



**Lab 1**

**Course Name:** Database

**Course Code:** CSE 301

**Student's Full Name:**

**Student ID:**

**Using draw.io to solve the problems below:**

1. Finding Entities, key Attributes and related Attributes
2. Finding Relationships
3. Finding weak Entities and weak Relationships (if any)
4. Draw an ER model

**Problem 1. Building an ER model for a hospital**

A hospital has a lot of doctors. Doctor's information includes doctor code (identifier), doctor's name, date of employment, and specialty. The patients are admitted to the hospital through doctors. Patient information includes patient identification (identifier) and patient name. A patient admitted to the hospital by only one doctor. One doctor can take on many patients. Once admitted to the hospital, a patient will be treated by at least one doctor. A doctor may treat no one patient or treat multiple patients. Hospitals need to save details about each time a doctor treats a patient. Treatment details include: date of treatment, duration of treatment and results.

**Problem 2. Building an ER model for a University**

A university needs to computerize its management processes. The university has multiple faculties, each managed with the following information: Faculty ID and Faculty Name. Each faculty has multiple classes, and the class information includes: Class ID, Class Name, and Number of Students. When enrolling, students are assigned to a specific class. Student information includes: Student ID, Full Name, Date of Birth, Gender, and Address. Students can take multiple courses, and each course is managed with the following information: Course ID, Course Name, and Credits. After completing a course, students receive a course grade, and at the end of the program, they are given a final graduation grade. Additionally, each student is issued a library card, and each library card belongs to only one student. Library card information includes: Card Number, Issue Date, and Expiration Date.

**Problem 3. Building an ER model and relational data model for 1 hotel needs to store information as follows:**

The hotel has many rooms, each room has room code (R101, R102, ...), room name (sunflower room, jade room, ...) Each room is located on 1 floor, floor information has floor code (F01, F02, ...), floor name (1st floor, 2nd floor, ...) Each room has a price corresponding to whether guests stay by week or by day. Each guest when arriving at the accommodation will have an identity card number, full name and corresponding phone number. There is also service information attached for each room: service code, service name and corresponding amount for each service when used 1 time. For example, service code: S01, service name is "Laundry", the amount is 50000.

Room payment invoice information for customers will have information: Invoice code, identity card code, full name of the customer, number of days of stay (arrival and departure dates), in which room, total amount to pay for the room. If guests stay for 1 week and 2 days, the week will be calculated according to the weekly unit price plus 2 odd days will be calculated according to the daily unit price. The invoice also stores information: service name and total service amount. The total amount of the guest to be paid (the sum of the total room amount and service fee).