

COMP3013 2025 Fall

Assignment 2

This assignment covers Lecture 1 – 7 and Lab 1 – 7.

Note: there is no requirement on ER diagram drawing. You are allowed to draw ER-diagrams using any tool. But you need to make sure that your drawing is clear enough. TAs have rights to remove marks if your graph unreadable. Please do not try to challenge us.

The makeup exam will be harder than this assignment.

Students are expected to submit two files.

- “COMP3013_25F_A2_XXX.sql”, where “XXX” is your student ID. This SQL file contains all the SQL queries for Q1. First line of the file should contain your name and ID as a comment. And question number for each question is also included as a comment. SQL comments are quoted by the sign `/*...*/`.
- “COMP3013_25F_A2_XXX.pdf”, for the ER diagram of Q2.

Submissions which do not follow the guideline may **not be marked**.

Q1. The schema of a database is given as follows. Keys are underlined.

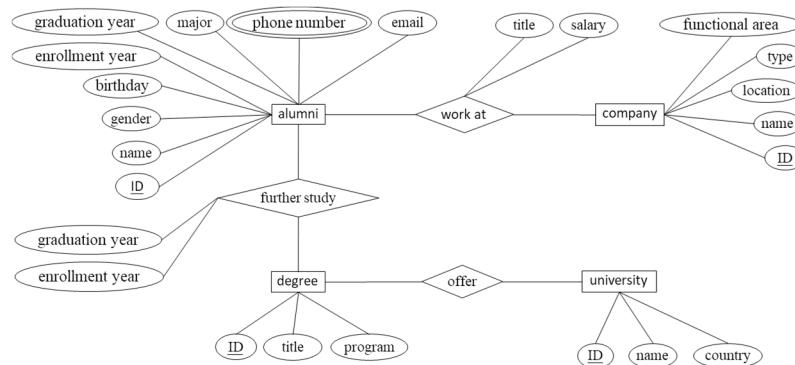
- `student=(sID, sname, gender, age, gpa, pname)`
// gender is either male or female.
- `program=(pname, division)`
// pname is the program name
- `course=(cID, cname, pname, credit)`
// credit is an integer and $1 \leq \text{credit} \leq 3$.
- `enroll=(sID, cID, grade)`
// grade is one of A, B, C, D, or F.

Write a query for each following question. Please submit your answers of this question via **iSpace Feedback**. (8 marks for each)

- Find the course names that Goliath (student name) has taken.
- Display the number of students for each program.
- Display the average GPA for among the students in each program by program name and average GPA.
- For each student, display the student ID, name, and the number of failed courses. If a student has not failed any course, the value should be 0.
- Define the tables from the logical schemas. ID numbers, ages, and credits for courses are integers. GPA is a real from 0.0 to 4.0. Other attributes are variable length character string. (10 marks for this question)
- Implement foreign keys for `enroll`, `student`, and `course`.
- Student Goliath receives an A (grade) in the course COMP3013 (course ID). Add this record to the system.
- Student Dave of ID 1840007211 has been dismissed from the college. Remove his information from the database.

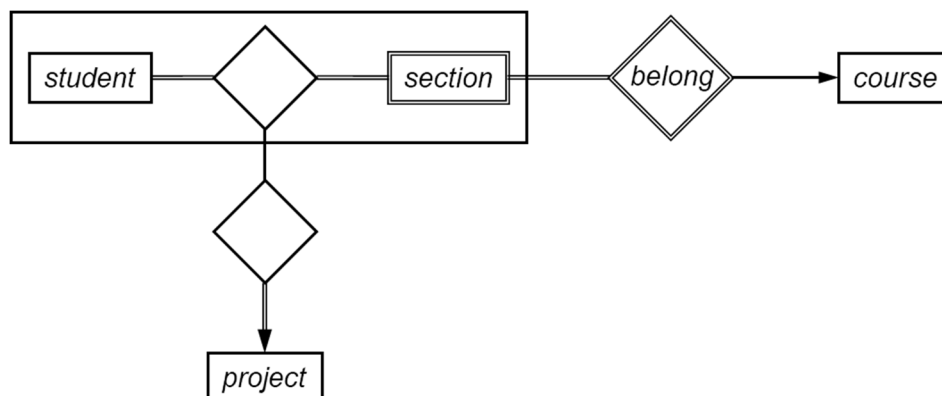
Q2. Modify the given ER-model for Q2 in Assignment 1 to further model the following constraints. (18 marks)

- Every degree is offered by a university.
- Some degrees can be offered by multiple universities.
- Every university offers some degrees.
- Some alumni continue their studies in some universities for some degrees.
- Every degree is obtained by some alumni.
- Some alumni are not working.
- One alumnus works in at most one company.
- Every company employs some alumni.



You do not need to make more assumptions on your design. Attributes can be omitted. It is possible to change some links or add more relationship sets.

Q3. Given the following ER-model, justify which meaning can be expressed and which one cannot. You don't need to give the reason. (16 marks)



- Every project is a course project.
- Every project is done by some students.
- Some projects are group projects.
- Every student can only do one project for one course.
- Every student can only enroll one section for one course.
- Some courses do not have a project.
- If a section of a course has projects, then all other sections also have.
- Students in the same group projects are from the same section.