

**LAPORAN HASIL PRAKTIKUM 13**  
**PEMROMGRAMAN BERBASIS OBJEK**



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**TI 2A**

**PROGRAM STUDI TEKNIK INFORMATIKA**

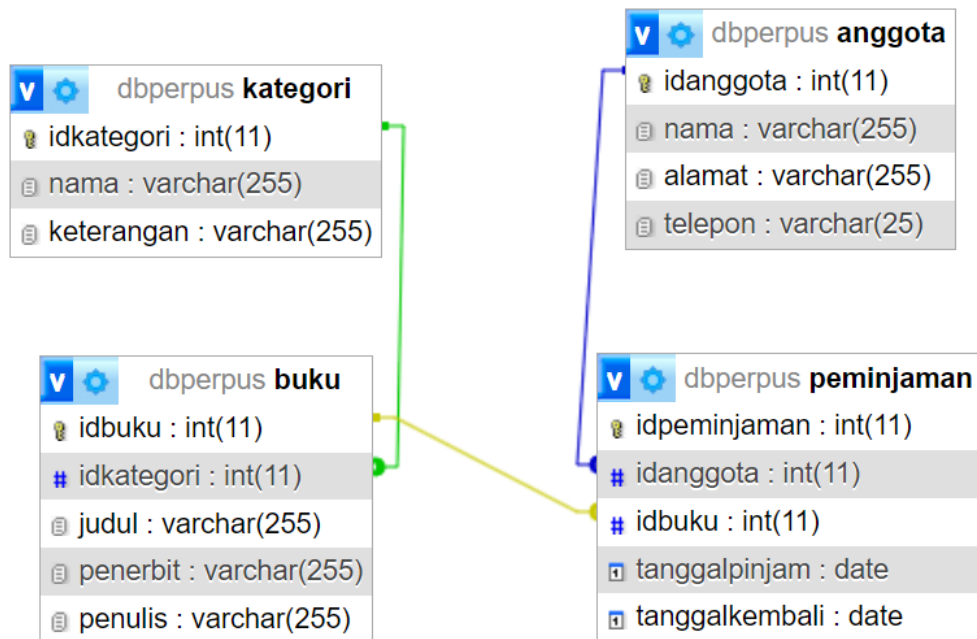
**JURUSAN TEKNOLOGI INFORMASI**

**POLITEKNIK NEGERI MALANG**

**2025**

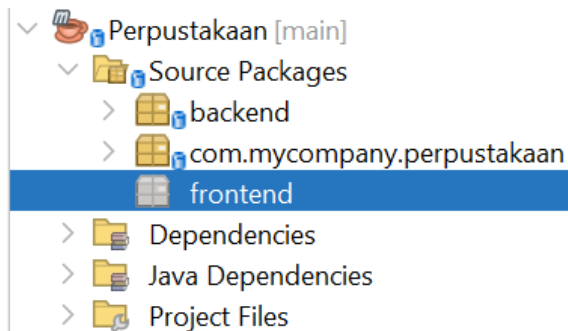
## Percobaan 1

Membuat database.



## Percobaan 2

Mempersiapkan project.



## Percobaan 3

Membuat class helper untuk mengeksekusi query SQL.

```

package backend;

import java.sql.*;

public class DBHelper {
    private static Connection koneksi;

    public static void bukaKoneksi() {
        if (koneksi == null) {
            try {
                String url = "jdbc:mysql://localhost:3306/dbperpus";
                String user = "root";
                String password = ""; // Kosongkan jika default
                // Register driver (Format baru untuk mysql
                // connector 8+)
                DriverManager.registerDriver(new
                com.mysql.cj.jdbc.Driver());
                koneksi = DriverManager.getConnection(url, user,
                password);
            } catch (SQLException t) {
                System.out.println("Error koneksi!");
            }
        }
    }

    public static int insertQueryGetId(String query) {
        bukaKoneksi();
        int num = 0;
        int result = -1;
        try {
            Statement stmt = koneksi.createStatement();
            num = stmt.executeUpdate(query,
            Statement.RETURN_GENERATED_KEYS);
            ResultSet rs = stmt.getGeneratedKeys();
            if (rs.next()) {
                result = rs.getInt(1);
            }
            rs.close();
        }
    }
}

```

```

        stmt.close();
    } catch (Exception e) {
        e.printStackTrace();
        result = -1;
    }
    return result;
}

public static boolean executeQuery(String query) {
    bukaKoneksi();
    boolean result = false;
    try {
        Statement stmt = koneksi.createStatement();
        stmt.executeUpdate(query);
        result = true;
        stmt.close();
    } catch (Exception e) {
        e.printStackTrace();
    }
    return result;
}

public static ResultSet selectQuery(String query) {
    bukaKoneksi();
    ResultSet rs = null;
    try {
        Statement stmt = koneksi.createStatement();
        rs = stmt.executeQuery(query);
    } catch (Exception e) {
        e.printStackTrace();
    }
    return rs;
}
}

```

## Percobaan 4

Membuat class Kategori untuk handle CRUD pada tabel kategori.

```
package backend;

import java.util.ArrayList;
import java.sql.*;

public class Kategori {

    private int idkategori;
    private String nama;
    private String keterangan;

    public Kategori() {
    }

    public Kategori(String nama, String keterangan) {
        this.nama = nama;
        this.keterangan = keterangan;
    }

    // Getter dan Setter (Generate via Insert Code di NetBeans)
    public int getIdkategori() { return idkategori; }
    public void setIdkategori(int idkategori) { this.idkategori = idkategori; }
    public String getNama() { return nama; }
    public void setNama(String nama) { this.nama = nama; }
    public String getKeterangan() { return keterangan; }
    public void setKeterangan(String keterangan) { this.keterangan = keterangan; }

    public Kategori getById(int id) {
        Kategori kat = new Kategori();

        ResultSet rs = DBHelper.selectQuery("SELECT * FROM kategori WHERE idkategori = '" + id + "'");

        try {
            while (rs.next()) {
                kat = new Kategori();
            }
        }
    }
}
```

```

        kat.setIdkategori(rs.getInt("idkategori"));
        kat.setNama(rs.getString("nama"));
        kat.setKeterangan(rs.getString("keterangan"));
    }
} catch (Exception e) {
    e.printStackTrace();
}
return kat;
}

public ArrayList<Kategori> getAll() {
    ArrayList<Kategori> ListKategori = new ArrayList();
    ResultSet rs = DBHelper.selectQuery("SELECT * FROM
kategori");
    try {
        while (rs.next()) {
            Kategori kat = new Kategori();
            kat.setIdkategori(rs.getInt("idkategori"));
            kat.setNama(rs.getString("nama"));
            kat.setKeterangan(rs.getString("keterangan"));
            ListKategori.add(kat);
        }
    } catch (Exception e) {
        e.printStackTrace();
    }
    return ListKategori;
}

public ArrayList<Kategori> search(String keyword) {
    ArrayList<Kategori> ListKategori = new ArrayList();
    String sql = "SELECT * FROM kategori WHERE nama LIKE '%" +
keyword + "%' OR keterangan LIKE '%" + keyword + "%'";
    ResultSet rs = DBHelper.selectQuery(sql);
    try {
        while (rs.next()) {
            Kategori kat = new Kategori();

```

```

        kat.setIdkategori(rs.getInt("idkategori"));
        kat.setNama(rs.getString("nama"));
        kat.setKeterangan(rs.getString("keterangan"));
        ListKategori.add(kat);
    }
} catch (Exception e) {
    e.printStackTrace();
}
return ListKategori;
}

public void save() {
    if (getById(idkategori).getIdkategori() == 0) {
        String SQL = "INSERT INTO kategori (nama, keterangan)
VALUES('\" + this.nama + "\", '\" + this.keterangan + "\')";
        this.idkategori = DBHelper.insertQueryGetId(SQL);
    } else {
        String SQL = "UPDATE kategori SET nama = '\" + this.nama
+ "\", keterangan = '\" + this.keterangan + \"' WHERE idkategori = '\" +
this.idkategori + \"'";
        DBHelper.executeQuery(SQL);
    }
}

public void delete() {
    String SQL = "DELETE FROM kategori WHERE idkategori = '\" +
this.idkategori + \"'";
    DBHelper.executeQuery(SQL);
}

@Override
public String toString() {
    return nama;
}
}

```

## Percobaan 5

Mencoba backed yang sudah dibuat dengan mengoperasikannya lewat frontend berbasis teks (console).

Design :

---

ID Kategori

Nama Kategori

Keterangan

Simpan

Tambah Baru

Hapus

Cari

Title 1	Title 2	Title 3	Title 4
<div></div>			
<div></div>			

Kode :

```
/*
 * 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 frontend;
import backend.*;
import java.util.ArrayList;
import javax.swing.table.DefaultTableModel;
```



```

/**
 *
 * @author H A F I Z H
 */
public class FrmKategori extends javax.swing.JFrame {

    public FrmKategori() {
        initComponents();
        tampilkanData();
        kosongkanForm();
    }

    public void kosongkanForm() {
        txtIdKategori.setText("0");
        txtNama.setText("");
        txtKeterangan.setText("");
    }

    public void tampilkanData() {
        String[] kolom = {"ID", "Nama", "Keterangan"};
        ArrayList<Kategori> list = new Kategori().getAll();
        Object rowData[] = new Object[3];

        tblKategori.setModel(new DefaultTableModel(new Object[][] {},
            kolom));

        for (Kategori kat : list) {
            rowData[0] = kat.getIdkategori();
            rowData[1] = kat.getNama();
            rowData[2] = kat.getKeterangan();

            ((DefaultTableModel)
tblKategori.getModel()).addRow(rowData);
        }
    }
}

```

```

public void cari(String keyword) {
    String[] kolom = {"ID", "Nama", "Keterangan"};
    ArrayList<Kategori> list = new Kategori().search(keyword);
    Object rowData[] = new Object[3];

    tblKategori.setModel(new DefaultTableModel(new Object[][] {},
kolom));

    for (Kategori kat : list) {
        rowData[0] = kat.getIdkategori();
        rowData[1] = kat.getNama();
        rowData[2] = kat.getKeterangan();
        ((DefaultTableModel)
tblKategori.getModel()).addRow(rowData);
    }
}

/**
 * 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() {

    jScrollPane1 = new javax.swing.JScrollPane();
    jTable1 = new javax.swing.JTable();
    jScrollPane2 = new javax.swing.JScrollPane();
    jTable2 = new javax.swing.JTable();
    jScrollPane3 = new javax.swing.JScrollPane();
    jTable3 = new javax.swing.JTable();
    txtIdKategori = new javax.swing.JTextField();
    txtNama = new javax.swing.JTextField();

```

```
jLabel1 = new javax.swing.JLabel();
jLabel2 = new javax.swing.JLabel();
jLabel3 = new javax.swing.JLabel();
txtKeterangan = new javax.swing.JTextField();
btnSimpan = new javax.swing.JButton();
btnHapus = new javax.swing.JButton();
btnTambahBaru = new javax.swing.JButton();
txtCari = new javax.swing.JTextField();
btnCari = new javax.swing.JButton();
jScrollPane5 = new javax.swing.JScrollPane();
tblKategori = new javax.swing.JTable();

jTable1.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}
    },
    new String [] {
        "Title 1", "Title 2", "Title 3", "Title 4"
    }
));
jScrollPane1.setViewportViewView(jTable1);

jTable2.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}
    },
    new String [] {
        "Title 1", "Title 2", "Title 3", "Title 4"
    }
));
```

```

jScrollPane2.setViewportViewView(jTable2);

jTable3.setModel(new javax.swing.table.DefaultTableModel(
    new Object [][] {
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}
    },
    new String [] {
        "Title 1", "Title 2", "Title 3", "Title 4"
    }
));
jScrollPane3.setViewportViewView(jTable3);

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

txtIdKategori.setEnabled(false);
txtIdKategori.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        txtIdKategoriActionPerformed(evt);
    }
});

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

jLabel1.setText("ID Kategori");

jLabel2.setText("Nama Kategori");

```

```
jLabel3.setText("Keterangan");

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

btnSimpan.setText("Simpan");
btnSimpan.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnSimpanActionPerformed(evt);
    }
});

btnHapus.setText("Hapus");
btnHapus.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnHapusActionPerformed(evt);
    }
});

btnTambahBaru.setText("Tambah Baru");
btnTambahBaru.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnTambahBaruActionPerformed(evt);
    }
});

btnCari.setText("Cari");
```

```

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

jScrollPane5.setBorder(javax.swing.BorderFactory.createLineBorder(new
java.awt.Color(0, 0, 0)));

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

tblKategori.setModel(new
javax.swing.table.DefaultTableModel(
    new Object [][] {
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}
    },
    new String [] {
        "Title 1", "Title 2", "Title 3", "Title 4"
    }
));

tblKategori.addMouseListener(new
java.awt.event.MouseAdapter() {
    public void mouseClicked(java.awt.event.MouseEvent evt)
{
        tblKategoriMouseClicked(evt);
    }
});

jScrollPane5.setViewportViewView(tblKategori);

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

```

```

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING
)

        .addGroup(layout.createSequentialGroup())

            .addContainerGap()

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.LEADING)

            .addGroup(layout.createSequentialGroup())

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.LEADING)

            .addComponent(jLabel1)
            .addComponent(jLabel2)
            .addComponent(jLabel3)
            .addComponent(btnTambahBaru)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.LEADING)

            .addGroup(layout.createSequentialGroup())

                .addGap(28, 28, 28)

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

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

            .addComponent(txtNama,
javax.swing.GroupLayout.DEFAULT_SIZE, 211, Short.MAX_VALUE)

            .addComponent(txtKeterangan)

            .addGap(0, 0, Short.MAX_VALUE)

            .addGroup(layout.createSequentialGroup())

                .addGap(6, 6, 6)

                .addComponent(btnHapus)

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

            .addComponent(txtCari)

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

            .addComponent(btnCari)))

        .addGroup(layout.createSequentialGroup())

```

```

        .addComponent(btnSimpan)

        .addGap(0, 0, Short.MAX_VALUE))

        .addComponent(jScrollPane5,
javax.swing.GroupLayout.DEFAULT_SIZE, 504, Short.MAX_VALUE))

        .addContainerGap())

    );

    layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING
)

        .addGroup(layout.createSequentialGroup())

            .addGap(22, 22, 22)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE)

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

            .addComponent(jLabel1))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE)

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

            .addComponent(jLabel2))

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE)

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

            .addComponent(jLabel3))

            .addGap(18, 18, 18)

            .addComponent(btnSimpan)

```



```

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE)

        .addComponent(btnHapus)

        .addComponent(btnTambahBaru)

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

        .addComponent(btnCari))

.addGap(18, 18, 18)

.addComponent(jScrollPane5,
javax.swing.GroupLayout.PREFERRED_SIZE, 131,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addContainerGap(35, Short.MAX_VALUE))

);

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

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

    // TODO add your handling code here:

}

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

    // TODO add your handling code here:

}

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

    // TODO add your handling code here:

}

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

    kosongkanForm();
}

```

```

    }

    private void btnSimpanActionPerformed(java.awt.event.ActionEvent
    evt) {
        Kategori kat = new Kategori();

        kat.setIdkategori(Integer.parseInt(txtIdKategori.getText()));
        kat.setNama(txtNama.getText());
        kat.setKeterangan(txtKeterangan.getText());
        kat.save();

        txtIdKategori.setText(Integer.toString(kat.getIdkategori()));
        tampilkanData();
    }

    private void btnHapusActionPerformed(java.awt.event.ActionEvent
    evt) {
        DefaultTableModel model = (DefaultTableModel)
        tblKategori.getModel();

        int row = tblKategori.getSelectedRow();
        Kategori kat = new Kategori();

        kat = kat.getById(Integer.parseInt(model.getValueAt(row,
        0).toString()));
        kat.delete();
        kosongkanForm();
        tampilkanData();
    }

    private void btnCariActionPerformed(java.awt.event.ActionEvent
    evt) {
        cari(txtCari.getText());
    }

    private void tblKategoriMouseClicked(java.awt.event.MouseEvent
    evt) {
        DefaultTableModel model = (DefaultTableModel)
        tblKategori.getModel();

        int row = tblKategori.getSelectedRow();

```

```

        txtIdKategori.setText(model.getValueAt(row, 0).toString());
        txtNama.setText(model.getValueAt(row, 1).toString());
        txtKeterangan.setText(model.getValueAt(row, 2).toString());
    }

    /**
     * @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 (ReflectiveOperationException |
            javax.swing.UnsupportedLookAndFeelException ex) {

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

        }

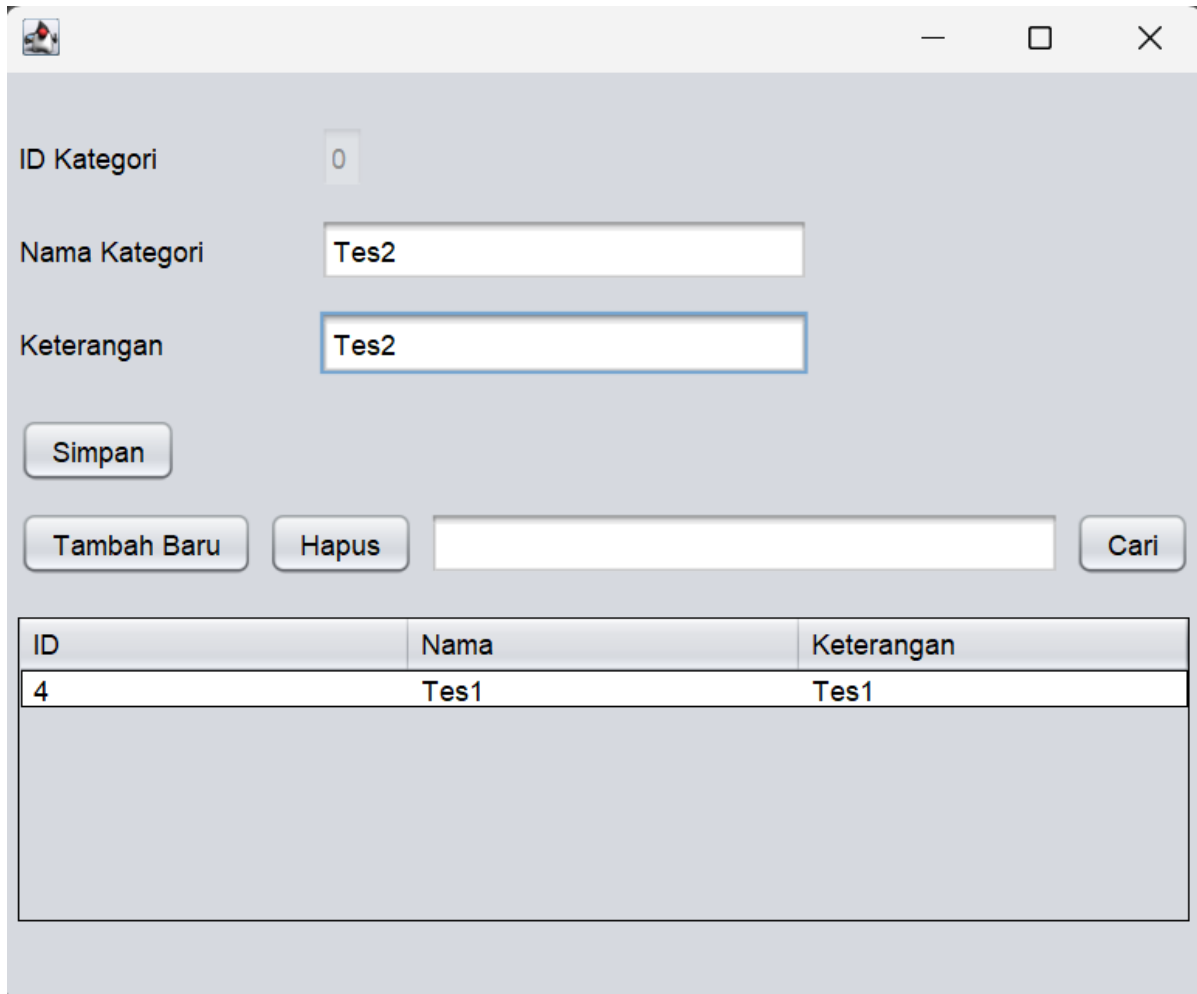
        //</editor-fold>

        /* Create and display the form */
        java.awt.EventQueue.invokeLater(() -> new

```

```
FrmKategori().setVisible(true));  
  
    }  
  
    // Variables declaration - do not modify  
    private javax.swing.JButton btnCari;  
    private javax.swing.JButton btnHapus;  
    private javax.swing.JButton btnSimpan;  
    private javax.swing.JButton btnTambahBaru;  
    private javax.swing.JLabel jLabel1;  
    private javax.swing.JLabel jLabel2;  
    private javax.swing.JLabel jLabel3;  
    private javax.swing.JScrollPane jScrollPane1;  
    private javax.swing.JScrollPane jScrollPane2;  
    private javax.swing.JScrollPane jScrollPane3;  
    private javax.swing.JScrollPane jScrollPane5;  
    private javax.swing.JTable jTable1;  
    private javax.swing.JTable jTable2;  
    private javax.swing.JTable jTable3;  
    private javax.swing.JTable tblKategori;  
    private javax.swing.JTextField txtCari;  
    private javax.swing.JTextField txtIdKategori;  
    private javax.swing.JTextField txtKeterangan;  
    private javax.swing.JTextField txtNama;  
  
    // End of variables declaration  
}
```

## Output



ID Kategori: 0

Nama Kategori: Tes2

Keterangan: Tes2

Simpan

Tambah Baru Hapus

Cari

ID	Nama	Keterangan
4	Tes1	Tes1

## Percobaan 6

Lakukan hal yang sama untuk data Anggota!

1. Buat class Anggota pada package backend, lengkapi atribut dan method-nya.

Kode :

```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-
 * default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java
 * to edit this template
 */
package backend;
import java.util.ArrayList;
```

```
import java.sql.*;

/**
 *
 * @author H A F I Z H
 */
public class Anggota {
    private int idanggota;
    private String nama;
    private String alamat;
    private String telepon;

    public Anggota() {
    }

    public Anggota(String nama, String alamat, String telepon) {
        this.nama = nama;
        this.alamat = alamat;
        this.telepon = telepon;
    }

    public int getIdanggota() {
        return idanggota;
    }

    public void setIdanggota(int idanggota) {
        this.idanggota = idanggota;
    }

    public String getNama() {
        return nama;
    }

    public void setNama(String nama) {
        this.nama = nama;
    }
}
```

```

public String getAlamat() {
    return alamat;
}

public void setAlamat(String alamat) {
    this.alamat = alamat;
}

public String getTelepon() {
    return telepon;
}

public void setTelepon(String telepon) {
    this.telepon = telepon;
}

public Anggota getById(int id) {
    Anggota ang = new Anggota();

    ResultSet rs = DBHelper.selectQuery("SELECT * FROM anggota
WHERE idanggota = '" + id + "'");

    try {
        while (rs.next()) {
            ang = new Anggota();
            ang.setIdanggota(rs.getInt("idanggota"));
            ang.setNama(rs.getString("nama"));
            ang.setAlamat(rs.getString("alamat"));
            ang.setTelepon(rs.getString("telepon"));
        }
    } catch (Exception e) {
        e.printStackTrace();
    }

    return ang;
}

```

```

public ArrayList<Anggota> getAll() {
    ArrayList<Anggota> ListAnggota = new ArrayList();
    ResultSet rs = DBHelper.selectQuery("SELECT * FROM
anggota");

    try {
        while (rs.next()) {
            Anggota ang = new Anggota();
            ang.setIdanggota(rs.getInt("idanggota"));
            ang.setNama(rs.getString("nama"));
            ang.setAlamat(rs.getString("alamat"));
            ang.setTelepon(rs.getString("telepon"));
            ListAnggota.add(ang);
        }
    } catch (Exception e) {
        e.printStackTrace();
    }
    return ListAnggota;
}

public ArrayList<Anggota> search(String keyword) {
    ArrayList<Anggota> ListAnggota = new ArrayList();
    String sql = "SELECT * FROM anggota WHERE "
        + "      nama LIKE '%" + keyword + "%' "
        + "      OR alamat LIKE '%" + keyword + "%' ";
    ResultSet rs = DBHelper.selectQuery(sql);

    try {
        while (rs.next()) {
            Anggota ang = new Anggota();
            ang.setIdanggota(rs.getInt("idanggota"));
            ang.setNama(rs.getString("nama"));
            ang.setAlamat(rs.getString("alamat"));
            ang.setTelepon(rs.getString("telepon"));
            ListAnggota.add(ang);
        }
    }
}

```



```

        }

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

        return ListAnggota;
    }

    public void save() {
        if (getById(idanggota).getIdanggota() == 0) {
            String SQL = "INSERT INTO anggota (nama, alamat,
telepon) VALUES ("
                + "      '" + this.nama + "', "
                + "      '" + this.alamat + "', "
                + "      '" + this.telepon + "' "
                + "    )";

            this.idanggota = DBHelper.insertQueryGetId(SQL);
        } else {
            String SQL = "UPDATE anggota SET "
                + "      nama = '" + this.nama + "', "
                + "      alamat = '" + this.alamat + "', "
                + "      telepon = '" + this.telepon + "' "
                + "      WHERE idanggota = '" + this.idanggota +
            """;

            DBHelper.executeQuery(SQL);
        }
    }

    public void delete() {
        String SQL = "DELETE FROM anggota WHERE idanggota = '" +
this.idanggota + """;

        DBHelper.executeQuery(SQL);
    }
}

```

2. Lakukan test pada class TestBackend pada package frontend.

Kode :

```
package frontend;

import backend.*;

public class TestBackend {
    public static void main(String[] args) {

        // 1. Buat objek Anggota baru
        Anggota ang1 = new Anggota("Timur", "Jl. Surabaya 12",
"1234567");
        Anggota ang2 = new Anggota("Barat", "Jl. Jakarta 45",
"9876543");
        Anggota ang3 = new Anggota("Selatan", "Jl. Bandung 99",
"5555555");

        // 2. Test Insert (Simpan data baru)
        ang1.save();
        ang2.save();
        ang3.save();

        // 3. Test Update (Ubah data)
        // Mengubah alamat anggota ke-2
        ang2.setAlamat("Jl. Jawa Timur No 1");
        ang2.save();

        // 4. Test Delete (Hapus data)
        // Menghapus anggota ke-3
        ang3.delete();

        // 5. Test Select All (Tampilkan semua data)
        System.out.println("--- MENAMPILKAN SEMUA DATA ---");
        for(Anggota a : new Anggota().getAll()){
            System.out.println("Nama: " + a.getNama() + ", Alamat: "
+ a.getAlamat() + ", Telepon: " + a.getTelepon());
        }

        // 6. Test Search (Cari data)
```

```

        System.out.println("\n---  Pencarian 'Timur' ---");
        for(Anggota a : new Anggota().search("Timur")){
            System.out.println("Nama: " + a.getNama() + ", Alamat: "
+ a.getAlamat() + ", Telepon: " + a.getTelepon());
        }
    }
}

```

Output :

```

--- exec:3.1.0:exec (default-cli) @ Perpustakaan ---
--- MENAMPILKAN SEMUA DATA ---
Nama: Timur, Alamat: Jl. Surabaya 12, Telepon: 1234567
Nama: Barat, Alamat: Jl. Jawa Timur No 1, Telepon: 9876543

--- Pencarian 'Timur' ---
Nama: Timur, Alamat: Jl. Surabaya 12, Telepon: 1234567
Nama: Barat, Alamat: Jl. Jawa Timur No 1, Telepon: 9876543
-----
BUILD SUCCESS
-----

Total time:  4.502 s
Finished at: 2025-11-19T22:40:02+07:00
-----

```

## Percobaan 7

Buat form untuk data Anggota.

1. Buat FrmAnggota pada package frontend dan lengkapi komponen, method serta event-nya.

Desain :

ID Anggota

Nama Anggota

Alamat

Telepon

Simpan

Tambah Baru

Hapus

Cari

Title 1	Title 2	Title 3	Title 4

Kode :

```

/*
 * 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 frontend;
import backend.*;
import java.util.ArrayList;
import javax.swing.table.DefaultTableModel;

/**
 *
 * @author H A F I Z H
 */

```

```

public class FrmAnggota extends javax.swing.JFrame {

    private static final java.util.logging.Logger logger =
    java.util.logging.Logger.getLogger(FrmAnggota.class.getName());

    /**
     * Creates new form FrmAnggota
     */
    public FrmAnggota() {
        initComponents();
        tampilkanData();
        kosongkanForm();
    }

    public void kosongkanForm() {
        txtIdAnggota.setText("0");
        txtNama.setText("");
        txtAlamat.setText("");
        txtTelepon.setText("");
    }

    public void tampilkanData() {
        String[] kolom = {"ID", "Nama", "Alamat", "Telepon"};
        ArrayList<Anggota> list = new Anggota().getAll();
        Object rowData[] = new Object[4];

        tblAnggota.setModel(new DefaultTableModel(new Object[][] {},
        kolom));

        for (Anggota ang : list) {
            rowData[0] = ang.getIdanggota();
            rowData[1] = ang.getNama();
            rowData[2] = ang.getAlamat();
            rowData[3] = ang.getTelepon();

            ((DefaultTableModel)
            tblAnggota.getModel()).addRow(rowData);
        }
    }
}

```

```

    }

    public void cari(String keyword) {
        String[] kolom = {"ID", "Nama", "Alamat", "Telepon"};
        ArrayList<Anggota> list = new Anggota().search(keyword);
        Object rowData[] = new Object[4];

        tblAnggota.setModel(new DefaultTableModel(new Object[][]{},
        kolom));

        for (Anggota ang : list) {
            rowData[0] = ang.getIdanggota();
            rowData[1] = ang.getNama();
            rowData[2] = ang.getAlamat();
            rowData[3] = ang.getTelepon();

            ((DefaultTableModel)
tblAnggota.getModel()).addRow(rowData);
        }
    }

    /**
     * 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() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();
        txtIdAnggota = new javax.swing.JTextField();
        txtNama = new javax.swing.JTextField();
    }

```

```

txtAlamat = new javax.swing.JTextField();
txtTelepon = new javax.swing.JTextField();
btnSimpan = new javax.swing.JButton();
btnTambahBaru = new javax.swing.JButton();
btnHapus = new javax.swing.JButton();
txtCari = new javax.swing.JTextField();
btnCari = new javax.swing.JButton();
jScrollPane1 = new javax.swing.JScrollPane();
tblAnggota = new javax.swing.JTable();

setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

jLabel1.setText("ID Anggota");

jLabel2.setText("Nama Anggota");

jLabel3.setText("Alamat");

jLabel4.setText("Telepon");

txtIdAnggota.setEnabled(false);

btnSimpan.setText("Simpan");
btnSimpan.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnSimpanActionPerformed(evt);
    }
});

btnTambahBaru.setText("Tambah Baru");
btnTambahBaru.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnTambahBaruActionPerformed(evt);
    }
});

```

```

        }

    });

    btnHapus.setText("Hapus");

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

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

            btnHapusActionPerformed(evt);

        }

    });

    btnCari.setText("Cari");

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

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

            btnCariActionPerformed(evt);

        }

    });

jScrollPane1.setBorder(javax.swing.BorderFactory.createLineBorder(ne
w java.awt.Color(0, 0, 0)));

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

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

        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null},
        {null, null, null, null}

    },
    new String [] {

        "Title 1", "Title 2", "Title 3", "Title 4"

    }

));

```



```

        tblAnggota.addMouseListener(new
java.awt.event.MouseAdapter() {
            public void mouseClicked(java.awt.event.MouseEvent evt)
{
                tblAnggotaMouseClicked(evt);
            }
        });
jScrollPane1.setViewportView(tblAnggota);

        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(16, 16, 16)

.addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
                .addComponent(jScrollPane1)

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

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

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                .addComponent(txtCari,
javax.swing.GroupLayout.PREFERRED_SIZE, 176,
javax.swing.GroupLayout.PREFERRED_SIZE)

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(btnCari))
                .addComponent(btnSimpan)
                .addGroup(layout.createSequentialGroup()

```

```

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

                                .addComponent(jLabel1)

                                .addComponent(jLabel2)

                                .addComponent(jLabel3)

                                .addComponent(jLabel4))

.addGap(29, 29, 29)

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

                                .addComponent(txtAlamat)

.addGroup(layout.createSequentialGroup())

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

                                .addComponent(txtIdAnggota,
javax.swing.GroupLayout.PREFERRED_SIZE, 71,
javax.swing.GroupLayout.PREFERRED_SIZE)

                                .addComponent(txtTelepon,
javax.swing.GroupLayout.PREFERRED_SIZE, 158,
javax.swing.GroupLayout.PREFERRED_SIZE)

                                .addComponent(txtNama,
javax.swing.GroupLayout.PREFERRED_SIZE, 239,
javax.swing.GroupLayout.PREFERRED_SIZE))

                                .addGap(0, 0,
Short.MAX_VALUE))))))

.addContainerGap(21, Short.MAX_VALUE))

);

layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

                                .addGroup(layout.createSequentialGroup())

                                    .addGap(17, 17, 17)

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

                                .addComponent(jLabel1)

                                .addComponent(txtIdAnggota,
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(jLabel2)

        .addComponent(txtNama,
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(jLabel3)

        .addComponent(txtAlamat,
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(jLabel4)

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

        .addGap(18, 18, 18)

        .addComponent(btnSimpan)

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

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

        .addComponent(btnTambahBaru)

        .addComponent(btnHapus)

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

        .addComponent(btnCari))

```

```

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE, 183,
javax.swing.GroupLayout.PREFERRED_SIZE)

        .addContainerGap(15, Short.MAX_VALUE))

    );

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

private void btnSimpanActionPerformed(java.awt.event.ActionEvent
evt) {
    Anggota ang = new Anggota();
    ang.setIdanggota(Integer.parseInt(txtIdAnggota.getText()));
    ang.setNama(txtNama.getText());
    ang.setAlamat(txtAlamat.getText());
    ang.setTelepon(txtTelepon.getText());
    ang.save();
    txtIdAnggota.setText(Integer.toString(ang.getIdanggota()));
    tampilkanData();
}

private void btnCariActionPerformed(java.awt.event.ActionEvent
evt) {
    cari(txtCari.getText());
}

private void btnHapusActionPerformed(java.awt.event.ActionEvent
evt) {
    DefaultTableModel model = (DefaultTableModel)
tblAnggota.getModel();

    int row = tblAnggota.getSelectedRow();

    Anggota ang = new Anggota();
    ang = ang.getById(Integer.parseInt(model.getValueAt(row,
0).toString()));
    ang.delete();
}

```

```

        kosongkanForm();
        tampilkanData();
    }

    private void
    btnTambahBaruActionPerformed(java.awt.event.ActionEvent evt) {
        kosongkanForm();
    }

    private void tblAnggotaMouseClicked(java.awt.event.MouseEvent
    evt) {
        DefaultTableModel model = (DefaultTableModel)
        tblAnggota.getModel();
        int row = tblAnggota.getSelectedRow();

        txtIdAnggota.setText(model.getValueAt(row, 0).toString());
        txtNama.setText(model.getValueAt(row, 1).toString());
        txtAlamat.setText(model.getValueAt(row, 2).toString());
        txtTelepon.setText(model.getValueAt(row, 3).toString());
    }

    /**
     * @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 (ReflectiveOperationException |
javax.swing.UnsupportedLookAndFeelException ex) {

        logger.log(java.util.logging.Level.SEVERE, null, ex);

    }

//</editor-fold>

    /* Create and display the form */

    java.awt.EventQueue.invokeLater(() -> new
FrmAnggota().setVisible(true));

}

// Variables declaration - do not modify
private javax.swing.JButton btnCari;
private javax.swing.JButton btnHapus;
private javax.swing.JButton btnSimpan;
private javax.swing.JButton btnTambahBaru;
private javax.swing.JLabel jLabel1;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel3;
private javax.swing.JLabel jLabel4;
private javax.swing.JScrollPane jScrollPane1;
private javax.swing.JTable tblAnggota;
private javax.swing.JTextField txtAlamat;
private javax.swing.JTextField txtCari;
private javax.swing.JTextField txtIdAnggota;
private javax.swing.JTextField txtNama;
private javax.swing.JTextField txtTelepon;

// End of variables declaration
}

```

Output :

The screenshot shows a Java Swing application window with a light gray background. At the top, there is a title bar with a small icon on the left and standard window controls (minimize, maximize, close) on the right. The main area contains a form with four labels and text input fields: 'ID Anggota' with a value of '0', 'Nama Anggota', 'Alamat', and 'Telepon'. Below these fields are three buttons: 'Simpan', 'Tambah Baru' (highlighted with a blue border), and 'Hapus'. To the right of the 'Hapus' button is another empty text input field, followed by a 'Cari' button. At the bottom of the window is a table with four columns: 'ID', 'Nama', 'Alamat', and 'Telepon'. The table contains three data rows. Below the table is a large, empty rectangular area.

ID	Nama	Alamat	Telepon
1	Timur	Jl. Surabaya 12	1234567
2	Barat	Jl. Jawa Timur N...	9876543
4	Hafizh	Pakis	0813666788870

### Percobaan 8

Membuat GUI untuk data Buku, yang dilengkapi dengan combo box untuk memilih kategori yang terhubung dengan tabel kategori.

Desain :

ID Buku

Kategori

Item 1 ▾

Judul

Penerbit

Penulis

Simpan

Tambah Baru

Hapus

Cari

Title 1	Title 2	Title 3	Title 4

Kode :

```

/*
 * 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 frontend;

import backend.*;
import java.util.ArrayList;
import javax.swing.table.DefaultTableModel;

```



```

import javax.swing.DefaultComboBoxModel;

/**
 *
 * @author H A F I Z H
 */
public class FrmBuku extends javax.swing.JFrame {

    private static final java.util.logging.Logger logger =
        java.util.logging.Logger.getLogger(FrmBuku.class.getName());

    /**
     * Creates new form FrmBuku
     */
    public FrmBuku() {
        initComponents();
        tampilkanData();
        tampilkanCmbKategori();
        kosongkanForm();
    }

    public void kosongkanForm() {
        txtIdBuku.setText("0");
        if (cmbKategori.getItemCount() > 0) {
            cmbKategori.setSelectedIndex(0);
        }
        txtJudul.setText("");
        txtPenulis.setText("");
        txtPenerbit.setText("");
    }

    public void tampilkanData() {
        String[] kolom = {"ID", "Kategori", "Judul", "Penulis",
            "Penerbit"};
        ArrayList<Buku> list = new Buku().getAll();
        Object rowData[] = new Object[5];
    }

```

```
tblBuku.setModel(new DefaultTableModel(new Object[][] {},
kolom));
```

```
for (Buku buku : list) {
    rowData[0] = buku.getIdbuku();
    rowData[1] = buku.getKategori().getNama();
    rowData[2] = buku.getJudul();
    rowData[3] = buku.getPenulis();
    rowData[4] = buku.getPenerbit();

    ((DefaultTableModel)
tblBuku.getModel()).addRow(rowData);
}
}
```

```
public void cari(String keyword) {
    String[] kolom = {"ID", "Kategori", "Judul", "Penulis",
"Penerbit"};
    ArrayList<Buku> list = new Buku().search(keyword);
    Object rowData[] = new Object[5];
```

```
tblBuku.setModel(new DefaultTableModel(new Object[][] {},
kolom));
```

```
for (Buku buku : list) {
    rowData[0] = buku.getIdbuku();
    rowData[1] = buku.getKategori().getNama();
    rowData[2] = buku.getJudul();
    rowData[3] = buku.getPenulis();
    rowData[4] = buku.getPenerbit();

    ((DefaultTableModel)
tblBuku.getModel()).addRow(rowData);
}
}
```

```
public void tampilkanCmbKategori() {
```

```

        cmbKategori.setModel(new DefaultComboBoxModel(new
Kategori().getAll().toArray()));
    }

    /**
     * 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() {

        jLabel1 = new javax.swing.JLabel();
        jLabel2 = new javax.swing.JLabel();
        jLabel3 = new javax.swing.JLabel();
        jLabel4 = new javax.swing.JLabel();
        jLabel5 = new javax.swing.JLabel();
        txtIdBuku = new javax.swing.JTextField();
        cmbKategori = new javax.swing.JComboBox<>();
        txtJudul = new javax.swing.JTextField();
        txtPenerbit = new javax.swing.JTextField();
        txtPenulis = new javax.swing.JTextField();
        btnSimpan = new javax.swing.JButton();
        btnTambahBaru = new javax.swing.JButton();
        btnHapus = new javax.swing.JButton();
        txtCari = new javax.swing.JTextField();
        btnCari = new javax.swing.JButton();
        jScrollPane1 = new javax.swing.JScrollPane();
        tblBuku = new javax.swing.JTable();

        setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

```

```
jLabel1.setText("ID Buku");

jLabel2.setText("Kategori");

jLabel3.setText("Judul");

jLabel4.setText("Penerbit");

jLabel5.setText("Penulis");

txtIdBuku.setEnabled(false);

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

cmbKategori.setModel(new
javax.swing.DefaultComboBoxModel<>(new String[] { "Item 1", "Item
2", "Item 3", "Item 4" }));

btnSimpan.setText("Simpan");

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

btnTambahBaru.setText("Tambah Baru");

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

```

        }

    });

    btnHapus.setText("Hapus");

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

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

            btnHapusActionPerformed(evt);

        }

    });

    btnCari.setText("Cari");

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

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

            btnCariActionPerformed(evt);

        }

    });

jScrollPane1.setBorder(javax.swing.BorderFactory.createLineBorder(ne
w java.awt.Color(0, 0, 0)));

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

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

            {null, null, null, null},
            {null, null, null, null},
            {null, null, null, null},
            {null, null, null, null}

        },
        new String [] {

            "Title 1", "Title 2", "Title 3", "Title 4"

        }

    ));

```

```
tblBuku.addMouseListener(new java.awt.event.MouseAdapter() {  
    public void mouseClicked(java.awt.event.MouseEvent evt)  
{  
  
        tblBukuMouseClicked(evt);  
  
    }  
});  
jScrollPane1.setViewportViewView(tblBuku);  
  
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(14, 14, 14)  
  
        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)  
            .addGroup(layout.createSequentialGroup()  
                .addComponent(btnSimpan)  
  
                .addContainerGap(javax.swing.GroupLayout.DEFAULT_SIZE,  
Short.MAX_VALUE))  
            .addGroup(layout.createSequentialGroup()  
  
                .addComponent(jScrollPane1,  
javax.swing.GroupLayout.PREFERRED_SIZE, 459,  
javax.swing.GroupLayout.PREFERRED_SIZE)  
                .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.TRAILING)  
                    .addComponent(btnTambahBaru)  
                    .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)  
                    .addComponent(btnHapus)
```

```

.addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.RELATED)
                                .addComponent(txtCari,
javax.swing.GroupLayout.PREFERRED_SIZE, 198,
javax.swing.GroupLayout.PREFERRED_SIZE))

.addGroup(layout.createSequentialGroup())

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

                                .addComponent(jLabel1)
                                .addComponent(jLabel2)
                                .addComponent(jLabel3)
                                .addComponent(jLabel4)
                                .addComponent(jLabel5))
                                .addGap(44, 44, 44)

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

.addGroup(layout.createSequentialGroup())

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

.addComponent(txtPenerbit)

.addComponent(txtPenulis, javax.swing.GroupLayout.DEFAULT_SIZE, 188,
Short.MAX_VALUE)

.addComponent(cmbKategori, 0, 188, Short.MAX_VALUE)

.addComponent(txtIdBuku))

                                .addGap(105, 105,
105))

.addComponent(txtJudul)))

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

                                .addComponent(btnCari))

                                .addGap(0, 18, Short.MAX_VALUE)))

);

layout.setVerticalGroup(

```

```

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING
)

        .addGroup(layout.createSequentialGroup())

            .addGap(32, 32, 32)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE))

            .addComponent(jLabel1)

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

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE))

            .addComponent(jLabel2)

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

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE))

            .addComponent(jLabel3)

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

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE
D)

        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignme
nt.BASELINE))

            .addComponent(jLabel4)

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

        .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATE

```



```

)

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

        .addComponent(jLabel15)

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

        .addGap(18, 18, 18)

        .addComponent(btnSimpan)

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

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

        .addComponent(btnTambahBaru)

        .addComponent(btnHapus)

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

        .addComponent(btnCari))

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

        .addComponent(jScrollPane1,
javax.swing.GroupLayout.PREFERRED_SIZE, 157,
javax.swing.GroupLayout.PREFERRED_SIZE)

        .addContainerGap(18, Short.MAX_VALUE))

);

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

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

    // TODO add your handling code here:

}

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

    Buku buku = new Buku();

```

```

        buku.setIdbuku(Integer.parseInt(txtIdBuku.getText()));
        buku.setKategori((Kategori) cmbKategori.getSelectedItem());
        buku.setJudul(txtJudul.getText());
        buku.setPenulis(txtPenulis.getText());
        buku.setPenerbit(txtPenerbit.getText());
        buku.save();

        txtIdBuku.setText(Integer.toString(buku.getIdbuku()));
        tampilkanData();
    }

    private void
    btnTambahBaruActionPerformed(java.awt.event.ActionEvent evt) {
        kosongkanForm();
    }

    private void btnCariActionPerformed(java.awt.event.ActionEvent
    evt) {
        cari(txtCari.getText());
    }

    private void btnHapusActionPerformed(java.awt.event.ActionEvent
    evt) {
        DefaultTableModel model = (DefaultTableModel)
        tblBuku.getModel();
        int row = tblBuku.getSelectedRow();

        Buku buku = new
        Buku().getById(Integer.parseInt(model.getValueAt(row,
        0).toString()));
        buku.delete();
        kosongkanForm();
        tampilkanData();
    }

    private void tblBukuMouseClicked(java.awt.event.MouseEvent evt)
    {
        DefaultTableModel model = (DefaultTableModel)
        tblBuku.getModel();

```

```

        int row = tblBuku.getSelectedRow();

        Buku buku = new Buku();

        buku = buku.getById(Integer.parseInt(model.getValueAt(row,
0).toString()));

        txtIdBuku.setText(String.valueOf(buku.getIdbuku()));
        cmbKategori.getModel().setSelectedItem(buku.getKategori());
        txtJudul.setText(buku.getJudul());
        txtPenerbit.setText(buku.getPenerbit());
        txtPenulis.setText(buku.getPenulis());
    }

    /**
     * @param args the command line arguments
     */
    public static void main(String args[]) {
        /* Set the Nimbus look and feel */
        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 | InstantiationException |
IllegalAccessException | javax.swing.UnsupportedLookAndFeelException
ex) {

        }

        java.util.logging.Logger.getLogger(FrmBuku.class.getName()).log(java
.util.logging.Level.SEVERE, null, ex);
    }

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

```

```
        }

    });

}

// Variables declaration - do not modify
private javax.swing.JButton btnCari;
private javax.swing.JButton btnHapus;
private javax.swing.JButton btnSimpan;
private javax.swing.JButton btnTambahBaru;
private javax.swing.JComboBox<String> cmbKategori;
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.JScrollPane jScrollPane1;
private javax.swing.JTable tblBuku;
private javax.swing.JTextField txtCari;
private javax.swing.JTextField txtIdBuku;
private javax.swing.JTextField txtJudul;
private javax.swing.JTextField txtPenerbit;
private javax.swing.JTextField txtPenulis;

// End of variables declaration
}
```

Output :

ID Buku: 0

Kategori: Tes1

Judul:

Penerbit:

Penulis:

Simpan

Tambah Baru Hapus Cari

ID	Kategori	Judul	Penulis	Penerbit
1	Tes1	Harry Potter	Athaulla Hafizh	Athaulla Hafizh

### Tugas

1. Buatlah class Peminjaman.
2. Buatlah form FrmPeminjaman dan susun sebagai berikut:

ID

ID Anggota

Cari

Nama Anggota

ID Buku

Cari

Judul Buku

Tanggal Pinjam

Format: YYYY/MM/DD

Tanggal Kembali

Format: YYYY/MM/DD

Simpan

Tambah Baru

Hapus

Title 1	Title 2	Title 3	Title 4

3. Atur kode program agar dapat menangani transaksi peminjaman dan pengembalian. Note: Pada textbox ID Anggota, pengguna tinggal memasukkan ID anggota, kemudian menekan tombol Cari. Jika ketemu, maka label “Nama Anggota” yang ada di samping tombol Cari tersebut akan menampilkan nama anggota dari ID yang dimasukkan tadi. Begitu juga dengan ID Buku.

Desain :

ID

ID Anggota

Cari

Nama Anggota

ID Buku

Cari

Judul Buku

Tanggal Pinjam

Format: YYYY/MM/DD

Tanggal Kembali

Format: YYYY/MM/DD

Simpan

Tambah Baru

Hapus

Title 1	Title 2	Title 3	Title 4

Kode Class Peminjaman :

```

/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-
default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java
to edit this template
 */
package backend;
import java.util.ArrayList;
import java.sql.*;

/**
 *
 * @author H A F I Z H
 */

```

```

public class Peminjaman {

    private int idPeminjaman;

    private Anggota anggota = new Anggota();

    private Buku buku = new Buku();

    private String tanggalPinjam;

    private String tanggalKembali;

    public Peminjaman() {

    }

    public Peminjaman(Anggota anggota, Buku buku, String
tanggalPinjam, String tanggalKembali) {

        this.anggota = anggota;

        this.buku = buku;

        this.tanggalPinjam = tanggalPinjam;

        this.tanggalKembali = tanggalKembali;

    }

    public int getIdPeminjaman() { return idPeminjaman; }

    public void setIdPeminjaman(int idPeminjaman) {
this.idPeminjaman = idPeminjaman; }

    public Anggota getAnggota() { return anggota; }

    public void setAnggota(Anggota anggota) { this.anggota =
anggota; }

    public Buku getBuku() { return buku; }

    public void setBuku(Buku buku) { this.buku = buku; }

    public String getTanggalPinjam() { return tanggalPinjam; }

    public void setTanggalPinjam(String tanggalPinjam) {
this.tanggalPinjam = tanggalPinjam; }

    public String getTanggalKembali() { return tanggalKembali; }

    public void setTanggalKembali(String tanggalKembali) {
this.tanggalKembali = tanggalKembali; }

    public Peminjaman getById(int id) {

        Peminjaman pem = new Peminjaman();

        String sql = "SELECT p.*, a.nama as nama_anggota, b.judul as
judul_buku " +

                        "FROM peminjaman p " +

```



```

        "LEFT JOIN anggota a ON p.idanggota =
a.idanggota " +
        "LEFT JOIN buku b ON p.idbuku = b.idbuku " +
        "WHERE p.idpeminjaman = '" + id + "'";
ResultSet rs = DBHelper.selectQuery(sql);
try {
    while (rs.next()) {
        pem = new Peminjaman();
        pem.setIdPeminjaman(rs.getInt("idpeminjaman"));

pem.getAnggota().setIdanggota(rs.getInt("idanggota"));

pem.getAnggota().setNama(rs.getString("nama_anggota"));
        pem.getBuku().setIdbuku(rs.getInt("idbuku"));
        pem.getBuku().setJudul(rs.getString("judul_buku"));
        pem.setTanggalPinjam(rs.getString("tanggalpinjam"));

pem.setTanggalKembali(rs.getString("tanggalkembali"));
    }
} catch (Exception e) {
    e.printStackTrace();
}
return pem;
}

public ArrayList<Peminjaman> getAll() {
    ArrayList<Peminjaman> ListPeminjaman = new ArrayList();
    String sql = "SELECT p.*, a.nama as nama_anggota, b.judul as
judul_buku " +
        "FROM peminjaman p " +
        "LEFT JOIN anggota a ON p.idanggota =
a.idanggota " +
        "LEFT JOIN buku b ON p.idbuku = b.idbuku";
    ResultSet rs = DBHelper.selectQuery(sql);
    try {
        while (rs.next()) {
            Peminjaman pem = new Peminjaman();
            pem.setIdPeminjaman(rs.getInt("idpeminjaman"));

```

```

pem.getAnggota().setIdanggota(rs.getInt("idanggota"));

pem.getAnggota().setNama(rs.getString("nama_anggota"));
        pem.getBuku().setIdbuku(rs.getInt("idbuku"));
        pem.getBuku().setJudul(rs.getString("judul_buku"));
        pem.setTanggalPinjam(rs.getString("tanggalpinjam"));

pem.setTanggalKembali(rs.getString("tanggalkembali"));
        ListPeminjaman.add(pem);
    }
} catch (Exception e) {
    e.printStackTrace();
}
return ListPeminjaman;
}

public void save() {
    if (getById(idPeminjaman).getIdPeminjaman() == 0) {
        String SQL = "INSERT INTO peminjaman (idanggota, idbuku,
tanggalpinjam, tanggalkembali) VALUES(" +
            "'" + this.getAnggota().getIdanggota() +
            "', " +
            "'" + this.getBuku().getIdbuku() + "', " +
            "'" + this.tanggalPinjam + "', " +
            "'" + this.tanggalkembali + "'"");
        this.idPeminjaman = DBHelper.insertQueryGetId(SQL);
    } else {
        String SQL = "UPDATE peminjaman SET " +
            "idanggota = '" +
this.getAnggota().getIdanggota() + "', " +
            "idbuku = '" + this.getBuku().getIdbuku() +
            "', " +
            "tanggalpinjam = '" + this.tanggalPinjam +
            "', " +
            "tanggalkembali = '" + this.tanggalkembali
            + "' " +
            "WHERE idpeminjaman = '" +
this.idPeminjaman + "'";
        DBHelper.executeQuery(SQL);
    }
}

```

```

        }

    }

    public void delete() {

        String SQL = "DELETE FROM peminjaman WHERE idpeminjaman = '"
+ this.idPeminjaman + "'";

        DBHelper.executeQuery(SQL);

    }

}

```

Kode Class FrmPeminjaman :

```

/*
 * 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 frontend;

import backend.*;
import java.util.ArrayList;
import javax.swing.table.DefaultTableModel;

/**
 *
 * @author H A F I Z H
 */
public class FrmPeminjaman extends javax.swing.JFrame {

    private static final java.util.logging.Logger logger =
java.util.logging.Logger.getLogger(FrmPeminjaman.class.getName());

    public FrmPeminjaman() {

        initComponents();

        tampilkanData();

        kosongkanForm();

    }

```

```

public void kosongkanForm() {
    txtId.setText("0");
    txtIdAnggota.setText("");
    txtIdBuku.setText("");
    txtTanggalPinjam.setText("");
    txtTanggalKembali.setText("");
    lblNamaAnggota.setText("Nama Anggota");
    lblJudulBuku.setText("Judul Buku");
}

public void tampilkanData() {
    String[] kolom = {"ID", "Nama Anggota", "Judul Buku", "Tgl
Pinjam", "Tgl Kembali"};

    ArrayList<Peminjaman> list = new Peminjaman().getAll();
    Object rowData[] = new Object[5];

    tblPeminjaman.setModel(new DefaultTableModel(new
Object[][]{{}}, kolom));

    for (Peminjaman pem : list) {
        rowData[0] = pem.getIdPeminjaman();
        rowData[1] = pem.getAnggota().getNama();
        rowData[2] = pem.getBuku().getJudul();
        rowData[3] = pem.getTanggalPinjam();
        rowData[4] = pem.getTanggalKembali();

        ((DefaultTableModel)
tblPeminjaman.getModel()).addRow(rowData);
    }
}

/**
 * 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() {

    jLabel1 = new javax.swing.JLabel();
    jLabel2 = new javax.swing.JLabel();
    jLabel3 = new javax.swing.JLabel();
    jLabel4 = new javax.swing.JLabel();
    jLabel5 = new javax.swing.JLabel();
    txtId = new javax.swing.JTextField();
    txtIdAnggota = new javax.swing.JTextField();
    txtIdBuku = new javax.swing.JTextField();
    txtTanggalPinjam = new javax.swing.JTextField();
    txtTanggalKembali = new javax.swing.JTextField();
    btnCariAnggota = new javax.swing.JButton();
    lblNamaAnggota = new javax.swing.JLabel();
    btnCariBuku = new javax.swing.JButton();
    lblJudulBuku = new javax.swing.JLabel();
    jLabel8 = new javax.swing.JLabel();
    jLabel9 = new javax.swing.JLabel();
    btnSimpan = new javax.swing.JButton();
    btnTambahBaru = new javax.swing.JButton();
    btnHapus = new javax.swing.JButton();
    jScrollPane1 = new javax.swing.JScrollPane();
    tblPeminjaman = new javax.swing.JTable();

    setDefaultCloseOperation(javax.swing.WindowConstants.EXIT_ON_CLOSE);

    jLabel1.setText("ID");

    jLabel2.setText("ID Anggota");

    jLabel3.setText("ID Buku");

    jLabel4.setText("Tanggal Pinjam");
```

```
jLabel5.setText("Tanggal Kembali");

txtId.setEnabled(false);

btnCariAnggota.setText("Cari");
btnCariAnggota.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnCariAnggotaActionPerformed(evt);
    }
});

lblNamaAnggota.setText("Nama Anggota");

btnCariBuku.setText("Cari");
btnCariBuku.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnCariBukuActionPerformed(evt);
    }
});

lblJudulBuku.setText("Judul Buku");

jLabel8.setText("Format: YYYY/MM/DD");

jLabel9.setText("Format: YYYY/MM/DD");

btnSimpan.setText("Simpan");
btnSimpan.addActionListener(new
java.awt.event.ActionListener() {
    public void actionPerformed(java.awt.event.ActionEvent
evt) {
        btnSimpanActionPerformed(evt);
    }
});
```

```

    });

    btnTambahBaru.setText("Tambah Baru");

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

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

            btnTambahBaruActionPerformed(evt);

        }

    });

    btnHapus.setText("Hapus");

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

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

            btnHapusActionPerformed(evt);

        }

    });

jScrollPane1.setBorder(javax.swing.BorderFactory.createLineBorder(new
java.awt.Color(0, 0, 0)));

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

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

    new Object [][] {

        {null, null, null, null},

        {null, null, null, null},

        {null, null, null, null},

        {null, null, null, null}

    },

    new String [] {

        "Title 1", "Title 2", "Title 3", "Title 4"

    }

));

```

```

tblPeminjaman.addMouseListener(new
java.awt.event.MouseAdapter() {
    public void mouseClicked(java.awt.event.MouseEvent evt)
    {
        tblPeminjamanMouseClicked(evt);
    }
});
jScrollPane1.setViewportView(tblPeminjaman);

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(17, 17, 17)
        .addGroup(layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING, false)
            .addComponent(jScrollPane1)
            .addGroup(layout.createSequentialGroup()
                .addComponent(btnTambahBaru)
                .addPreferredGap(javax.swing.LayoutStyle.ComponentPlacement.UNRELATED)
                .addComponent(btnHapus)
                .addComponent(btnSimpan)
                .addGroup(layout.createSequentialGroup()
                    .addComponent(jLabel1)
                    .addGap(87, 87, 87)
                    .addComponent(txtId,
javax.swing.GroupLayout.PREFERRED_SIZE, 98,
javax.swing.GroupLayout.PREFERRED_SIZE))
                .addGroup(layout.createSequentialGroup()
                    .addComponent(jLabel2)
                    .addComponent(jLabel3)

```



```

        .addGap(37, 37, 37)

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

            .addComponent(txtIdAnggota,
                javax.swing.GroupLayout.DEFAULT_SIZE, 99, Short.MAX_VALUE)

            .addComponent(txtIdBuku))

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

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

            .addGroup(layout.createSequentialGroup()

                .addComponent(btnCariAnggota)

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

                .addComponent(lblNamaAnggota)

            .addGroup(layout.createSequentialGroup()

                .addComponent(btnCariBuku)

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

                .addComponent(lblJudulBuku)))

            .addGroup(layout.createSequentialGroup()

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

                    .addGroup(layout.createSequentialGroup()

                        .addComponent(jLabel5)

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

                        .addComponent(txtTanggalKembali))

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

                            .addComponent(jLabel4)

                            .addGap(18, 18, 18)

                            .addComponent(txtTanggalPinjam,
                                javax.swing.GroupLayout.PREFERRED_SIZE, 226,
                                javax.swing.GroupLayout.PREFERRED_SIZE)))

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

```

```

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

                                .addComponent(jLabel8)

                                .addComponent(jLabel9)))

        .addContainerGap(16, Short.MAX_VALUE))

    );

    layout.setVerticalGroup(

layout.createParallelGroup(javax.swing.GroupLayout.Alignment.LEADING)

        .addGroup(layout.createSequentialGroup())

            .addGap(17, 17, 17)

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

            .addComponent(jLabel11)

            .addComponent(txtId,
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(jLabel2)

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

            .addComponent(btnCariAnggota)

            .addComponent(lblNamaAnggota))

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

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

            .addComponent(jLabel3)

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

            .addComponent(btnCariBuku)

```

```

        .addComponent(lblJudulBuku))

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

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

        .addComponent(jLabel14)

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

        .addComponent(jLabel18))

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

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

        .addComponent(jLabel15,
            javax.swing.GroupLayout.PREFERRED_SIZE, 16,
            javax.swing.GroupLayout.PREFERRED_SIZE)

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

        .addComponent(jLabel19))

        .addGap(18, 18, 18)

        .addComponent(btnSimpan)

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

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

        .addComponent(btnTambahBaru)

        .addComponent(btnHapus))

        .addGap(18, 18, 18)

        .addComponent(jScrollPane1,
            javax.swing.GroupLayout.PREFERRED_SIZE, 167,
            javax.swing.GroupLayout.PREFERRED_SIZE)

        .addContainerGap(14, Short.MAX_VALUE))

    );

    pack();
}

```

```

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

            // Cari Anggota berdasarkan ID yang diketik

            int idAnggota = Integer.parseInt(txtIdAnggota.getText());

            Anggota ang = new Anggota().getById(idAnggota);

            if(ang.getIdanggota() != 0) {

                lblNamaAnggota.setText(ang.getNama()); // Tampilkan nama
di Label

            } else {

                lblNamaAnggota.setText("Anggota tidak ditemukan!");

            }

        }

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

            // Cari Buku berdasarkan ID yang diketik

            int idBuku = Integer.parseInt(txtIdBuku.getText());

            Buku buk = new Buku().getById(idBuku);

            if(buk.getIdbuku() != 0) {

                lblJudulBuku.setText(buk.getJudul()); // Tampilkan judul
di Label

            } else {

                lblJudulBuku.setText("Buku tidak ditemukan!");

            }

        }

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

            Peminjaman pem = new Peminjaman();

            pem.setIdPeminjaman(Integer.parseInt(txtId.getText()));

            pem.getAnggota().setIdanggota(Integer.parseInt(txtIdAnggota.getText(
            )));

            pem.getBuku().setIdbuku(Integer.parseInt(txtIdBuku.getText()));

            pem.setTanggalPinjam(txtTanggalPinjam.getText());

```

```

        pem.setTanggalKembali(txtTanggalKembali.getText());
        pem.save();

        txtId.setText(Integer.toString(pem.getIdPeminjaman()));
        tampilkanData();
    }

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

        kosongkanForm();
    }

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

        DefaultTableModel model = (DefaultTableModel)
        tblPeminjaman.getModel();

        int row = tblPeminjaman.getSelectedRow();

        Peminjaman pem = new
        Peminjaman().getById(Integer.parseInt(model.getValueAt(row,
        0).toString()));

        pem.delete();

        kosongkanForm();

        tampilkanData();
    }

    private void tblPeminjamanMouseClicked(java.awt.event.MouseEvent
    evt) {

        DefaultTableModel model = (DefaultTableModel)
        tblPeminjaman.getModel();

        int row = tblPeminjaman.getSelectedRow();

        // Ambil data dari backend berdasarkan ID yang diklik

        Peminjaman pem = new
        Peminjaman().getById(Integer.parseInt(model.getValueAt(row,
        0).toString()));

        // Tampilkan ke form

        txtId.setText(String.valueOf(pem.getIdPeminjaman()));
    }

```

```

txtIdAnggota.setText(String.valueOf(pem.getAnggota().getIdanggota()));
};

txtIdBuku.setText(String.valueOf(pem.getBuku().getIdbuku()));

txtTanggalPinjam.setText(pem.getTanggalPinjam());
txtTanggalKembali.setText(pem.getTanggalKembali());

// Tampilkan juga nama dan judulnya
lblNamaAnggota.setText(pem.getAnggota().getNama());
lblJudulBuku.setText(pem.getBuku().getJudul());
}

/**
 * @param args the command line arguments
 */
public static void main(String args[]) {
    /* Set the Nimbus look and feel */
    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 | InstantiationException |
IllegalAccessException | javax.swing.UnsupportedLookAndFeelException
ex) {
        java.util.logging.Logger.getLogger(FrmPeminjaman.class.getName()).lo
g(java.util.logging.Level.SEVERE, null, ex);
    }

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

```

```

        }


    });
}

// Variables declaration - do not modify
private javax.swing.JButton btnCariAnggota;
private javax.swing.JButton btnCariBuku;
private javax.swing.JButton btnHapus;
private javax.swing.JButton btnSimpan;
private javax.swing.JButton btnTambahBaru;
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 jLabel8;
private javax.swing.JLabel jLabel9;
private javax.swing.JScrollPane jScrollPane1;
private javax.swing.JLabel lblJudulBuku;
private javax.swing.JLabel lblNamaAnggota;
private javax.swing.JTable tblPeminjaman;
private javax.swing.JTextField txtId;
private javax.swing.JTextField txtIdAnggota;
private javax.swing.JTextField txtIdBuku;
private javax.swing.JTextField txtTanggalKembali;
private javax.swing.JTextField txtTanggalPinjam;

// End of variables declaration
}

```

Output :



—

□

×

ID

ID Anggota

Cari

Nama Anggota

ID Buku

Cari

Judul Buku

Tanggal Pinjam

Format: YYYY/MM/DD

Tanggal Kembali

Format: YYYY/MM/DD

Simpan

Tambah Baru

Hapus

ID	Nama Anggota	Judul Buku	Tgl Pinjam	Tgl Kembali
1	Timur	Harry Potter	2025-12-23	2025-12-25