COMP3278

Project: Part-2

AIRLINE SYSTEM

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DESCRIPTION

The proposed Airline System finds its application in retrieval and manipulation of *Flight Reservations Data* and *Flight Scheduling Data.* Information related to Flight Reservations and Customers can be stored in the Proposed Manner, and this facilitates Queries to be performed on the same, in order to extract useful information.

BUSINESS RULES & ASSUMPTIONS

I. Each Airport is represented by its own Database, wherein the Name, City, and Province is recorded. Each Airport is Identified by its unique *AIRPORT_CODE*.
II. Each Flight, of a particular Airline, wherein Airline Name, days of the week the flight operates on, as well as unique *FLIGHT_ID* is recorded.
III. A particular flight may be composed of one or more legs. Each Leg stores Departure Airport, Scheduled Time of Departure, Arrival Airport, Schedules Time of Arrival. A Leg is uniquely identified by its LEG_ID. Thus, the Database design caters for the Efficient Data Management of Connecting Flights.
IV. E.g. A Flight from A to B, may be composed of the following 2 legs:
    a) Leg 1, from A to C
    b) Leg 2, from C to B

V. A Leg Instance, refers to a particular instance of a leg, concluded on a particular date. The data recorded for a leg instance includes, Actual time of Departure, Actual time of Arrival, Number of Seats Available, and the Aircraft.
VI. Information regarding Aircrafts is also recorded. For each, the Type of Aircraft, the Owning Company, as well as the maximum seating capacity is recorded.
VII. The Airport Data also is recorded, including information regarding whether a particular aircraft, can be physically accommodated in a particular airport.

SUPPORTED SYSTEM FUNCTIONALITIES

I. Finding out the number of aircraft types, capable of landing on a particular airport.
II. Finding out the aircrafts, which have greater than 200 seats(i.e. passenger aircrafts).
III. Listing the Reservations for all Direct Flights.
IV. Printing of Pre-departure list of passengers for each flight.
V. Listing the Total Number of Delayed Flights (i.e. flights for which actual departure time is after the scheduled departure time, or actual arrival time is after the scheduled arrival time, or both.)
VI. Listing out the Passengers eligible for the Frequent Flyers Rewards Programme (i.e. Top 5 Customers with highest accumulated miles).
VII. Listing out the Busiest Departure & Arrival Ports of 2020 (i.e. Ranking of airports based on highest number of gross arrived and departed flights)
VIII. Listing out the Overall Busiest Port of 2020

DATA REQUIREMENTS ANALYSIS

1. AIRPORT

ATTTRIBUTE	DESCRIPTION	
AIRPORT_CODE	Unique identifying Airport Number.	Mandatory/ Optional: Mandatory Type: INT Length: Format: Validation: Default: EXAMPLE: 001
AIRPORT_NAME	Name of Airport.	Mandatory/ Optional: Mandatory Type: VARCHAR Length: 50 Format: Validation: Default: EXAMPLE: Hong Kong International

			Airport
AIRPORT_CITY	City of Origin.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	Mumbai
AIRPORT_PROVINCE	Province of Location.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	Maharashtra

2. FLIGHT

ATTTRIBUTE	DESCRIPTION		
FLIGHT_ID	Unique Flight ID assigned by the Airline.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	33
AIRLINE_NAME	Name of the operating Airline.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	Lufthansa
FLIGHT_DAYS	Days of operation of flight.	Mandatory/ Optional	Mandatory
		Type	DATE
		Length	
		Format	
		Validation	

		Default	
		EXAMPLE	2020-01-01

3. FLIGHT_LEG

ATTTRIBUTE	DESCRIPTION		
LEG_ID	Unique LEG_ID of the Leg within a particular flight.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	1002
DEPARTURE_AIRPORT _CODE	The AIRPORT_CODE of the Port of Departure.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	001
SCHEDULED_DEPARTURE _TIME	Scheduled Time of Departure.	Mandatory/ Optional	Mandatory
		Type	DATETIME
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	'2020-01-01 20:59:59'
ARRIVAL_AIRPORT _CODE	The AIRPORT_CODE of the Port of Arrival.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	002
SCHEDULED_ARRIVAL_TIME	Scheduled Time of Arrival.	Mandatory/ Optional	Mandatory
		Type	DATETIME
		Length	

		Format	
		Validation	
		Default	
		EXAMPLE	'2020-01-01 20:59:59'

4. AIRPLANE_TYPE

ATTTRIBUTE	DESCRIPTION		
Airplane_TYPE	The Predefined TYPE of the Aircraft.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	American
MAX_SEATS	Maximum Manufactured Seating Capacity of the Aircraft.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	300
COMPANY	The Name of the Firm Manufacturing the Aircraft.	Mandatory/ Optional	Mandatory
		Type	VARCHAT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	USA.CO

5. AIRPLANE

ATTTRIBUTE	DESCRIPTION		
AIRPLANE_ID	The unique ID of the Aircraft.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	5001
AVAILABLE_SEATS	Available Seating Capacity of the Aircraft.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	290
Airplane_TYPE	The Predefined TYPE of the Aircraft.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	American

6. LEG_INSTANCE

ATTTRIBUTE	DESCRIPTION		
LEGDATE	The date of occurrence of the leg.	Mandatory/ Optional	Mandatory
		Type	DATE
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	2020-01-01
AVAILABLE_SEATS	The Seats available on the leg.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	150
DEPARTURE_TIME	Actual Time of Departure.	Mandatory/ Optional	Mandatory
		Type	DATETIME
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	'2020-01-01 20:59:59'
ARRIVAL_TIME	Actual Time of Arrival.	Mandatory/ Optional	Mandatory
		Type	DATETIME
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	'2020-01-01 20:59:59'

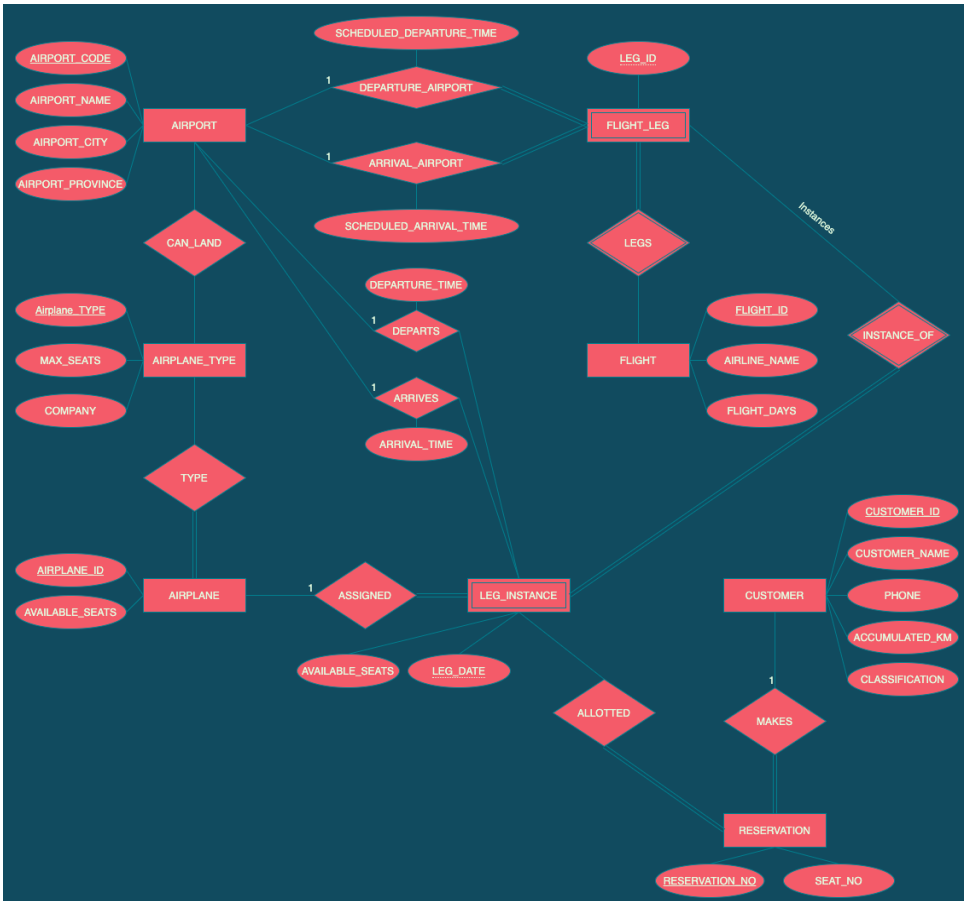
7. CUSTOMER

ATTTRIBUTE	DESCRIPTION		
CUSTOMER_ID	Unique ID of the Customer.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	30001
CUSTOMER_NAME	Name of the Customer.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	Ross
PHONE	Phone Number of the Customer.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	64639958
ACCUMULATED_KM	Accumulated Frequent flier kilometers of the Customer.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	1500
CLASSIFICATION	Classification of the Customer.	Mandatory/ Optional	Mandatory
		Type	VARCHAR
		Length	50
		Format	
		Validation	
		Default	
		EXAMPLE	Silver

8. RESERVATION

ATTTRIBUTE	DESCRIPTION		
RESERVATION_NUMBER	The unique ID of the Reservation.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	6001
SEAT_NUMBER	The Seat Number on the flight.	Mandatory/ Optional	Mandatory
		Type	INT
		Length	
		Format	
		Validation	
		Default	
		EXAMPLE	104

ENITITY RELATIONSHIP MODEL DIAGRAM



ER MODEL DIAGRAM EXPLANATION

I. A leg instance is assigned to one and only one aircraft.
II. Seats are assigned to one and only one leg instance.
III. A Flight leg has one and only one airport of departure.
IV. A Flight leg has one and only one airport of arrival.
V. A leg instance has exactly one airport of departure.
VI. A leg instance has exactly one airport of arrival.
VII. An aircraft has exactly one aircraft type.
VIII. A leg instance can be instantiated as exactly one flight leg.
IX. A flight can contain one or more than one flight legs.

RELATIONAL SCHEMA