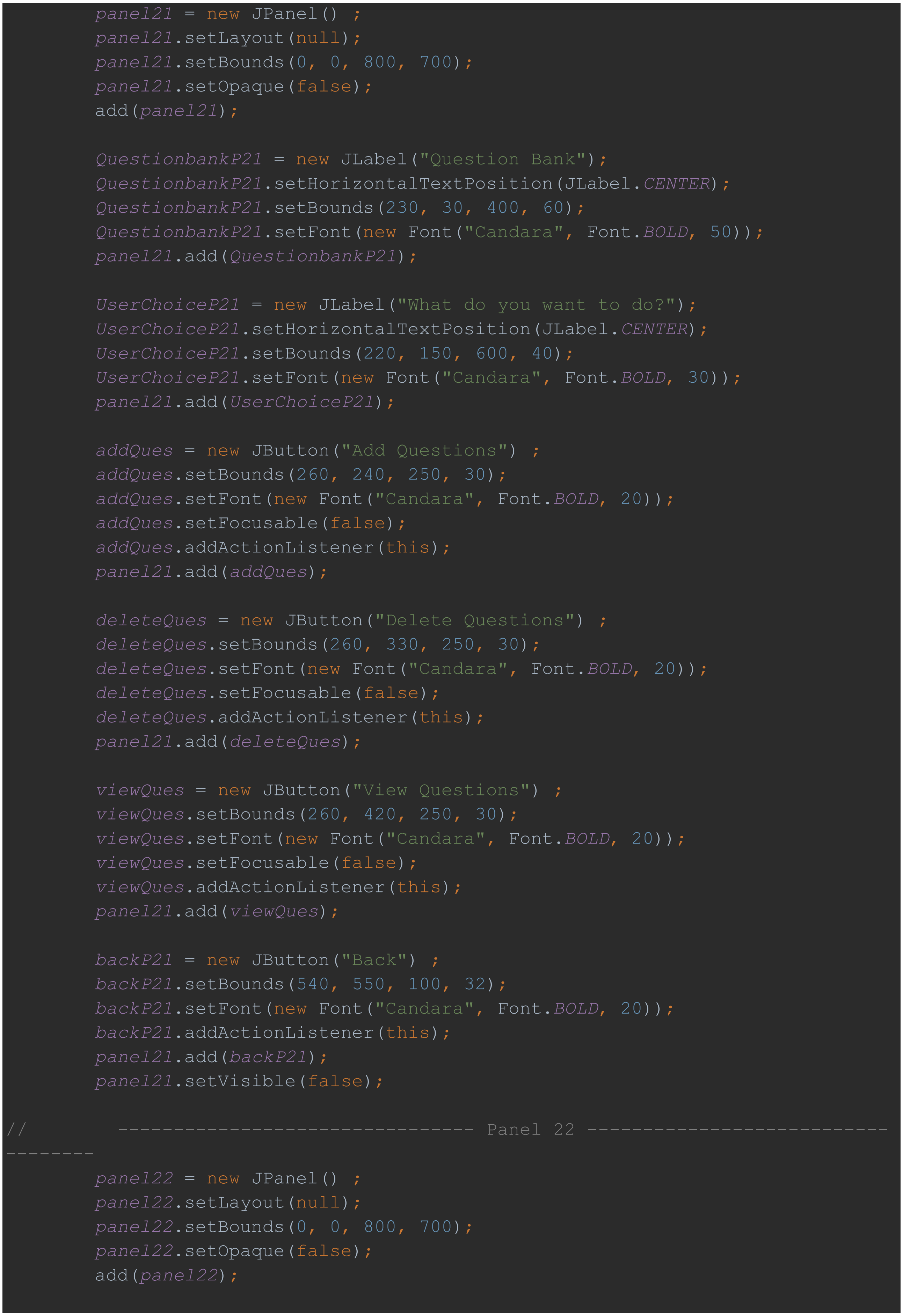
```
import javax.swing.*;
import javax.swing.table.DefaultTableModel;
import javax.swing.table.JTableHeader;
import java.awt.*;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import java.sql.*;

public class AdminPortal extends JFrame implements ActionListener {

    // panel16 components
    static JButton questionBank , viewData ,signOutP16 ;
    static JPanel panel16 ;
    static JLabel adminPortal ;

    // panel17 components
    static JPanel panel17;
    static JLabel userInfo ;
    JTable tableP17;
    JScrollPane scrollPaneP17;
    static JButton backP17 ;

    // panel20 components
    public static JButton cppP20, javaP20, pythonP20, backP20;
    public static JLabel QuestionbankP20, chooseSubP20;
    public static JPanel panel20;
    String subject;

    // panel21 components
    public static JButton addQues, deleteQues, viewQues, backP21;
    public static JLabel QuestionbankP21, UserChoiceP21;
    public static JPanel panel21;

    // panel22 components
    public static JPanel panel22;
    public static JLabel QuestionbankP22, QuestionStatementP22,
correctoptionP22, status;
    public static JTextField QuestionStatementTextFieldP22,
correctoptionfieldP22;
    public  static JButton addP22, backP22;

    // panel 23 Components
    static JPanel panel23;
    static JLabel DeleteQuestionsP23, statusP23;
    static JButton deleteP23, BackP23;
    JTable tableP23;
    JScrollPane scrollPaneP23;
    //  panel 24 components
```



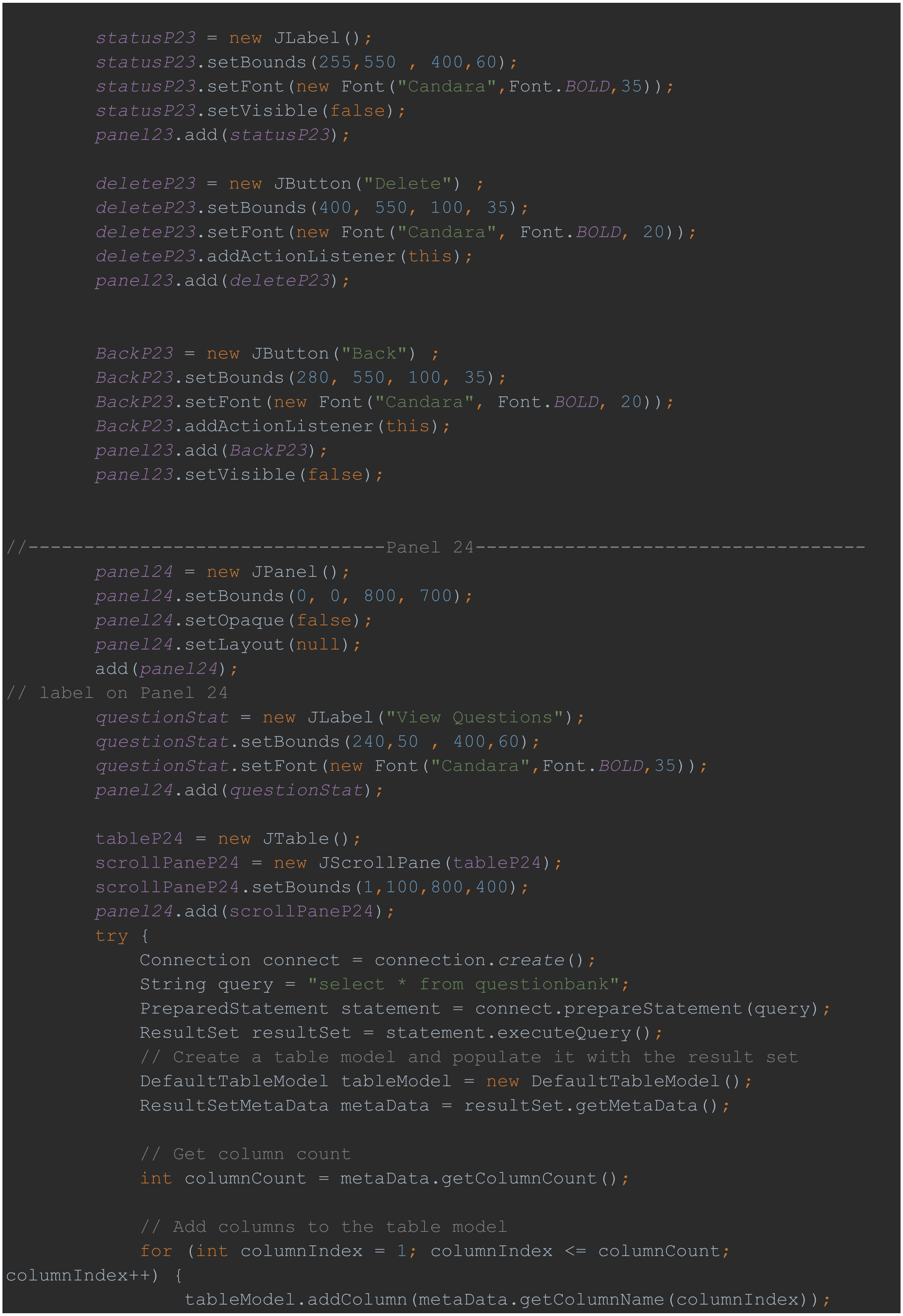
```
    static JPanel panel24;
    static JLabel questionStat;
    JTable tableP24;
    JScrollPane scrollPaneP24;
    static JButton backP24 ;
    AdminPortal() {
        // frame properties
        setSize(800, 700);
        setTitle("CodePro Certification System");
        setLocation(320, 10);
        setLayout(null);
        getContentPane().setBackground(Color.WHITE);
        setDefaultCloseOperation(EXIT_ON_CLOSE);
        setFocusable(true);

        // -------------------------------- Panel 16 --------------------------
-

        panel16 = new JPanel();
        panel16.setBounds(0, 0, 800, 700);
        panel16.setOpaque(false);
        panel16.setLayout(null);
        add(panel16);
// Labels on Panel16
        adminPortal = new JLabel("Admin Portal");
        adminPortal.setBounds(250,50 , 400,60);
        adminPortal.setFont(new Font("Candara",Font.BOLD,45));
        panel16.add(adminPortal);
// Buttons on Panel16
        questionBank = new JButton("Question Bank System") ;
        questionBank.setBounds(270, 220, 250, 35);
        questionBank.setFont(new Font("Candara", Font.BOLD, 20)) ;
        questionBank.addActionListener(this);
        panel16.add(questionBank);

        viewData = new JButton("View User Data") ;
        viewData.setBounds(270, 320, 250, 35);
        viewData.setFont(new Font("Candara", Font.BOLD, 20));
        viewData.addActionListener(this);
        panel16.add(viewData);

        signOutP16 = new JButton("Sign Out") ;
        signOutP16.setBounds(270, 420, 250, 35);
        signOutP16.setFont(new Font("Candara", Font.BOLD, 20)) ;
        signOutP16.addActionListener(this);
        panel16.add(signOutP16);

        // -------------------------------- Panel 17 --------------------------
---
        panel17 = new JPanel();
        panel17.setBounds(0, 0, 800, 700);
        panel17.setOpaque(false);
        panel17.setLayout(null);
        add(panel17);
```



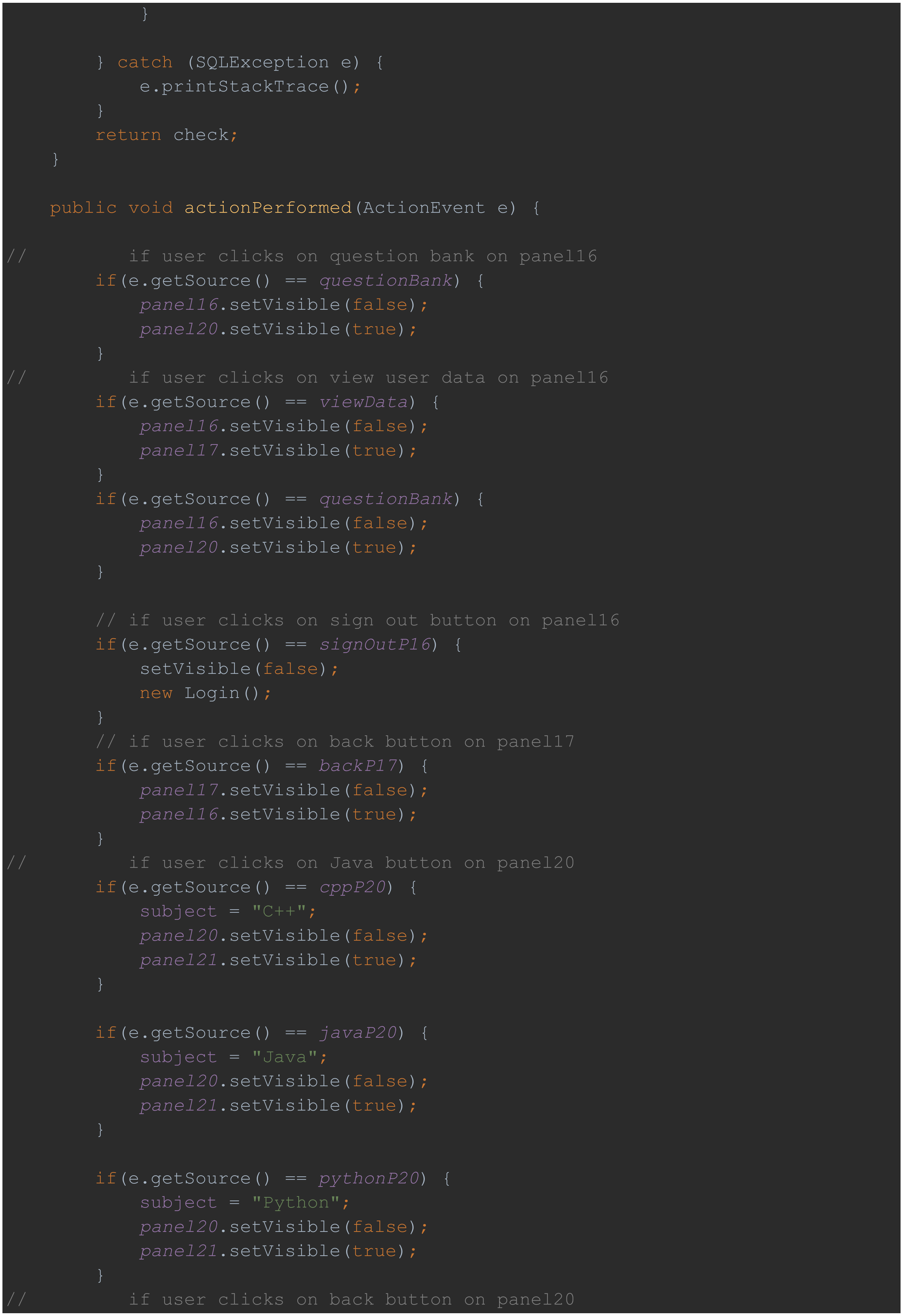
```
        userInfo = new JLabel("All User's Information");
        userInfo.setBounds(225,50 , 400,60);
        userInfo.setFont(new Font("Candara",Font.BOLD,35));
        panel17.add(userInfo);


        tableP17 = new JTable();
        scrollPaneP17 = new JScrollPane(tableP17);
        scrollPaneP17.setBounds(1,100,800,400);
        panel17.add(scrollPaneP17);
        try {
            Connection connect = connection.create();
            String query = "select * from userdata";
            PreparedStatement statement = connect.prepareStatement(query);
            ResultSet resultSet = statement.executeQuery();
            // Create a table model and populate it with the result set
            DefaultTableModel tableModel = new DefaultTableModel();
            ResultSetMetaData metaData = resultSet.getMetaData();

            // Get column count
            int columnCount = metaData.getColumnCount();

            // Add columns to the table model
            for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                tableModel.addColumn(metaData.getColumnName(columnIndex));
            }

            // Add rows to the table model
            while (resultSet.next()) {
                Object[] rowData = new Object[columnCount];
                for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                    rowData[columnIndex - 1] =
resultSet.getObject(columnIndex);
                }
                tableModel.addRow(rowData);
            }

            // Set the table model to the JTable
            tableP17.setModel(tableModel);

            // Close the result set, statement, and connection
            resultSet.close();
            statement.close();
            connect.close();

        } catch (SQLException e) {
            e.printStackTrace();
        }


        backP17 = new JButton("Back") ;
        backP17.setBounds(350, 530, 100, 35);
        backP17.setFont(new Font("Candara", Font.BOLD, 20));
        backP17.addActionListener(this);
        panel17.add(backP17);
        panel17.setVisible(false);

        // ----------------------------- Panel 20 --------------------------
        panel20 = new JPanel() ;
        panel20.setLayout(null);
        panel20.setBounds(0, 0, 800, 700);
        panel20.setOpaque(false);
        add(panel20);

        QuestionbankP20 = new JLabel("Question Bank");
        QuestionbankP20.setHorizontalTextPosition(JLabel.CENTER);
        QuestionbankP20.setBounds(230, 30, 400, 60);
        QuestionbankP20.setFont(new Font("Candara", Font.BOLD, 50));
        panel20.add(QuestionbankP20);

        chooseSubP20 = new JLabel("Choose Subject:");
        chooseSubP20.setHorizontalTextPosition(JLabel.CENTER);
        chooseSubP20.setBounds(280, 150, 600, 40);
        chooseSubP20.setFont(new Font("Candara", Font.BOLD, 30));
        panel20.add(chooseSubP20);

        cppP20 = new JButton("C++") ;
        cppP20.setBounds(260, 240, 250, 30);
        cppP20.setFont(new Font("Candara", Font.BOLD, 20));
        cppP20.setFocusable(false);
        cppP20.addActionListener(this);
        panel20.add(cppP20);

        javaP20 = new JButton("Java") ;
        javaP20.setBounds(260, 330, 250, 30);
        javaP20.setFont(new Font("Candara", Font.BOLD, 20));
        javaP20.setFocusable(false);
        javaP20.addActionListener(this);
        panel20.add(javaP20);

        pythonP20 = new JButton("Python") ;
        pythonP20.setBounds(260, 420, 250, 30);
        pythonP20.setFont(new Font("Candara", Font.BOLD, 20));
        pythonP20.setFocusable(false);
        pythonP20.addActionListener(this);
        panel20.add(pythonP20);

        backP20 = new JButton("Back") ;
        backP20.setBounds(540, 550, 100, 32);
        backP20.setFont(new Font("Candara", Font.BOLD, 20));
        backP20.addActionListener(this);
        panel20.add(backP20);
        panel20.setVisible(false);

        // ---------------------------- Panel 21 ------------------------------
--
```



```
        panel21 = new JPanel() ;
        panel21.setLayout(null);
        panel21.setBounds(0, 0, 800, 700);
        panel21.setOpaque(false);
        add(panel21);

        QuestionbankP21 = new JLabel("Question Bank");
        QuestionbankP21.setHorizontalTextPosition(JLabel.CENTER);
        QuestionbankP21.setBounds(230, 30, 400, 60);
        QuestionbankP21.setFont(new Font("Candara", Font.BOLD, 50));
        panel21.add(QuestionbankP21);

        UserChoiceP21 = new JLabel("What do you want to do?");
        UserChoiceP21.setHorizontalTextPosition(JLabel.CENTER);
        UserChoiceP21.setBounds(220, 150, 600, 40);
        UserChoiceP21.setFont(new Font("Candara", Font.BOLD, 30));
        panel21.add(UserChoiceP21);

        addQues = new JButton("Add Questions") ;
        addQues.setBounds(260, 240, 250, 30);
        addQues.setFont(new Font("Candara", Font.BOLD, 20));
        addQues.setFocusable(false);
        addQues.addActionListener(this);
        panel21.add(addQues);

        deleteQues = new JButton("Delete Questions") ;
        deleteQues.setBounds(260, 330, 250, 30);
        deleteQues.setFont(new Font("Candara", Font.BOLD, 20));
        deleteQues.setFocusable(false);
        deleteQues.addActionListener(this);
        panel21.add(deleteQues);

        viewQues = new JButton("View Questions") ;
        viewQues.setBounds(260, 420, 250, 30);
        viewQues.setFont(new Font("Candara", Font.BOLD, 20));
        viewQues.setFocusable(false);
        viewQues.addActionListener(this);
        panel21.add(viewQues);

        backP21 = new JButton("Back") ;
        backP21.setBounds(540, 550, 100, 32);
        backP21.setFont(new Font("Candara", Font.BOLD, 20));
        backP21.addActionListener(this);
        panel21.add(backP21);
        panel21.setVisible(false);

//        -------------------------------- Panel 22 ---------------------------
--------

        panel22 = new JPanel() ;
        panel22.setLayout(null);
        panel22.setBounds(0, 0, 800, 700);
        panel22.setOpaque(false);
        add(panel22);
        QuestionbankP22 = new JLabel("Add Question");
        QuestionbankP22.setBounds(260, 30, 400, 60);
        QuestionbankP22.setFont(new Font("Candara", Font.BOLD, 50));
        panel22.add(QuestionbankP22);

        QuestionStatementP22 = new JLabel("Write question statement:");
        QuestionStatementP22.setBounds(30, 130, 400, 30);
        QuestionStatementP22.setFont(new Font("Candara", Font.BOLD, 20));
        panel22.add(QuestionStatementP22);

        QuestionStatementTextFieldP22 = new JTextField();
        QuestionStatementTextFieldP22.setBounds(30, 170, 725, 100);
        QuestionStatementTextFieldP22.setFont(new Font("Candara", Font.PLAIN,
20));
        QuestionStatementTextFieldP22.setBackground(Color.decode("#ffeaa7"));
        panel22.add(QuestionStatementTextFieldP22);


        correctoptionP22 = new JLabel("Correct Option:");
        correctoptionP22.setBounds(200, 340, 200, 30);
        correctoptionP22.setFont(new Font("Candara", Font.BOLD, 20));
        panel22.add(correctoptionP22);


        correctoptionfieldP22 = new JTextField();
        correctoptionfieldP22.setBounds(400, 340, 300, 30);
        correctoptionfieldP22.setFont(new Font("Candara", Font.PLAIN, 20));
        correctoptionfieldP22.setBackground(Color.decode("#ffeaa7"));
        panel22.add(correctoptionfieldP22);

        status = new JLabel();
        status.setBounds(150, 500, 500, 30);
        status.setFont(new Font("Candara", Font.BOLD, 20));
        status.setVisible(false);
        panel22.add(status);

        backP22 = new JButton("Back");
        backP22.setBounds(270, 430, 100, 32);
        backP22.setFont(new Font("Candara", Font.BOLD, 20));
        backP22.addActionListener(this);
        panel22.add(backP22);

        addP22 = new JButton("Add") ;
        addP22.setBounds(390, 430, 100, 32);
        addP22.setFont(new Font("Candara", Font.BOLD, 20));
        addP22.addActionListener(this);
        panel22.add(addP22);
        panel22.setVisible(false);

        //--------------------------------Panel 23-----------------------------
------
        panel23 = new JPanel();
        panel23.setBounds(0, 0, 800, 700);
        panel23.setOpaque(false);
        panel23.setLayout(null);
        add(panel23);
// label on panel23
        DeleteQuestionsP23 = new JLabel("Delete Questions");
        DeleteQuestionsP23.setBounds(255,50 , 400,60);
        DeleteQuestionsP23.setFont(new Font("Candara",Font.BOLD,35));
        panel23.add(DeleteQuestionsP23);


// Table Showcasing on panel23
        tableP23 = new JTable();
        scrollPaneP23 = new JScrollPane(tableP23);
        scrollPaneP23.setBounds(1,100,800,400);
        panel23.add(scrollPaneP23);
        try {
            Connection connect = connection.create();
            String query = "select * from questionbank";
            PreparedStatement statement = connect.prepareStatement(query);
            ResultSet resultSet = statement.executeQuery();
            // Create a table model and populate it with the result set
            DefaultTableModel tableModel = new DefaultTableModel();
            ResultSetMetaData metaData = resultSet.getMetaData();

            // Get column count
            int columnCount = metaData.getColumnCount();

            // Add columns to the table model
            for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                tableModel.addColumn(metaData.getColumnName(columnIndex));
            }

            // Add rows to the table model
            while (resultSet.next()) {
                Object[] rowData = new Object[columnCount];
                for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                    rowData[columnIndex - 1] =
resultSet.getObject(columnIndex);
                }
                tableModel.addRow(rowData);
            }

            // Set the table model to the JTable
            tableP23.setModel(tableModel);

//             Close the result set, statement, and connection
            resultSet.close();
            statement.close();
            connect.close();

        } catch (SQLException e) {
            e.printStackTrace();
        }
```

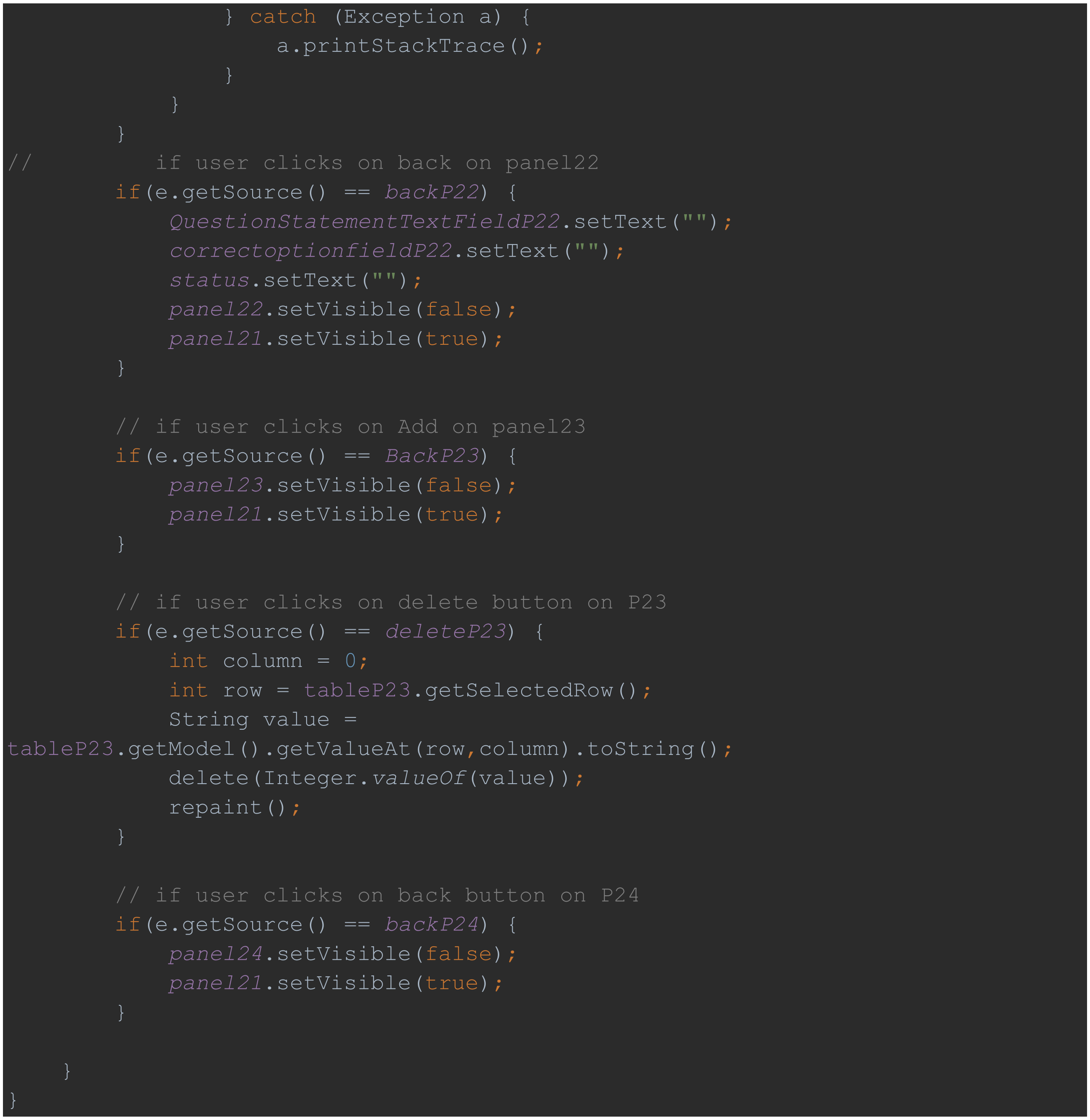


```
        statusP23 = new JLabel();
        statusP23.setBounds(255,550 , 400,60);
        statusP23.setFont(new Font("Candara",Font.BOLD,35));
        statusP23.setVisible(false);
        panel23.add(statusP23);

        deleteP23 = new JButton("Delete") ;
        deleteP23.setBounds(400, 550, 100, 35);
        deleteP23.setFont(new Font("Candara", Font.BOLD, 20));
        deleteP23.addActionListener(this);
        panel23.add(deleteP23);


        BackP23 = new JButton("Back") ;
        BackP23.setBounds(280, 550, 100, 35);
        BackP23.setFont(new Font("Candara", Font.BOLD, 20));
        BackP23.addActionListener(this);
        panel23.add(BackP23);
        panel23.setVisible(false);


//--------------------------------Panel 24-----------------------------------
        panel24 = new JPanel();
        panel24.setBounds(0, 0, 800, 700);
        panel24.setOpaque(false);
        panel24.setLayout(null);
        add(panel24);
// label on Panel 24
        questionStat = new JLabel("View Questions");
        questionStat.setBounds(240,50 , 400,60);
        questionStat.setFont(new Font("Candara",Font.BOLD,35));
        panel24.add(questionStat);

        tableP24 = new JTable();
        scrollPaneP24 = new JScrollPane(tableP24);
        scrollPaneP24.setBounds(1,100,800,400);
        panel24.add(scrollPaneP24);
        try {
            Connection connect = connection.create();
            String query = "select * from questionbank";
            PreparedStatement statement = connect.prepareStatement(query);
            ResultSet resultSet = statement.executeQuery();
            // Create a table model and populate it with the result set
            DefaultTableModel tableModel = new DefaultTableModel();
            ResultSetMetaData metaData = resultSet.getMetaData();

            // Get column count
            int columnCount = metaData.getColumnCount();

            // Add columns to the table model
            for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                tableModel.addColumn(metaData.getColumnName(columnIndex));
            }

            // Add rows to the table model
            while (resultSet.next()) {
                Object[] rowData = new Object[columnCount];
                for (int columnIndex = 1; columnIndex <= columnCount;
columnIndex++) {
                    rowData[columnIndex - 1] =
resultSet.getObject(columnIndex);
                }
                tableModel.addRow(rowData);
            }

            // Set the table model to the JTable
            tableP24.setModel(tableModel);

            // Close the result set, statement, and connection
            resultSet.close();
            statement.close();
            connect.close();

        } catch (SQLException e) {
            e.printStackTrace();
        }


// Buttons on Panel 24
        backP24 = new JButton("Back") ;
        backP24.setBounds(350, 530, 100, 35);
        backP24.setFont(new Font("Candara", Font.BOLD, 20));
        backP24.addActionListener(this);
        panel24.add(backP24);
        panel24.setVisible(false);

        setVisible(true);
    }

    public boolean delete(int id) {
        boolean check = false;
        try {
            Connection connect = connection.create();
            String query = "delete from questionbank where ID = ?";
            PreparedStatement ps = connect.prepareStatement(query);
            ps.setString(1,String.valueOf(id));
            ps.executeUpdate();

            check = true;

            if (check) {
                int selectedRow = tableP23.getSelectedRow();
                if (selectedRow != -1) {
                    ((DefaultTableModel)
tableP23.getModel()).removeRow(selectedRow);
                }
```



```
            }

        } catch (SQLException e) {
            e.printStackTrace();
        }
        return check;
    }

    public void actionPerformed(ActionEvent e) {

//         if user clicks on question bank on panel16
        if(e.getSource() == questionBank) {
            panel16.setVisible(false);
            panel20.setVisible(true);
        }
//         if user clicks on view user data on panel16
        if(e.getSource() == viewData) {
            panel16.setVisible(false);
            panel17.setVisible(true);
        }
        if(e.getSource() == questionBank) {
            panel16.setVisible(false);
            panel20.setVisible(true);
        }

        // if user clicks on sign out button on panel16
        if(e.getSource() == signOutP16) {
            setVisible(false);
            new Login();
        }
        // if user clicks on back button on panel17
        if(e.getSource() == backP17) {
            panel17.setVisible(false);
            panel16.setVisible(true);
        }
//         if user clicks on Java button on panel20
        if(e.getSource() == cppP20) {
            subject = "C++";
            panel20.setVisible(false);
            panel21.setVisible(true);
        }

        if(e.getSource() == javaP20) {
            subject = "Java";
            panel20.setVisible(false);
            panel21.setVisible(true);
        }

        if(e.getSource() == pythonP20) {
            subject = "Python";
            panel20.setVisible(false);
            panel21.setVisible(true);
        }
//         if user clicks on back button on panel20
```

```java
        if(e.getSource() == backP20) {
            panel20.setVisible(false);
            panel16.setVisible(true);
        }
//         if user clicks on Add Question on panel21
        if(e.getSource() == addQues) {
            panel21.setVisible(false);
            panel22.setVisible(true);
        }
//         if user clicks on delete Question on panel21
        if(e.getSource() == deleteQues) {
            panel21.setVisible(false);
            panel23.setVisible(true);
            repaint();
        }
//         if user clicks on view Question on panel21
        if(e.getSource() == viewQues) {
            panel21.setVisible(false);
            panel24.setVisible(true);
        }
//         if user clicks on back on panel21
        if(e.getSource() == backP21) {
            panel21.setVisible(false);
            panel20.setVisible(true);
        }

        //  if user clicks on Add on panel22
        if(e.getSource() == addP22) {
            if(QuestionStatementTextFieldP22.getText().equals("") || correctoptionfieldP22.getText().equals("")) {
                status.setText("Please make sure you have entered all the fields properly!");
                status.setBounds(150, 500, 500, 30);
                status.setVisible(true);
                repaint();
            } else {
                String questionStatementP22 = QuestionStatementTextFieldP22.getText();
                String correctOptionP22 = correctoptionfieldP22.getText();

                try {
                    Connection connect = connection.create();
                    String query = "insert into questionbank (Subject, Question_Statement, Correct_Option) values (?,?,?)";
                    PreparedStatement ps = connect.prepareStatement(query);
                    ps.setString(1, subject);
                    ps.setString(2, questionStatementP22);
                    ps.setString(3, correctOptionP22);
                    ps.executeUpdate();
                    status.setText("Data entered successfully!");
                    status.setBounds(270, 500, 500, 30);
                    status.setVisible(true);
                    repaint();
```



```
                } catch (Exception a) {
                    a.printStackTrace();
                }
            }
        }
//         if user clicks on back on panel22
        if(e.getSource() == backP22) {
            QuestionStatementTextFieldP22.setText("");
            correctoptionfieldP22.setText("");
            status.setText("");
            panel22.setVisible(false);
            panel21.setVisible(true);
        }

        // if user clicks on Add on panel23
        if(e.getSource() == BackP23) {
            panel23.setVisible(false);
            panel21.setVisible(true);
        }

        // if user clicks on delete button on P23
        if(e.getSource() == deleteP23) {
            int column = 0;
            int row = tableP23.getSelectedRow();
            String value =
tableP23.getModel().getValueAt(row,column).toString();
            delete(Integer.valueOf(value));
            repaint();
        }

        // if user clicks on back button on P24
        if(e.getSource() == backP24) {
            panel24.setVisible(false);
            panel21.setVisible(true);
        }

    }
}
```