LAB 05 REPORT

GUI Programming with Java Swing

Student: Le Viet Anh
Student ID: 202416774
Course: Object-Oriented Programming (OOP)
Instructor: Ho Viet Duc Luong
Semester: 2024–2025

Hanoi University of Science and Technology

Contents

1 Introduction

Lab 05 focuses on building a graphical user interface (GUI) for the AIMS system developed in Lab 04. In this lab, Java Swing is used to design interactive windows, while reusing the core object-oriented classes such as `Store`, `Cart`, and `Media`.

2 Objectives

The main objectives of Lab 05 are:

- To become familiar with GUI programming using Java Swing
- To build Store and Cart interfaces for the AIMS system
- To connect GUI components with the business logic implemented in Lab 04
- To practice event handling in Java

3 Development Environment

- Programming Language: Java
- IDE: Eclipse
- GUI Library: Java Swing (AWT & Swing)
- Operating System: Windows

4 System Architecture

4.1 Relationship with Lab 04

Lab 05 reuses all model classes implemented in Lab 04, including:

- `Media`, `Book`, `CompactDisc`, `DigitalVideoDisc`
- `Store`
- `Cart`

No changes are made to the core logic of these classes; they are only integrated into the GUI layer.

4.2 Package Structure

- `hust.soict.cs.dsai.aims.media`: Media-related classes
- `hust.soict.cs.dsai.aims.store`: Store class
- `hust.soict.cs.dsai.aims.cart`: Cart class
- `hust.soict.cs.dsai.aims.screen`: GUI classes (Lab 05)

5 Implementation

5.1 StoreScreen Class

The `StoreScreen` class extends `JFrame` and represents the main window of the application. It displays all available media in the store and allows users to:

- View media information
- Add media to the cart
- Play media if it implements the `Playable` interface

```
public class StoreScreen extends JFrame {

    private Store store;
    private Cart cart;

    public StoreScreen(Store store) {
        this.store = store;
        this.cart = new Cart();
        setTitle("AIMS Store");
        setSize(1024, 768);
        setVisible(true);
    }
}
```

5.2 MediaStore Class

The `MediaStore` class extends `JPanel` and represents a single media item displayed in the StoreScreen. Each MediaStore panel includes:

- Media title
- Media cost
- An `Add to Cart` button
- A `Play` button (if applicable)

```
public class MediaStore extends JPanel {

    public MediaStore(Media media) {
        JLabel title = new JLabel(media.getTitle());
        JButton addToCart = new JButton("Add to Cart");
    }
}
```

5.3 CartScreen Class

The `CartScreen` class extends `JFrame` and displays all media items currently stored in the cart, along with the total cost.

```
public class CartScreen extends JFrame {

    private Cart cart;

    public CartScreen(Cart cart) {
        this.cart = cart;
        setTitle("Cart");
        setSize(600, 400);
        setVisible(true);
    }
}
```

6 Results

6.1 Store Interface

Figure 1 shows the StoreScreen interface displaying available media items.

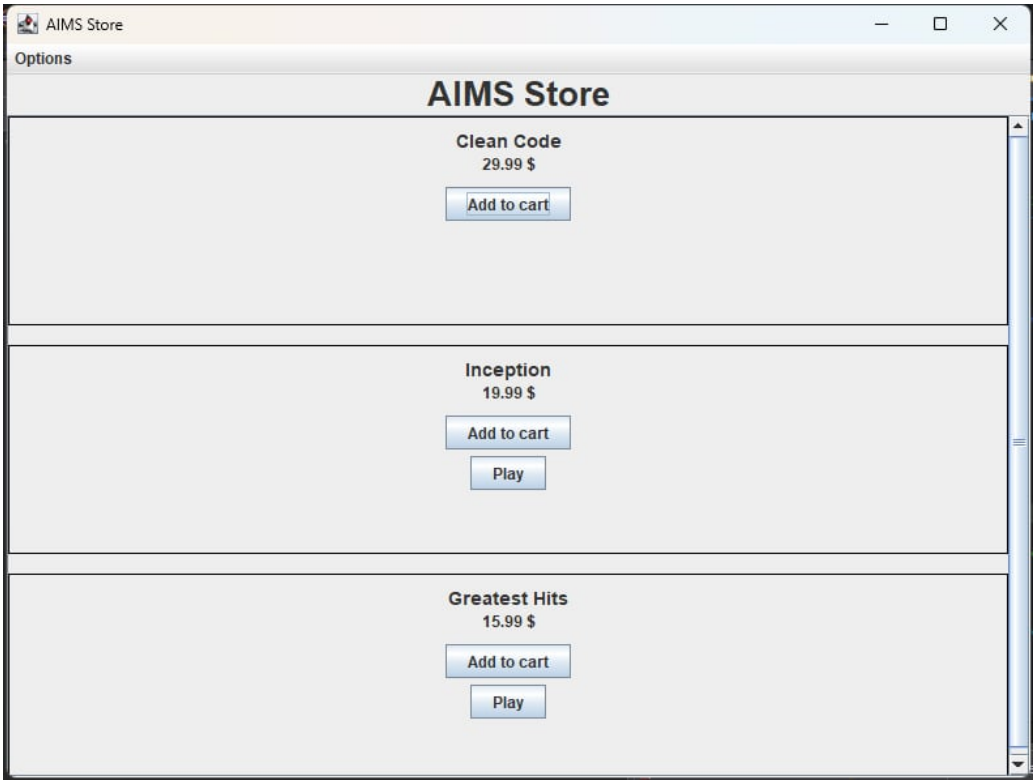

Figure 1: StoreScreen Interface

Screenshot instructions:

- Run the StoreScreen class

- Ensure multiple media items are displayed
- Capture the full Store window
- Save the image as `Store.jpg`

6.2 Cart Interface

Figure 2 shows the CartScreen after adding media items.

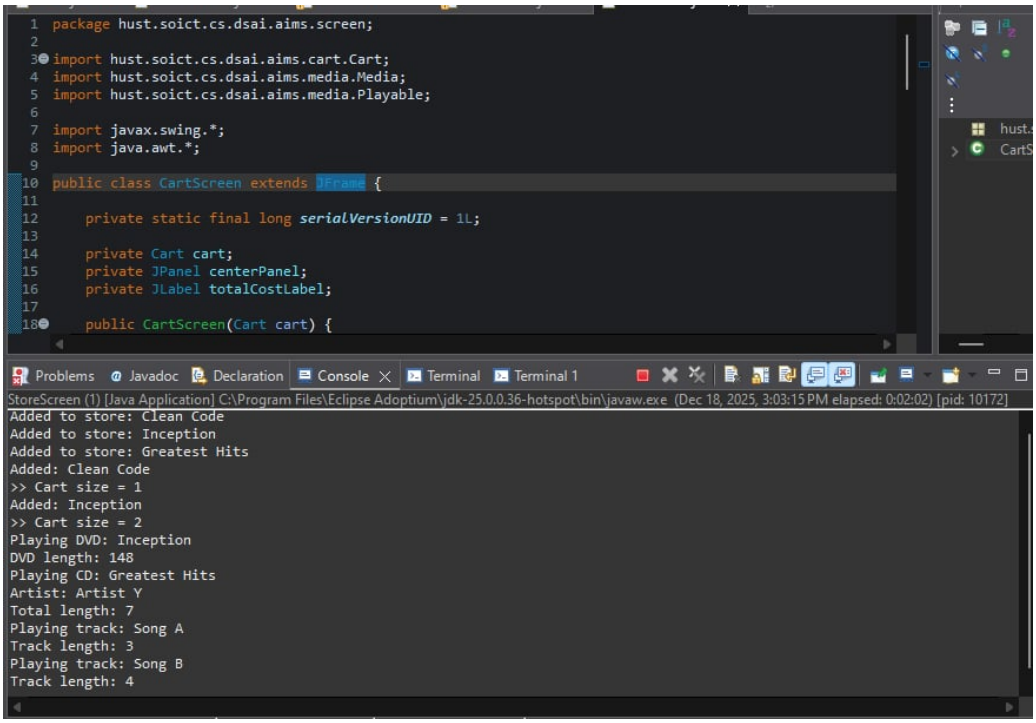

Figure 2: CartScreen Interface

Screenshot instructions:

- Add at least two media items to the cart
- Open the CartScreen
- Capture the full Cart window
- Save the image as `Cart.jpg`

7 Evaluation

The application fully satisfies the requirements of Lab 05. The GUI is responsive and user-friendly, and all core functionalities such as Add to Cart, Play Media, and View Cart work correctly. Reusing the model layer from Lab 04 improves maintainability and extensibility.

8 Conclusion

Through Lab 05, students gain practical experience in building graphical user interfaces using Java Swing and integrating them with object-oriented application logic. This lab demonstrates how GUI programming complements core OOP principles in real-world applications.