Database Management
2020-2021
Midterm Project: Extending a Conceptual Design
(Do the homework with your 4-members team. Team members will be determined by instructor.)

PART-I ANALYSIS and DESIGN (40/100 points)
(Due date is 15 January 2021. Analysis and Design Report only.)

In this project, you will reverse engineer a database design given below.

1. Draw an EER diagram for AIRLINE relational database.

AIRPORT

Airport_code	Name	City	State

FLIGHT

Flight_number	Airline	Weekdays

FLIGHT_LEG

Flight_number	Leg_number	Departure_airport_code	Scheduled_departure_time
		Arrival_airport_code	Scheduled_arrival_time

LEG_INSTANCE

Flight_number	Leg_number	Date	Number_of_available_seats	Airplane_id
		Departure_airport_code	Departure_time	Arrival_airport_code	Arrival_time

FARE

Flight_number	Fare_code	Amount	Restrictions

AIRPLANE_TYPE

Airplane_type_name	Max_seats	Company

CAN_LAND

Airplane_type_name	Airport_code

AIRPLANE

Airplane_id	Total_number_of_seats	Airplane_type

SEAT_RESERVATION

Flight_number	Leg_number	Date	Seat_number	Customer_name	Customer_phone

According to model, the following requirements are satisfied:

The AIRLINE relational database schema shown in the above figure describes a database for airline flight information. Each FLIGHT is identified by a Flight_number, and consists of one or more FLIGHT_LEGs with Leg_numbers 1, 2, 3, and so on. Each FLIGHT_LEG has scheduled arrival and departure times, airports, and one or more LEG_INSTANCEs—one for each Date on which the flight travels. FAREs are kept for each FLIGHT. For each FLIGHT_LEG instance, SEAT_RESERVATIONs are kept, as are the AIRPLANE used on the leg and the actual arrival and departure times and airports. An AIRPLANE is identified by an Airplane_id and is of a particular AIRPLANE_TYPE. CAN_LAND relates AIRPLANE_TYPEs to the AIRPORTs at which they can land. An AIRPORT is identified by an Airport_code.

2. Extend your design to satisfy the following requirements:
    - Separate the CUSTOMER entity from the SEAT_RESERVATION and extend it with the following attributes; e-mail, adress, country, passport number.
    - Create a COMPANY entity for both AIRPLANE and AIRLINE. Use generalization/specialization hierarchy.
    - Create an entity for frequent flyer customer tracking called FFC to keep track of the customers' flight information. If a customer has checked-in physically a flight create a transaction record with the mileage information assigned to that flight leg.

    Identify all the important concepts represented in EER diagram. In particular, identify the abstractions of classification (entity types and relationship types), aggregation, identification, and specialization/generalization. Specify (min, max) cardinality constraints whenever possible. List details that will affect the eventual design but that have no bearing on the conceptual design. List the semantic constraints separately. Please do not hesitate to state your own assumptions regarding the conceptual design.

Good luck.