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

CSLR51 – Database Management Systems Laboratory

#Session: 05 || Date: 22/08/2024

Viva Due: 1. Queries a – i (22/08/2024) and j - y (29/08/2024), 2 and 3. 29/08/2024
Moodle Due: 28/08/2024 at 06 PM

1. Relational Database Design – Airlines Travel Schema

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

Flights(flno: integer, from: string, to: string, distance: integer, departs: time, arrives: time, price: integer)
Aircraft(aid: integer, aname: string, cruisingrange: integer)
Certified(eid: integer, aid: integer)
Employees(eid: integer, ename: string, salary: integer)

Note: Every pilot is certified for some aircraft, and only pilots are certified to fly. ***cruisingrange*** *means the maximum distance an aircraft can fly without landing say, 10000 miles. Aircraft Id(aid) is the company id of the aircraft e.g. Aircraft(101, Boeing, 1000). Employess include pilots along with Airlines(Aircraft) staff.*
Identify the Primary key for each table. Before inserting values, please go through the questions below which shall facilitate you to choose appropriate values for the fields in the table.

a. Find the names of aircraft such that all pilots certified to operate them earn more than Rs. 50,000.

b. For each pilot who is certified for more than three aircraft, find the eid and the maximum cruisingrange of the aircraft for which she/he is certified.

c. Find the names of pilots whose salary is less than the price of the cheapest route from Trichy to Agartala.

d. For all aircraft with cruisingrange over 1000 miles, find the name of the aircraft and the average salary of all pilots certified for this aircraft.

e. Find the names of pilot/s certified for some Boeing aircraft who drove the maximum distance on all flights departing from Ladakh.

f. Find the aids of all aircraft that can be used on routes from Chandigarh to Surat.

g. Identify the routes that can be piloted by every pilot who makes more than 100,000.

h. Print the enames of pilots who can operate planes with cruisingrange greater than 3000 miles but are not certified on any Boeing aircraft.

i. Compute the difference between the average salary of a pilot and the average salary of all employees (including pilots).

j. Print the name and salary of every nonpilot whose salary is more than the average salary for pilots.

k. Print the names of employees who are certified only on aircrafts with cruising range longer than 1000 miles.

l. Print the names of employees who are certified only on aircrafts with cruising range

shorter than 1000 miles, but on at least two such aircrafts.

m. Print the names of employees who are certified only on aircrafts with cruising range longer than 1000 miles and who are certified on some Boeing aircraft.

n. Find the eids of pilots certified for some Boeing aircraft.

o. Retrieve the names of pilots certified for some Boeing aircraft.

p. Find the aids of all aircraft that can be used on non-stop flights from Kolkata to Madras.

q. Identify the flights that can be piloted by every pilot whose salary is more than 70,000.

r. Find the names of pilots who can operate planes with a range greater than 3,000 miles but are not certified on any Boeing aircraft.

s. Find the eids of employees who make the highest salary in every airlines.

t. Retrieve the eids of employees who make the second highest salary.

u. Find the eids of employees who are certified for the largest number of aircraft.

v. Find the eids of employees who are certified for exactly three aircrafts.

w. Find the total amount paid to pilots who drove greater than 500,000 miles together across all their journey on the routes from Chennai to Dublin and return route also. You need to consider all direct flights along with the connecting flights as well.

x. Is there a sequence of flights from Tiruchirappalli to Frankfurt? Each flight in the sequence is required to depart from the city that is the destination of the previous flight; the first flight must leave Tiruchirappalli, the last flight must reach Frankfurt, and there is no restriction on the number of intermediate flights. Your query must determine whether a sequence of flights from Tiruchirappalli to Frankfurt exists for any input Flights relation instance.

y. **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.

2. With continuation to Session 04 exercise, execute all the example queries provided in Subsections 7.1.1 to 7.4.2 in text book by Navathe et al. pertaining to keywords 'TRIGGER', 'VIEW', 'EXCEPT' and 'CONTAINS'.

3. Write the following as **triggers** on the EMPLOYEE Schema which you have already created. In each case, disallow if it does not satisfy the stated constraint. You may assume that the desired condition holds before any change to the database is attempted. Also, prefer to modify the database, even if it means inserting tuples with NULL or default values, rather than rejecting the attempted modification.
   a. Assure that deleting details of an employee deletes his dependent records also.
   b. Whenever a department with exactly one project is shifted to a new location, ensure that the project is also shifted to the new location.
   c. Assure at all times that there are no departments with more than 3 projects.
   d. Assure that no employees work for more than one department.
   e. Whenever a project is dropped, dissociate all the employees from the particular project.
   f. When a new department is inaugurated, ensure that it is not co-located with any other departments.
   g. For every employee, ensure that his dependent Birthdate is less than his Birthdate.
   h. Increment 1000 rupees to the salary for those employees if any of his/her dependent expire.

---THE END---