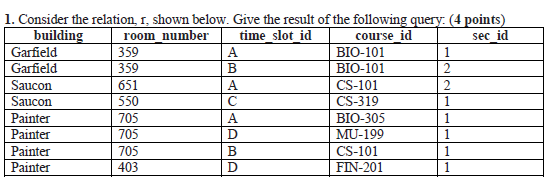
ERIC WEBB

**Assignment#2**

**MSIT 630 Database Systems (Summer, 2019)**

**Total: 50 points**

***Due: 6/16/2019 11:59PM***



SELECT building, room\_number, time\_slot\_id, count(\*)

FROM r

GROUP BY ROLLUP (building, room\_number, time\_slot\_id)

In MySQL, use:

SELECT building, room\_number, time\_slot\_id, count(\*)

FROM r

GROUP BY building, room\_number, time\_slot\_id with rollup;

**2.** In the university database, write a query to find departments whose instructors earn a lower salary, on average, than the average salary at “Biology”. Use user defined SQL functions (**create function command**) as appropriate to answer the above query, the function takes the department name as the input and returns the average salary of the given department. **(6 points)**

**3.** Write the following queries in relational algebra, using the university schema. (Appendix A, page 1271) (**16 points, 4 points each**)

a. Find the names of all students who have taken at least one Elec. Eng. course.

b. Find the IDs and names of all students who have not taken any course offering before 2010.

c. For each department, find the average salary of instructors in that department. You may assume that every department has at least one instructor.

d. Find the lowest, across all departments, of the per-department average salary computed by the preceding query.

**4**. Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted.(**6 points**)

**5.** Explain the distinction between disjoint and overlapping constraints. Provide an example for each constraint. (**3 points**)

**6.** Explain the distinction between total and partial constraints. Provide an example for each constraint. (**3 points**)

**7.** Consider the following set F of functional dependencies on the relation schema r(A,B,C,D,E,F): (**12 points, 4 points each.**)

ABCD

BCDE

BD

DA

a. Compute B+.

b. Compute D+.

c. Prove (using Armstrong’s axioms) that AF is a superkey