Course: CS345: Database Lab
Type of database: Relational
Implementation: MYSQL

Stage 3: Join and Aggregate operations. Various SELECT clauses (WHERE, GROUP BY, ORDER etc.)

Note: A set of practice queries is given. It is expected that you get familiar with the practice queries before coming to Lab. Otherwise, TAs will also be helping you to formulate these queries in the Lab. Once you are able to formulate SQL queries for those practice queries, you will be given another five queries similar to the ones given in practice set. You should complete those five queries your own. You can attempt the new set of queries, only if you complete the practice queries.

You have to use the database created in the Stage – 2.

A university consists of a number of departments. A student belongs to only one department. A lecturer belongs to only one department. Each department offers several courses. Students enrol in a particular course. A course may be taught by more than one lecturer from the appropriate department, and a lecturer may teach more than one course. A student can enrol courses offered in any department. However, a lecture can teach the courses that are offered only in his department.

Focus: The objective of this Lab is to learn (i) JOIN operation, (ii) Aggregate operation, and (ii) various SELECT clauses. You are advised to get to know all relevant commands discussed in the SQL class (Slide can be found from the Canvass).

Marks:
   (i)   5 for practice queries.
   (ii)   5 for additional queries.
   (iii)   Total: 10.

Tutorial queries (These queries can be formed using different Clauses and commands. You are advised to explored different possible formulations):
   1. Given a student's id, find the list of students who have enrolled the courses that the student has not enrolled.
   2. Given a student's id, find the list of students who have enrolled the courses (all) that the student has enrolled.
   3. Given two lecturers (lecturerIDs), find the name of the students who have attended the courses (different lecture may offer different course) offered by the lecturers.
   4. Given two lecturers (lecturerIDs), find the name of the students who have attended the courses offered by a lecturer, but not by the other.
   5. Find the name of the students of a course who have score higher than the average of another course.

Evaluators are requested to check the correctness of the queries by changing values in the relevant tables.

   6. How many lecturers are there in each department?
   7. Given a lecturer's id, find the list of students who have not attended any of the courses offered by the lecturer.
   8. Find the course wise average mark of the students of each department.
   9. Find the course in each department that has highest average mark compare to other courses in the same department.
   10. Assume that student scoring (i) lesser than 40 has F grade, (ii) greater than or equal to 40, but lesser than 70 has B grade, and (iii) greater than or equal to 70 has A grade. Highest possible mark is 100. Given a course, find the grade wise number of students.