# **Airline Reservation System using MySQL**

**Objective:**

To design and implement a relational database system using SQL to manage airline flights, customers, bookings, and seat availability, ensuring efficient and secure handling of reservations.

**Tools Used:**

* MySQL Workbench
* SQL (Structured Query Language)

**Scope of the Project:**

This system helps airlines manage their core operations, including:

* Flight scheduling
* Customer management
* Booking reservations
* Seat tracking
* Reporting and automation via triggers

**Database Design:**

**Main Tables:**

1. **Flights:** Stores information about scheduled flights.
2. **Customers:** Stores customer information.
3. **Bookings:** Tracks flight reservations.
4. **Seats:** Manages seat availability on each flight.

**Normalization & Constraints:**

* The schema was normalized to **3rd Normal Form (3NF)**.
* **Primary keys** for identification (e.g., flight\_id, customer\_id, etc.).
* **Foreign keys** to maintain relational integrity.
* **Not Null**, **Default**, and **Unique** constraints used for validation.

## Implementation & Features

**Sample Data Insertion:**

* Inserted **20 sample flight records** covering major Indian cities.
* Added sample customers, bookings, and seats.

**SQL Queries Implemented:**

1. Search flights by source and destination
2. Check available seats for a flight
3. View customer booking history
4. Display all upcoming flights
5. Count total bookings per flight
6. Sort flights by departure time
7. Search bookings by date
8. List cancelled bookings
9. Find frequent flyers
10. Generate booking summary reports

(20 total queries prepared – available separately)

**Triggers Used:**

* **After Insert Trigger** on Bookings:
  + Automatically updates the seat status to "Booked".
* **After Delete Trigger** on Bookings:
  + Marks seat as "Available" when a booking is cancelled.

**Views Created:**

* flight\_availability\_view: Shows flights with available seats.
* booking\_summary\_view: Aggregates booking data by date and flight.

**Conclusion:**

The Airline Reservation System successfully demonstrates how to manage a real-world booking scenario using MySQL. It ensures data consistency through normalization, enforces business rules with constraints and triggers, and supports reporting through SQL queries and views.