

Part One

System's Description

1. Summary: The Flight Reservation Web Application is a comprehensive and user-friendly online platform designed to facilitate flight booking, seat selection, and payment processing for customers. It caters to different user roles, including regular users, tourism agents, airline agents, and system administrators. The system ensures a seamless and secure experience for users by offering various features and services tailored to their needs.

2. User Roles:

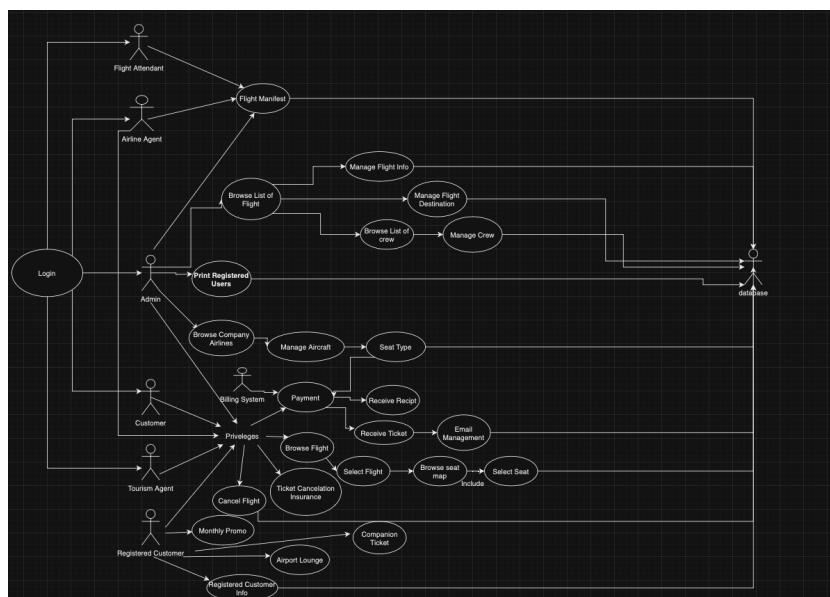
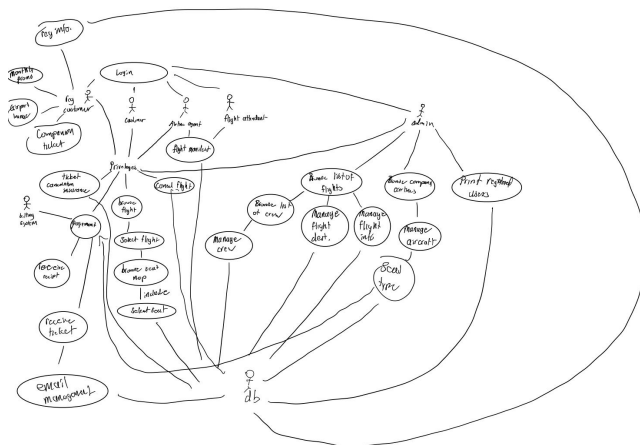
- **Regular Users:** They can search for available flights, choose seats, make bookings, manage their profiles, and receive email confirmations and receipts.
- **Tourism Agents:** They have access to a wide range of flight options, enabling them to assist customers in booking flights and managing reservations.
- **Airline Agents:** These agents can view passenger lists, manage flight crews, aircraft, flight destinations, and flight information. They have tools for efficient flight management.
- **System Administrators:** Admins have complete control over the system. They can manage user information, oversee system activities, and configure various aspects of the application.

3. Key Features:

- **Flight Search and Booking:**
 - Users can search for flights based on destination, date, and preferences.
 - Detailed flight information, including departure time, arrival time, and ticket prices, is displayed.
 - Users can select seats (ordinary, comfort, or business-class) and add ticket cancellation insurance during the booking process.
 - Membership registration allows users to apply for the company's credit card and enjoy exclusive benefits.
- **Seat Selection:**
 - Graphical seat maps are provided for users to select their desired seats.
 - Seat prices are calculated based on the selected class (ordinary, comfort, or business-class).
- **Payment Processing:**
 - Secure payment gateway integration allows users to make payments using credit cards.
 - Email confirmations and receipts are sent to users after successful payment.
- **User Account Management:**
 - Registered users can manage their profiles, view booking history, and update personal information.
 - Membership benefits, such as monthly promotion news and companion tickets, are available to registered users.

- **Flight Management (for Airline Agents and Admins):**
 - Airline agents can view passenger lists for specific flights.
 - Flight crews, aircraft, flight destinations, and flight information can be managed by airline agents and admins.
 - Admins can add/remove crews, aircraft, flights, and destinations.
- **Admin Dashboard:**
 - System admins have access to a comprehensive dashboard to monitor system activities, manage users, and generate reports.
 - Admins can print lists of registered users and oversee the application's overall performance.
- **Email Notifications:**
 - Automated email notifications are sent to users for ticket confirmations, payment receipts, and flight cancellations, ensuring timely communication.

System's Use Case Diagram (Rough Draft)



System's Scenarios for each Use-Case

Scenario: Completing a Reservation on a Flight

Flow of Events:

1. User logs into application and the system validates the login
2. System presents menu to user
3. User browses available flights to the desired destination
4. User selects their preferred flight from the list of available options
5. System displays the seat map graphically for the selected flight
6. User interacts with the seat map to view available seats in ordinary, comfort, or business class
7. User selects desired seat by selecting on the graphical representation of the seat
8. System prompts the user to select ticket cancellation insurance if interested
9. User selects to either decline or accept ticket cancellation insurance
10. User proceeds to payment
11. User provides credit card information to proceed payment processing
12. System generates and sends the flight ticket via email and sends the receipt for payment via email

Notes: User can be the actor Airline Agent, Customer or Tourism Agent

Scenario: Canceling a Flight Reservation

Flow of Events:

1. User logs into application and the system validates the login
2. User navigates to the reservation section of the system
3. User selects the flight that they would like to cancel
4. System prompts them to confirm that they would like to cancel that specific flight
5. User selects to accept the cancellation
6. System processes the cancellation and will give a refund if applicable (ticket cancellation insurance was purchased)
7. System generates and sends the cancellation confirmation via email

Notes: Users can be the actor Airline Agent, Customer or Tourism Agent

Scenario: Browsing and Managing Flight Destinations

Flow of Events:

1. User logs into application and the system validates the login
2. User accesses the system's admin dashboard
3. User selects the option to "Browse List of Flights"

4. System presents the complete list of flights in the system
5. User is able to:
 - a. Browse List of Crew**
 - i. User selects a specific flight
 - ii. User selects the option to “Browse List of Crew”
 - iii. System presents the complete list of crew for the specific flight
 - b. Manage Crew**
 - i. User selects a specific flight
 - ii. User selects the option to “Browse List of Crew”
 - iii. System presents the complete list of crew for the specific flight
 - iv. User is able to:
 1. Select an existing a member of crew to remove
 2. Select the option “Add member” to add a member of crew
 - c. Manage Flight Information**
 - i. User selects a specific flight
 - ii. User is able to:
 1. Modify Flight Information (Change departure time, Update seat availability, etc.)
 2. Cancel the flight
 - d. Manage Flight Destinations**
 - i. User is able to
 1. Filter all flights to a specific destination to be removed
 2. Add flights to a specific destination

Notes: User must be the actor Admin

Scenario: Managing Aircrafts

Flow of Events:

1. User logs into application and the system validates the login
2. User accesses the system’s admin dashboard
3. User selects the option to “Browse List of Company Aircrafts”
4. System presents the complete list of company aircrafts
5. User is able to:
 - a. Add New Aircraft**
 - i. User selects the option to “Add Aircraft”
 - ii. User enters the details for the new aircraft
 - iii. System adds the new aircraft to the database
 - b. Remove Aircraft**
 - i. User selects an existing aircraft in the list of company aircrafts

- ii. User selects the option to “Delete Aircraft”
- iii. System prompts for confirmation to delete the selected aircraft
- iv. User confirms the removal
- v. System removes the aircraft from the database

Notes: User must be an Admin

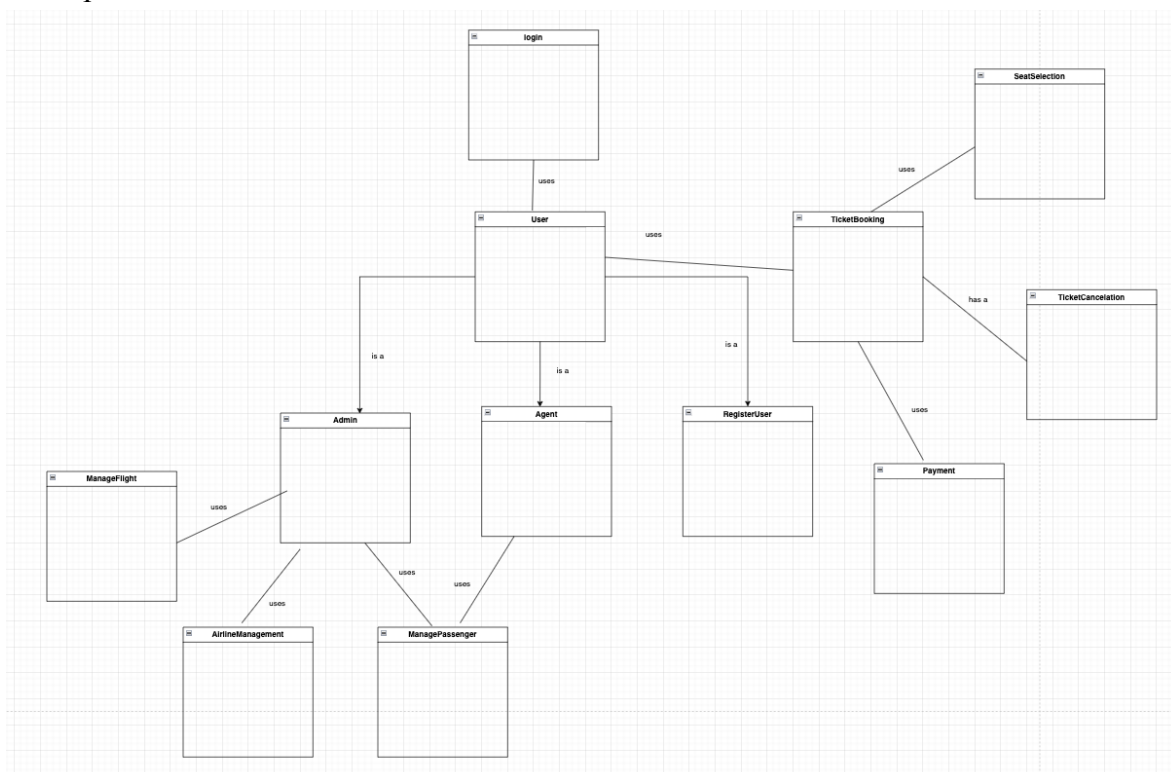
Scenario: Retrieving Information of the Registered Users

Flow of Events:

1. User logs into application and the system validates the login
2. User accesses the system’s admin dashboard
3. User selects the option to “Browse List of Registered Users”
4. System presents the complete list of registered users
5. User selects the option to “Print All Registered Users”
6. System prints all of the registered users’ information (name, address, contact details, membership status, credit card application status, etc.)

Notes: User must be an Admin

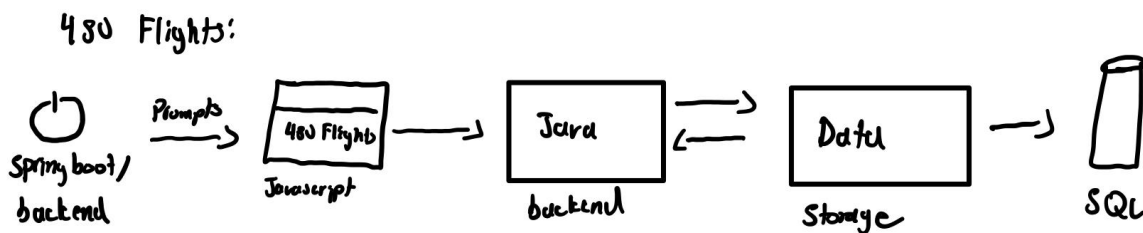
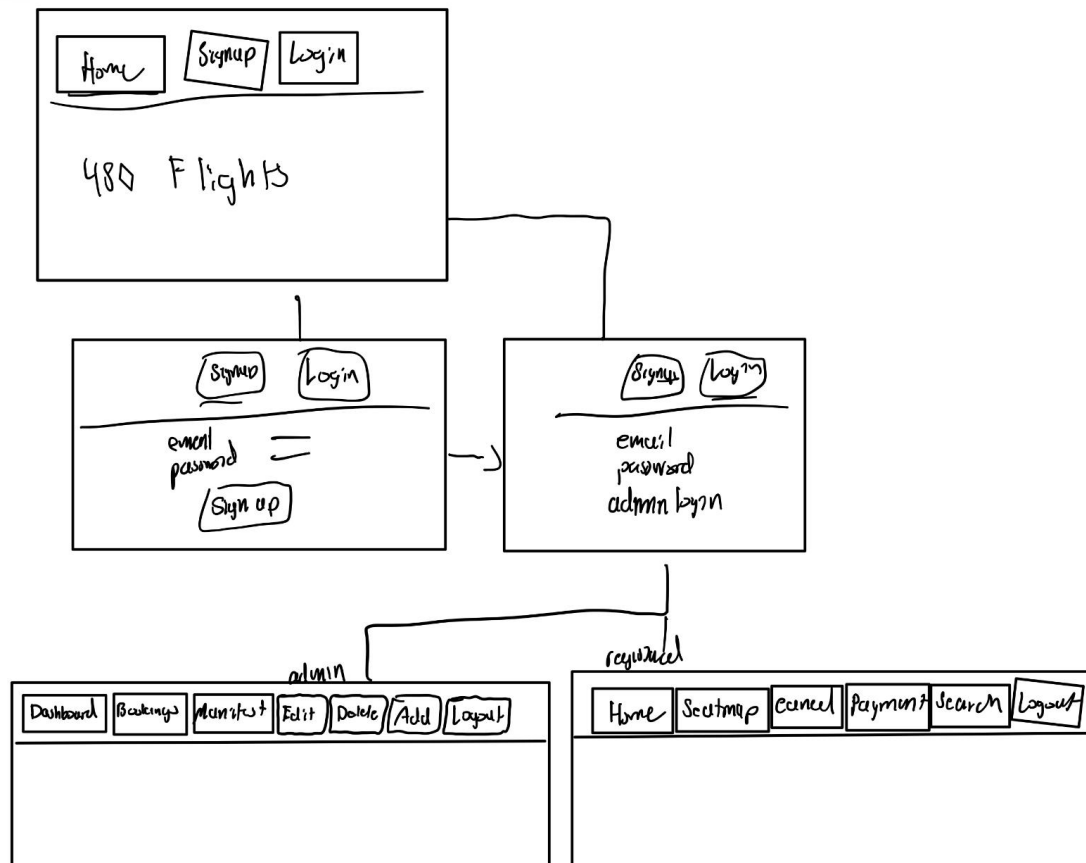
Conceptual model:



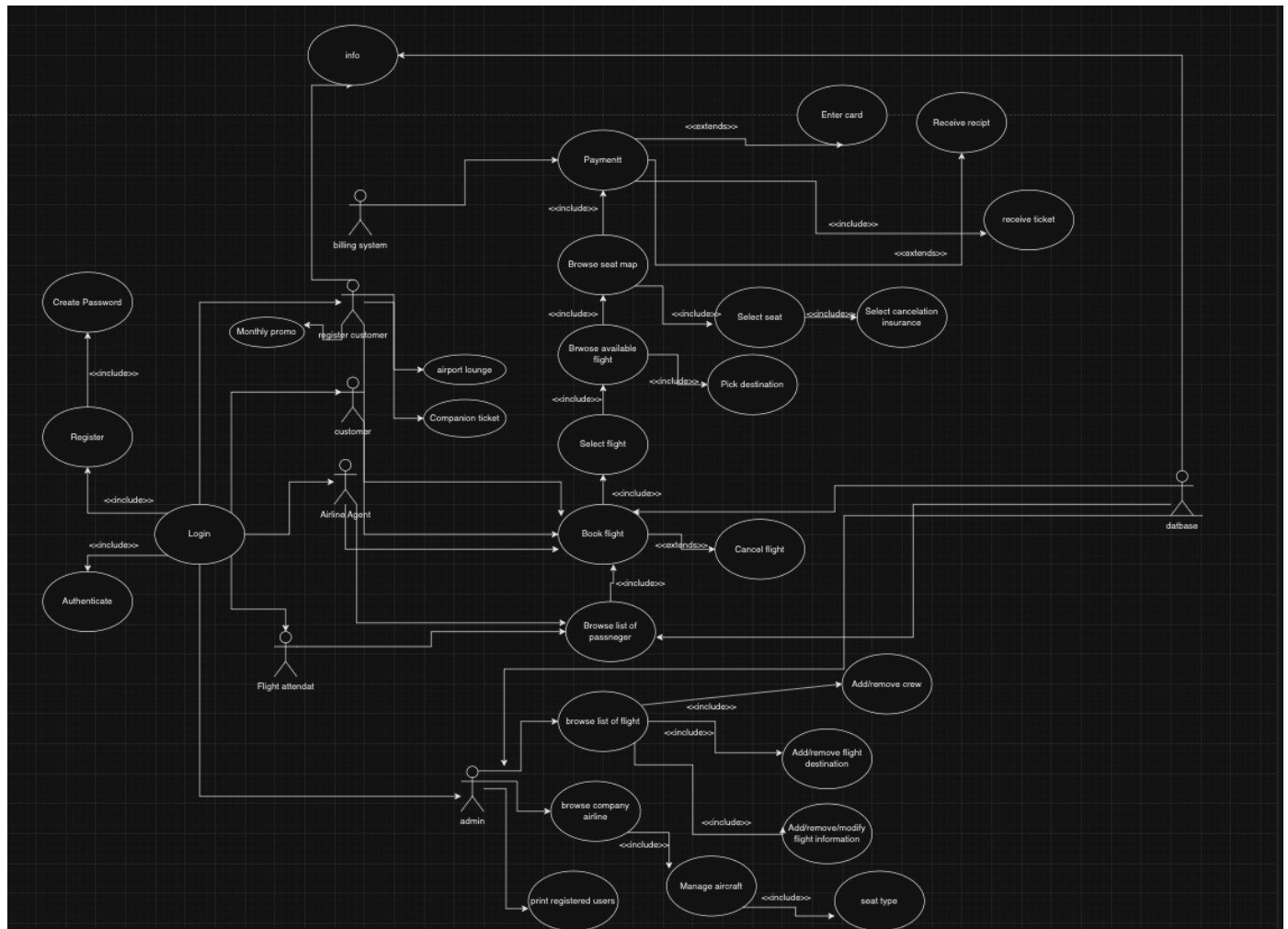
Part B - Domain Diagrams

Highlights of system's architecture

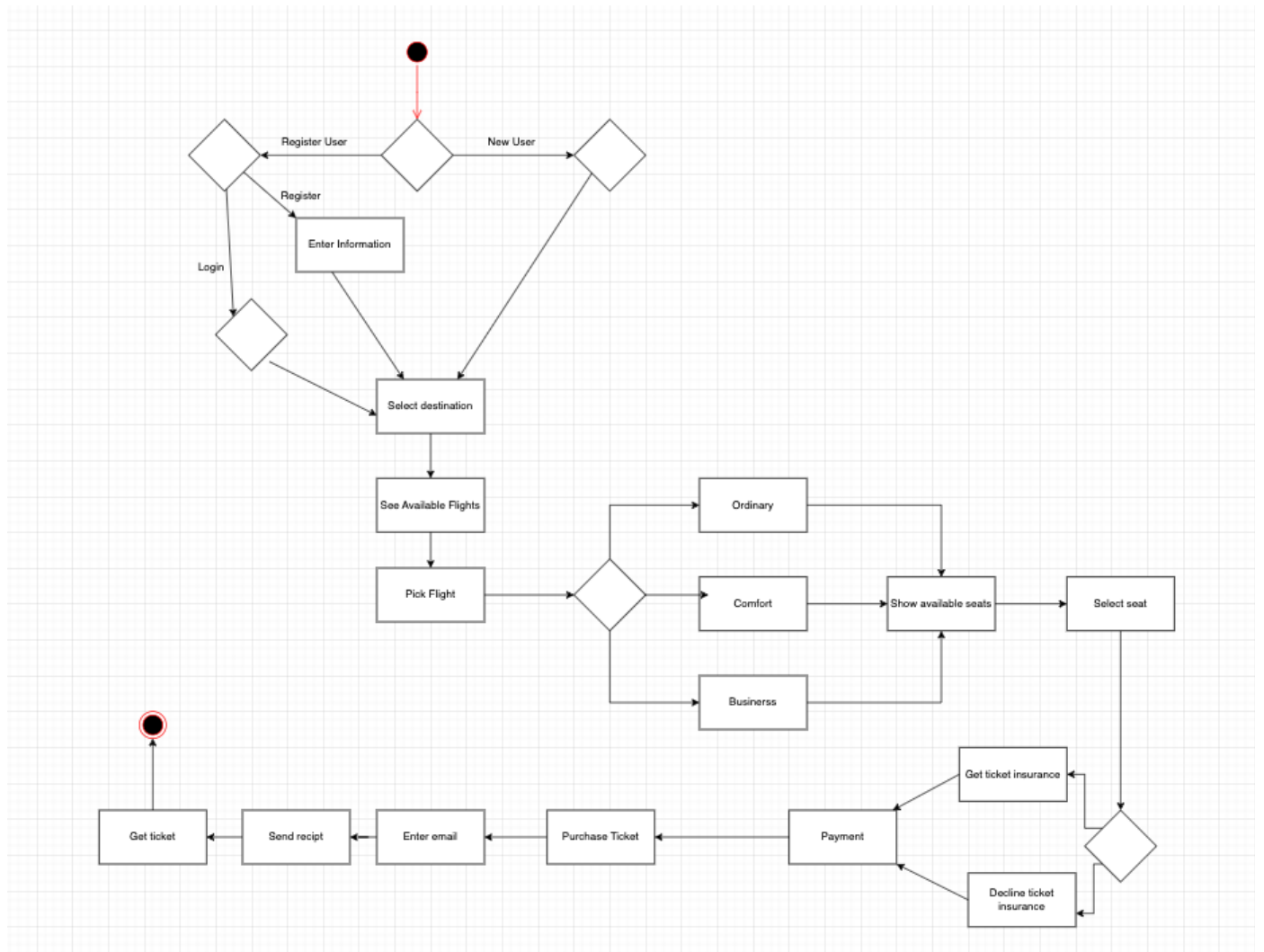
This system architecture employs Spring Boot for the backend, Java for business logic, and integrates with an SQL database for data storage. On the client side, a web browser application handles user interactions. The web browser asks the user to login where this login info is then taken to the backend and then verified. The SQL database stores and manages structured application data. Communication is facilitated through RESTful APIs.



Updated use-case

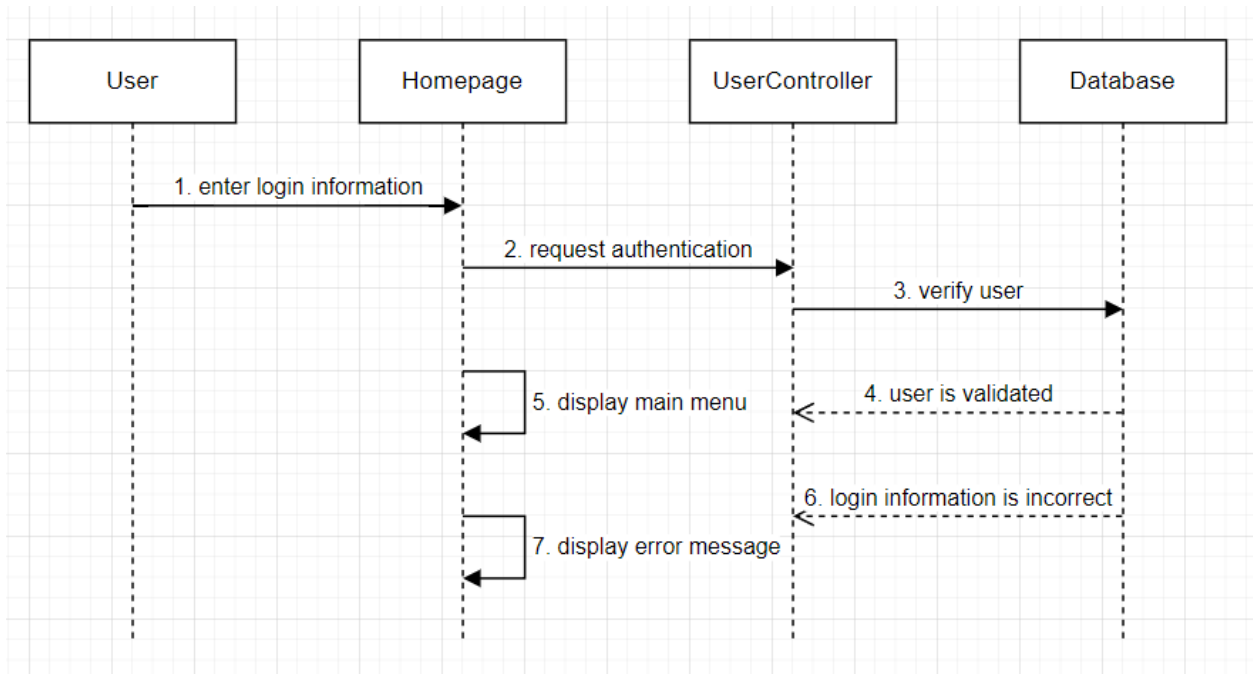


Systems activity diagram:

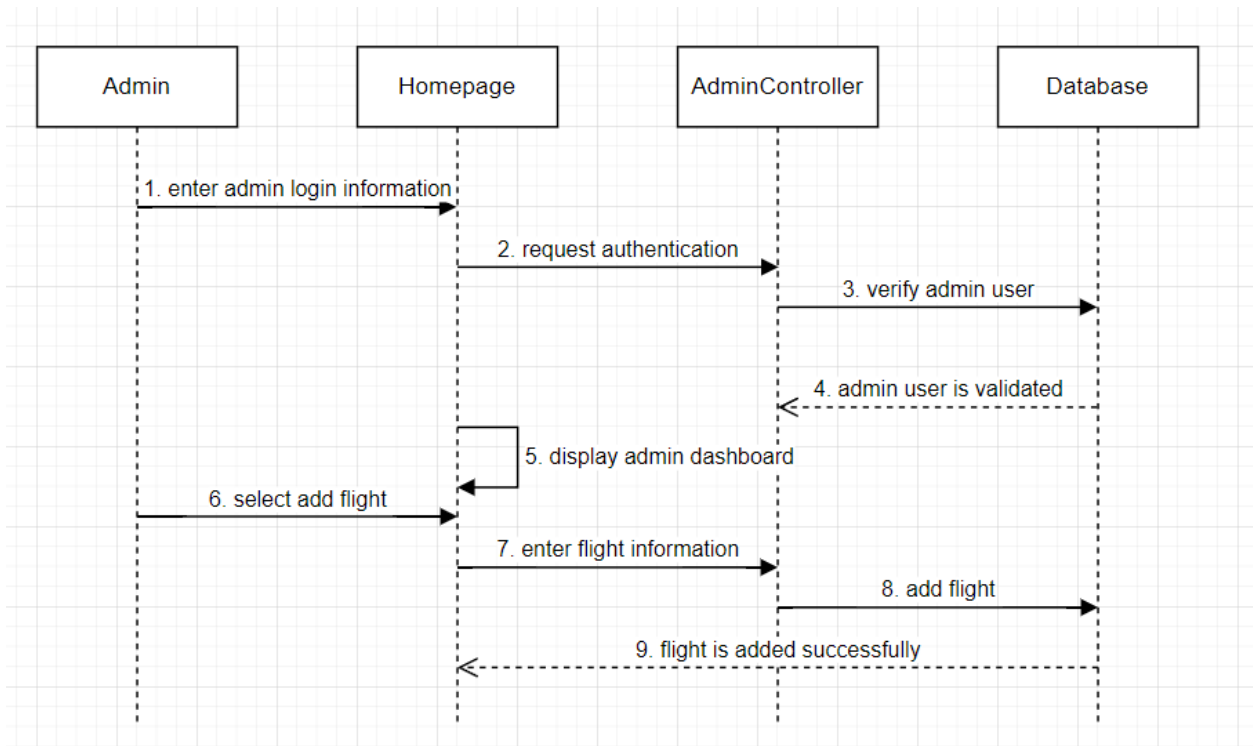


Sequence diagrams

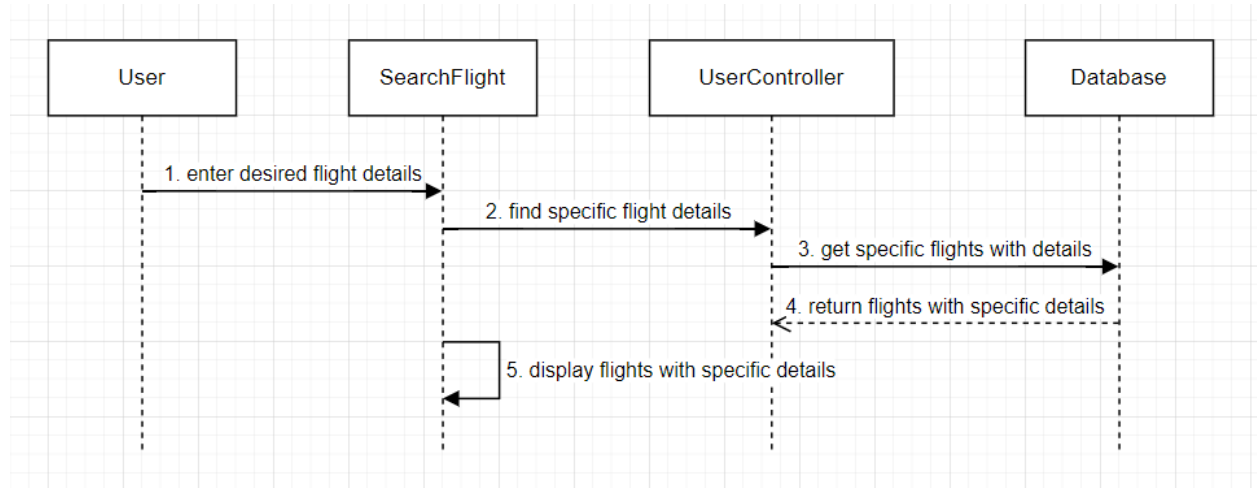
Use-Case: Login



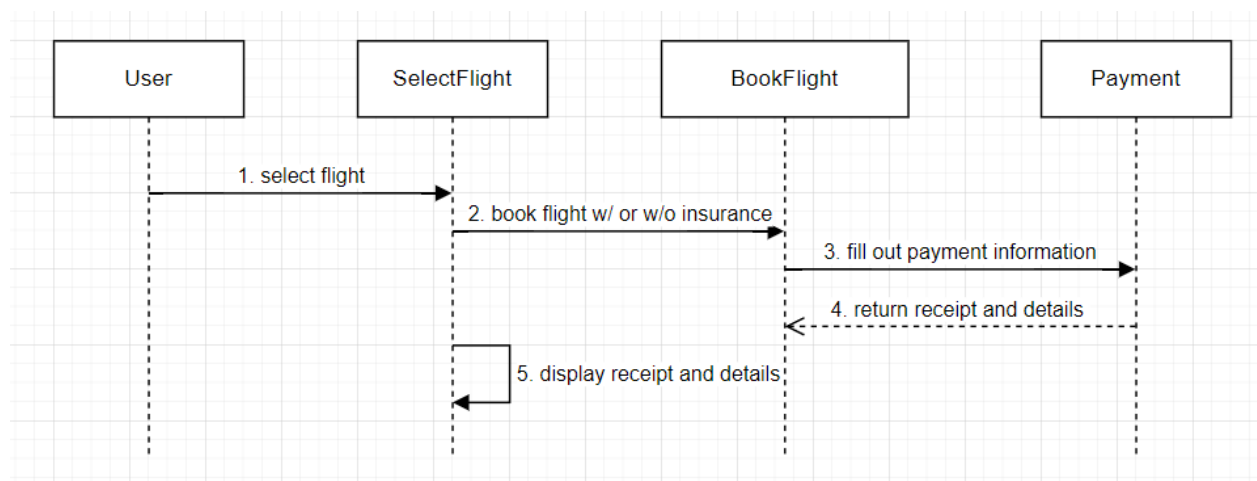
Use-Case: Add a Flight



Use-Case: Search Flight

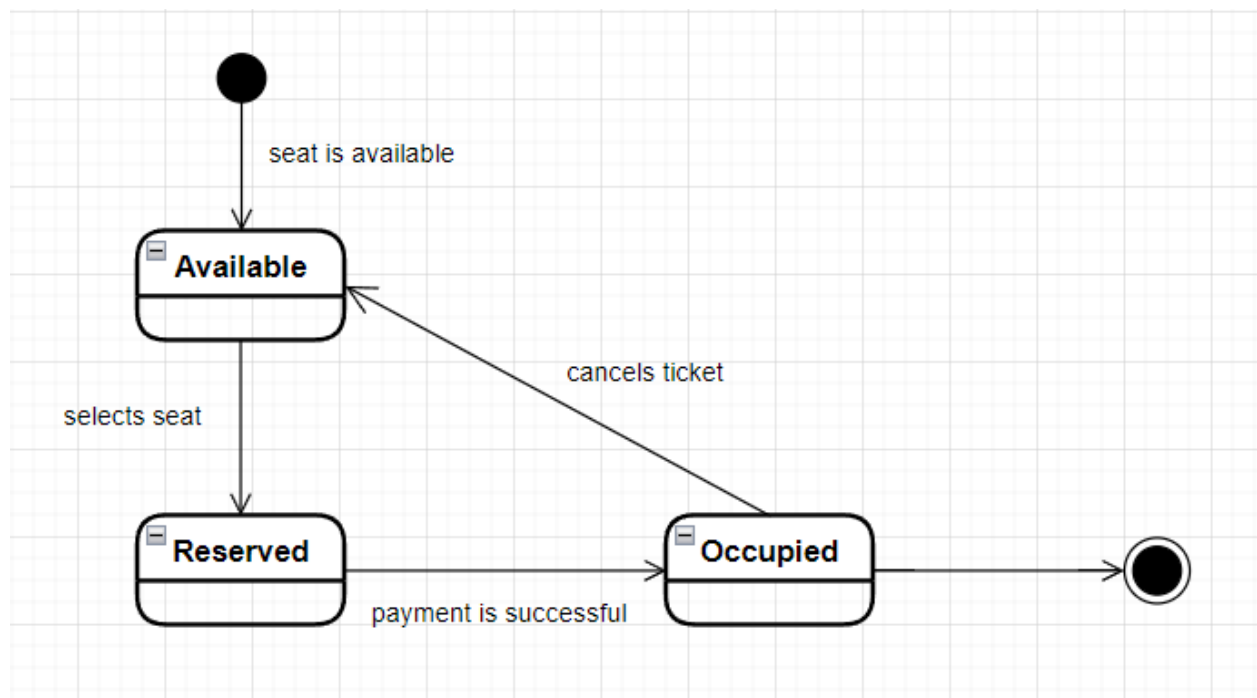


Use-Case: Book Ticket

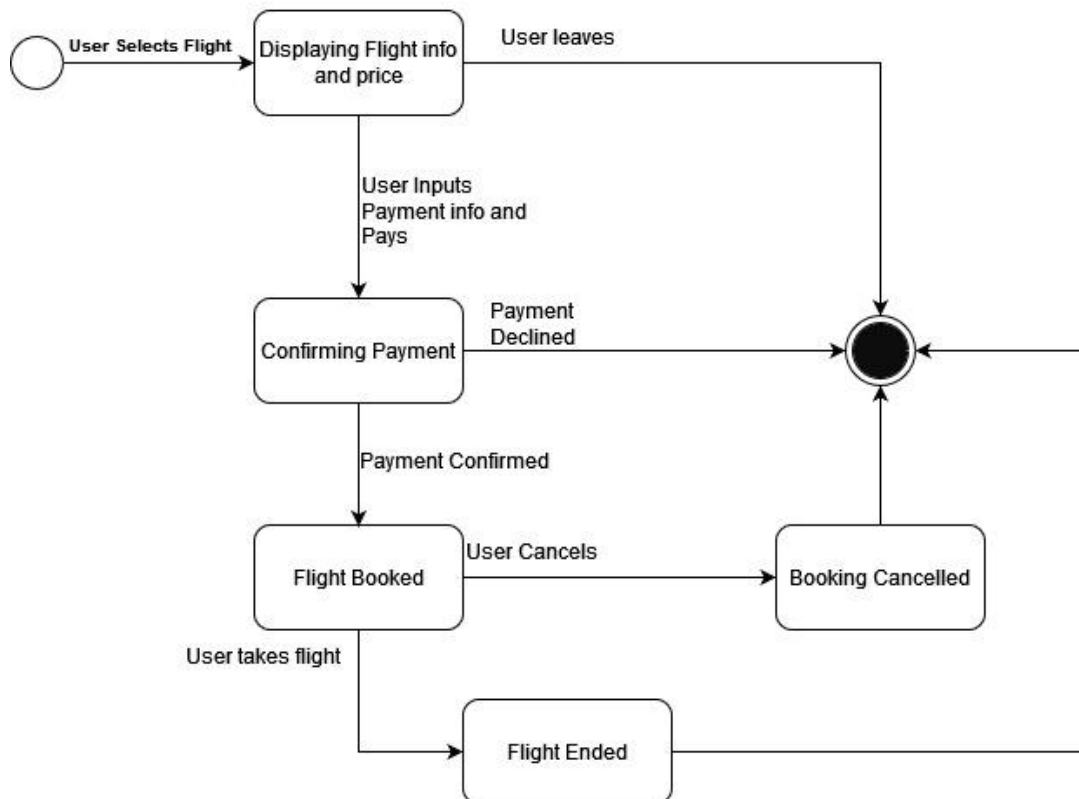


State transition Diagrams

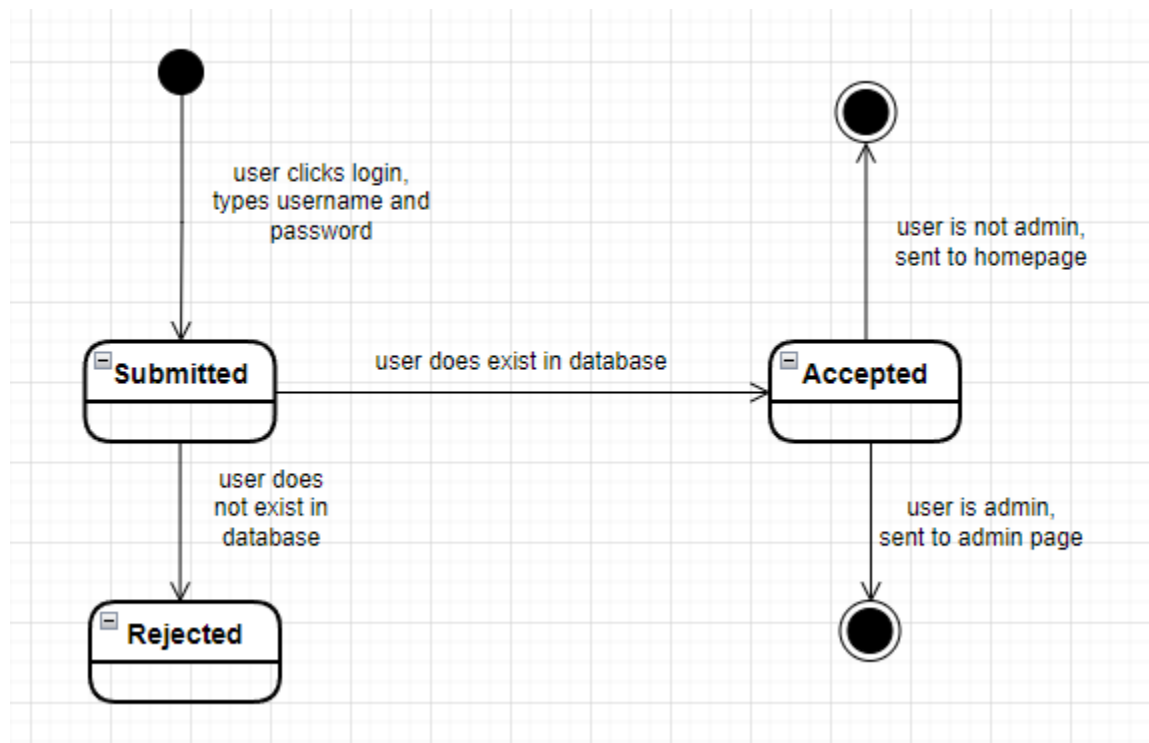
State transition for Seat



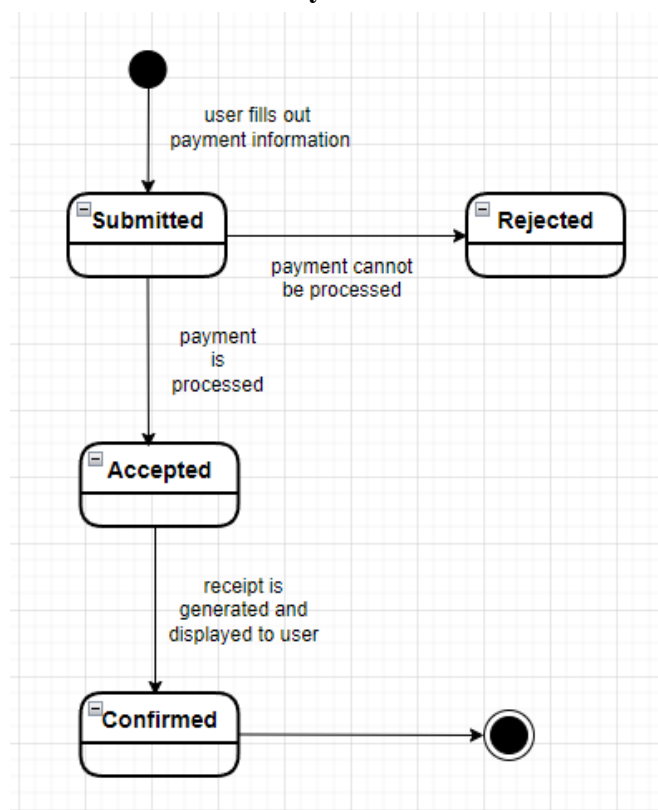
State transition for Flight:



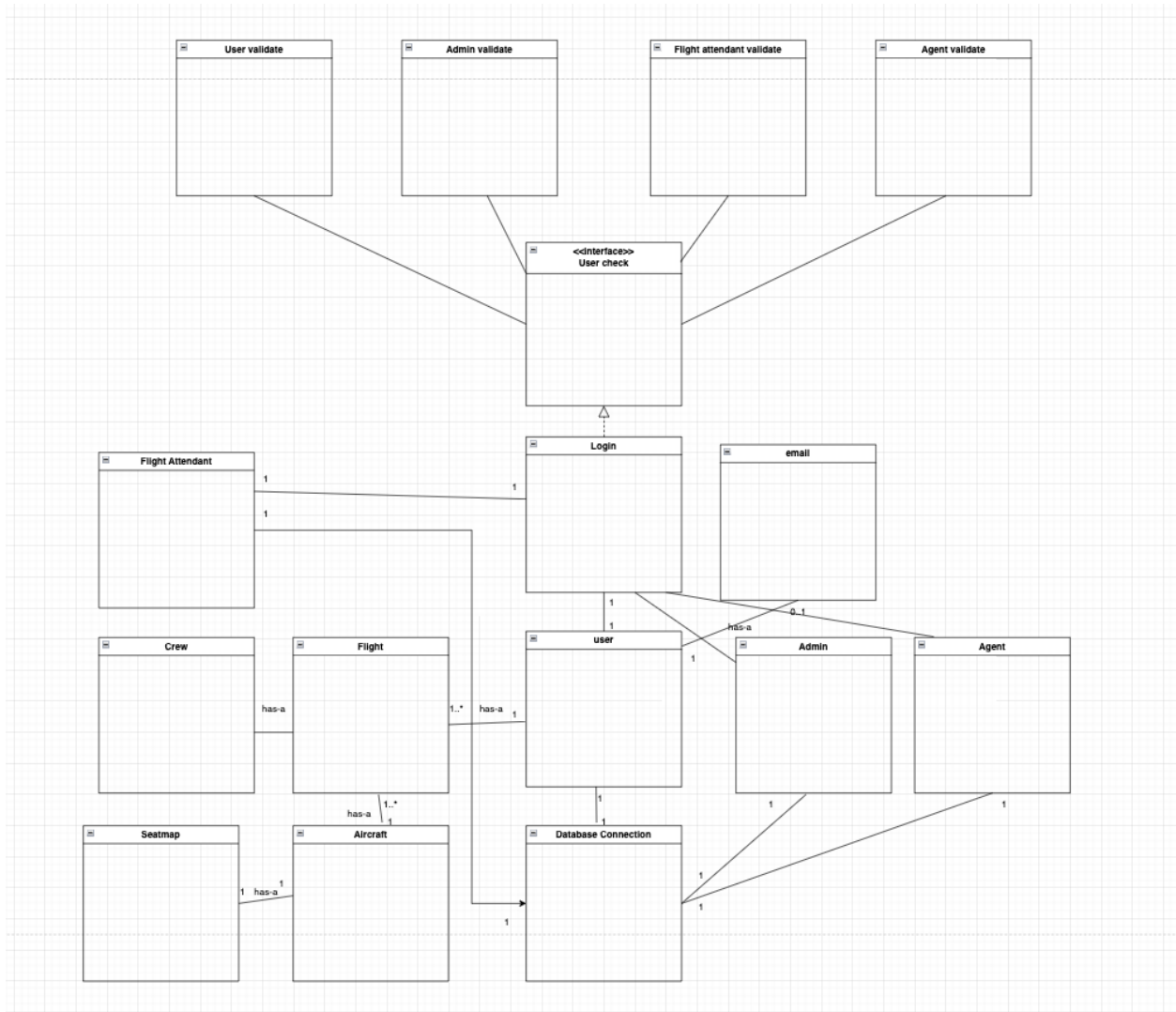
State transition for Login:



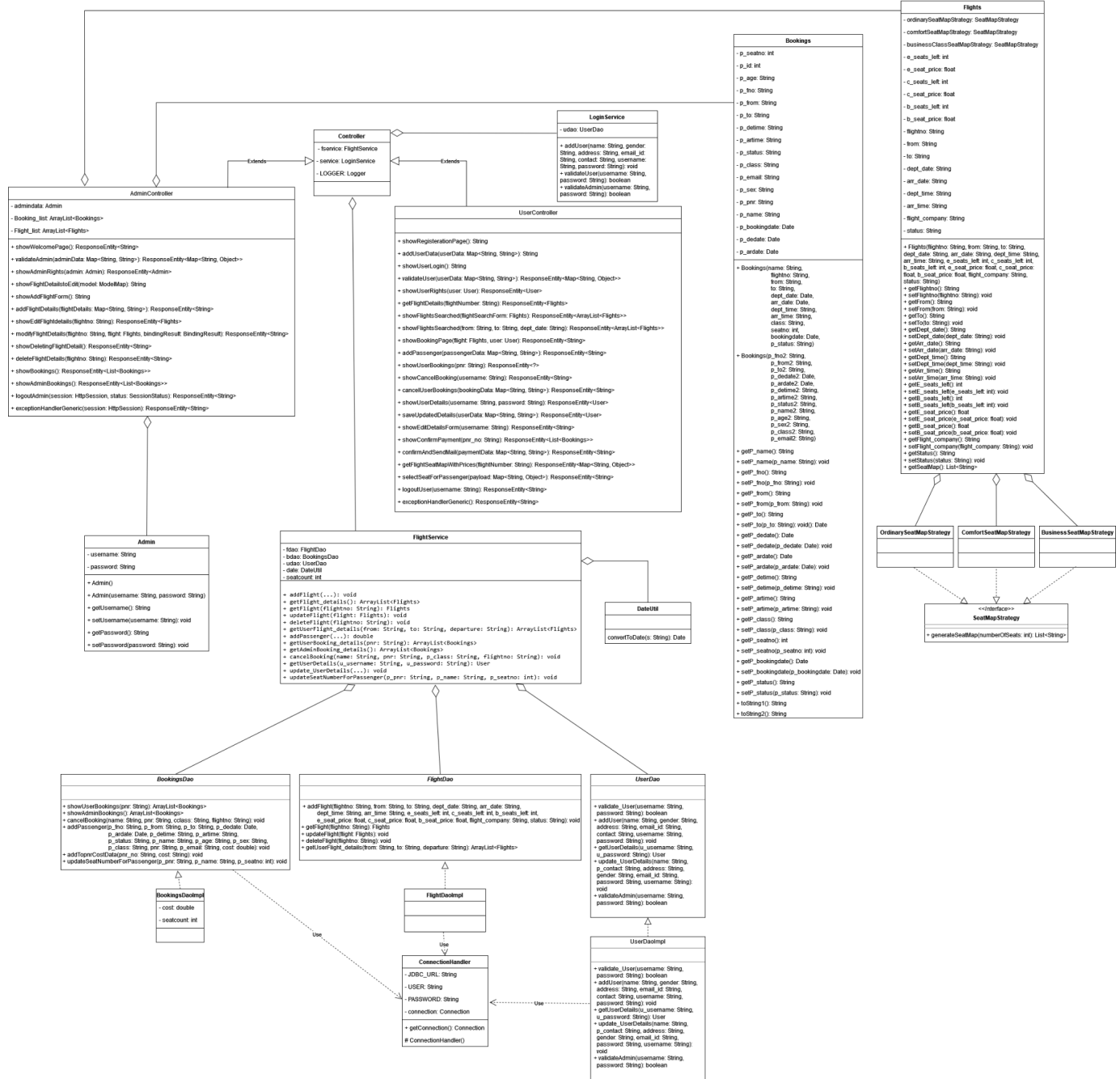
State transition for Payment:



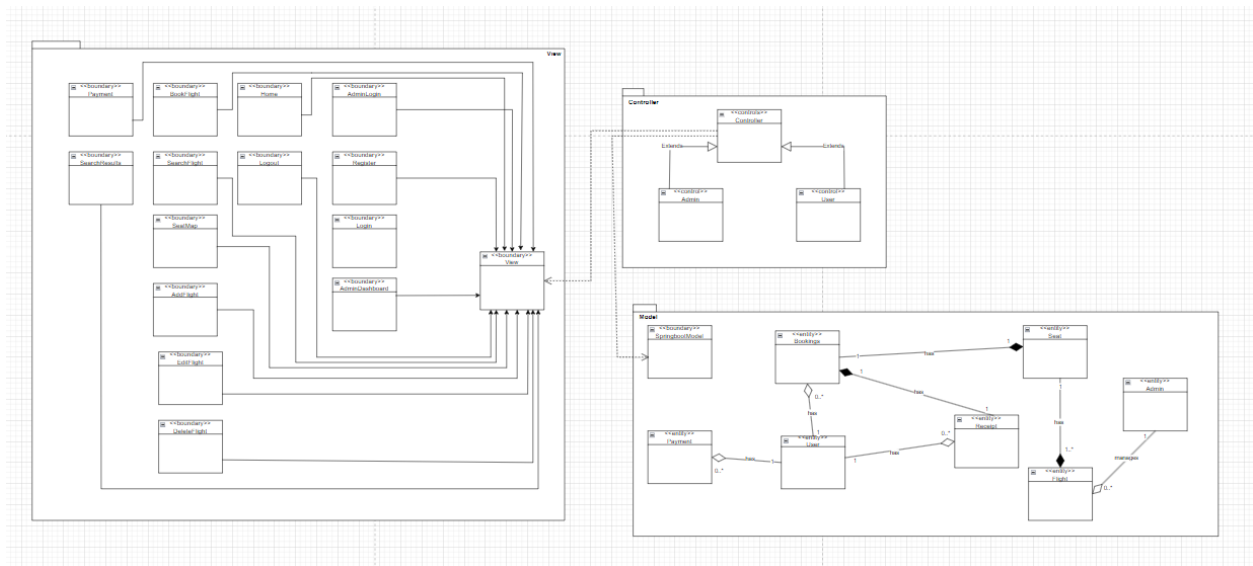
System Domain class diagram



System Domain class diagram with attributes:

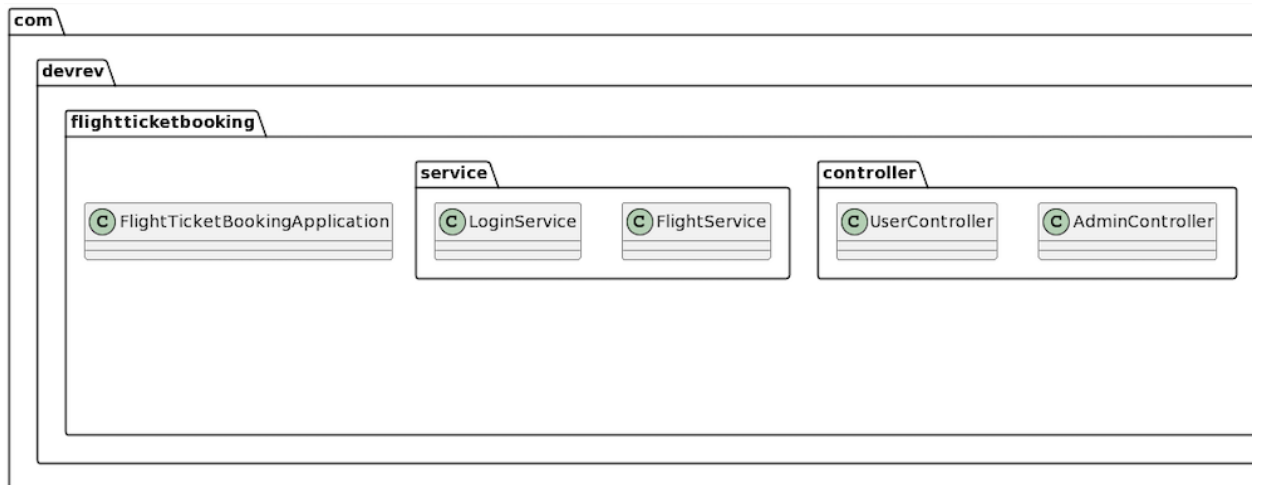
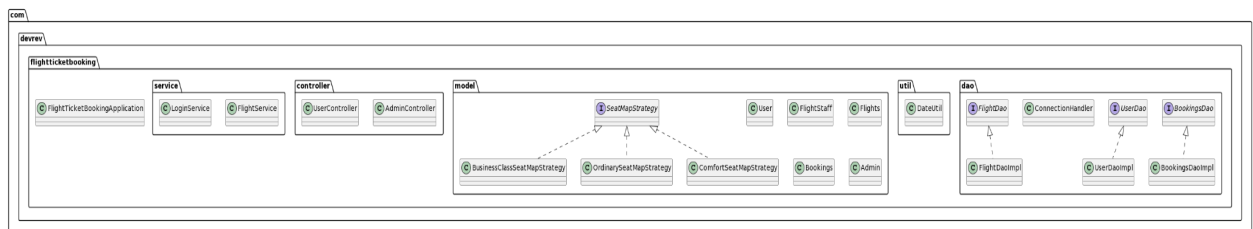


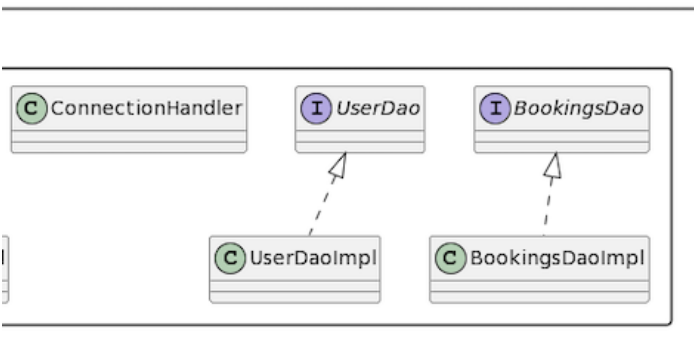
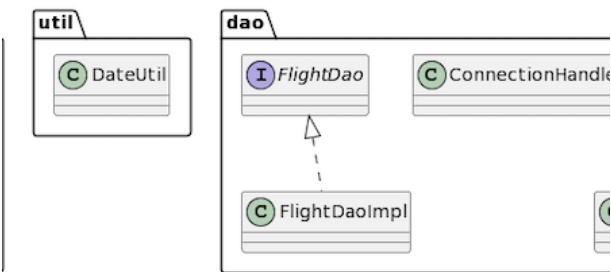
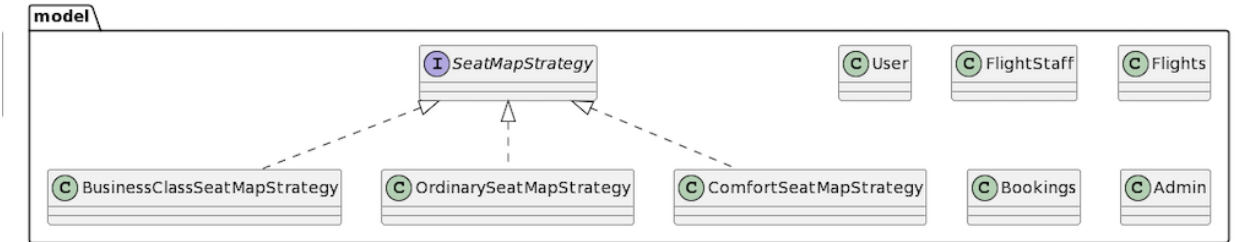
Part C - System's detailed design-class diagram



Part D - High Level System Architecture

Package Diagram:





Deployment Diagram:

