



Avyndor Airlines

Team Member Names	Roll Numbers	Position
Mudassar Khalid	22i-1072	Designer
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Title

Airline Ticket Management System

Scope

We shall focus on implementing an airline ticket management system. In this system, we are planning to build an entire interface from where user can manage their flights. From booking to the status of the flight, everything that the customer needs will be provided in this ticket management system.

Objective

Customers can book a flight.

Customers can see the current status of their booked flights.

Customers can print their tickets.

Check ticket prices.

Problem Statement and Description

Our major aim is to help the users with their flight booking for our Avyndor Airlines. Through our program, we will enable our customers to book the flight. After booking this flight, the user can view the flight's status, so that in case of any delay, the customer should know that beforehand.

Our program will be user-friendly and facilitate them in their travel plan. They can book tickets, see prices and check the status of their flights.

Use Cases:

Mudassar Khalid

22i-1072

Use Case Name: Manage Refunds

Scope:

User-level goal

Scope the system under design

Airline Ticket Management System

Primary Actor:

Passenger

Stakeholders and Interests:

- **Passenger:** Seeks to process a refund for a canceled flight or unsatisfactory service.
- **Customer Support Team:** Aims to efficiently handle refund requests and maintain customer satisfaction.

Preconditions:

- Passenger has a valid booking eligible for a refund.
- The passenger is logged in to the system.

Success Guarantee (Postcondition):

- The refund is processed, and the passenger receives confirmation and the refund amount.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Navigate to the "Manage Refunds" section.	2. Display the refund options.
3. Select the booking for which they want a refund.	4. Retrieve and display booking details.
5. Submit a refund request, providing a reason if necessary.	6. Verify the eligibility of the refund.
7. Receive confirmation of the refund request.	8. Process the refund request and calculate the refund amount.
9. Receive notification with refund details.	10. End confirmation and refund details to the passenger.

Extensions:

- **2a:** Refund request is ineligible.
 - **2a1:** Notify the passenger that the refund request cannot be processed with reasons.
- **3a:** System encounters an error during processing.
 - **3a1:** Log the error and inform the passenger to contact customer support for assistance.

Use Case Name: Make Payment**Scope:**

User-level goal

Primary Actor:

Passenger

Scope the system under design

Airline Ticket Management System

Stakeholders and Interests:

- **Passenger:** Wants to securely complete payment for a flight booking.

- **Payment Gateway Provider:** Ensures secure and successful transaction processing.

Preconditions:

- Passenger has selected a flight to book.
- The passenger is logged in to the system.

Success Guarantee (Postcondition):

- The payment is successfully processed, and the passenger receives a confirmation of payment.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Proceed to the payment section after selecting a flight.	2. Display payment options and total amount.
3. Enter payment details and review the total amount.	4. Validate the payment information.
5. Submit the payment.	6. Process the payment through a secure gateway.
7. Receive confirmation of payment.	8. Update the booking status and notify the passenger.

Extensions:

- **2a:** Payment information is invalid.
 - **2a1:** Prompt the passenger to correct the payment details.
- **3a:** Payment processing fails.
 - **3a1:** Inform the passenger of the failure and suggest retrying or using an alternate payment method.

Use Case Name: Make Complaint

Scope:

User-level goal

Primary Actor:

Passenger

Scope the system under design

Airline Ticket Management System

Stakeholders and Interests:

- **Passenger:** Wants to report an issue or dissatisfaction with service.
- **Customer Support Team:** Aims to address complaints and improve service quality.

Preconditions:

- The passenger is logged in to the system.

Success Guarantee (Postcondition):

- The complaint is recorded, and the passenger receives acknowledgment of their submission.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Navigate to the "Complain" section.	2. Display the complaint form.
3. Fill out the complaint form with details and evidence.	4. Record the complaint and assign a tracking number.
5. Submit the complaint.	6. Acknowledge receipt of the complaint to the passenger.

Extensions:

- **1a:** Complaint submission fails.
 - **1a1:** Inform the passenger to retry and log the issue for review.
- **2a:** Passenger provides insufficient information.
 - **2a1:** Prompt the passenger to add more details before submission.

Use Case Name: Make Online Check-in

Scope:

User-level goal

Primary Actor:

Passenger

Scope the system under design

Airline Ticket Management System

Stakeholders and Interests:

- **Passenger:** Wants to check in for their flight online for convenience.
- **Airport Management System:** Aims to streamline the check-in process.

Preconditions:

- The passenger has a valid booking.
- The check-in period for the flight has opened.

Success Guarantee (Postcondition):

- The passenger successfully checks in and receives a boarding pass.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Navigate to the "Online Check-in" section.	2. Display check-in options.
3. Enter booking details to access their flight.	4. Verify booking details and availability.
5. Select seats and confirm check-in.	6. Generate a boarding pass and send it to the passenger.

Extensions:

- **2a:** Check-in period has not opened.
 - **2a1:** Inform the passenger that check-in is not yet available.
- **3a:** Passenger changes their mind about seat selection.
 - **3a1:** Allow the passenger to modify seat selection before confirming.

Use Case Name: Check Aeroplane Details

Scope:

User-level goal

Primary Actor:

Passenger

Scope the system under design

Airline Ticket Management System

Stakeholders and Interests:

- **Passenger:** Wants to know specific details about the aircraft for their flight.
- **Airport Management System:** Aims to provide accurate aircraft information to enhance customer experience.

Preconditions:

- The passenger has selected a flight.

Success Guarantee (Postcondition):

- The passenger receives detailed information about the aircraft.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Navigate to the "Aeroplane Details" section after selecting a flight.	2. Display aircraft options.
3. View information about the aircraft type, amenities, and seating configuration.	4. Retrieve aircraft details from the database.
5. Receive detailed aircraft information.	6. Display the information to the passenger.

Extensions:

- **1a:** Aircraft information is not available.
 - **1a1:** Notify the passenger that details are currently unavailable and suggest checking back later.
- **2a:** Passenger wants more information.
 - **2a1:** Provide links to further resources or customer support for additional queries.

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22i-0875

Use Case: Create Account

Scope: User-level goal

Scope the system under design: Airline Ticket Management System

Stakeholders and Interests:

User (Passenger): Wants to create an account in the system to access features such as flight booking, tracking, and management.

System Administrator: Ensures that user account data is stored securely and the registration process is efficient.

Preconditions:

The user is not already registered in the system.

The system is accessible via web or mobile application.

The system has a valid database to store user information.

Success Guarantee (Postcondition):

The user successfully creates an account, and a confirmation is displayed or sent, indicating that the account has been created.

Main Success Scenario:

Passenger (User Goal)	System Response
1. User opens the account registration page.	2. System displays a registration form, prompting the user to enter required details (e.g., full name, email, password, contact information).
3. User enters the required information and submits the form.	4. System validates the provided details.
8. User is now able to log in to the system.	5. System creates the new account and stores the user's details in the database.
	6. System sends a confirmation email or SMS with an activation link or verification code to the user.
	7. System verifies the user's activation and confirms account creation.

Extensions:**3a. User enters incomplete or invalid information:**

3a1. The system detects missing or invalid details (e.g., incorrect email format, password too short).

3a2. The system prompts the user to correct the information and resubmit the form

4a. Email or username already exists:

4a1. The system notifies the user that the email address or username is already registered.

4a2. The user is prompted to either recover the existing account or use a different email/username.

Use case name: Search Flight

Scope: User level goal

Primary Actor: Passenger

Scope the system under design: Airline Ticket Management System

Stakeholders and Interests:

Passenger – Wants to find flights available.

Airport Management System – Wants to ensure that all the flight data is available.

Preconditions:

Flight data is available in the airport management system.

The passenger is logged in.

Success guarantee (postcondition):

A list of available flights is displayed to the passenger.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Passenger chooses the flight search section in the system.	2. The system displays a form prompting the passenger to input search criteria such as destination, departure date, return date, time, price range.
3. Passenger fills the search criteria and submits the request.	4. The system retrieves relevant data from the database, and displays a list of flights that match the criteria.
5. Passenger views the list of available flights and flight details.	

Extensions:

2a. Passenger enters invalid or incomplete search criteria:

2a1. The system displays an error message to the passenger to correct or complete the input.

3a. No flights are found with the matching criteria:

3a1. The system notifies the passenger that no flights were found with the entered criteria and offers the passenger to modify their search criteria.

Use case name: Book Flight

Scope: User level goal

Primary Actor: Passenger

Scope the system under design: Airline Ticket Management System

Stakeholders and Interests:

Passenger – Wants to book a flight that fits their travel plan.

Airport Management System – Wants to ensure the bookings are accurately recorded and updated.

Preconditions:

Passenger is logged in the system.

Passenger searches for available flights.

Passenger has successfully selected a flight to book.

The selected flight has available seats.

Success guarantee (postcondition):

The passenger successfully books a flight, and a booking confirmation is displayed and sent to the passenger.

Main Success Scenario:

Passenger (User Goal)	System Response
1. Passenger selects an available flight from the search results	2. The System displays the flight details and prompts the passenger to confirm booking details.
3. Passenger confirms the booking.	4. System calculates the total fare.
5. Passenger proceeds to the payment screen and enters payment information.	6. System processes the payment and confirms the successful booking.
7. Passenger receives the booking confirmation.	

Extensions:

2b. Flight is fully booked:

2b1. The system notifies the passenger that the selected flight is fully booked and offers the option to select another flight.

3a. Passenger provides incorrect or incomplete personal information:

3a1. The system prompts the passenger to correct or complete the required information.

Use case name: Manage Flights

Scope: System level goal

Primary Actor: Airport Management System

Scope the system under design: Airline Ticket Management System

Stakeholders and Interests:

Airport Management System:

Wants to manage flight schedules, updates, and cancellations, ensuring real-time accuracy in flight data and coordinating with airlines, passengers, pilots.

Success Guarantee (Postcondition):

Flights are successfully managed in the system, including updates, delays, and cancellations, emergencies with notifications sent to relevant parties (airlines, passengers, and airport staff).

Main Success Scenario:

Passenger (User Goal)	System Response
	1. Airport Management System monitors scheduled flights and their statuses.
	2. System receives updates from airlines regarding flight changes (e.g., delays, cancellations, gate changes).
	3. System processes the updates and modifies the flight schedule accordingly.
	4. System sends notifications to affected parties.
	5. System ensures that any required resources (gates, baggage handlers, etc.) are reassigned if flights are canceled or delayed.
	6. System logs all changes and maintains accurate flight data for reporting and analysis.

Extensions:

2a. Airline changes flight schedule or cancels a flight:

2a1. The system processes the updated schedule or cancellation and automatically notifies affected parties.

3a. System detects a conflict with flight scheduling (e.g., overlapping gate assignments):

3a1. The system identifies the conflict and prompts the airport operations team to resolve the issue (e.g., reassign gates or delay flights).

4a. Flight experiences an emergency or unscheduled landing:

4a1. The system registers the emergency landing and coordinates with emergency services and relevant airport personnel.

4a2. The system sends critical updates to passengers, airlines, and airport staff.

Use case name: Monitor Revenue

Scope: System level goal

Primary Actor: Airport Management System

Scope the system under design: Airline Ticket Management System

Stakeholders and interests:

Airport Management System:

Wants to accurately and timely track the revenue generated by flight ticket sales.

Finance Department:

Keeps track of the financial data, in order to make certain important decisions.

Preconditions:

Flight bookings are recorded in the system.

The revenue manager or user is logged into the system.

The system is up-to-date.

Success Guarantee (Postcondition):

The system provides an accurate and up-to-date report of revenue generated by ticket sales, including filtering options and detailed analysis.

Main Success Scenario:

Finance department	System Response
	1. Airport Management System continuously monitors ticket sales across all booking platforms (online and offline).
	2. System retrieves ticket sale data in real-time, including details such as ticket prices, taxes, fees, and discounts applied during the sale.
	3. As ticket sales are processed, the System calculates the total revenue generated from each sale, including breakdowns by flight, route, and fare class.
	4. System automatically stores the calculated revenue data in a revenue database, ensuring that every transaction is recorded.
	5. System generates detailed reports summarizing the total revenue, allowing for real-time and historical analysis.
7. Finance department receives a detailed report.	6. The System ensures that all revenue data is backed up regularly to avoid data loss.

Extensions:

2a. System triggers notifications:

2a1. In case of significant revenue changes, the system sends notifications and triggers alerts.

3a. System detects incorrect revenue calculation (e.g., due to system error or data corruption):

3a1. The system runs an automated check and identifies discrepancies in calculated revenue (e.g., the sum of individual ticket prices doesn't match total revenue).

3a2. The system recalculates the revenue using the correct ticket sales data and updates the revenue database.

4a. Data storage failure or database connection issue:

4a1. The system detects an issue with saving revenue data to the database (e.g., database connection lost or storage failure).

4a2. The system retries saving the data and, if unsuccessful, switches to a backup storage system to prevent data loss.

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a. Use case name:

SELECT MEAL

b. Scope the system under design

Airline Ticket Management System

c. Level

User Level

d. Primary actor

Passenger (User)

e. Stakeholders and interests

Passenger: Wants to select a meal based on his preferences.

Flight Attendant: Wants to know the meal preferences of the passenger.

Catering Service: Wants to know about passenger preferences to prepare food accordingly.

f. Preconditions

Customer must have logged in into the system

Customer should have booked a ticket

g. Postconditions

The Customers meal preferences are saved and will be transferred to the catering department and the flight attendant would also be notified.

h. Main success scenario

Actor Action	System Response
1-Customer logs into the system	
2-Customer selects the booked flight	
3-Customer goes to "Select Meal" option	4-System shows the list of available food choice in a drop down list
5-Customer chooses the meal that best suits his/her preferences.	5- System saves this choice and updates the catering department and flight attendant accordingly.

i. Extensions

- 1i) Login fails, then he won't be able to select meal
- 2i) No booked flight, so passenger won't be able to select meal.
- 3i) Less than 24 hours left for flight, this menu won't be available then.

- **Use case name**

PRINT TICKET

b. Scope the system under design

Airline Ticket Management System

c. Level

User level

d. Primary actor

Passenger (User)

e. Stakeholders and interests

The airport staff: To confirm if the passenger has booked the ticket or not.

Airline: To avoid any fraud.

f. Preconditions

Customer is logged into the system

Customer should have booked a flight in order to print its ticket

g. Postconditions

Customer shall receive a pdf form of his ticket which he will print into hard copy and bring along for his journey.

h. Main success scenario

Actor Action	System Response
1-Logs into the system	
2-Selects the booked flight	
3-Clicks the option to print ticket	4-System creates a PDF document of passengers ticket and downloads that to passengers device.

i. Extensions

- 1i) Login fails, so user won't be able to print ticket**
- 2i) No booked flight, so user won't be able to print ticket**

• Use case name

GET FLIGHT STATUS

b. Scope the system under design

Airline Ticket Management System

c. Level

User level

d. Primary actor

Customer (User)

e. Stakeholders and interests

Customer: To know the status of flight in case of any delay customers can manage their time schedule and commitments accordingly and arrive at the airport at the desired time.

Relevant Staff: So that they can prepare and manage customers accordingly.

f. Preconditions

Customer should be logged into the system

Customer should have the flight number to search for the status of the flight

g. Postconditions

The passenger receives the current status of the flight and get notified in case of any delays.

h. Main success scenario

Actor Actions	System Response
1-Logs into the system	
2-Goes to "Track Flight Section"	
3-Enters the flight number of the flight and clicks on "Search"	4-System give the clear update of the flight and its delay to the user. In case the flight is in journey, the system will return the current route and the estimated time to reach the destination.

i. Extensions

- 1i) Login fails: user wont be able to get the status of the flight
- 3i) If the flight number is invalid, so an error would be displayed

- **Use case name**

CANCEL TICKET

b. Scope the system under design

Airline Ticket Management System

c. Level

User level

d. Primary actor

Customer (User)

e. Stakeholders and interests

Customer: To get a refund of the ticket

Airline Management: To give this ticket to other customers to avoid any loss

f. Preconditions

Customer should be logged into the system

Customer should have booked the flight ticket

Ticket can only be canceled till 5hrs before departure time. After that ticket can't be cancelled.

g. Postconditions

Customer should receive a request number for their refund

System is updated accordingly so that other customers can book that ticket.

h. Main success scenario

Actor Actions	System Response
1-Log into the system	
2-Selects the booked flight	
3-Clicks on "Cancel Flight" button	4-The system returns a request number for the refund of the ticket amount

i. Extensions

1i) Login fails; user can't cancel booking if login fails

2i) No booked flight; if no booked flight then user can't cancel booking

3i) Less than 5hours remaining for departure, then the ticket can't be cancelled.

- **Use case name**

HANDLE PROMOTIONS

b. Scope the system under design

Airline Ticket Management System

c. Level

User level

d. Primary actor

Customer (User)

e. Stakeholders and interests

Customer: He could save money.

Marketing department: To get their performance by knowing how many customers they have attracted through their performance

f. Preconditions

Customer should have a promotion code

g. Postconditions

Customer should receive a discount on their tickets

The promo code should be deleted from the system as its used once

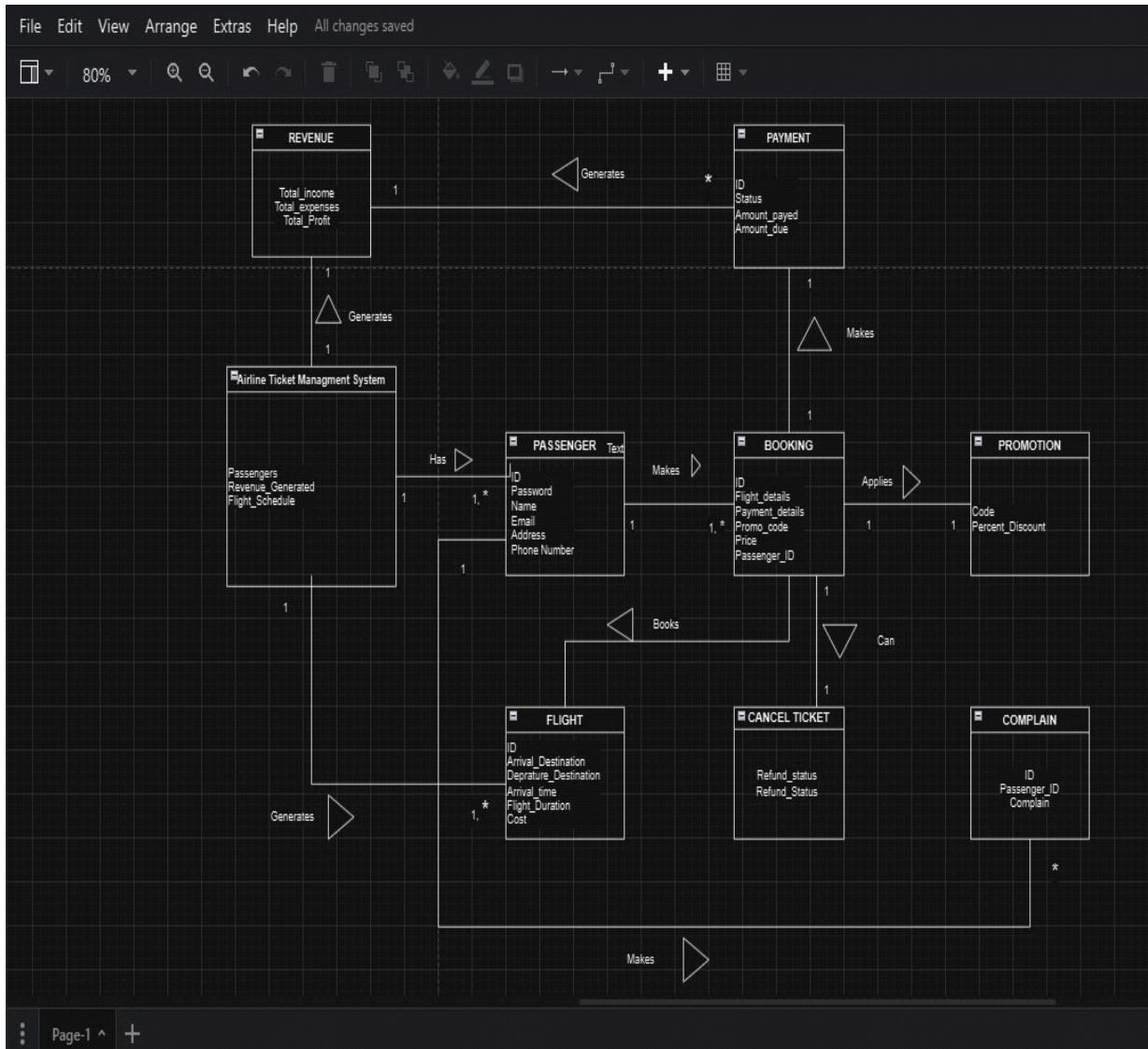
h. Main success scenario

Actor Actions	System Response
1-Logs into the system	
2-Goes to “book ticket” section	
3-Writes the promotion code in the promo text bar.	4-System validates the promo code. If it is valid then it applies the discount.

i. Extensions

- 1i) If login fails, then user can't apply on promotion
- 2i) Promotion code won't be applied on booked flight, it will only be applied on new bookings
- 4i) If the promo code is invalid then the discount won't be applied.

Domain Model DIAGRAM:



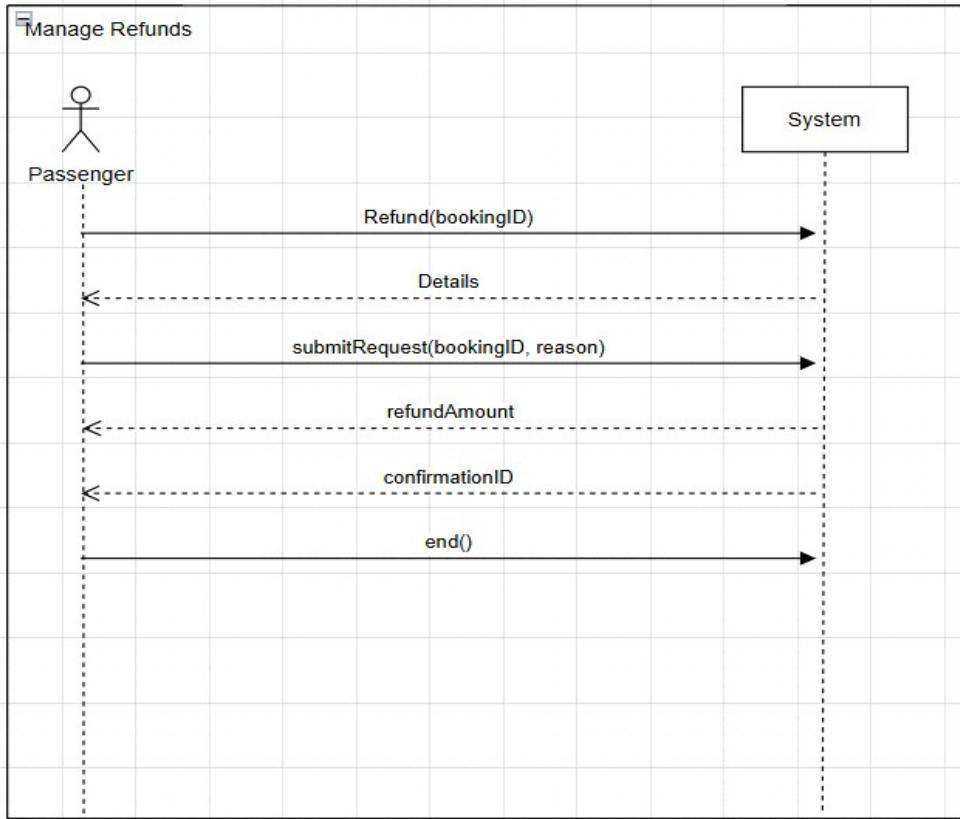
DOMAIN MODEL DIAGRAM

SYSTEM SEQUENCE DIAGRAMS (SSDs)

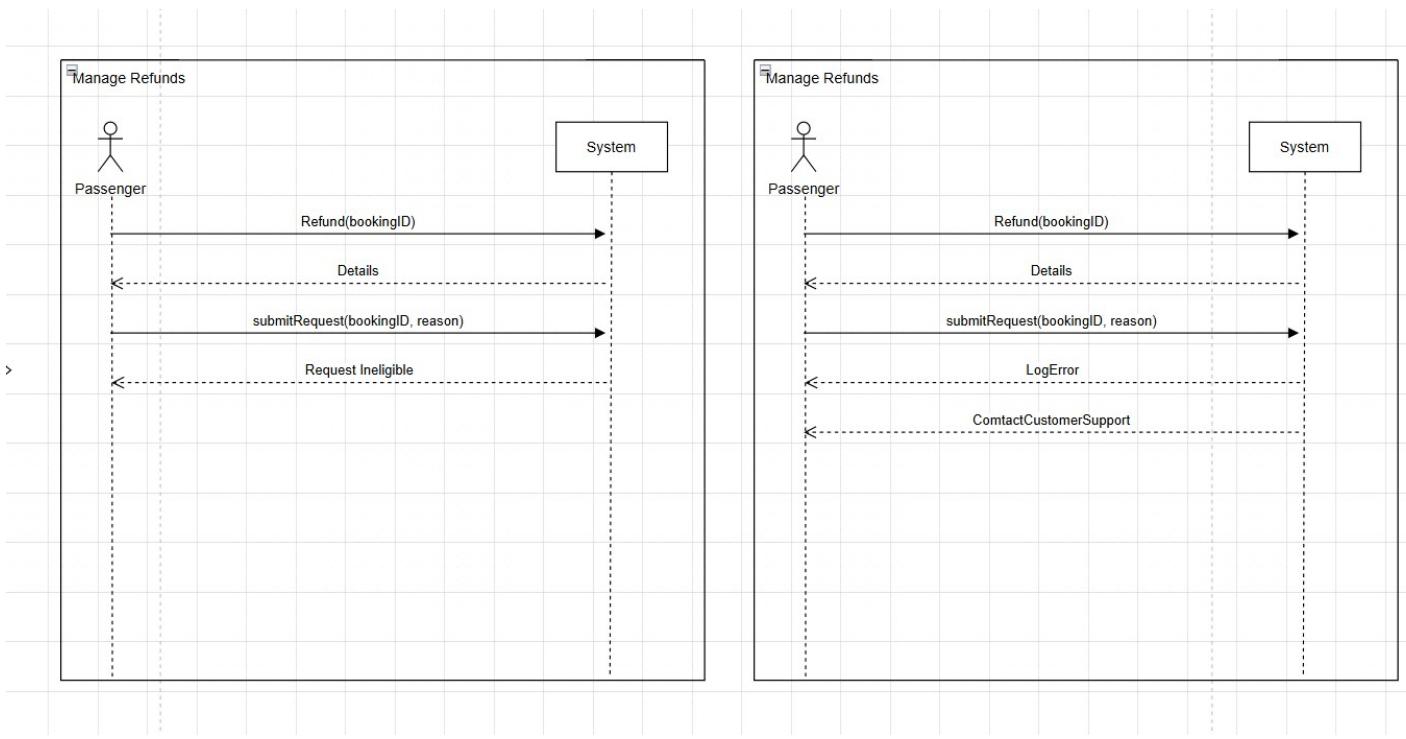
Mudassar Khalid

22i-1072

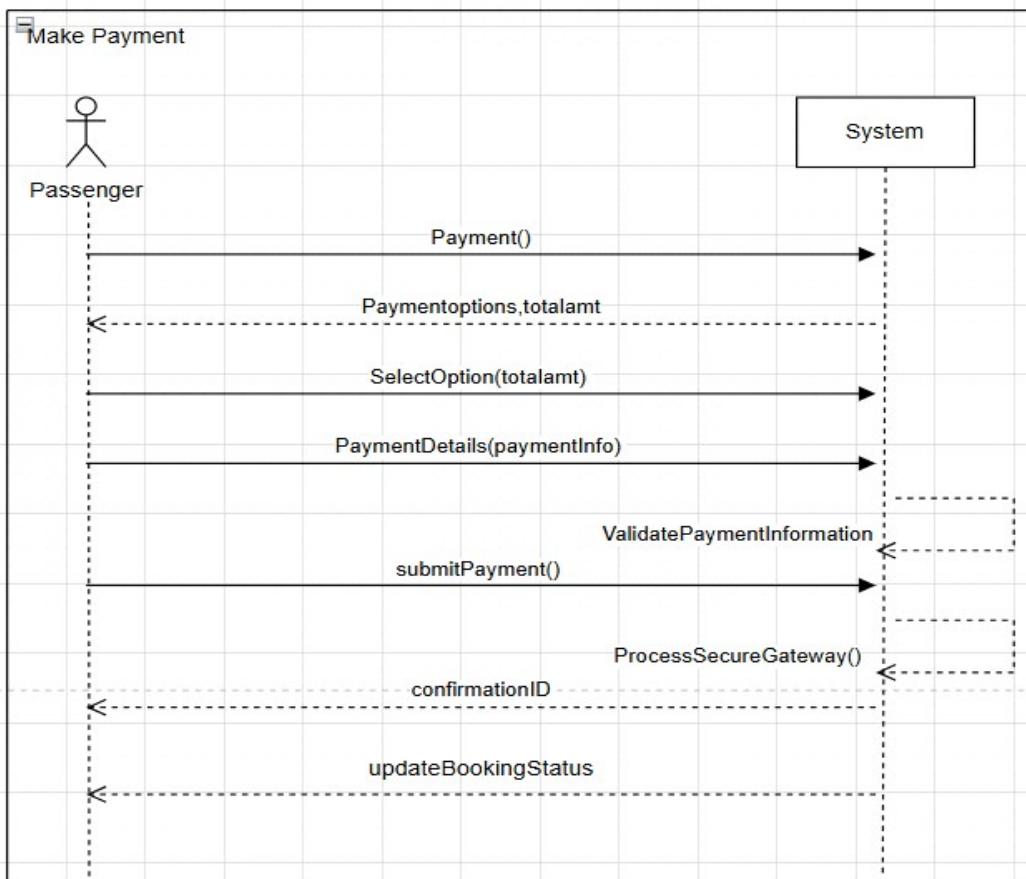
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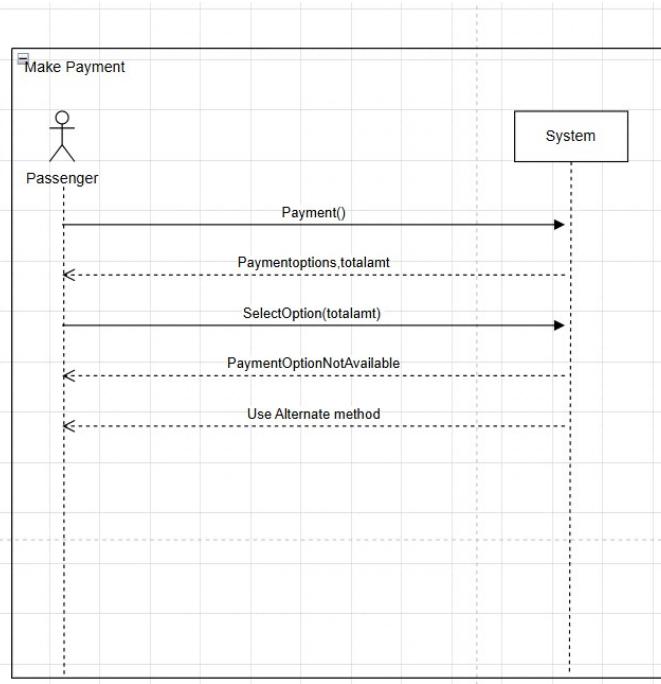
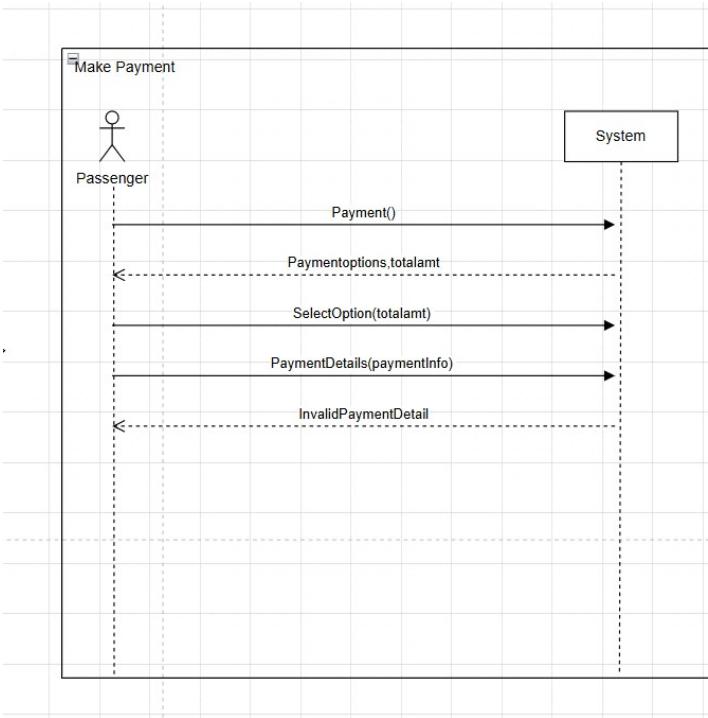
Alternate Scenario



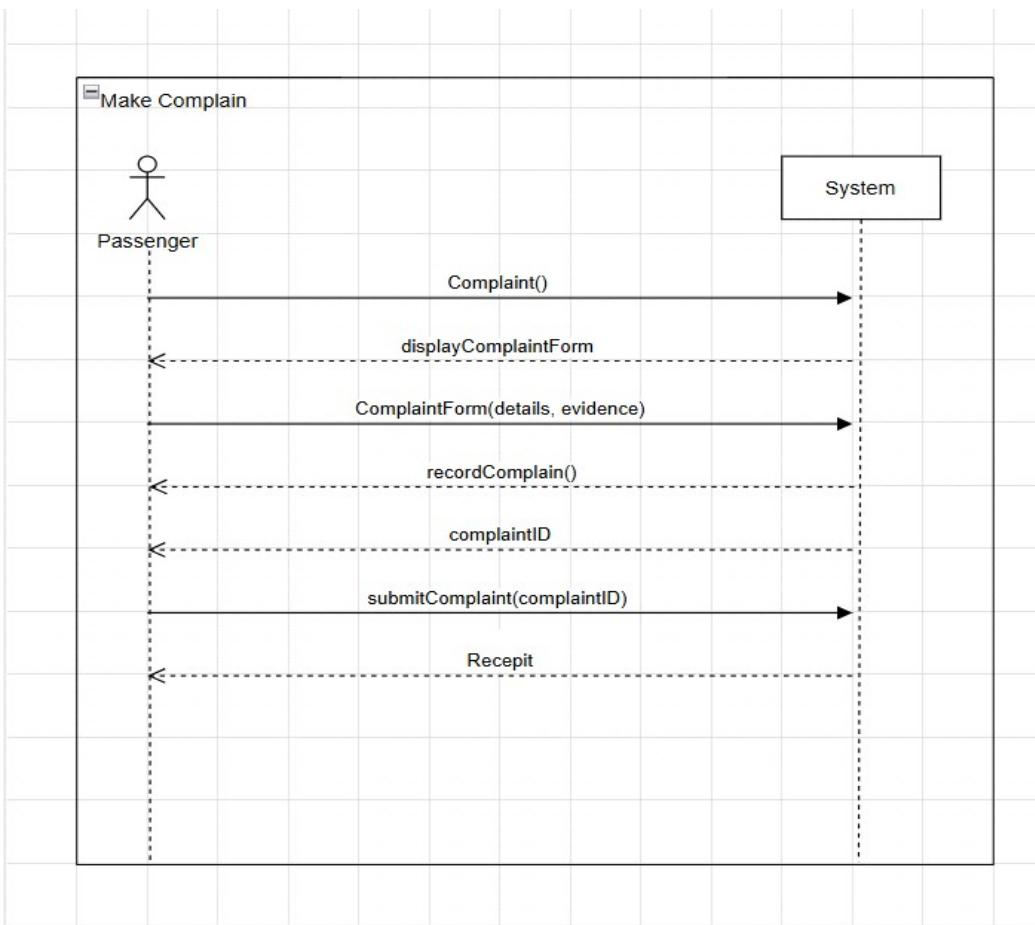
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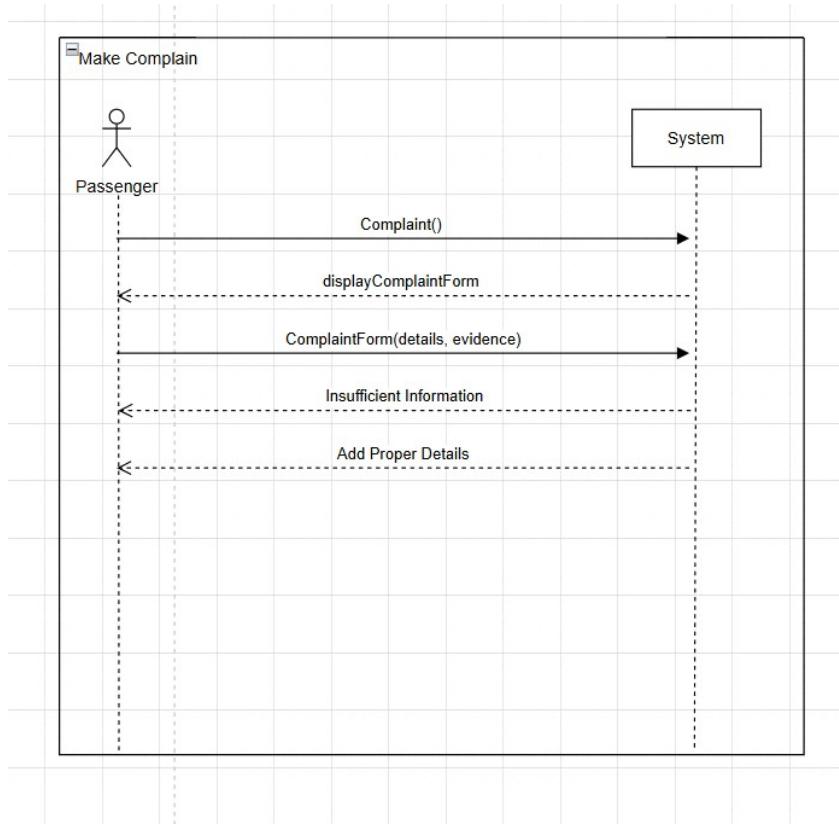
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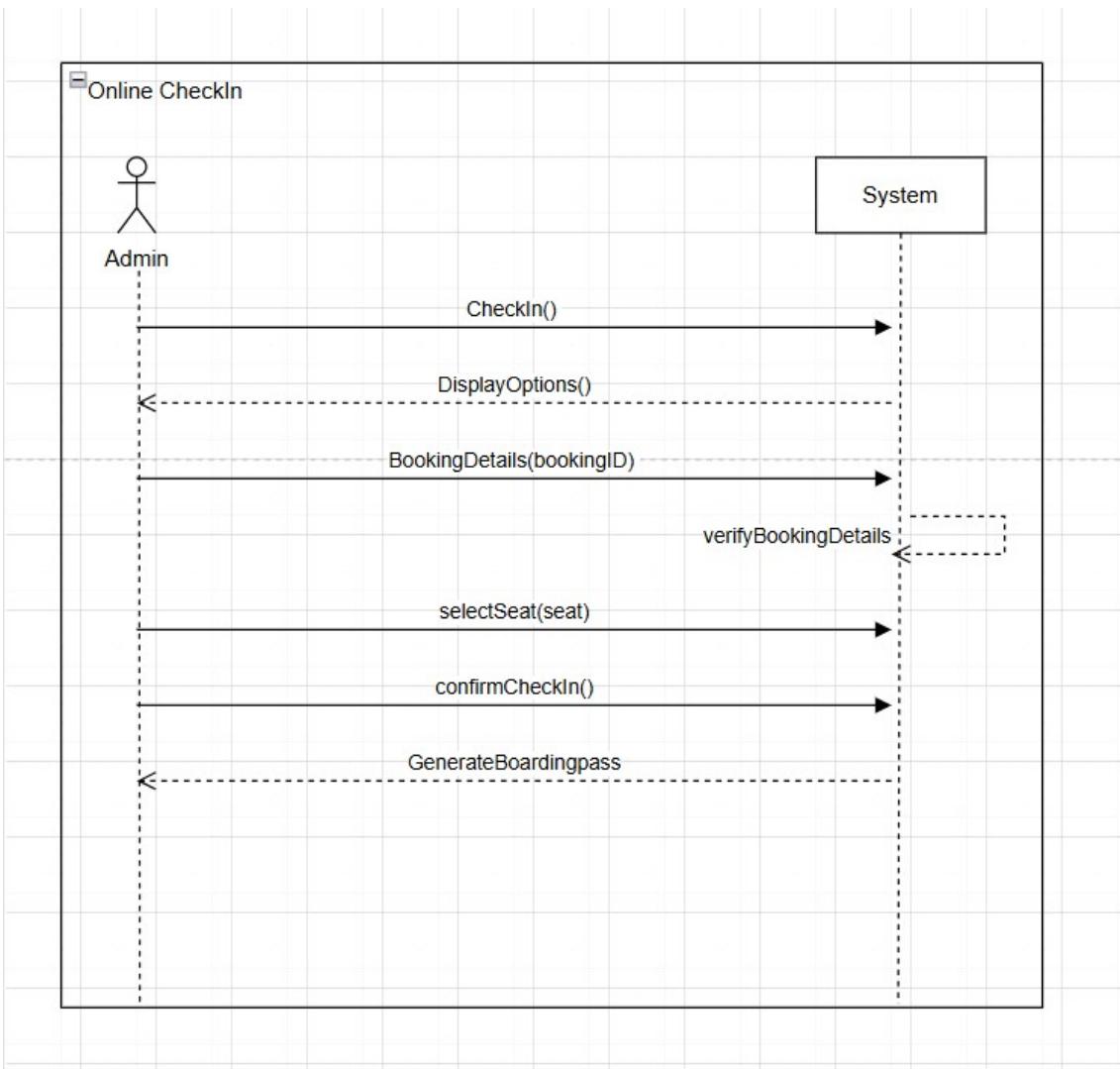
Make Complain



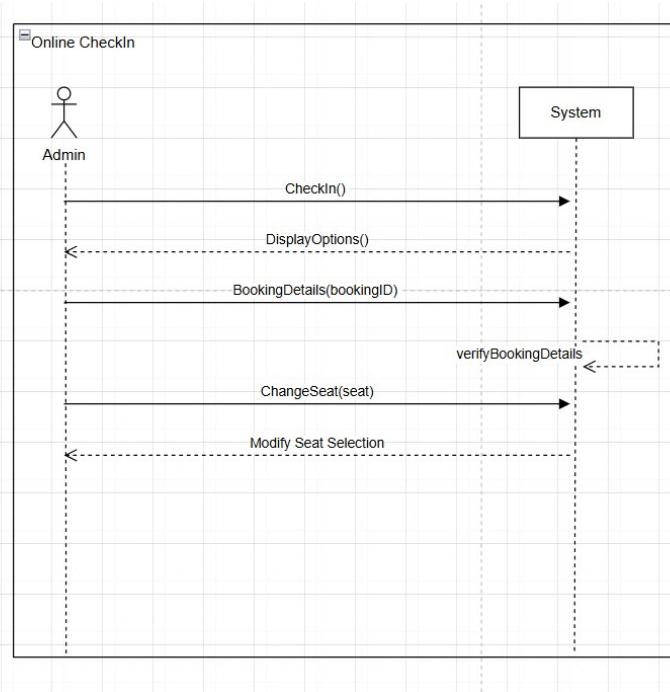
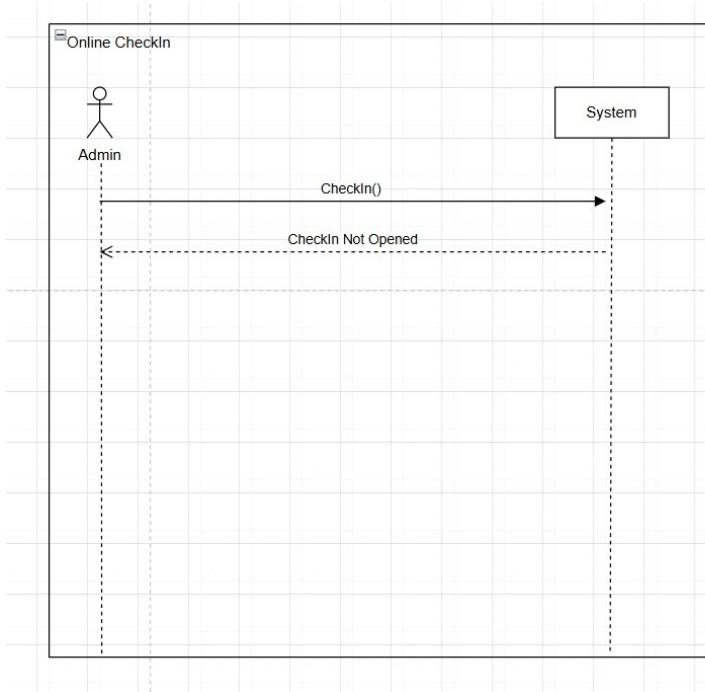
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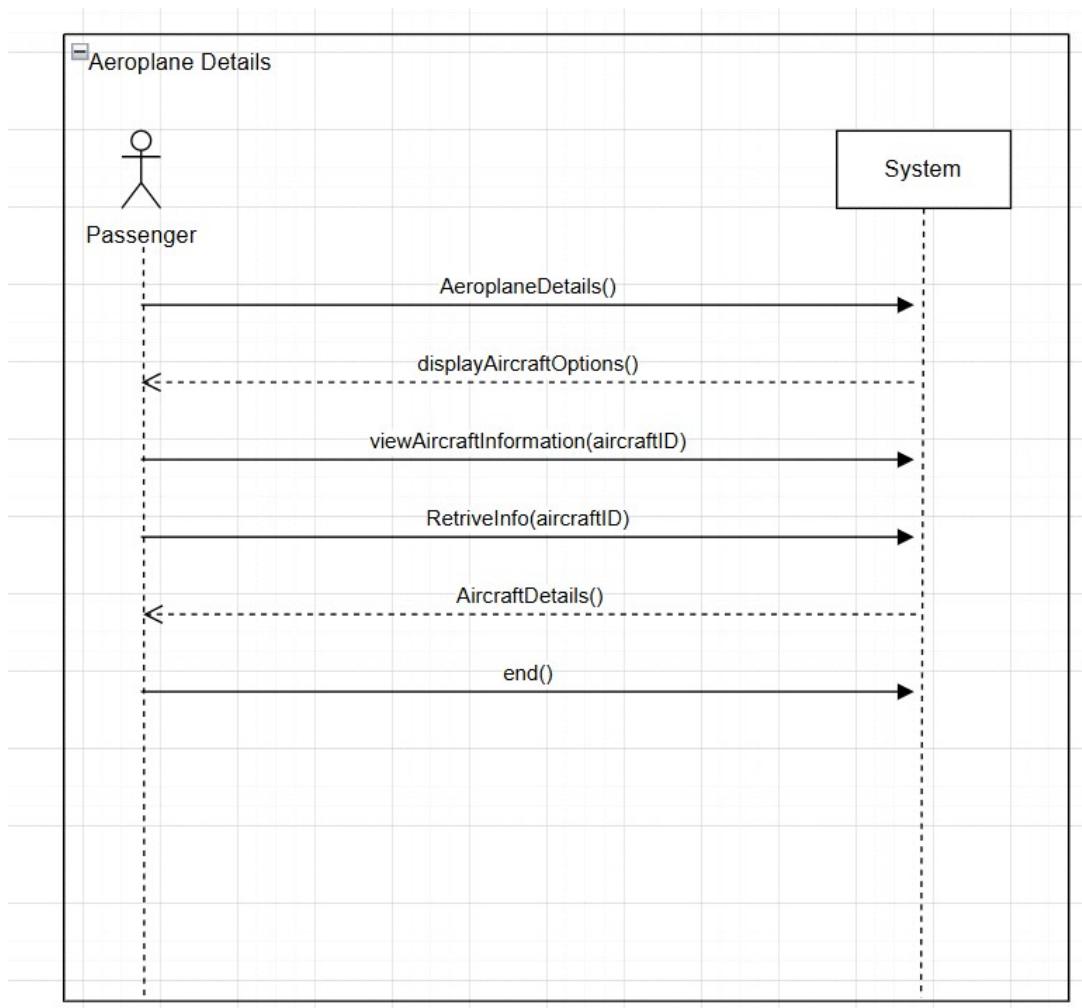
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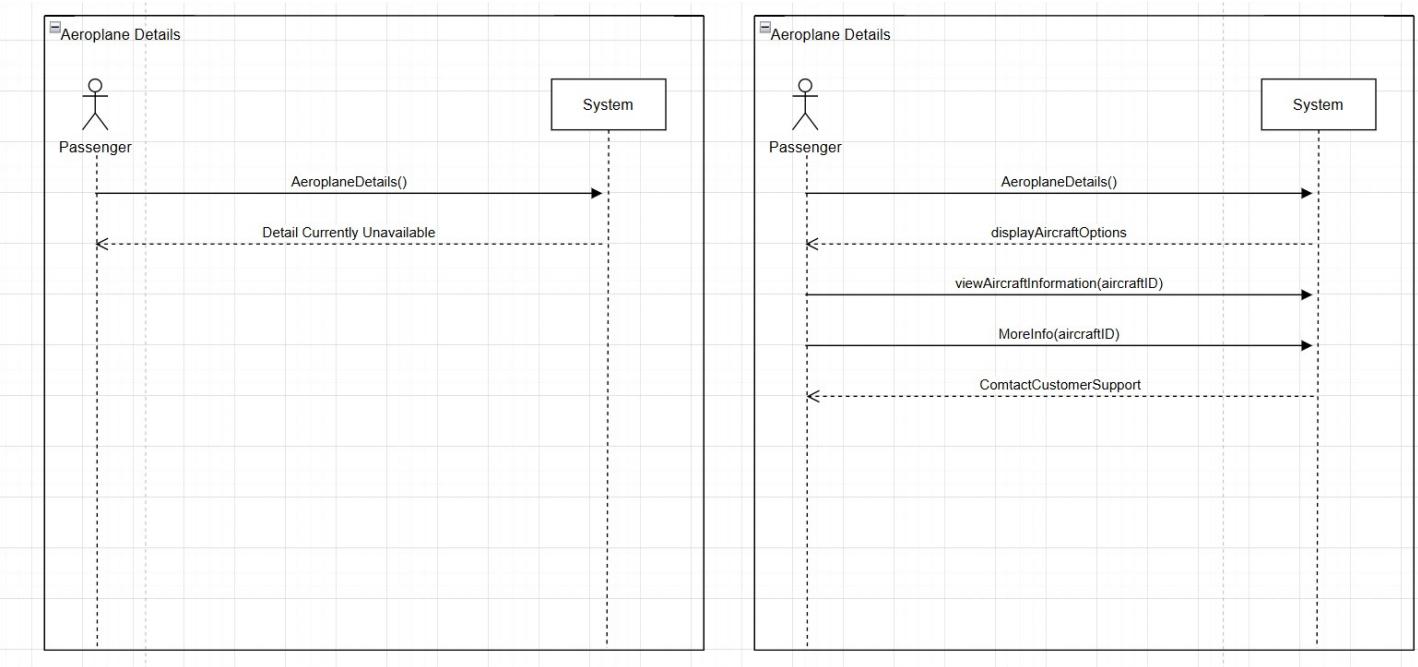
Alternate Scenario



Aeroplane Details



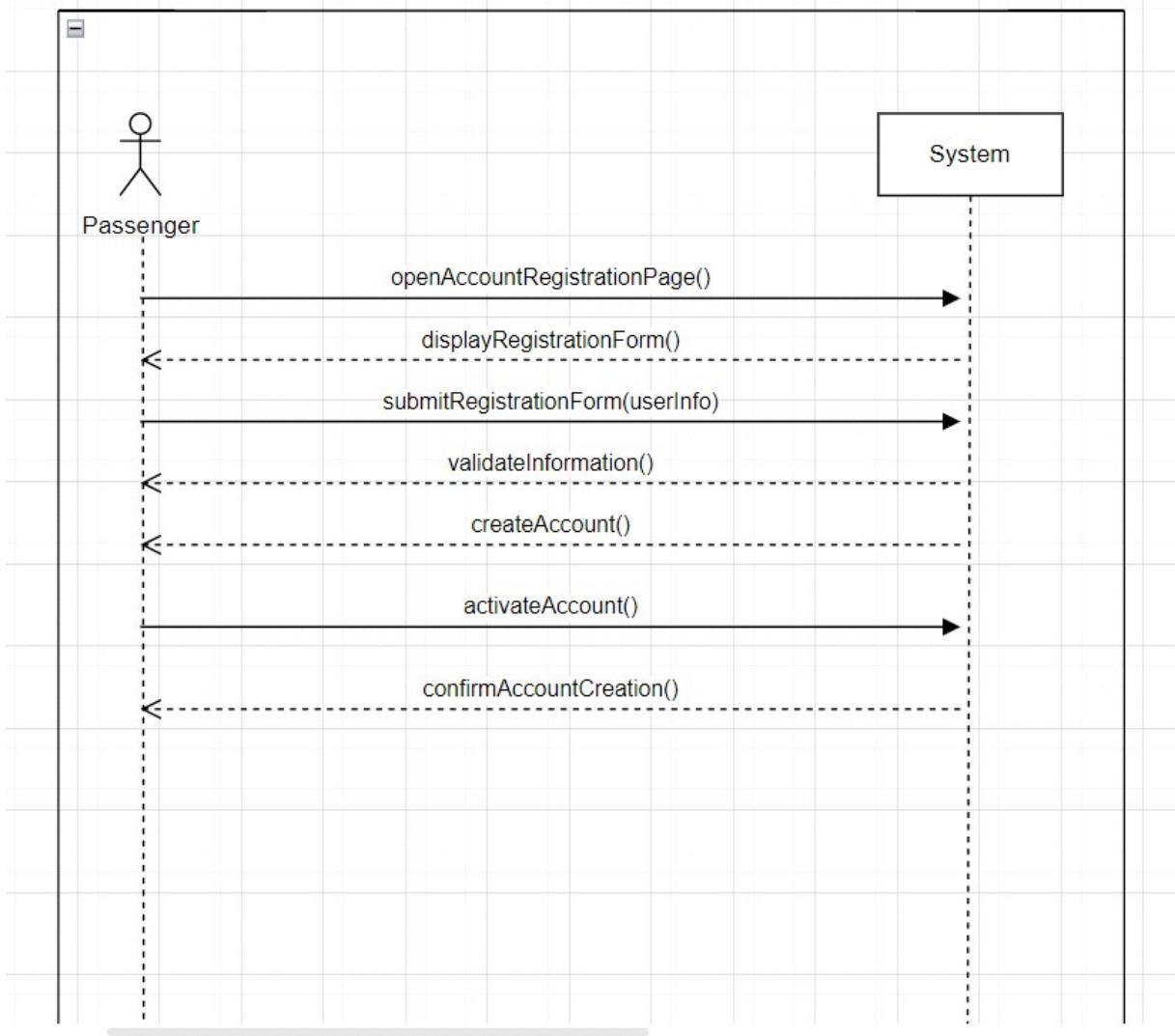
Alternate Scenario

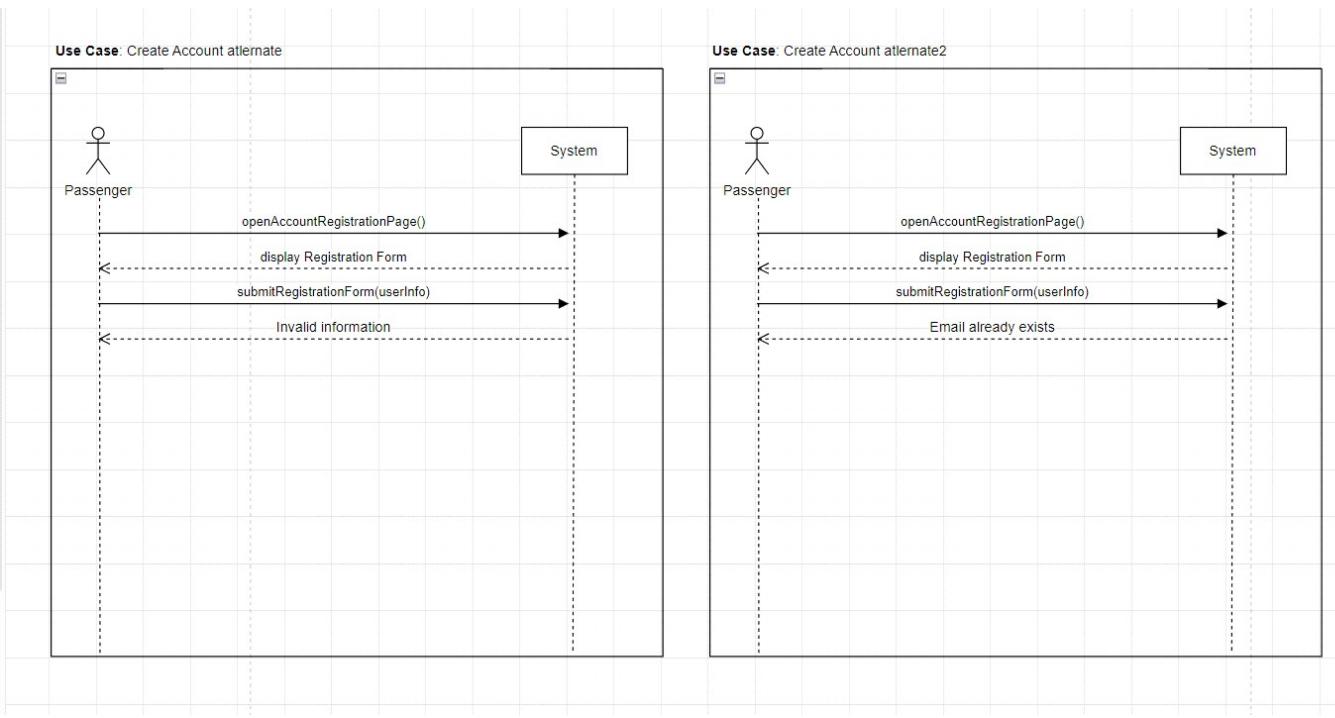


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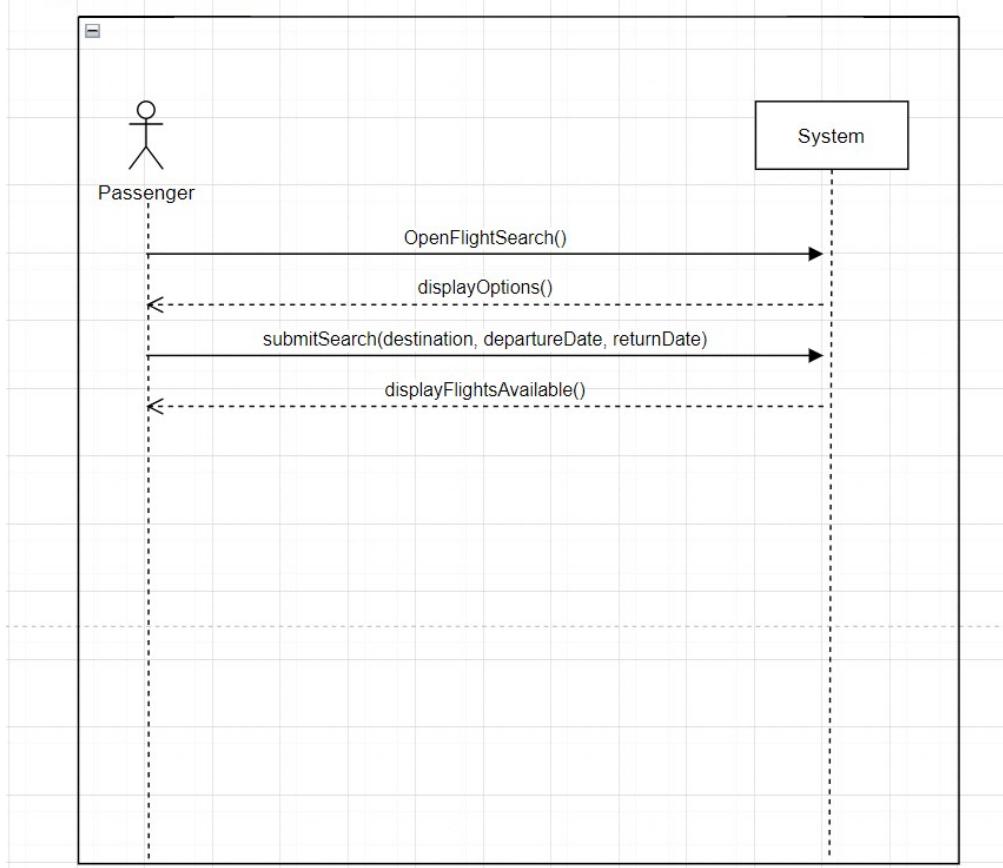
Use Case: Create Account

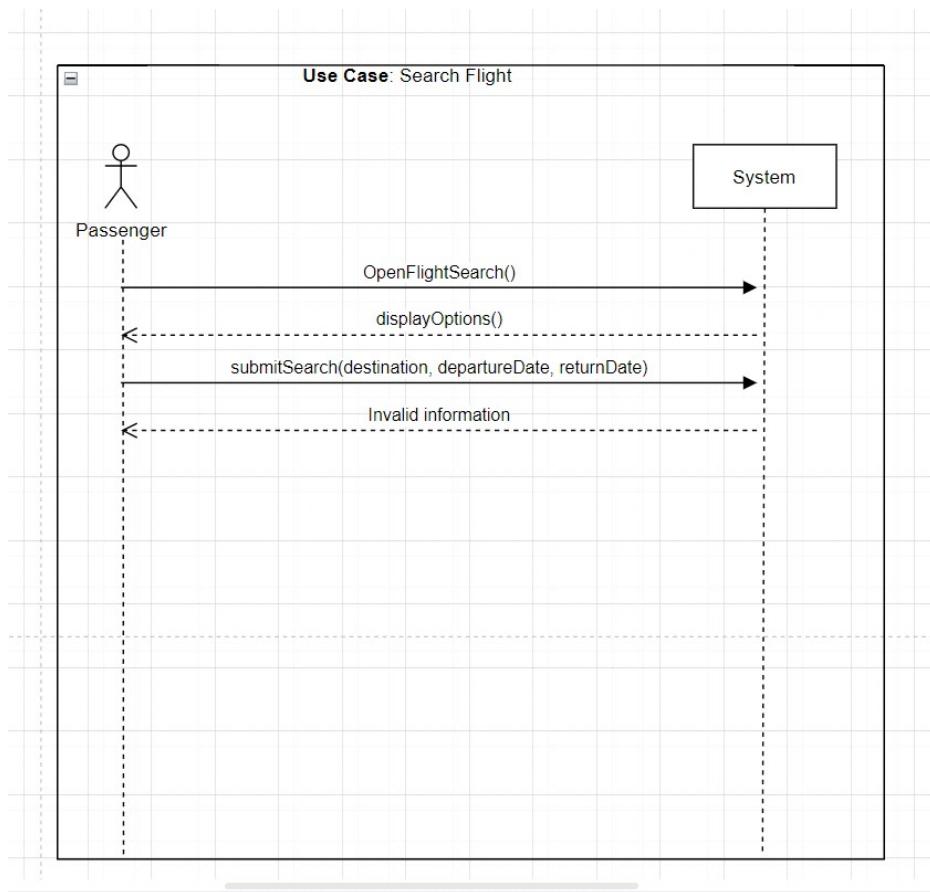




Search Flight

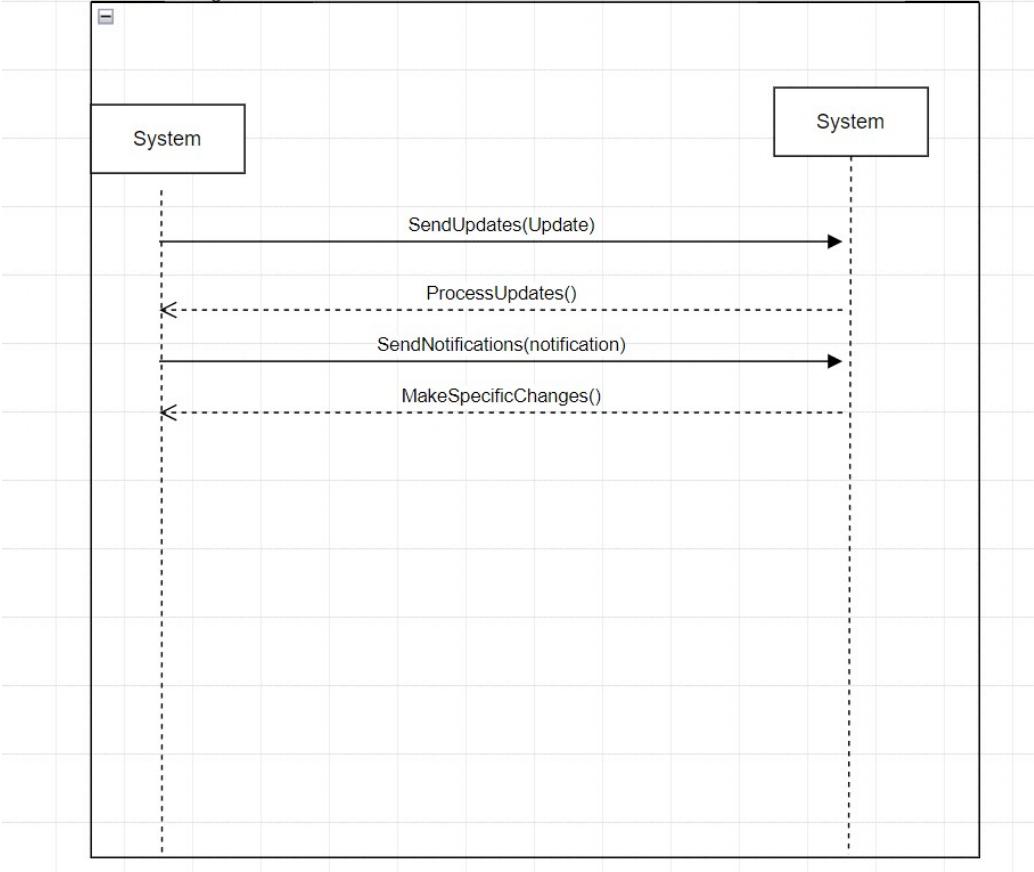
Use Case: Search Flight

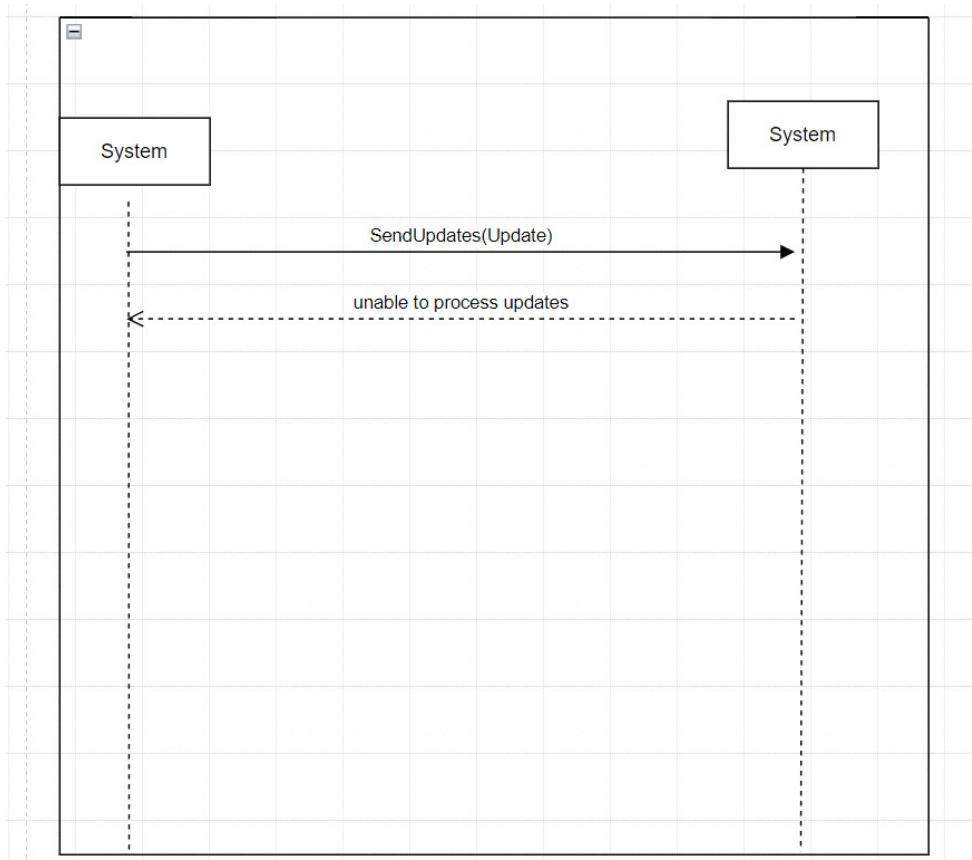




Monitor Flight

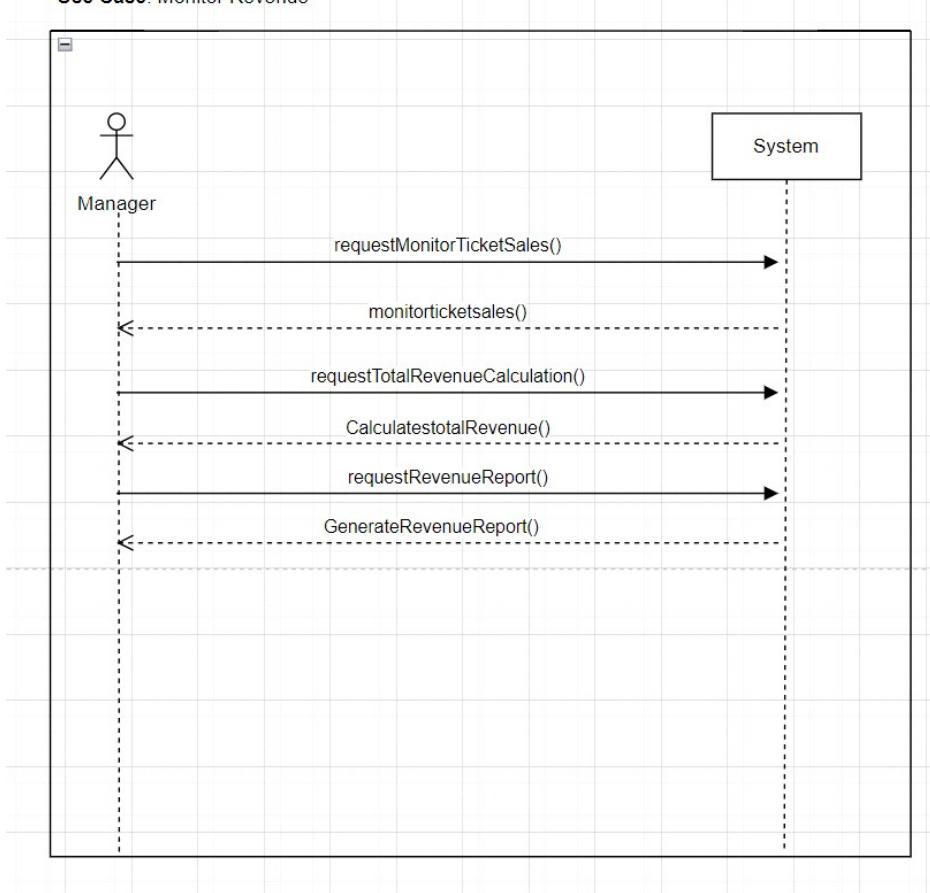
Use Case: Monitor Flight

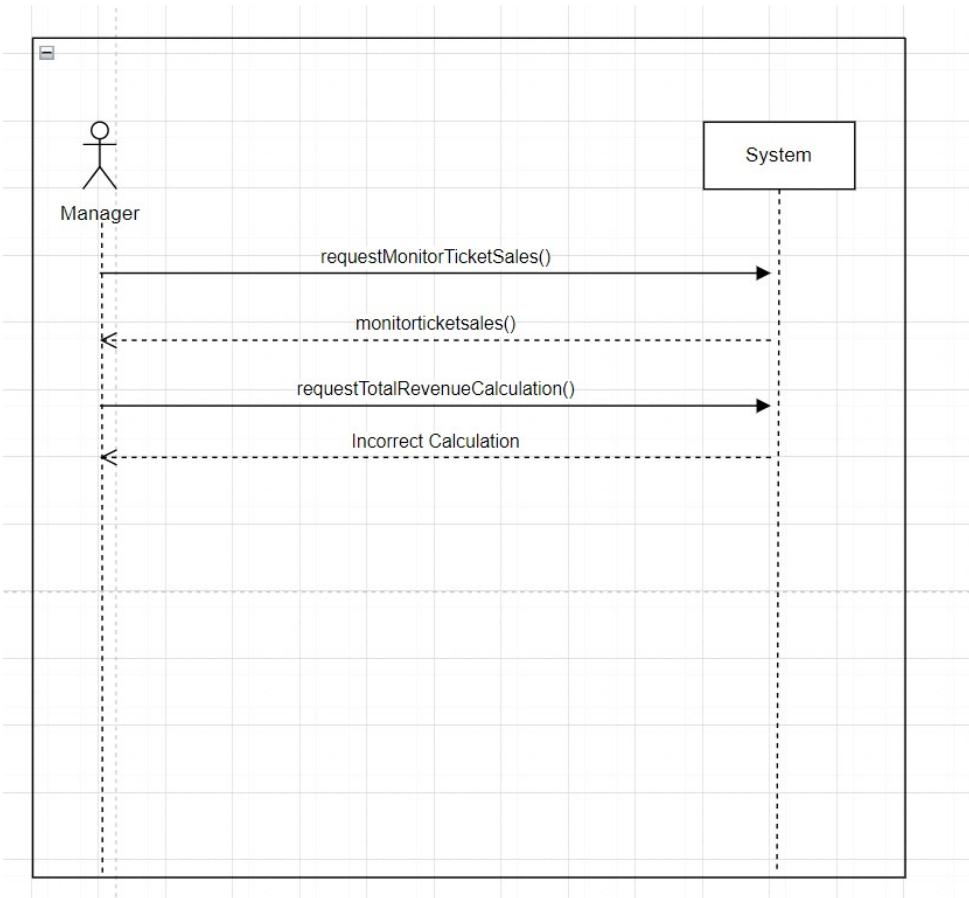




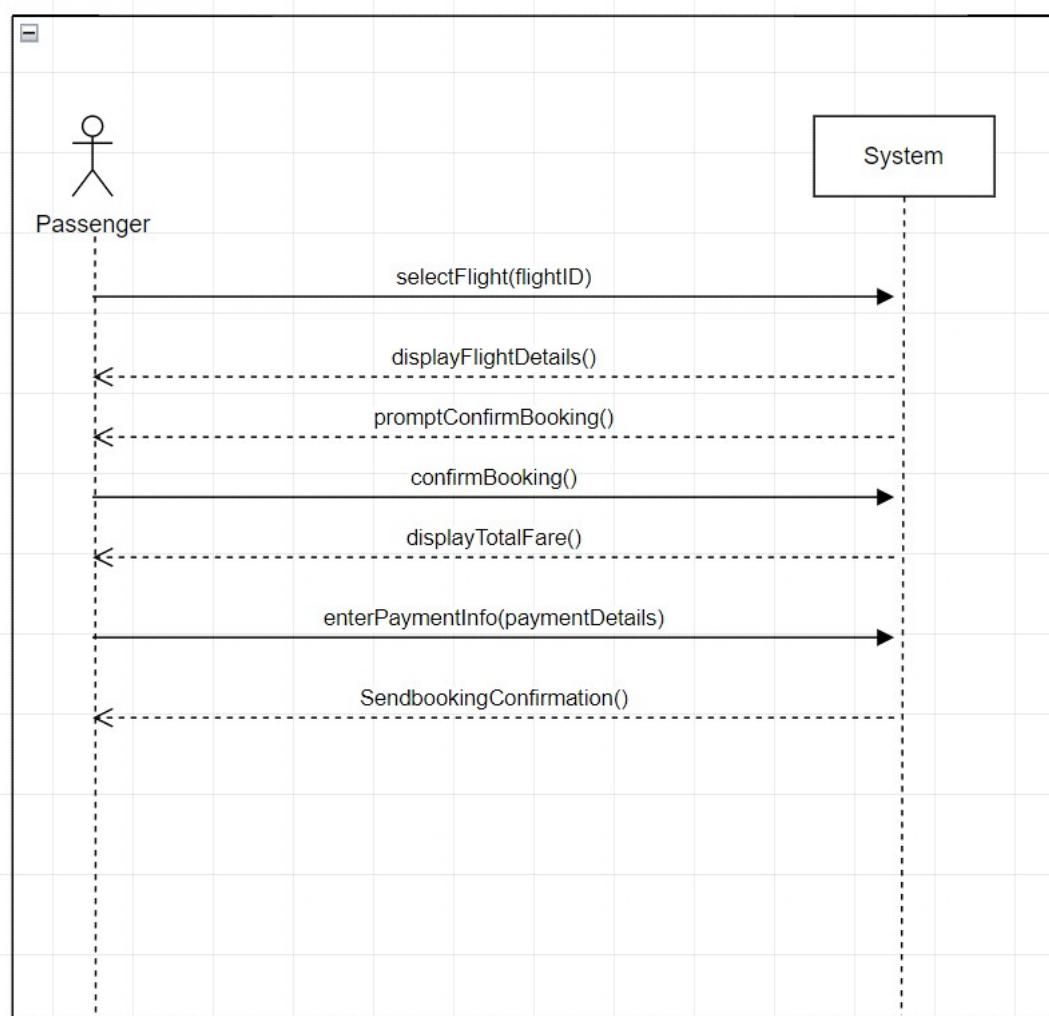
Monitor Revenue

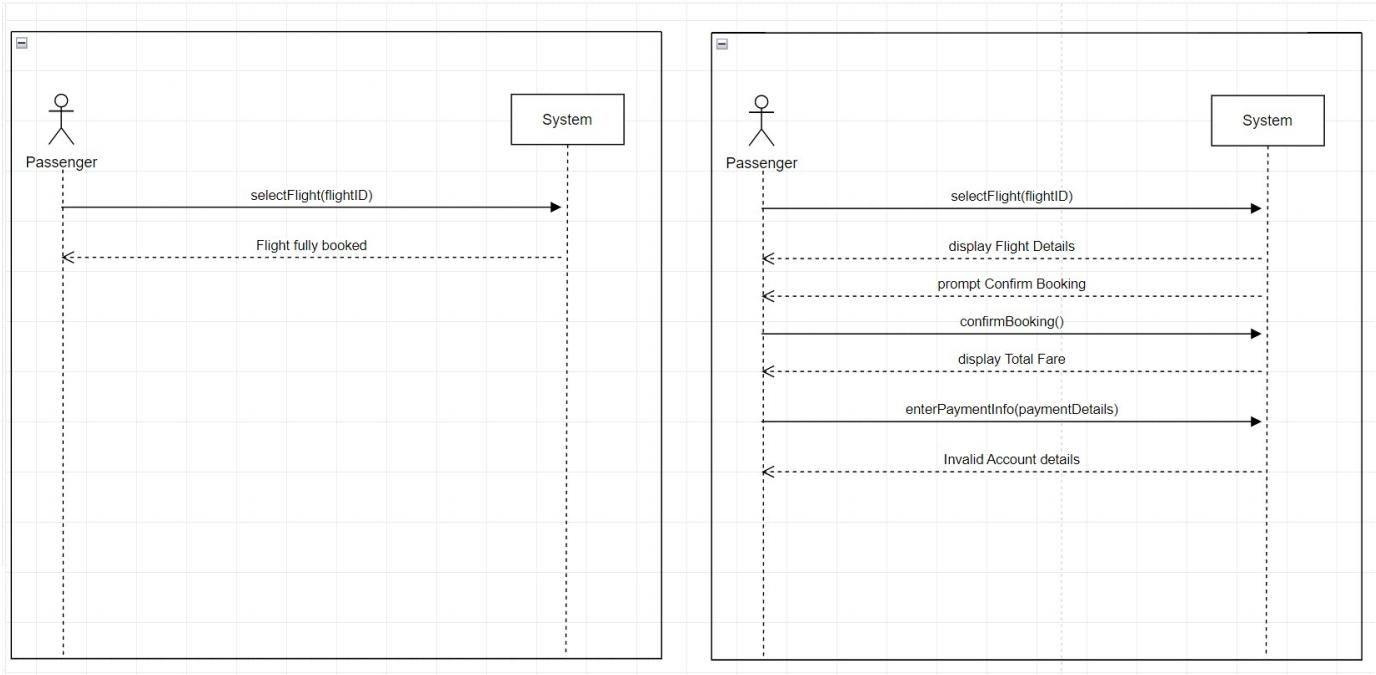
Use Case: Monitor Revenue





Flight Booking:

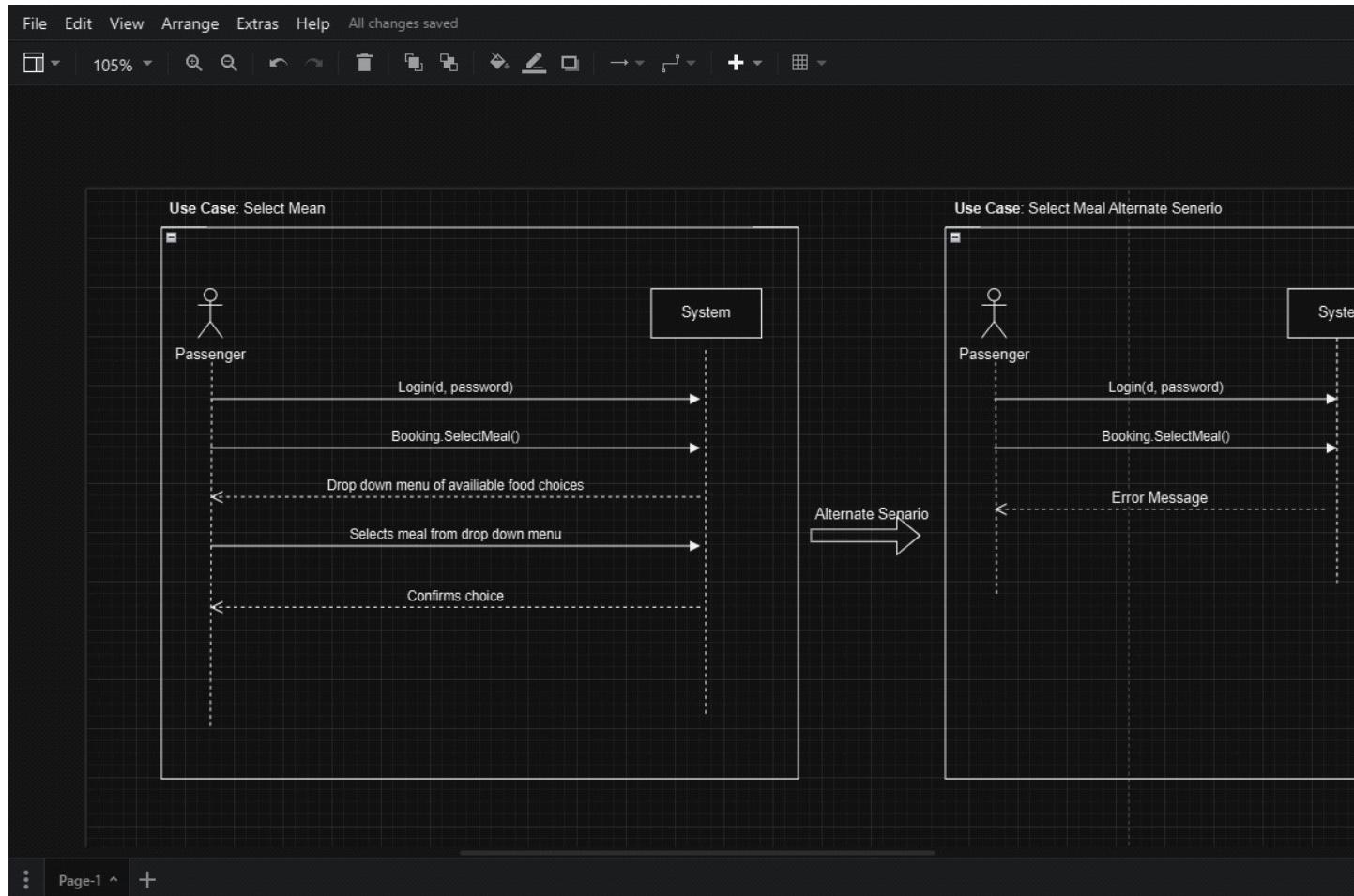




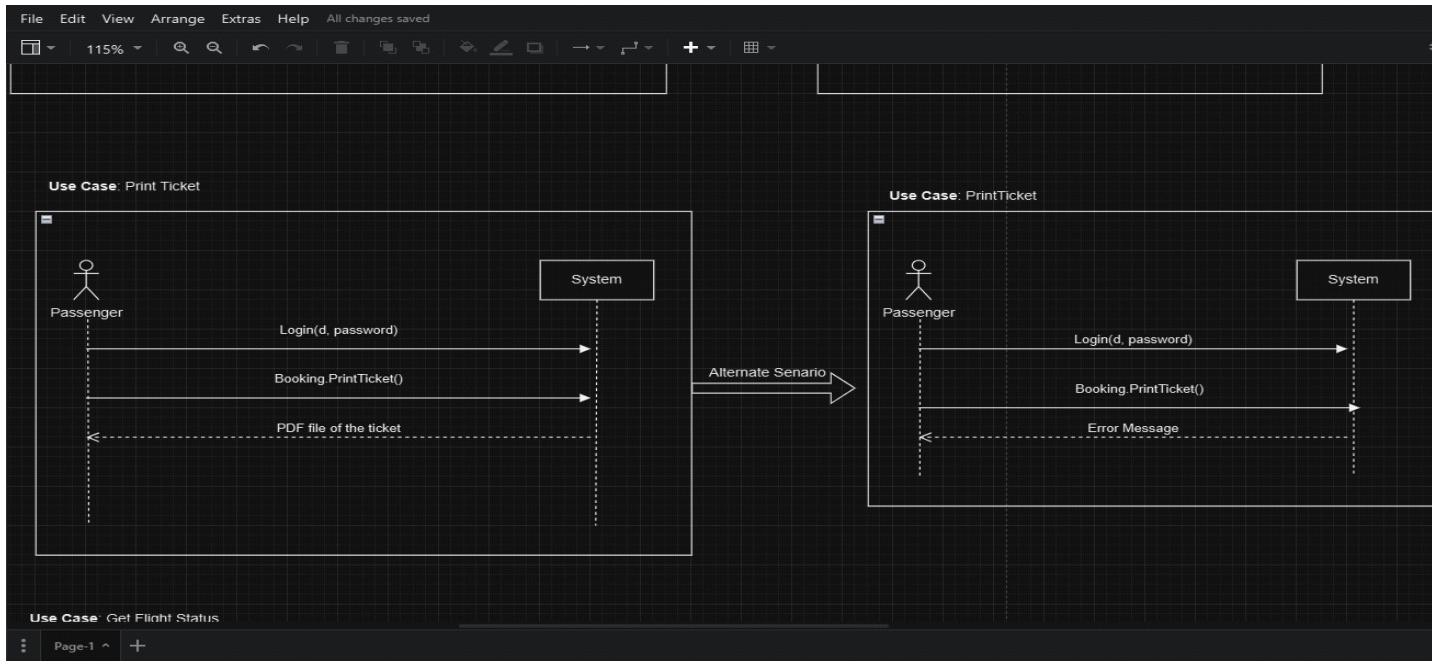
Muhammad Rahat Shafi

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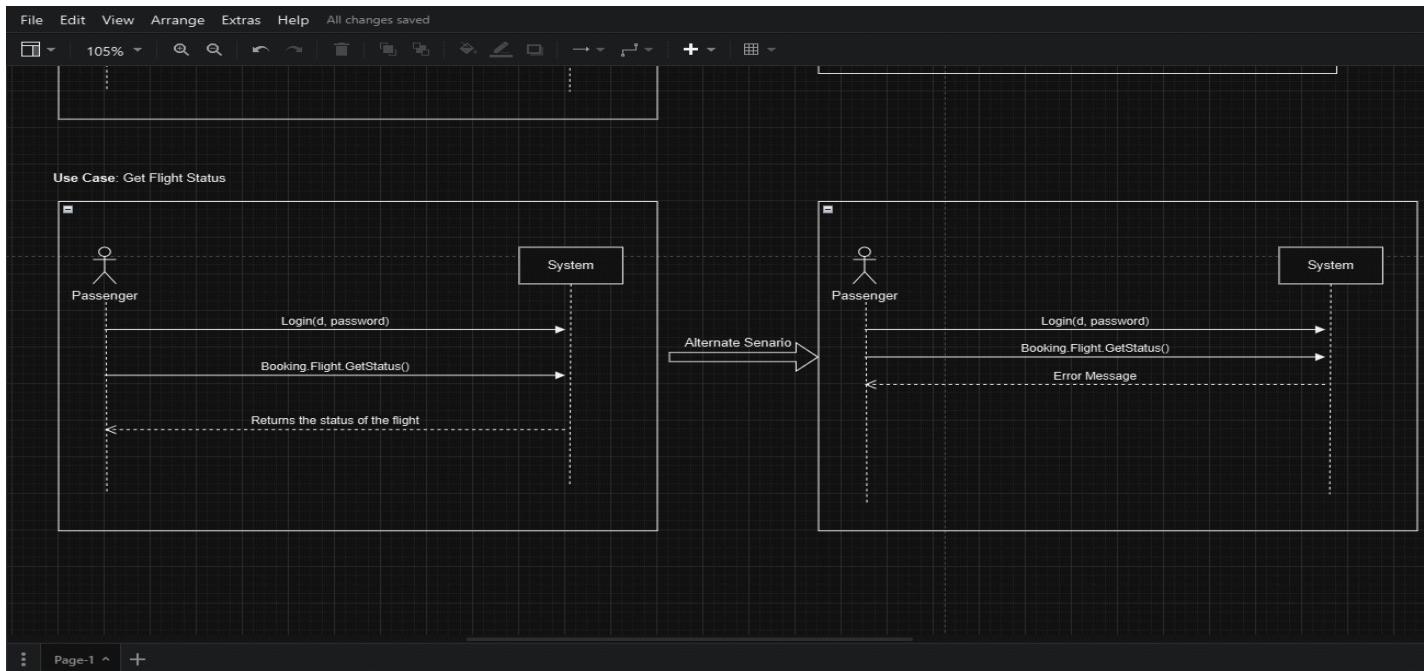
Select Meal;



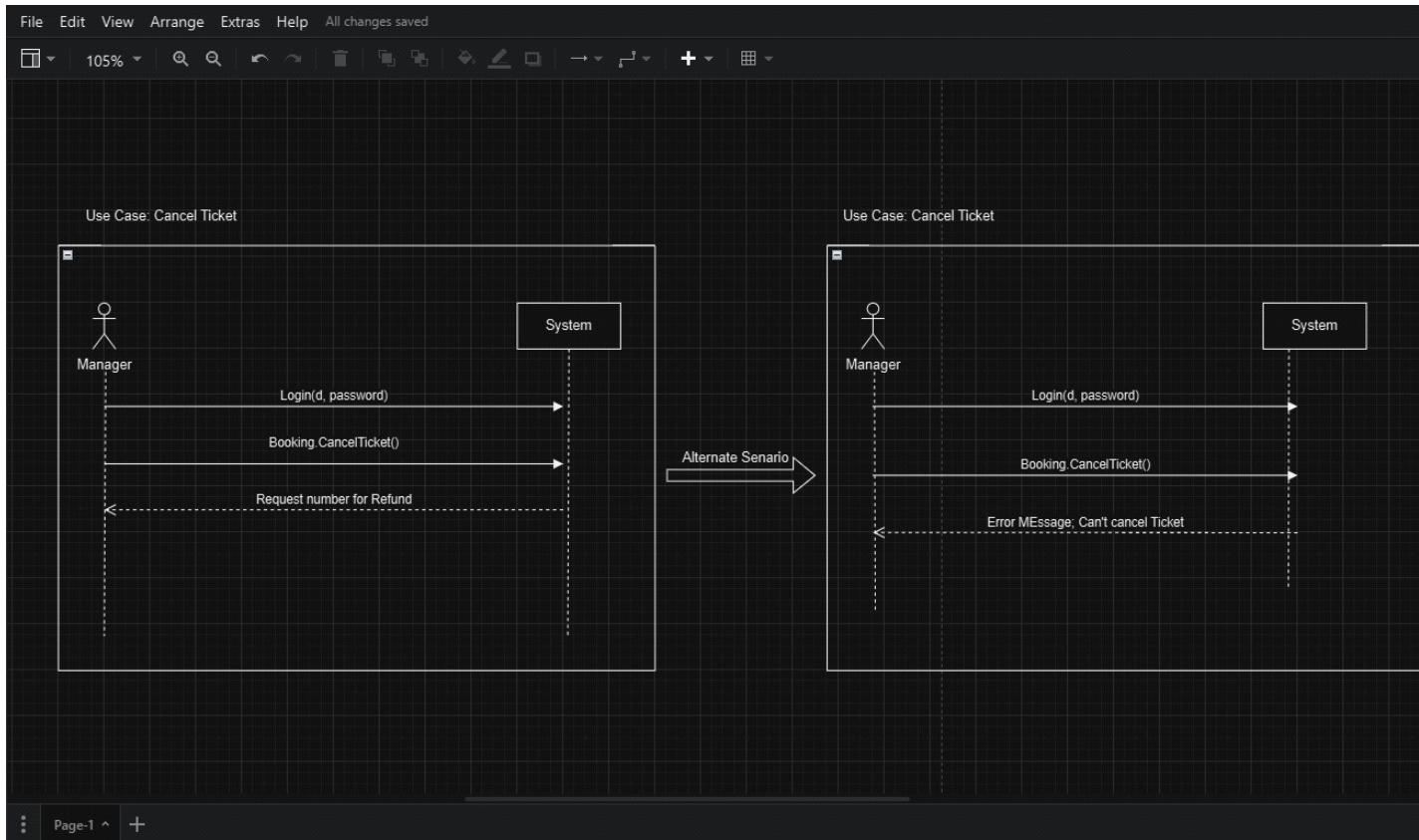
Print Ticket;



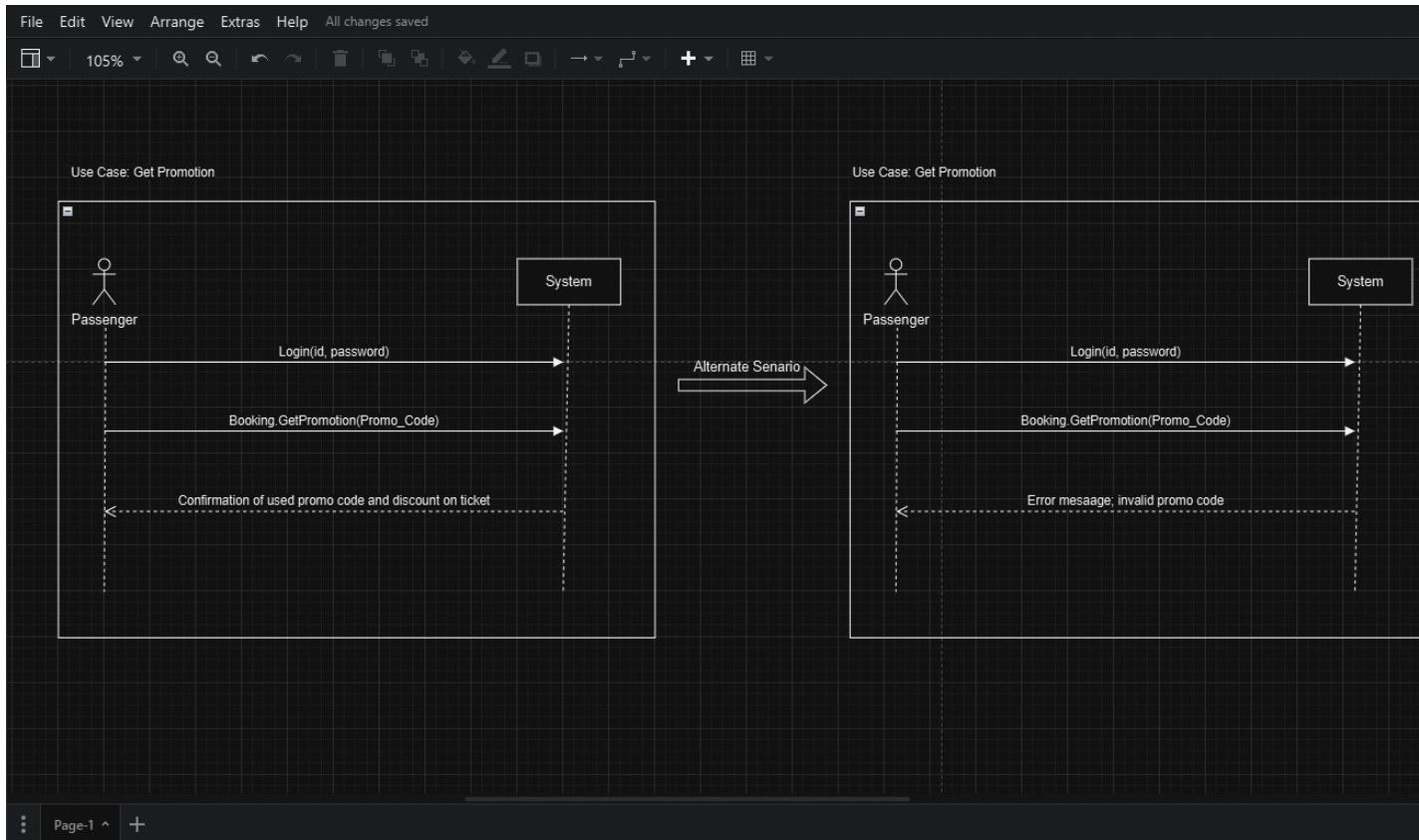
Get Flight Status;



Cancel Ticket



Get Promotion

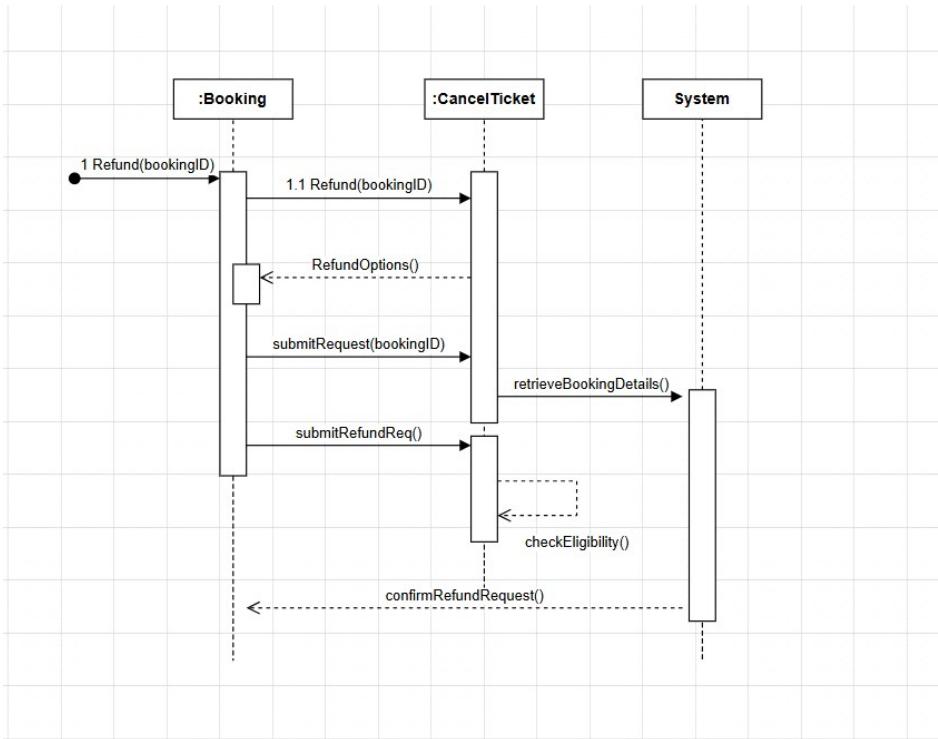


SEQUENCE DIAGRAMS (SSDs)

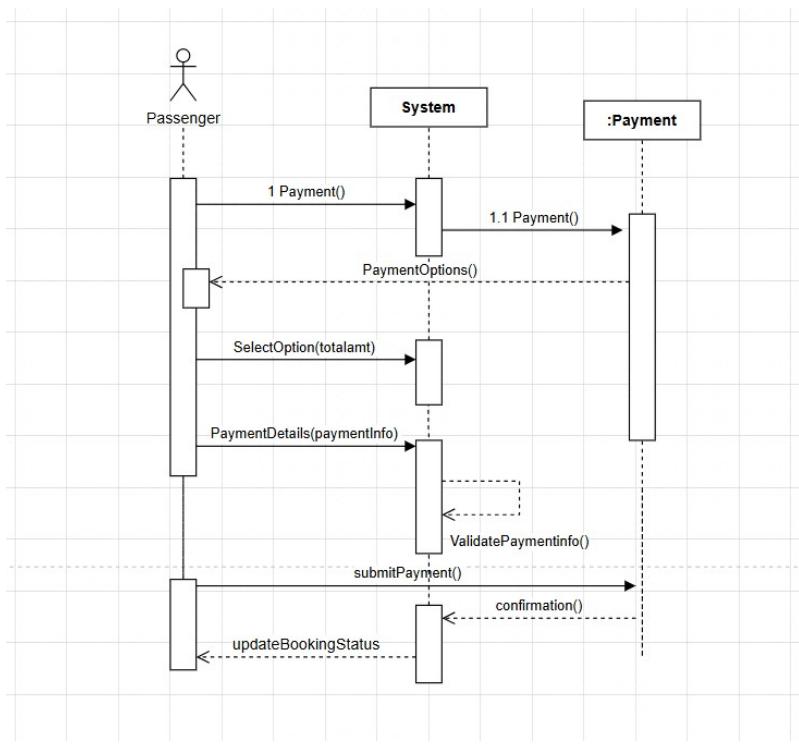
Mudassar Khalid

22i-1072

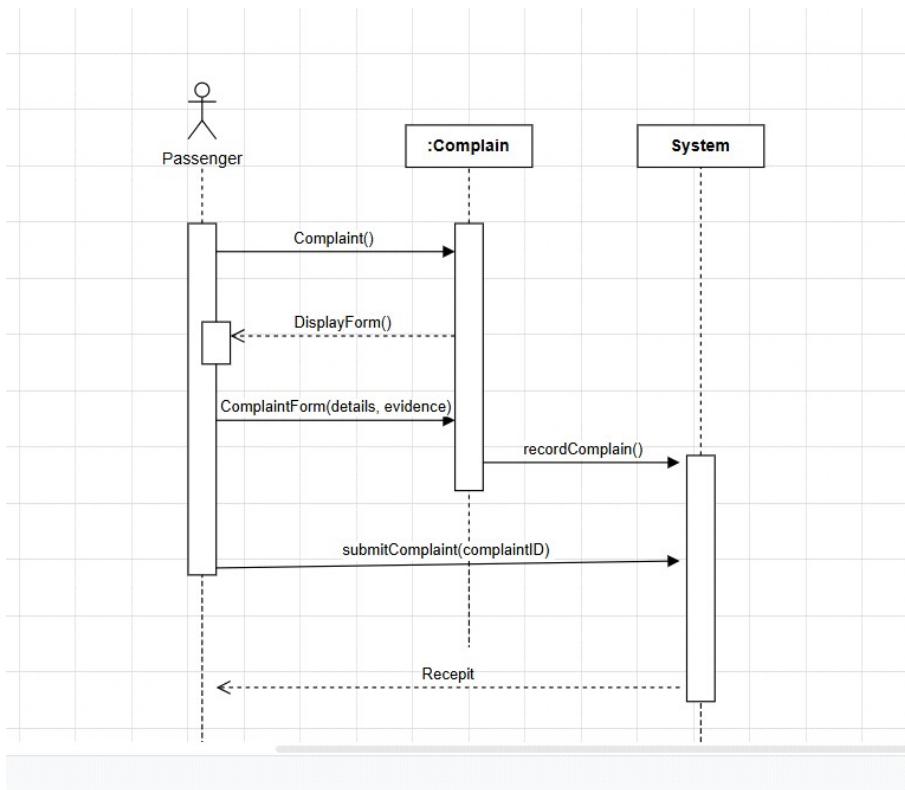
Manage Refunds



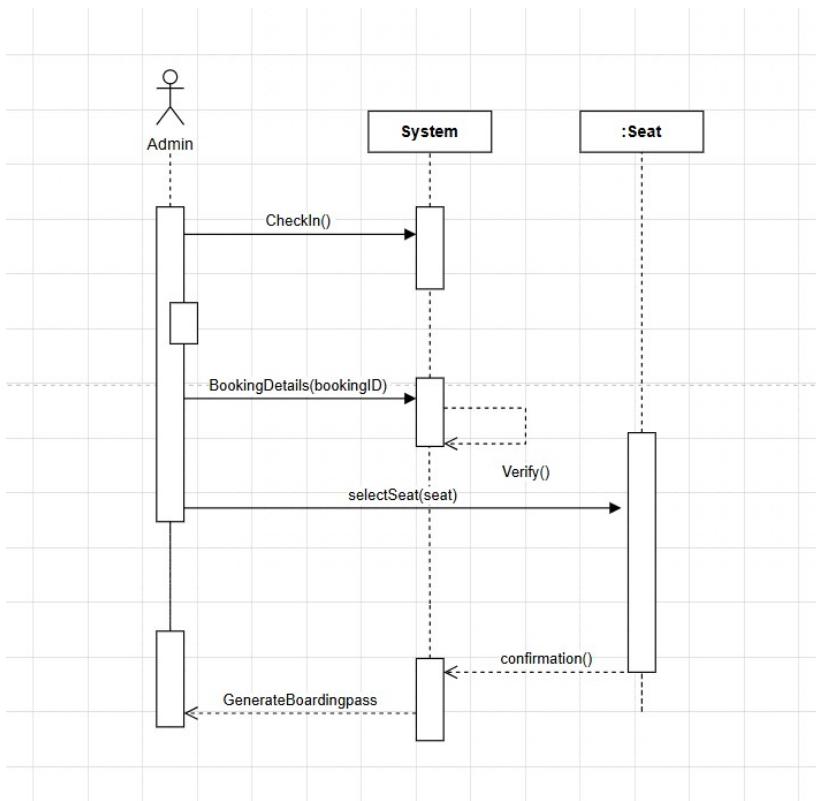
Make Payment



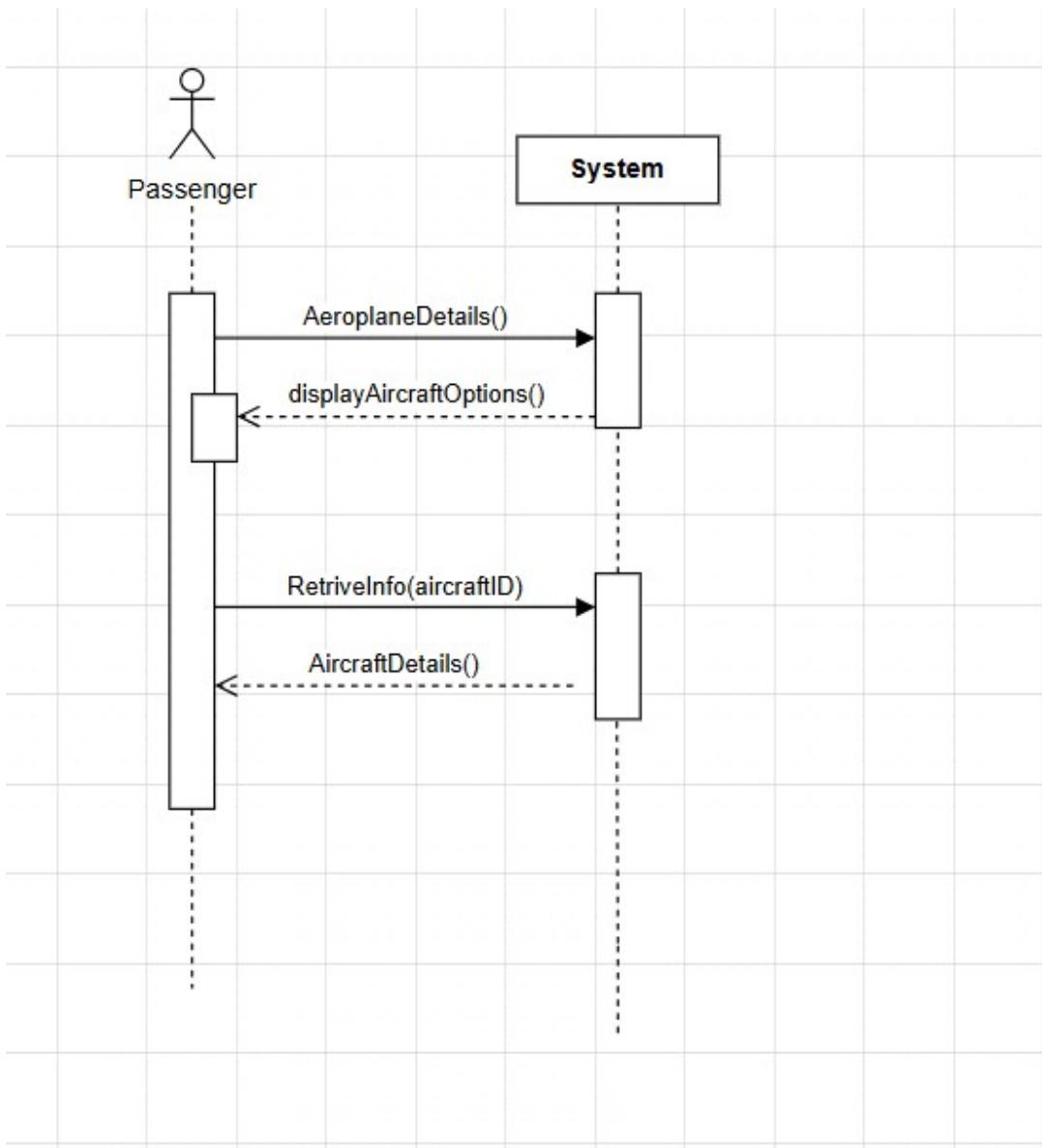
Make Complain



Online CheckIn



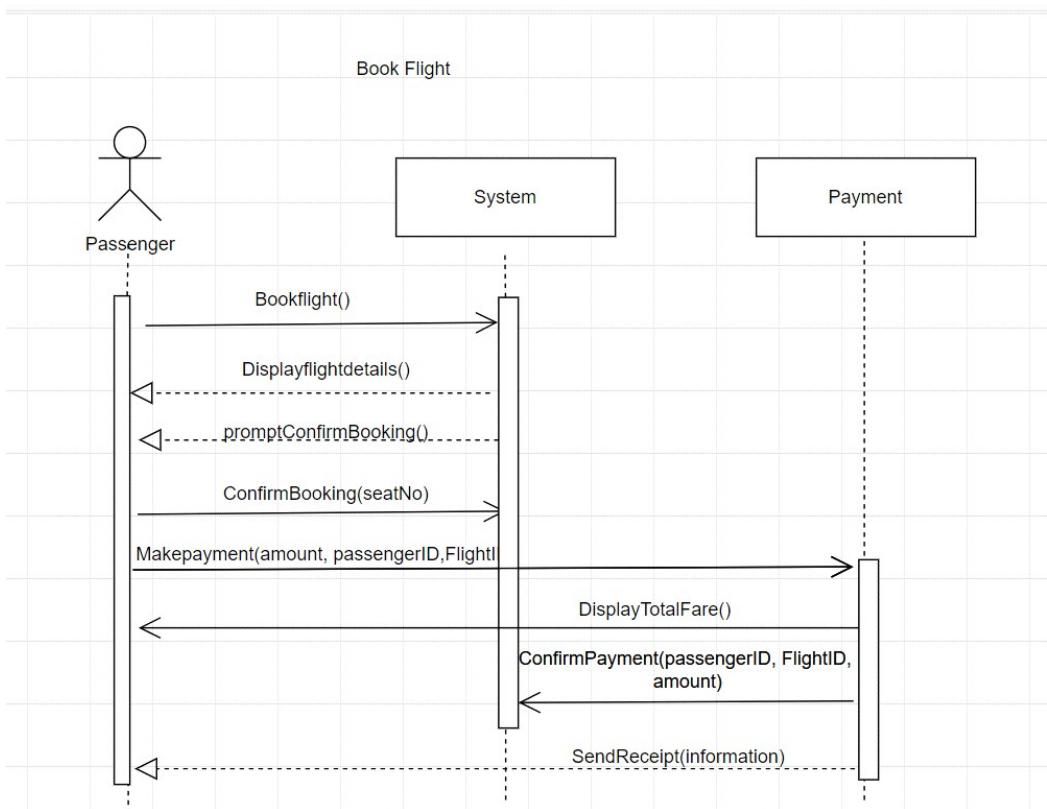
Aeroplane Details



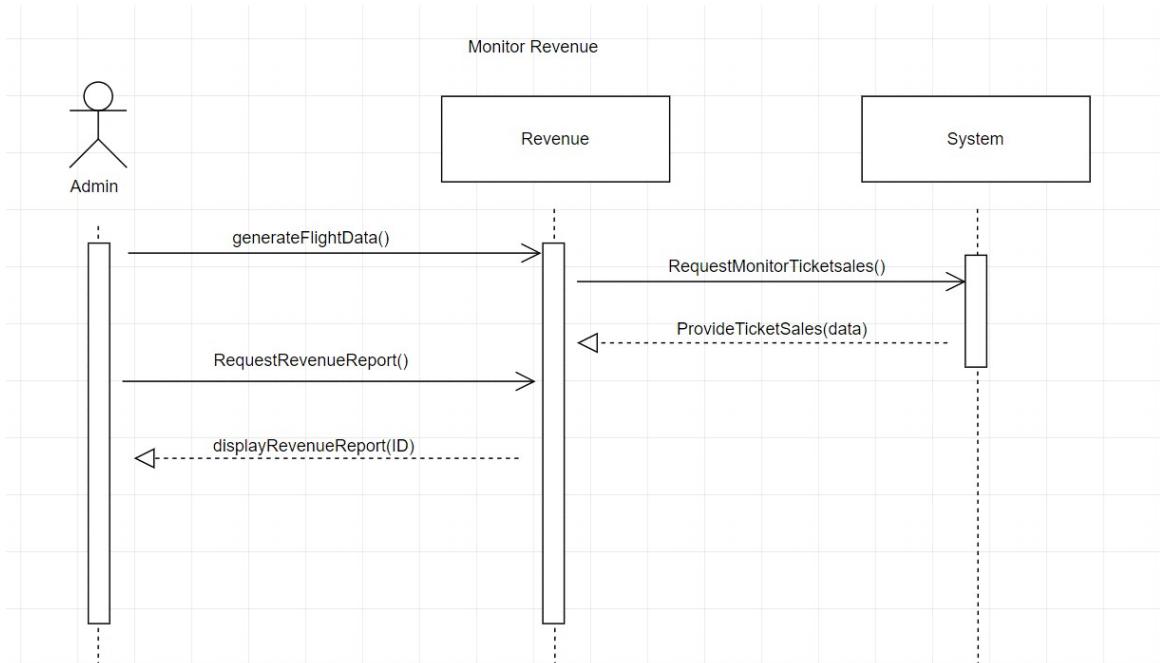
Muhammad Daud Cheema

22i-0875

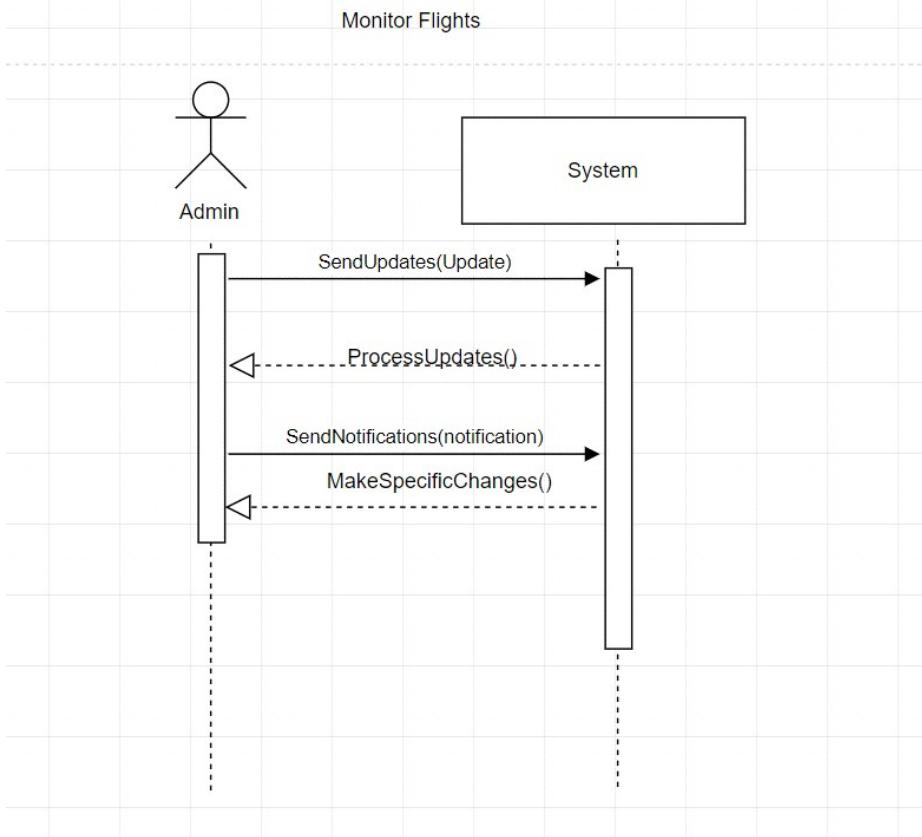
Book Flight;



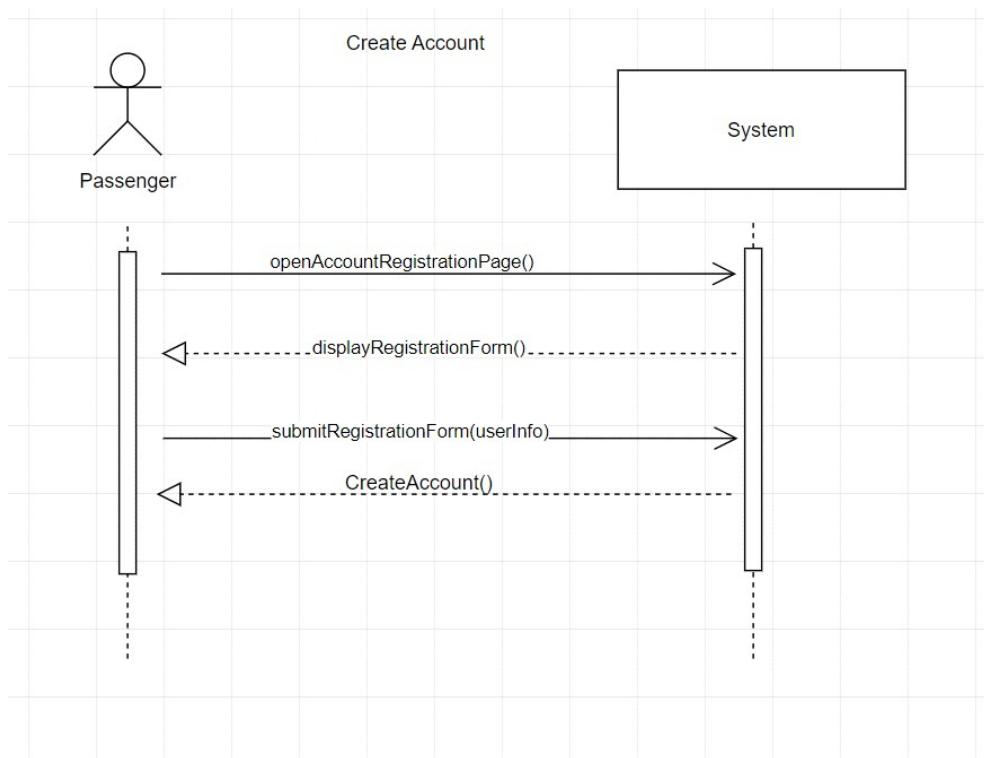
Monitor Revenue:



Monitor Flights:



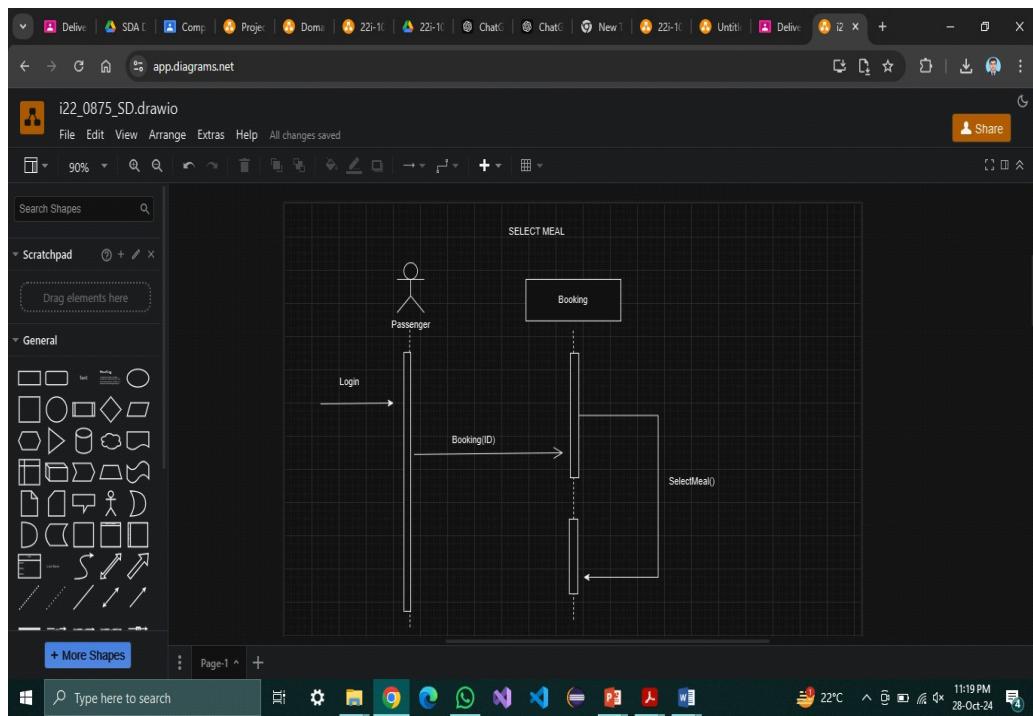
Create Account:



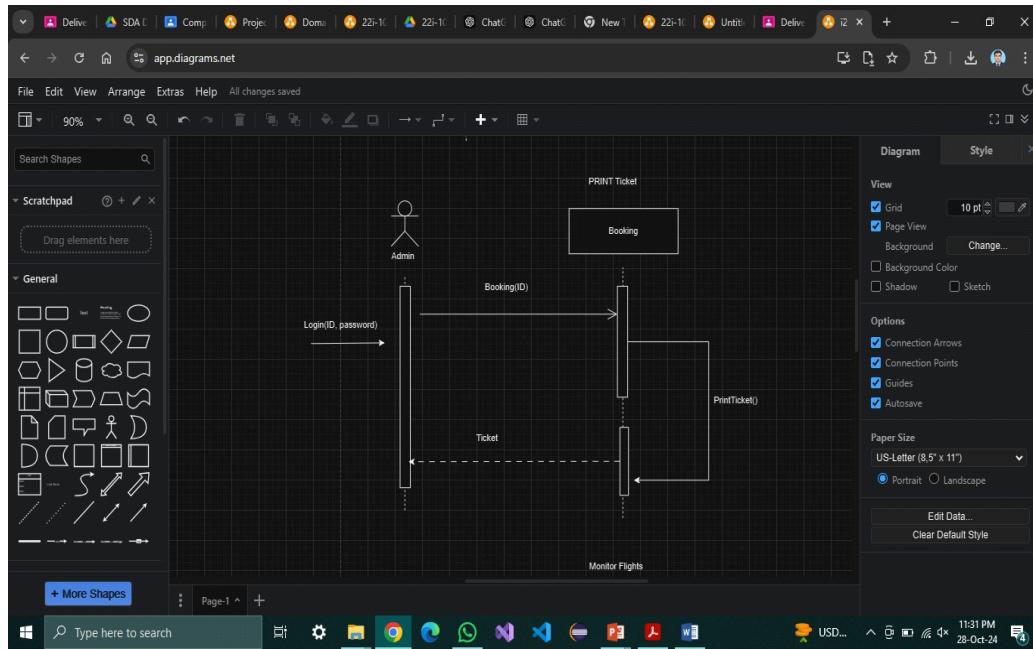
Muhammad Rahat Shafi

22i-1061

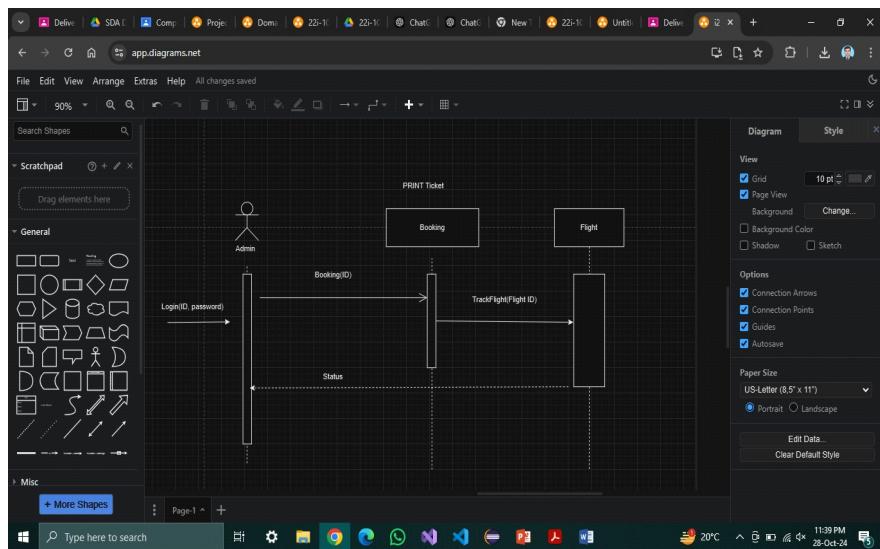
Select Meal;



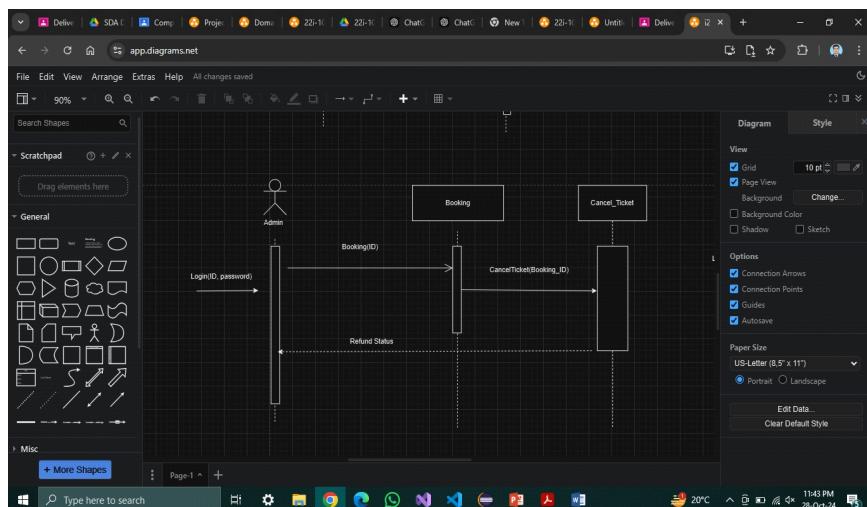
Print Ticket;



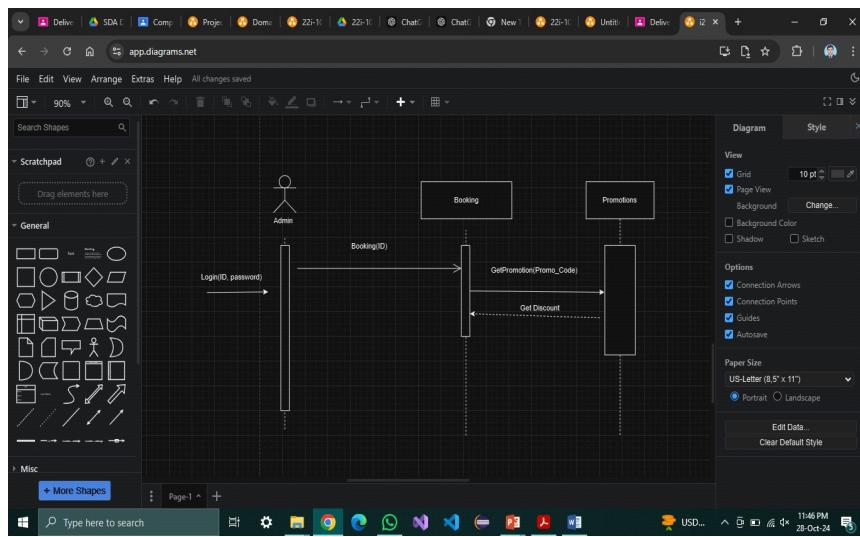
Print Ticket



Cancel Ticket



Get Promotions



Class Diagram:

