Labs

Lab 9.1: Scrollable Result Set

What is the purpose?

In this lab, you will write a program that uses the buttons First, Next, Prior, Last, Insert, Delete, and Update display, and modifies a single record in the Staff table.

The Staff table is created as follows:

```
create table Staff (
        id char(9) not null,
        lastName varchar(15),
        firstName varchar(15),
        mi char(1),
        address varchar(20),
        city varchar(20),
        state char(2),
        zip char(5),
        telephone char(10),
        email varchar(40),
        primary key (id)
);
```

Figure 9-1-1

What are the steps?

- **Task 1**

  Procedure:

  1. Create a Java GUI class named Scrollable. It should display a scrollable view—record by record—and update a database table named staff.
  2. Complete the following code or create your own code:

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

public class Scrollable extends javax.swing.JApplet {
  // Result set
  ResultSet resultSet;

  // Current row number
  int currentRowNumber;

  /** Creates new form Scrollable */
  public Scrollable() {
    initComponents();

    // Connect to database, create statement, get result set
```

```
    initializeDB();
  }

  /** This method is called from within the constructor to
   * initialize the form.
   */
  private void initComponents() {//GEN-BEGIN:initComponents
    jPanel1 = new javax.swing.Jpanel();
    jbtFirst = new javax.swing.Jbutton();
    jbtNext = new javax.swing.Jbutton();
    jbtPrior = new javax.swing.Jbutton();
    jbtLast = new javax.swing.Jbutton();
    jbtInsert = new javax.swing.Jbutton();
    jbtDelete = new javax.swing.Jbutton();
    jbtUpdate = new javax.swing.Jbutton();
    jlblStatus = new javax.swing.Jlabel();
    jpAddress = new javax.swing.Jpanel();
    jPanel2 = new javax.swing.Jpanel();
    jLabel1 = new javax.swing.Jlabel();
    jtfFirstName = new javax.swing.JtextField();
    jLabel2 = new javax.swing.Jlabel();
    jtfMI = new javax.swing.JtextField();
    jLabel3 = new javax.swing.Jlabel();
    jtfLastName = new javax.swing.JtextField();
    jPanel3 = new javax.swing.Jpanel();
    jLabel4 = new javax.swing.Jlabel();
    jtfStreet = new javax.swing.JtextField();
    jPanel4 = new javax.swing.Jpanel();
    jLabel5 = new javax.swing.Jlabel();
    jtfCity = new javax.swing.JtextField();
    jLabel6 = new javax.swing.Jlabel();
    jtfState = new javax.swing.JtextField();
    jLabel7 = new javax.swing.Jlabel();
    jtfZip = new javax.swing.JtextField();
    jPanel5 = new javax.swing.Jpanel();
    jLabel8 = new javax.swing.Jlabel();
    jtfTelephone = new javax.swing.JtextField();
    jPanel6 = new javax.swing.Jpanel();
    jLabel9 = new javax.swing.Jlabel();
    jtfEmail = new javax.swing.JtextField();

    jbtFirst.setText("First");
    jbtFirst.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtFirstActionPerformed(evt);
      }
    });

    jPanel1.add(jbtFirst);

    jbtNext.setText("Next");
    jbtNext.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtNextActionPerformed(evt);
      }
    });
```

```
    jPanel1.add(jbtNext);

    jbtPrior.setText("Prior");
    jPanel1.add(jbtPrior);

    jbtLast.setText("Last");
    jbtLast.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtLastActionPerformed(evt);
      }
    });

    jPanel1.add(jbtLast);

    jbtInsert.setText("Insert");
    jbtInsert.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtInsertActionPerformed(evt);
      }
    });

    jPanel1.add(jbtInsert);

    jbtDelete.setText("Delete");
    jbtDelete.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtDeleteActionPerformed(evt);
      }
    });

    jPanel1.add(jbtDelete);

    jbtUpdate.setText("Update");
    jbtUpdate.addActionListener(new java.awt.event.ActionListener() {
      public void actionPerformed(java.awt.event.ActionEvent evt) {
        jbtUpdateActionPerformed(evt);
      }
    });

    jPanel1.add(jbtUpdate);

    getContentPane().add(jPanel1, java.awt.BorderLayout.NORTH);

    jlblStatus.setText("jLabel1");
    getContentPane().add(jlblStatus, java.awt.BorderLayout.SOUTH);

    jpAddress.setLayout(new java.awt.GridLayout(5, 0));

    jPanel2.setLayout(new
java.awt.FlowLayout(java.awt.FlowLayout.LEFT));

    jLabel1.setText("First Name");
    jPanel2.add(jLabel1);

    jtfFirstName.setColumns(10);
    jPanel2.add(jtfFirstName);
```

```
    jLabel2.setText("MI");
    jPanel2.add(jLabel2);

    jtfMI.setColumns(2);
    jPanel2.add(jtfMI);

    jLabel3.setText("Last Name");
    jPanel2.add(jLabel3);

    jtfLastName.setColumns(15);
    jPanel2.add(jtfLastName);

    jpAddress.add(jPanel2);

    jPanel3.setLayout(new
java.awt.FlowLayout(java.awt.FlowLayout.LEFT));

    jLabel4.setText("Street");
    jPanel3.add(jLabel4);

    jtfStreet.setColumns(40);
    jPanel3.add(jtfStreet);

    jpAddress.add(jPanel3);

    jPanel4.setLayout(new
java.awt.FlowLayout(java.awt.FlowLayout.LEFT));

    jLabel5.setText("City");
    jPanel4.add(jLabel5);

    jtfCity.setColumns(15);
    jPanel4.add(jtfCity);

    jLabel6.setText("State");
    jPanel4.add(jLabel6);

    jtfState.setColumns(2);
    jPanel4.add(jtfState);

    jLabel7.setText("ZIP");
    jPanel4.add(jLabel7);

    jtfZip.setColumns(5);
    jPanel4.add(jtfZip);

    jpAddress.add(jPanel4);

    jPanel5.setLayout(new
java.awt.FlowLayout(java.awt.FlowLayout.LEFT));

    jLabel8.setText("Telephone");
    jPanel5.add(jLabel8);

    jtfTelephone.setColumns(12);
    jPanel5.add(jtfTelephone);
```

```
    jpAddress.add(jPanel5);

    jPanel6.setLayout(new
java.awt.FlowLayout(java.awt.FlowLayout.LEFT));

    jLabel9.setText("Email");
    jPanel6.add(jLabel9);

    jtfEmail.setColumns(25);
    jPanel6.add(jtfEmail);

    jpAddress.add(jPanel6);

    getContentPane().add(jpAddress, java.awt.BorderLayout.CENTER);

  }//GEN-END:initComponents

  private void jbtUpdateActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtUpdateActionPerformed
    try
    {
      updateRecord(); // Update fields in the current row

      // Inovke the update method in the result set
      resultSet.updateRow();
    }
    catch (Exception ex)
    {
      jlblStatus.setText(ex.toString());
    }
  }//GEN-LAST:event_jbtUpdateActionPerformed

  private void jbtDeleteActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtDeleteActionPerformed
    try {
      resultSet.deleteRow();
      jlblStatus.setText("Deletion succeeded");
    }
    catch (Exception ex) {
      jlblStatus.setText(ex.toString());
    }
  }//GEN-LAST:event_jbtDeleteActionPerformed

  private void jbtInsertActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtInsertActionPerformed
    try {
      insert();
      jlblStatus.setText("Insertion succeeded");
    }
    catch (SQLException ex) {
      jlblStatus.setText(ex.getMessage());
    }
  }//GEN-LAST:event_jbtInsertActionPerformed

  private void jbtLastActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtLastActionPerformed
    try {
```

```
      if (resultSet.isFirst())
        jlblStatus.setText("This is already the first row");
      else {
        resultSet.previous();
        showRecord();
      }
    }
    catch (Exception ex) {
      jlblStatus.setText(ex.toString());
    }
  }//GEN-LAST:event_jbtLastActionPerformed

  private void jbtNextActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtNextActionPerformed
    try {
      if (resultSet.isLast())
        jlblStatus.setText("This is already the last row");
      else {
        resultSet.next();
        showRecord();
      }
    }
    catch (Exception ex) {
      jlblStatus.setText(ex.toString());
    }
  }//GEN-LAST:event_jbtNextActionPerformed

  private void jbtFirstActionPerformed(java.awt.event.ActionEvent evt)
{//GEN-FIRST:event_jbtFirstActionPerformed
    try {
      if (resultSet.first())
        showRecord();
      else
        jlblStatus.setText("There is no row in the result set");
    }
    catch (Exception ex) {
      jlblStatus.setText(ex.toString());
    }
  }//GEN-LAST:event_jbtFirstActionPerformed

  /**Initialize the database connection, create statement, and
   *result set */
  private void initializeDB() {
    try {
      // Load the JDBC-ODBC bridge driver
      Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
      System.out.println("Driver loaded");

      // Establish connection
      Connection connection = DriverManager.getConnection
        ("jdbc:odbc:Staff", "", "");
            if (connection != null)
            System.out.println("Database connected");

      // Create a statement
      Statement statement = connection.createStatement
        (ResultSet.TYPE_SCROLL_SENSITIVE,
```

```
          ResultSet.CONCUR_UPDATABLE);

      // Get result set
            String sql = “select lastname, firstname, mi, address,
city, state, zip, telephone, email from Staff”;
      resultSet = statement.executeQuery(sql);
      // Show the first record in the result set
      resultSet.first();
      showRecord();
    }
    catch (Exception ex) {
      jlblStatus.setText(ex.toString());
    }
  }

  private void showRecord() throws Exception {
    jtfFirstName.setText(resultSet.getString(“firstname”));
    jtfLastName.setText(resultSet.getString(“lastname”));
    jtfMI.setText(resultSet.getString(“mi”));
    jtfStreet.setText(resultSet.getString(“address”));
    jtfCity.setText(resultSet.getString(“city”));
    jtfState.setText(resultSet.getString(“state”));
    jtfTelephone.setText(resultSet.getString(“telephone”));
    jtfZip.setText(resultSet.getString(“zip”));
    jtfEmail.setText(resultSet.getString(“email”));

    currentRowNumber = resultSet.getRow();
    jlblStatus.setText(“Current row number: “ + currentRowNumber);
  }

  /**Main method*/
  public static void main(String[] args) {
    Scrollable applet = new Scrollable();
    Jframe frame = new Jframe();
    //EXIT_ON_CLOSE == 3
    frame.setDefaultCloseOperation(3);
    frame.setTitle(“Scrollable Result Set”);
    frame.getContentPane().add(applet, BorderLayout.CENTER);
    applet.init();
    applet.start();
    frame.pack();
    Dimension d = Toolkit.getDefaultToolkit().getScreenSize();
    frame.setLocation((d.width – frame.getSize().width) / 2, (d.height
– frame.getSize().height) / 2);
    frame.setVisible(true);
  }

  /**Insert a new record to the database*/
  protected void insert() throws SQLException {
    // Update the fields
    updateRecord();

    // Insert the row
    resultSet.insertRow();

    // Move the cursor back to the position before the insertion
    resultSet.moveToCurrentRow();
```

```
  }

  /**Update fields in the record*/
  protected void updateRecord() throws SQLException {
    // Gather data from the UI and update the database fields
    resultSet.updateString("firstname",
      jtfFirstName.getText().trim());
    resultSet.updateString("mi", jtfMI.getText().trim());
    resultSet.updateString("lastname", jtfLastName.getText().trim());
    resultSet.updateString("address", jtfStreet.getText().trim());
    resultSet.updateString("city", jtfCity.getText().trim());
    resultSet.updateString("zip", jtfZip.getText().trim());
    resultSet.updateString("telephone",
      jtfTelephone.getText().trim());
    resultSet.updateString("email", jtfEmail.getText().trim());
  }

  // Variables declaration – do not modify//GEN-BEGIN:variables
  private javax.swing.JtextField jtfStreet;
  private javax.swing.JtextField jtfLastName;
  private javax.swing.Jpanel jPanel6;
  private javax.swing.Jpanel jPanel5;
  private javax.swing.Jpanel jPanel4;
  private javax.swing.Jpanel jPanel3;
  private javax.swing.JtextField jtfMI;
  private javax.swing.Jpanel jPanel2;
  private javax.swing.Jpanel jPanel1;
  private javax.swing.Jbutton jbtLast;
  private javax.swing.Jbutton jbtPrior;
  private javax.swing.JtextField jtfCity;
  private javax.swing.JtextField jtfZip;
  private javax.swing.Jbutton jbtUpdate;
  private javax.swing.JtextField jtfEmail;
  private javax.swing.JtextField jtfFirstName;
  private javax.swing.Jlabel jlblStatus;
  private javax.swing.JtextField jtfState;
  private javax.swing.Jbutton jbtInsert;
  private javax.swing.Jbutton jbtFirst;
  private javax.swing.Jlabel jLabel9;
  private javax.swing.Jbutton jbtNext;
  private javax.swing.Jlabel jLabel8;
  private javax.swing.Jpanel jpAddress;
  private javax.swing.Jlabel jLabel7;
  private javax.swing.Jlabel jLabel6;
  private javax.swing.Jlabel jLabel5;
  private javax.swing.Jlabel jLabel4;
  private javax.swing.Jlabel jLabel3;
  private javax.swing.JtextField jtfTelephone;
  private javax.swing.Jlabel jLabel2;
  private javax.swing.Jlabel jLabel1;
  private javax.swing.Jbutton jbtDelete;
  // End of variables declaration//GEN-END:variables

}
```

Figure 9-1-2

Here is a sample of the output:

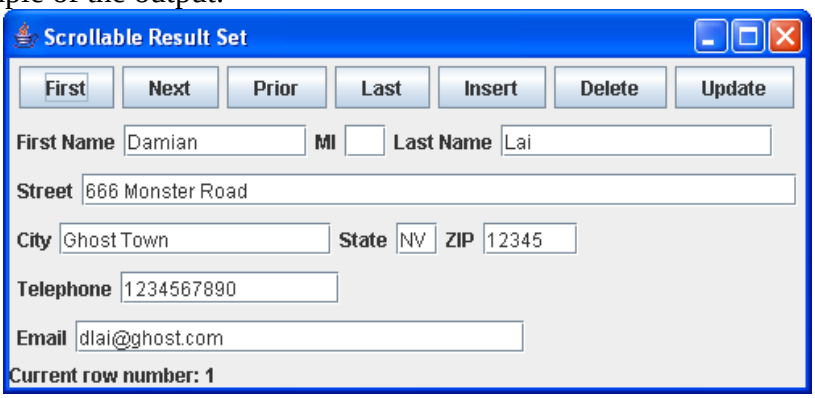

Figure 9-1-3

3. Submit your Java code and sample output to your instructor.

Did it work?

Were you able to use the interface to:

- Display the first record of the Staff table by default?
- Scroll to the next record of the Staff table?
- Scroll to the prior record of the Staff table?
- Display the last record of the Staff table?
- Insert a new record to the Staff table?
- Delete an existing record from the Staff table?
- Update an existing record from the Staff table?

Lab 9.2: Displaying Images and Text from a Database

What is the purpose?

For this lab, you will refer to Example 33.11: StoreAndRetrieveImage.java on pages 28-30 of Chapter 38 available on the *Programming in Java II Student CD*. Test out how to store and retrieve images or other objects in JDBC.

Note: JDBC does not support getBlob() to display image objects for Microsoft Access. Please consult your instructor if you encounter any problems when using other database connections.

What are the steps?

- **Task 1**

  Procedure:

  1. Copy StoreAndRetrieveImage.java on pages 28-30 of Chapter 38 on the *Programming in Java II Student CD*. It can display images and text from a database table called Country.

Note: The code from the book is written for using MySQL. If you want to use MS SQL instead, you need to modify the JDBC DriverManager.getConnection() method.

Here is a sample of the output:

Figure 9-2-1

2. Submit your Java code and sample output to your instructor.

Did it work?

Were you able to:

- Use the interface to display an images and a related description from the Country table?
- Use the interface to scroll to another image wand description with a combo box?