**Instructions:**

**In a word document, answer the following questions.**

**Keep question in the exact order they are listed in.**

**Questions should be in bold font.**

**Answers should be in non-bold font.**

**All questions are worth the same points**

**Question 1( Chapter 9) Carry out the 9 (nine) steps of the ER-to-Relational mapping algorithm on the ER diagram of following figure (An ER diagram for an AIRLINE database schema). Number / highlight as step 1,2, etc. Briefly explain each step, if possible.**

**An e r diagram of an Airport database schema. The entity, Airplane is related to Airplane type by type. Airplane has a key attribute, Airplane i d and Total no of seats. Double lines connect the entity Airplane with Type relationship box. Cardinality ratio from Airplane to Airplane Type is N:1. Airplane Type has the attributes, Type name, Maximum seats, and Company. Type name is the key attribute. Airplane type is related to airport by can land attribute. Airport has the attributes, Airport code, City, State and Name. Cardinality ratio from Airplane Type and Airport is N: M. Airport is linked to Flight leg through the attributes, Departure Airport and Arrival Airport. Departure airport has the attribute scheduled d e p time. Arrival airport has the attribute, scheduled arrival time. The relation, Departure Airport between Airport and Flight leg has a cardinality ratio 1: N. The relation, Arrival Airport between Airport and Flight leg has the cardinality ratio, 1:N. Flight leg is placed within double rectangles and has a key attribute, leg number. Double lines connect to the Flight leg from Departure and Arrival attributes. Flight Leg is related to Flight by an identifying relationship, Legs. The cardinality ratio from Flight leg to Flight is N: 1. Flight is related to Fare by the identifying relationship fares. Flight has the attributes, number, airline, and weekdays. Number is the key attribute. Cardinality ratio from Flight to Fare is 1: N. Fare has the attributes, Code, Amount, and Restrictions. Code is the key attribute. An instance of flight leg is assigned to Airplane from the Leg instance entity. Leg instance is a weak entity. It has the attributes date and Number of available seats. Date being the key attribute. The cardinality ratio from Flight Leg to Leg instance is 1:N. Cardinality ratio from Airplane to Leg instance is 1:N. Leg instance is related to airport by Departure time and Arrival time. Cardinality ratio from Leg instance to Airport through the Arrival time relation is N:1 and ratio from Leg instance to airport through departure time relation is also N:1. Entity seat is related to Reservation and the cardinality ratio is N. It has a key attribute of seat number. The reservation entity has the attributes, customer name and customer phone.   The relationship box is related to leg instance and has a cardinal ratio of 1.  A note below the diagram reads, A Leg is a nonstop portion of a flight. A LEG INSTANCE is a particular occurrence of a LEG on a particular date.**

Step 1: Strong Entity

Airport, Flight, Airplane, Airplane\_type

Step 2: Weak Entity

Leg\_instance, Flight\_Leg, Seat, Fare

Step 3: 1:1 Mapping

This step includes mapping 1:1 relationship types, which it looks like there are none of.

Step 4: 1:N Mapping

Type, Assigned, Reservation, Departs, Arrives, Departure\_airport, Arrival\_airport, Instance\_of, Legs, Fares

Step 5: M:N Mapping

Can\_land

Step 6: Multivalued Attributes

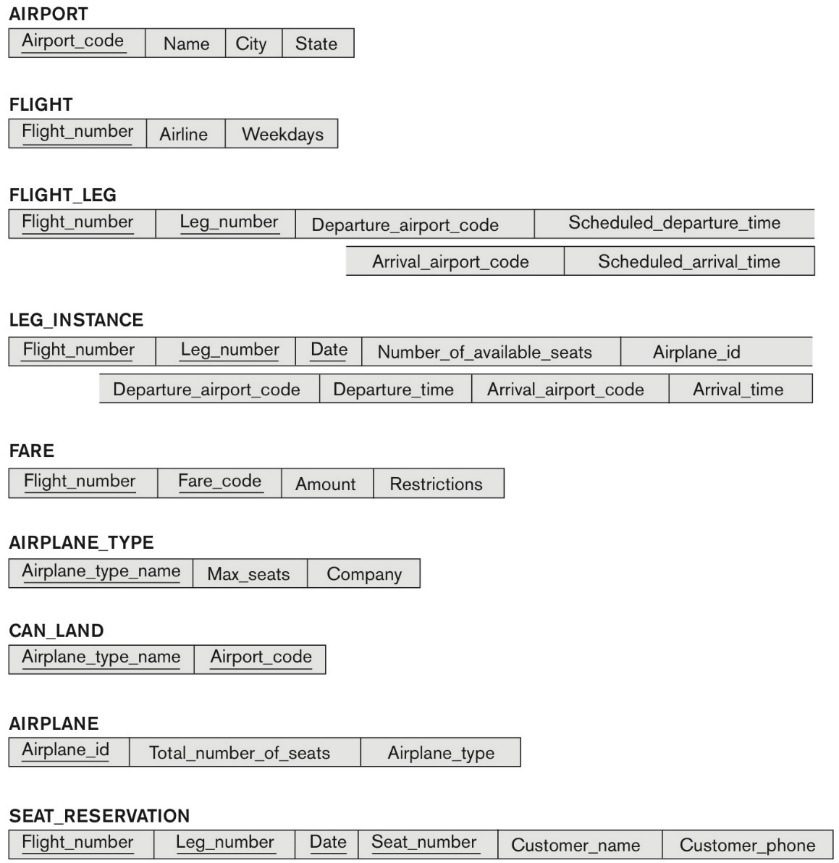
It seems like this ER doesn’t have any multivalued attributes

Step 7: N-ary Mapping

Seat\_Reservation

Step 8: Options for Mapping Generalization

Step 9: Mapping of Union Type

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