


Faculty of Information Technology									
<p>I declare that I am familiar with, and will abide to the Examination rules of CTU</p>  <p>Signature</p>	<p>SUBJECT NAME: Advanced Java SUBJECT CODE: JD522</p>								
	<p>Summative Assessment Duration: Date: Total Marks: 100 Total pages: 34</p>					<p>Examiner: Junior Manganyi Moderator:</p>			
	<p>Student number</p>								
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	<p>Surname: Mkhize</p>				<p>Initials: ME</p>		/		%

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Formative Question(s)

Overview: The University Resource Management Application is a comprehensive Java-based solution designed to centralize and streamline the processes of managing academic resources within a university setting. Instead of just focusing on schools, this system encompasses various departments, courses, faculty members, and students across a university.

Abstract: The primary goal of this application is to facilitate efficient management and allocation of academic resources. Universities often grapple with manual and decentralized systems, leading to inefficiencies and potential inaccuracies. This application aims to consolidate data, automate tasks, and ensure easy retrieval of information. It will handle records for courses offered, faculty expertise, student enrollment, and departmental assets. The system will feature different modules catering to administrators, department heads, faculty, and students. Administrators will oversee the overall data integrity, adding new entries, updating existing information, and ensuring regular backups. Department heads can allocate resources, faculty can manage their courses and research, and students can access course materials and transcripts.

Response:

UniResManApp.java

StudentPage.java

```
/*
```

```
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```

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edit this template
```

```
*/
```

```
package org.mondemkhize.jd522summative;
```

```
/**
```

```
 *
```

```
 * @author Monde
```

```
*/
```

```
public class StudentPage extends javax.swing.JFrame {
```

```
 /**
```

```
  * Creates new form StudentPage
```

```
 */
```

```
public StudentPage() {
    initComponents();
    this.setLocationRelativeTo(null);

}

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

    enrollBtn = new javax.swing.JButton();
    viewCoMatBtn = new javax.swing.JButton();
    viewGradesBtn = new javax.swing.JButton();
    backBtn = new javax.swing.JButton();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    enrollBtn.setText("Enroll");
    enrollBtn.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            enrollBtnActionPerformed(evt);
        }
    });
});
```

```
viewCoMatBtn.setText("View Course Materials");  
viewCoMatBtn.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        viewCoMatBtnActionPerformed(evt);  
    }  
});
```

```
viewGradesBtn.setText("View Grades");  
viewGradesBtn.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        viewGradesBtnActionPerformed(evt);  
    }  
});
```

```
backBtn.setText("Back");  
backBtn.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        backBtnActionPerformed(evt);  
    }  
});
```

```
javax.swing.GroupLayout layout = new  
javax.swing.GroupLayout(getContentPane());  
getContentPane().setLayout(layout);  
layout.setHorizontalGroup(  
  
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
    .addGroup(layout.createSequentialGroup()  
        .addGap(76, 76, 76)  
        .addComponent(enrollBtn)  
        .addGap(34, 34, 34)  
        .addComponent(viewCoMatBtn)
```

```
.addGap(30, 30, 30)
.addComponent(viewGradesBtn)
.addContainerGap(55, Short.MAX_VALUE))
.addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup())
.addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
.addComponent(backBtn)
.addGap(22, 22, 22))
);
layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
.addGroup(layout.createSequentialGroup())
.addGap(128, 128, 128)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)

.addComponent(enrollBtn)
.addComponent(viewCoMatBtn)
.addComponent(viewGradesBtn))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 93,
Short.MAX_VALUE)
.addComponent(backBtn)
.addGap(18, 18, 18))
);

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

private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
    UniResManApp mainPage = new UniResManApp();
```

```
        mainPage.setVisible(true);
        this.dispose();
    }

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

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

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

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

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

} catch (ClassNotFoundException ex) {

java.util.logging.Logger.getLogger(StudentPage.class.getName()).log(java.util.lo
gging.Level.SEVERE, null, ex);

    } catch (InstantiationException ex) {

java.util.logging.Logger.getLogger(StudentPage.class.getName()).log(java.util.lo
gging.Level.SEVERE, null, ex);

    } catch (IllegalAccessException ex) {

java.util.logging.Logger.getLogger(StudentPage.class.getName()).log(java.util.lo
gging.Level.SEVERE, null, ex);

    } catch (javax.swing.UnsupportedLookAndFeelException ex) {

java.util.logging.Logger.getLogger(StudentPage.class.getName()).log(java.util.lo
gging.Level.SEVERE, null, ex);

    }
}

//</editor-fold>

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

// Variables declaration - do not modify
private javax.swing.JButton backBtn;
private javax.swing.JButton enrollBtn;
```



```
private javax.swing.JButton viewCoMatBtn;
private javax.swing.JButton viewGradesBtn;
// End of variables declaration
}

FacultyPage.java
/*
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 * Click nbfs://nbhost/SystemFileSystem/Templates/GuiForms/JFrame.java to
edit this template
 */
package org.mondemkhize.jd522summative;

/**
 *
 * @author Monde
 */
public class FacultyPage extends javax.swing.JFrame {

    /**
     * Creates new form FacultyPage
     */
    public FacultyPage() {
        initComponents();
        this.setLocationRelativeTo(null);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.

```

```
*/  
@SuppressWarnings("unchecked")  
// <editor-fold defaultstate="collapsed" desc="Generated Code">  
private void initComponents() {  
  
    manageCoBtn = new javax.swing.JButton();  
    manageGraBtn = new javax.swing.JButton();  
    manStuBtn = new javax.swing.JButton();  
    backBtn = new javax.swing.JButton();  
  
    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);  
  
    manageCoBtn.setText("Manage Courses");  
    manageCoBtn.addActionListener(new java.awt.event.ActionListener() {  
        public void actionPerformed(java.awt.event.ActionEvent evt) {  
            manageCoBtnActionPerformed(evt);  
        }  
    });  
  
    manageGraBtn.setText("Manage Grades");  
    manageGraBtn.addActionListener(new java.awt.event.ActionListener() {  
        public void actionPerformed(java.awt.event.ActionEvent evt) {  
            manageGraBtnActionPerformed(evt);  
        }  
    });  
  
    manStuBtn.setText("Manage Students");  
    manStuBtn.addActionListener(new java.awt.event.ActionListener() {  
        public void actionPerformed(java.awt.event.ActionEvent evt) {  
            manStuBtnActionPerformed(evt);  
        }  
    });  
}
```

```
    }  
});  
  
backBtn.setText("Back");  
backBtn.addActionListener(new java.awt.event.ActionListener() {  
    public void actionPerformed(java.awt.event.ActionEvent evt) {  
        backBtnActionPerformed(evt);  
    }  
});  
  
javax.swing.GroupLayout layout = new  
javax.swing.GroupLayout(getContentPane());  
getContentPane().setLayout(layout);  
layout.setHorizontalGroup(  
  
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
    .addGroup(layout.createSequentialGroup()  
        .addGap(44, 44, 44)  
  
        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
            .addComponent(backBtn)  
            .addGroup(layout.createSequentialGroup()  
                .addComponent(manageCoBtn)  
                .addGap(45, 45, 45)  
                .addComponent(manageGraBtn)  
                .addGap(41, 41, 41)  
                .addComponent(manStuBtn))  
            .addGap(16, Short.MAX_VALUE))  
        );  
layout.setVerticalGroup(  
  
layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
```

```
.addGroup(layout.createSequentialGroup())
    .addGap(108, 108, 108)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
    .addComponent(manageCoBtn)
    .addComponent(manageGraBtn)
    .addComponent(manStuBtn))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 137,
Short.MAX_VALUE)
    .addComponent(backBtn)
    .addGap(22, 22, 22))
);

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

private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {
    UniResManApp mainPage = new UniResManApp();
    mainPage.setVisible(true);
    this.dispose();
}

private void manageCoBtnActionPerformed(java.awt.event.ActionEvent evt) {
    CoursesPage g = new CoursesPage();
    g.setVisible(true);
    this.dispose();
}

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

```
}

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

}

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

java.util.logging.Logger.getLogger(FacultyPage.class.getName()).log(java.util.lo
gging.Level.SEVERE, null, ex);

    } catch (InstantiationException ex) {
```

```
java.util.logging.Logger.getLogger(FacultyPage.class.getName()).log(java.util.lo  
gging.Level.SEVERE, null, ex);
```

```
    } catch (IllegalAccessException ex) {
```

```
java.util.logging.Logger.getLogger(FacultyPage.class.getName()).log(java.util.lo  
gging.Level.SEVERE, null, ex);
```

```
    } catch (javax.swing.UnsupportedLookAndFeelException ex) {
```

```
java.util.logging.Logger.getLogger(FacultyPage.class.getName()).log(java.util.lo  
gging.Level.SEVERE, null, ex);
```

```
    }
```

```
//</editor-fold>
```

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

```
java.awt.EventQueue.invokeLater(new Runnable() {
```

```
    public void run() {
```

```
        new FacultyPage().setVisible(true);
```

```
    }
```

```
});
```

```
}
```

```
// Variables declaration - do not modify
```

```
private javax.swing.JButton backBtn;
```

```
private javax.swing.JButton manStuBtn;
```

```
private javax.swing.JButton manageCoBtn;
```

```
private javax.swing.JButton manageGraBtn;
```

```
// End of variables declaration
```

```
}
```

[CoursesPage.java](#)

```
/*
```

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```
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```

edit this template

```
*/
package org.mondemkhize.jd522summative;

import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.ArrayList;
import javax.swing.JOptionPane;
import javax.swing.table.DefaultTableModel;

/**
 *
 * @author Monde
 */
public class CoursesPage extends javax.swing.JFrame {

    /**
     * Creates new form CoursesPage
     */
    public CoursesPage() {
        initComponents();
        this.setLocationRelativeTo(null);
        this.idField.setText(new DatabaseUtils().nextId(this, "Course"));

        DefaultTableModel tableModel = (DefaultTableModel) jTable1.getModel();
        ArrayList entries = new DatabaseUtils().selectTable(this, "Course");
        for(int a = 0; a< entries.size(); a++) {
            tableModel.addRow((Object[]) entries.get(a));
        }

    }

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

        backBtn = new javax.swing.JButton();
        addOrRemoveComboBox = new javax.swing.JComboBox<>();
        jScrollPane1 = new javax.swing.JScrollPane();
        jTable1 = new javax.swing.JTable();
        idField = new javax.swing.JTextField();
        nameField = new javax.swing.JTextField();
        addBtn = new javax.swing.JButton();
        jLabel2 = new javax.swing.JLabel();

    }
}
```

```
jLabel3 = new javax.swing.JLabel();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

backBtn.setText("Back");
backBtn.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        backBtnActionPerformed(evt);
    }
});

addOrRemoveComboBox.setModel(new
javax.swing.DefaultComboBoxModel<>(new String[] { "Add", "Remove" }));
addOrRemoveComboBox.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        addOrRemoveComboBoxActionPerformed(evt);
    }
});

jTable1.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {

        },
    new String [] {
        "id", "name", "dep_id", "fac_id", "course_mat", "grades",
"students_ids"
    }
) {
    boolean[] canEdit = new boolean [] {
        false, true, true, true, true, true, true
    };

    public boolean isCellEditable(int rowIndex, int columnIndex) {
        return canEdit [columnIndex];
    }
});
jTable1.setColumnSelectionAllowed(true);
jTable1.getTableHeader().setReorderingAllowed(false);
jScrollPane1.setViewportViewView(jTable1);

jTable1.getColumnModel().getSelectionModel().setSelectionMode(javax.swing.Lis
tSelectionModel.SINGLE_SELECTION);

idField.setEditable(false);
idField.setText("1");

addBtn.setText("Add");
addBtn.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        addBtnActionPerformed(evt);
    }
});
```



```
    }  
    });  
  
    jLabel2.setText("ID");  
  
    jLabel3.setText("Name");  
  
    javax.swing.GroupLayout layout = new  
    javax.swing.GroupLayout(getContentPane());  
    getContentPane().setLayout(layout);  
    layout.setHorizontalGroup(  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,  
    layout.createSequentialGroup()  
        .addGap(javax.swing.GroupLayout.DEFAULT_SIZE,  
Short.MAX_VALUE)  
        .addComponent(backBtn)  
        .addGap(25, 25, 25))  
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,  
    layout.createSequentialGroup()  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,  
    layout.createSequentialGroup()  
        .addGap(18, Short.MAX_VALUE)  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
        .addComponent(jLabel2)  
        .addComponent(jLabel3))  
        .addGap(18, 18, 18)  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)  
        .addComponent(nameField,  
    javax.swing.GroupLayout.DEFAULT_SIZE, 119, Short.MAX_VALUE)  
        .addComponent(idField))  
        .addGap(26, 26, 26))  
        .addGroup(layout.createSequentialGroup()  
        .addGap(38, 38, 38)  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
        .addComponent(addBtn)  
        .addComponent(addOrRemoveComboBox,  
    javax.swing.GroupLayout.PREFERRED_SIZE,  
    javax.swing.GroupLayout.DEFAULT_SIZE,  
    javax.swing.GroupLayout.PREFERRED_SIZE))  
  
    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.RELATED,
```

```

javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)))
    .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE, 452,
javax.swing.GroupLayout.PREFERRED_SIZE)
    .addGap(13, 13, 13))
);
layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
    .addGroup(layout.createSequentialGroup()
        .addContainerGap(32, Short.MAX_VALUE)
        .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE, 336,
javax.swing.GroupLayout.PREFERRED_SIZE)

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
        .addComponent(backBtn))
        .addGroup(layout.createSequentialGroup()
            .addGap(20, 20, 20)
            .addComponent(addOrRemoveComboBox,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addGap(30, 30, 30)

            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAI
LING)
                .addGroup(layout.createSequentialGroup()
                    .addComponent(idField,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addGap(18, 18, 18)
                    .addComponent(nameField,
javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGroup(layout.createSequentialGroup()
                    .addComponent(jLabel2)
                    .addGap(18, 18, 18)
                    .addComponent(jLabel3)))

            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            .addComponent(addBtn)
            .addGap(55, 55, 55))
    );

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

private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {

```

```
// TODO add your handling code here:
UniResManApp mainPage = new UniResManApp();
mainPage.setVisible(true);
this.dispose();
}

private void
addOrRemoveComboBoxActionPerformed(java.awt.event.ActionEvent evt) {
    switch (addOrRemoveComboBox.getSelectedIndex()){
        case 0:
        {
            this.nameField.setVisible(true);
            this.idField.setVisible(true);
            this.jLabel2.setVisible(true);
            this.jLabel3.setVisible(true);
            this.addBtn.setText("Add");

            DatabaseUtils databaseUtils = new DatabaseUtils();
            this.idField.setText(databaseUtils.nextId(this, "Course"));

            this.revalidate();
            this.repaint();
            break;
        }
        case 1:
        {
            this.nameField.setVisible(false);
            this.idField.setVisible(false);
            this.jLabel2.setVisible(false);
            this.jLabel3.setVisible(false);
            this.addBtn.setText("Remove");
            this.revalidate();
            this.repaint();
            break;
        }
        default:
            break;
    }
}

private void addBtnActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
    DatabaseUtils dbut = new DatabaseUtils();
    if(this.addBtn.getText().equals("Add")){
        String Table = "Course";
        int ID = Integer.parseInt(this.idField.getText());
        String Name = this.nameField.getText();
        dbut.InsertInto(this, Table, ID, Name);
        DefaultTableModel tableModel = (DefaultTableModel)
jTable1.getModel();
        ArrayList entries = new DatabaseUtils().selectTable(this, "Course");
    }
}
```

```

        for (int a = 0; a < entries.size(); a++) {
            tableModel.addRow((Object[]) entries.get(a));
        }

this.idField.setText(String.valueOf(Integer.parseInt(this.idField.getText()) + 1));
this.nameField.setText("");
    }else if(this.addBtn.getText().equals("Remove")){

    }
}

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

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

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

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

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

```

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

// Variables declaration - do not modify
private javax.swing.JButton addBtn;
private javax.swing.JComboBox<String> addOrRemoveComboBox;
private javax.swing.JButton backBtn;
private javax.swing.JTextField idField;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel3;
private javax.swing.JScrollPane jScrollPane1;
private javax.swing.JTable jTable1;
private javax.swing.JTextField nameField;
// End of variables declaration
}
```

DepartmentsPage.java

```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt
to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/GUIForms/JFrame.java to
edit this template
 */
package org.mondemkhize.jd522summative;

/**
 *
 * @author Monde
 */
public class DepartmentsPage extends javax.swing.JFrame {

    /**
     * Creates new form DepartmentsPage
     */
    public DepartmentsPage() {
        initComponents();
        this.setLocationRelativeTo(null);
    }

    /**
     * This method is called from within the constructor to initialize the form.
     * WARNING: Do NOT modify this code. The content of this method is always
     * regenerated by the Form Editor.
     */
    @SuppressWarnings("unchecked")
```

```
// <editor-fold defaultstate="collapsed" desc="Generated Code">
private void initComponents() {

    courseBtn = new javax.swing.JButton();
    facultyBtn = new javax.swing.JButton();
    backBtn = new javax.swing.JButton();
    adminBtn = new javax.swing.JButton();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    courseBtn.setText("Manage Courses");
    courseBtn.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            courseBtnActionPerformed(evt);
        }
    });

    facultyBtn.setText("Manage Faculty");
    facultyBtn.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            facultyBtnActionPerformed(evt);
        }
    });

    backBtn.setText("Back");
    backBtn.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            backBtnActionPerformed(evt);
        }
    });

    adminBtn.setText("Admin");
    adminBtn.addActionListener(new java.awt.event.ActionListener() {
        public void actionPerformed(java.awt.event.ActionEvent evt) {
            adminBtnActionPerformed(evt);
        }
    });

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

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .add(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .add(courseBtn)
                .add(facultyBtn)
                .add(backBtn)
                .add(adminBtn))
            .addContainerGap())
        .addGroup(layout.createSequentialGroup()
            .add(container)
            .addContainerGap())
    );
}


```

```

        .addComponent(courseBtn)
        .addGap(47, 47, 47)
        .addComponent(facultyBtn)
        .addGap(105, 105, 105))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup())
        .addComponent(backBtn)
        .addGap(44, 44, 44))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
layout.createSequentialGroup())
        .addComponent(adminBtn)
        .addGap(126, 126, 126))))
    );
    layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGap(103, 103, 103)
            .addComponent(adminBtn)
            .addGap(18, 18, 18)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASE
LINE)
            .addComponent(courseBtn)
            .addComponent(facultyBtn))

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 114,
Short.MAX_VALUE)
            .addComponent(backBtn)
            .addGap(37, 37, 37))
    );

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

private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {
    UniResManApp mainPage = new UniResManApp();
    mainPage.setVisible(true);
    this.dispose();
}

private void adminBtnActionPerformed(java.awt.event.ActionEvent evt) {
    AdminPage adminPage = new AdminPage();
    adminPage.setVisible(true);
    this.dispose();
}

private void courseBtnActionPerformed(java.awt.event.ActionEvent evt) {
    CoursesPage coursesPage = new CoursesPage();
    coursesPage.setVisible(true);
    this.dispose();
}

```

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

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

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

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

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

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

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



```
// Variables declaration - do not modify
private javax.swing.JButton adminBtn;
private javax.swing.JButton backBtn;
private javax.swing.JButton courseBtn;
private javax.swing.JButton facultyBtn;
// End of variables declaration
}
```

AdminPage.java

```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt
 to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/GUIForms/JFrame.java to
 edit this template
 */
package org.mondemkhize.jd522summative;

/**
 *
 * @author Monde
 */
public class AdminPage extends javax.swing.JFrame {

    /**
     * Creates new form AdminPage
     */
    public AdminPage() {
        initComponents();
        this.setLocationRelativeTo(null);
    }

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

        manUsersBtn = new javax.swing.JButton();
        systemBtn = new javax.swing.JButton();
        backBtn = new javax.swing.JButton();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        manUsersBtn.setText("Manage Users");
        manUsersBtn.addActionListener(new java.awt.event.ActionListener() {
            public void actionPerformed(java.awt.event.ActionEvent evt) {
                manUsersBtnActionPerformed(evt);
            }
        })
    }
```

```
});

systemBtn.setText("System Settings");

backBtn.setText("Back");
backBtn.addActionListener(new java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent evt) {
        backBtnActionPerformed(evt);
    }
});

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

    layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addGap(51, 51, 51)
            .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addGroup(layout.createSequentialGroup()
                    .addComponent(manUsersBtn)
                    .addGap(48, 48, 48)
                    .addComponent(systemBtn)
                    .addGap(84, 84, 84)
                    .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)
                        .addComponent(backBtn)
                        .addGap(27, 27, 27)))
                .addGap(27, 27, 27))
            .addContainerGap(153, true))
        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASELINE)
            .addComponent(manUsersBtn)
            .addComponent(systemBtn)
            .addGap(76, 76, 76)
            .addComponent(backBtn)
            .addGap(25, 25, 25))
            .addContainerGap(153, true))
        .addGap(51, 51, 51)
    );

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

```
private void backBtnActionPerformed(java.awt.event.ActionEvent evt) {
    UniResManApp mainPage = new UniResManApp();
    mainPage.setVisible(true);
    this.dispose();
}

private void manUsersBtnActionPerformed(java.awt.event.ActionEvent evt) {
    // TODO add your handling code here:
    UsersPage mainPage = new UsersPage();
    mainPage.setVisible(true);
    this.dispose();
}

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

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

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

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

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

```

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

// Variables declaration - do not modify
private javax.swing.JButton backBtn;
private javax.swing.JButton manUsersBtn;
private javax.swing.JButton systemBtn;
// End of variables declaration
}

```

DatabaseUtils.java

```

/*
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to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit
this template
 */
package org.mondemkhize.jd522summative;

/**
 *
 * @author Monde
 */
import java.awt.Component;
import java.sql.*;
import java.util.ArrayList;
import javax.swing.JOptionPane;
public class DatabaseUtils {

    private Connection connect(Component c){
        Connection conn = null;
        String connString =
"jdbc:sqlserver://MONDE;databaseName=UniversityResourceManagement;integr
atedSecurity=true;trustServerCertificate=true";

        try {
            conn = DriverManager.getConnection(connString);

        } catch (SQLException e) {
            System.out.println("Error connecting");
            new JOptionPane().showMessageDialog(c, e.getMessage());
        }
        return conn;
    }

    public ArrayList<String[]> selectTable(Component c, String Table){

```

```
String id, name, depID, facID, courseID, courseMat, grades, students;

ArrayList<String[]> values = new ArrayList();

try (Connection con = this.connect(c)){
    switch (Table) {
        case "Department" -> Table = "Departments";
        case "Faculty" -> Table = "Faculties";
        case "Student" -> Table = "Students";
        case "Course" -> Table = "Courses";
        default -> {
        }
    }

    Statement st = con.createStatement();
    String sql = "select * from "+Table;
    ResultSet rs = st.executeQuery(sql);
    while(rs.next()){
        switch (Table) {
            case "Departments" ->{
                id = String.valueOf(rs.getInt("dep_id"));
                name = rs.getString("dep_name");
                String tableData[] = {id, name};
                values.add(tableData);
                break;
            }
            case "Students" ->{
                id = String.valueOf(rs.getInt("stu_id"));
                name = rs.getString("stu_name");

                depID = String.valueOf(rs.getInt("dep_id"));
                depID = rs.isNull() ? "null" : depID;

                facID = String.valueOf(rs.getInt("fac_id"));
                facID = rs.isNull() ? "null" : facID;

                courseID = String.valueOf(rs.getInt("course_id"));
                courseID = rs.isNull() ? "null" : courseID;

                courseMat = rs.getString("course_materials");
                courseMat = rs.isNull() ? "null" : courseMat;

                grades = rs.getString("grades");
                grades = rs.isNull() ? "null" : grades;
                String tableData[] = {id, name, depID, facID, courseID,
courseMat, grades};
                values.add(tableData);
                break;
            }
            case "Faculties" ->{
                id = String.valueOf(rs.getInt("fac_id"));
                name = rs.getString("fac_name");
```

```

        depID = String.valueOf(rs.getInt("dep_id"));
        depID = rs.isNull() ? "null" : depID;

        courseID = String.valueOf(rs.getInt("course_id"));
        courseID = rs.isNull() ? "null" : courseID;

        String tableData[] = {id, name, depID, courseID};
        values.add(tableData);
        break;
    }
    case "Courses" -> {
        id = String.valueOf(rs.getInt("course_id"));
        name = rs.getString("course_name");

        depID = String.valueOf(rs.getInt("dep_id"));
        depID = rs.isNull() ? "null" : depID;

        facID = String.valueOf(rs.getInt("fac_id"));
        facID = rs.isNull() ? "null" : facID;

        courseMat = rs.getString("course_materials");
        courseMat = rs.isNull() ? "null" : courseMat;

        grades = rs.getString("grades");
        grades = rs.isNull() ? "null" : grades;

        students = rs.getString("students_ids");
        students = rs.isNull() ? "null" : students;

        String tableData[] = {id, name, depID, facID, courseMat,
grades, students};
        values.add(tableData);
    }
    default -> {
        break;
    }
}
}

return values;
} catch (SQLException ex) {
    new JOptionPane().showMessageDialog(c, ex.getMessage());
    return values;
}

}

public String nextId(Component c, String Table){
    int id=0;
    try(Connection con = this.connect(c)){

```

```

String idString = "";
switch (Table) {
    case "Department" -> {
        Table = "Departments";
        idString = "dep_id";
    }
    case "Faculty" -> {
        Table = "Faculties";
        idString = "fac_id";
    }
    case "Student" -> {
        Table = "Students";
        idString = "stu_id";
    }
    case "Course" -> {
        Table = "Courses";
        idString = "course_id";
    }
    default -> {
    }
}

String sql = "select "+idString+" from "+Table;
Statement pstmt = con.createStatement();
ResultSet rs = pstmt.executeQuery(sql);
while(rs.next()){
    //System.out.println(rs.getInt(idString));
    id++;
}
id++;
return String.valueOf(id);

}
catch (SQLException ex) {
    new JOptionPane().showMessageDialog(c, ex.getMessage());
    return "1";
}

}

public void InsertInto(Component c, String Table, int ID, String Name){

    String sql = "";
    switch (Table) {
        case "Department" -> sql ="INSERT INTO
Departments(dep_id,dep_name) VALUES(?,?)";
        case "Faculty" -> sql = "INSERT INTO Faculties(fac_id,fac_name)
VALUES(?,?)";
        case "Student" -> sql = "INSERT INTO Students(stu_id,stu_name)
VALUES(?,?)";
        case "Course" -> sql = "INSERT INTO Courses(course_id,course_name)
VALUES(?,?)";
    }
}

```

```

    default -> {
    }
}

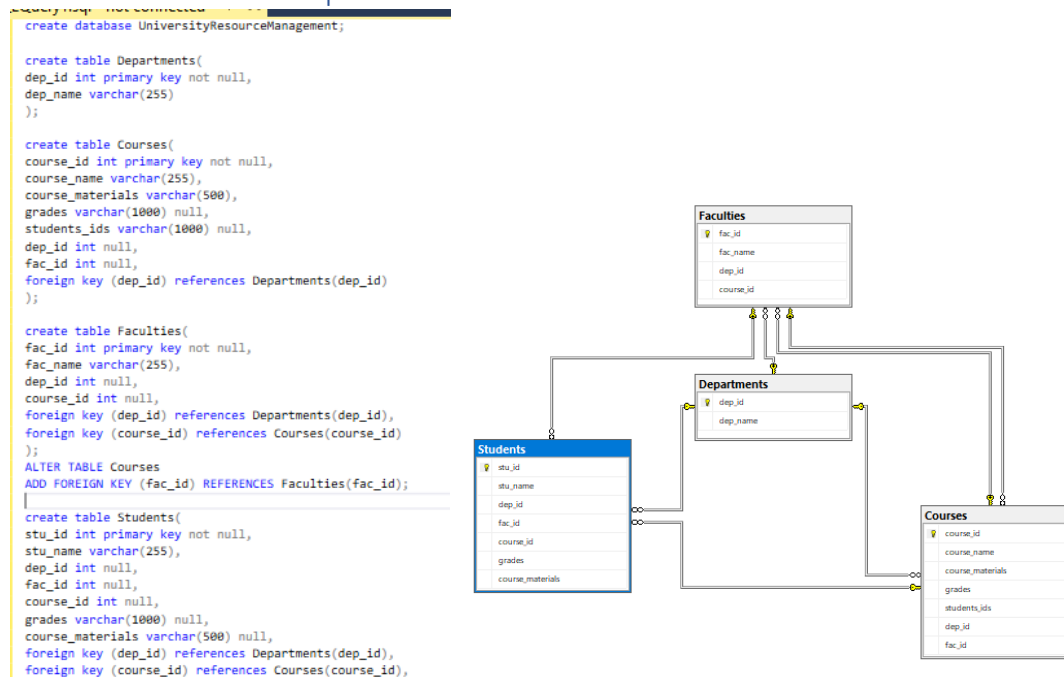
```

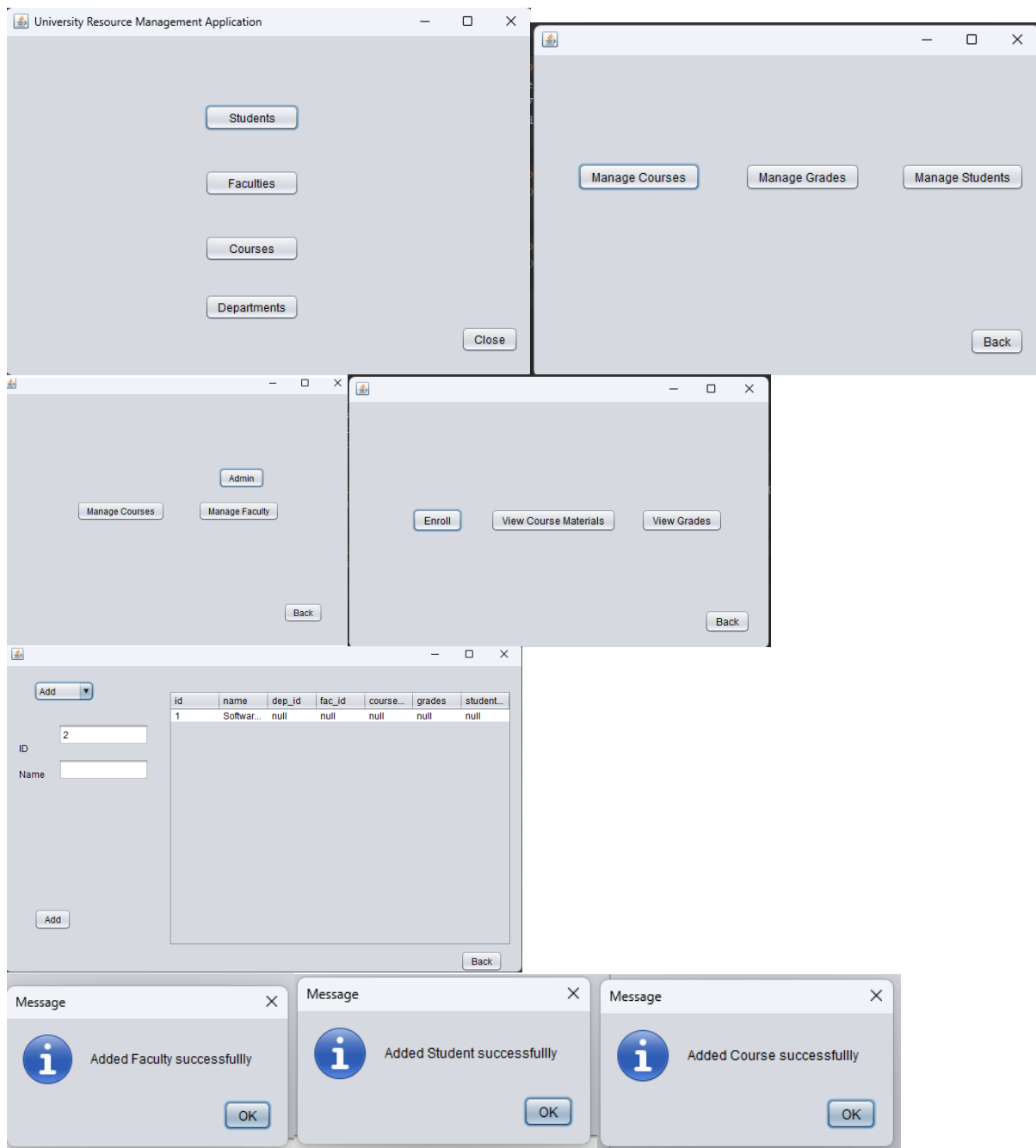
```

try (Connection conn = this.connect(c); PreparedStatement pstmt =
conn.prepareStatement(sql)) {
    pstmt.setInt(1, ID);
    pstmt.setString(2, Name);
    pstmt.executeUpdate();
    new JOptionPane().showMessageDialog(c, "Added "+Table+"
successfully");
} catch (SQLException e) {
    new JOptionPane().showMessageDialog(c, e.getMessage());
}
}
}

```

Screenshots of the output:





Completed Declaration of Authenticity

I, Monde Mkhize, solemnly declare that the work presented in this formative is entirely my own. I have not plagiarized or copied the work of others without proper acknowledgment. I affirm that the content, ideas, and arguments presented herein are the result of my independent effort and an intellectual contribution. I understand the significance of academic integrity and the detrimental consequences of engaging in plagiarism or other forms of dishonesty. Therefore, I assure you the following:

1. All sources used in this work, including but not limited to books, articles, websites, and personal communications, have been appropriately cited and referenced according to the specified guidelines or referencing style.
2. Any direct quotations or paraphrased information from external sources have been identified by using quotation marks or proper citation methods.
3. I have not received any unauthorized assistance or collaboration from others in completing this work, except for instances explicitly permitted by the instructor or clearly stated in the assignment guidelines.
4. The ideas, arguments, and interpretations expressed in this work are my own and have not been submitted for assessment in any other academic setting unless explicitly mentioned and properly acknowledged.
5. I acknowledge that failure to adhere to these principles of academic honesty and integrity may result in severe penalties, including but not limited to the rejection of this work, loss of marks, academic probation, or disciplinary action as deemed appropriate by the educational institution.

Signature: Monde Date: 21 November 2023