



CMPE353/CMSE354

Database Management Systems

Labs 2-6

Design of a Simplified Airline Ticket Reservation System

Fall 2023 Semester

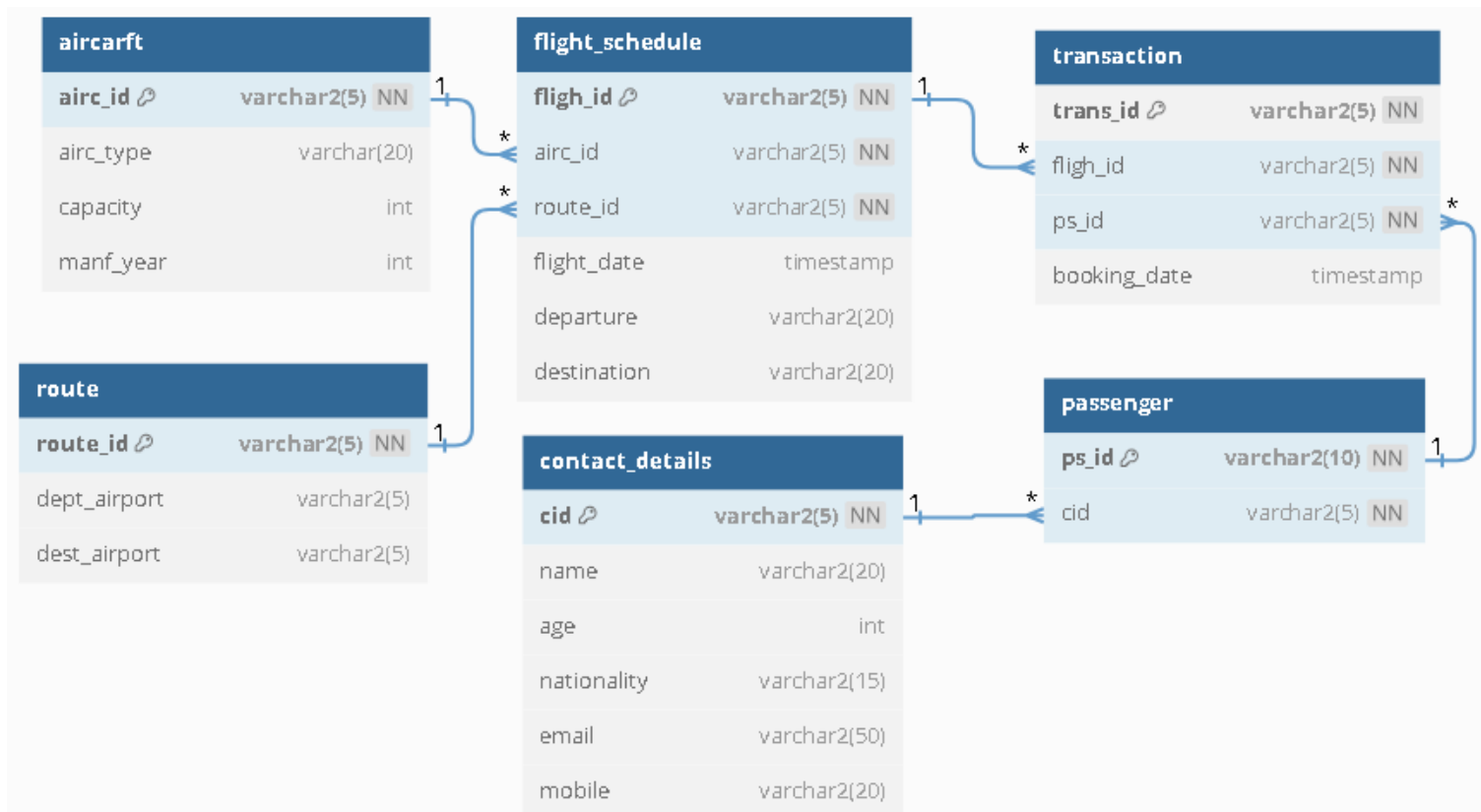
**Task:** You are asked to design a relational database according to the given schema diagram below using Oracle Live SQL software. The task has several subtasks and each of them is described below. Each task will be carried out during weekly lab hours (Labs 2-6). Therefore, each subtask must be completed weekly by the set lab dates (see dates below).

**Problem:** The aim is to develop a simple database scheme that represents an example of a used dataset in an Airline Ticket Reservation System.

The schema diagram below is designed to keep the data of an airline company. The data includes the fleets' information, routes, flight schedules, passengers, and reserved tickets.

In an airline ticket reservation system, an airline provides flights in specified routes according to the market need and available fleets. Passengers according to their schedule and the offered flights by the airline reserve their tickets. At the time of ticket reservation companies usually ask for more personal information which is used later for sending advertisements or announcements. In this system,

1. There are 6 tables in total. "aircraft", "flight\_schedule", "transaction", "route", "passenger", and "contact\_details".
2. Each airplane has a unique ID and their information including their type, their capacity, and their manufacture year are saved in a table named "aircraft".
3. Available routes including the departure and arrival points are saved in the "route" table with a unique ID. Departure and arrival points are the abbreviation of the airport name.
4. The information of customers regardless of reserving a ticket or not is saved in the "contact\_details" table. Information includes a unique ID for each person, name, age, nationality, email, and phone number.
5. A list of scheduled flights by the airline is saved in the flight\_schedule table. Each entry in this table includes a unique ID for each flight, the ID of the aircraft assigned to that route, the ID of the route, date, and departure and arrival airports.
6. Each passenger is saved in the "passenger" table with a unique ID and the customer ID from the "contact\_details" table.
7. Information on the reserved tickets is saved in the "transaction" table. Each transaction has a unique ID. Other information includes flight ID, passenger ID, and reservation date.
8. Each passenger can have many reservations. However, each reservation is assigned to a single passenger.
9. Each aircraft can be used in many scheduled flights. However, each flight is performed by a specific aircraft.
10. There can be many transactions for a specific scheduled flight.
11. Each entry of the "contact\_details" table goes to many entries of the "passenger" table.
12. Each scheduled flight has a specific route, however, the reverse is not correct.



### LAB 2:

- Build the tables in Oracle Live SQL with your account according to the schema.
- Build the relations among the tables.
- Delete, modify, or update the tables.
- Delete, modify, or update the constraints.
- Insert sample data into tables.

### LAB 3:

- Insert sample data into the tables. (**AT LEAST 20 RECORDS FOR EACH TABLE**)
- Modify, update, or delete entries.

### LAB 4, 5:

1. How many aircraft does the company have?
2. How many “**Airbus A320**” does the company have?
3. Which aircraft has the maximum and minimum capacity?
4. How many registered customers does the company have?
5. Which aircraft has the most number of scheduled flights?
6. Assuming that all the airplanes are in operation, what is the total number of seats?
7. What is the flight information of passenger “**Sophie Martin**”?
8. Which route has the most number of flights?
9. What is the first scheduled flight to the “**JFK**” airport?
10. In which route does the oldest aircraft operate?

11. Which passenger has the most number of reserved tickets?
12. “**Emma Schwass**” is a new customer. First, register her in the system. Then, reserve a ticket for her on the nearest flight from MUC to FCO.
13. Passenger “**Elena Petrova**” has a problem and needs to reschedule his flight. Update his ticket and reschedule it to the next available flight.
14. Flight number “**F018**” has been cancelled. What is the name and phone number of passengers on that flight?
15. How many flights each airplane has per day?
16. Repeat Question 12 using variable declaration and fetching data.

**LAB 6:**

Write a trigger when a reservation gets canceled by the passenger, the corresponding entry gets removed from the transaction table too. (Update and Delete).

**LAB 7:**

Quiz and representation of all works done throughout the semester.