AIRLINE RESERVATION SYSTEM

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INTRODUCTION

- **Overview:**
  - The Airline Reservation System is a Java-based software solution designed for managing airline ticket bookings.
  - It simplifies the process of flight search, seat selection, booking management, and user authentication.
- **Purpose:**
  - Enhancing user experience in booking airline tickets online.
  - Streamlining flight management for administrators.
- **Objectives:**
  - Implementing core functionalities like flight search, seat booking, and user authentication.
  - Ensuring data accuracy, reliability, and security in the system.

PROJECT OVERVIEW

- **System Architecture:**
- Frontend: Command-line interface for user interaction.
- Backend: Java classes for flight and booking management, database integration.
- Database: In-memory storage for flights and bookings.
- **Components:**
- Flight Management: Add, view, and update flight details.
- Booking Management: Reserve seats, manage bookings.
- User Authentication: Login and registration for users.
- Database Integration: Store and retrieve flight and booking information.
- User Interface: Text-based interface for user interactions.

FEATURES

Key Features:

- Flight search based on origin, destination, and date.
- Seat selection and booking with real-time seat availability updates.
- User registration and login with authentication checks.
- Admin controls for adding, updating, and removing flights.
- Booking management for users to view, modify, and cancel bookings.
- In-memory database for storing flight and booking data.

TECHNOLOGY STACK

Technologies Used:

- Java Programming Language: Core logic and backend implementation.
- Object-Oriented Design: Modular and reusable code structure.
- Data Structures: Lists, maps for efficient data management.
- Integrated Development Environment (IDE): IntelliJ IDEA for coding.
- Version Control: Git for code collaboration and versioning.

CODE OVERVIEW

Code Snippets:

- Flight and Booking classes with attributes and methods.
- Database management for storing and retrieving data.
- User input handling using the Scanner class.
- Booking process logic for seat reservation and updates.
- View functions for displaying flights and bookings.

CHALLENGES FACED AND LESSONS LEARNED

Challenges Encountered:

- User Input Validation: Ensuring valid and accurate user inputs.
- Real-Time Seat Availability: Managing seat updates during bookings.
- Secure User Authentication: Implementing password encryption and authentication checks.
- Database Schema Design: Designing an efficient data structure for flights and bookings.

Key Takeaways:

- Importance of clear system design and architecture for scalability.
- Effective use of data structures for managing data efficiently.
- Considerations for user interface design and user experience.
- Collaboration using version control for code management and collaboration.

FUTURE ENHANCEMENTS

Potential Enhancements:

- Implementing a web-based frontend using HTML/CSS/JavaScript for a more interactive user interface.
- Integrating with a relational database management system (RDBMS) for persistent data storage.
- Adding payment processing functionality for secure online transactions.
- Enhancing user experience with responsive design and mobile compatibility.