Airline Reservation System

Mahendra Singh

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A SQL-based relational database project for managing flights, passengers, and bookings

1 Introduction

Airline operations involve complex logistics, from flight scheduling to passenger management. This project presents a relational database system designed to manage flights, bookings, and ticketing efficiently. Built using MySQL, the system ensures data integrity, automation, and scalability for real-world airline scenarios.

2 Abstract

The Airline Flight and Booking Management System simulates core airline workflows using SQL. It includes tables for airports, flights, passengers, bookings, tickets, and seats. The system supports realistic operations such as booking confirmation, ticket issuance, seat availability checks, and cancellations. Triggers automate updates, and queries generate actionable reports. This project demonstrates practical database design, normalization, and procedural logic.

3 Tools Used

- **MySQL 8.0+**: Relational database engine for schema and query execution.
- **SQL Workbench / phpMyAdmin**: GUI tools for managing and testing SQL code.
- **DDL & DML**: Used for table creation, data insertion, and updates.
- **Triggers & Views**: For automation and reporting.

4 Steps Involved in Building the Project

1. **Schema Design**: Defined normalized tables with foreign key relationships.
2. **Data Population**: Inserted realistic sample data for airports, flights, passengers, bookings, and tickets.

3. **Seat Generation**: Created a seat map ('1A' to '30F') using MySQL-compatible logic.

4. **Core Queries**: Implemented flight search, available seat lookup, and booking summary reports.

5. **Triggers**: Added 'AFTER INSERT' and 'AFTER DELETE' triggers to automate booking status updates and ticket cleanup.

6. **Reporting**: Generated a booking summary showing passenger name, flight details, seat, class, and price.

5 Conclusion

This project successfully demonstrates the design and implementation of a robust airline booking system using MySQL. It covers key aspects of database normalization, referential integrity, automation, and reporting. The system is modular and ready for integration with front-end applications or APIs. Future enhancements could include aircraft-specific seat layouts, dynamic pricing, loyalty programs, and real-time seat assignment.

Prepared by: Mahendra
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