OBE IMPLEMENTATION:DEPARTMENTS

by

SYNTAX SQUAD
K.PRANAV RITHWIK[AP22110010337]
CH.YASWANTH[AP22110010383]
P.BALAJI[AP22110010384]
HASITH NAGENDRA[AP22110010359]
KOLLIPARA VISHNU[AP22110010391]

A report for the CS307:Mobile Application Development using JAVA

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SRM UNIVERSITY AP::AMARAVATI

INDEX

Introduction

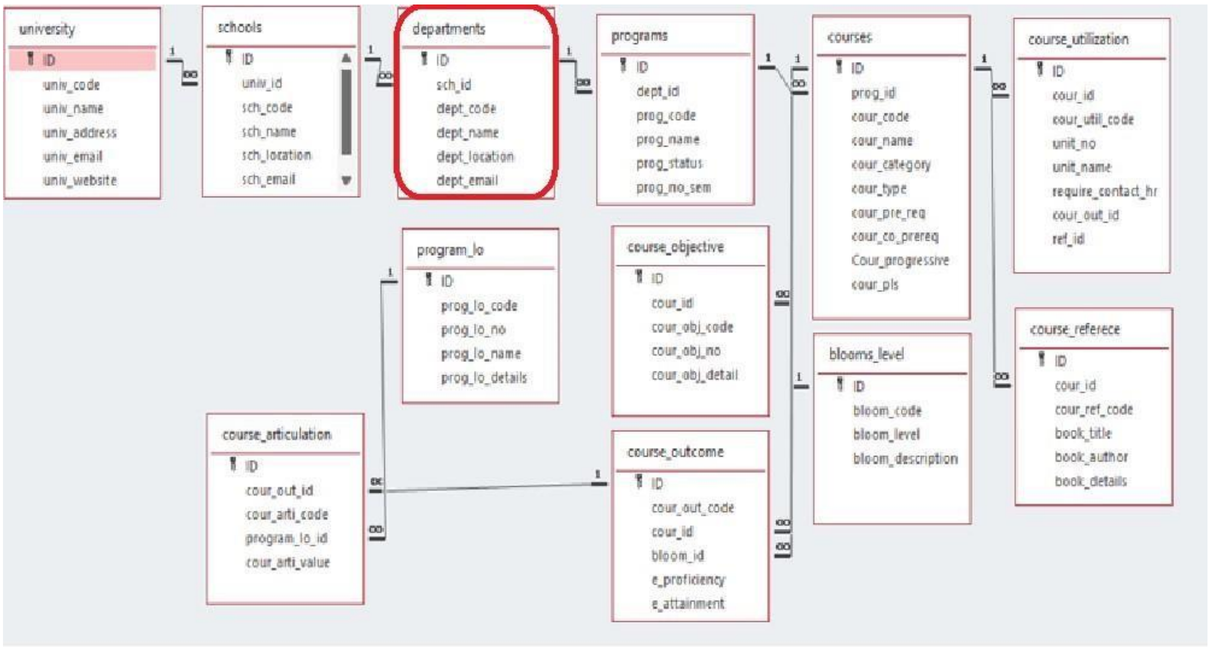
Our University (herewith considered as SRM-AP) is going to implement OBE(Outcome Based Education) in their university and you are assigned in the project
to develop a CURD(Create,Update,Retrieve and Delete) windows and mobile application using JAVA programming andAndroid studio for the same.
The SyntaxSquad_Departments project is a Java-based desktop application developed using the Swing GUI toolkit. It is designed to manage academic department data efficiently by providing a user-friendly interface for interacting with a SQLite database. This application allows users to create, view, update, and delete department records with ease.
With a clean layout, labeled form fields, and responsive buttons, it offers a seamless experience for administrators or academic staff to maintain departmental information such as department code, name, location, email, and associated school ID. The application is lightweight, offline-capable, and suitable for educational institutions or admin systems where quick data management is essential.

Project Modules:

Various Modules available in the project are

1.Blooms Level setting
2.Program Level Objective Setting
3.University
4.Schools
5.Department
6.Programs
7.Courses
8.Course objective setting
9.Course Outcome Setting
10.Course Articulation matrix Setting
11.Course Utilization Setting
12.Course Reference Setting.

Architecture Diagram



‘

Module Description

Module Name: Departments **Module Description:**
This module is used to create,Update,Retrieve,Delete(hereafter known as CURD) details of the module and storing the details in the database table(eg.MySQL).

Programming Details naming conventions to be used:

- **class name/activity name:**syntaxsquad_departments
- **Function/method name**
  - **Create:**AP22110010337_departments _create
  - **Update:**AP22110010337_departments_update
  - **Retrieve:**AP22110010337_departments_retrive
  - **Delete:**AP22110010337_departments_delete

Table details: departments

Field Name	**Data Type**
ID	Integer
sch_id	Integer
dept_code	String
dept_name	String
dept_location	String
Dept_email	String

SOURCE CODE

Login.java:

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

public class Login extends JFrame implements ActionListener {
private JTextField txtUsername;     private JPasswordField
txtPassword;
   private JButton btnLogin, btnReset;

   public Login() {        setTitle("Login");
      setSize(400, 250);
setDefaultCloseOperation(EXIT_ON_CLOSE);
setLocationRelativeTo(null);
setResizable(false);

      // Main panel setup
      JPanel panel = new JPanel(new GridBagLayout());
      panel.setBorder(BorderFactory.createEmptyBorder(20, 30, 20, 30));
panel.setBackground(new Color(245, 245, 245));

      GridBagConstraints gbc = new GridBagConstraints();
gbc.insets = new Insets(10, 10, 10, 10);
      gbc.fill = GridBagConstraints.HORIZONTAL;

      Font labelFont = new Font("Segoe UI", Font.BOLD, 14);
      Font fieldFont = new Font("Segoe UI", Font.PLAIN, 13);

      JLabel lblUsername = new JLabel("Username:");
lblUsername.setFont(labelFont);
gbc.gridx = 0; gbc.gridy = 0;
      panel.add(lblUsername, gbc);

      txtUsername = new JTextField(15);
txtUsername.setFont(fieldFont);
      txtUsername.setBorder(BorderFactory.createLineBorder(Color.LIGHT_GRAY));
gbc.gridx = 1;
      panel.add(txtUsername, gbc);
```

```
        JLabel lblPassword = new JLabel("Password:");
lblPassword.setFont(labelFont);         gbc.gridx = 0; gbc.gridy
= 1;
        panel.add(lblPassword, gbc);

        txtPassword = new JPasswordField(15);
txtPassword.setFont(fieldFont);
txtPassword.setBorder(BorderFactory.createLineBorder(Color.LIGHT_GRA
Y));        gbc.gridx = 1;
panel.add(txtPassword, gbc);

        btnLogin = createButton("Login");
gbc.gridx = 0; gbc.gridy = 2;
        panel.add(btnLogin, gbc);

        btnReset = createButton("Reset");
gbc.gridx = 1;
        panel.add(btnReset, gbc);

        btnLogin.addActionListener(this);
        btnReset.addActionListener(this);

        setContentPane(panel);
setVisible(true);
    }

    private JButton createButton(String text) {         JButton
btn = new JButton(text);         btn.setFocusPainted(false);
        btn.setBackground(new Color(66, 133, 244));
btn.setForeground(Color.WHITE);          btn.setFont(new
Font("Segoe            UI",            Font.BOLD,            13));
btn.setPreferredSize(new Dimension(120, 35));
return btn;
    }

    public void actionPerformed(ActionEvent e) {
if (e.getSource() == btnLogin) {
            String uname = txtUsername.getText().trim();
            String pwd = new String(txtPassword.getPassword()).trim();

            if (uname.isEmpty() || pwd.isEmpty()) {
                JOptionPane.showMessageDialog(this, "Please fill in all fields.");
return;
            }
```

```
      try (Connection conn =
DriverManager.getConnection("jdbc:sqlite:C:/Users/vamsi/Desktop/Apps/javaapp.db");
         PreparedStatement stmt = conn.prepareStatement("SELECT * FROM users
WHERE uname=? AND pwd=?")) {

        stmt.setString(1, uname);              stmt.setString(2,
pwd);
        ResultSet rs = stmt.executeQuery();
         if (rs.next())
{
          JOptionPane.showMessageDialog(this, "Login Successful");
dispose(); // close login window
          new syntaxsquad_departments(); // open main UI
        } else {
          JOptionPane.showMessageDialog(this, "Invalid credentials");
        }

      } catch (SQLException ex) {
ex.printStackTrace();
        JOptionPane.showMessageDialog(this, "Database error: " + ex.getMessage());
      }
    } else if (e.getSource() == btnReset) {
txtUsername.setText("");
      txtPassword.setText("");
    }
  }

  public static void main(String[] args) {
SwingUtilities.invokeLater(Login::new);
  }
}
```

SyntaxSquad_departments.java

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

public class SyntaxSquad_departments extends JFrame {     private static final String URL =
"jdbc:sqlite:C:/Users/vamsi/Desktop/Apps/javaapp.db";     private JTextField txtDeptId,
txtDeptCode, txtDeptName, txtDeptLocation, txtDeptEmail, txtSchId;
    private JTextArea txtDisplay;     public
SyntaxSquad_departments() {
setTitle("Department Manager");
        setSize(950, 700);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
setLocationRelativeTo(null);

        JPanel content = new JPanel(new BorderLayout(15, 15));
content.setBorder(BorderFactory.createEmptyBorder(15, 15, 15, 15));
content.setBackground(new Color(245, 245, 245));

        JPanel formPanel = new JPanel(new GridBagLayout());
formPanel.setBorder(BorderFactory.createTitledBorder("Department Form"));
formPanel.setBackground(Color.WHITE);

        GridBagConstraints gbc = new GridBagConstraints();
gbc.insets = new Insets(10, 10, 10, 10);
        gbc.fill = GridBagConstraints.HORIZONTAL;

        Font labelFont = new Font("Segoe UI", Font.BOLD, 14);
        Font fieldFont = new Font("Segoe UI", Font.PLAIN, 13);
          int y =
0;
        formPanel.add(createLabel("Department ID:", labelFont), gbc(0, y));
        txtDeptId = createTextField(fieldFont); formPanel.add(txtDeptId, gbc(1, y++));

        formPanel.add(createLabel("Dept Code:", labelFont), gbc(0, y));
        txtDeptCode = createTextField(fieldFont); formPanel.add(txtDeptCode, gbc(1, y++));
        formPanel.add(createLabel("Dept Name:", labelFont), gbc(0, y));
        txtDeptName = createTextField(fieldFont); formPanel.add(txtDeptName, gbc(1, y++));

        formPanel.add(createLabel("Location:", labelFont), gbc(0, y));          txtDeptLocation
= createTextField(fieldFont); formPanel.add(txtDeptLocation, gbc(1,
y++));

        formPanel.add(createLabel("Email:", labelFont), gbc(0, y));
        txtDeptEmail = createTextField(fieldFont); formPanel.add(txtDeptEmail, gbc(1, y++));

        formPanel.add(createLabel("School ID:", labelFont), gbc(0, y));
        txtSchId = createTextField(fieldFont); formPanel.add(txtSchId, gbc(1, y++));

        JPanel buttonPanel = new JPanel(new FlowLayout(FlowLayout.CENTER, 20, 10));
buttonPanel.setBackground(new Color(245, 245, 245));

        JButton btnAdd = createButton("Add");
        JButton btnRetrieve = createButton("Retrieve");
        JButton btnUpdate = createButton("Update");
        JButton btnDelete = createButton("Delete");

        buttonPanel.add(btnAdd);
buttonPanel.add(btnRetrieve);         buttonPanel.add(btnUpdate);
        buttonPanel.add(btnDelete);

        txtDisplay = new JTextArea(15, 60);
txtDisplay.setFont(new Font("Consolas", Font.PLAIN, 13));
txtDisplay.setEditable(false);
        JScrollPane scrollPane = new JScrollPane(txtDisplay);
        scrollPane.setBorder(BorderFactory.createTitledBorder("Department Records"));

        content.add(formPanel, BorderLayout.NORTH);
content.add(buttonPanel, BorderLayout.CENTER);          content.add(scrollPane,
BorderLayout.SOUTH);
        setContentPane(content);

        btnAdd.addActionListener(e -> AP22110010337_departments_create());
btnRetrieve.addActionListener(e -> AP22110010337_departments_retrive());
btnUpdate.addActionListener(e -> AP22110010337_departments_update());
btnDelete.addActionListener(e -> AP22110010337_departments_delete());

        setVisible(true);
    }
```

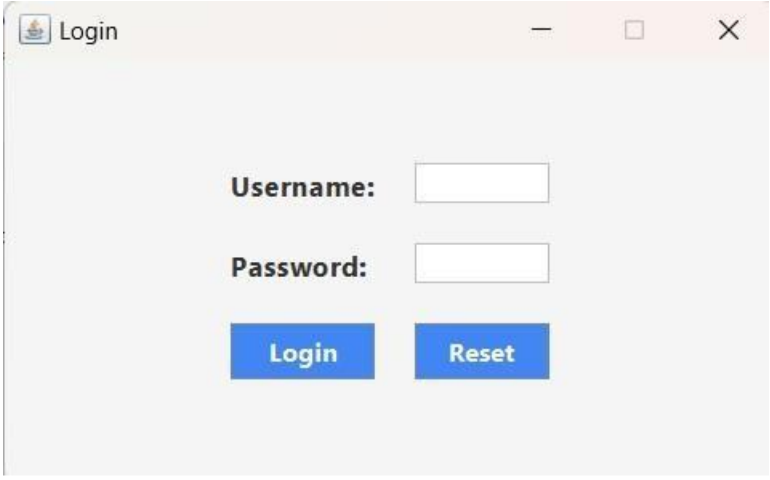
```
   private GridBagConstraints gbc(int x, int y) {
GridBagConstraints gbc = new GridBagConstraints();        gbc.gridx
= x;        gbc.gridy = y;
      gbc.insets = new Insets(8, 8, 8, 8);        gbc.fill
= GridBagConstraints.HORIZONTAL;          return
gbc;
   }

   private JLabel createLabel(String text, Font font) {
      JLabel label = new JLabel(text);
      label.setFont(font);
return label;
   }

   private JTextField createTextField(Font font) {        JTextField tf = new
JTextField(20);        tf.setFont(font);
tf.setBorder(BorderFactory.createLineBorder(Color.LIGHT_GRAY));
return tf;
   }

   private JButton createButton(String text) {        JButton
btn = new JButton(text);        btn.setFocusPainted(false);
      btn.setBackground(new Color(66, 133, 244));
btn.setForeground(Color.WHITE);        btn.setFont(new
Font("Segoe UI", Font.BOLD, 13));
btn.setPreferredSize(new Dimension(130, 40));        return
btn;
   }

   private Connection connect() {
      try {
         Class.forName("org.sqlite.JDBC");
return DriverManager.getConnection(URL);
      } catch (Exception e) {
         JOptionPane.showMessageDialog(this, "Connection Error: " + e.getMessage());
return null;
      }
   }

   private void clearFields() {
txtDeptId.setText("");        txtDeptCode.setText("");
txtDeptName.setText("");
```

```
txtDeptLocation.setText("");
txtDeptEmail.setText("");
        txtSchId.setText("");
    }

    private boolean validateIdField() {          if
(txtDeptId.getText().trim().isEmpty()) {
            JOptionPane.showMessageDialog(this, "Please enter Department ID.");             return
false;
        }         try
{
Integer.parseI
nt(txtDeptId.g
etText());
return true;
        } catch (NumberFormatException e) {
            JOptionPane.showMessageDialog(this, "Department ID must be numeric.");
return false;
        }
    }

    private void AP22110010337_departments_create() {
        String sql = "INSERT INTO departments (dept_code, dept_name, dept_location,
dept_email, sch_id) VALUES (?, ?, ?, ?, ?)";
        try (Connection conn = connect(); PreparedStatement ps = conn.prepareStatement(sql))
{            ps.setString(1,
txtDeptCode.getText());
ps.setString(2, txtDeptName.getText());            ps.setString(3,
txtDeptLocation.getText());            ps.setString(4,
txtDeptEmail.getText());            ps.setInt(5,
Integer.parseInt(txtSchId.getText()));
ps.executeUpdate();
            JOptionPane.showMessageDialog(this, "Added successfully!");
clearFields();
        } catch (SQLException e) {
            JOptionPane.showMessageDialog(this, "Insert Error: " + e.getMessage());
        }
    }

    private void AP22110010337_departments_retrive() {
String sql = "SELECT * FROM departments";
        txtDisplay.setText("");          try (Connection conn = connect(); Statement stmt =
conn.createStatement(); ResultSet rs
```

```
= stmt.executeQuery(sql)) {             while (rs.next()) {
txtDisplay.append("ID: " + rs.getInt("ID") +
" | Code: " + rs.getString("dept_code") +
                    " | Name: " + rs.getString("dept_name") +
                    " | Location: " + rs.getString("dept_location") +
                    " | Email: " + rs.getString("dept_email") +
                    " | School ID: " + rs.getInt("sch_id") + "\n");
          }
      } catch (SQLException e) {
          JOptionPane.showMessageDialog(this, "Fetch Error: " + e.getMessage());
      }
   }

   private void AP22110010337_departments_update() {
if (!validateIdField()) return;
      String sql = "UPDATE departments SET dept_code=?, dept_name=?, dept_location=?,
dept_email=?, sch_id=? WHERE ID=?";
      try (Connection conn = connect(); PreparedStatement ps = conn.prepareStatement(sql))
{            ps.setString(1,
txtDeptCode.getText());
ps.setString(2, txtDeptName.getText());            ps.setString(3,
txtDeptLocation.getText());            ps.setString(4,
txtDeptEmail.getText());            ps.setInt(5,
Integer.parseInt(txtSchId.getText()));            ps.setInt(6,
Integer.parseInt(txtDeptId.getText()));            int rows =
ps.executeUpdate();
          if (rows > 0) {
              JOptionPane.showMessageDialog(this, "Updated successfully!");
clearFields();            } else {
              JOptionPane.showMessageDialog(this, "No matching record found.");
          }
      } catch (SQLException e) {
          JOptionPane.showMessageDialog(this, "Update Error: " + e.getMessage());
      }
   }

   private void AP22110010337_departments_delete() {
if (!validateIdField()) return;
      String sql = "DELETE FROM departments WHERE ID=?";          try (Connection
conn = connect(); PreparedStatement ps = conn.prepareStatement(sql))
{            ps.setInt(1,
Integer.parseInt(txtDeptId.getText()));
```

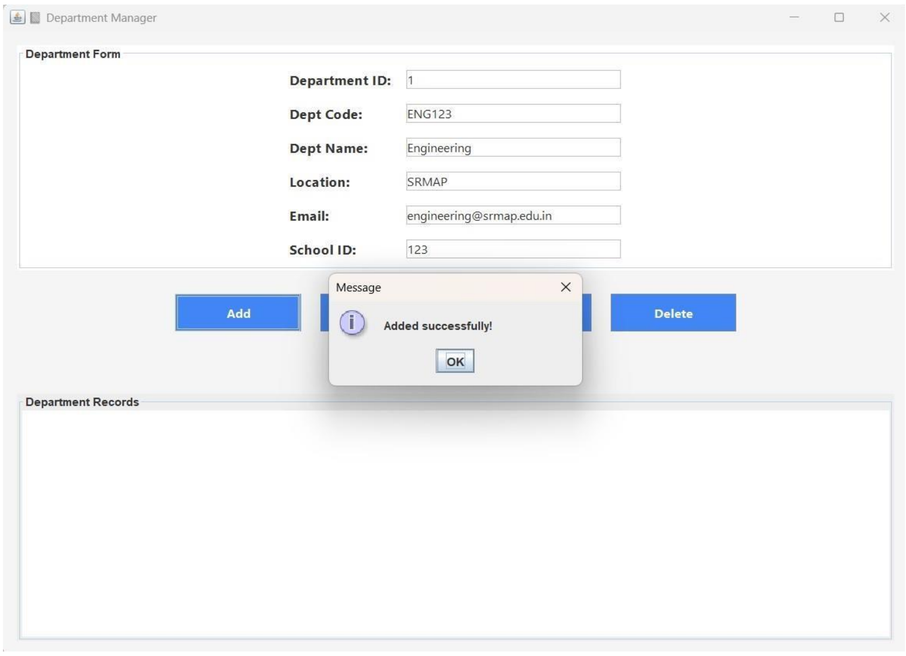
```
int rows = ps.executeUpdate();
if (rows > 0) {
                JOptionPane.showMessageDialog(this, "Deleted successfully!");
clearFields();             } else {
                JOptionPane.showMessageDialog(this, "No matching record found.");
            }
        } catch (SQLException e) {
            JOptionPane.showMessageDialog(this, "Delete Error: " + e.getMessage());
        }
    }

    public static void main(String[] args) {
        SwingUtilities.invokeLater(SyntaxSquad_departments::new);
    }
}
```

SCREEN SHOTS



Username:

Password:

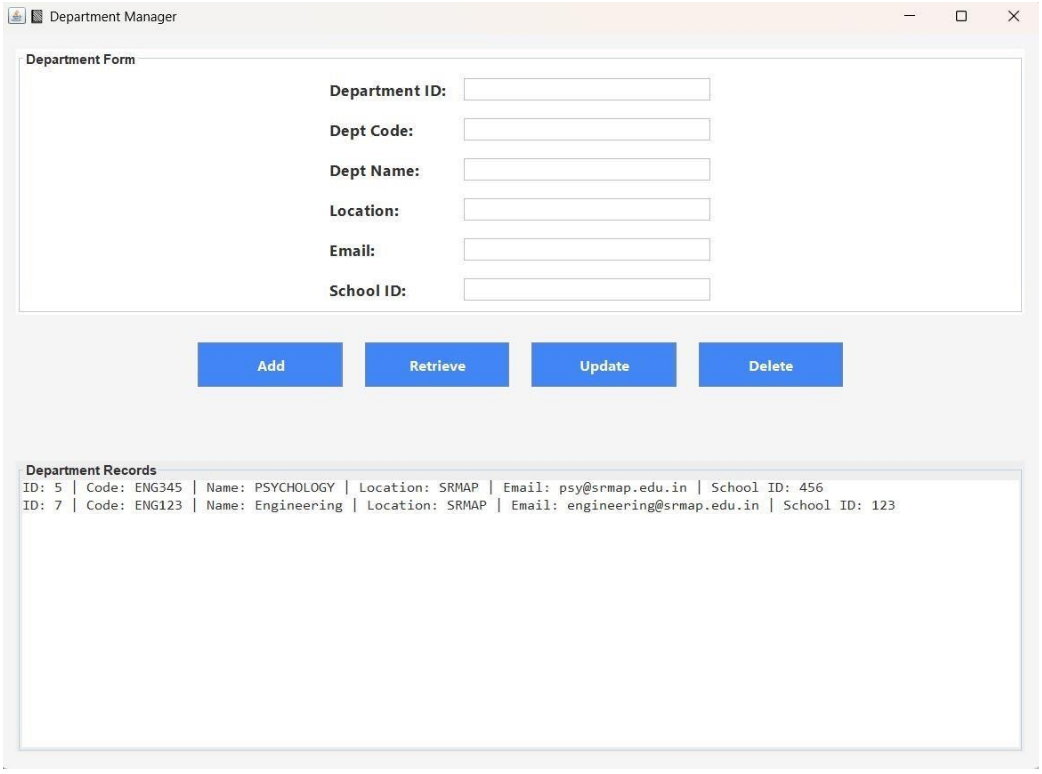


Department Form

Department ID:	1
Dept Code:	ENG123
Dept Name:	Engineering
Location:	SRMAP
Email:	engineering@srmap.edu.in
School ID:	123

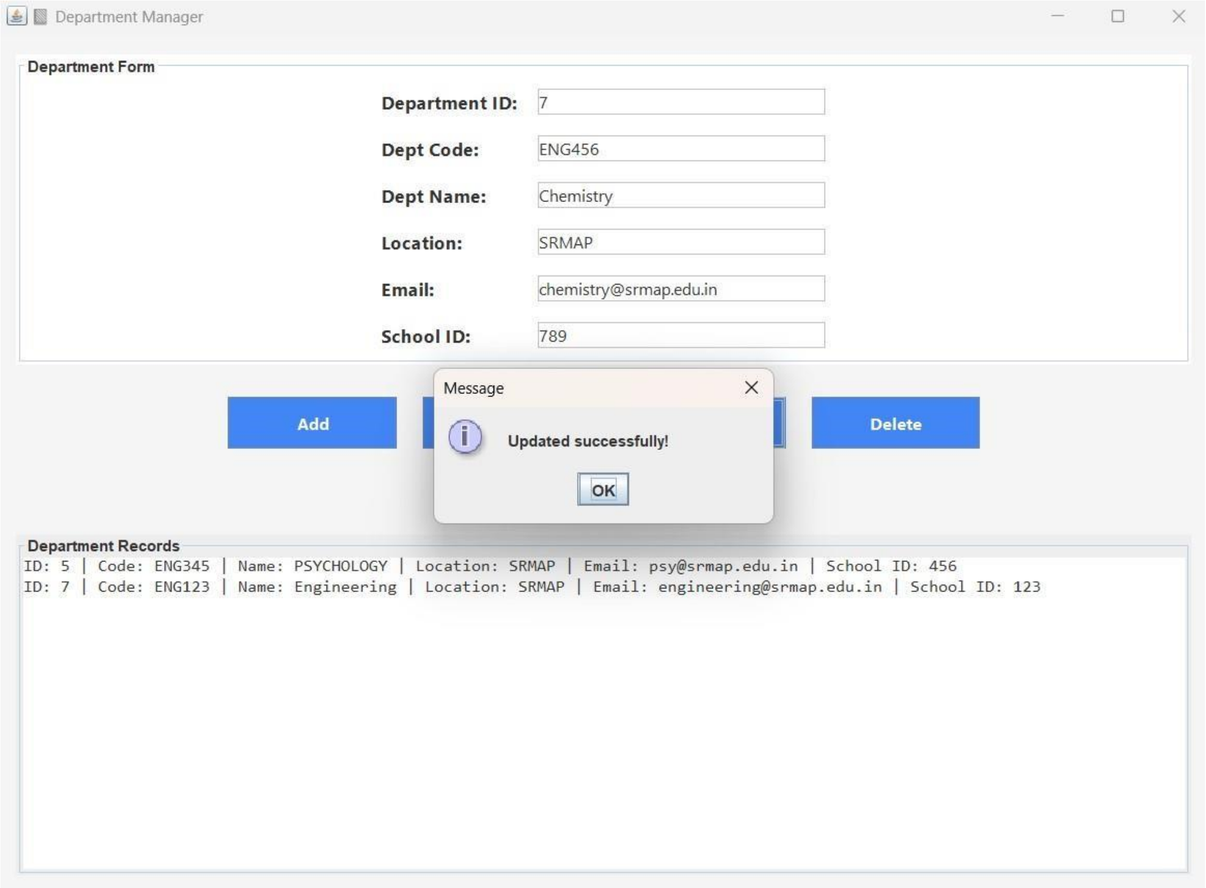
Added successfully!

Department Records



Department ID:	
Dept Code:	
Dept Name:	
Location:	
Email:	
School ID:	

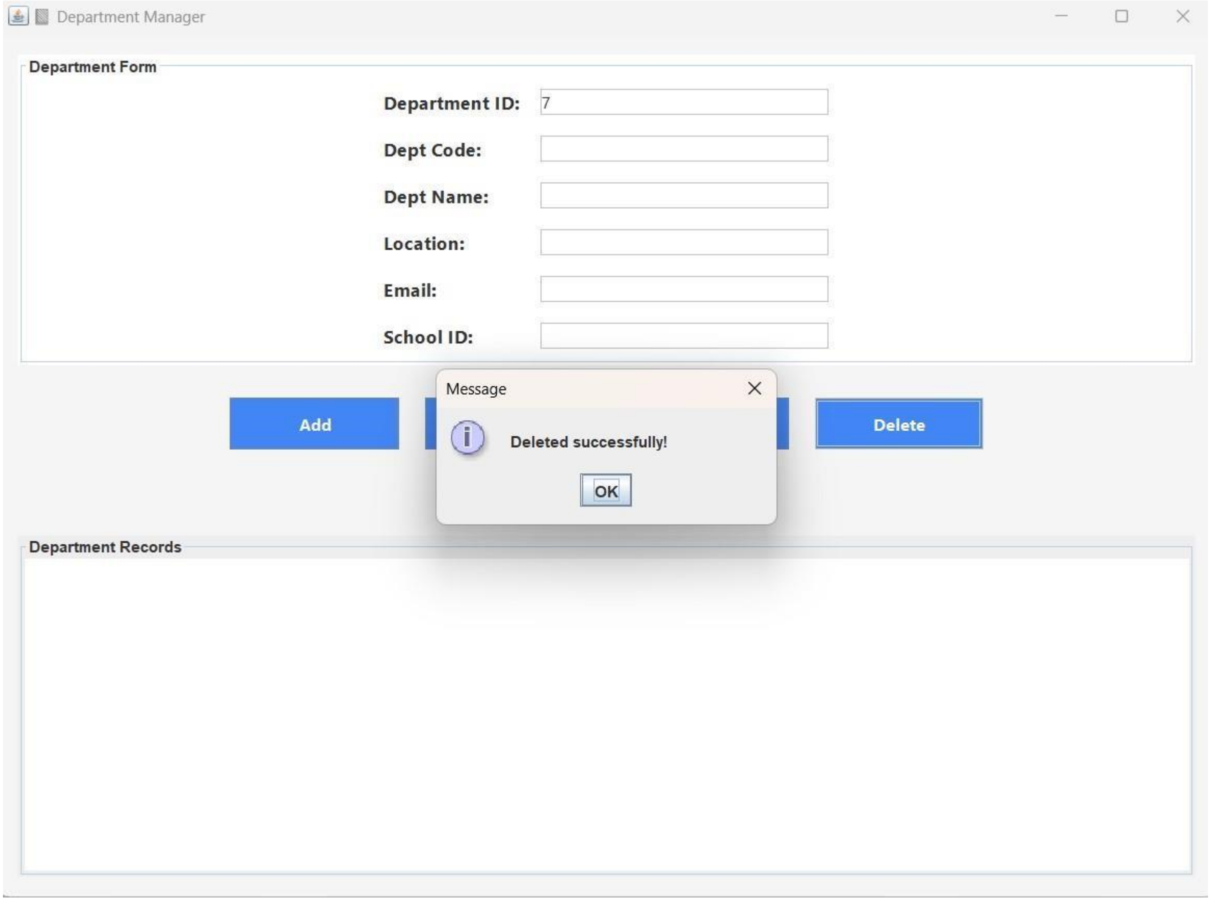
```
ID: 5 | Code: ENG345 | Name: PSYCHOLOGY | Location: SRMAP | Email: psy@srmap.edu.in | School ID: 456
ID: 7 | Code: ENG123 | Name: Engineering | Location: SRMAP | Email: engineering@srmap.edu.in | School ID: 123
```



Department ID:	7
Dept Code:	ENG456
Dept Name:	Chemistry
Location:	SRMAP
Email:	chemistry@srmap.edu.in
School ID:	789

Updated successfully!

```
ID: 5 | Code: ENG345 | Name: PSYCHOLOGY | Location: SRMAP | Email: psy@srmap.edu.in | School ID: 456
ID: 7 | Code: ENG123 | Name: Engineering | Location: SRMAP | Email: engineering@srmap.edu.in | School ID: 123
```



Department ID: 7

Dept Code:

Dept Name:

Location:

Email:

School ID:

Deleted successfully!

CONCLUSION

This project successfully demonstrates the design and development of a desktopbased Academic Department Management System using Java Swing and SQLite. It incorporates essential CRUD (Create, Read, Update, Delete) functionalities that allow users to manage departmental records efficiently. The integration of a secure login system adds an additional layer of authentication, ensuring that only authorized users can access and manipulate the data.The use of Java Swing provided a user-friendly graphical interface, while SQLite offered a lightweight, yet powerful, backend database suitable for standalone applications.Overall, the project lays a strong foundation for further development, such as adding roles (Admin/User), enhancing UI design, implementing validation checks, and scaling up to networked or cloud-based systems for larger institutions.

GitHub Link:

https://github.com/Pranav-8080/Java_Departments