DAMG 6210 SkyReserve: Airline Reservation Management System

Database Specification: Purpose, Business Problems Addressed and Business Rules

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Database Purpose:

The purpose of developing an Airline Reservation Management System is to create an efficient and centralized platform that automates and streamlines the process of managing airline reservations, ticketing, and related operations. It aims to enhance the overall booking experience for customers, optimize seat utilization, improve data management, and facilitate effective fare management.

Business Problems Addressed:

1. Student-focused benefits: The system aims to prioritize affordability and accessibility for students. It should offer discounts and benefits tailored to students, ensuring they have access to cost-effective travel options
2. Pricing and Fare Management: The system helps airlines manage fares, discounts, and promotional offers effectively to attract customers while ensuring profitability
3. Paperless Booking Process: The system addresses the challenge of manual reservation processes, eliminating the need for physical ticketing and reducing the dependency on paper-based systems
4. Efficient flight management: The system should optimize the reservation process and streamline operations for airlines and travel agencies. It should enable efficient management of flight details, passenger information, and reservations
5. Customer satisfaction: The system should contribute to customer satisfaction by providing a user-friendly interface, reliable information, and seamless reservation and booking processes

Business Rules:

1. A Passenger can have zero or more baggage/s
2. A Passenger can give zero or more feedback/s
3. A Passenger may or may not be a student
4. A Student can be part of only one Student Group Booking
5. A Student can have one or many students benefits
6. An Airline will have one or many Flights
7. A Flight can have zero or many Reservations
8. An airport can have one or many Flights
9. A Loyalty program will have one or more program benefits

Design Decisions:

Entity Name	Why Entity is included	How entity is related to other entities
Flight	The Flight entity is included to store information about individual flights, including their schedules, to manage reservations, seat availability, and fares. It represents a specific flight instance.	As being the core entity in the database, the Flight entity is related to the Airline entity through the AirlineCode foreign key, indicating which airline operates the flight. It is also related to the Reservation entity through the FlightNumber foreign key. This relationship allows for associating reservations with specific flights. In this entity the departure and destination airports share one airport entity and hence have dual relationship with airport entity. The data in the DepartureAirport and DestinationAirport is same as the data in AiportName attribute in the Airport entity. It is also related to the StudentGroupBooking entity.
Student	The student entity is included to store information about students who may be passengers in the airline reservation system. This allows for specific handling of student-related discounts and benefits.	The student entity is related to the Passenger entity as it inherits the PassengerID attribute as its foreign key and other common attributes such as FirstName, LastName, Gender, DateOfBirth, Nationality,StudentEmailID & SchoolName. It is also related to the StudentGroupBooking & StudentBenefits entities through therewq GroupBookingID & BenefitID. These relationships allow students to be associated with group bookings and can get multiple benefits as well.

Passenger	The entity is included to store information about passengers who book flights in the airline reservation system.	The Passenger entity is directly related to the student entity, as a student can also be a passenger. It is related to the Flight entity through Reservation (entity), to the Airline entity through LoyaltyProram entity, to the baggage and baggage tracking entities as passengers usually travel with luggage.
Baggage	This entity is included to store the information about baggage like baggage ID and weight which can directly be linked to passengers to track their baggage status.	Baggage entity is related to the Passenger entity, indicating that a passenger can have zero or more bags. The Baggage entity is also related to Baggage Tracking and serves as the parent entity, with its primary key combined with the Passenger entity's primary key being used as the primary key for Baggage Tracking
Airport	The entity is included to store information about airports, which are essential for managing flight schedules and bookings.	The Airport entity is related to the Flight entity through the AirportName attribute, which represents the unique name assigned to each airport. The DestinationAirport and DepartureAirport attributes in flight entity have same values as AirportName. It is related to the Country entity, which provides information about the country where the airport is located.
Airline	The entity is included to store information about airlines, which operate flights and provide services to passengers.	The Airline entity is related to the Flight entity as one airline can have one or more flights. It is also related to the Baggage Tracking entity, allowing the airline to track and manage baggage associated with its flights. Additionally, the Airline entity is related to the Airline Company entity, which represents the company that owns or operates the airline. Airline entity is related to the Loyalty Program entity, as it provides benefits and rewards to passengers based on their association with specific airlines.
Feedback	The feedback entity contributes to customer satisfaction, quality improvement, issue resolution, service enhancements, performance evaluation, and reputation management.	Feedback entity is associated with the Passenger entity through PassengerID being the primary key, allowing customers to provide individual feedback on their booking experience. This enables customers to share their rating and comments regarding their overall journey. This relationship enables the airline to address concerns, improve operations, and enhance customer satisfaction.
Country	The Country entity is included to store information about different countries. It ensures the system can effectively handle country-specific data, meet regional requirements, provide accurate information, and enhance the overall user experience. It enables the system to adapt to different countries' regulations,	Country entity is associated with the "AirlineCompany" entity through AirlineCode, capturing nationality and origin/destination information respectively. It also relates to the CountryName, providing insights of

	preferences, and operational considerations, contributing to the success and efficiency of the airline reservation system.	airport locations. Furthermore, it is also related to Airport by AirportCode. These relationships enable efficient travel management, compliance with regulations, and organized data categorization based on countries.
Loyalty Program	The Loyalty Program entity allows airlines to offer rewards, such as points or miles, to passengers based on their travel activities. Passengers can accumulate these points or miles over time and can redeem them for various benefits such as free flights, upgrades, or other benefits offered by the airline. The Loyalty Program entity tracks and manages the accumulation and redemption of points/miles, ensuring a seamless and rewarding experience for participating passengers based on then program ID	The Loyalty Program entity is associated with the Airline entity, airline can have one or more loyalty programs, allowing passengers to earn rewards and benefits specific to that airline. It is related to the Passenger entity. One passenger can be associated with multiple loyalty programs from different airlines. It is related to Program Benefit and Redemption Options one loyalty program can have one or more program benefits and redemption options can be none or many as individual choice.
Reservation	The Reservation entity has information related to the flight reservation like PassengerID, FlightNumber, TicketPrice, ReservationStatus, and PaymentStatus. These attributes capture crucial information about the reservation, allowing the system to manage and track bookings within the airline management system.	A single reservation can involve multiple passengers, but each passenger is associated with only one reservation. This relationship tells that a reservation can include multiple passengers traveling together, such as a family or a group of friends. It is related to TravelInsurance, PaymentTransaction, and Flight entities. .
Payment Transaction	This stores information related to a specific payment made by a customer, including details such as the transaction ID, payment amount, payment method, payment status, and transaction date/time. This entity allows for effective tracking and monitoring of payment transactions within the system.	Each payment transaction is associated with one and only one reservation, and each reservation is linked to a single payment transaction. This relationship implies that a payment transaction corresponds to a specific reservation made by a customer.
Travel Insurance	The Travel Insurance entity is used for storing and managing information about the insurance policies provided by the airline. It contains attributes that store relevant information about each insurance policy. These attributes enable the system to handle insurance-related aspects of the airline's operations.	Travel insurance policy is associated with one and only one reservation, and each reservation is linked to a single travel insurance policy. This relationship indicates that a travel insurance policy is directly connected to a specific reservation made by a customer.It has one to many relationship with Coverage Details entity

Coverage Details	It helps users easily understand what is covered in their policy and supports efficient data retrieval when querying specific coverage details for a reservation. Overall, CoverageDetails contributes to a well-structured travel insurance system that accommodates future changes and delivers a seamless user experience.	The CoverageDetails entity is related to the TravelInsurance entity through the foreign key InsurancePolicyNumber. Each entry in the CoverageDetails table is linked to a specific travel insurance policy represented by the InsurancePolicyNumber in the TravelInsurance table. This relationship ensures that the coverage details are associated with the correct insurance policy and can be easily accessed when needed.