**Title: Flight Reservation System using Grails Web Application Framework**

**Objective**: The objective of this assignment is to develop a web-based Flight Reservation System using the Grails Web Application Framework. This system should allow users to search for available flights, reserve seats, and manage their bookings. The project will help students understand the core concepts of Grails, such as domain-driven design, the GORM persistence layer, and the MVC architecture, while also gaining practical experience in web application development.

Requirements:

1. **System Overview**

* Develop a web application for managing flight reservations.
* Implement user authentication and authorization to ensure secure access.
* Design a user-friendly interface that allows easy navigation and operation.

1. **Flight Search**

* Implement a search functionality that enables users to find flights based on the departure and arrival locations, date, and time.
* Display available flights with details such as flight number, departure and arrival time, and airline.

1. **Flight Reservation**

* Allow users to reserve seats on a selected flight.
* Implement seat selection functionality, showing the seat layout and allowing users to choose their preferred seats.
* Enable users to enter passenger information (name, email, contact number) and confirm the reservation.

1. **Booking Management**

* Allow users to view their reservations and manage them, such as canceling or modifying the booking.
* Generate and send a reservation confirmation email to the user with booking details and a unique booking reference number.

1. **Admin Dashboard**

* Implement an admin dashboard that enables administrators to manage flights, including adding, editing, and deleting flights.
* Admins should also be able to view and manage user reservations

**Evaluation Criteria:**

1. Functionality: The system should meet all the specified requirements and perform as expected.
2. Design: The user interface should be visually appealing and user-friendly.
3. Code Quality: The code should be well-organized, efficient, and follow best practices for Grails development.

Sample dataset for the Flight Reservation System. The dataset is divided into four tables: Airlines, Airports, Flights, and Users. You may expand or modify the dataset as needed for your project.

1. Airlines:

| **id** | **name** |
| --- | --- |
| 1 | Airline Alpha |
| 2 | Bravo Airlines |
| 3 | Charlie Air |
| 4 | Delta Skies |

1. Airports:

| **id** | **code** | **city** | **country** |
| --- | --- | --- | --- |
| 1 | LAX | Los Angeles | United States |
| 2 | JFK | New York | United States |
| 3 | LHR | London | United Kingdom |
| 4 | CDG | Paris | France |
| 5 | NRT | Tokyo | Japan |
| 6 | SYD | Sydney | Australia |

1. Flights:

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **id** | **flight\_number** | **airline\_id** | **departure\_airport\_id** | **arrival\_airport\_id** | **departure\_date** | **departure\_time** | **arrival\_date** | **arrival\_time** | **duration** | **available\_seats** | **price** |
| 1 | AA100 | 1 | 1 | 2 | 2023-04-01 | 08:00:00 | 2023-04-01 | 16:30:00 | 8h30m | 50 | 300 |
| 2 | BA200 | 2 | 1 | 4 | 2023-04-01 | 10:30:00 | 2023-04-02 | 07:00:00 | 10h30m | 60 | 450 |
| 3 | CA300 | 3 | 2 | 5 | 2023-04-02 | 12:00:00 | 2023-04-03 | 11:00:00 | 11h | 70 | 550 |
| 4 | DS400 | 4 | 3 | 6 | 2023-04-02 | 15:30:00 | 2023-04-03 | 12:30:00 | 9h | 80 | 500 |

1. Users:

| **id** | **first\_name** | **last\_name** | **email** | **password\_hash** | **role** |
| --- | --- | --- | --- | --- | --- |
| 1 | John | Doe | [john.doe@email.com](mailto:john.doe@email.com) | 5f4dcc3b5aa765d61d8327deb882cf99 | user |
| 2 | Jane | Smith | [jane.smith@email.com](mailto:jane.smith@email.com) | 7c6a180b36896a0a8c02787eeafb0e4c | user |
| 3 | Alice | Johnson | [alice.johnson@email.com](mailto:alice.johnson@email.com) | 0b14d501a594442a01c6859541bcb3e8164d183d32937b851835442f69d5c94e | user |
| 4 | Bob | Brown | [bob.brown@email.com](mailto:bob.brown@email.com) |  |  |