B.TECH. COMPUTER SCIENCE AND ENGINEERING – July - Dec, 2024

CSLR51 – Database Management Systems Laboratory

#Session: 06 || Date: 05/09/2024

Viva Due: 1. Queries a – i (05/09/2024) and j - w (12/09/2024)
Moodle Due: 10/09/2024 at 11 PM

1. Relational Database Design – University Schema

Execute the following Queries in SQL over the University Schema given below.

classroom(*building, room_number, capacity*)
department(*dept_name, building, budget*)
course(*course_id, title, dept_name, credits*)
professor(*pID, name, dept_name, salary*)
section(*course_id, sec_id, semester, year, building, room_number, time_slot_id*)
teaches(*pID, course_id, sec_id, semester, year*)
student(*pID, name, dept_name, tot_cred*)
takes(*sID, course_id, sec_id, semester, year, grade*)
guide(*sID, pID*)
time_slot(*time_slot_id, day, start_time, end_time*)
prereq(*course_id, prere_id*)

Before inserting values, please go through the questions below which shall facilitate you to choose appropriate values for the fields in the table. Populate each table with a minimum of 5 records and ensure empty set is not returned for any query.
State and Make Valid Assumptions where required. Use of Views is not permitted unless its explicitly mentioned in the Query.

a. Find the titles of courses in the CSE department that have 3 credits.
b. Find the highest salary of any professor.
c. Find all professors earning the highest salary (there may be more than one with the same salary).
d. Find the maximum enrollment, across all sections, in Fall 2020.
e. Find the enrollment of each section that was offered in Spring 2019.
f. Find the IDs and names of all students who have not taken any course offering before Spring 2013.
g. Find the lowest, across all departments, of the per-department maximum salary computed by the preceding query.
h. Create a new course “CS-001”, titled “Weekly Seminar”, with 1 credit.
i. Delete the course CS-001. What will happen if you run this delete statement without first deleting offerings (sections) of this course.
j. Display the list of all course sections offered in Spring 2022, along with the names of the professors teaching the section. If a section has more than one professor, it should appear as many times in the result as it has professor. If it does not have any professors, it should still appear in the result with the professor name set to “-”.
k. Find the professor ID, name, dept name, and salary for professors whose salary is greater than 50,000.
l. Find the names of all professors in the Chemical Engineering department together with the course id of all courses they teach.
m. Find the set of all courses taught in the Fall 2021 semester, the Spring 2021 semester, or both.
n. Find the names of all professors whose department is in the ‘ORION’ building.
o. Find the set of all courses taught in the Fall 2023 semester, or in the Spring 2022 semester, or both.

p. Find the set of all courses taught in the Fall 2021 semester, but not in the Spring 2019 semester.
q. Find the IDs of all students who were taught by an professor named Tejaswi; make sure there are no duplicates in the result.
r. Find the names of all students who have taken at least one Computer Science course; make sure there are no duplicate names in the result.
s. For each department, find the maximum salary of professors in that department. You may assume that every department has at least one professor.
t. Display a list of all professors, showing their ID, name, and the number of sections that they have taught. Make sure to show the number of sections as 0 for professors who have not taught any section. Your query should use an outerjoin, and should not use scalar subqueries.
u. Write the same query as above, but using a scalar subquery, without outerjoin.
v. Find all students who have taken all courses offered in the Biology department.
w. **Create your own query**: define what you want to do in English, then write the query in SQL. Make it as difficult as you wish, the harder the better.
x. Use the DCL commands to perform the following operations.
   i. Create a new user 'testuser' on the localhost.
   ii. Grant all privileges for the testuser on the University database you have created.
   iii. Revoke all the privileges given to testuser.
y. Use the DCL command to revoke privilege to the user.
   i. Create a new user 'testuser1' on the localhost.
   ii. Grant only select privileges for the testuser1 on the Student table.
   iii. Revoke the select privileges for the testuser1 on the Student table.

---THE END---