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## 07a – SQL Review: The good, the bad, and the ugly

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Assume the following relations (underlined attributes are primary keys):

- **students** (sid, name, email, pet)
- **majors** (sid, major)
- **courses** (cid, major, number, title)
- **courses\_taken** (sid, cid, semester, grade)
- **prereqs** (precid, cid) – course precid is a prerequisite for course cid. Assume that if a course cid is included in this table, it would have a prerequisite course (i.e., no NULL values allowed).

(Q1) Which of the following statements are true, given the above database schema?

- [T / F] Every student must have a pet.
- [T / F] A course can be repeated by the same student.
- [T / F] A student can have at most one declared major.
- [T / F] A course cannot be taken together with its prerequisite course.
- [T / F] A course can have more than one prerequisite.

How many true answers did you get?

Provide the SQL query to answer the following questions.

(Q2) Count how many students have not declared a major yet.

(Q3) Show a breakdown of the number of students that have single, double, triple, and quad majors. Hint: use a view.

(Q4) Show cases when a student took a course together with its prerequisite (i.e., in the same semester). Display name of student, semester, course and its prerequisite (titles).

(Q5) Show which student(s) have had the highest number of repetitions for any one class. Hint: use a view. Display the name of student(s), the course title, and the number of repetitions. Must handle ties properly.

(Q6) Show which courses(s) have had the highest number of students taking them. Hint: use a view. Display the title of the course(s) and the number of repetitions. Must handle ties properly.

(Q7) Show the average GPA of students (average of all grades, regardless of repetitions), broken down by pet type. Hint: use a view.