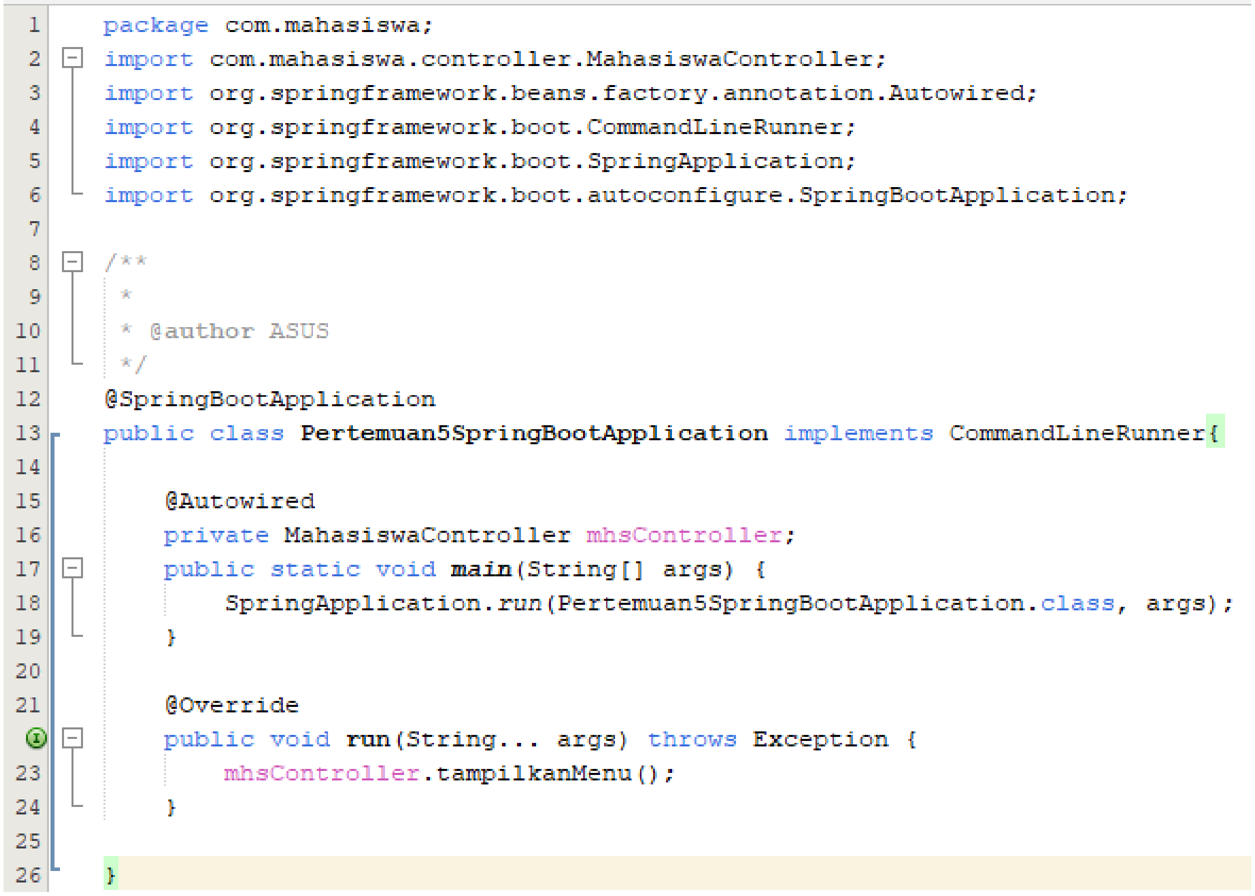
Nama: Shaun Patrick Hendra

NPM: 51421416

Kelas: 4IA28

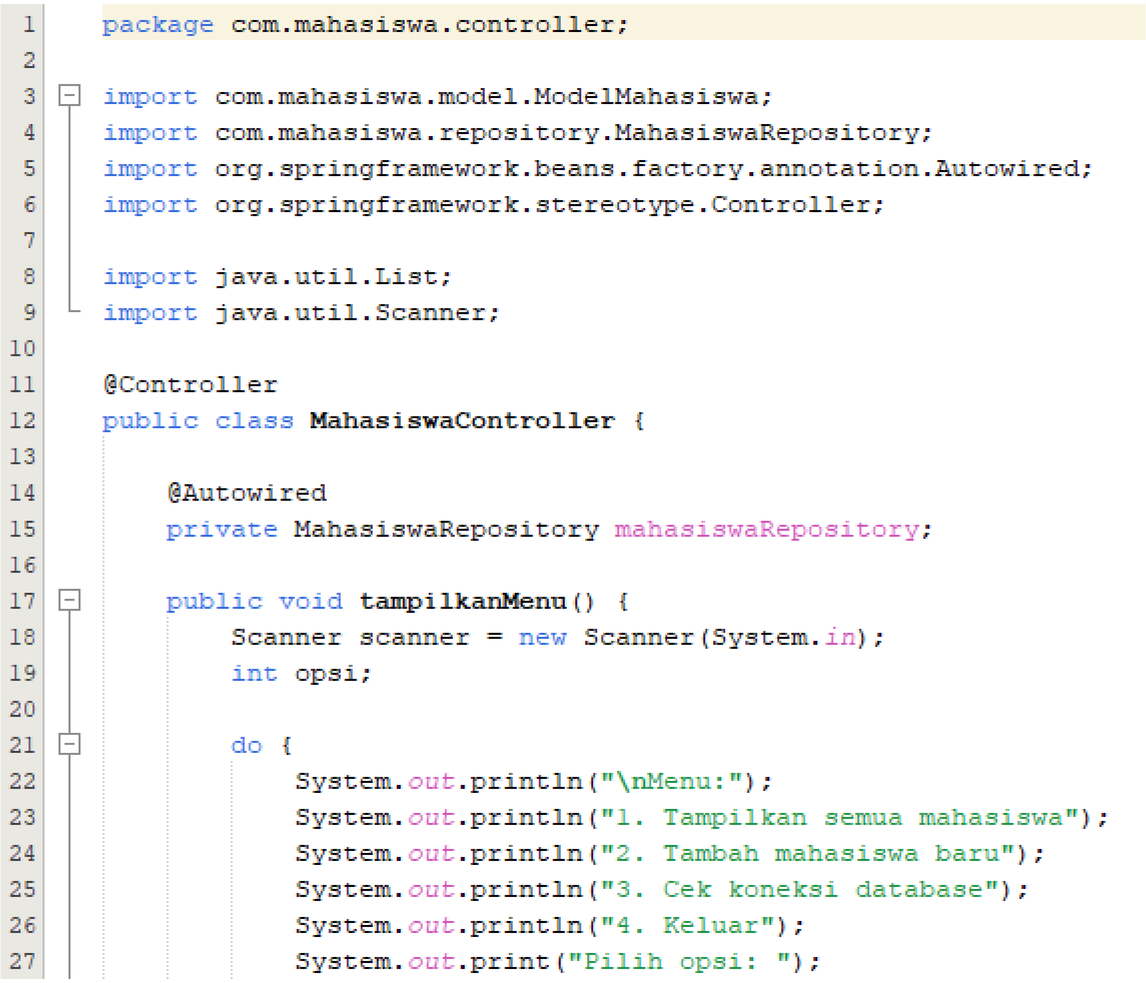
Pertemuan 5

Source Code:
SpringBootApplication

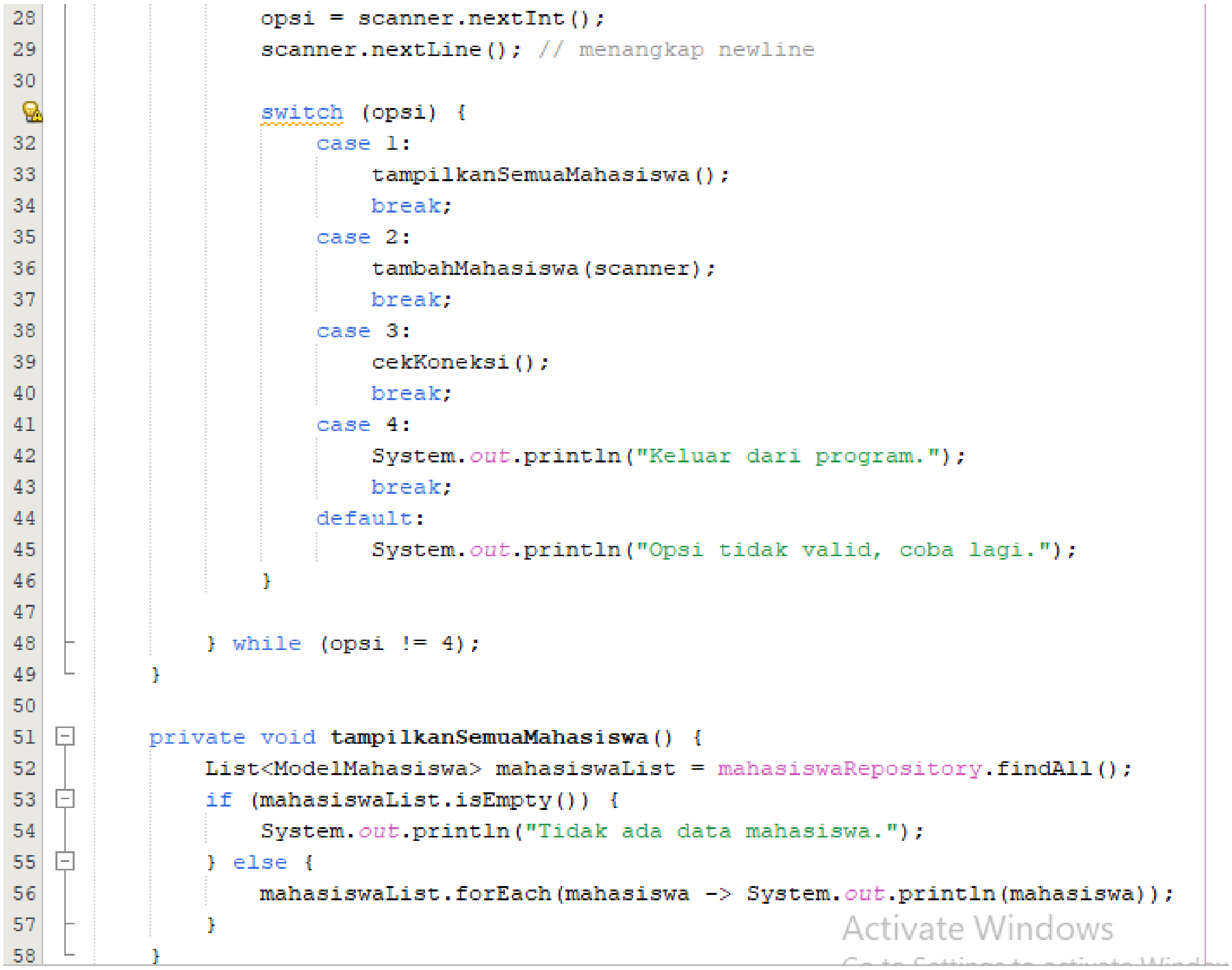


```java
package com.mahasiswa;
import com.mahasiswa.controller.MahasiswaController;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.boot.CommandLineRunner;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;

/**
 *
 * @author ASUS
 */
@SpringBootApplication
public class Pertemuan5SpringBootApplication implements CommandLineRunner{

    @Autowired
    private MahasiswaController mhsController;
    public static void main(String[] args) {
        SpringApplication.run(Pertemuan5SpringBootApplication.class, args);
    }

    @Override
    public void run(String... args) throws Exception {
        mhsController.tampilkanMenu();
    }

}
```

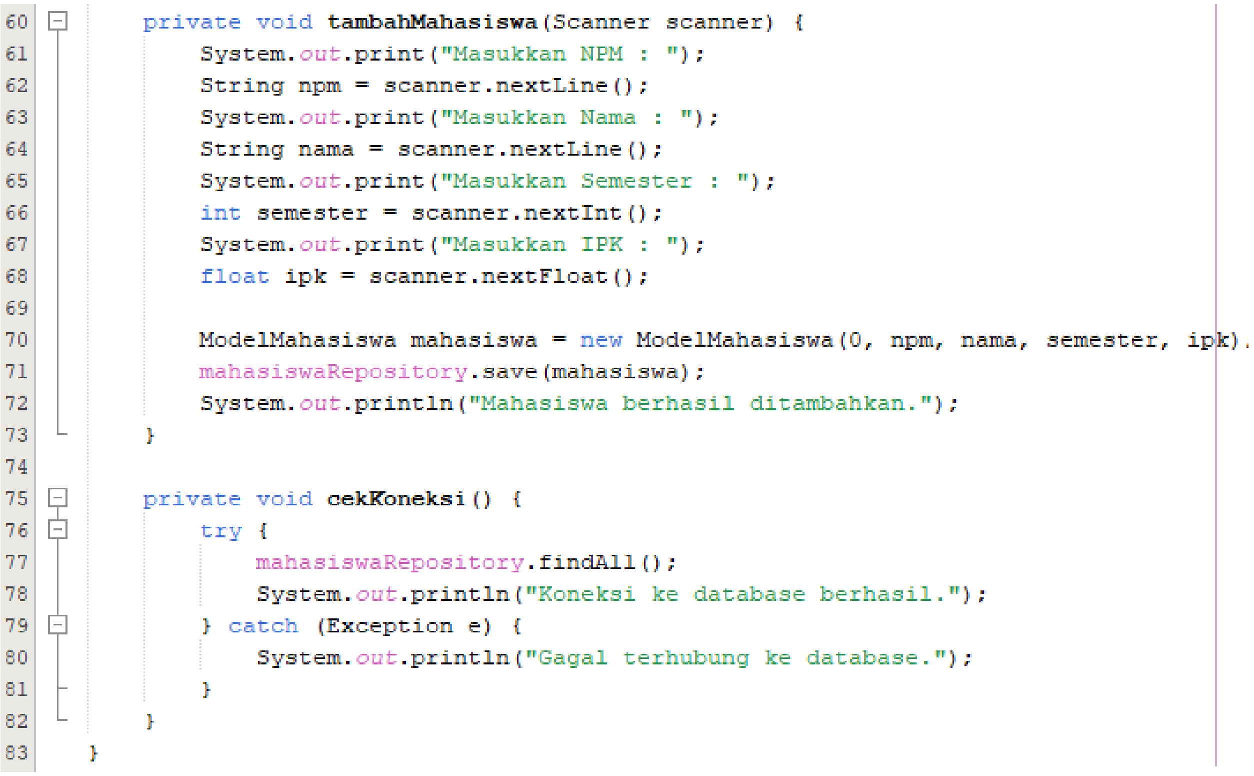
MahasiswaController



```java
package com.mahasiswa.controller;

import com.mahasiswa.model.ModelMahasiswa;
import com.mahasiswa.repository.MahasiswaRepository;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Controller;

import java.util.List;
import java.util.Scanner;

@Controller
public class MahasiswaController {

    @Autowired
    private MahasiswaRepository mahasiswaRepository;

    public void tampilkanMenu() {
        Scanner scanner = new Scanner(System.in);
        int opsi;

        do {
            System.out.println("\nMenu:");
            System.out.println("1. Tampilkan semua mahasiswa");
            System.out.println("2. Tambah mahasiswa baru");
            System.out.println("3. Cek koneksi database");
            System.out.println("4. Keluar");
            System.out.print("Pilih opsi: ");
```

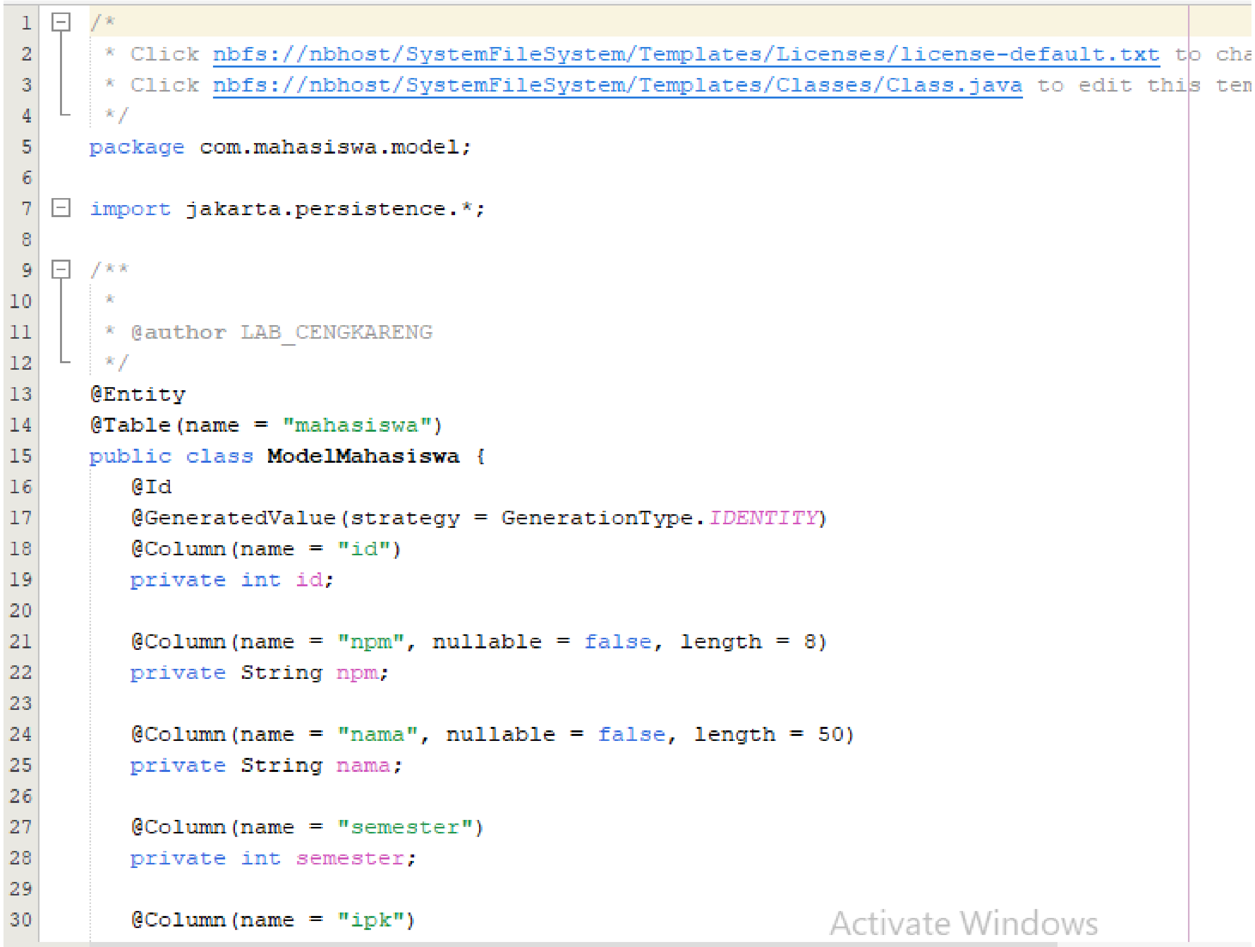


```java
            opsi = scanner.nextInt();
            scanner.nextLine(); // menangkap newline

            switch (opsi) {
                case 1:
                    tampilkanSemuaMahasiswa();
                    break;
                case 2:
                    tambahMahasiswa(scanner);
                    break;
                case 3:
                    cekKoneksi();
                    break;
                case 4:
                    System.out.println("Keluar dari program.");
                    break;
                default:
                    System.out.println("Opsi tidak valid, coba lagi.");
            }

        } while (opsi != 4);
    }

    private void tampilkanSemuaMahasiswa() {
        List<ModelMahasiswa> mahasiswaList = mahasiswaRepository.findAll();
        if (mahasiswaList.isEmpty()) {
            System.out.println("Tidak ada data mahasiswa.");
        } else {
            mahasiswaList.forEach(mahasiswa -> System.out.println(mahasiswa));
        }
    }
```

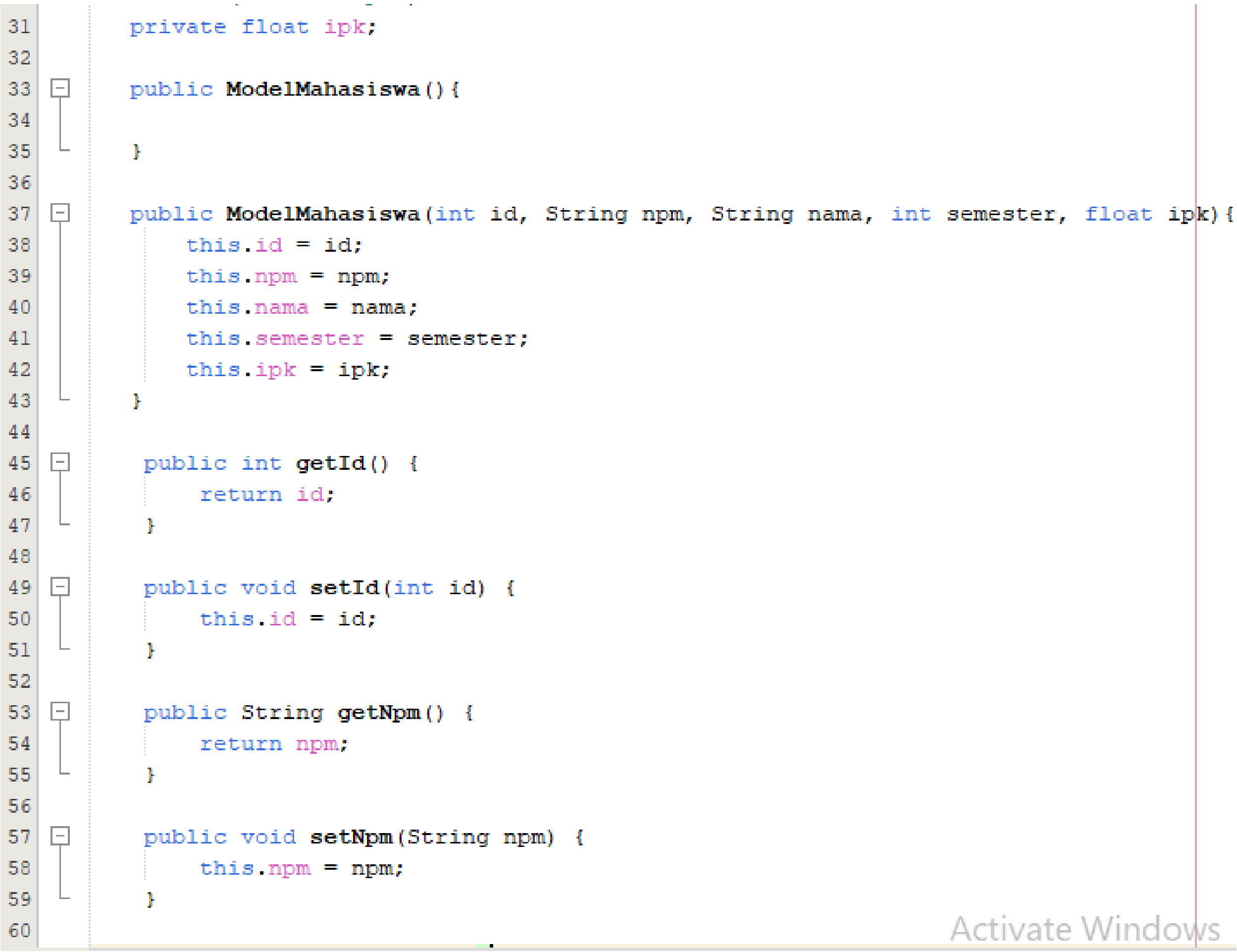


```
    private void tambahMahasiswa(Scanner scanner) {
        System.out.print("Masukkan NPM : ");
        String npm = scanner.nextLine();
        System.out.print("Masukkan Nama : ");
        String nama = scanner.nextLine();
        System.out.print("Masukkan Semester : ");
        int semester = scanner.nextInt();
        System.out.print("Masukkan IPK : ");
        float ipk = scanner.nextFloat();

        ModelMahasiswa mahasiswa = new ModelMahasiswa(0, npm, nama, semester, ipk);
        mahasiswaRepository.save(mahasiswa);
        System.out.println("Mahasiswa berhasil ditambahkan.");
    }

    private void cekKoneksi() {
        try {
            mahasiswaRepository.findAll();
            System.out.println("Koneksi ke database berhasil.");
        } catch (Exception e) {
            System.out.println("Gagal terhubung ke database.");
        }
    }
}
```

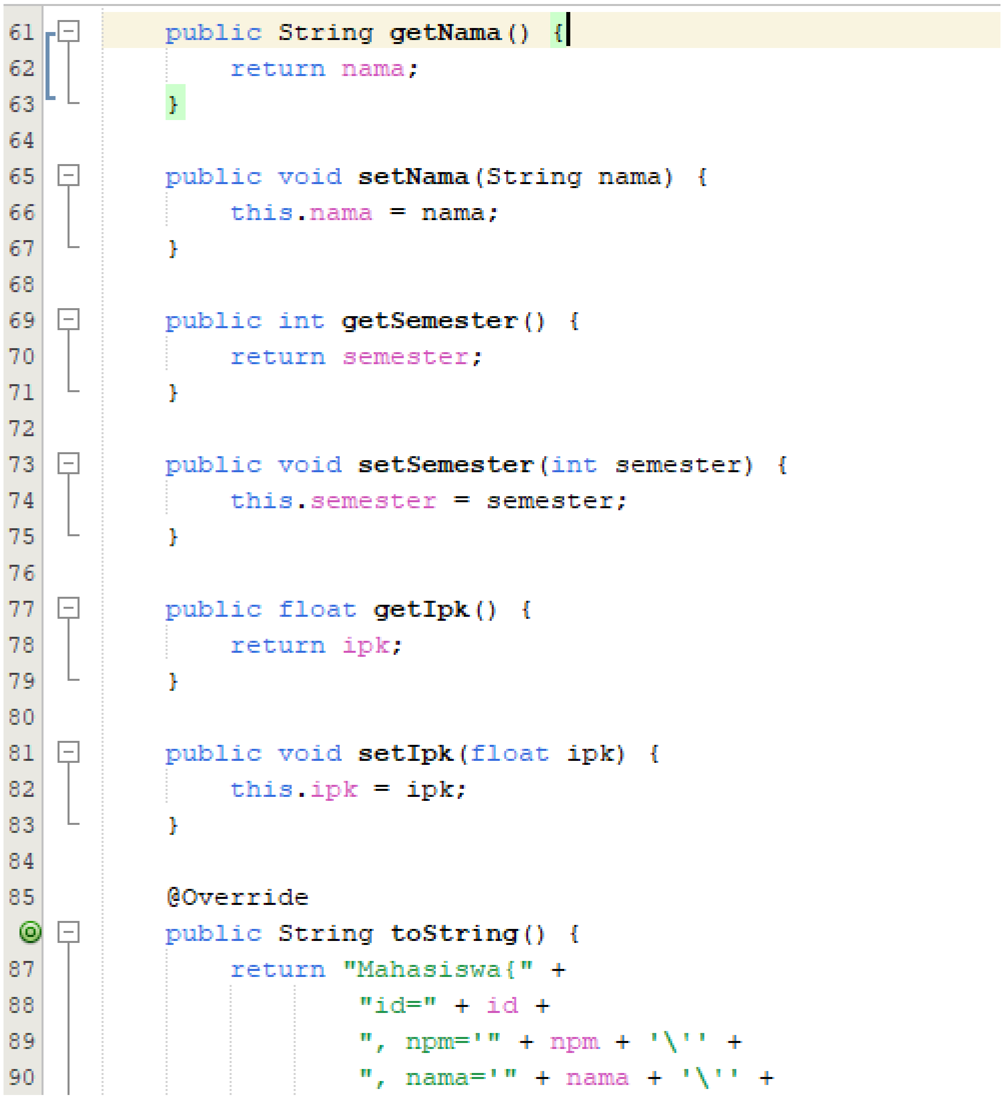
ModelMahasiswa



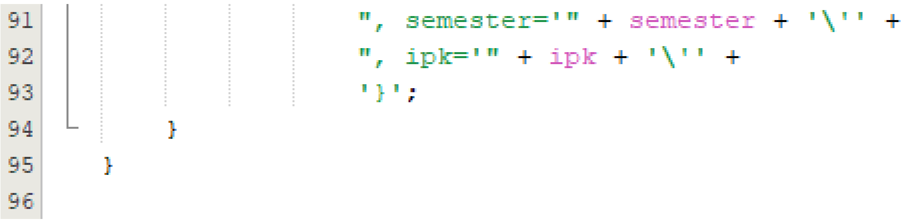
```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to cha
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this tem
 */
package com.mahasiswa.model;

import jakarta.persistence.*;

/**
 *
 * @author LAB_CENGKARENG
 */
@Entity
@Table(name = "mahasiswa")
public class ModelMahasiswa {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "id")
    private int id;

    @Column(name = "npm", nullable = false, length = 8)
    private String npm;

    @Column(name = "nama", nullable = false, length = 50)
    private String nama;

    @Column(name = "semester")
    private int semester;

    @Column(name = "ipk")
```



```
    private float ipk;

    public ModelMahasiswa(){

    }

    public ModelMahasiswa(int id, String npm, String nama, int semester, float ipk){
        this.id = id;
        this.npm = npm;
        this.nama = nama;
        this.semester = semester;
        this.ipk = ipk;
    }

     public int getId() {
         return id;
     }

     public void setId(int id) {
         this.id = id;
     }

     public String getNpm() {
         return npm;
     }

     public void setNpm(String npm) {
         this.npm = npm;
     }

```

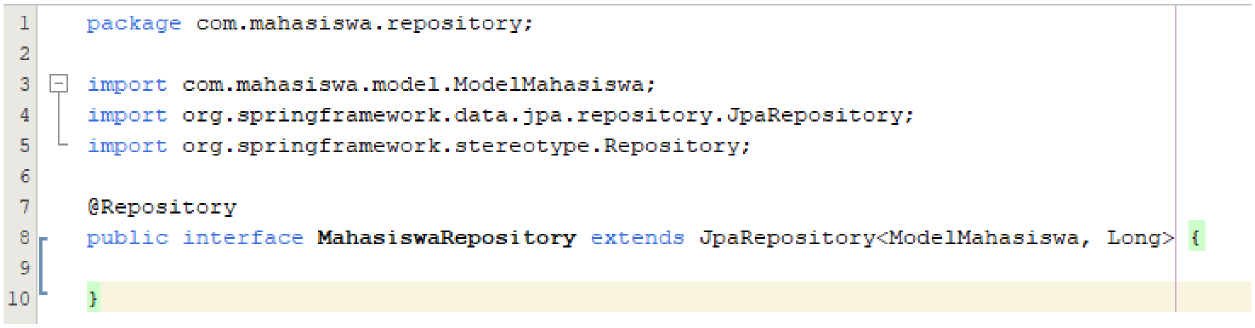


```
    public String getNama() {
        return nama;
    }

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

    public int getSemester() {
        return semester;
    }

    public void setSemester(int semester) {
        this.semester = semester;
    }

    public float getIpk() {
        return ipk;
    }

    public void setIpk(float ipk) {
        this.ipk = ipk;
    }

    @Override
    public String toString() {
        return "Mahasiswa{" +
                "id=" + id +
                ", npm='" + npm + '\'' +
                ", nama='" + nama + '\'' +
```



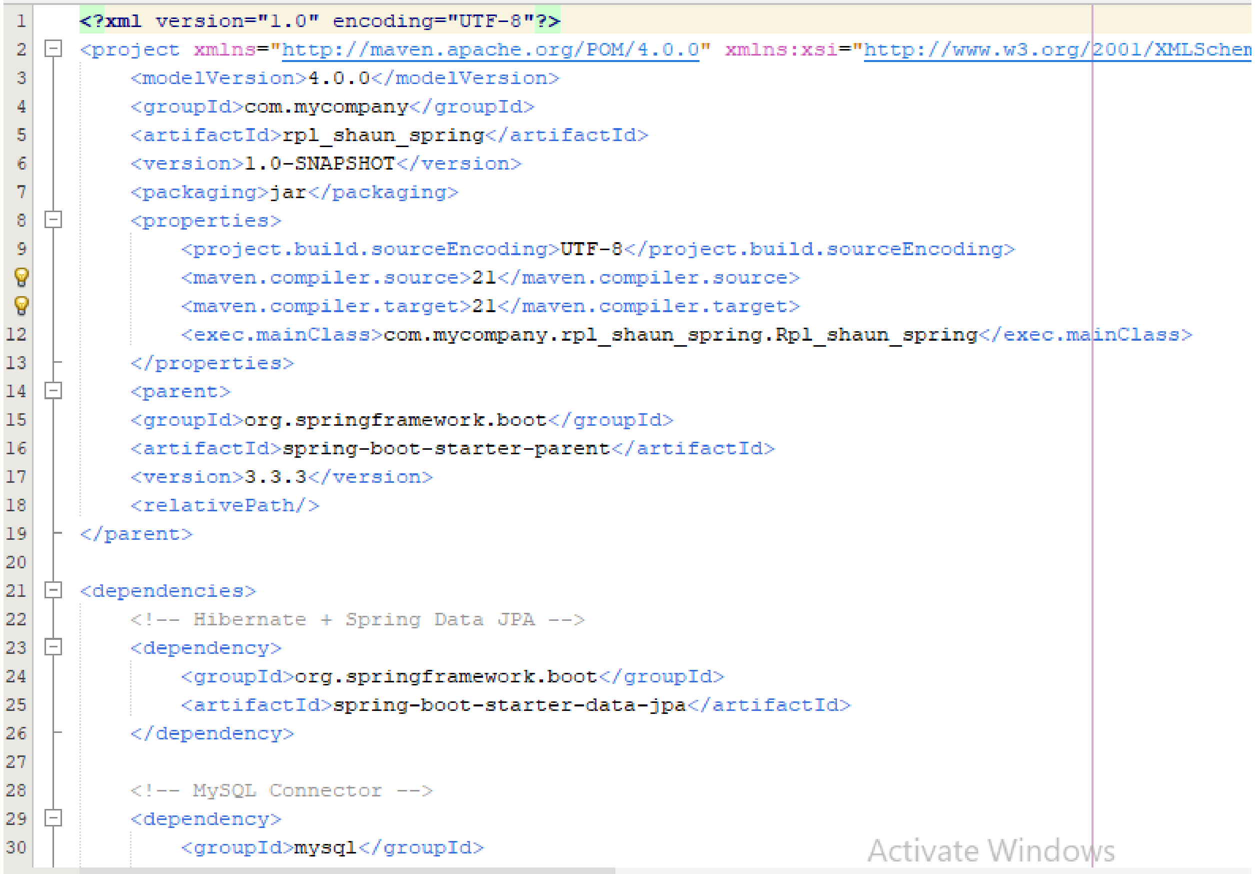
```
                ", semester='" + semester + '\'' +
                ", ipk='" + ipk + '\'' +
                '}';
    }
}
```

MahasiswaRepository

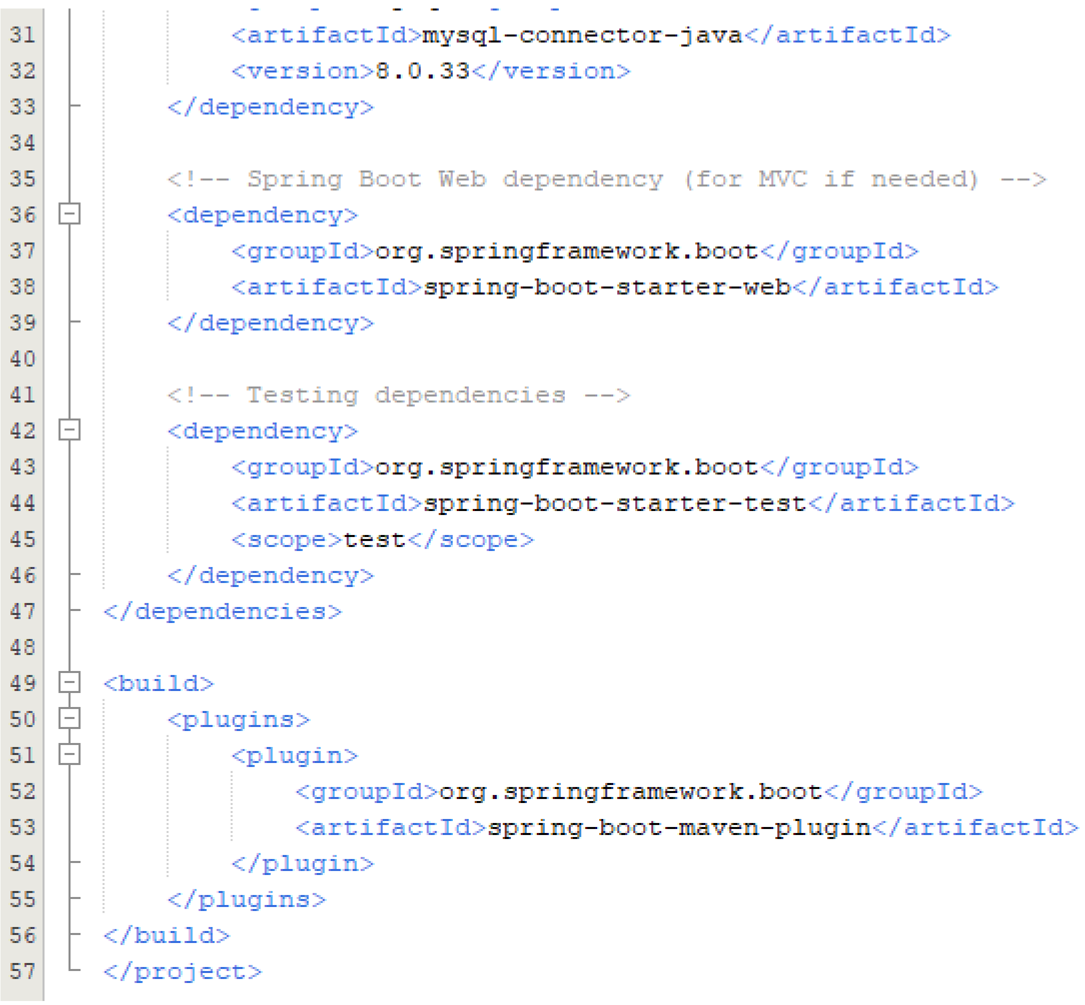


```java
package com.mahasiswa.repository;

import com.mahasiswa.model.ModelMahasiswa;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

@Repository
public interface MahasiswaRepository extends JpaRepository<ModelMahasiswa, Long> {

}
```

Pom.xml

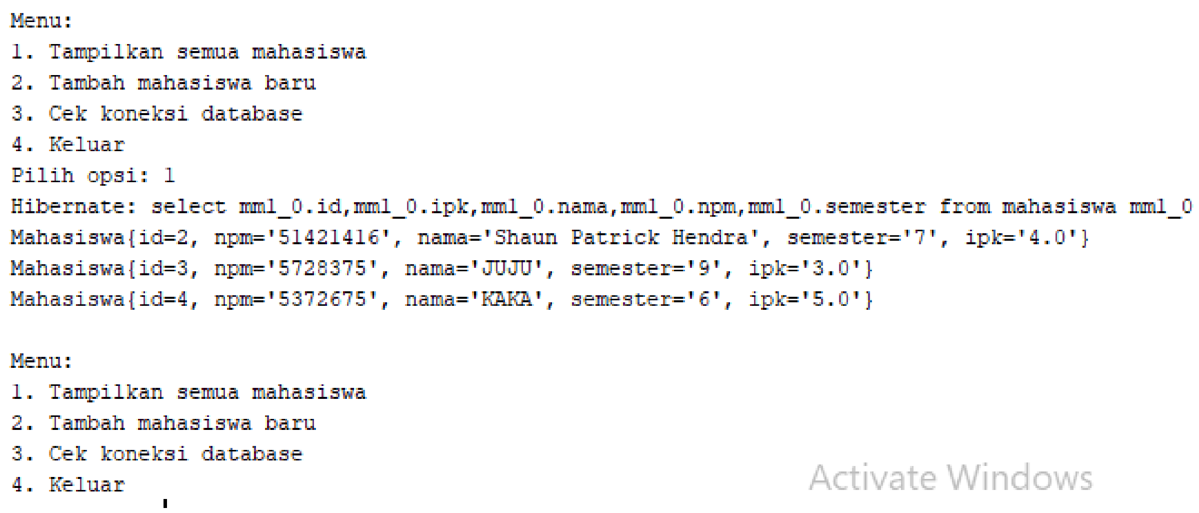


```xml
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchem
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mycompany</groupId>
    <artifactId>rpl_shaun_spring</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>jar</packaging>
    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>21</maven.compiler.source>
        <maven.compiler.target>21</maven.compiler.target>
        <exec.mainClass>com.mycompany.rpl_shaun_spring.Rpl_shaun_spring</exec.mainClass>
    </properties>
    <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>3.3.3</version>
    <relativePath/>
</parent>

<dependencies>
    <!-- Hibernate + Spring Data JPA -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>

    <!-- MySQL Connector -->
    <dependency>
        <groupId>mysql</groupId>
```



```xml
            <artifactId>mysql-connector-java</artifactId>
            <version>8.0.33</version>
        </dependency>

        <!-- Spring Boot Web dependency (for MVC if needed) -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-web</artifactId>
        </dependency>

        <!-- Testing dependencies -->
        <dependency>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-starter-test</artifactId>
            <scope>test</scope>
        </dependency>
    </dependencies>

    <build>
        <plugins>
            <plugin>
                <groupId>org.springframework.boot</groupId>
                <artifactId>spring-boot-maven-plugin</artifactId>
            </plugin>
        </plugins>
    </build>
</project>
```

Output:



```
Menu:
1. Tampilkan semua mahasiswa
2. Tambah mahasiswa baru
3. Cek koneksi database
4. Keluar
Pilih opsi: 1
Hibernate: select m1_0.id,m1_0.ipk,m1_0.nama,m1_0.npm,m1_0.semester from mahasiswa m1_0
Mahasiswa{id=2, npm='51421416', nama='Shaun Patrick Hendra', semester='7', ipk='4.0'}
Mahasiswa{id=3, npm='5728375', nama='JUJU', semester='9', ipk='3.0'}
Mahasiswa{id=4, npm='5372675', nama='KAKA', semester='6', ipk='5.0'}

Menu:
1. Tampilkan semua mahasiswa
2. Tambah mahasiswa baru
3. Cek koneksi database
4. Keluar
```

Nama: Shaun Patrick Hendra

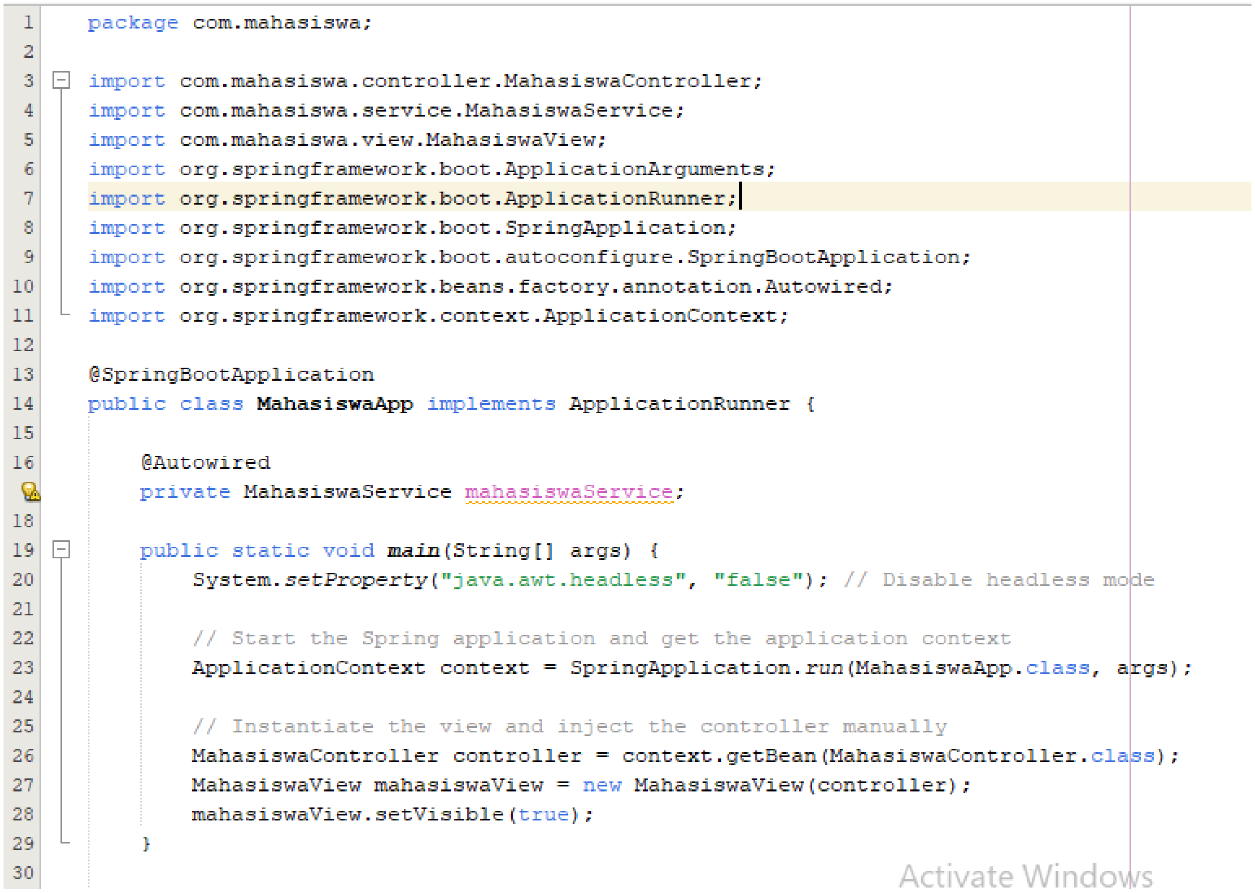
NPM: 51421416

Kelas: 4IA28

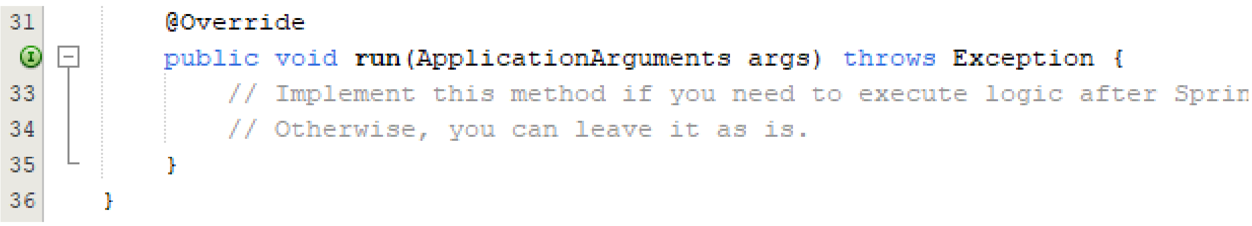
Pertemuan 6

Source Code:

MahasiswaApp

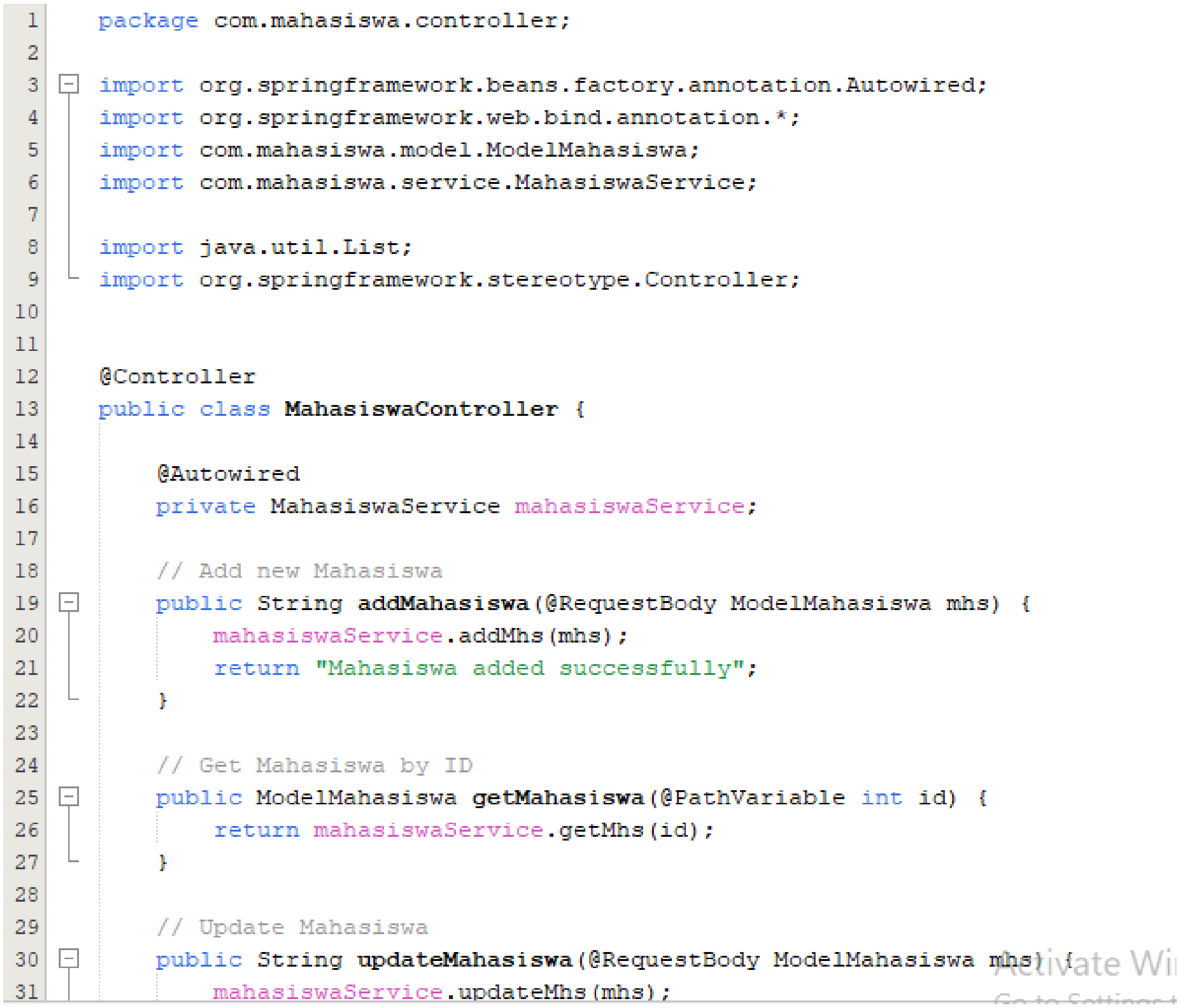


```java
package com.mahasiswa;

import com.mahasiswa.controller.MahasiswaController;
import com.mahasiswa.service.MahasiswaService;
import com.mahasiswa.view.MahasiswaView;
import org.springframework.boot.ApplicationArguments;
import org.springframework.boot.ApplicationRunner;
import org.springframework.boot.SpringApplication;
import org.springframework.boot.autoconfigure.SpringBootApplication;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.context.ApplicationContext;

@SpringBootApplication
public class MahasiswaApp implements ApplicationRunner {

    @Autowired
    private MahasiswaService mahasiswaService;

    public static void main(String[] args) {
        System.setProperty("java.awt.headless", "false"); // Disable headless mode

        // Start the Spring application and get the application context
        ApplicationContext context = SpringApplication.run(MahasiswaApp.class, args);

        // Instantiate the view and inject the controller manually
        MahasiswaController controller = context.getBean(MahasiswaController.class);
        MahasiswaView mahasiswaView = new MahasiswaView(controller);
        mahasiswaView.setVisible(true);
    }

```

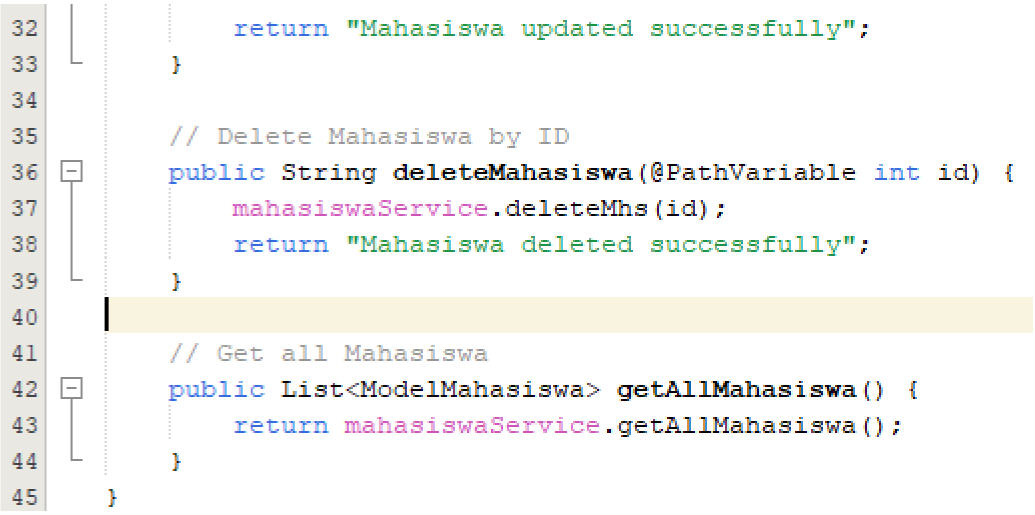


```java
    @Override
    public void run(ApplicationArguments args) throws Exception {
        // Implement this method if you need to execute logic after Sprin
        // Otherwise, you can leave it as is.
    }
}
```

MahasiswaController

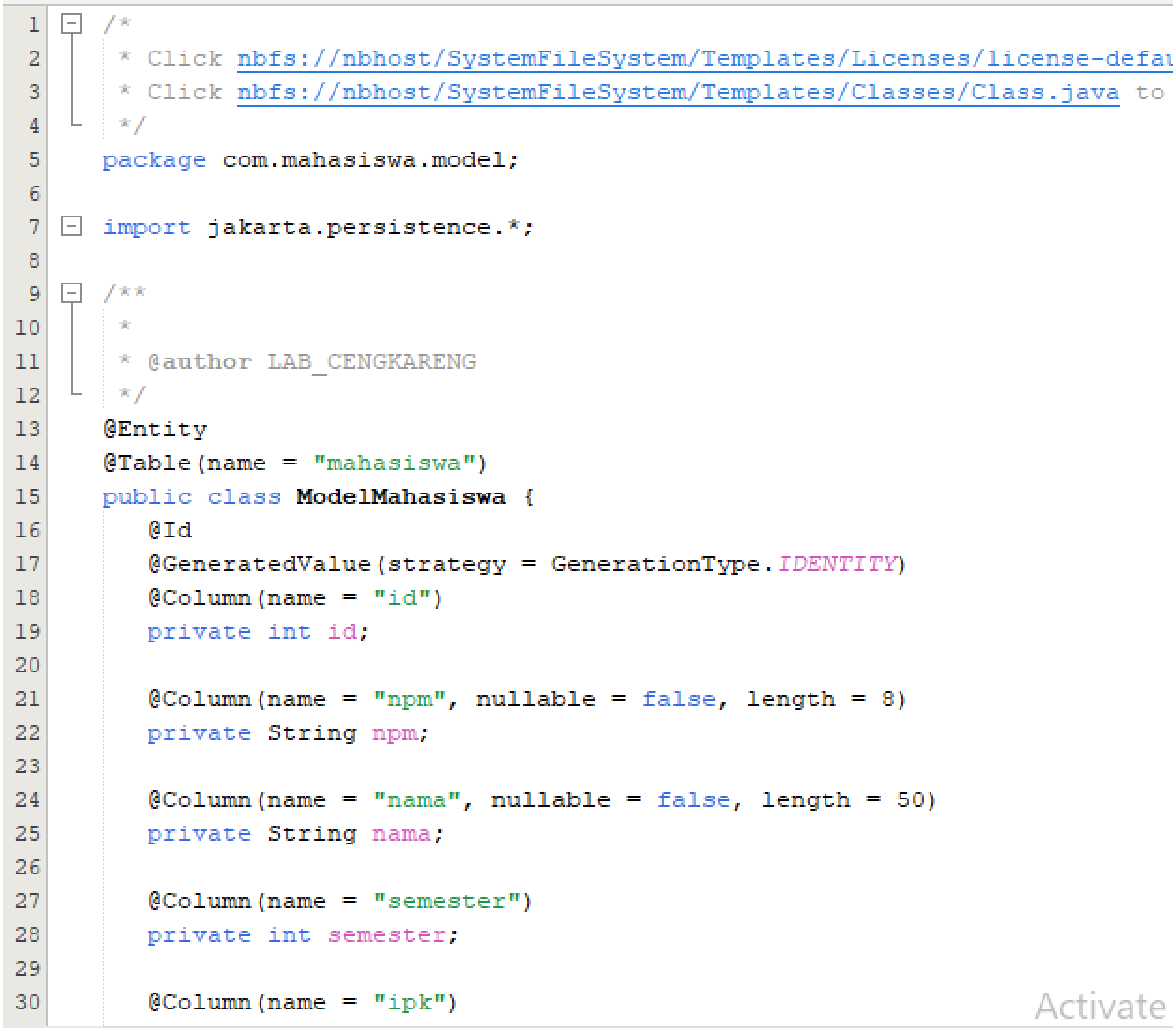


```
package com.mahasiswa.controller;

import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.web.bind.annotation.*;
import com.mahasiswa.model.ModelMahasiswa;
import com.mahasiswa.service.MahasiswaService;

import java.util.List;
import org.springframework.stereotype.Controller;


@Controller
public class MahasiswaController {

    @Autowired
    private MahasiswaService mahasiswaService;

    // Add new Mahasiswa
    public String addMahasiswa(@RequestBody ModelMahasiswa mhs) {
        mahasiswaService.addMhs(mhs);
        return "Mahasiswa added successfully";
    }

    // Get Mahasiswa by ID
    public ModelMahasiswa getMahasiswa(@PathVariable int id) {
        return mahasiswaService.getMhs(id);
    }

    // Update Mahasiswa
    public String updateMahasiswa(@RequestBody ModelMahasiswa mhs) {
        mahasiswaService.updateMhs(mhs);
```

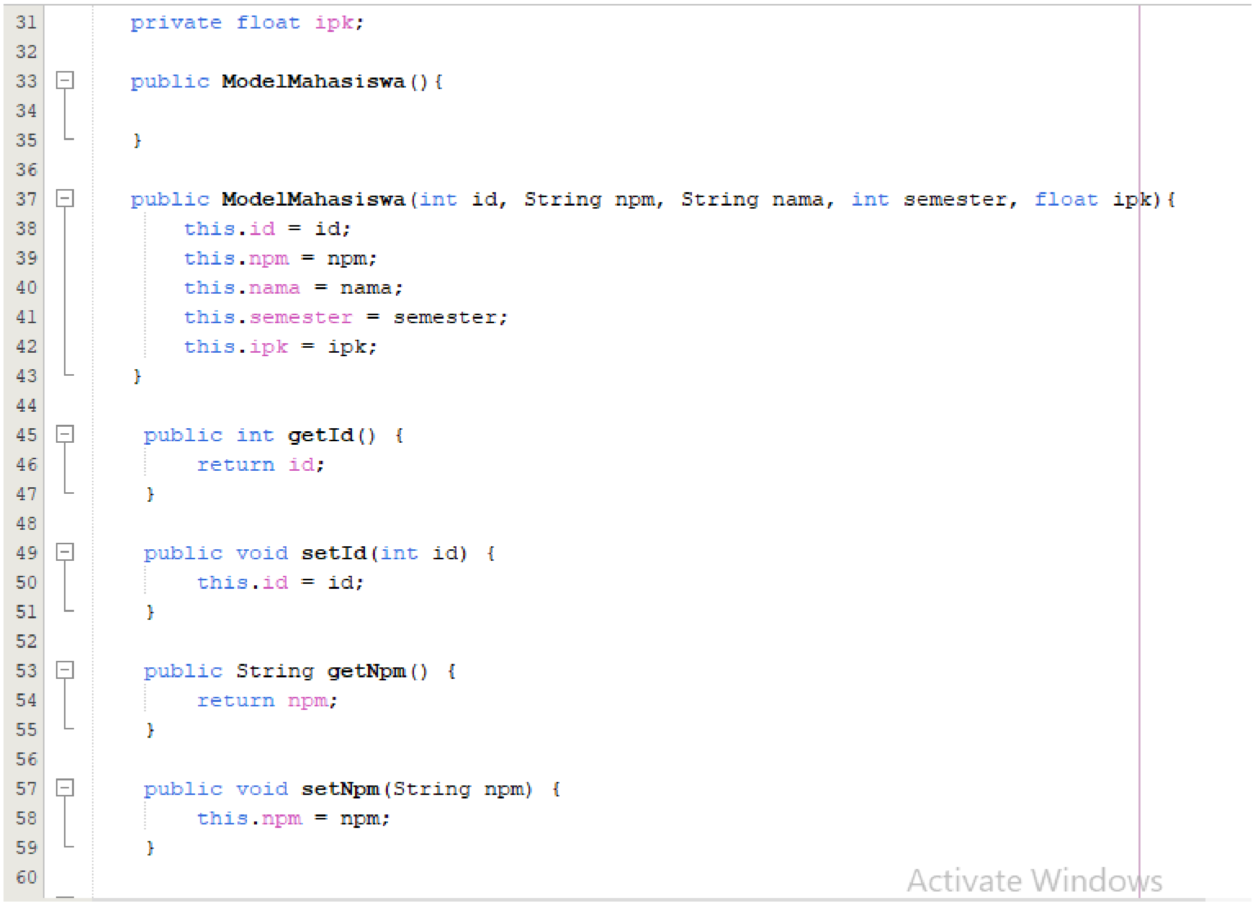


```
        return "Mahasiswa updated successfully";
    }

    // Delete Mahasiswa by ID
    public String deleteMahasiswa(@PathVariable int id) {
        mahasiswaService.deleteMhs(id);
        return "Mahasiswa deleted successfully";
    }

    // Get all Mahasiswa
    public List<ModelMahasiswa> getAllMahasiswa() {
        return mahasiswaService.getAllMahasiswa();
    }
}
```

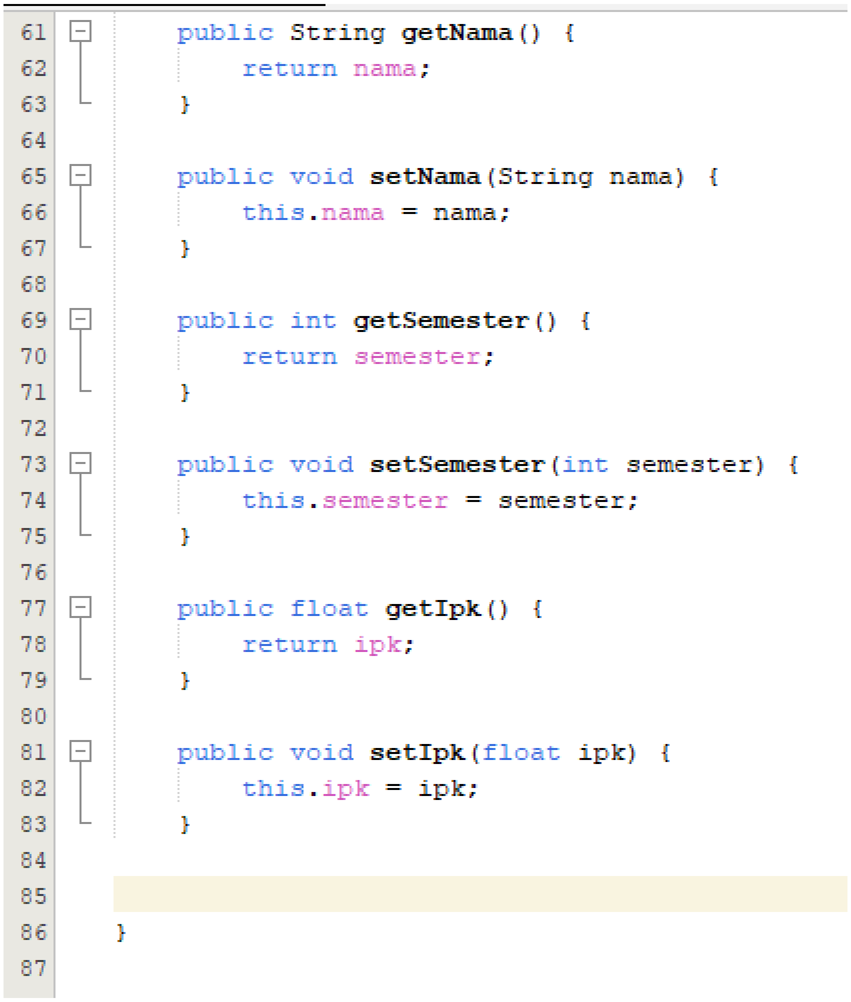
ModelMahasiswa



```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-defau
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to
 */
package com.mahasiswa.model;

import jakarta.persistence.*;

/**
 *
 * @author LAB_CENGKARENG
 */
@Entity
@Table(name = "mahasiswa")
public class ModelMahasiswa {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    @Column(name = "id")
    private int id;

    @Column(name = "npm", nullable = false, length = 8)
    private String npm;

    @Column(name = "nama", nullable = false, length = 50)
    private String nama;

    @Column(name = "semester")
    private int semester;

    @Column(name = "ipk")
```

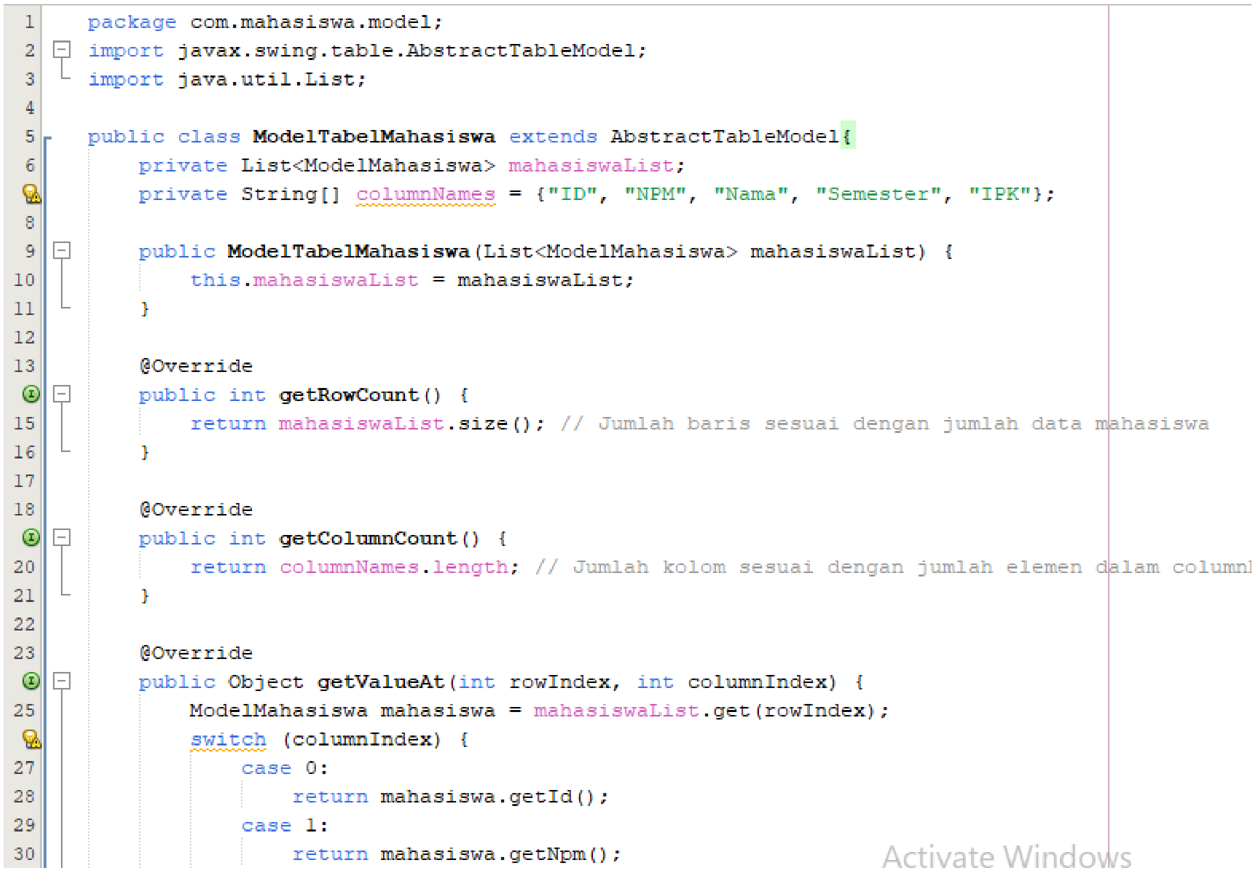


```
    private float ipk;

    public ModelMahasiswa(){

    }

    public ModelMahasiswa(int id, String npm, String nama, int semester, float ipk){
        this.id = id;
        this.npm = npm;
        this.nama = nama;
        this.semester = semester;
        this.ipk = ipk;
    }

     public int getId() {
         return id;
     }

     public void setId(int id) {
         this.id = id;
     }

     public String getNpm() {
         return npm;
     }

     public void setNpm(String npm) {
         this.npm = npm;
     }

```

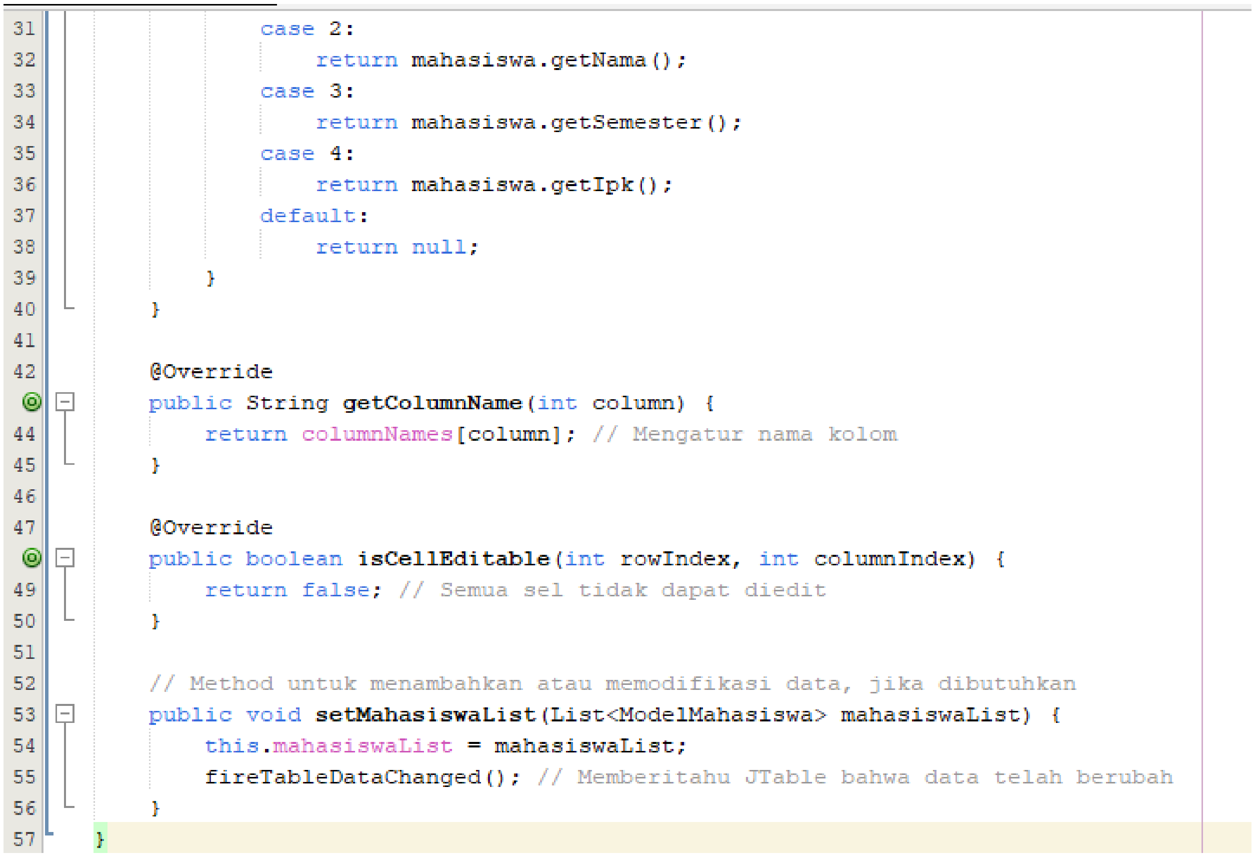


```
    public String getNama() {
        return nama;
    }

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

    public int getSemester() {
        return semester;
    }

    public void setSemester(int semester) {
        this.semester = semester;
    }

    public float getIpk() {
        return ipk;
    }

    public void setIpk(float ipk) {
        this.ipk = ipk;
    }


}
```

ModelTabelMahasiswa

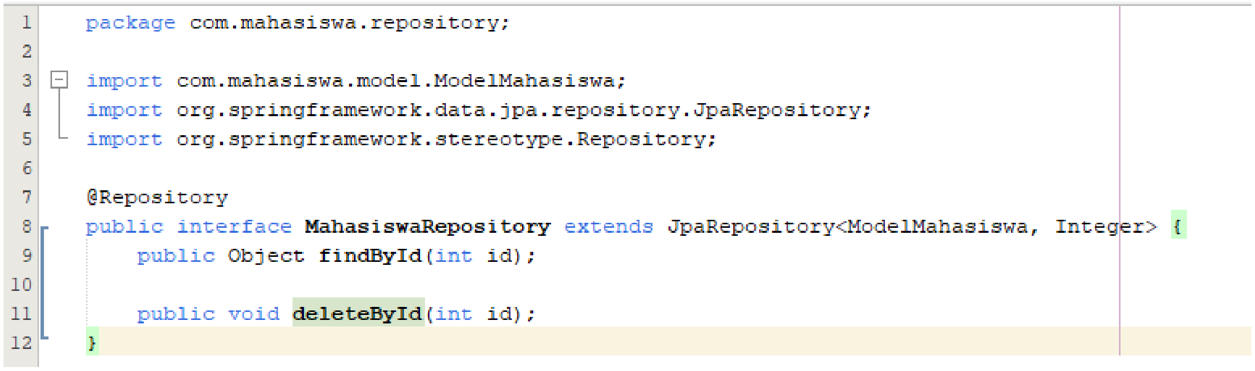


```java
package com.mahasiswa.model;
import javax.swing.table.AbstractTableModel;
import java.util.List;

public class ModelTabelMahasiswa extends AbstractTableModel{
    private List<ModelMahasiswa> mahasiswaList;
    private String[] columnNames = {"ID", "NPM", "Nama", "Semester", "IPK"};

    public ModelTabelMahasiswa(List<ModelMahasiswa> mahasiswaList) {
        this.mahasiswaList = mahasiswaList;
    }

    @Override
    public int getRowCount() {
        return mahasiswaList.size(); // Jumlah baris sesuai dengan jumlah data mahasiswa
    }

    @Override
    public int getColumnCount() {
        return columnNames.length; // Jumlah kolom sesuai dengan jumlah elemen dalam columnN
    }

    @Override
    public Object getValueAt(int rowIndex, int columnIndex) {
        ModelMahasiswa mahasiswa = mahasiswaList.get(rowIndex);
        switch (columnIndex) {
            case 0:
                return mahasiswa.getId();
            case 1:
                return mahasiswa.getNpm();
```



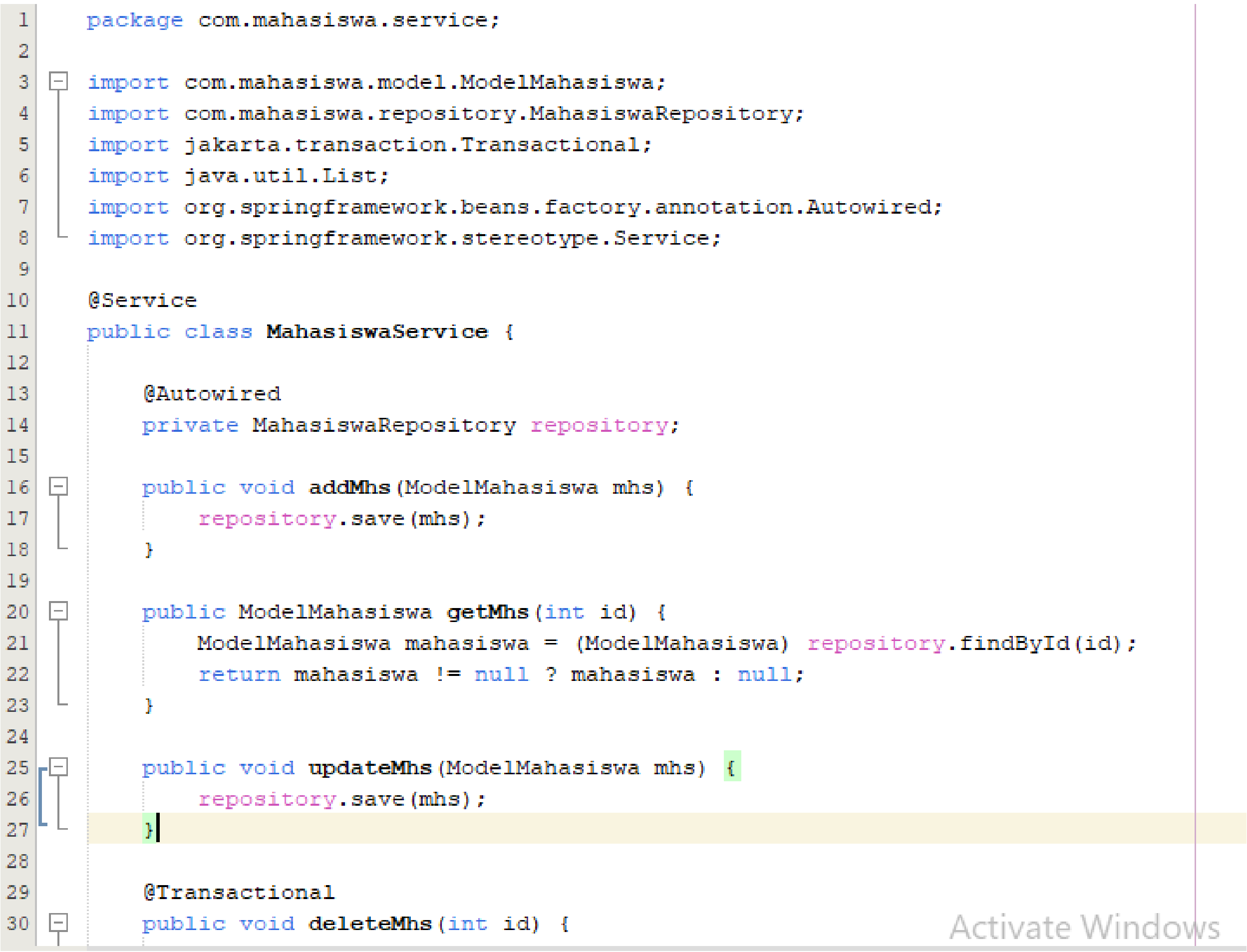
```java
            case 2:
                return mahasiswa.getNama();
            case 3:
                return mahasiswa.getSemester();
            case 4:
                return mahasiswa.getIpk();
            default:
                return null;
        }
    }

    @Override
    public String getColumnName(int column) {
        return columnNames[column]; // Mengatur nama kolom
    }

    @Override
    public boolean isCellEditable(int rowIndex, int columnIndex) {
        return false; // Semua sel tidak dapat diedit
    }

    // Method untuk menambahkan atau memodifikasi data, jika dibutuhkan
    public void setMahasiswaList(List<ModelMahasiswa> mahasiswaList) {
        this.mahasiswaList = mahasiswaList;
        fireTableDataChanged(); // Memberitahu JTable bahwa data telah berubah
    }
}
```

MahasiswaRepository

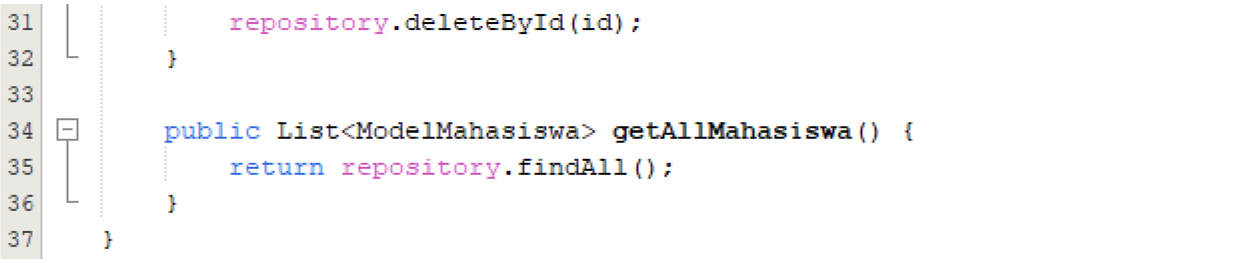


```java
package com.mahasiswa.repository;

import com.mahasiswa.model.ModelMahasiswa;
import org.springframework.data.jpa.repository.JpaRepository;
import org.springframework.stereotype.Repository;

@Repository
public interface MahasiswaRepository extends JpaRepository<ModelMahasiswa, Integer> {
    public Object findById(int id);

    public void deleteById(int id);
}
```

MahasiswaService

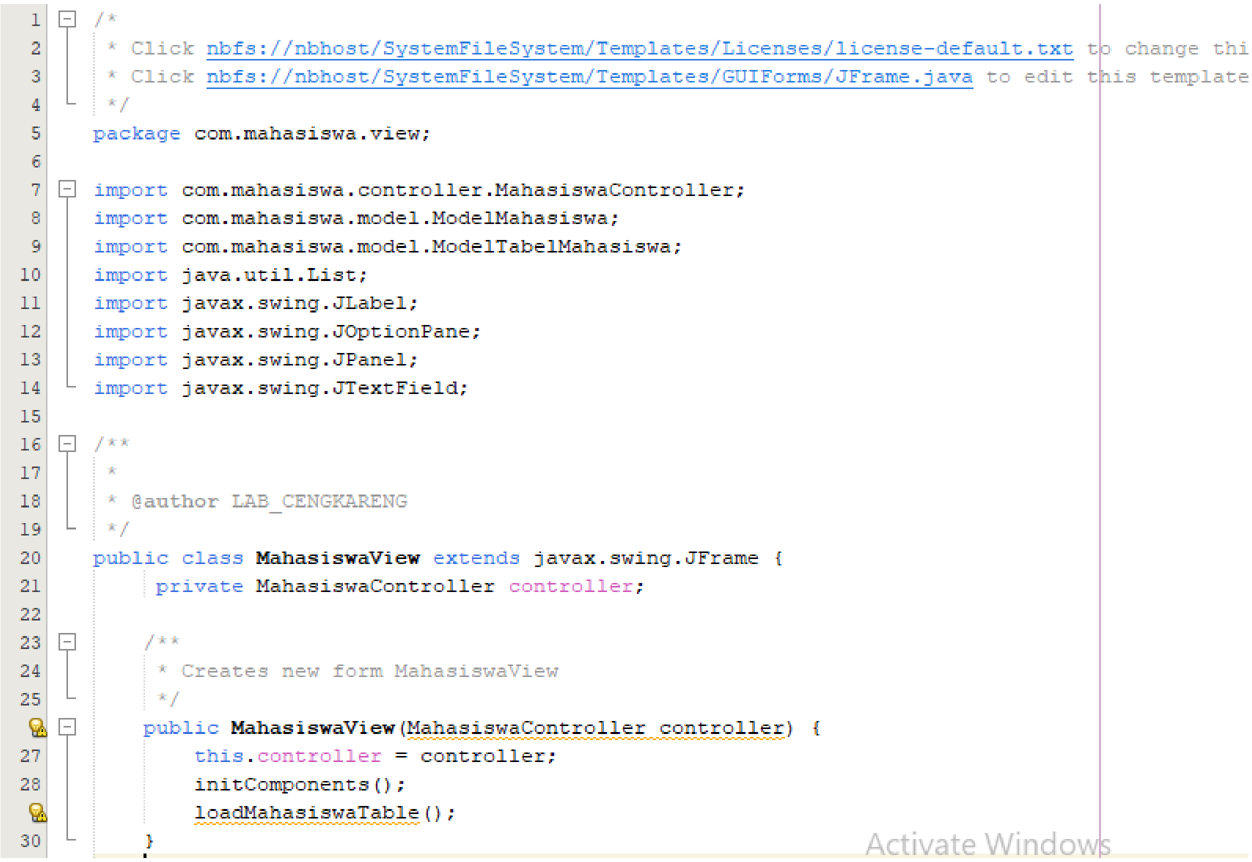


```java
package com.mahasiswa.service;

import com.mahasiswa.model.ModelMahasiswa;
import com.mahasiswa.repository.MahasiswaRepository;
import jakarta.transaction.Transactional;
import java.util.List;
import org.springframework.beans.factory.annotation.Autowired;
import org.springframework.stereotype.Service;

@Service
public class MahasiswaService {

    @Autowired
    private MahasiswaRepository repository;

    public void addMhs(ModelMahasiswa mhs) {
        repository.save(mhs);
    }

    public ModelMahasiswa getMhs(int id) {
        ModelMahasiswa mahasiswa = (ModelMahasiswa) repository.findById(id);
        return mahasiswa != null ? mahasiswa : null;
    }

    public void updateMhs(ModelMahasiswa mhs) {
        repository.save(mhs);
    }

    @Transactional
    public void deleteMhs(int id) {
```

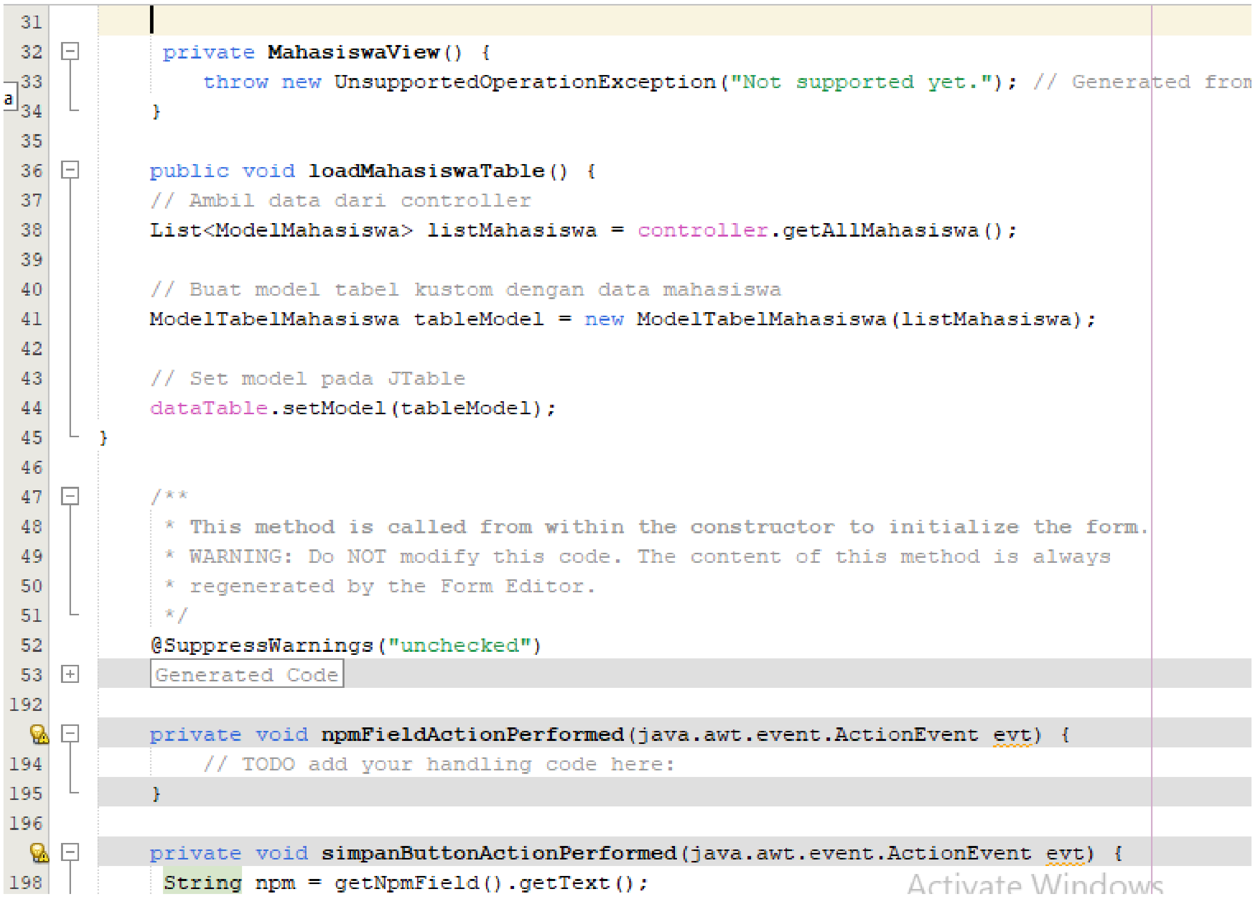


```java
        repository.deleteById(id);
    }

    public List<ModelMahasiswa> getAllMahasiswa() {
        return repository.findAll();
    }
}
```

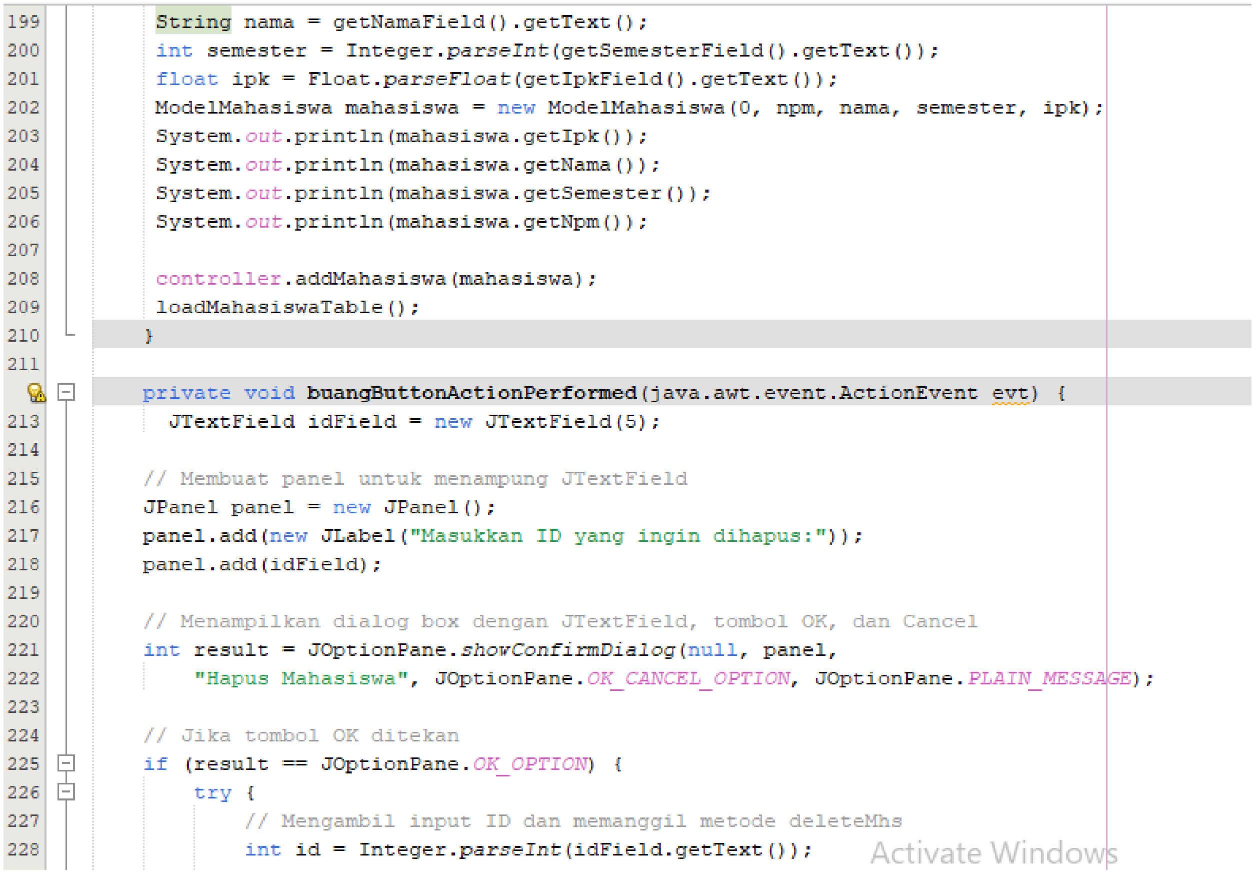
MahasiswaView



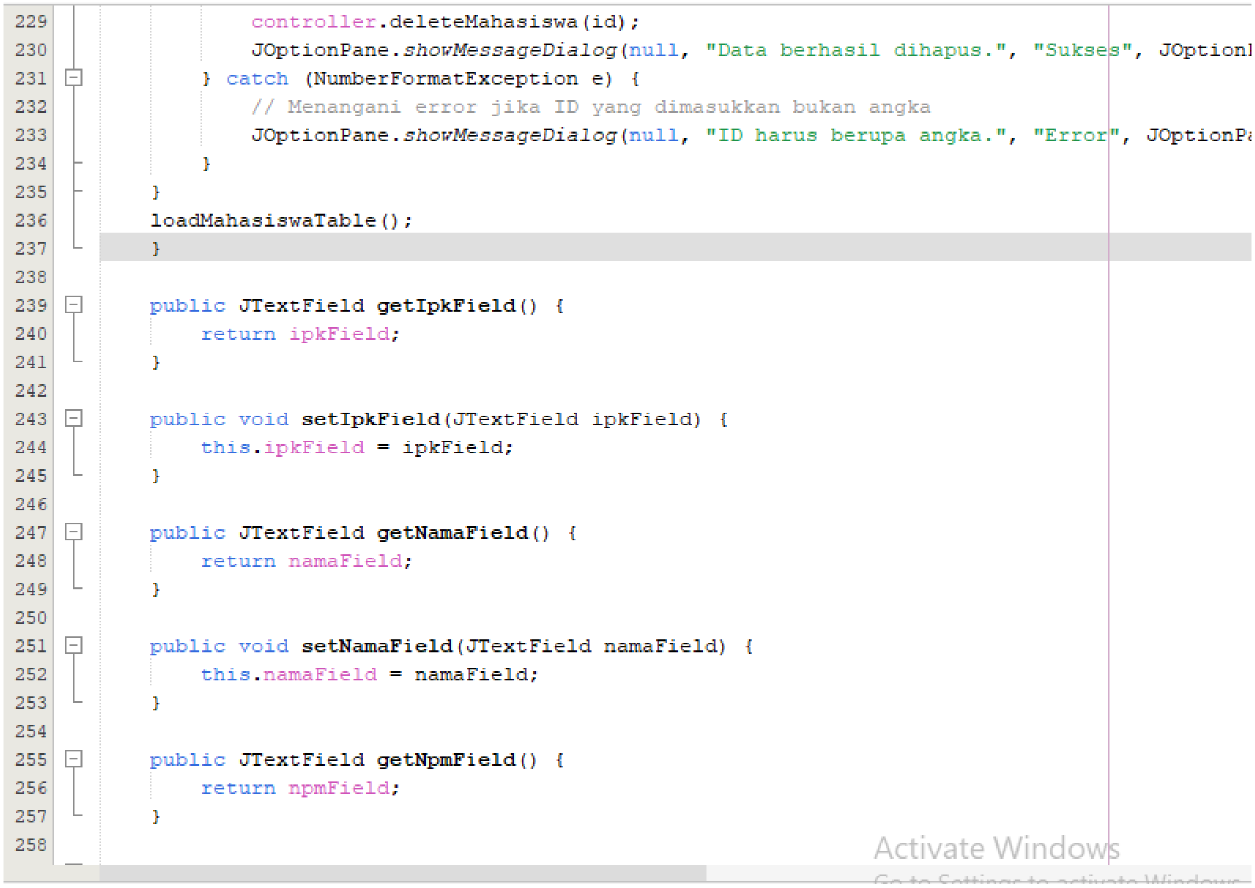
```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change thi
 * Click nbfs://nbhost/SystemFileSystem/Templates/GUIForms/JFrame.java to edit this template
 */
package com.mahasiswa.view;

import com.mahasiswa.controller.MahasiswaController;
import com.mahasiswa.model.ModelMahasiswa;
import com.mahasiswa.model.ModelTabelMahasiswa;
import java.util.List;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JTextField;

/**
 *
 * @author LAB_CENGKARENG
 */
public class MahasiswaView extends javax.swing.JFrame {
    private MahasiswaController controller;

    /**
     * Creates new form MahasiswaView
     */
    public MahasiswaView(MahasiswaController controller) {
        this.controller = controller;
        initComponents();
        loadMahasiswaTable();
    }
```



```java

     private MahasiswaView() {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from
    }

    public void loadMahasiswaTable() {
    // Ambil data dari controller
    List<ModelMahasiswa> listMahasiswa = controller.getAllMahasiswa();

    // Buat model tabel kustom dengan data mahasiswa
    ModelTabelMahasiswa tableModel = new ModelTabelMahasiswa(listMahasiswa);

    // Set model pada JTable
    dataTable.setModel(tableModel);
}


    /**
     * 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")
    Generated Code

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

    private void simpanButtonActionPerformed(java.awt.event.ActionEvent evt) {
     String npm = getNpmField().getText();
```

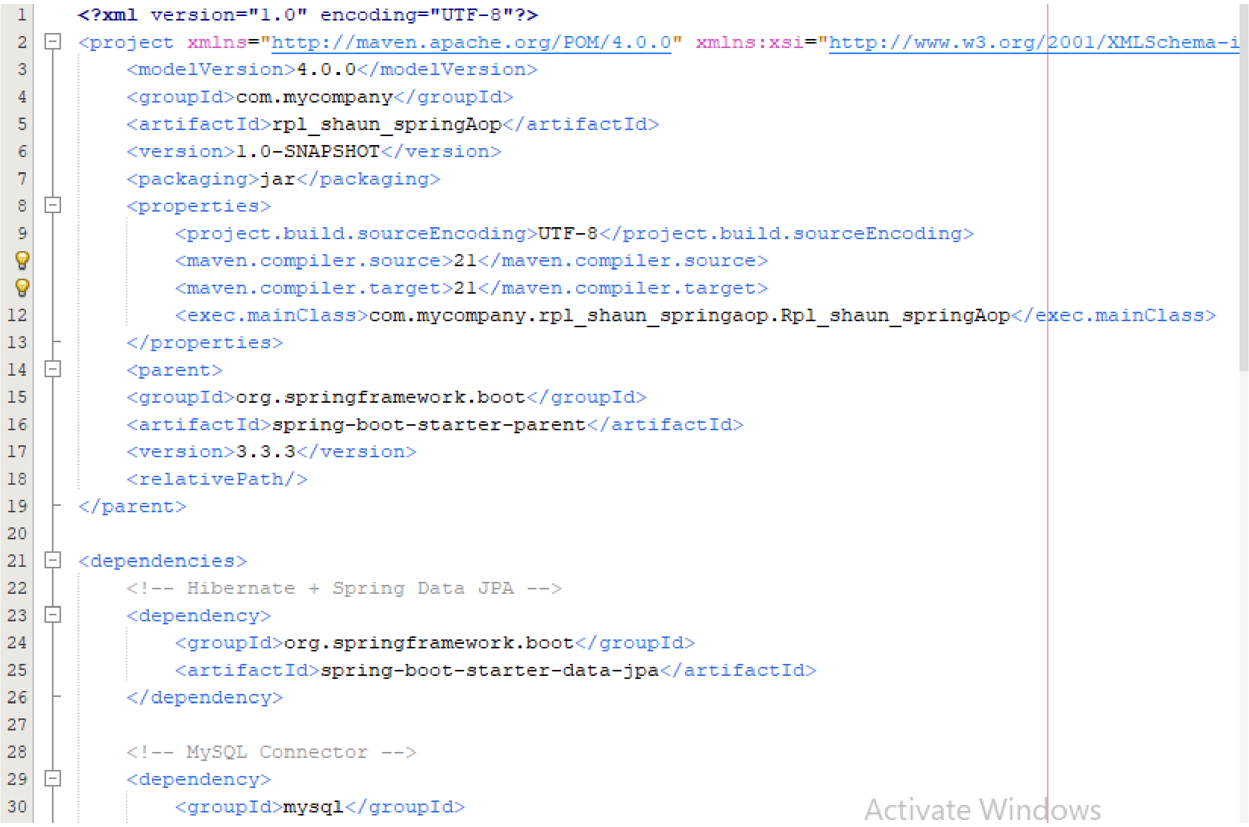


```
     String nama = getNamaField().getText();
     int semester = Integer.parseInt(getSemesterField().getText());
     float ipk = Float.parseFloat(getIpkField().getText());
     ModelMahasiswa mahasiswa = new ModelMahasiswa(0, npm, nama, semester, ipk);
     System.out.println(mahasiswa.getIpk());
     System.out.println(mahasiswa.getNama());
     System.out.println(mahasiswa.getSemester());
     System.out.println(mahasiswa.getNpm());

     controller.addMahasiswa(mahasiswa);
     loadMahasiswaTable();
    }

    private void buangButtonActionPerformed(java.awt.event.ActionEvent evt) {
      JTextField idField = new JTextField(5);

    // Membuat panel untuk menampung JTextField
    JPanel panel = new JPanel();
    panel.add(new JLabel("Masukkan ID yang ingin dihapus:"));
    panel.add(idField);

    // Menampilkan dialog box dengan JTextField, tombol OK, dan Cancel
    int result = JOptionPane.showConfirmDialog(null, panel,
        "Hapus Mahasiswa", JOptionPane.OK_CANCEL_OPTION, JOptionPane.PLAIN_MESSAGE);

    // Jika tombol OK ditekan
    if (result == JOptionPane.OK_OPTION) {
        try {
            // Mengambil input ID dan memanggil metode deleteMhs
            int id = Integer.parseInt(idField.getText());
```

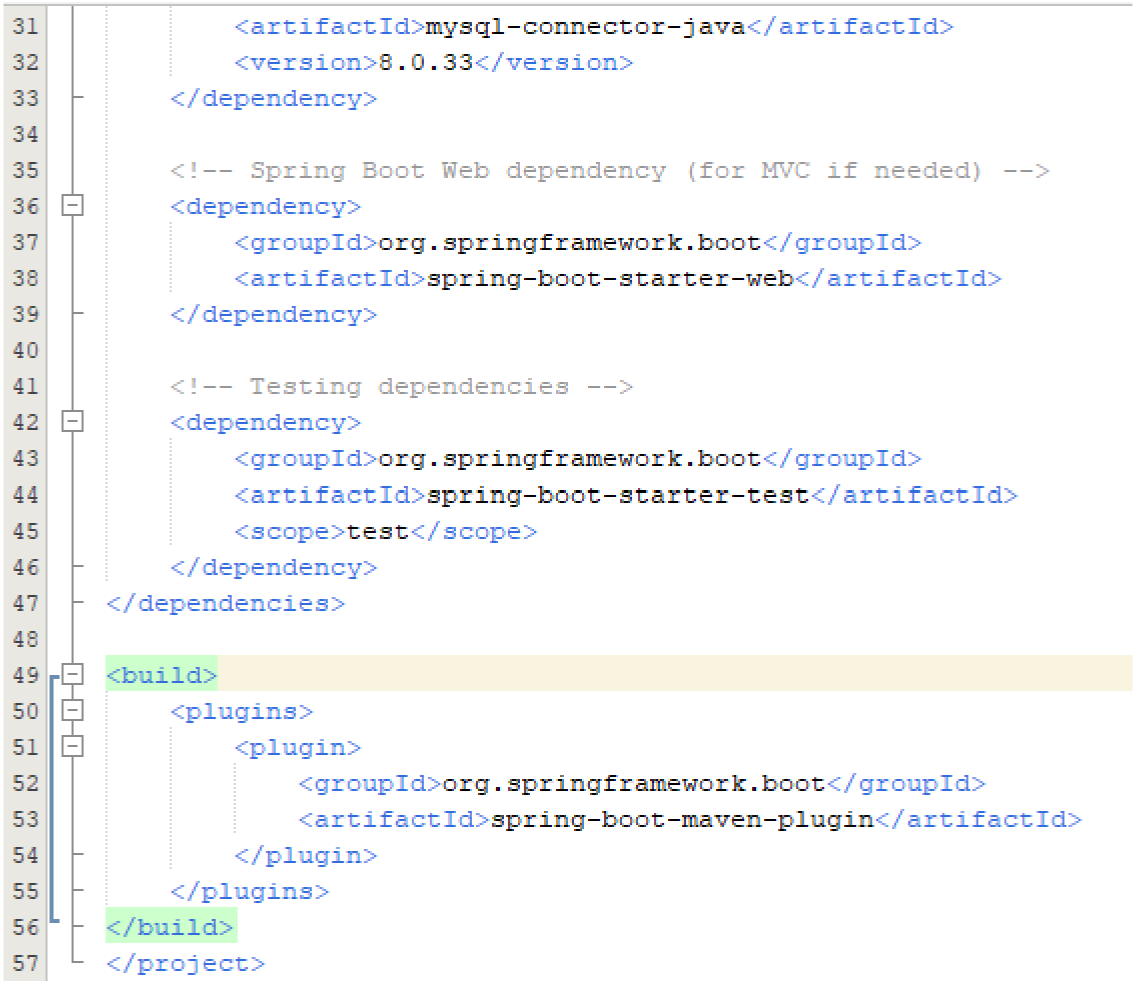


```java
            controller.deleteMahasiswa(id);
            JOptionPane.showMessageDialog(null, "Data berhasil dihapus.", "Sukses", JOptionI
        } catch (NumberFormatException e) {
            // Menangani error jika ID yang dimasukkan bukan angka
            JOptionPane.showMessageDialog(null, "ID harus berupa angka.", "Error", JOptionPa
        }
    }
    loadMahasiswaTable();
    }

    public JTextField getIpkField() {
        return ipkField;
    }

    public void setIpkField(JTextField ipkField) {
        this.ipkField = ipkField;
    }

    public JTextField getNamaField() {
        return namaField;
    }

    public void setNamaField(JTextField namaField) {
        this.namaField = namaField;
    }

    public JTextField getNpmField() {
        return npmField;
    }

```

Pom.xml

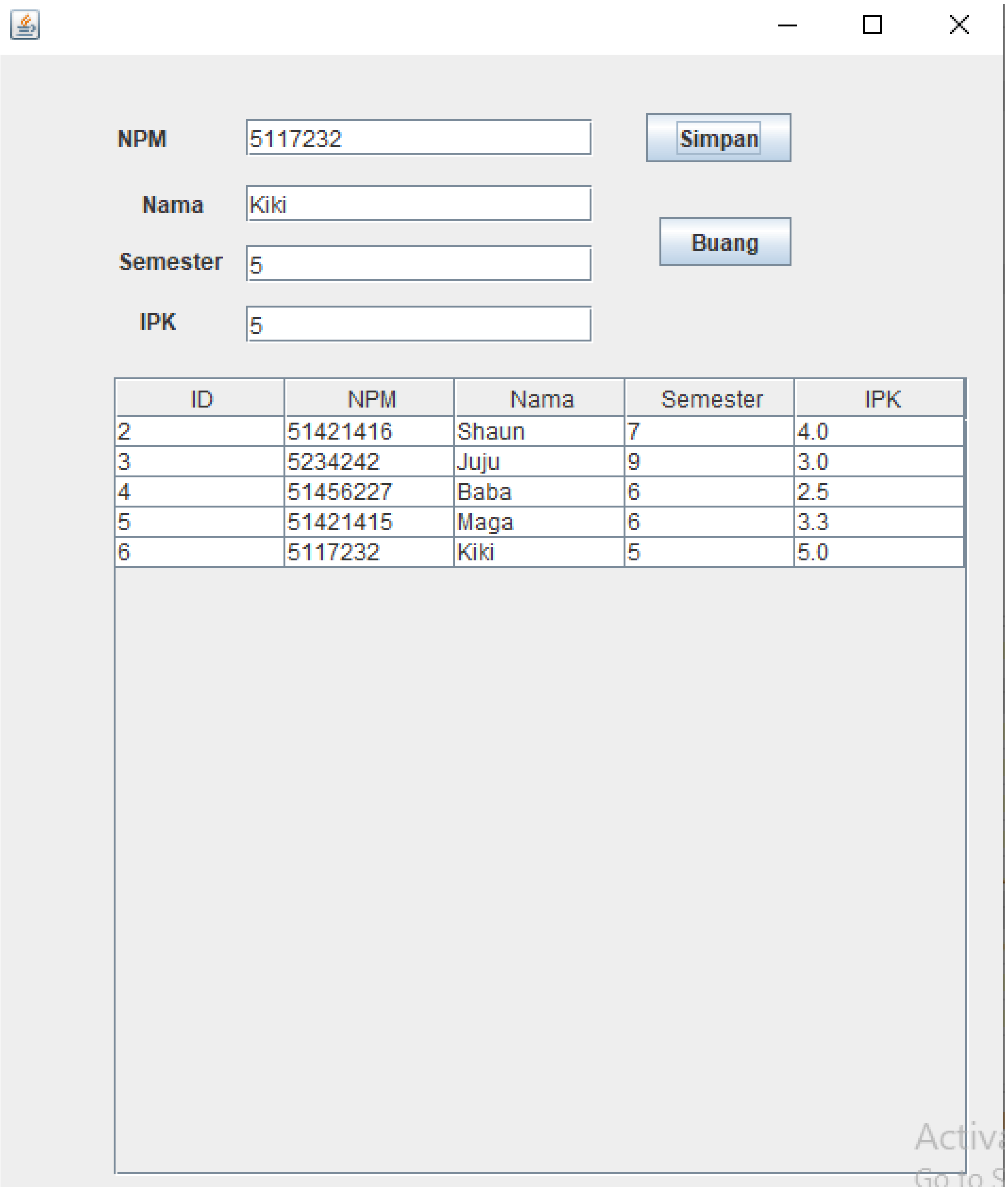


```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-i
    <modelVersion>4.0.0</modelVersion>
    <groupId>com.mycompany</groupId>
    <artifactId>rpl_shaun_springAop</artifactId>
    <version>1.0-SNAPSHOT</version>
    <packaging>jar</packaging>
    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>21</maven.compiler.source>
        <maven.compiler.target>21</maven.compiler.target>
        <exec.mainClass>com.mycompany.rpl_shaun_springaop.Rpl_shaun_springAop</exec.mainClass>
    </properties>
    <parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>3.3.3</version>
    <relativePath/>
</parent>

<dependencies>
    <!-- Hibernate + Spring Data JPA -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-data-jpa</artifactId>
    </dependency>

    <!-- MySQL Connector -->
    <dependency>
        <groupId>mysql</groupId>
```



```xml
        <artifactId>mysql-connector-java</artifactId>
        <version>8.0.33</version>
    </dependency>

    <!-- Spring Boot Web dependency (for MVC if needed) -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
    </dependency>

    <!-- Testing dependencies -->
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-test</artifactId>
        <scope>test</scope>
    </dependency>
</dependencies>

<build>
    <plugins>
        <plugin>
            <groupId>org.springframework.boot</groupId>
            <artifactId>spring-boot-maven-plugin</artifactId>
        </plugin>
    </plugins>
</build>
</project>
```

Output Simpan:



NPM: 5117232

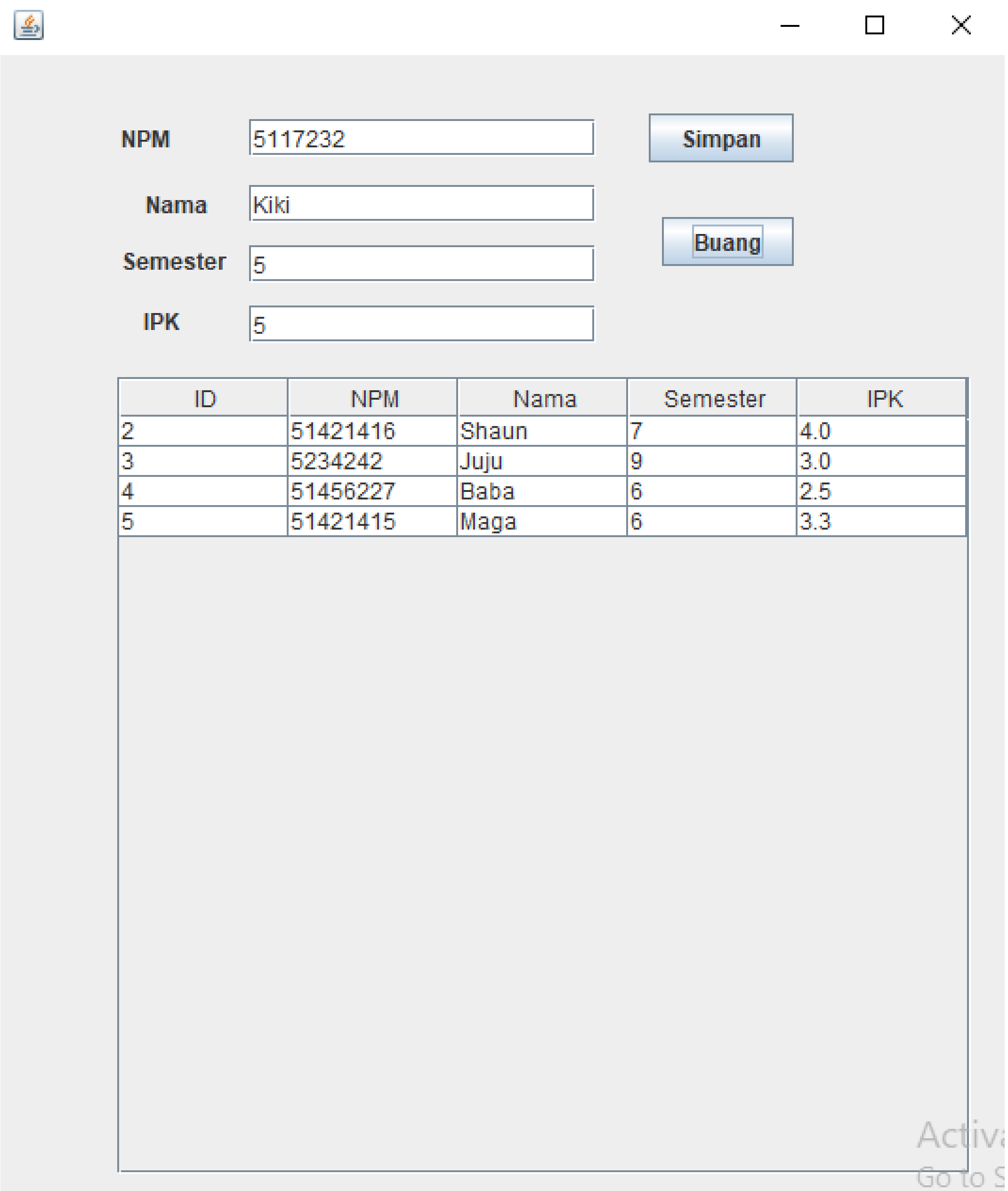
Nama: Kiki

Semester: 5

IPK: 5

ID	NPM	Nama	Semester	IPK
2	51421416	Shaun	7	4.0
3	5234242	Juju	9	3.0
4	51456227	Baba	6	2.5
5	51421415	Maga	6	3.3
6	5117232	Kiki	5	5.0

Output Buang:



NPM	5117232
Nama	Kiki
Semester	5
IPK	5

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