

Level: 2nd year Bachelor's degree in Computer Science (2024/2025)

Module: Information Systems

Exercise Set No. 6

Exercise 1:

The preliminary study of an information system for managing thesis defenses at a university has resulted in the following management rules:

RG1 - A student can be enrolled in only one program.

RG2 - A program comprises several students.

RG3 - A professor can be part of at most two juries.

RG4 - A jury is composed of at least 3 and at most 4 professors.

RG5 - A final project is defended in front of only one jury.

RG6 - A jury evaluates at least one final project and at most three final projects.

RG7 - A student prepares one and only one final project.

RG8 - A final project is prepared by at most three students.

The collection of information handled by this system has led to the following data list:

ProfessorCode, StudentLastName, StudentFirstName, ProfessorLastNameFirstName, degree, ProgramCode, ProgramName, FinalProjectTitle, FinalProjectCode, jury president, JuryCode, StudentCode, university entry date, defense date.

- Propose a data dictionary for this system.
- Propose a conceptual data model for this system.

Exercise 2:

Consider a real estate agency that offers the rental of various types of accommodations (houses and apartments). This agency wishes to manage its accommodations, knowing the name of the municipality and neighborhood where each type of accommodation is located and also the individuals who have rented these accommodations (only the signatories). The price for each accommodation depends on its type (house, apartment, studio), and the agency will always charge the same flat fee to its clients in addition to the rent. For example, to rent a studio, the price equals the rent + 1000 DZD in charges per month. An accommodation is also characterized by its area, address, and rent. Each client is characterized by their name, first name, date of birth,

and phone number. This system must record the number of residents in each municipality and the distance between the municipality and the agency. The developed system must also manage the rental history of these accommodations by individuals. It must also record the start date and end date of each rental. Each client can sign several lease agreements. Additionally, each accommodation may be rented multiple times over time. It is considered that each municipality has one or more neighborhoods. The neighborhood is the geographical unit used for managing these accommodations.

- Propose a conceptual data model for this system.

Exercise 3:

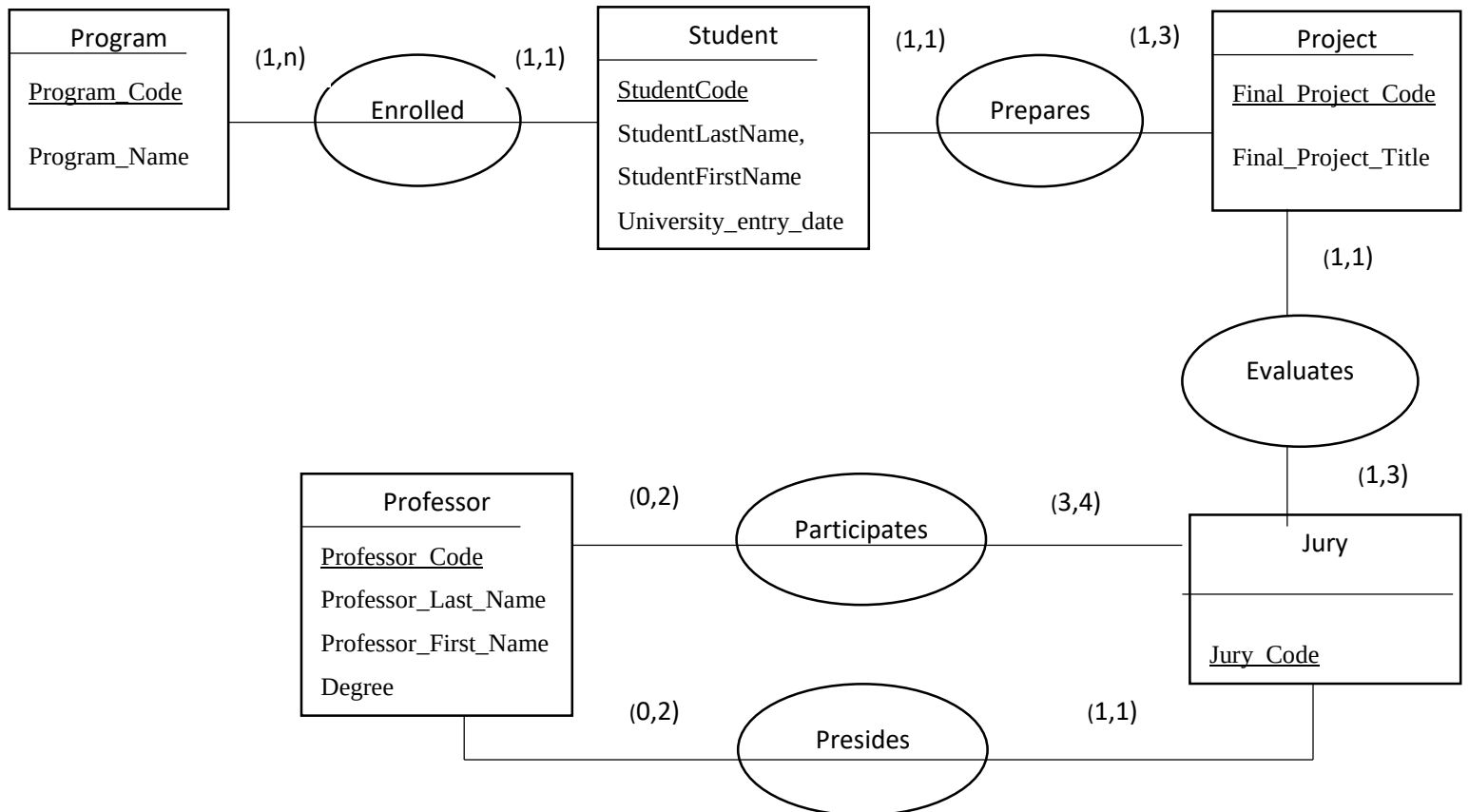
The company "Beautiful House" is an LLC specialized in the construction and furnishing of modern houses for its clients. Each construction project is distinguished by a building permit number, an area, an address, a start date of the work, and an anticipated completion duration in months. In addition, the company keeps information about its clients, such as their names, first names, and phone numbers, knowing that a client may own more than one house. The company carries out its work with a set of workers, where each worker is distinguished by a code, a name, a first name, and a phone number. The workers are distributed according to a range of specialties, where each specialty is distinguished by a number, a designation (masonry, electricity, plumbing, plaster, painting, etc.), and a salary. A worker belongs to only one specialty. Each project is designed by an architect. For the proper monitoring of the work, the company must coordinate with this architect, and consequently, it must keep their contact information (business registration number, name, first name, and phone number).

- Propose a conceptual data model for this system.

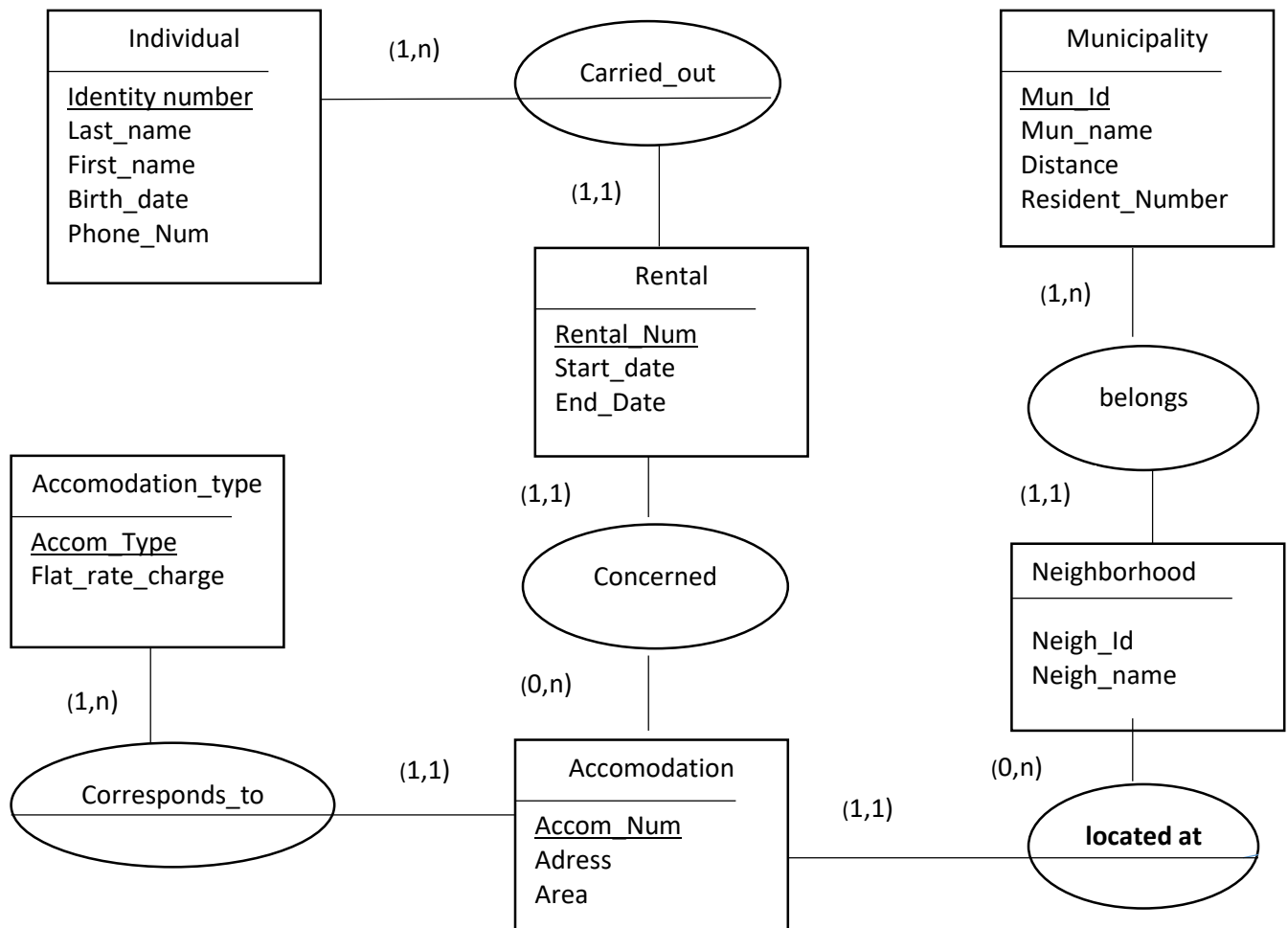
Correction

Exo1

Code	Meaning	Type	Length	Syntax rules	Semantic rules
Student_Code	Student code	N	10	DD/MM/YYYY	
Student_Last_Name,	Student last name	A	20		
Student_First_Name	Student first name	A	20		
University_entry_date	Univ entry date	D	10		
Program_Code	Program code	N	10		
Program_Name	Program name	A	20		
Professor_Code	Professor code	N	10		
Professor_Last_Name	Professor last name	A	20		
Professor_First_Name	Professor first name	A	20		
Degree	Professor degree	A	20		
Final_Project_Code	Final project code	N	10	DD/MM/YYYY	
Final_Project_Title	Final project title	AN	15		
Jury_Code	Jury code	N	10		
Defense_date	Defense date	D	10		



Exo 2



Exo 3

