

American University of Beirut
Department of Electrical and Computer Engineering

EECE 433 Database Management Systems
Fall 2024

Assignment 3 – E-R Design

This programming assignment is due on Monday Sept 30, 2024 at 12.00 pm.

General Rules:

- **Late Submissions:** Submissions are not allowed after 24 hours from the deadline. For every additional hour past the deadline, a penalty of 4% will be applied.
- **Cheating and Copying:** Any form of cheating or copying from other students' work will result in a zero grade for all involved students, regardless of who copied from whom. Each assignment must be entirely unique.
- **Plagiarism and Academic Misconduct:** All forms of plagiarism, cheating, and academic misconduct are strictly prohibited and will be dealt with severely. We have a **zero-tolerance policy** regarding these offenses. Any student found guilty will receive a zero grade, the case will be referred to a disciplinary committee, and a Dean's warning will be issued. Be aware of the consequences: you may lose scholarships or other benefits. Please avoid such actions; they are not worth the risk.
- **Submission Quality:** Submissions that are unintelligible, corrupt, or missing will be considered incorrect and will receive a grade of zero. It is your responsibility to ensure the accuracy and completeness of your submission not ours.
- Please refer to the Student Code of Conduct, all relevant university policies, and the course syllabus for further penalties related to academic offenses.

N.B. Students that have accommodation letters should contact us as soon as possible.

Deliverables:

- You are requested to submit two ER diagrams per each exercise, one using min max notation and another ER diagram for cardinality & total /partial participation (both diagrams following Chen notation). For each exercise, state any assumptions you make in clear text, in case there's any missing requirement concerning cardinalities.
- Use draw.io for your ER Diagrams, then use the snipping tool to insert each drawing in the word file.
- **You are asked to submit one single word file with the solutions of all 3 Exercises.**

Exercise 1 –

Draw an E-R diagram for a health company that rents room clinics for doctors. The following describes this company:

- Patients are identified by an SSN, a name, an address, and a date of birth.
- Doctors are identified by a doc ID. For each doctor, the name, specialty, years of experience, and room rent fee must be recorded.
- Each pharmacy is identified by a pharm ID, name and a phone number.
- Each drug has a drug ID, a trade name and formula.
- Patients may have one or more doctors. Doctors may have many patients.
- Doctors and their dependents, spouse, children, parents, and other relatives are insured by the company at a cost.

- Each dependent has a name, relation to the doctor and associated insured price the doctor has to pay.
- Each pharmacy sells drugs and has a price for each. A drug could be sold at several pharmacies, and the price could vary from one pharmacy to another.
- Doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors. Each prescription has a date, a drug item and a quantity associated with it. You can assume that, if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored.
- Pharmacies appoint a supervisor, who is a doctor. There must always be one supervisor for each pharmacy.

Exercise 2 –

Draw an E-R diagram for a real estate firm that lists property for sale. The following describes this organization:

- The firm has a number of sales offices in several cities in Lebanon. Attributes of sales office include Office_Number (identifier), location and budget.
- Each sales office is assigned one or more employees. Attributes of employee include Employee_ID (Identifier) & Employee_Name.
- An employee must be assigned to only one sales office.
- For each sales office, there is always one employee assigned to manage that office. An employee may manage only the sales office to which he/she is assigned.
- The firm lists property for sale. Attributes of property include Property_ID (identifier), addresses, and prices. We may have several addresses associated for each property.
- Each unit of property must be listed with one (and only one) of the sales offices. A sales office may have any number of properties listed, or may have no properties listed.
- Each unit of property has one or more owners. Attributes of owners are Owner_ID (identifier) and Owner_Name. An owner may own one or more units of property. An attribute of the relationship between property and owner is Percent_Owned.

Exercise 3 –

Draw an E-R diagram for a national library organization. The following describes this library system:

- A publisher has a name and an address.
- A book has a book ID, one or more Authors, and a title. It has only one publisher.
- We have several libraries where each library branch has a branch ID, name and address.
- A specific book can be found in different library branches.
- A borrower has a card ID, name and phone#.
- The borrower can borrow a book from a specific library branch at a specific date.
- There is also a set due date and a penalty price for a late book return.