

## TD – Entity-Relationship Model

### Exercise 1.

Propose a conceptual schema for a library according to the following requirements :

The library allows its registered members to borrow any (available) copy of any book at any time. Each member is required to submit his name, address and telephone number at registration, at which time a unique member id is assigned to her/him. Each book is characterised by its title, author, first publication date and ISBN. The library stores some of the books in several copies, however, it may also happen that some books are not available at all. For each copy, the library additionally records the date and publisher of the issue, the language and a unique code of the copy.

### Exercise 2.

Propose a conceptual schema for the following usecase :

A fast food chain is designing a new employee management system. They want to record the following information about each employee : name, address, SSN, date of birth, sex, salary, start date and the restaurant at which they're employed. The restaurant is characterised by its location, size (in terms of customer seating) and internal identifier (number). Additionally, the manager and the date they started their job as manager and the total number of employees should be recorded for each restaurant. Finally, the company has recently started a new program for training new employees. Each new employee is assigned a single supervisor among the senior employees.

### Exercise 3.

Propose a conceptual schema for a football player database :

Design a database that will keep track of performance of football players during a single season. The database should contain information on each player of each team, regardless whether they are in the starting eleven. Each team is characterised by its name, home stadium and home city. Apart from team affiliation, the following information should be tracked about each player : appearances, goals, assists, cards, date of birth, age and of course name and a unique player id. Finally, it is desirable to keep track of each match, including the date, result, participating teams and players and position played, goals, assists and cards for each player.

### Exercise 4.

Propose a conceptual schema for tracking of applied remedies in a hospital :

The hospital is separated into several wards. Each ward has an unique identifier, name, location and specialisation. The wards are populated by patients. Each patient is assigned a registration number and the his name, address, sex and date of birth (age) are recorded. The medicine prescribed to the patients is characterised by its name, producer, address of producer/distributer and a unique identification code. Each prescription is done by a single doctor on a specific date. Each doctor has an employee number, name and works in one of the hospital wards.

**B variant :** The medicine prescriptions are done for a precise time period. Prevent having the same medicine prescribed for the same patient twice on the same day.

### Exercise 5.

Construct a conceptual schema for a simplified airline information system according to the following requirements, justify any additional assumption you make.

- Maintain a database of airports, characterised by their ICAO code, name and location (city and country).
- The airlines has numerous scheduled flights, characterised by flight number, days of the week at which the flight operates, departure and arrival airports and departure and arrival times.
- For each of the scheduled flights individual flight instances are kept for each date the flight is active.
- An aircraft is assigned to each of the flight instances.
- Each aircraft is characterised by its tail number, model, year of manufacture (age) and base (the airport where its parked outside of active hours).
- Customers can make reservations for flights, possibly multiple at once.
- Each reservation is characterised by a reservation number, the passengers (name, passport number), a customer contact email and telephone and a seats for each flight.