Topic: **Phonebook Application**

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Overview

This Phonebook Application is designed for a Namibian telecommunications company to efficiently manage contacts. It allows users to insert, search, update, delete, and display contacts using basic linear data structures. The application focuses on providing a simple and user-friendly interface for managing contact information.

Features

Insert Contact: Add new contacts to the phonebook.

Search Contact: Find contacts by name.

Update Contact: Modify existing contact information.

Delete Contact: Remove contacts from the phonebook.

Display Contacts: List all contacts in the phonebook.

Sort Contacts: (Optional) Organize contacts alphabetically for quicker access.

Efficiency Analysis: Analyse the performance of the search function.

Modules

1. Insert Module

Function: InsertContact(String name, String phoneNumber) Purpose:

Adds a new contact to the phonebook.

2. Search Module

Function: SearchContact(String name)

Purpose: Searches for a contact by name and returns the contact details.

3. Update Module

Function: UpdateContact(String name, String newPhoneNumber) Purpose:

Updates the phone number of an existing contact.

4. Delete Module

Function: DeleteContact(String name)

Purpose: Deletes a contact from the phonebook.

5. Display Module

Function: DisplayContacts()

Purpose: Displays all contacts currently stored in the phonebook.

Pseudocode

Insert Module:

```
Start
FUNCTION InsertContact(phonebook, name, phoneNumber)
   NEW_NODE = CREATE_NODE(name, phoneNumber)
IF phonebook IS EMPTY THEN        phonebook =
NEW_NODE
   ELSE
      CURRENT = phonebook
```

```
        WHILE CURRENT.next IS NOT NULL DO
            CURRENT = CURRENT.next
        END WHILE
        CURRENT.next = NEW_NODE
    END IF
END FUNCTION
End
```

Search Module:

```
Start
FUNCTION SearchContact(phonebook, name)
    CURRENT = phonebook
    WHILE CURRENT IS NOT NULL DO
        IF CURRENT.name == name THEN
            RETURN CURRENT.phoneNumber
        END IF
        CURRENT = CURRENT.next
    END WHILE
    RETURN "Contact not found"
END FUNCTION
End
```

Display Module:

```
BEGIN
    Prompt user for contact details
    Get Contacts
```

If (Contacts name and number not found) THEN

Display ‘’No contacts available’’

END

ELSE If (contact name AND number found) THEN Display ‘’Contact Details found’’

END IF

END IF

END

DELETE MODULE :

START

DATA: contact name
PHONE: contact phone number
NEXT: pointer to next contact
PREV: pointer to previous contact

CONSTRUCTOR Node(name, phone, email)
DATA = name
PHONE = phone
NEXT = NULL
PREV = NULL

FUNCTION deleteAtGivenPos(head)
TEMP = head
DISPLAY "Enter position where you want to delete"
GET position
i =
1
WHILE(i < position - 1)
IF temp.next is null

```
            DISPLAY "Contact not found"
              RETURN head
          ENDIF

          TEMP = TEMP.NEXT
              i = i + 1
          ENDWHILE

          IF temp.next is null
            DISPLAY "Contact not found"
              RETURN head
         ENDIF

nextnode = temp.next
temp.next = nextnode.next

          IF nextnode.next is not null
nextnode.next.prev = temp
          ENDIF

nextnode = free
DISPLAY "Contact deleted successfully”
```

```
RETURN head

    head = deleteAtGivenPos(head)

END
```

Update Module:

```
  Start
        FUNCTION UpdateContact(phonebook, name, newContact)
              FOR EACH contact IN phonebook
                IF contact.name == name
                  contact = newContact
RETURN "Contact updated"
                END IF
            END FOR
                RETURN "Contact not found"
         END FUNCTION
   End
```

Sort Module:

```
Start
FUNCTION SortContacts(phonebook)
    IF phonebook IS NULL OR phonebook.next IS NULL THEN
            RETURN phonebook
      END IF
          SPLIT_LINKED_LIST(phonebook, LEFT, RIGHT)
      LEFT = SortContacts(LEFT)
      RIGHT = SortContacts(RIGHT)
```

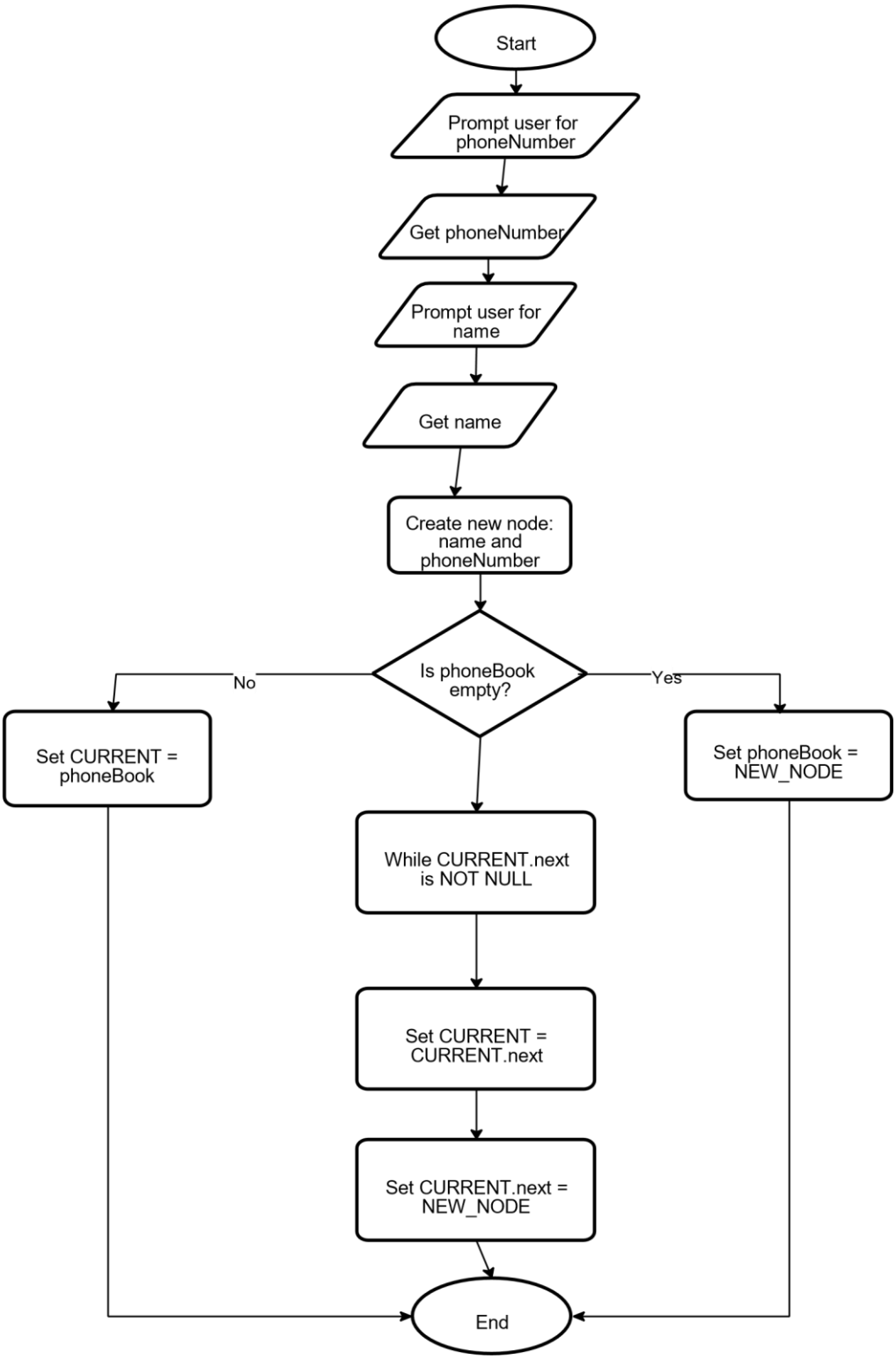
```
    RETURN MERGE(LEFT, RIGHT)
END FUNCTION
End
```

Analyse the efficiency of your search Algorithm

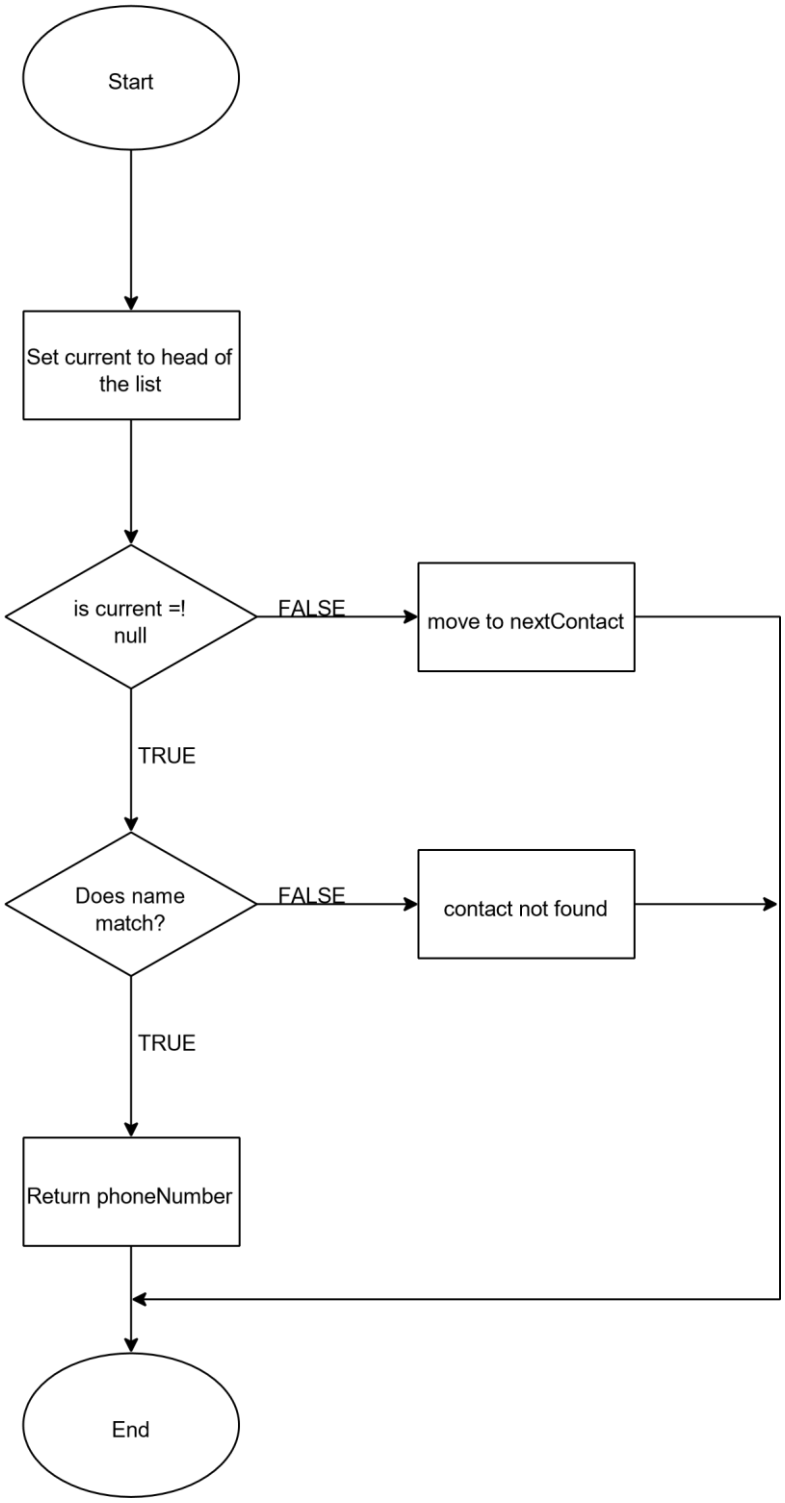
```
Start
    FUNCTION AnalyzeSearchEfficiency(phonebook, name)
START_TIME = CURRENT_TIME()
       result = SearchContact(phonebook, name)
       END_TIME = CURRENT_TIME()
            TIME_TAKEN = END_TIME - START_TIME
         PRINT "Search result:", result
         PRINT "Time taken:", TIME_TAKEN
      END FUNCTION
End
```

Flowcharts

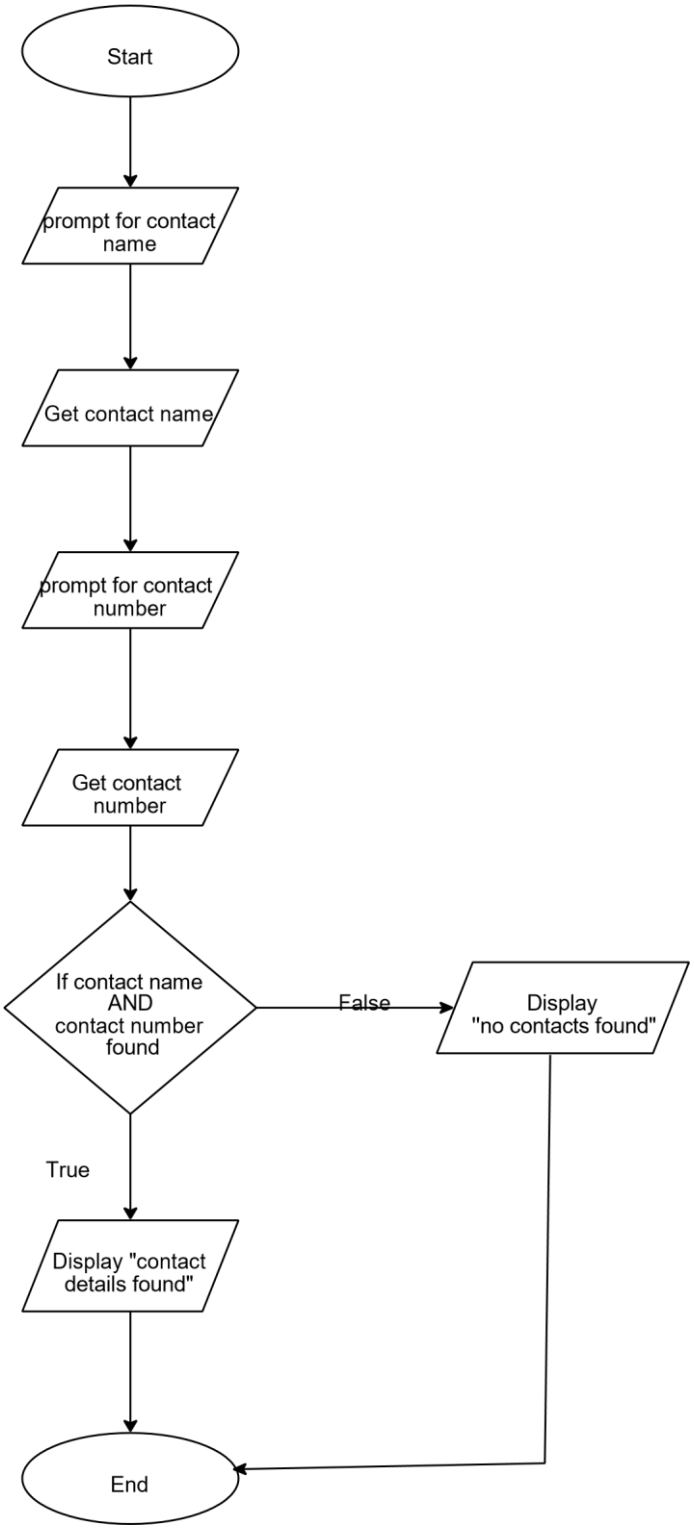
Insert Module:



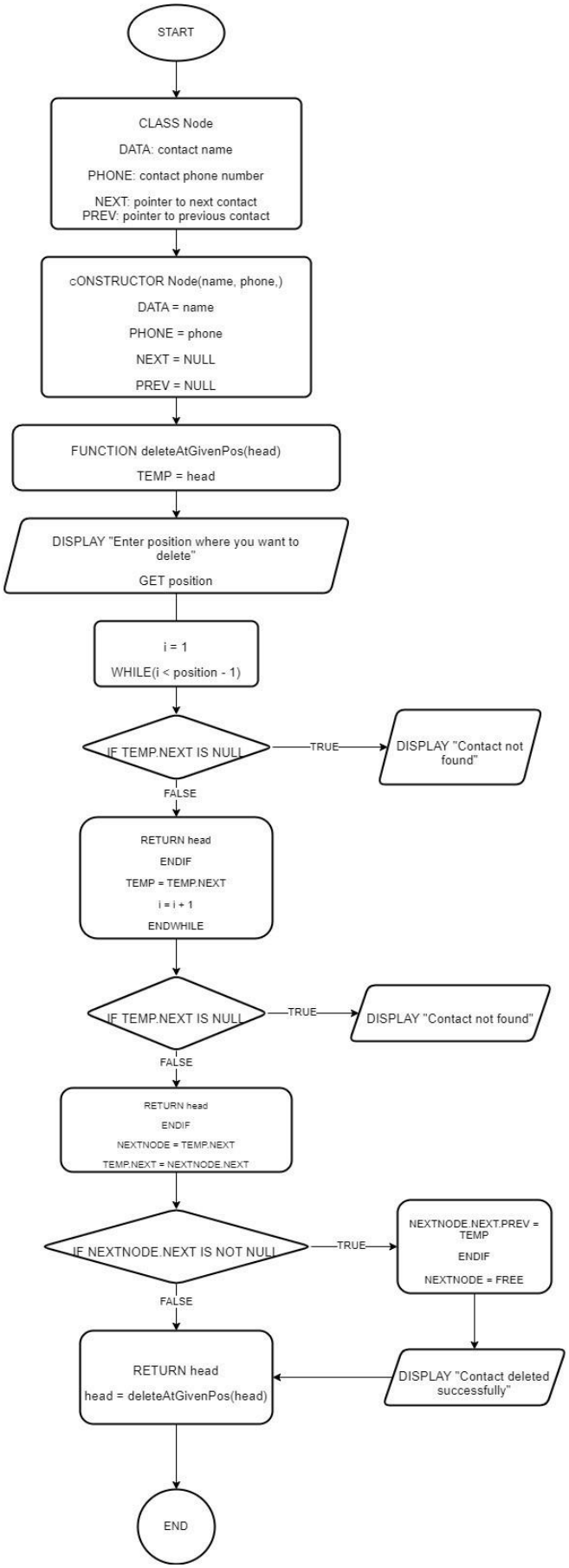
Search Module:



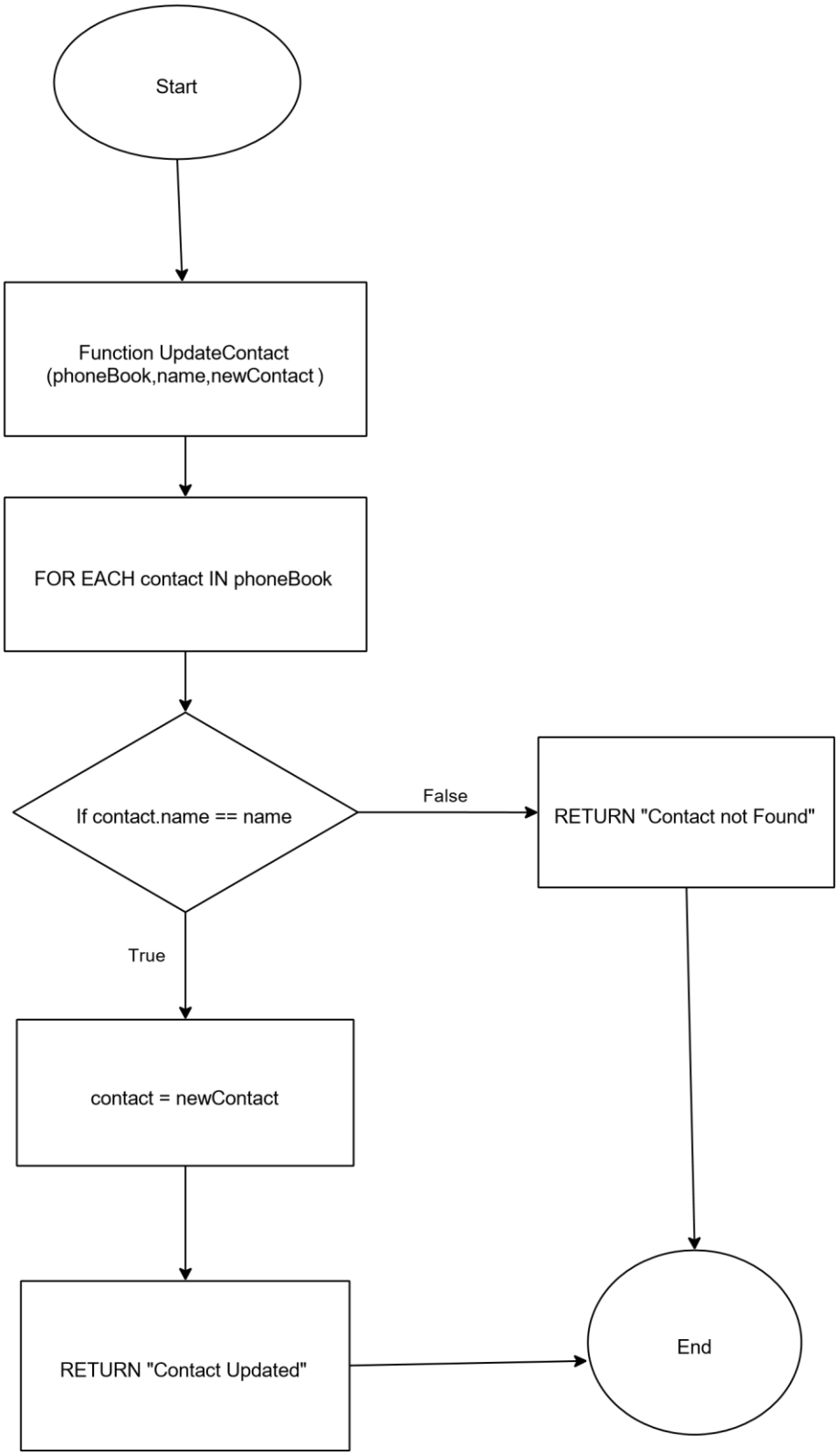
Display Module:



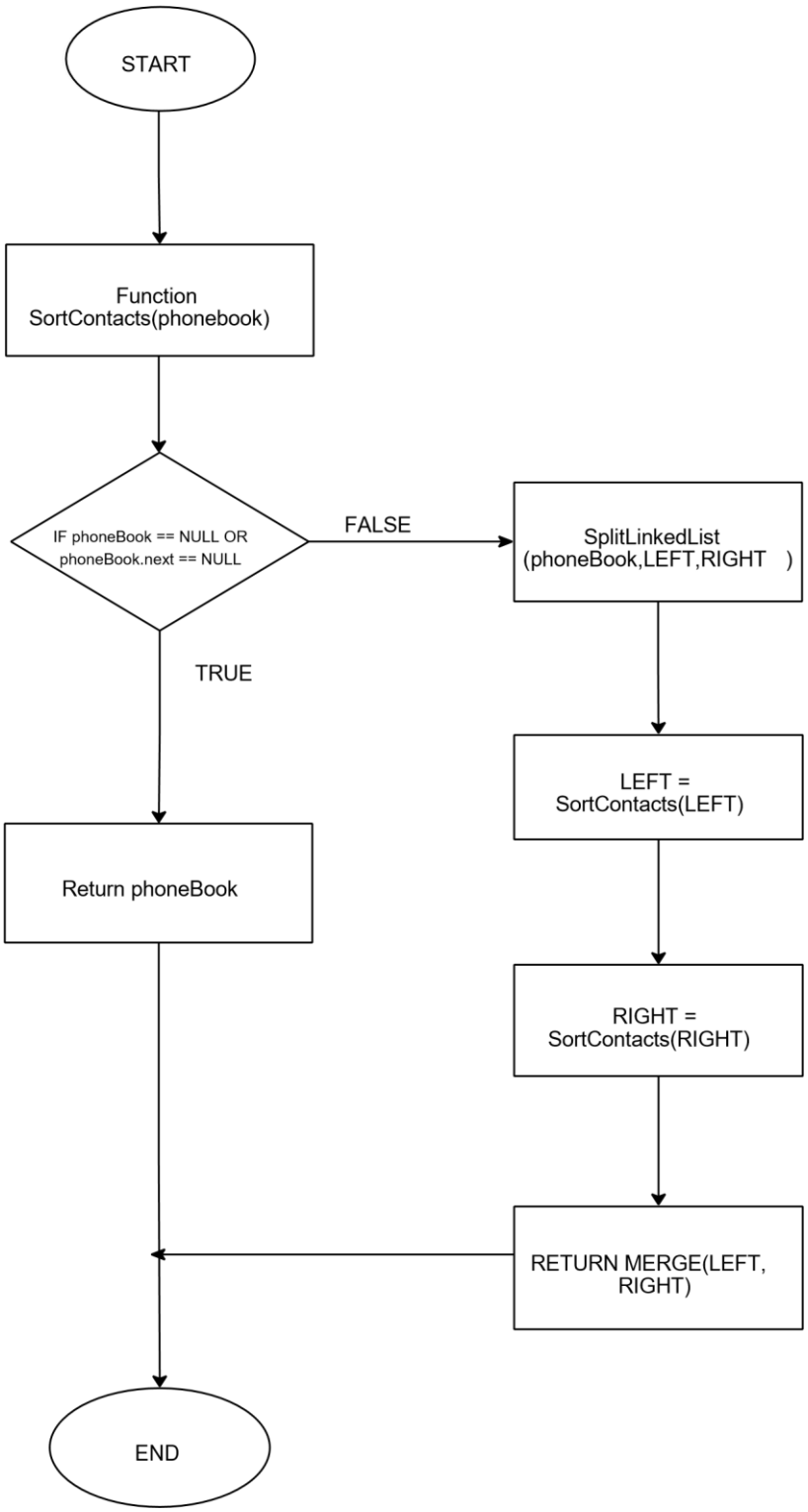
Delete Module:


START
CLASS Node
DATA: contact name
PHONE: contact phone number
NEXT: pointer to next contact
PREV: pointer to previous contact
cONSTRUCTOR Node(name, phone,)
DATA = name
PHONE = phone
NEXT = NULL
PREV = NULL
FUNCTION deleteAtGivenPos(head)
TEMP = head
DISPLAY "Enter position where you want to delete"
GET position
i = 1
WHILE(i < position - 1)
IF TEMP.NEXT IS NULL
TRUE
DISPLAY "Contact not found"
FALSE
RETURN head
ENDIF
TEMP = TEMP.NEXT
i = i + 1
ENDWHILE
IF TEMP.NEXT IS NULL
TRUE
DISPLAY "Contact not found"
FALSE
RETURN head
ENDIF
NEXTNODE = TEMP.NEXT
TEMP.NEXT = NEXTNODE.NEXT
IF NEXTNODE.NEXT IS NOT NULL
TRUE
NEXTNODE.NEXT.PREV = TEMP
ENDIF
NEXTNODE = FREE
FALSE
RETURN head
head = deleteAtGivenPos(head)
DISPLAY "Contact deleted successfully"
END

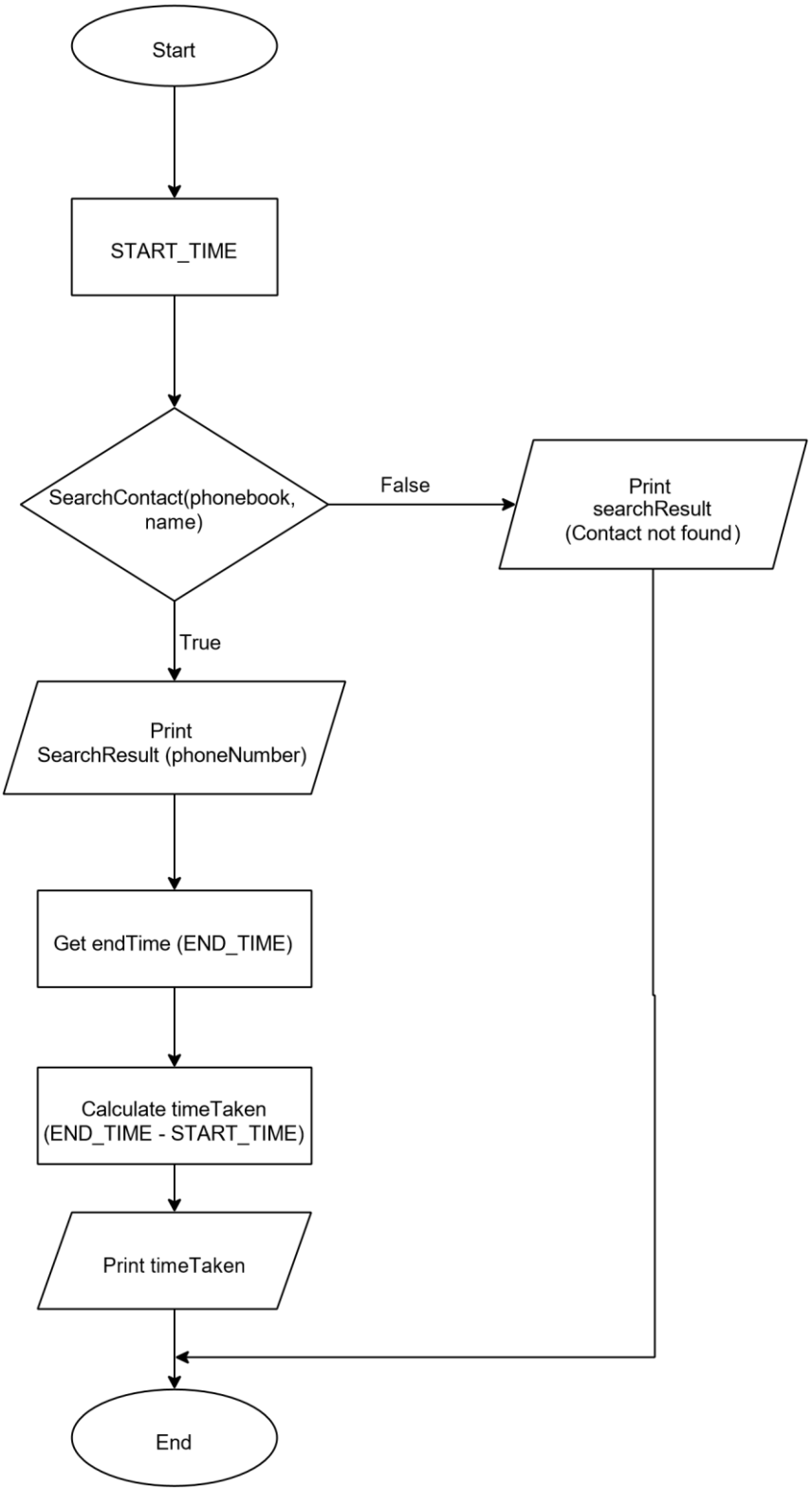
Update Module:



Sort Module:


START
Function SortContacts(phonebook)
IF phoneBook == NULL OR phoneBook.next == NULL
FALSE
TRUE
SplitLinkedList (phoneBook,LEFT,RIGHT)
LEFT = SortContacts(LEFT)
RIGHT = SortContacts(RIGHT)
RETURN MERGE(LEFT, RIGHT)
Return phoneBook
END

Analyse the efficiency of your search Algorithm



Contributors

Student Name	Contribution
Uahenua P.M Hengari	Pseudocode and flowchart for Insert Contact.
Natanael N. Treves	Pseudocode and flowchart for Search Contact. Pseudocode and flowchart for analyse the efficiency of your search Algorithm.
Iiyambo T. Nangombe	Pseudocode and flowchart for Display Contacts.
Wapingena Muukua	Pseudocode and flowchart for Delete Contact
Ally M. Kafidi	Pseudocode and flowchart for Update Contact.
Simeon P. Penda	Pseudocode and flowchart for Sorting Contact.

Codes

Admin login code.

```
package phnbook;


import java.awt.Component;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import java.sql.Connection; import
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.Connection; import
```

```
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.ResultSet; import
java.sql.ResultSetMetaData;
import javax.swing.JOptionPane;
import java.sql.SQLException;
import javax.swing.JOptionPane;
import
javax.swing.table.DefaultTableMo
del;

/**
 *
* @author KTCC
 */
public class Admin extends javax.swing.JFrame {

    /**
* Creates new form Admin
     */
    public Admin() {
initComponents();
    }

    /**
* 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() {

        jLabel3 = new javax.swing.JLabel();
jPanel1 = new javax.swing.JPanel();         jLabel1
= new javax.swing.JLabel();         jLabel2 = new
javax.swing.JLabel();         jPanel2 = new
javax.swing.JPanel();         jLabel4 = new
javax.swing.JLabel();         jLabel5 = new
javax.swing.JLabel();         cnCancel = new
javax.swing.JButton();          txtusername = new
javax.swing.JTextField();         txtpass = new
javax.swing.JPasswordField();         cnLog = new
javax.swing.JButton();

        jLabel3.setText("jLabel3");

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

        jPanel1.setBackground(new java.awt.Color(153, 153, 153));
        jPanel1.setBorder(javax.swing.BorderFactory.createLineBorder(new  java.awt.Color(0,
0, 0)));

        jLabel1.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
jLabel1.setText("Admin Login ");

        jLabel2.setText("Please enter your login details!!");

        javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
jPanel1.setLayout(jPanel1Layout);         jPanel1Layout.setHorizontalGroup(
```

```
        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup()
            .addGap(177, 177, 177)
            .addComponent(jLabel1)
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel1Layout.createSequentialGroup()
            .addContainerGap(139, Short.MAX_VALUE)
            .addComponent(jLabel2,    javax.swing.GroupLayout.PREFERRED_SIZE,
        175, javax.swing.GroupLayout.PREFERRED_SIZE)
            .addGap(134, 134, 134))
    );
    jPanel1Layout.setVerticalGroup(
jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup()
            .addContainerGap()
            .addComponent(jLabel1)
            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
            .addComponent(jLabel2)
            .addContainerGap(10, Short.MAX_VALUE))
    );

    jPanel2.setBorder(javax.swing.BorderFactory.createLineBorder(new  java.awt.Color(0,
0, 0), 2));

    jLabel4.setText("Username");

    jLabel5.setText("Password");

    cnCancel.setBackground(new java.awt.Color(102, 102, 102));
cnCancel.setFont(new java.awt.Font("Segoe UI", 1, 12)); // NOI18N
```

```
cnCancel.setText("Cancel");
cnCancel.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.B
evel Border.RAISED));
        cnCancel.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnCancelActionPerformed(evt);
            }
        });

        txtusername.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
txtusernameActionPerformed(evt);
            }
        });

        cnLog.setBackground(new java.awt.Color(102, 102, 102));
cnLog.setFont(new java.awt.Font("Segoe UI", 1, 12)); // NOI18N
cnLog.setText("log in");

cnLog.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBo
rder.RAISED));
        cnLog.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnLogActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel2Layout = new javax.swing.GroupLayout(jPanel2);
jPanel2.setLayout(jPanel2Layout);        jPanel2Layout.setHorizontalGroup(
```

```
        jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel2Layout.createSequentialGroup()
            .addGap(22, 22, 22)

.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
                .addComponent(jLabel4, javax.swing.GroupLayout.PREFERRED_SIZE,
        85, javax.swing.GroupLayout.PREFERRED_SIZE)
                .addComponent(jLabel5, javax.swing.GroupLayout.PREFERRED_SIZE,
        73, javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGap(68, 68, 68)

.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG, false)
                .addComponent(txtusername)
                .addComponent(txtpass, javax.swing.GroupLayout.DEFAULT_SIZE, 176,
Short.MAX_VALUE))
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel2Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(cnCancel, javax.swing.GroupLayout.PREFERRED_SIZE, 70,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addGap(18, 18, 18)
            .addComponent(cnLog, javax.swing.GroupLayout.PREFERRED_SIZE, 70,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap())
    );
    jPanel2Layout.setVerticalGroup(
        jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel2Layout.createSequentialGroup()
            .addGap(60, 60, 60)
```

```
.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)
                .addComponent(jLabel4)
                .addComponent(txtusername,     javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGap(60, 60, 60)

.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)
                .addComponent(jLabel5)
                .addComponent(txtpass, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGap(31, 133, Short.MAX_VALUE))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel2Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)

.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)
                .addComponent(cnLog,  javax.swing.GroupLayout.PREFERRED_SIZE,      28,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addComponent(cnCancel, javax.swing.GroupLayout.PREFERRED_SIZE, 28,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addContainerGap())
    );


    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);        layout.setHorizontalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
```

```
        .addComponent(jPanel1, javax.swing.GroupLayout.Alignment.TRAILING,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
        .addComponent(jPanel2, javax.swing.GroupLayout.Alignment.TRAILING,
javax.swing.GroupLayout.DEFAULT_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
    );
    layout.setVerticalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addGap(18, 18, 18)
            .addComponent(jPanel2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
            .addContainerGap())
    );

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

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

    Component frame = new JFrame("Exit");
    if (JOptionPane.showConfirmDialog(frame, "Confirm if you want to exit","Contact
Management",
        JOptionPane.YES_NO_CANCEL_OPTION)==JOptionPane.YES_OPTION)
    {
      System.exit(0);
    }
  }
```

```
    private void cnLogActionPerformed(java.awt.event.ActionEvent evt) {

        // Get the username and password from your input fields
    String username = txtusername.getText(); // Assume this is your username input field
    String passwordInput = new String(txtpass.getPassword()); // Assume this is your
password input field

    // Database connection details
    String url = "jdbc:mysql://localhost:3306/phonebook";
    String user = "root";
    String password = "6161586";

    Connection conn = null;
    PreparedStatement pstmt = null;
    ResultSet rs = null;
     try
{
        // Establish the connection
        conn = DriverManager.getConnection(url, user, password);

        // Prepare the SQL query
        String sql = "SELECT * FROM admin WHERE user_name = ? AND password = ?";
pstmt = conn.prepareStatement(sql);         pstmt.setString(1, username);
pstmt.setString(2, passwordInput);

        // Execute the query
rs = pstmt.executeQuery();
```

```
        // Check if a result was returned
if (rs.next()) {
            // Login successful, proceed to the next JFrame
            new contact().setVisible(true); // Assuming ContactFrame is your next JFrame
this.dispose(); // Close the current JFrame if needed
        } else {
            // Show an error message if login fails
            JOptionPane.showMessageDialog(this, "Invalid username or password.", "Login
Failed", JOptionPane.ERROR_MESSAGE);
        }
    } catch (SQLException e) {
e.printStackTrace();
        JOptionPane.showMessageDialog(this, "Database connection error.",
            "Error", JOptionPane.ERROR_MESSAGE);
    } finally {
        // Close resources
try {
            if (rs != null) rs.close();
if (pstmt != null) pstmt.close();
if (conn != null) conn.close();         }
catch (SQLException e) {
e.printStackTrace();
        }
    }
    }


    private void txtusernameActionPerformed(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(Admin.class.getName()).log(java.util.logging.Level.SEV
ERE, null, ex);
        } catch (InstantiationException ex) {

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

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

java.util.logging.Logger.getLogger(Admin.class.getName()).log(java.util.logging.Level.SEV
ERE, null, ex);
```

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

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

    // Variables declaration - do not modify
private javax.swing.JButton cnCancel;
private javax.swing.JButton cnLog;     private
javax.swing.JLabel jLabel1;     private
javax.swing.JLabel jLabel2;     private
javax.swing.JLabel jLabel3;     private
javax.swing.JLabel jLabel4;     private
javax.swing.JLabel jLabel5;     private
javax.swing.JPanel jPanel1;     private
javax.swing.JPanel jPanel2;     private
javax.swing.JPasswordField txtpass;     private
javax.swing.JTextField txtusername;
    // End of variables declaration
}
```

ConnectionToDB

```
package phnbook; import
java.sql.Connection; import
java.sql.DriverManager; import
java.sql.SQLException; public
class connectionToDB {
private static final String
DB_URL =
"jdbc:mysql://localhost:3306/c
onnector";  // Change database
name, if needed

   private static final String DB_USER = "root";  // Your MySQL username
private static final String DB_PASSWORD = "6161586";  // Your MySQL password


   // Method to establish the connection
public static Connection getConnection() {
      Connection conn = null;
       try
{
         // Register the MySQL driver (optional for modern versions of JDBC)
         Class.forName("com.mysql.cj.jdbc.Driver");          //          MySQL          8
         and      later      use `com.mysql.cj.jdbc.Driver`


         // Attempt to establish a connection
         conn = DriverManager.getConnection(DB_URL, DB_USER, DB_PASSWORD);
         System.out.println("Connection to database established successfully.");
      } catch (ClassNotFoundException e) {
```

```
            System.err.println("MySQL JDBC Driver not found.");
e.printStackTrace();
        } catch (SQLException e) {
            System.err.println("Failed to connect to the database.");
e.printStackTrace();
        }

        return conn;
    }
}
```

Contact Management System code (Inserting, Deleting, Updating, Sorting, Displaying and Searching)

package phnbook;

```
import java.sql.Connection; import
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.Connection; import
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.ResultSet; import
java.sql.ResultSetMetaData; import
javax.swing.JOptionPane; import
java.sql.SQLException; import
```

```
javax.swing.JFrame; import
javax.swing.JOptionPane; import
javax.swing.table.DefaultTableModel;

/**
 *
 * @author KTCC
 */
public class contact extends javax.swing.JFrame {

private static final String username = "root"; private
static final String password = "6161586"; private
static final String dataConn =
"jdbc:mysql://localhost:3306/connector";

Connection sqlConn = null;
PreparedStatement pst = null;
ResultSet rs = null; int q, i,
id, deleteItem;     private
Object stmt;


    public contact() {
initComponents();
    }

    /**
```

```
     * 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() {

        jPanel1 = new javax.swing.JPanel();
jLabel1 = new javax.swing.JLabel();
jPanel2 = new javax.swing.JPanel();         cnAdd
= new javax.swing.JButton();         cnUpdate =
new javax.swing.JButton();         cnDelete =
new javax.swing.JButton();         cnDisplay =
new javax.swing.JButton();         jLabel5 = new
javax.swing.JLabel();         cnCancel = new
javax.swing.JButton();         cnSort = new
javax.swing.JButton();         jPanel3 = new
javax.swing.JPanel();         jLabel2 = new
javax.swing.JLabel();         jLabel3 = new
javax.swing.JLabel();         jLabel4 = new
javax.swing.JLabel();         txtId = new
javax.swing.JTextField();         txtlastName =
new javax.swing.JTextField();         txtfirstName
= new javax.swing.JTextField();         jLabel6 =
new javax.swing.JLabel();
txtphoneNumber = new
javax.swing.JTextField();         cnReset = new
javax.swing.JButton();         inputName = new
```

```
javax.swing.JTextField();        cnSearch = new
javax.swing.JButton();        jScrollPane1 = new
javax.swing.JScrollPane();        jTable1 = new
javax.swing.JTable();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    jPanel1.setBackground(new java.awt.Color(153, 153, 153));
    jPanel1.setBorder(javax.swing.BorderFactory.createLineBorder(new java.awt.Color(51,
51, 51)));

    jLabel1.setFont(new java.awt.Font("Segoe UI", 1, 24)); // NOI18N
jLabel1.setText("Contact management");

    javax.swing.GroupLayout jPanel1Layout = new javax.swing.GroupLayout(jPanel1);
jPanel1.setLayout(jPanel1Layout);        jPanel1Layout.setHorizontalGroup(
        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
.addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel1Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(jLabel1)
            .addGap(371, 371, 371))
    );
    jPanel1Layout.setVerticalGroup(
        jPanel1Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel1Layout.createSequentialGroup()
            .addGap(24, 24, 24)
            .addComponent(jLabel1)
            .addContainerGap(7, Short.MAX_VALUE))
```

```
        );

        jPanel2.setBackground(new java.awt.Color(204, 204, 204));
        jPanel2.setBorder(javax.swing.BorderFactory.createLineBorder(new java.awt.Color(0, 0, 0), 3));

        cnAdd.setBackground(new java.awt.Color(102, 102, 102));
cnAdd.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnAdd.setText("Add new");

cnAdd.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));
        cnAdd.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnAddActionPerformed(evt);
            }
        });

        cnUpdate.setBackground(new java.awt.Color(102, 102, 102));
        cnUpdate.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnUpdate.setText("Update");

cnUpdate.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBorder.RAISED));
        cnUpdate.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnUpdateActionPerformed(evt);
            }
        });
```

```
        cnDelete.setBackground(new java.awt.Color(102, 102, 102));
cnDelete.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnDelete.setText("Delete");

cnDelete.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.Bevel
Border.RAISED));
        cnDelete.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnDeleteActionPerformed(evt);
            }
        });

        cnDisplay.setBackground(new java.awt.Color(102, 102, 102));
cnDisplay.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnDisplay.setText("Display");

cnDisplay.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.Beve
lBorder.RAISED));
        cnDisplay.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
                cnDisplayActionPerformed(evt);
            }
        });

        jLabel5.setText("Sort: ASC");

        cnCancel.setBackground(new java.awt.Color(102, 102, 102));
cnCancel.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnCancel.setText("Cancel");
```

```
cnCancel.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.Bevel
Border.RAISED));
        cnCancel.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnCancelActionPerformed(evt);
            }
        });

        cnSort.setBackground(new java.awt.Color(102, 102, 102));
cnSort.setFont(new java.awt.Font("Segoe UI", 1, 18)); // NOI18N
cnSort.setText("Sort");

cnSort.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelBo
rder.RAISED));
        cnSort.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnSortActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel2Layout = new javax.swing.GroupLayout(jPanel2);
jPanel2.setLayout(jPanel2Layout);        jPanel2Layout.setHorizontalGroup(
jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel2Layout.createSequentialGroup()
                .addGap(17, 17, 17)

.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)
                    .addComponent(cnSort, javax.swing.GroupLayout.PREFERRED_SIZE, 120,
javax.swing.GroupLayout.PREFERRED_SIZE)
                    .addComponent(cnCancel, javax.swing.GroupLayout.PREFERRED_SIZE, 120,
javax.swing.GroupLayout.PREFERRED_SIZE)
```

```
.addGroup(jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILI
NG, false)
                .addComponent(cnAdd, javax.swing.GroupLayout.DEFAULT_SIZE, 120,
Short.MAX_VALUE)
                .addComponent(cnDelete, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(cnUpdate, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addComponent(cnDisplay, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
              .addComponent(jLabel5))
            .addContainerGap(17, Short.MAX_VALUE))
        );
        jPanel2Layout.setVerticalGroup(
           jPanel2Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
           .addGroup(jPanel2Layout.createSequentialGroup()
              .addContainerGap()
              .addComponent(cnAdd, javax.swing.GroupLayout.PREFERRED_SIZE, 35,
javax.swing.GroupLayout.PREFERRED_SIZE)
              .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
              .addComponent(cnDelete, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
              .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
              .addComponent(cnUpdate, javax.swing.GroupLayout.PREFERRED_SIZE, 43,
              javax.swing.GroupLayout.PREFERRED_SIZE)
              .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
              .addComponent(cnDisplay, javax.swing.GroupLayout.PREFERRED_SIZE, 41,
javax.swing.GroupLayout.PREFERRED_SIZE)
              .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
              .addComponent(jLabel5)
              .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
```

```
            .addComponent(cnSort, javax.swing.GroupLayout.PREFERRED_SIZE, 31,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
            .addComponent(cnCancel, javax.swing.GroupLayout.PREFERRED_SIZE, 33,
javax.swing.GroupLayout.PREFERRED_SIZE)
            .addContainerGap())
        );

        jPanel3.setBackground(new java.awt.Color(204, 204, 204));
        jPanel3.setBorder(javax.swing.BorderFactory.createLineBorder(new java.awt.Color(0,
0, 0), 3));

        jLabel2.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
jLabel2.setText("Id");

        jLabel3.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
jLabel3.setText("First Name");

        jLabel4.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
jLabel4.setText("Last Name");

        jLabel6.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
jLabel6.setText("Phone Number");

        cnReset.setBackground(new java.awt.Color(102, 102, 102));
cnReset.setFont(new java.awt.Font("Segoe UI", 1, 14)); // NOI18N
cnReset.setText("Reset");

cnReset.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.BevelB
order.RAISED));
```

```
        cnReset.addActionListener(new java.awt.event.ActionListener() {
public void actionPerformed(java.awt.event.ActionEvent evt) {
cnResetActionPerformed(evt);
            }
        });

        javax.swing.GroupLayout jPanel3Layout = new javax.swing.GroupLayout(jPanel3);
jPanel3.setLayout(jPanel3Layout);        jPanel3Layout.setHorizontalGroup(
            jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
            .addGroup(jPanel3Layout.createSequentialGroup()
                .addGap(31, 31, 31)

.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG)

.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADI
NG, false)
                    .addComponent(jLabel2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                    .addComponent(jLabel3, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                    .addComponent(jLabel4, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))
                .addComponent(jLabel6))
            .addGap(195, 195, 195)
            .addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignme
            nt.LEADI NG)
                .addComponent(txtfirstName, javax.swing.GroupLayout.DEFAULT_SIZE, 365,
Short.MAX_VALUE)
                .addComponent(txtlastName)
                .addComponent(txtId)
                .addComponent(txtphoneNumber))
```

```
            .addGap(75, 75, 75))
        .addGroup(javax.swing.GroupLayout.Alignment.TRAILING,
jPanel3Layout.createSequentialGroup()
            .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,
Short.MAX_VALUE)
            .addComponent(cnReset)
            .addContainerGap())
    );
    jPanel3Layout.setVerticalGroup(
        jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(jPanel3Layout.createSequentialGroup()
            .addContainerGap()
            .addComponent(cnReset)
            .addGap(1, 1, 1)

.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)
                .addComponent(jLabel2)
                .addComponent(txtId, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
            .addGap(39, 39, 39)

.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)
                .addComponent(txtfirstName, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)
                .addComponent(jLabel3))
            .addGap(36, 36, 36)

.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILI
NG)
```

```
                .addComponent(txtlastName, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)

                .addComponent(jLabel4))

            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED, 37,
Short.MAX_VALUE)


.addGroup(jPanel3Layout.createParallelGroup(javax.swing.GroupLayout.Alignment.BASEL
INE)

                .addComponent(jLabel6)

                .addComponent(txtphoneNumber,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))

            .addGap(30, 30, 30))

        );


        cnSearch.setBackground(new java.awt.Color(153, 153, 153));

cnSearch.setFont(new java.awt.Font("Segoe UI", 1, 12)); // NOI18N

cnSearch.setText("Search");


cnSearch.setBorder(javax.swing.BorderFactory.createBevelBorder(javax.swing.border.Bevel
Border.RAISED));

        cnSearch.addActionListener(new java.awt.event.ActionListener() {

public void actionPerformed(java.awt.event.ActionEvent evt) {

cnSearchActionPerformed(evt);

            }

        });


        jTable1.setBackground(new java.awt.Color(204, 204, 204));

jTable1.setModel(new javax.swing.table.DefaultTableModel(

new Object [][] {
```

```
        },
        new String [] {
            "Id", "First Name", "Last Name", "Phone Number"
        }
    ));
    jScrollPane1.setViewportView(jTable1);

    javax.swing.GroupLayout layout = new javax.swing.GroupLayout(getContentPane());
getContentPane().setLayout(layout);        layout.setHorizontalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addComponent(jPanel1, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
        .addGroup(layout.createSequentialGroup()

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
                .addComponent(jPanel3, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE)
                .addGroup(layout.createSequentialGroup()
                    .addGap(0, 0, Short.MAX_VALUE)
                    .addComponent(cnSearch)
                    .addGap(18, 18, 18)
                    .addComponent(inputName, javax.swing.GroupLayout.PREFERRED_SIZE,
265, javax.swing.GroupLayout.PREFERRED_SIZE)))
            .addGap(18, 18, 18)
            .addComponent(jPanel2, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE))
        .addComponent(jScrollPane1, javax.swing.GroupLayout.Alignment.TRAILING)
    );
    layout.setVerticalGroup(
        layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)
        .addGroup(layout.createSequentialGroup()
```

```
            .addComponent(jPanel1, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)


.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING,
false)

                .addGroup(layout.createSequentialGroup()

                    .addComponent(jPanel3, javax.swing.GroupLayout.PREFERRED_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)

                    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)


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

                        .addComponent(inputName,
javax.swing.GroupLayout.PREFERRED_SIZE, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.PREFERRED_SIZE)

                        .addComponent(cnSearch)))

                .addComponent(jPanel2, javax.swing.GroupLayout.DEFAULT_SIZE,
javax.swing.GroupLayout.DEFAULT_SIZE, Short.MAX_VALUE))

            .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)

            .addComponent(jScrollPane1, javax.swing.GroupLayout.PREFERRED_SIZE, 238,
javax.swing.GroupLayout.PREFERRED_SIZE)

            .addContainerGap(7, Short.MAX_VALUE))

        );


        pack();

        setLocationRelativeTo(null);

    }// </editor-fold>


    private void cnDeleteActionPerformed(java.awt.event.ActionEvent evt) {
```

```
            int selectedRow = jTable1.getSelectedRow();
Connection conn = null;        if (selectedRow != -1) {
        // Get the ID of the selected row (assuming it's in the first column)
        DefaultTableModel model = (DefaultTableModel) jTable1.getModel();
        Object id = model.getValueAt(selectedRow, 0);  // Adjust the column index if needed

        try {
            // Establish database connection
conn = connectionToDB.getConnection();



            // Prepare DELETE SQL query
            String sql = "DELETE FROM contact WHERE Id = ?";
PreparedStatement pstmt = conn.prepareStatement(sql);              pstmt.setObject(1,
id);

            // Execute delete
            int deletedRows = pstmt.executeUpdate();

            if (deletedRows > 0) {
            // Remove the row from the table model
model.removeRow(selectedRow);
            JOptionPane.showMessageDialog(null, "Row deleted successfully.");
        } else {
            JOptionPane.showMessageDialog(null, "Deletion failed or row not found in the
database.");
        }

        // Close the PreparedStatement
pstmt.close();
```

```
        } catch (SQLException e) {
e.printStackTrace();
            JOptionPane.showMessageDialog(null, "An error occurred: " + e.getMessage(),
"Error", JOptionPane.ERROR_MESSAGE);
        } finally {
            // Close the connection in the finally block
try {
                if (conn != null) {
conn.close();
                }
            } catch (SQLException e) {
e.printStackTrace();
            }
        }
    } else {
        JOptionPane.showMessageDialog(null, "Please select a row to delete.");
    }


    }

    private void cnSearchActionPerformed(java.awt.event.ActionEvent evt) {
String searchQuery = inputName.getText();

        // Database connection
        String url = "jdbc:mysql://localhost:3306/connector";
        String user = "root";
        String password = "6161586";

        try (Connection conn = DriverManager.getConnection(url, user, password)) {
```

```
        String sql = "SELECT * FROM contact WHERE Id LIKE ? OR firstName LIKE ? OR lastName LIKE ? OR phoneNumber LIKE ?";
        try (PreparedStatement pstmt = conn.prepareStatement(sql)) {
pstmt.setString(1, "%" + searchQuery + "%");               pstmt.setString(2, "%" + searchQuery + "%");               pstmt.setString(3, "%" + searchQuery + "%");               pstmt.setString(4, "%" + searchQuery + "%");
            ResultSet rs = pstmt.executeQuery();

            StringBuilder results = new StringBuilder();
while (rs.next()) {                    results
                    .append(", ID: ").append(rs.getString("Id"))
                    .append(", First Name: ").append(rs.getString("firstName"))
                    .append(", Last Name: ").append(rs.getString("lastName"))
                     .append(", Phone Number: ").append(rs.getString("phoneNumber"))
                    .append("\n");
            }

            if (results.length() > 0) {
               JOptionPane.showMessageDialog(this, results.toString());
            } else {
               JOptionPane.showMessageDialog(this, "No contacts found.");
            }
        }
    } catch (SQLException ex) {
        ex.printStackTrace();
        JOptionPane.showMessageDialog(this, "Error searching contact: " + ex.getMessage());
    }

}
```

```
    private JFrame frame;
    private void cnCancelActionPerformed(java.awt.event.ActionEvent evt) {

        frame = new JFrame("Exit");
        if (JOptionPane.showConfirmDialog(frame, "Confirm if you want to exit","Contact
Management",
                JOptionPane.YES_NO_CANCEL_OPTION)==JOptionPane.YES_OPTION)
        {
           System.exit(0);
        }
    }

    private void cnResetActionPerformed(java.awt.event.ActionEvent evt) {
txtId.setText("");      txtfirstName.setText("");      txtlastName.setText("");
txtphoneNumber.setText("");      inputName.setText("");
    }

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

        String Id = txtId.getText();
        String firstName = txtfirstName.getText();
        String lastName = txtlastName.getText();
        String phoneNumber = txtphoneNumber.getText();

        // Database connection
        String url = "jdbc:mysql://localhost:3306/connector";
        String user = "root";
        String password = "6161586";
```

```
        try (java.sql.Connection conn = DriverManager.getConnection(url, user, password)) {
            String sql = "INSERT INTO contact (Id, firstName, lastName, phoneNumber)
VALUES (?, ?, ?, ?)";
            try (PreparedStatement pstmt = conn.prepareStatement(sql)) {
pstmt.setString(1, Id);                pstmt.setString(2, firstName);
pstmt.setString(3, lastName);                pstmt.setString(4,
phoneNumber);                pstmt.executeUpdate();
                JOptionPane.showMessageDialog(this, "Contact saved successfully!");
            }
        } catch (SQLException ex) {
ex.printStackTrace();
            JOptionPane.showMessageDialog(this, "Error saving contact: " + ex.getMessage());
        }
    }

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

 Connection conn = null;
    PreparedStatement pstmt = null;
    ResultSet rs = null;

    try {
        // Establish the connection
conn = connectionToDB.getConnection();



        String query = "SELECT *  FROM contact";


        // Prepare the statement
pstmt = conn.prepareStatement(query);
```

```
        // Execute the query and get the result set
rs = pstmt.executeQuery();

        ResultSetMetaData rsmd = rs.getMetaData();         int
columnCount = rsmd.getColumnCount();

        // Create an array for column names
        String[] columnNames = new String[columnCount];
for (int i = 1; i <= columnCount; i++) {
columnNames[i - 1] = rsmd.getColumnName(i);
        }

        // Create a DefaultTableModel to store the data
        DefaultTableModel model = new DefaultTableModel(columnNames, 0);

        // Set the model for the table (jTable1)
jTable1.setModel(model);

        // Clear the table before adding new data
        model.setRowCount(0);

        // Iterate through the result set and add data to the table
while (rs.next()) {
            Object[] row = new Object[columnCount];

            for (int i = 1; i <= columnCount; i++) {
                row[i - 1] = rs.getObject(i);  // Get the object from each column
            }
```

```
            // Add the row to the table model
model.addRow(row);
        }


    } catch (SQLException e) {
        // Show an error dialog if an exception occurs
        JOptionPane.showMessageDialog(this, "An error occurred: " + e.getMessage(), "Error",
JOptionPane.ERROR_MESSAGE);
    } finally {
        // Close the resources
try {
            if (rs != null) rs.close();
if (pstmt != null) pstmt.close();
if (conn != null) conn.close();         }
catch (SQLException e) {
e.printStackTrace();
        }
    }
    }


    private void cnSortActionPerformed(java.awt.event.ActionEvent evt) {
Connection conn = null;
    PreparedStatement pstmt = null;
    ResultSet rs = null;
     try
{
        // Establish the connection
        conn = connectionToDB.getConnection();


        String query = "SELECT Id, firstName, lastName, phoneNumber FROM contact
ORDER BY firstName ASC";
```

```
        // Prepare the statement
        pstmt = conn.prepareStatement(query);

        // Execute the query and get the result set
rs = pstmt.executeQuery();
 ResultSetMetaData rsmd = rs.getMetaData();        int columnCount =
rsmd.getColumnCount();

        // Create an array for column names
        String[] columnNames = new String[columnCount];
for (int i = 1; i <= columnCount; i++) {
columnNames[i - 1] = rsmd.getColumnName(i);
        }

        // Create a DefaultTableModel to store the data
        DefaultTableModel model = new DefaultTableModel(columnNames, 0);

        // Set the model for the table (jTable1)
jTable1.setModel(model);

        // Clear the table before adding new data
model.setRowCount(0);

        // Iterate through the result set and add data to the table
while (rs.next()) {
            Object[] row = new Object[columnCount];

            for (int i = 1; i <= columnCount; i++) {
```

```
            row[i - 1] = rs.getObject(i);  // Get the object from each column
        }

        // Add the row to the table model
model.addRow(row);
    }

  } catch (SQLException e) {
    // Show an error dialog if an exception occurs
    JOptionPane.showMessageDialog(this, "An error occurred: " + e.getMessage(), "Error",
JOptionPane.ERROR_MESSAGE);
  } finally {
    // Close the resources
try {
        if (rs != null) rs.close();
if (pstmt != null) pstmt.close();
if (conn != null) conn.close();       }
catch (SQLException e) {
e.printStackTrace();

    }
  }


  }

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

   String Id = txtId.getText();
    String firstName = txtfirstName.getText();
    String lastName = txtlastName.getText();
    String phoneNumber = txtphoneNumber.getText();
```

```
        // Database connection
        String url = "jdbc:mysql://localhost:3306/connector";
        String user = "root";
        String password = "6161586";


  try (java.sql.Connection conn = DriverManager.getConnection(url, user, password)) {
        // SQL query to update the contact
        String sql = "UPDATE contact SET  firstName = ?, lastName = ?, phoneNumber = ?
WHERE Id = ?";


        // Prepare the statement
        try (PreparedStatement pstmt = conn.prepareStatement(sql)) {
pstmt.setString(1, firstName); // Set the first name            pstmt.setString(2,
lastName);   // Set the last name            pstmt.setString(3, phoneNumber);
// Set the phone number            pstmt.setString(4, Id); // Set the ID for the
WHERE clause


            // Execute the update
            int updatedRows = pstmt.executeUpdate();
            if (updatedRows > 0) {
                JOptionPane.showMessageDialog(this, "Contact updated successfully!");
            } else {
                JOptionPane.showMessageDialog(this, "No contact found with the given ID.");
            }
        }
    } catch (SQLException ex) {
        ex.printStackTrace(); // Consider using a logging framework here
        JOptionPane.showMessageDialog(this, "Error updating contact: " + ex.getMessage());
```

```
    }
    }

    /**
* @param args the command line arguments
     */
 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(contact.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (InstantiationException ex) {
java.util.logging.Logger.getLogger(contact.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
        } catch (IllegalAccessException ex) {
java.util.logging.Logger.getLogger(contact.class.getName()).log(java.util.logging.Level.SEVERE, null, ex);
```

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

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


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


    // Variables declaration - do not modify
private javax.swing.JButton cnAdd;     private
javax.swing.JButton cnCancel;     private
javax.swing.JButton cnDelete;     private
javax.swing.JButton cnDisplay;     private
javax.swing.JButton cnReset;
    private javax.swing.JButton cnSearch;     private
javax.swing.JButton cnSort;     private
javax.swing.JButton cnUpdate;     private
javax.swing.JTextField inputName;     private
javax.swing.JLabel jLabel1;     private
javax.swing.JLabel jLabel2;     private
javax.swing.JLabel jLabel3;     private
javax.swing.JLabel jLabel4;     private
```

```
javax.swing.JLabel jLabel5;     private
javax.swing.JLabel jLabel6;     private
javax.swing.JPanel jPanel1;     private
javax.swing.JPanel jPanel2;     private
javax.swing.JPanel jPanel3;     private
javax.swing.JScrollPane jScrollPane1;     private
javax.swing.JTable jTable1;     private
javax.swing.JTextField txtId;     private
javax.swing.JTextField txtfirstName;     private
javax.swing.JTextField txtlastName;     private
javax.swing.JTextField txtphoneNumber;
    // End of variables declaration
}
```