

Documentation

I am working independently on this project.

Libraries Used

The following libraries and frameworks are utilized:

- Java Swing (GUI components)
- Java AWT (Graphics, layout management)
- Java AWT Event Handling (User input events)
- SLF4J (Logging framework)
- Java Collections Framework (Data structures)
- Java Concurrency Utilities (Multithreading support)

Imports and Their Purposes

The specific classes and interfaces imported, along with their roles, are detailed below:

- `javax.swing.JPanel`: Used to create panels for organizing Swing components in the GUI.
- `javax.swing.JButton`: Provides clickable buttons to trigger actions.
- `javax.swing.JSlider`: Enables users to select values via a sliding control.
- `java.awt.event.ActionListener`: Interface for handling action events (e.g., button clicks).
- `java.awt.event.ActionEvent`: Represents events (e.g., button presses) processed by `ActionListener`.
- `java.awt.FlowLayout`: Arranges components in a left-to-right flow, wrapping to new lines as needed.
- `java.awt.Graphics`: Provides rendering capabilities for drawing shapes and images.
- `java.awt.Color`: Defines colors (predefined and custom) for UI components.
- `java.awt.Dimension`: Specifies the width and height of components.

- `javax.swing.JFrame`: Serves as the primary window for the Swing application.
- `java.awt.BorderLayout`: Organizes components into five regions: North, South, East, West, and Center.
- `javax.swing.JLabel`: Displays text or icons within the interface.
- `org.slf4j.Logger`: SLF4J interface for logging informational, debug, and error messages.
- `org.slf4j.LoggerFactory`: Factory class for creating Logger instances.
- `java.util.ArrayList`: Implements a dynamic, resizable array.
- `java.util.List`: Defines an ordered collection of elements.
- `java.util.concurrent.CopyOnWriteArrayList`: Thread-safe list optimized for frequent reads and rare writes.
- `java.util.concurrent.ExecutorService`: Manages asynchronous task execution via thread pools.
- `java.util.concurrent.Executors`: Utility for creating ExecutorService instances.