
Problem Set 2

Total –37.5 Points

Instructions:- This Problem Set covers materials from Chapters 2, 3 and 4.

- a. For Problems that require explanations, create space below the question and write your answers.
- b. For drawing type problems, you can use MS Word, Lucid Charts, ERD Plus or Visio. Refer to Problem Set 1 for links to access Lucid Charts, ERD Plus or Visio. Be sure to name your files appropriately.

Submission:- Download the file available under Problem Set 2.

Rename the file to have the form:-

YourStudentId#_<Your_Section_Number>_CS60_PS2_Lastname_Firstname.docx. After completing the Problem Set, load the file using the Problem Set 2 Upload option. If you have multiple files, create and upload your assignment in a zipped folder. If it's a single file, upload the Word document directly.

If you need to make changes to an already uploaded assignment, change your filename to:- YourStudentId#_CS60_PS2_VX_Lastname_Firstname.docx, where X indicates the version number.

Due Date:- 11.59pm on March 25th, 2022

Question 1:- Use the following tables to answer Parts (a) to (c) below:-

[9 Points]

Use the following business rules to create a Crow's Foot ERD. Write all appropriate connectivity and cardinalities in the ERD.

- A department employs many employees, but each employee is employed by only one department.
- Some employees, known as "rovers," are not assigned to any department.
- A division operates many departments, but each department is operated by only one division.
- An employee may be assigned many projects, and a project may have many employees assigned to it.
- A project must have at least one employee assigned to it.
- One of the employees manages each department, and each department is managed by only one employee.
- One of the employees runs each division, and each division is run by only one employee.

For maximum scores, make sure to clearly label your entities, relations, primary key, foreign key, any weak or strong relations. For the entities, be sure to at least indicate the Primary Key and Foreign key. If there are any M:N relations, create a composite entity to break the M:N into a 1:M or 1:1 relation.

Problem 2:-

[14.5 Points]

Using the **Crow's Foot notation**, create an ERD that can be implemented for a medical clinic, using the following business rules:-

- A patient can make many appointments with one or more doctors in the clinic, and a doctor can accept appointments with many patients. However, each appointment is made with only one doctor and one patient.
- Emergency cases do not require an appointment. However, for appointment management purposes, an emergency is entered in the appointment book as "unscheduled."
- If kept, an appointment yields a visit with the doctor specified in the appointment. The visit yields a diagnosis and, when appropriate, treatment.
- With each visit, the patient's records are updated to provide a medical history.
- Each patient visit creates a bill. Each patient visit is billed by one doctor, and each doctor can bill many patients.
- Each bill must be paid. However, a bill may be paid in many installments, and a payment may cover more than one bill.
- A patient may pay the bill directly, or the bill may be the basis for a claim submitted to an insurance company.
- If the bill is paid by an insurance company, the deductible is submitted to the patient for payment.

For maximum scores, make sure to label your entities clearly, include at least the primary and foreign keys and indicate how the entities are related. If you are making any assumptions, include a note at the bottom of your ERD.

Question 3:-**[14 Points]**

The Jonesburgh County Basketball Conference (JCBC) is an amateur basketball association. Each city in the county has one team as its representative. Each team has a maximum of 12 players and a minimum of 9 players. Each team also has up to 3 coaches (offensive, defensive, and physical training coaches). During the season, each team plays 2 games (home and visitor) against each of the other teams. Given those conditions, do the following:

- Identify the cardinality between teams and players and between teams and city. [4 Points]
- Draw the Crow's Foot ERD to represent the JCBC database. [10 Points]

For maximum scores, make sure to label your entities clearly, include at least the primary and foreign keys and indicate how the entities are related. If you are making any assumptions, include a note at the bottom of your ERD.