Exercise 1

You've been contracted as the database designer for an airline company. They want you to design a database which is able to handle large amounts of requests and therefore has to be normalized. The first step they want you to take is to design an E/R diagram to help their developers visualize the database.

They have set the following demands:

- Customers should have a first name, last name, email, phone number and an address
- Employees should have a first name, last name, work email, work phone and a representation of their role within the company (e.g. pilot, stewardess, cook, etc.)
- Tickets should have a price
- Flights should have origin, destination, departure time, arrival time, number of seats on the flight and number of seats left (e.g. number of seats minus number of bought tickets for the flight)
- Flights should have a crew (e.g. employees assigned a flight)
- Customers should be able to buy a ticket

Exercise 2

You've created your E/R diagram, but the developers don't understand SQL, so you need to create the tables and queries they need.

- Make tables based on your E/R diagram
- Make a query which gets a specific employee based on their phone number
- Make a query which gets a customer based on their ID
- Make a query which gets an employee based on their email
- Make a query which gets all customers with a Gmail email (e.g. all customers where the email ends with gmail.com)
- Make a query which gets all the customers for a specific flight
- Make a query which gets all the flights that travels to Amsterdam (Netherlands) between 1. June 2020 to 10. June 2020
- Make a query which get all the customers who have booked a flight to Paris (France) on 2. June 2020

Exercise 3

The developers are happy with your SQL queries; however, they have noticed that the database is a bit slow. Make the database faster. (NF = Normal Form)

- Check that your tables is in 1NF
- Check that your tables is in 2NF
- Check that your tables is in 3NF
- Check that your tables is in Boyce-Codd NF
- Check that your tables is in 4FN
- Create indexes to make the database faster

Exercise 4

The developers are impressed. They have one last request. They would like to be able to query how many seats are left on a specific flight without having to calculate it themselves (lazy developers).

- Create a Trigger which, whenever a ticket is sold, updates the number of seats left on a flight.