Database Management System – cs422 DE

Lab 1 – Wk 3 & 4

This Lab is based on lecture 3 & 4 (chapters 6 & 7).

- Submit your *own work* on time. No credit will be given if the lab is submitted after the due date.
- Note that the completed lab should be submitted in .zip or .rar format only.
- If you think that your answer needs explanation to get credit then please write it down.

Solve the questions from 6.32 to 6.40 in the Case Study 2 on page no. 173 (5th edition).

You are required to run & test all these queries in SQL Server. Note that you'll need to create and populate the tables first.

To get full credit for this lab, you need to submit the following:
(1) Screenshots for at least 4 of the queries with output.
(2) Answer SQL queries for all of the mentioned exercises.

For your quick reference, the schema and the questions are given below.

Employee (**empID**, fName, lName, address, DOB, sex, position, deptNo)

Department (**deptNo**, deptName, mgrEmpID)

Project (**projNo**, projName, deptNo)

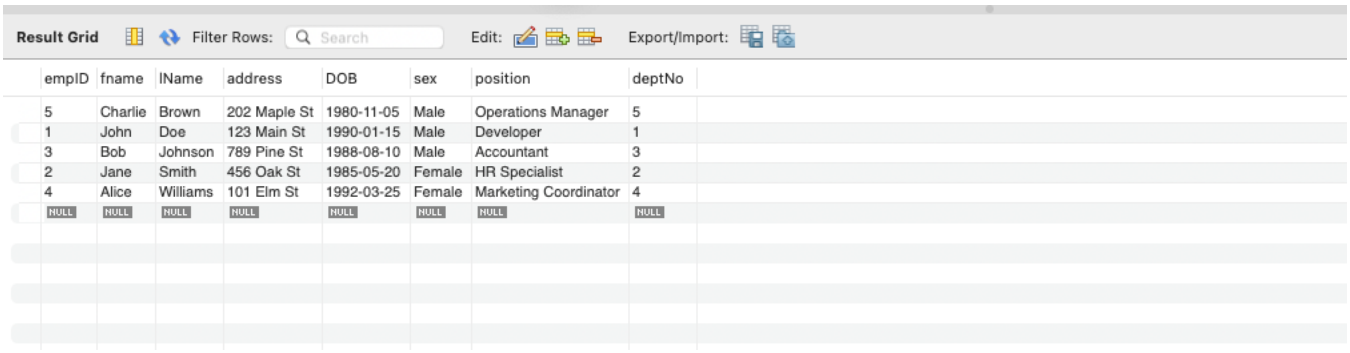
WorksOn (**empID**, **projNo**, hoursWorked)

where

- *Employee* contains employee details and *empID* is the key.
- *Department* contains department details and *deptNo* is the key. *mgrEmpID* identifies the employee who is the manager of the department. There is only one manager for each department.
- *Project* contains details of the projects in each department and the key is *projNo* (no two departments can run the same project).
- *WorksOn* contains details of the hours worked by employees on each project, and *empID/projNo* form the key.

Exercises

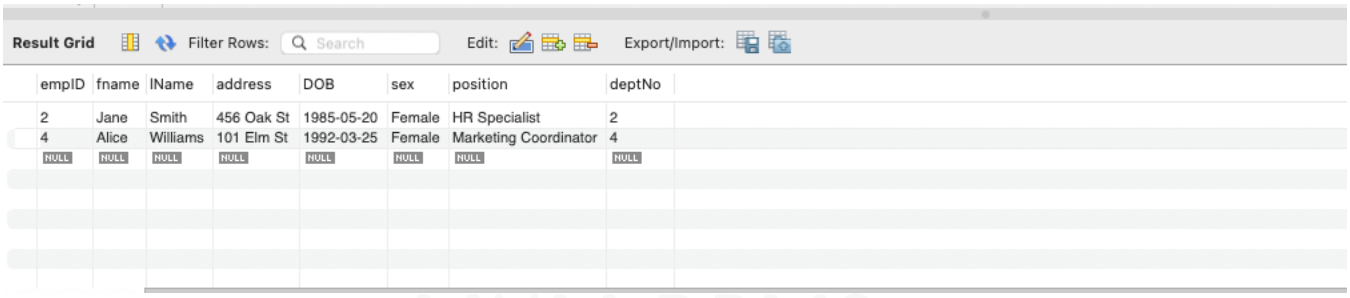
1. List all employees in alphabetical order of surname and within surname, first name.
   ANS:
   SELECT * FROM employee ORDER BY lName, fname;



empID	fname	lName	address	DOB	sex	position	deptNo
5	Charlie	Brown	202 Maple St	1980-11-05	Male	Operations Manager	5
1	John	Doe	123 Main St	1990-01-15	Male	Developer	1
3	Bob	Johnson	789 Pine St	1988-08-10	Male	Accountant	3
2	Jane	Smith	456 Oak St	1985-05-20	Female	HR Specialist	2
4	Alice	Williams	101 Elm St	1992-03-25	Female	Marketing Coordinator	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

2. List all the details of employees who are female.
   ANS:

   SELECT * FROM employee WHERE sex = 'Female';



empID	fname	lName	address	DOB	sex	position	deptNo
2	Jane	Smith	456 Oak St	1985-05-20	Female	HR Specialist	2
4	Alice	Williams	101 Elm St	1992-03-25	Female	Marketing Coordinator	4
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

3. List the names and addresses of all employees who are Managers.
   ANS:
   SELECT fname, lName, address FROM employee WHERE empID IN (SELECT mgrEmpID FROM department);

fname	lName	address
John	Doe	123 Main St
Jane	Smith	456 Oak St
Bob	Johnson	789 Pine St
Alice	Williams	101 Elm St

4. Produce a list of the names and addresses of all employees who work for the IT department.
   ANS:
   SELECT fname, lName, address FROM employee WHERE deptNo = (SELECT deptNo FROM department WHERE deptName = 'IT Department');

fname	lName	address
John	Doe	123 Main St

5. Produce a complete list of all managers who are due to retire this year, in alphabetical order of surname.
   ANS:
   SELECT fname, lName, address
   FROM employee
   WHERE empID IN (SELECT mgrEmpID FROM department)
   AND YEAR(DOB) <= (2023 - 65)
   ORDER BY lName;


Result Grid Filter Rows: Search Export:

fname	lName	address

6. Find out how many employees are managed by 'James Adams'.
   ANS:
   SELECT COUNT(*) AS numEmployees
   FROM employee
   WHERE mgrEmpID = (SELECT empID FROM employee WHERE fname = 'James' AND lName = 'Adams');


Result Grid Filter Rows: Search Export:

empID	fname	lName	deptNo	totalHours
1	John	Doe	1	55
2	Jane	Smith	2	45
3	Bob	Johnson	3	35
4	Alice	Williams	4	40
5	Charlie	Brown	5	45

7. Produce a report of the total hours worked by each employee, arranged in order of department number and within department, alphabetically by employee surname.
   ANS:
   SELECT e.empID, e.fname, e.lName, e.deptNo, SUM(w.hoursWorked) AS totalHours
   FROM employee e
   JOIN WorksOn w ON e.empID = w.empID
   GROUP BY e.empID, e.fname, e.lName, e.deptNo
   ORDER BY e.deptNo, e.lName;


Result Grid Filter Rows: Search Export:

empID	fname	lName	deptNo	totalHours
1	John	Doe	1	55
2	Jane	Smith	2	45
3	Bob	Johnson	3	35
4	Alice	Williams	4	40
5	Charlie	Brown	5	45

8. For each project on which more than two employees worked, list the project number, project name and the number of employees who work on that project.
   ANS:
   SELECT p.projNo, p.projName, COUNT(w.empID) AS numEmployees

```
FROM Project p
JOIN WorksOn w ON p.projNo = w.projNo
GROUP BY p.projNo, p.projName
HAVING COUNT(w.empID) > 2;
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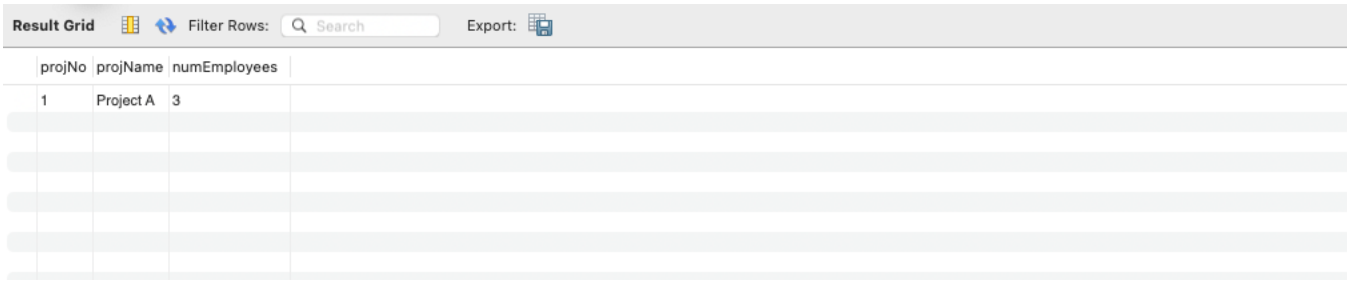

9. List the total number of employees in each department for those departments with more than 10 employees. Create an appropriate heading for the columns of the results table.
   ANS:

```
SELECT d.deptNo, d.deptName, COUNT(e.empID) AS numEmployees
FROM department d
JOIN employee e ON d.deptNo = e.deptNo
GROUP BY d.deptNo, d.deptName
HAVING COUNT(e.empID) > 10;
```