

Faculty of Engineering, University of Jaffna
Department of Computer Engineering
EC5070 – Database Systems
Lab - 03

Date: 15 Sep 2022

Time: 8.00 to 11.00

Intended Learning Outcome:

By the end of this laboratory, Apply the fundamental concepts in data modeling with specific reference to the ER models

Instructions:

- Any plagiarized work will be given 0 marks.
- Submit your lab work as a zip file named LAB03_20YYEXXX (20YYEXXX – Your Registration Number) on/before the given deadline via teams.
- The zip file should contains screen shots and your report (with your assumptions).
- You may use the online tools also to create the ER diagram.
Example: drawio (<https://app.diagrams.net/>)

1. Draw an ER diagram to model the application with the following assumptions.

- Each vehicle uniquely defined by vehicle number, engine chassis number, types, number of wheels, production country, color, price and an associated owner.
- Each owner has a NIC number, first name, last name, phone, and profession.
- An owner has one or more vehicles.
- Agents represent owners in the sale of a vehicle. An agent can list many vehicles, but only one agent can list a vehicle.
- An agent has a unique agent number, name, phone number and an associated office.
- When an owner agrees to list a vehicle with an agent, a commission and a selling price are determined.
- An office has office identifier, phone number, the manager name, address and an optional agent number.
- Many agents can work at one office.
- A buyer entity type has ID number, first name, last name, phone, preferences for the vehicle type, and a price range.
- An agent can work with many buyers, but a buyer works with only one agent.

2. Consider a CONFERENCE_REVIEW database in which researchers submit their research papers for consideration. Reviews by reviewers are recorded for use in the paper selection process. The database system caters primarily to reviewers who record answers to evaluation questions for each paper they review and make recommendations regarding whether to accept or reject the paper. The data requirements are summarized as follows:

- Authors of papers are uniquely identified by e-mail id. First and last names are also recorded.
- Each paper is assigned a unique identifier by the system and is described by a title, abstract, and the name of the electronic file containing the paper.

- A paper may have multiple authors, but one of the authors is designated as the contact author.
- Reviewers of papers are uniquely identified by e-mail address. Each reviewer's first name, last name, phone number, affiliation, and topics of interest are also recorded.
- Each paper is assigned between two and four reviewers. A reviewer rates each paper assigned to him or her on a scale of 1 to 10 in four categories: technical merit, readability, originality, and relevance to the conference. Finally, each reviewer provides an overall recommendation regarding each paper.
- Each review contains two types of written comments: one to be seen by the review committee only and the other as feedback to the author(s).

Design an Entity-Relationship diagram for the CONFERENCE_REVIEW database.

3. The Prescriptions-R-X chain of pharmacies has offered to give you a free lifetime supply of medicines if you design its database. Given the rising cost of health care, you agree. Here's the information that you gather:

- Patients are identified by an SSN, and their names, addresses, and ages must be recorded.
- Doctors are identified by an SSN. For each doctor, the name, specialty, and years of experience must be recorded.
- Each pharmaceutical company is identified by name and has a phone number.
- For each drug, the trade name and formula must be recorded. Each drug is sold by a given pharmaceutical company, and the trade name identifies a drug uniquely from among the products of that company. If a pharmaceutical company is deleted, you need not keep track of its products any longer.
- Each pharmacy has a name, address, and phone number.
- Every patient has a primary physician. Every doctor has at least one patient.
- Each pharmacy sells several 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 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.
- Pharmaceutical companies have long-term contracts with pharmacies. A pharmaceutical company can contract with several pharmacies, and a pharmacy can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract.
- Pharmacies appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract.

Draw an ER diagram that captures the above information.