

AIRLINE MANAGEMENT SYSTEM DATABASE

Documentation

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INTRODUCTION

OVERVIEW

This database is designed to manage an **airline operations system**, covering key aspects such as flight scheduling, crew assignments, passenger bookings, payment processing, and baggage handling. The system is structured into **4 schemas** (core, crew, customer, financial) to logically organize data and ensure efficient querying and maintenance.

KEY FEATURES

- **Flight Management:** tracks flight routes, schedules, aircraft details, and real-time flight status
- **Crew Operations:** manages pilots, flight attendants, ground staff, and their assignments
- **Passenger & Booking System:** handles passenger profiles, seat reservations, and booking records
- **Financial Transactions:** processes payments via credit cards, bank transfers, or loyalty points
- **Baggage Tracking:** monitors checked and carry-on luggage with status updates

BUSINESS RULES

CORE FLIGHT OPERATIONS

1. Flight Scheduling
 - Every flight must have a defined route (origin & destination airports)
 - Each flight must be assigned to an aircraft with valid maintenance records
 - Scheduled departure/arrival times must follow the route's average duration
2. Aircraft Management
 - Aircraft cannot be scheduled for flights if status is "Maintenance"
 - Each aircraft has a fixed seat configuration that cannot be modified after creation

CREW MANAGEMENT

3. Staff Assignments
 - Pilots must have type ratings matching the aircraft model
 - Flight attendants must have valid safety certifications
 - No crew member can be assigned to overlapping flights
4. Work Regulations
 - Pilots cannot exceed 100 flight hours per month
 - Crew must have minimum 10 hours rest between assignments

PASSENGER & BOOKING SYSTEM

5. Reservation Rules
 - Each booking must be tied to an existing passenger record
 - Seats can only be booked if marked as available
 - No duplicate seat assignments per flight
6. Payment Processing
 - All bookings must have an associated payment record
 - Loyalty point redemptions can't exceed passenger's available points
 - Credit card payments require last 4 digits and authorization code

7. Baggage Policies

- Maximum 3 bags per passenger (1 carry-on + 2 checked)
- Checked bags over 23kg incur excess fees
- Special baggage requires advance notice

BUSINESS LOGIC ENFORCEMENT

8. Status Automations

- Flight status automatically updates based on departure/arrival times
- Seats are automatically marked reserved upon booking
- Passenger's has_booking flag updates with reservations

9. Reporting Requirements

- Daily flight performance metrics
- Monthly revenue by payment method
- Aircraft utilization reports

10. Data Integrity

- No airport can be deleted if referenced in active routes
- Passenger records persist even if bookings are cancelled
- Historical flight data must be preserved for 5 years