FAST School of Computing

Object Oriented Programming – Spring 2023

Sessional Exam

Time: 1.5 hours

XYZ Flight Booking System

The **Flight booking system** is designed to allow customers to search for flights, view available seats, and make reservations. Each **Flight** has a unique flight number, origin, destination, departure time, and arrival time. The system tracks the availability of seats in each flight, including the seat number, class (economy or business), and availability status.

Customers can search for flights using different search criteria such as origin, destination, and departure time. The system then displays a list of available flights that match the search criteria. Customers can select a flight and view the available seats. The system displays a seat map for each flight, showing the available and occupied seats.

Customers can make a **Reservation** by selecting an available seat and entering their personal information, including their name, contact information, and payment details. The system then confirms the reservation and updates the seat availability status.

If a customer needs to cancel their reservation, they can do so by providing their reservation information, including the flight number, seat number, and personal information and payment status. The system then cancels the reservation and updates the seat availability status. If the cancellation is made within a certain time frame, the customer may be eligible for a refund.

To ensure that all flights are fully booked before takeoff, the system includes a **FlightManager** that tracks the bookings for each flight. The FlightManager should have access to Flight and Bookings, allowing the system to track the number of bookings for each flight.

To enable sorting of reservations, the **Reservation** class includes operator overloading to compare booking objects based on different criteria such as flight number, passenger name, or departure time. This allows the system to display bookings in a sorted order for better organization and management.

To ensure secure and verified payments, the flight booking system includes a **Payment** feature that is responsible for handling payment processing. When a customer makes a reservation, they enter their

payment details, including the credit card number, expiration date, and security code. The Payment feature then verifies the payment information and processes the payment.

The Payment feature should be linked to **Reservation.** This ensures that payments are accurately recorded and associated with the correct reservation.

If the payment is not successful, the system notifies the customer and prompts them to enter their payment information again. If the payment is successful, the system generates a payment confirmation number and updates the reservation status to indicate that the payment has been processed.

Note:

- All the necessary functions (constructors, getters, setters) should be implemented.

- You can use all the concepts which have been covered in lab. No marks will be awarded for using advanced concepts.

- Minimum 3 instances should be created of each class to test the functionality.

The expected outcome of the given case study is shown on the next page.

Expected Outcome:


```
Welcome to XYZ Airlines Reservation System!

Please enter your desired departure city: New York
Please enter your desired arrival city: Los Angeles
Please enter your departure date (YYYY-MM-DD): 2023-05-15
Please enter your preferred departure time (HH:MM): 09:00
Please enter your preferred arrival time (HH:MM): 13:00
```

```
Searching for available flights...

Flight 1:
Departure: New York, NY (JFK) at 09:00 on May 15, 2023
Arrival: Los Angeles, CA (LAX) at 13:00 on May 15, 2023
Airline: XYZ Airlines
Flight duration: 6 hours

Flight 2:
Departure: New York, NY (JFK) at 10:00 on May 15, 2023
Arrival: Los Angeles, CA (LAX) at 14:00 on May 15, 2023
Airline: ABC Airlines
Flight duration: 6 hours
```

```
Please enter the flight number you want to book (1 or 2): 1

Please select your seat preference:
1. Window seat
2. Aisle seat
3. Middle seat

Please enter your choice (1-3): 1

Please enter your full name: John Smith
Please enter your email address: john.smith@example.com
Please enter your phone number: 555-555-1234
```

```
Please confirm your booking details:
Flight: XYZ Airlines, Flight 1
Departure: New York, NY (JFK) at 09:00 on May 15, 2023
Arrival: Los Angeles, CA (LAX) at 13:00 on May 15, 2023
Seat: Window seat
Passenger name: John Smith
Email address: john.smith@example.com
Phone number: 555-555-1234


Is this information correct? (Y/N): Y
```

```
Please enter your payment information:
Card number: 1234 5678 9012 3456
Expiration date (MM/YY): 06/25
CVV: 123

Processing payment...

Payment successful! Thank you for using XYZ Airlines Reservation System.
```

Submission Details:

1. Save all the .h and .cpp files.
2. Make zip file of all the header and source files(Do not create .rar file) with roll no and lab no. e.g. i22-XXXX_OOP_SessionalExam.zip.
3. Submit the zip file on google class room.