**UML Diagram**

A computer screen shot of a computer program

Description automatically generated with medium confidence

**Architecture Design**

The system follows a layered architecture:

1. **User Interface (UI)**: Built with JavaFX to provide an interactive platform for users to book tickets, select movies, and view bookings.
2. **Application Logic**: Handles booking validation, data manipulation, and navigation between scenes.
3. **Data Management**: Uses HashMap for booking records and ArrayLists for managing lists of movies, showtimes, and seats.
4. **Data Persistence**: Saves booking information in a text file (bookings.txt) to ensure data is retained across sessions.

**Component Interaction**

* The **UI Layer** interacts with the logic layer to send user inputs (e.g., selected movie, seats) and display outputs (e.g., confirmation messages).
* The **Logic Layer** processes inputs, validates bookings, and retrieves/stores data using the data management layer.
* The **Data Management Layer** handles efficient storage and retrieval of booking and movie-related data.