**Spring-2024 DataBase Systems (CS-103)**

# Lab Task # 03

# Data Modeling Using the Entity-Relationship (ER) Model

*Instructors: Mr. Hamza Javed*        *Date: 29 March 2023*

## Important Instruction

1. No plagiarism allowed.
2. You will required to submit only soft copy via google classroom
3. Late submission not accepted
4. Rename submission file DB24-Name-RegNo. **like: DB24-hamza-1234**
5. You will required to submit single **pdf** file which contain all ER-diagram

**Question 1**

## University management System

In Muslim Youth University, A number of departments are present, and students are members of one of those departments. An individual professor serves as the head of each department, which is accompanied by a distinct department number, a name, a location, and a phone number. There is a distinct employment identification number, name, and phone number assigned to each professor. The following information related to students is something that we prefer to keep track of: the individual's name, unique roll number, gender, phone number, date of birth, age, and may be more but at least one email address are required.

A Students have a local address consisting of the hostel name and the room number. They also have home address consisting of house number, street, city and PIN. It is assumed that all students reside in the hostels

A course taught in a semester of the year is called a section. There can be several sections of the same course in a semester; these are identified by the section number. Each section is taught by a different professor and has its own timings and a room to meet.
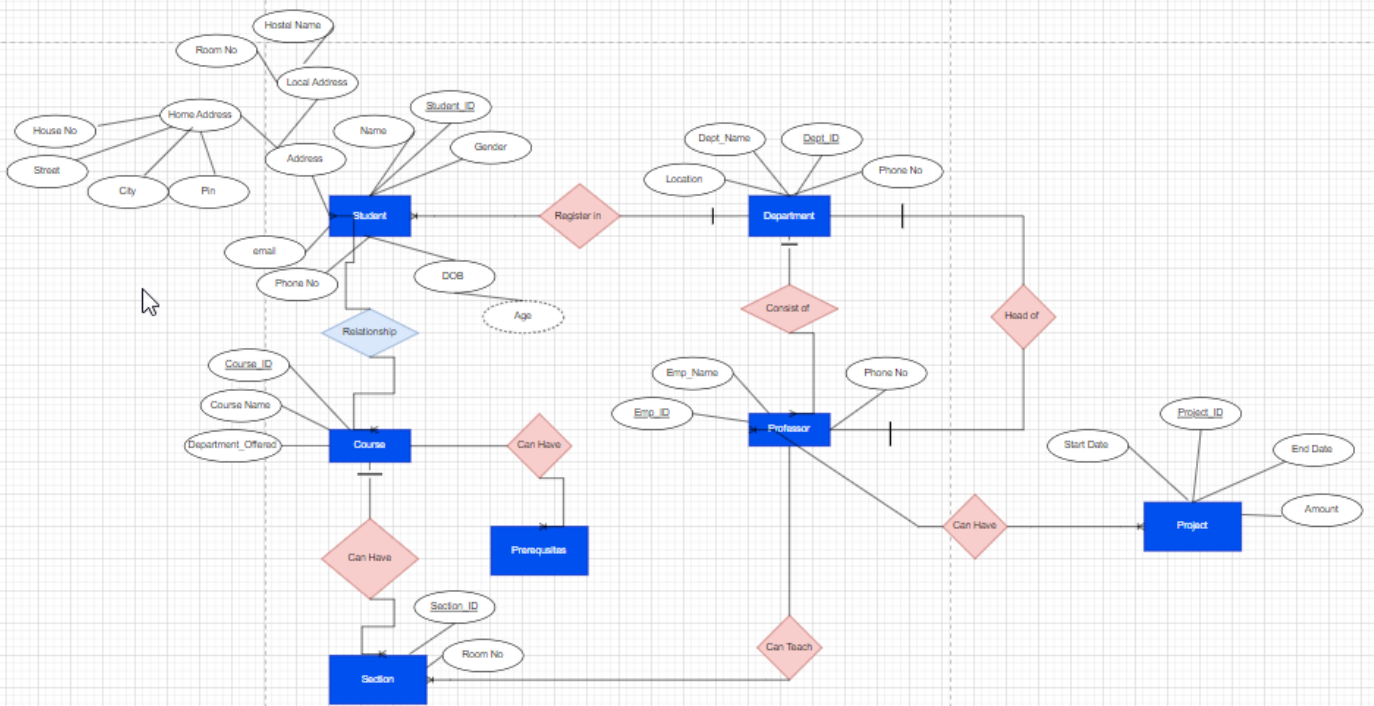
Students enroll for several sections in a semester. Each course has a name, number of credits and the department that offers it. A course may have other courses as prerequisites i.e, courses to be completed before it can be enrolled in

Professors also undertake research projects. These are sponsored by funding agencies and have a specific start date, end date and amount of money given. More than one professor can be involved in a project. Also a professor may be simultaneously working on several projects. A project has a unique *projectId*
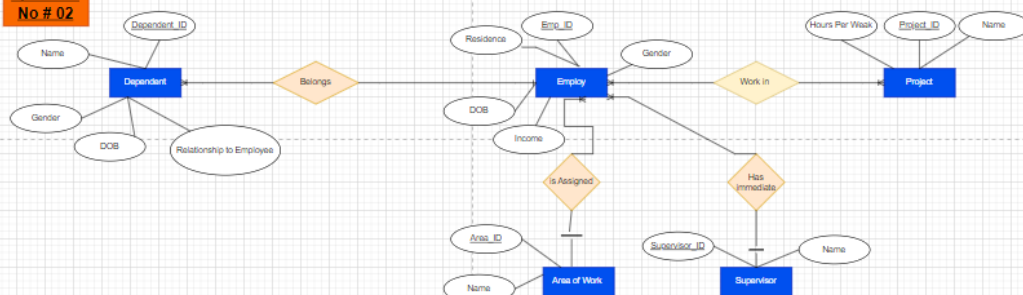
**Solution**

## Question 2

### Social Security Firm

The database of social security firm contain: number, residence, date of birth, gender, and income of each employee . Every worker is assigned to one area of work, yet they may be involved in many projects at the same time. The amount of hours per week that an employee is currently working on each project is taken into account and recorded by our company. In addition to this, we maintain a record of the immediate supervisor of each employee.Each employee may have a number of Dependents. For each dependent, we keep track of their name, gender, date of birth, and relationship to employee.

### Solution

## L & M pet grooming management System

L & M Pet Grooming wants to set up a database to manage its appointment system. They need to store information on each pet. This information includes a unique pet identifier and the name, age, and gender of the pet. Gender will be coded as M (male), F (female), N (neutered), S (spayed).

Each pet has an owner. If the pet lives with a family, only one person is recorded as the owner. Information on the owner includes a unique owner identification number plus their name and phone number. Owners often own more than one pet and bring each of them to the grooming service.

Services provided by L & M Grooming include such things as shampooing, treatment for fleas, haircuts, and combing. Information on each service includes a unique service identifier, service description, and fee. Any given pet can have an appointment for one or more services. Some pets have regular appointments such as a shampoo every two weeks while others have appointments on needed basis (such as a flea treatment). Appointments are made for a specific pet and service on a specific day and time. L & M Grooming needs to be able to record and retrieve this appointment information routinely. Pets can have more than one appointment on a given day. For example, they may have a haircut scheduled for 10:00 am and a shampoo scheduled for 10:20 am. Each of these is considered a separate appointment. L & M Grooming has several employees who actually perform the services associated with an appointment. When an appointment is scheduled, one specific employee is assigned to carry out the service for that appointment. If two appointments are scheduled for the same day (different times), it is possible that different employees will perform each service. Information about employees includes a unique employee number and their name.

## Solution