Practice Class 2

Objectives

Conceptual Design of Database
Use of Entity-Relationship Diagrams

Note: You must follow the response template provided and only legible diagram submissions in PDF or image format (PNG, BMP, JPG and SVG) are accepted.

Assignment 2.1

Consider a Stock Management System of a company. This exercise proposes to model the part of the orders of this information system according to the following premises:

- The company commercializes various products that are characterized by a code, name, price and VAT rate;
- At every moment the number of units of each product in warehouse should be known;
- One order is characterized by the order number, the date it was placed, and a single supplier. An order contains one or more items (i.e. products) and correspondent units;
- Each supplier is characterized by a name, tax information number, address, fax number, payment terms (ready, 30 days, 60 days, etc.) and an internal code of the type of supplier (this code is associated with a designation);

a) Identify the entities, attributes, and relationships of the database;
b) Specify the relationships regarding the degree, cardinality and instances mandatory participation of the entities in the relationship;
c) Develop the conceptual design of the database using an entity-relationship diagram. In the first phase, use a pencil and paper to complete the task. Once the paper drawing is complete, transpose the diagram into an electronic format using a graphical tool such as draw.io, Microsoft Visio, or Visual Paradigm.

Assignment 2.2

Use an Electronic Medicines Prescription System with the following characteristics:

- A prescription is performed by a doctor of the National Health System (SNS) for a patient, involving one or more drugs. Each prescription has associated a unique number of prescriptions and a date.
- A doctor is characterized by an identification number assigned by the NHS, a name and a medical speciality;
- A patient is characterized by a user number, name, date of birth and address;
- A drug is characterized by a trading name (which may not be unique) and a formula. A drug is produced by a pharmaceutical company and its name is unique among all products of this pharmaceutical;
- A pharmacist is characterized by a number of national registration, name, address and telephone number;

- The drugs are sold in pharmacies. A prescription is processed by a single pharmacy, i.e. it is not possible to purchase part of the drugs of the same prescription in different pharmacies;
- It is intended to keep the date on which a prescription was processed at the pharmacy. However, there are situations in which patients do not make use of the prescription;
- A pharmacy is featured by a NIF, name, address and telephone number (NIF is a Portuguese fiscal number).

a) Develop the conceptual design of the basis of the Electronic Medicines Prescription System using an entity-related diagram.

Assignment 2.3

Consider a Conference Management System with the following features:

- A number of scientific articles are presented at a conference, each characterized by a title and a registration number;
- An article has one or more authors characterized by a name, email address, and institution;
- A person can be the author of several articles;
- An institution is characterized by a name and address;
- In one conference we also have the participants for whom we want to register the name, address, email address, institution and registration date;
- There are two types of participants: students and non-students;
- Student participants require a proof issued by the educational institution to be exempt from the cost of registration. The information system shall record the location of that evidence;
- For non-student participants it is necessary to record the reference of the bank transaction that supported the registration fee.

a) Develop the conceptual design of the Conference Management System database using an entity-related diagram.

Assignment 2.4

Consider an Kindergarten Management System with the following characteristics:

- The Kindergarten is organized by classes with a certain level of education and there are 5 classes: 0 (preschool), 1, 2, 3 and 4;
- A class is characterized by an identifier, school year, assignment, teacher, and maximum number of students;
- There is a set of activities available for one or more classes. Each activity has an identifier, designation, and associated cost (financial value). The attendance of an activity by a student in a class is optional;
- A student is characterized by name, citizen card number, address and date of birth;

- A teacher is characterized by an employee number, name, citizen card number, address, date of birth, telephone contact and email;
- A student has a guardian characterized by name, citizen card number, address, date of birth, telephone contact, email and a relationship with the student (father, mother, grandfather, grandmother, etc.);
- There is a list of people with permission to deliver or pick up the student. These people have a similar type of record to the parent.

a) Develop the conceptual design of the University Information System database using an entity-related diagram.
b) *[Optional]* Continue to model the problem to record the financial processes (monthly fees, activities, payments, family discount, etc.). Define requirements freely;