Database Systems (CS 2005) Spring 2022

Assignment 01

Topic: Entity Relationship Diagram

Deadline: 6 Feb, 2022

Total Marks: 100

1. Design a conceptual schema through ER diagrams for all the given scenarios.
2. It is necessary to specify all entities, attributes, constraints, relationships and all the concepts that you have studied in Chapter 03.
3. Mention the diagramming software that you have used for the assignment.
4. If you had to make assumptions concerning the requirements, state them clearly.
5. Mention constraints (business rules) apparent from the requirements that you are unable to model via your ERD.
6. A group of two members is allowed for this assignment.
7. Any sort of plagiarism will result in ZERO marks in Assignment.

Question 1: A Music Company   [25 marks]

The Coke Studio music company wants to efficiently manage the record of their music library. They want to store and manage their music collection (e.g., MP3, CD, or vinyl). The music collection consists of various albums and each album is made by the musician. Every musician that records at Coke Studio has a CNIC, a name, an address, and a phone number. A musician makes one or more albums that further contain one or more tracks. Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course. Each album that is recorded on the Coke Studio label has a title, a copyright date, a format, and an album identifier. Each track belongs to exactly one album which has a time length, measured in seconds. Each track recorded at Coke Studio has a title and an author. Every instrument used in tracks at Coke Studio has a name, for instance, guitar, synthesizer, and flute. Each musician may play several instruments, and several musicians may play a given instrument.

Question 2: Ride Service Management System

Careem has intended to save data about rides, customers, payments, and feedback in SQL Server. This company has intelligently selected you to do the job. They want to store the information regarding the driver which includes the usual attributes like name, surname, date of birth, and driving license number. A driver drives at least one car but may drive more than one car. Each car has a model description, vehicle registration plate, owner id, and status about whether the company

is still using a car. Each car is driven by exactly one driver. A car is registered in exactly one area and each area can have several registered cars. The most important information is about rides booked by the customers. Each ride is fulfilled by exactly one car. A customer can request more than one ride. The ride starts and end time, source and target location, fare, the status of the ride (i.e., Yes/No value that tells if a ride has been canceled or accepted) should be stored efficiently. The system can keep track of drivers' working hours and total earnings per month.

Question 3: Chaklala Airport database   [25 marks]

Create an ER diagram for Chaklala Airport database that is used to keep track of airplanes, their owners, airport employees, and pilots. Each airplane has a registration number that is of a particular plane type and is stored in a particular store. Each plane type has a model number, a capacity, and a weight. Each store has a number, a capacity, and a location. The database also keeps track of the owners of each plane and the employees who have maintained the plan. Each relationship instance owns relates an airplane to an owner and includes the purchase date. Each relationship instance maintain relates to an employee to a service record. Each plane undergoes service many times; hence, it is related to several service records. A service record includes attributes to the date of maintenance, the number of hours spent on the work, and the type of work done. An owner is either a person or a corporation. Each pilot has specific attributes license number and restrictions; each employee has specific attributes salary and shift, etc. All person entities in the database have data kept on their social security number, name, address, and telephone number. For corporation entities, the data kept includes name, address, and telephone number. The database also keeps track of the types of planes each pilot is authorized to fly and the types of planes each employee can do maintenance work on.

Question 4: Kar-e-Khair Foundation   [25 marks]

Kar-e-Khair Foundation is a non-profit organization to help widows and orphans financially and provide them grocery items on monthly basis. This organization has a manager who creates an account of every employee working in this foundation. The manager has an ID, a username, password whereas a charity employee has an ID, name, password, rank/status, phone number, and email id. Some needy people approach the manager of this foundation for any help. The donor also communicates with the Manager for providing the donations. Needy people need to provide information about their national ID, name, password, phone number, income, the total number of family members, location, and the amount needed to the foundation. Each donor has specific attributes like name, CNIC, email, phone number, location, amount donated, and address. Each charity employee can deliver donations to many needy people who approach the foundation. Each donation has its ID and type. A charity employee receives multiple donations. Many donations have many types of items. Each type has its ID and name. The items only have the total type of items in them.