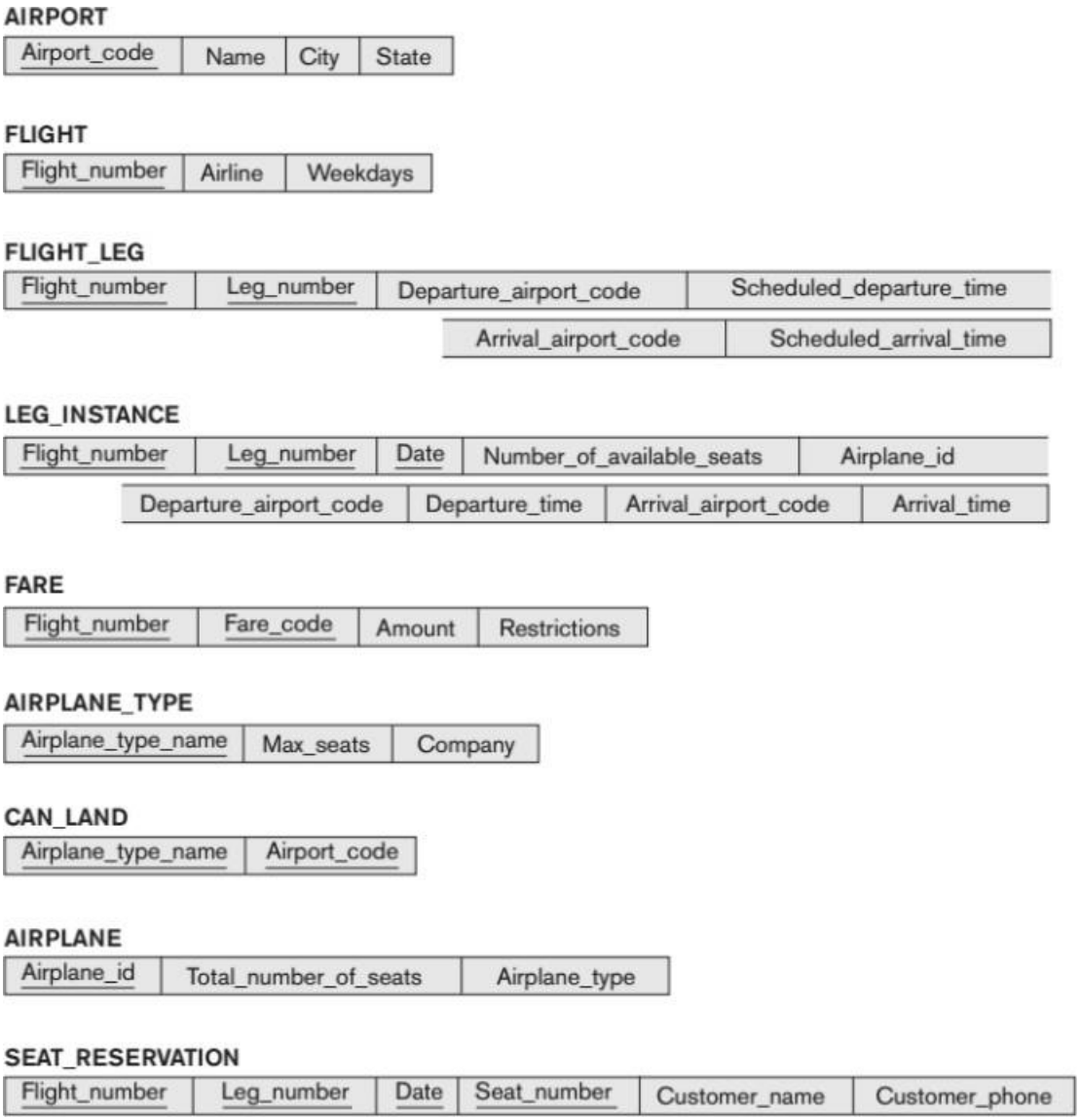
REPORT

1.1) INFORMATION ABOUT SCHEMA



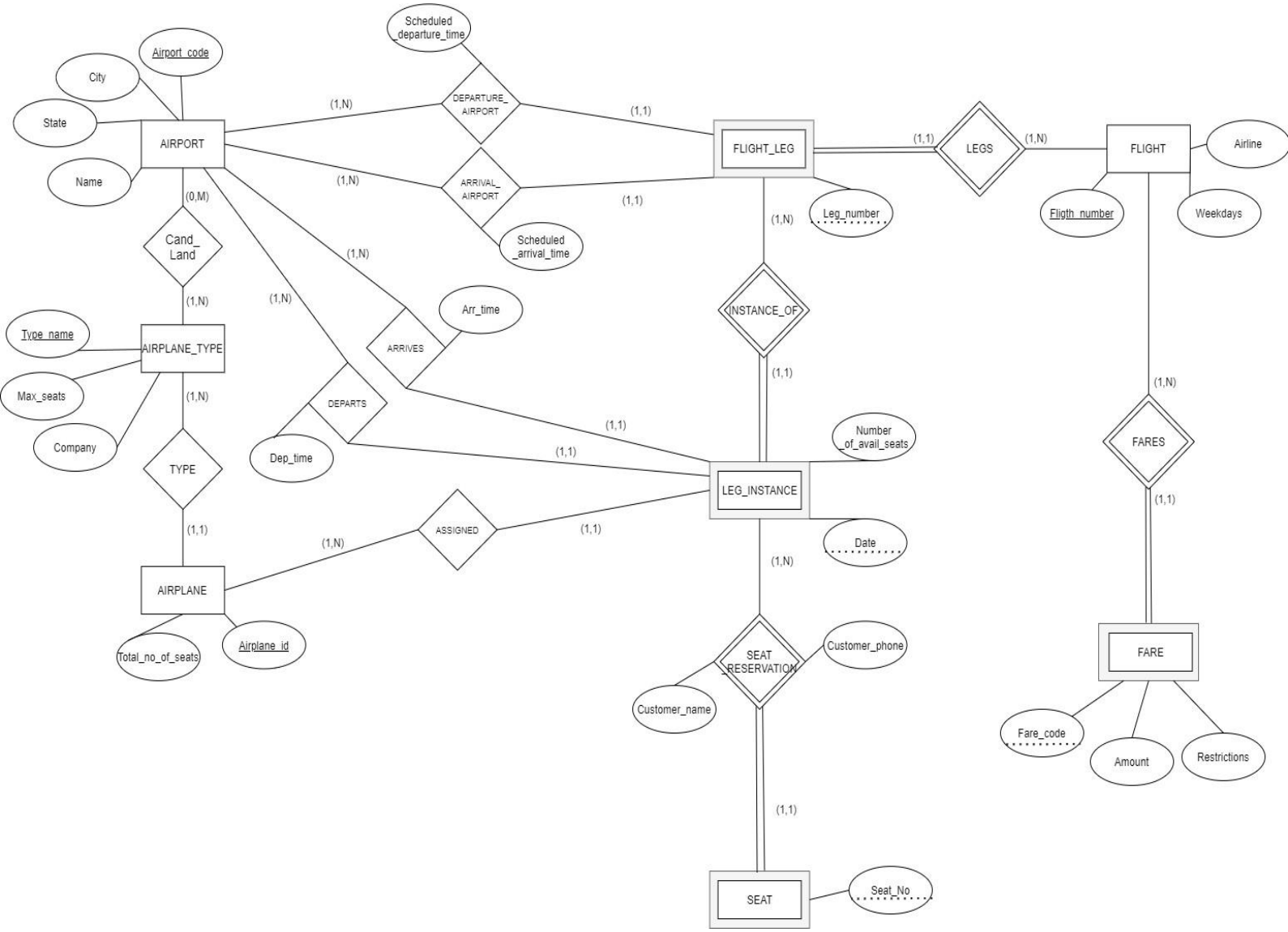
Primary Keys:

PrimaryKey(AIRPORT) = AIRPORT.Airport_code
PrimaryKey(FLIGHT) = FLIGHT.Flight_number
PrimaryKey(FLIGHT_LEG) = FLIGHT_LEG.Flight_number + FLIGHT_LEG.Leg_number
PrimaryKey(LEG_INSTANCE) = LEG_INSTANCE.Flight_number +
LEG_INSTANCE.Leg_number
PrimaryKey(FARE) = FARE.Flight_number + FARE.Fare_code
PrimaryKey(AIRPLANE_TYPE) = AIRPLANE_TYPE.Airplane_type_name
PrimaryKey(CAN_LAND) = CAN_LAND.Airplane_type_name +
CAN_LAND.Airport_code
PrimaryKey(AIRPLANE) = AIRPLANE.Airplane_id
PrimaryKey(SEAT_RESERVATION) = SEAT_RESERVATION.Flight_number +

Foregin Keys:

SEAT_RESERVATION.Leg_number + SEAT_RESERVATION.Date +
SEAT_RESERVATION.Seat_number
For FLIGHT_LEG, Flight-number is a foreign key.
For LEG_INSTANCE, Flight-number and Leg_number are foreign keys.
For FARE, Flight_number is foreign key.
For CAN_LAND, Airplane_type_name and Airport_code are foreign keys.
For SEAT_RESERVATION, Flight_number and Leg_number are foreign keys.

1.2) EER DIAGRAM



1.3-) EXPLANATION OF EER DIAGRAM

In the diagram below,

- An AIRPLANE must have one AIRPLANE_TYPE, an AIRPLANE_TYPE can be the type of one or more AIRPLANE.

- An AIRPLANE_TYPE can land to one or more AIRPORT, an AIRPORT can be landed by zero or more AIRPLANE_TYPE.

- A FLIGHT can have zero (this FLIGHT can be made by a person) or more FARE ,a FARE must depend on one FLIGHT.

- A FLIGHT can have one or more FLIGHT_LEG, A FLIGHT_LEG must depend on one FLIGHT.

- A FLIGHT_LEG must have one DEPARTURE_AIRPORT and one ARRIVAL_AIRPORT, AIRPORT can be added by one or more FLIGHT_LEG.

- A FLIGHT_LEG can be instanced by one or more LEG_INSTANCE, LEG_INSTANCE must instance one FLIGHT_LEG.

- A LEG_INSTANCE can be made by one AIRPLANE, AIRPLANE can be assigned to one or more LEG_INSTANCE.

- A LEG_INSTANCE can have zero or more reservation.

- A SEAT must depend on one LEG_INSTANCE.

2.1) INFORMATION ABOUT SCHEMA

AIRPORT

Airport_code	Name	City	State	Airport_cordinats

FLIGHT

Flight_number	Airline_id	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	Airplane_id	Number_of_available_seats	Departure_airport_code	Arrival_airport_code	Departure_time	Arrival_time

FARE

Fligth_number	Fare_code	Amount	Restrictions

AIRPLANE_TYPE

Airplane_type_name	Max_seats

CAN_LAND

Airplane_type_name	Airport_code

AIRPLANE

Airplane_id	Company_id	Airplane_type_name	Total_number_of_seats

SEAT_RESERVATION

Fligth_number	Leg_number	Customer_id	Seat_number	Date

CUSTOMER

Customer_id	Customer_name	Customer_phone	Pasaport_number	Customer_email	Customer_adress	Customer_country

CHECK_IN

Customer_id	Fligth_number	Leg_number	Check_position

TRANSACTION_RECORD

Fligth_number	Leg_number	Customer_id	Mileage

FFC

Customer_id	FFC_card_no	Credit_point	Airline_id

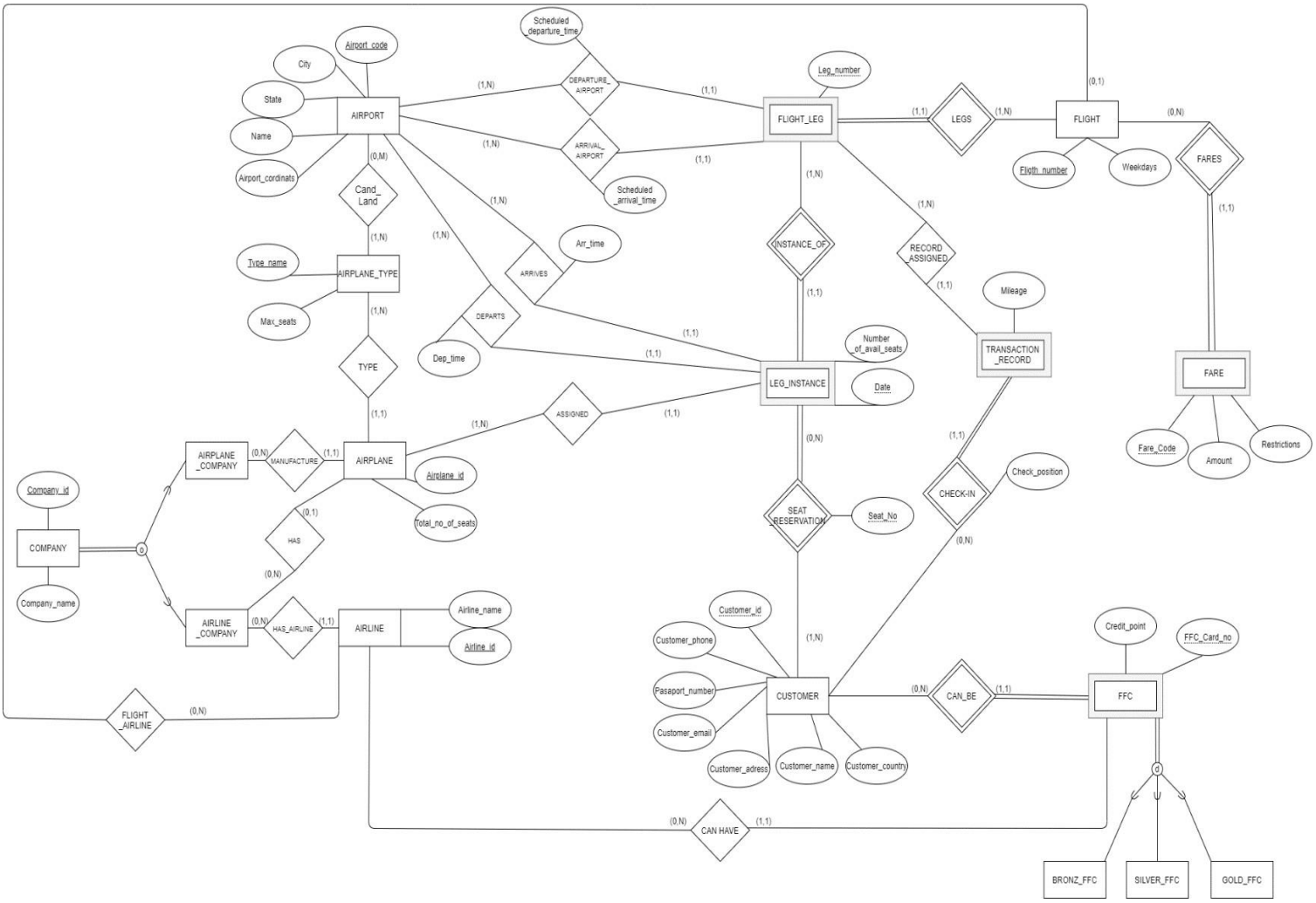
AIRLINE

Airline_id	Company_id	Airline_name

COMPANY

Company_id	Company_name

2.2) EER DIAGRAM



2.3) EER DIAGRAM EXPLANATIONS

- COMPANY can be a AIRPLANE_COMPANY, AIRLANE_COMPANY or both of them.
- If this COMPANY is an AIRPLANE_COMPANY, it can manufacture zero or more AIRPLANE and an AIRPLANE must be manufactured by one AIRPLANE_COMPANY.
- If this COMPANY is an AIRLINE_COMPANY, it can have zero or more AIRPLANE and an AIRPLANE can be depended on zero (this AIRPLANE can be a private jet) or more AIRLINE_COMPANY.
- If this COMPANY is an AIRLINE, it can have zero or more AIRLINE and an AIRLINE must be depended on an AIRLINE_COMPANY.
- An AIRPLANE must have one AIRPLANE_TYPE, an AIRPLANE_TYPE can be the type of one or more AIRPLANE.
- An AIRPLANE_TYPE can land to one or more AIRPORT, an AIRPORT can be landed by zero or more AIRPLANE_TYPE.
- An AIRLINE can have zero or more FLIGHT, FLIGHT can have zero (this FLIGHT can be made by a person) or one AIRLINE.
- A FLIGHT can have zero (this FLIGHT can be made by a person) or more FARE ,a FARE must depend on one FLIGHT.
- A FLIGHT can have one or more FLIGHT_LEG, A FLIGHT_LEG must depend on one FLIGHT.
- A FLIGHT_LEG must have one DEPARTURE_AIRPORT and one ARRIVAL_AIRPORT, AIRPORT can be added by one or more FLIGHT_LEG.
- A FLIGHT_LEG can be instanced by one or more LEG_INSTANCE, LEG_INSTANCE must instance one FLIGHT_LEG.
- A FLIGHT_LEG can hold one or more TRANSACTION_RECORD, a TRANSACTION_RECORD can assigned to one FLIGHT_LEG.
- A TRANSACTION_RECORD can be created by one CUSTOMER when this CUSTOMER physically check-in and a CUSTOMER can create one or more TRANSACTION_RECORD.
- A LEG_INSTANCE can be made by one AIRPLANE, AIRPLANE can be assigned to one or more LEG_INSTANCE.
- A LEG_INSTANCE's seat can be made reservation by zero (this FLIGHT can be made by a person) or more customer, CUSTOMER can make reservation to one or more LEG_INSTANCE.
- A CUSTOMER can be one or more (for different companies) Frequently Flyer Customer, a FFC must be a CUSTOMER.
- A FFC must be depended on an AIRLINE, an AIRLINE can have zero or more FFC.
- A FFC can be a BRONZ_FFC, SILVER_FFC or GOLD_FFC.

2.4) NEW REQUIREMENTS

COMPANY: We added two different types for company entity. AIRPLANE_COMPANY is manufacturer company of an AIRPLANE.AIRLINE_COMPANY is that has AIRLINE and AIRPLANES.
For example: THY and AnadoluJet are two different AIRLINE but THY COMPANY is owner of AnadoluJet. In this example we presume that THY COMPANY has AnadoluJet and THY airlines.

FFC: We create FFC entity according to total mileages of Customer.
There are 3 different FFC types. These are BRONZ_FFC, SILVER_FFC and GOLD_FFC.
We differ customer according to FFC's Credit_point.

TRANSACTION_RECORD: If a customer check-in, it creates a transaction record with the mileage information assigned to that flight leg.
We calculate milage from the Airport_cordinates attribute that is placed at AIRPORT entity.

2.5) SPECIALIZATION/ GENERALIZATION:

COMPANY entity type is a superclass to two different subclasses:AIRLINE_COMPANY and AIRPLANE_COMPANY. This
specialization is overlapping, meaning a COMPANY can be one of them or both of them.

FFC entity type is a superclass to three different subclasses: BRONZ_FFC, SILVER_FFC and GOLD_FFC. This specialization is disjoint, meaning a FFC can be only one type FFC type.

2.6) CLASSIFICATION

Strong Entities:

FLIGHT
CUSTOMER
AIRPORT
AIRLINE
AIRPLANE_TYPE
COMPANY

WEAK ENTITIES:

FFC
FLIGHT_LEG
FARE
TRANSCATION_RECORD
LEG_INSTANCE

RELATIONSHIPS:

MANUFACTURE
HAS
HAS_AIRLINE
FLIGHT_AIRLINE
TYPE
CAND_LAND
DEPARTURE_AIRPORT
ARRIVAL_AIRPORT
CAN_HAVE
ASSIGNED
DEPARTS
ARRIVES

IDENTIFICATION RELATIONSHIPS:

LEGS
FARES
INSTANCE_OF
SEAT_RESERVATION
CHECK-IN
CAN_BE

2.7) SEMANTIC CONSTRAINTS:

- Seat reservation count of a LEG_INSTANCE must be less than or equal to count of total seat number of plane.
- Customer count of a LEG_INSTANCE must be less than or equal to count of total seat number of plane.
- Before a AIRPLANE lands, it cannot take off.
- FFC count must be less than or equal to count of CUSTOMER.
- If landing is forced landing, a AIRPLANE can land to unspecified airport.
- A CUSTOMER cannot check-in for more than one FLIGHT at the same time.

2.8) DETAILS THAT WILL AFFECT THE EVENTUAL DESING:

- A CUSTOMER has to check in 60 minutes before departure.
- Kids between 2-12 can’t fly without parent.
- Kids over 2 years old must buy a ticket.
- A CUSTOMER cannot get on the plane without payment,reservation or check-in.
- A CUSTOMER cannot make reservation to a SEAT that had been made reservation by another CUSTOMER.
- For some reasons, flights can be cancelled or postponed.