SIR SYED UNIVERSITY OF ENGINEERING & TECHNOLOGY
COMPUTER SCIENCE DEPARTMENT

SPRING 2025

DATABASE SYSTEM (CS-229)
Assignment 1

Semester: 4TH
Due Date: 25th -May-2025

Batch: 2022F
Max Marks:3

Create an ERD / EERD for given scenarios

1. A course can have multiple faculty members categorized as course coordinator, co-teacher and lab teacher. For a single course theory and lab attendance need to be maintained. Faculty can create single session for each class. Faculty can enroll multiple students in the session. Students can mark only his/her attendance. Student can view only his attendance. Student can mark only one attendance at a time. Student can be enrolled in various session as per selected course. Each course has its own session of managing attendance. Monthly report can be generated to view total attendance. Monthly report can be accessed by only course coordinator of course. Two separate reports can be generated for theory and lab classes. Lab monthly report can only be accessed by Lab teacher.

2. UPS prides itself on having up-to-date information on the processing and current location of each shipped item. To do this, UPS relies on a company-wide information system. Shipped items are the heart of the UPS product tracking information system. Shipped items can be characterized by item number (unique), weight, dimensions, insurance amount, destination, and final delivery date. Shipped items are received into the UPS system at a single retail center. Retail centers are characterized by their type, uniqueID, and address. Shipped items make their way to their destination via one or more standard UPS transportation events (i.e., flights, truck deliveries). These transportation events are characterized by a unique scheduleNumber, a type (e.g, flight, truck), and a deliveryRoute

3. Suppose that you are designing a schema to record information about reality shows on TV. Your database needs to record the following information:
    - For each reality show, its name, genre, basic_info and participants name. Any reality show has at least two or more participants.
    - For each producer, the company name, company country. A show is produced by exactly one producer. And one producer produces exactly one show.
    - For each television, its name, start year, head office. A television may broadcast multiple shows. Each show is broadcasted by exactly one television.
    - For each user, his/her username, password, and age. A user may rate multiple shows, and a show may be rated by multiple users. Each rating has a score of 0 to 1

4. Consider the following information about a university database.
    - Professors have an SSN, a name, an age, a rank, and a research specialty.
    - Projects have a project number, a sponsor name (e.g., NSF), a starting date, an ending date, and a budget.
    - Graduate students have an SSN, a name, an age, and a degree program (e.g., M.S. or Ph.D.).
    - Each project is managed by one professor (known as the project's principal investigator).
    - Each project is worked on by one or more professors (known as the project's co-investigators).
    - Professors can manage and/or work on multiple projects
    - Each project is worked on by one or more graduate students (known as the project's research assistants).
    - When graduate students work on a project, a professor must supervise their work on the project. Graduate students can work on multiple projects, in which case they will have a (potentially different) supervisor for each one.
    - Departments have a department number, a department name, and a main office.
    - Departments have a professor (known as the chairman) who runs the department.
    - Professor's work in one or more departments and for each department that they work in, a time percentage is associated with their job.
    - Graduate students have one major department in which they are working on their degree.
    - Each graduate student has another, more senior graduate student (known as a student advisor) who advises him or her on what courses to take.

5. ABC Band is an orchestra that plays different types of concerts. The orchestra's popularity is growing fast and they are starting to have problems to keep track of the musicians that should play in each concert as well as the musical works that are most suitable for the concert. Help the orchestra to create a database model, as a first step to implement a database, so that the orchestra can keep track of both musicians and musical works. The database model must represent the following points:
    - The orchestra plays three types of concerts: church concerts, private parties, and outdoor concerts. The orchestra plays three types of music: classical, Swedish folk, and German folk. The orchestra always plays classical music in their church concerts. The orchestra always plays German folk on private parties. Finally, the orchestra plays a blend of the three types of music when playing outdoor.
    - It should be possible to find in the database the music works that are suitable for each type of concert so that the repertoire can be easily planned well in advance.
    - For each musical work, the database should store which musical setting (i.e. the instruments) are required to play the work.
    - The database should store information for each coming concert. The information should include the place, date and time of the concert as well as the type of concert and the repertoire that will be played.
    - For each musician in the orchestra, the database should store his/her name, the instrument that he/she plays, and in which of the coming concerts he/she will participate

6. A person may be employed by one or more organizations, and each organization may be the employer of one or more persons. An organization can be an internal organizational unit or an external organization. For persons and organizations, we want to know their ID, name, address, and phone number. For persons, we want to know their birth date, and for organizations, we want to know their budget number. Employee can be permanent employee or may be a part time job holder but at the same time a person can be both. For permeant they have extra bonus and credit while for part time job older we keep their extra hours. For each employment, we want to know the employment date, termination date, and bonus. Employment of a person by an organization may result in the person holding many positions over time. For each position, we want to know its title, and each time someone holds that position, we need to know the start date and termination date and salary. An organization is responsible for each position. It is possible for a person to be employed by one organization and hold a position for which another organization is responsible.