CS1555 Recitation 7

Objectives: 1. To practice more relational algebra, especially aggregations, joins, and division.
2. To practice SQL queries.

Consider the following relation schemas:

Student (SID, Name, Class, Major)
Student_Dir (ID, Address, Phone)
FK: (ID) → Student (SID)
Courses_taken (Course_No, Term, SID, Grade)
FK: (Course_No) → Course (Course_No); (SID) → Student (SID)
Course (Course_No, Course_Name, Level)
Instructor (ID, Fname, Lname)
Courses_offered (Course_No, Term, InstructorID)
FK: (Course_No) → Course (Course_No); (InstructorID) → Instructor(ID)

Part 1: Relational Algebra

Write a relational algebra query for each of the queries below:

1. List the students who do not enroll in any course in Fall 18.

2. (Optional) Find the total number of students.

3. Find the total number of students who have enrolled in the course "Operating Systems"

4. List the SID, name, and address (if available) of all students.

5. Find the SID(s) of the student(s) who has/have the highest GPA

6. Find the SID(s) of the student(s) who has/have taken all courses at the UGrad level.

7. Find for each instructor, the course names of the courses he/she is teaching this term (Fall 18). List in addition to the course name, the first name and the last names of the instructor.

8. (Optional) Find for each instructor the number of courses he/she has taught or is teaching. List the first name and the last name of each instructor along with his/her ID and number of courses.

Part 2: SQL

Write a relational algebra query for each of the queries below:

1. List the student ID and course number for every student who took a course in Spring 18 but has not received a grade yet.

2. List the SIDs of all the students and the number of courses they have taken.

3. List the SIDs, names *and GPAs* of the students whose GPAs are greater than 3.7. List them in the descending order of the GPAs.