Chapter - 1 Project Overview

The Flight Management System is a Java-based booking solution for flight tickets. It consolidates data provided by different airline carriers and hence provides the user details and rates in real-time. Travellers may want to make changes in their bookings. The application allows them to book, cancel and view their bookings with ease. Other than this, it eases the management of bookings too. All the bookings, flights, schedules and routes can be viewed, added and modified on a single application by the administrator.

Chapter - 2 Features

This website provides Features like

- Passenger Management
- Flight scheduling and management
- Date wise Booking
- Flexible ticket booking
- User Feedback

Chapter -3 Modules And Functionalities

"Flight management system" provides two modules:

- Admin
- Customer

Admin

Admin can manage and view Airports Routes, Flights details. Admin can also view user feedbacks, ticket details and passenger details.

The functionalities provided for admin module are:

- Login
- Add/Update/View Airports
- Add/Update/View Routes
- Add/Update/View Flights
- View User Feedbacks
- View User Details
- View Ticket Details
- Logout

Customer

Customer can book flights, cancel bookings and give feedback.

The functionalities provided in this module consist of:

- Create user account
- Login
- Check for available flights
- Book/View flight details
- Give Feedback
- Logout

Chapter - 4. Technologies

- Frontend:
  - JSP
  - CSS
  - Java script
  - Bootstrap

- Backend:
  - Java
  - Spring Boot
  - Spring Security
  - Spring Data JPA

- Database:
  - MySQL

Chapter-5. Design

5.1 Data Dictionary

- airport

Field Name	Data Type	Relational Key
airport_code	Varchar	Primary Key
airport_location	Varchar	-

Table 5.1.1 airport

- feedback

Field Name	Data Type	Relational Key
username	Varchar	Primary Key
content	Longtext	-

Table 5.1.2 feedback

- flight

Field Name	Data Type	Relational Key
flight_number	Bigint	Primary Key
arrival_time	Varchar	-
carrier_name	Varchar	-
departure_time	Varchar	-
route_id	Bigint	-
seat_booked	Int	-
seat_capacity	Int	-

Table 5.1.3 flight

- flight_datewise

Field Name	Data Type	Relational Key
date	Varchar	Primary Key
flight_number	Bigint	Primary Key
seat_booked	Int	-

Table 5.1.4 flight_datewise

- flight_user

Field Name	Data Type	Relational Key
username	Varchar	Primary Key
password	Varchar	-
type	Varchar	-

Table 5.1.5 flight_user

- passenger

Field Name	Data Type	Relational Key
serial_number	Int	Primary Key
ticket_number	Bigint	Primary Key
fare	Double	-
passenger_dob	Varchar	-
passenger_name	Varchar	-

Table 5.1.6 passenger

- route

Field Name	Data Type	Relational Key
route_id	Bigint	Primary Key
destination_airport_code	Varchar	-
source_airport_code	Varchar	-
ticket_cost	Double	-

Table 5.1.7 route

- ticket

Field Name	Data Type	Relational Key
ticket_number	Bigint	Primary Key
carrier_name	Varchar	-
flight_number	Bigint	-
route_id	Bigint	-
total_amount	Double	-
date	Varchar	-

Table 5.1.8 ticket

5.2 Class and Method Description

5.2.1 DTO Layer

1) Airport: This class stores the details of an airport.

Attributes:
airportCode: String
airportLocation: String

Methods:
Getter and setter methods for all attributes

2) Feedback: This class stores the details of feedback.

Attributes:
username: String
content: String

Methods:
Getter and setter methods for all attributes

3) Flight: This class stores all the details of a flight.

Attributes:
flightNumber: Long
carrierName: String
routeId: Long
seatCapacity: Integer
departureTime: String
arrivalTime: String
seatBooked: Integer

Methods:
Getter and setter methods for all attributes

4) FlightDateEmbed: This class stores the flight number and date.

Attributes:
flightNumber: Long
date: String

Methods:
Getter and setter with hashcode() and equals() method

5) FlightDatewise: This class stores the seat booked on a particular flight on a particular date.

Attributes:
embeddedId: FlightDateEmbed
seatBooked: Integer

Methods:
Getter and setter for all attributes

6) FlightUser: This class stores the user type(admin or customer) and all user information

Attributes:
username: String
password: String
type: String

Methods:
Getter and setter for all attributes

7) Route: This class stores route details.

Attributes:
routeId: Long
sourceAirportCode: String
destinationAirportCode: String
ticketCost: Double

Methods:
Getter and setter for all attributes

8) Ticket: This class stores ticket details.

Attributes:
ticketNumber: Long
routeId: Long
flightNumber: Long
carrierName: String
totalAmount: Double
date: String

Methods:
Getter and setter for all attributes

9) TicketPassengerEmbed: This class stores the ticket number and serial number.

Attributes:
ticketNumber: Long
serialNumbe: Integer

Methods:
Getter and setter with hashcode() and equals() method

10) Passenger: This class stores the seat booked on a particular flight on a particular date.

Attributes:
embeddedId: TicketPassengerEmbed
passengerName: String
passengerDOB: String
fare: Double

Methods:
Getter and setter for all attributes

5.2.2 Service Layer

1) <u>FlightService:</u>

   Attributes:
   flightDao: FlightDao
   routeDao: RouteDao

   Methods:
   i) createReturnFlight(Flight flight, String dtime, String atime) : Flight
   - Creates a return flight based on the given flight details.

   ii) getFlightsByDate(String date): List<Flight>
   - Retrieves flights by date and sets the number of seats booked for each flight.

   iii) setSeatBookedToZero(): void
   - Sets the number of seats booked to zero for all flights.

2) <u>FlightUserService:</u>

   Attributes:
   repository : FlightUserRepository
   type: String

   Methods:
   i) save(FlightUser user): void
   - Saves the user details in the database.

   ii) getType(): String
   - Retrieves the type of the current user.

   iii) loadUserByUsername(String username): UserDetails
   - Loads the user by their username.

3) <u>RouteService:</u>

   Attributes: -

   Methods:
   i) createReturnRoute(Route route): Route
   - Creates a return route based on the given route. The return route will have the source and destination airport codes swapped and a new route ID.

4) TicketService:

Attributes:

flightDao: FlightDao
flightDatewiseDao: FlightDatewiseDao

Methods:

i) discountCalculation(Passenger passenger): Double
- Calculates the discounted fare based on passenger age.
  - Passengers 14 years old or younger get a 50% discount.
  - Passengers 60 years old or older get a 30% discount.

ii) ageCalculation(String passengerDOB): Integer
- Calculates the age of the passenger based on their date of birth.

iii) capacityCalculation(int numberOfSeatBooking,long flightNumber, String date) : Boolean
- Checks if there is enough capacity on the flight for the given number of seats. If capacity allows, updates the booked seat count.

iv) ticketCancellation(String date, Long flightNumber, int noOfPassengers): void
- Cancels the specified number of tickets and updates the booked seat count.

5.2.3 DAO Layer

1) AirportDaoImpl:

Attributes:
repository: AirportRepository

Methods:

i) addAirport(Airport airport): void
- saves airport object in database

ii) showAllAirports(): List<Airport>
- returns all details of all airports stored in database

iii) showAirport(String id): Airport
- returns airport details of airport where airport code is id

iv) findAllAirportCodes(): List<String>
- returns all airport codes stored in database

v) findAllAirportLocation(): List<String>
- returns all airport locations stored in database

vi) findAirportLocationByCode(String airportCode): String
- returns airport location whose airport code is airportCode

vii) findAirportCodeByLocation(String airportLocation): String
- returns airport code whose airport location is airportLocation

2) FeedbackDaoImpl:

Attributes:
repository: FeedbackRepository

Methods:

i) save(Feedback feedback): void
- saves feedback object in database

ii) showAllFeedbacks(): List<Feedback>
- returns all feedback stored in database

3) FlightDaoImpl:

Attributes:
repository: FlightRepository

Methods:

i) addFlight(Flight flight): void
- saves flight object in database

ii) showAllFlights(): List<Flight>
- returns all details of all flights stored in database

iii) showFlight(Long id): Flight
- returns flight details of flight where flight number is id

iv) findAllFlightNumbers(): List<Long>
- returns all flight numbers stored in database

v) findByRouteId(Long routeId): List<Flight>
- returns all flights from in database whose route id is routeId

vi) findFlightsByDate(String date): List<Object[]>
- returns flights and seat booked from flight datewise table where date is given date.

4) FlightDatewiseDaoImpl:

Attributes:
repository: FlightDatewiseRepository

Methods:

i) save(FlightDatewise flightDatewise): void
- saves flightDatewise object in database

ii) findByDateAndFlightNumber(String date, Long flightNumber): FlightDatewise
- returns flight datewise object where flight number is flightNumber and date is given date.

5) PassengerDaoImpl:

Attributes:
repository: PassengerRepository

Methods:

i) save(Passenger passenger): void
- saves passenger object in database

ii) findByTicketNumber(Long ticketNumber): List<Passenger>
- returns all passenger's details whose ticket number is ticketNumber

iii) deletePassenger(Passenger p) : void
- Deletes the given passenger record from the database.

iv) showAllPassengerDetails(): List<Passenger>
- Returns all passenger details stored in the database

6) RouteDaoImpl:

Attributes:
repository: RouteRepository

Methods:

i) addRoute(Route route): void
- saves route object in database

ii) showRoute(Long id): Route
- returns a route object whose route id is id

iii) showAllRoutes(): List<Route>
- Returns all route details of all routes stored in the database

iv) findAllRouteId():List<Long>
- Returns all route id stored in the database

v) findRouteBySourceAndDestination(String source, String destination): Route
- returns route whose source and destination code matches the given source and destination code

vi) generateRouteId(): Long
- Find the last route id and return its value by adding one to it.

7) TicketDaoImpl:

Attributes:
repository: TicketRepository

Methods:

ii) save(Ticket ticket): void
- saves ticket object in database

ii) findLastTicketNumber(): Long
- Find the last ticket number and return its value by adding one to it.

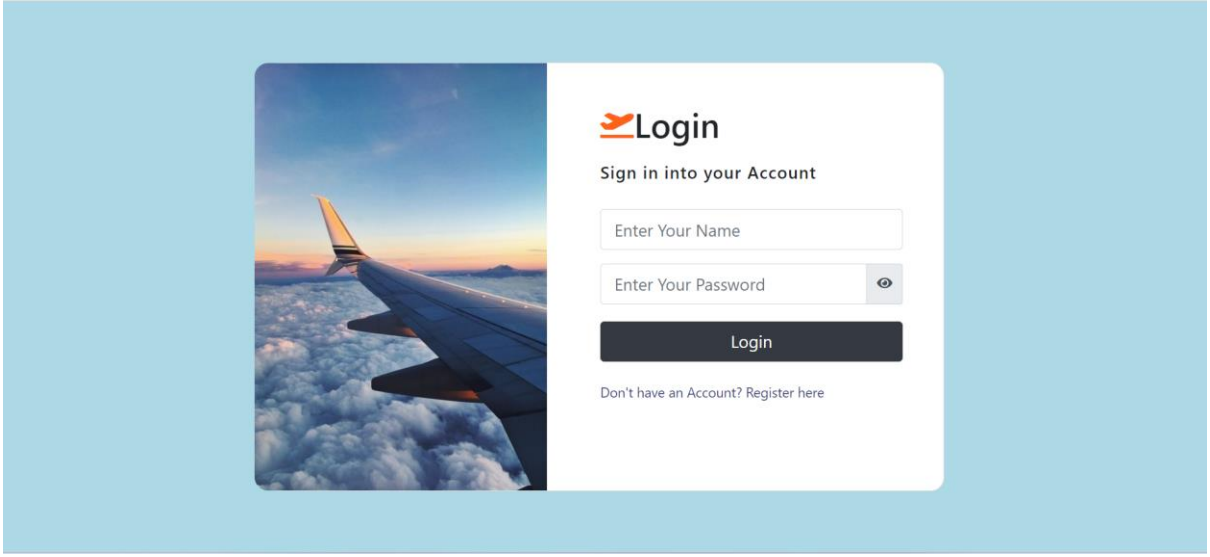
iii) findByTicketNumber(Long ticketNumber): Ticket
- Returns a ticket object whose ticket number is ticketNumber

iv) cancelTicket(Long ticketNumber): void
- Deletes record of the ticket whose ticket number is ticketNumber

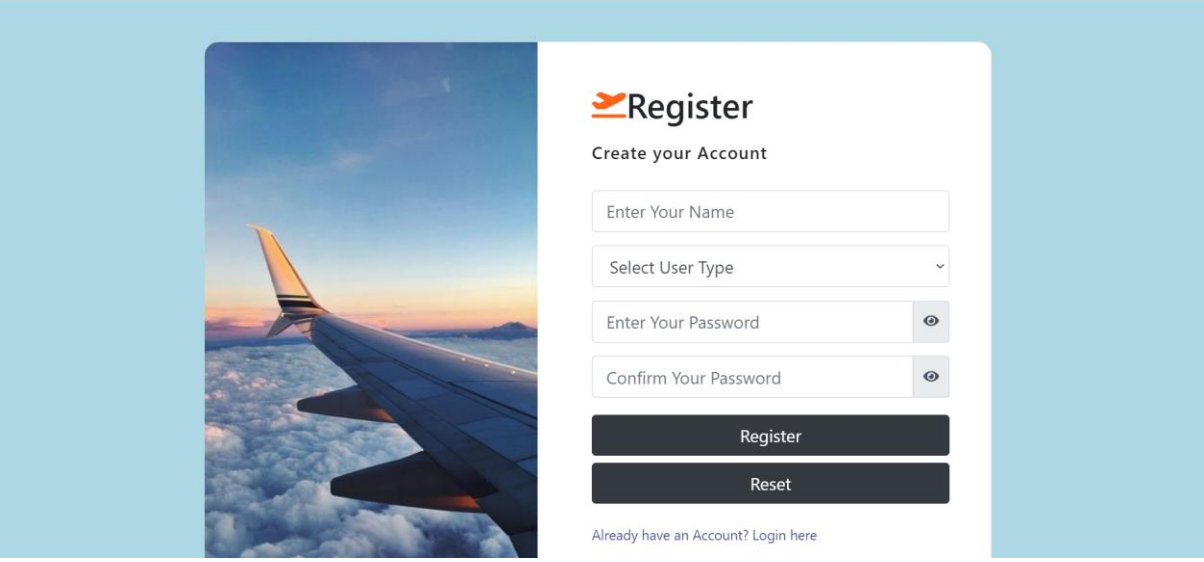
v) showAllTickets(): List<Ticket>
- returns all ticket records stored in the database

Chapter-6. Implementation Screenshots

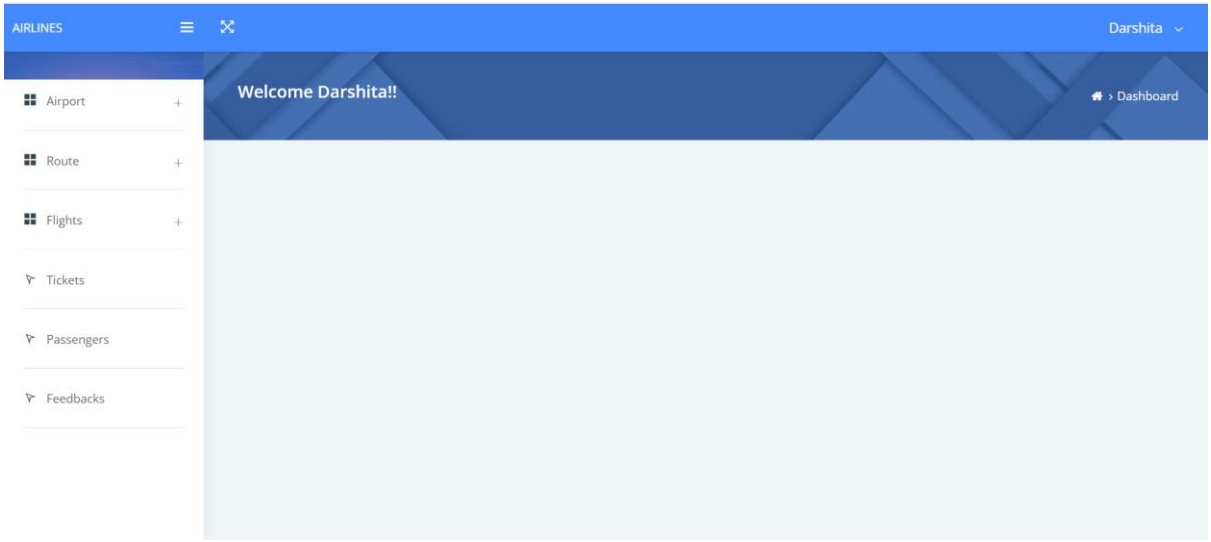
6.1 Login Page:



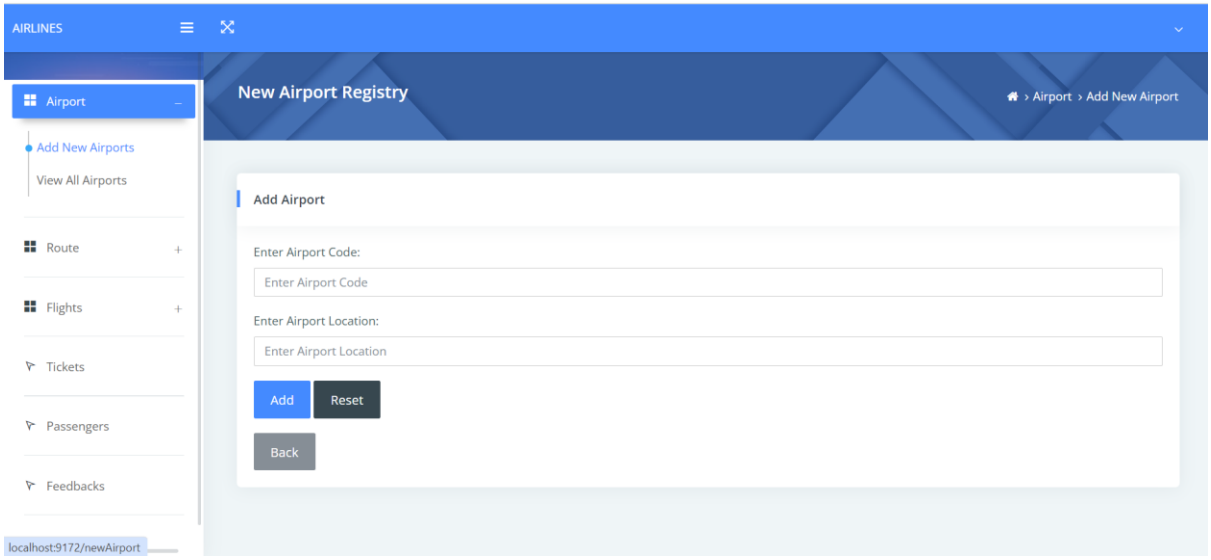
6.2 Sign Up Page:



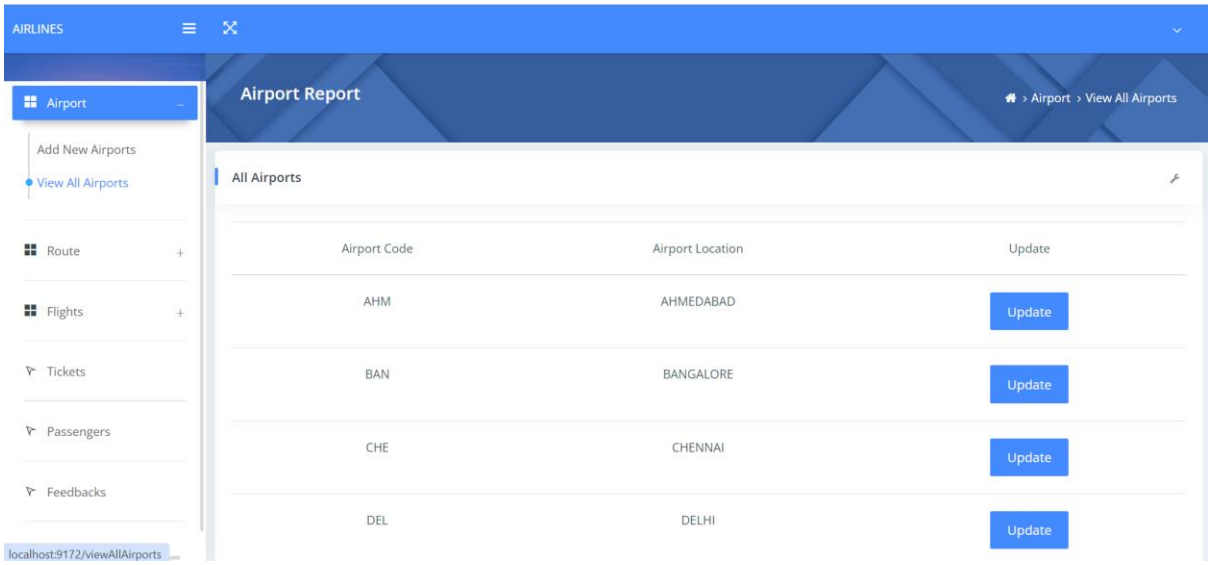
6.3 Admin Features:



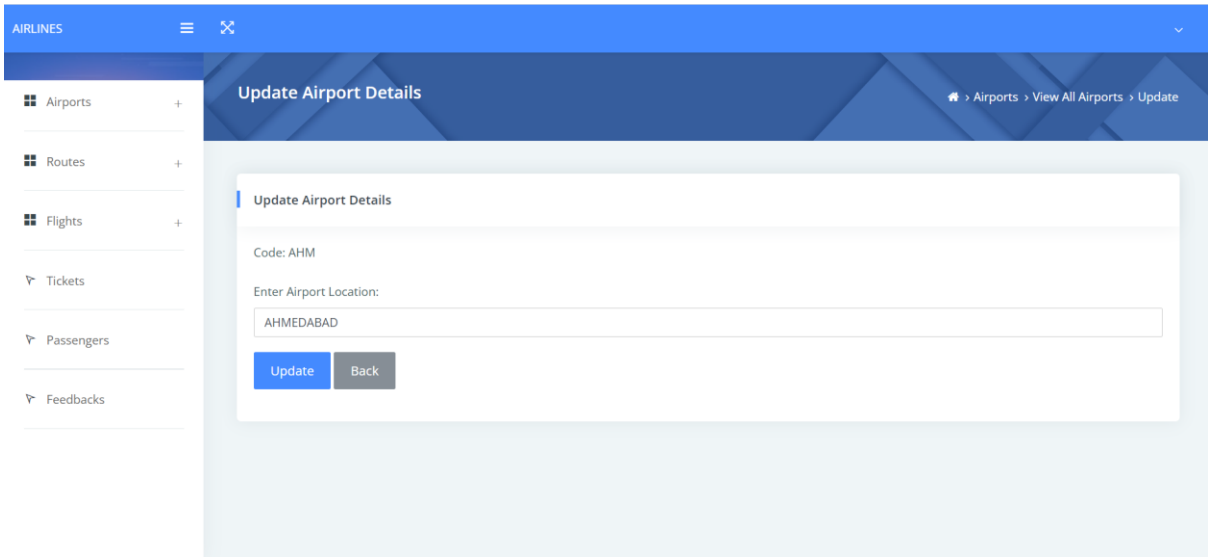
6.3.1 Admin Dashboard



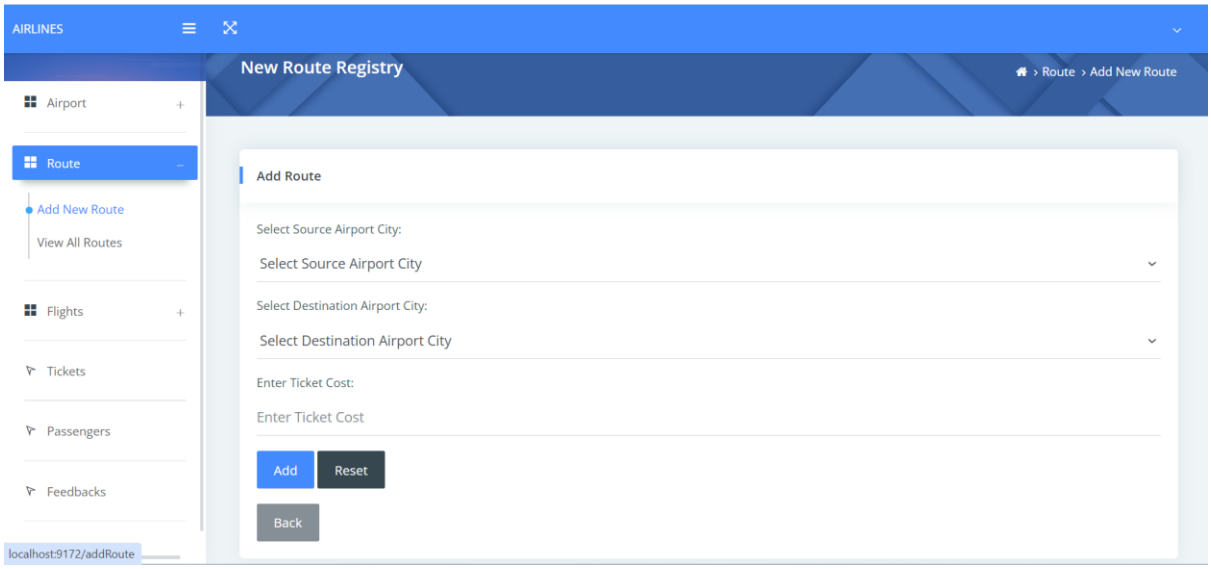
6.3.2 Add New Airport Page



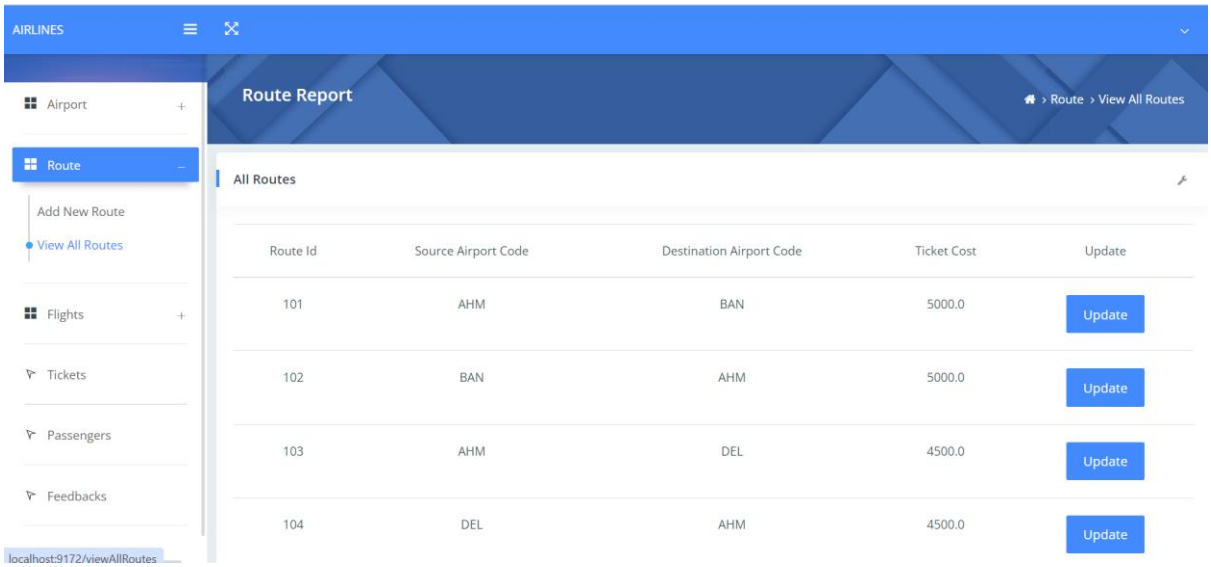
6.3.3 View All Airports Page



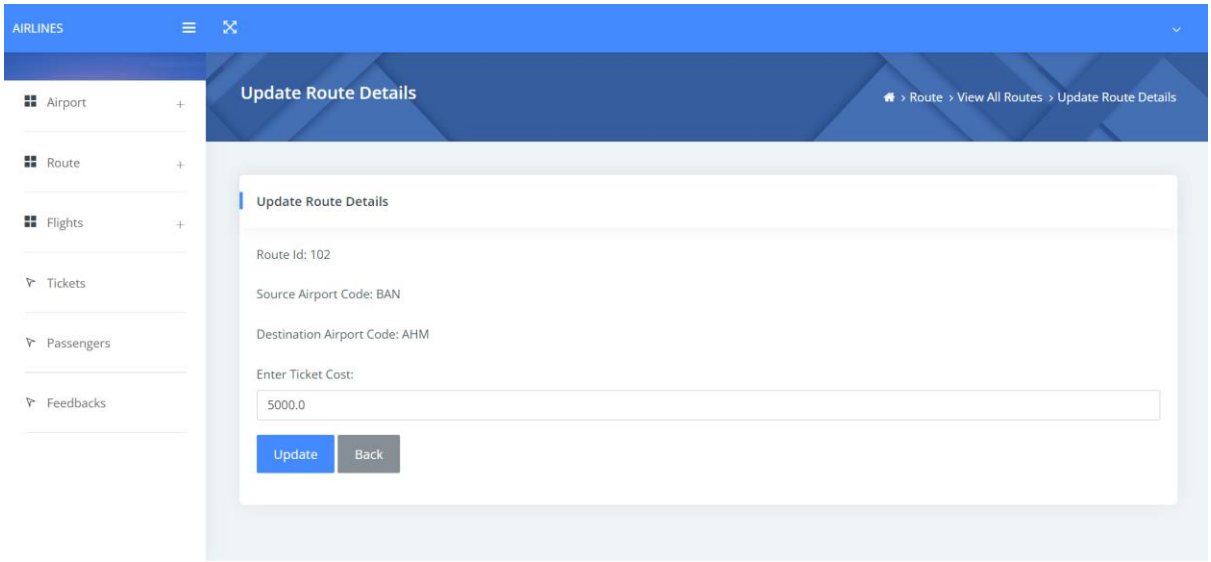
6.3.4 Update Airport Details Page



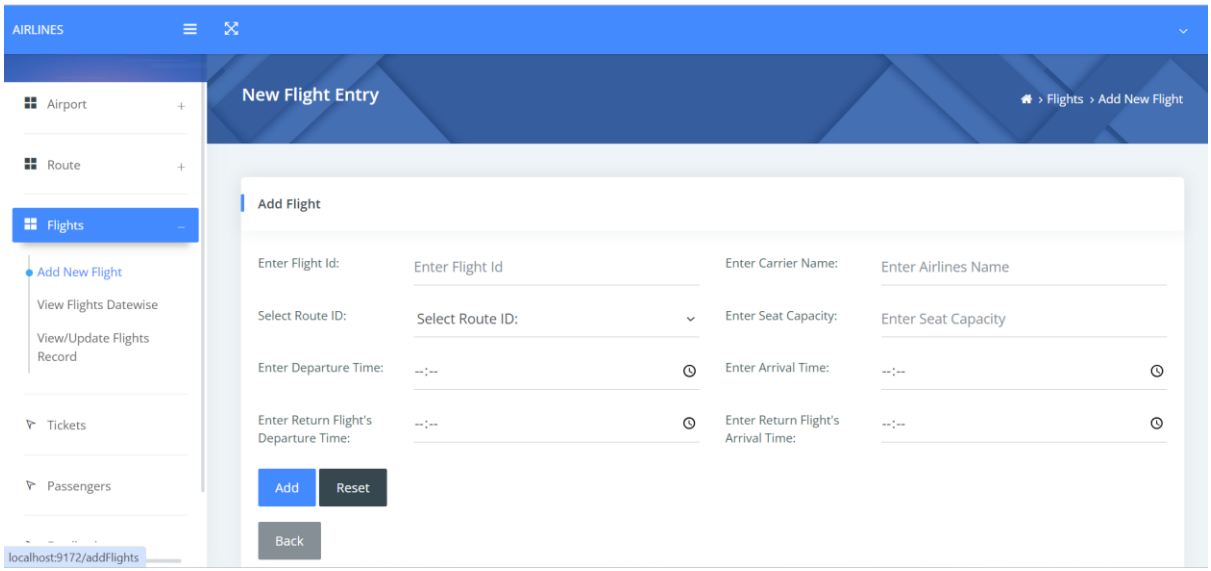
6.3.5 Add New Route Page



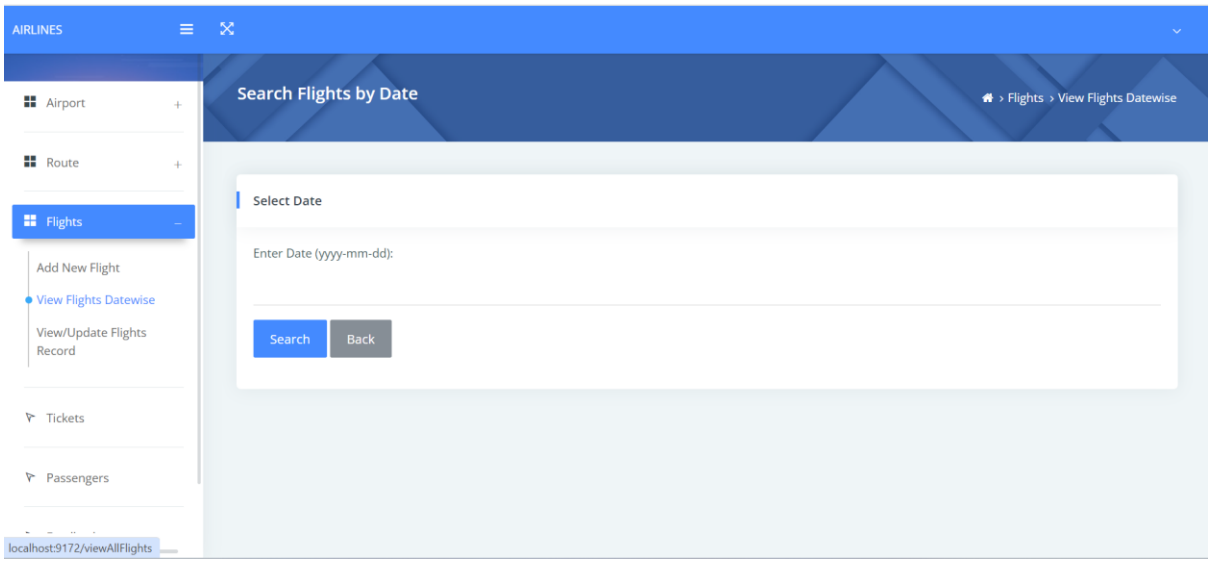
6.3.6 View All Routes Page



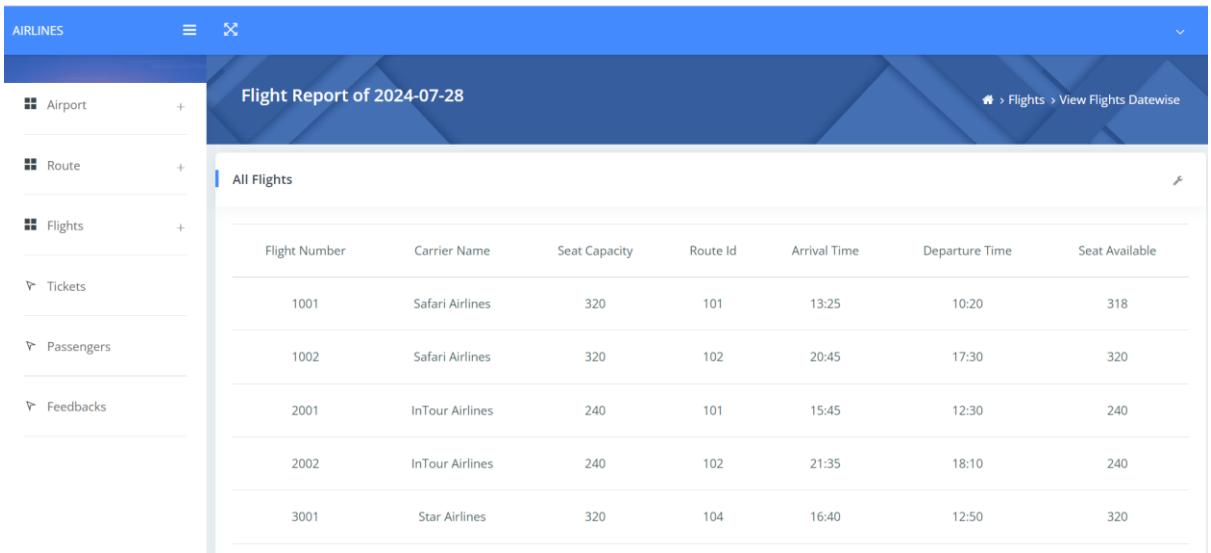
6.3.7 Update Route Details Page



6.3.8 Add New Flight Page



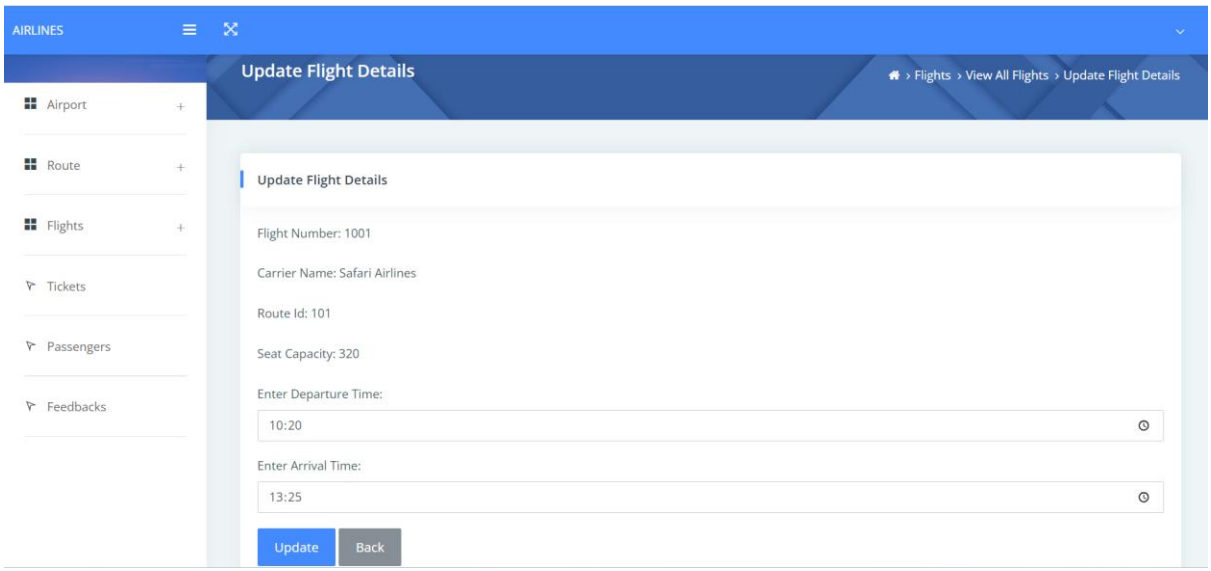
6.3.9 Search Flights by Date Page



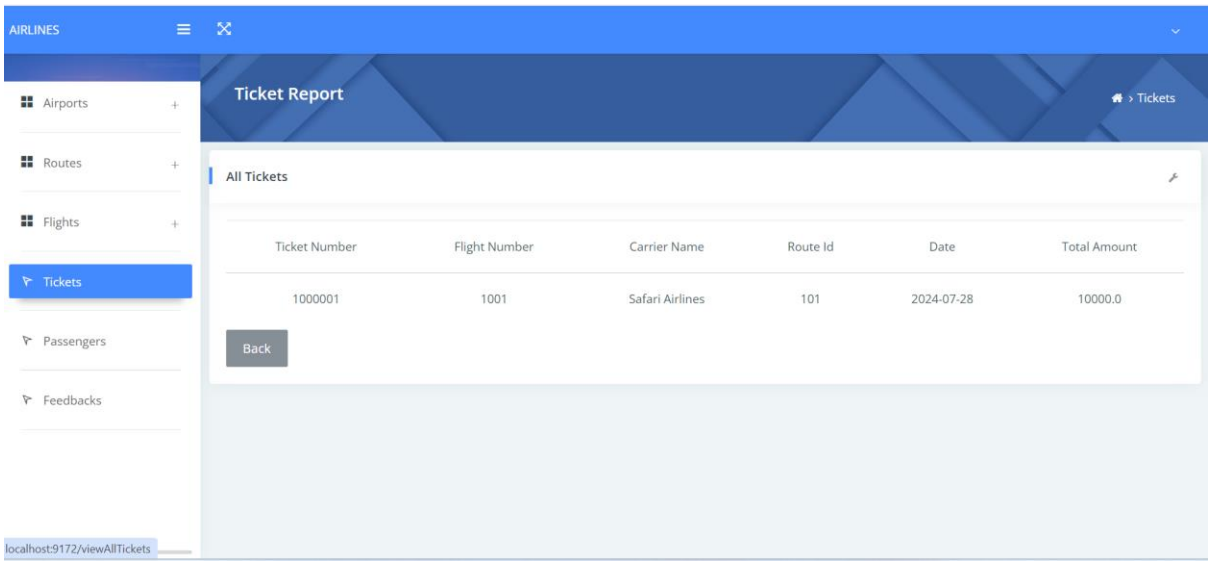
Flight Number	Carrier Name	Seat Capacity	Route Id	Arrival Time	Departure Time	Seat Available
1001	Safari Airlines	320	101	13:25	10:20	318
1002	Safari Airlines	320	102	20:45	17:30	320
2001	InTour Airlines	240	101	15:45	12:30	240
2002	InTour Airlines	240	102	21:35	18:10	240
3001	Star Airlines	320	104	16:40	12:50	320

6.3.10 View Flights Datewise Page

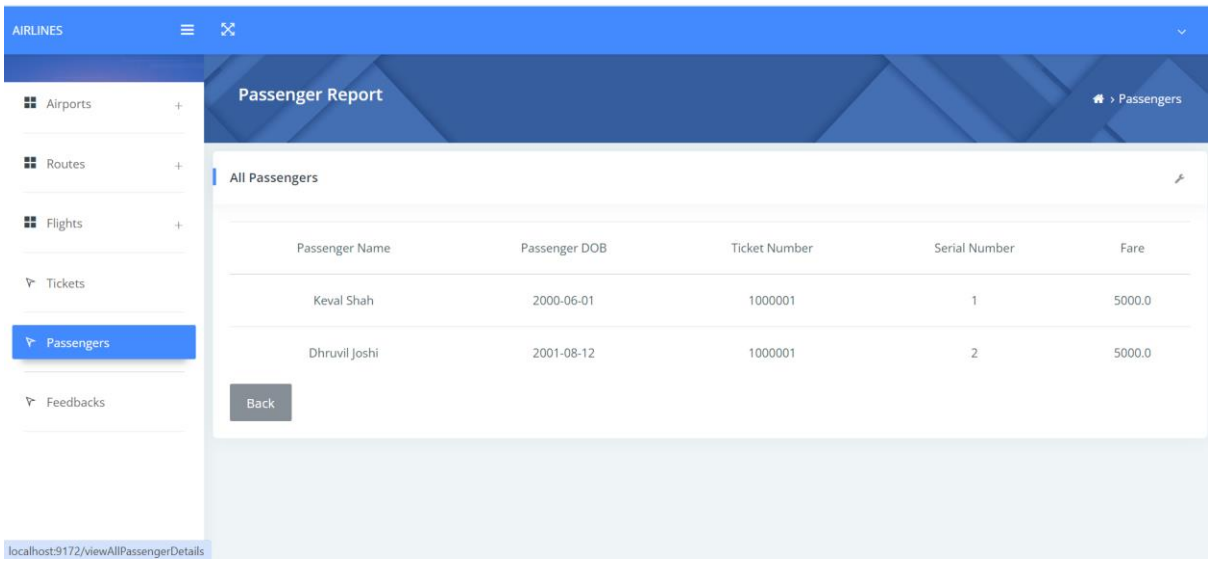
6.3.11 View All Flights Page



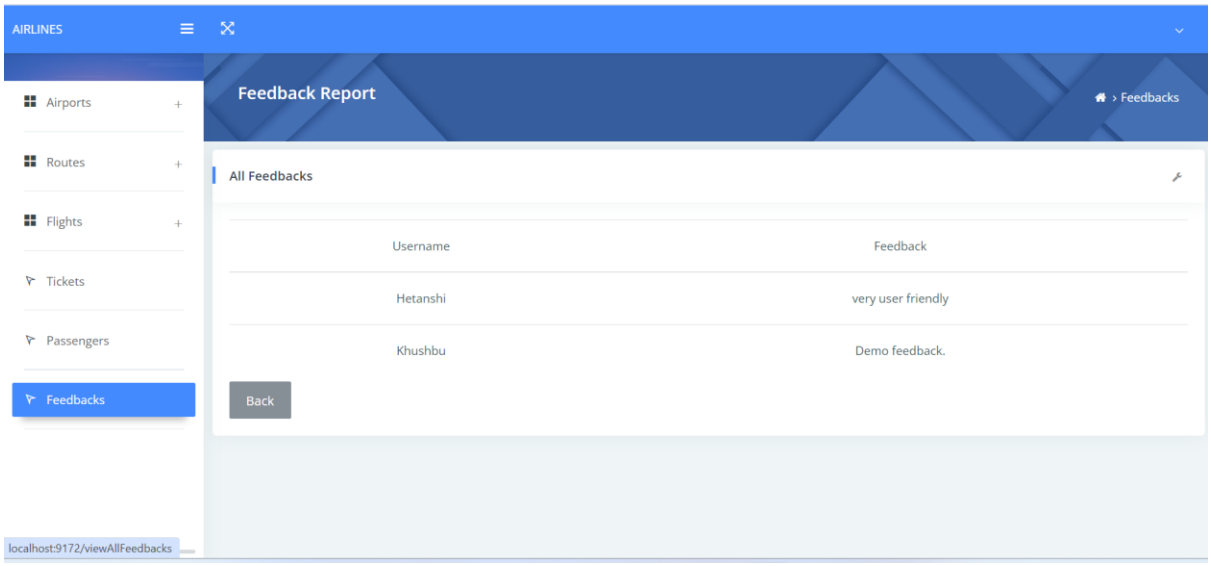
6.3.12 Update Flight Details Page



6.3.13 Ticket Details Page

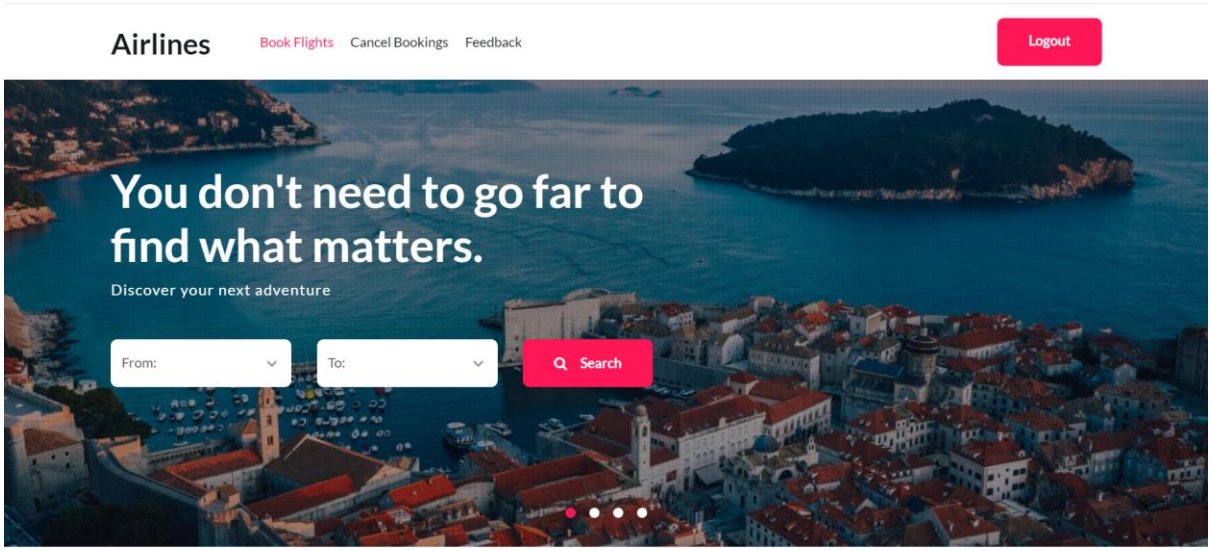


6.3.14 Passenger Details Page

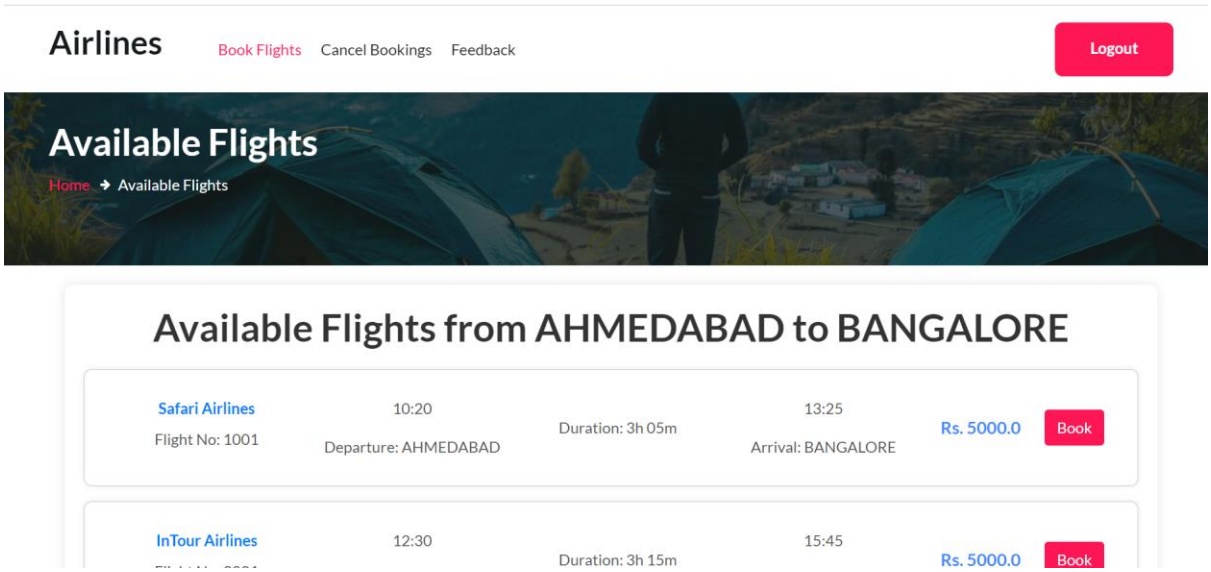


6.3.14 Feedback Report Page

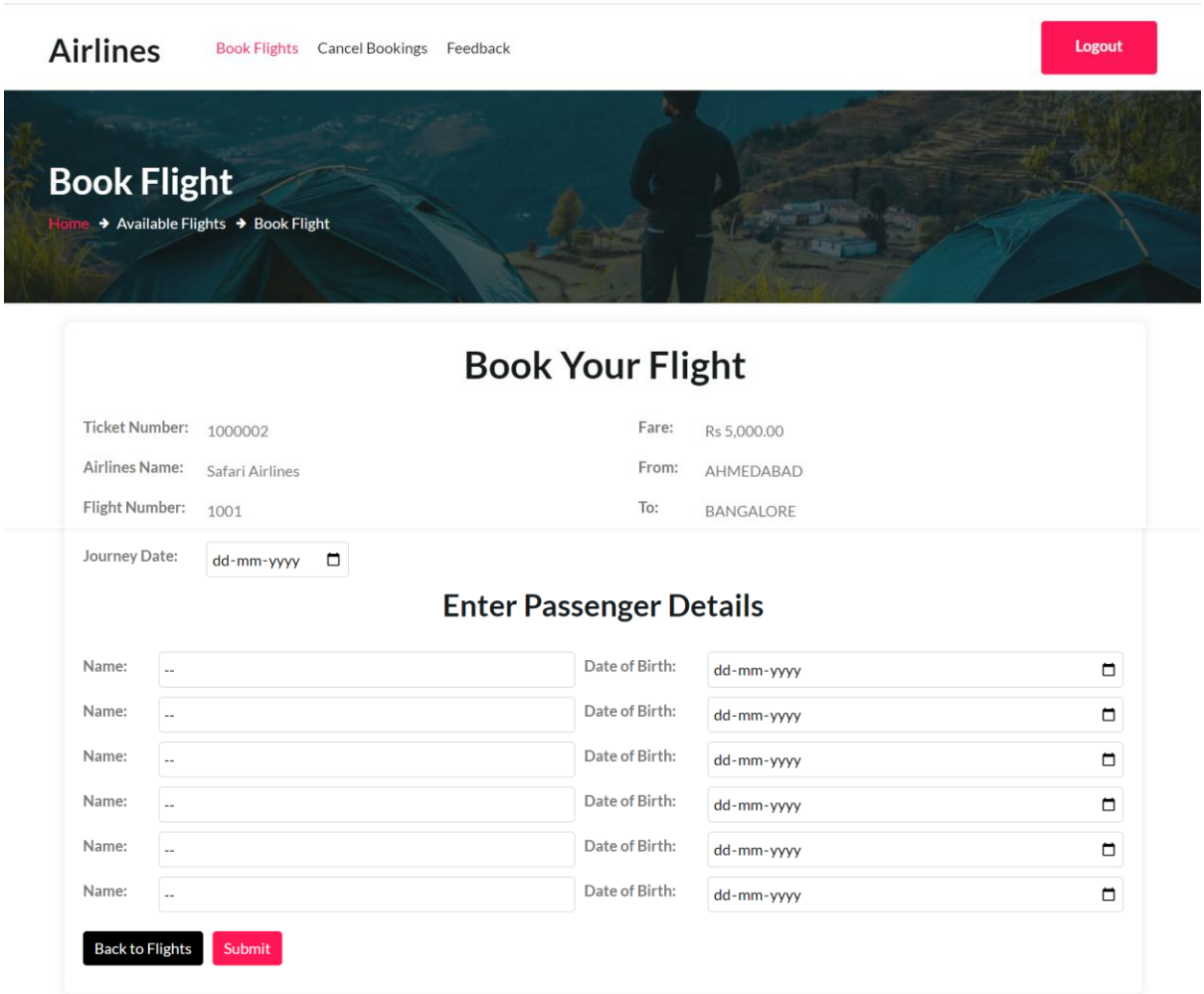
6.4 Customer Features:



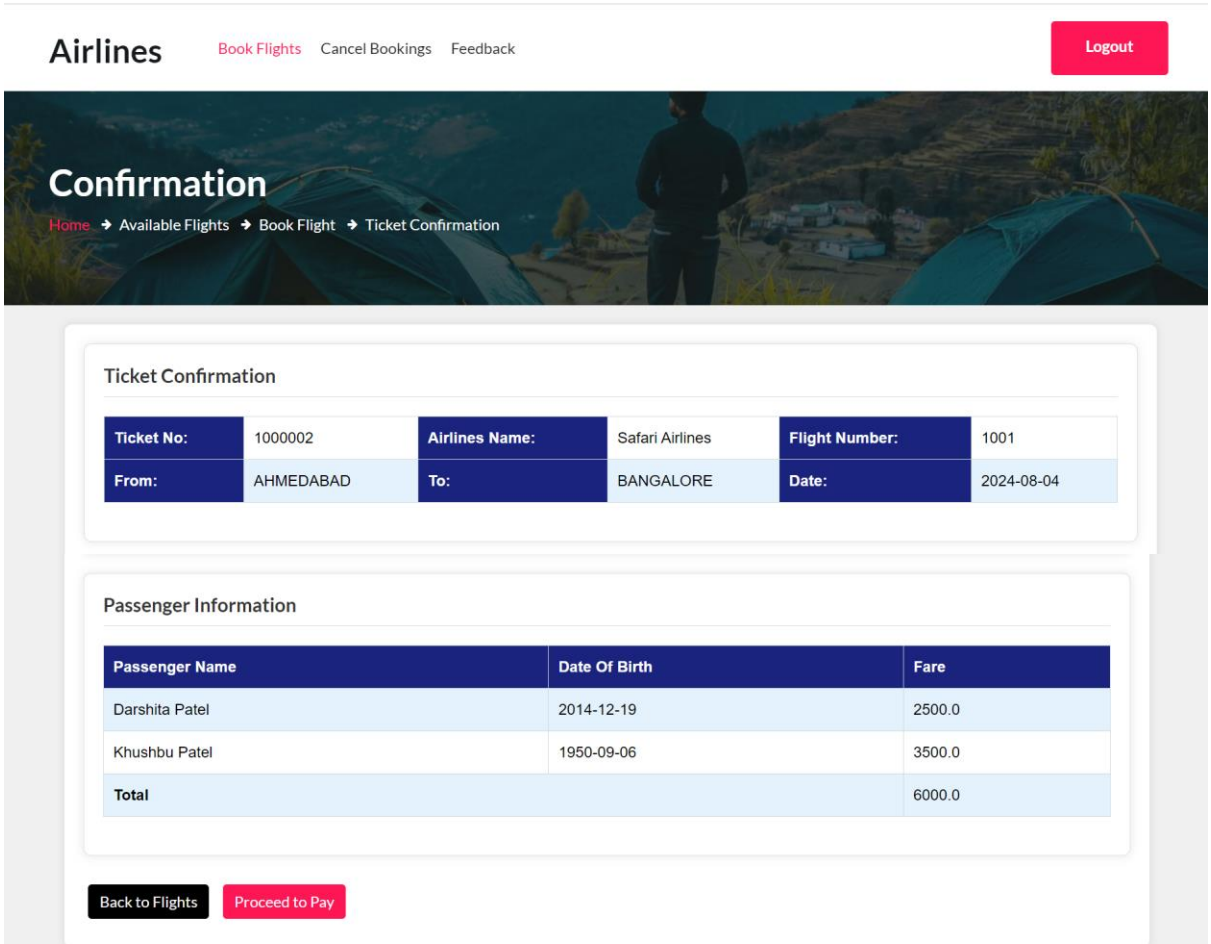
6.4.1 Home Page



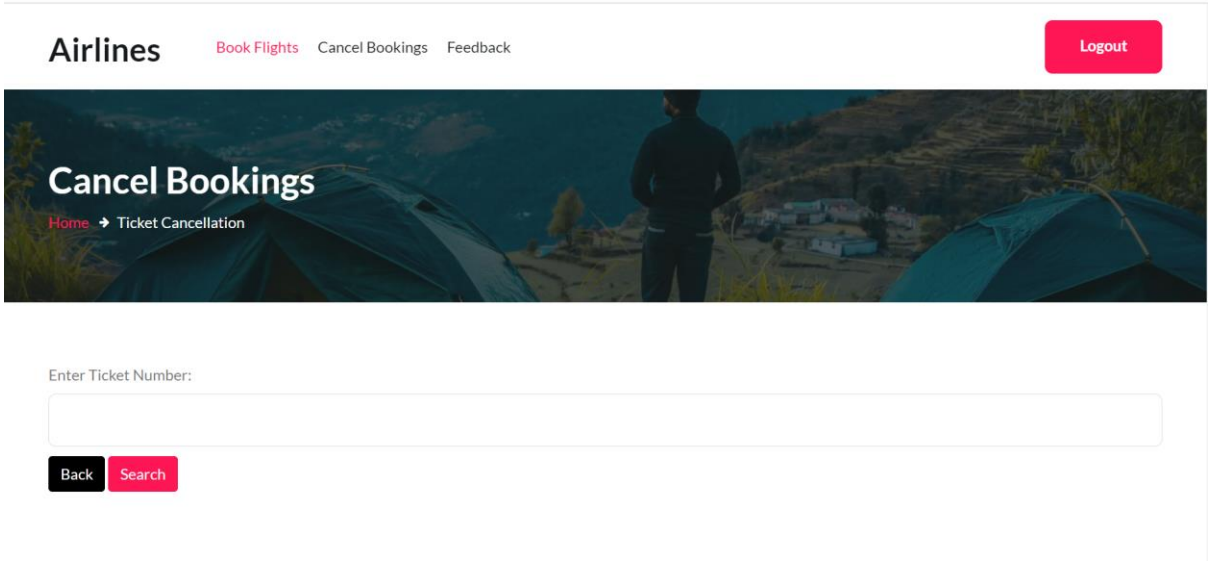
6.4.2 Available Flights Page



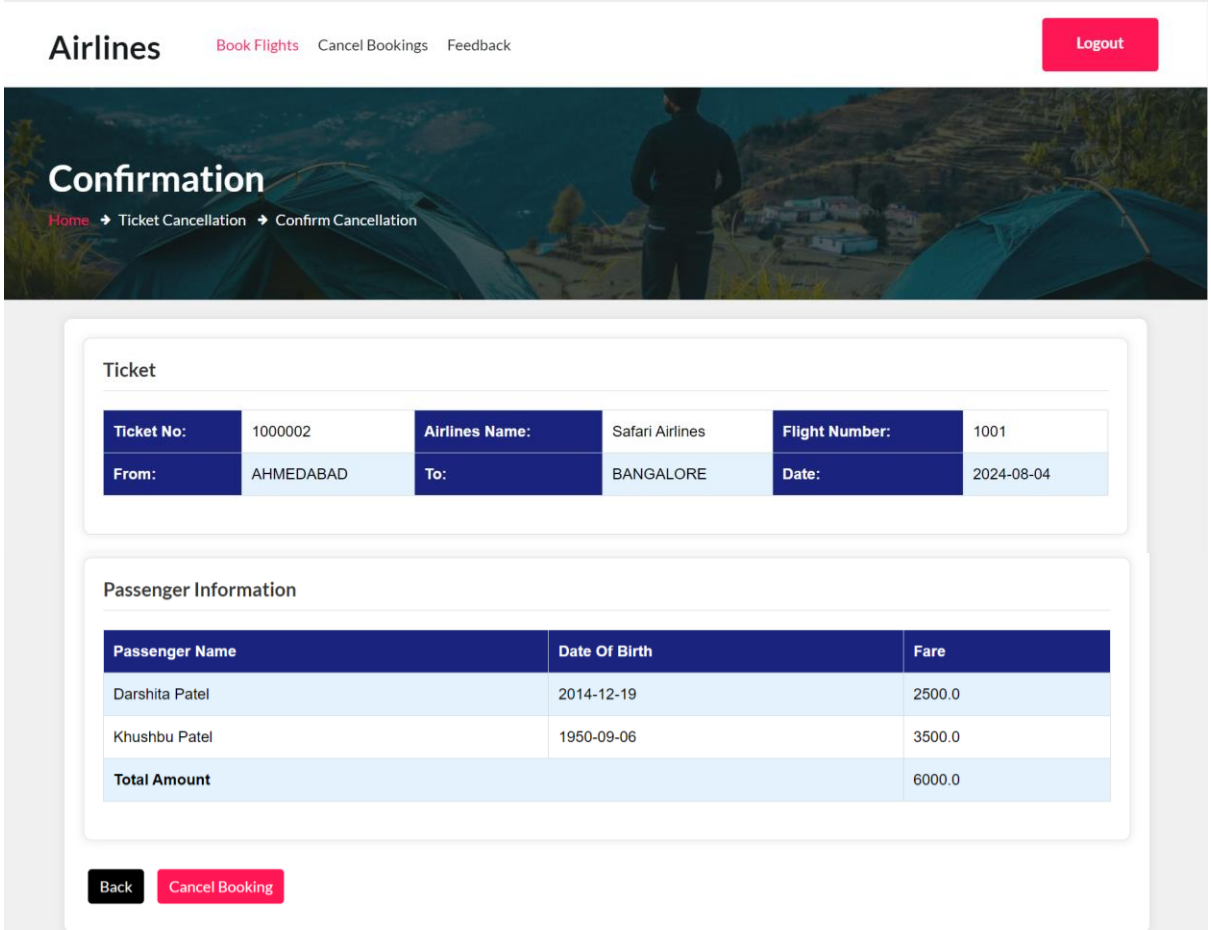
6.4.3 Book Flight Page



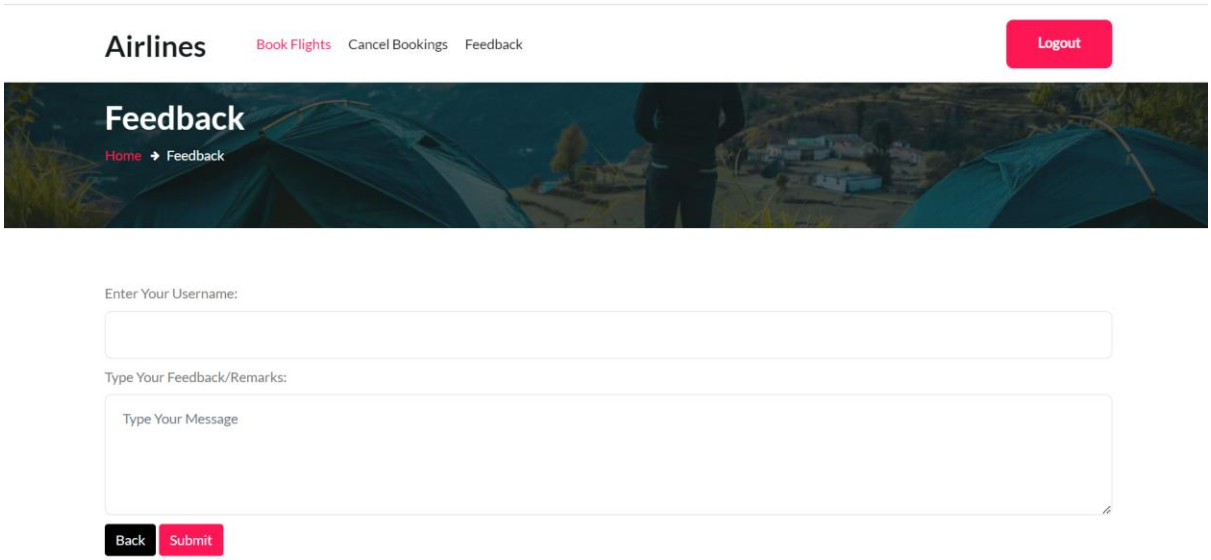
6.4.4 Booking Confirmation Page



6.4.5 Cancel Booking Page



6.4.6 Cancellation Confirmation Page



6.4.7 Feedback Page