Database Systems LAB – BSDSF23

(Morning & Afternoon)

Lab 07 – 25-04-2025

Copy the portable DB Browser for SQLite from server (\\printsrv) and start it.

OBJECTIVE :This lab focuses on implementing SQL joins to retrieve and manipulate data across multiple tables while applying aggregate functions for data analysis. Students will practice combining related data, performing calculations, filtering results, and organizing information to extract meaningful insights.

Emp Table:

ENO	Ename	Title
Filter	Filter	Filter
101	Alice	Manager
102	Bob	Engineer
103	Charlie	Analyst
104	David	Engineer
105	Eva	Manager
106	Frank	Developer
107	Grace	HR Specialist
108	Henry	Data Scientist
109	Ivy	Analyst
110	Jack	Developer

ASG Table:

ENO	PNO	RESP	DUR
Filter	Filter	Filter	Filter
101	1	Lead Research	12
102	2	Backend Developer	8
103	3	Data Analysis	10
104	2	UI Developer	6
105	4	HR Automation	5
106	5	Security Engineer	9
107	4	HR Policy Developer	7
108	6	Cloud Architect	11
109	3	Blockchain Specialist	8
110	2	Frontend Developer	6

PNO	PNAME	BUDGET
Filter	Filter	Filter
1	AI Research	50000
2	Web Development	30000
3	Finance App	40000
4	HR System	20000
5	Cybersecurity	60000
6	Cloud Migration	70000

TITLE	SAL
Filter	Filter
Manager	8000
Engineer	6000
Analyst	5000
Developer	6500
HR Specialist	5500
Data Scientist	7500

TASK # 01 Use the above tables and write SQL statements for the following tasks.

a. Retrieve the employee name and project count for all the employees working on multiple projects.
b. Give the total employee count and total salary cost for the projects Cybersecurity and Finance App.
c. Give salary to budget ratio in descending order for all the employees whose name ends with “e”.
d. List the names of employees who are working on projects whose total assignment duration is more than the average total duration of all projects. Also, only include those employees whose salary is higher than the average salary of all employees.
e. Display the names, titles, and salaries of employees working on projects that meet the following conditions: The project budget is greater than the average budget of all projects, the employee is assigned to projects with more than one employee working on them, the employee’s salary is greater than the average salary for employees with the title Engineer or The employee has worked on a project with a duration greater than the average project duration.

f. Write a SQL query to identify employees who have worked on the project with the highest total work duration (across all employees). The query should:
    - Identify the project with the highest total duration (sum of all employees' work durations).
    - Select the employees who have worked on this project for longer than 6 months.
    - For each selected employee, display the following:
    - Employee Name (Ename), Employee Title (Title), Total Duration they have worked on the project (sum of all tasks assigned to them), The Project's Budget (BUDGET).

salgrade Table

grade	losal	hisal
1	7000.00	12000.00
2	12001.00	14000.00
4	20001.00	30000.00
5	30001.00	100000.00
3	100001.00	200000.00

emp Table

empno	ename	job	mgr	hiredate	sal	comm	deptno
7369	WAHID	CLERK	7902	1993-06-13	8000.00		20
7499	AHMAD	SALESMAN	7698	1998-08-15	16000.00	3000.00	30
7521	WAJID	SALESMAN	7698	1996-03-26	12500.00	5000.00	30
7566	JAMEEL	MANAGER	7839	1995-10-31	29750.00		20
7698	BABAR	MANAGER	7839	1992-06-11	28500.00		30
7782	CRISTOFAR	MANAGER	7839	1993-05-14	24500.00		10
7788	SMEEA	ANALYST	7566	1996-03-05	30000.00		20
7839	BADSHAH	CHAIRPERSON		1990-06-09	50000.00		10
7844	TANVEER	SALESMAN	7698	1995-06-04	15000.00	0.00	30
7876	ADNAN	CLERK	7788	1999-06-04	11000.00		20
7900	JAFFER	CLERK	7698	2000-06-23	9500.00		30
7934	MEENA	CLERK	7782	2000-01-21	13000.00		10
7902	FOWAD	ANALYST	7566	1997-12-05	30000.00		20
7654	MAJID	SALESMAN	7698	1998-12-05	12500.00	14000.00	30

dept Table

deptno	dname	location
10	Accounting	Sargodha
20	Research	Karachi
30	Sales	Multan
40	Operations	Vehari

TASK # 02 : Use the above tables and write SQL statements for the following tasks.

g. Retrieve the name, salary and grade for all pairs of employees where one earns exactly twice as much as another.
h. Write a query to display the names of departments and the number of employees in those departments whose names start with the letter 'A' or 'M', but only for those departments where the average salary is higher than the overall average salary of all departments.
i. Display the names of employees, their department names, and their salaries only if their salary is greater than the average salary of employees in departments located in cities that contain the letter 'a' (case-insensitive).
j. Display the names of employees, their job, salary, and department name only if their salary is greater than the average salary of all MANAGERS, and their department has more than 3 employees in total.
k. Retrieve the grade and grade-wise employee count for all the employees working in the department located in Multan in ascending order wrt grade.
l. For each manager, show their name, salary and the average salary of their direct reports i.e employees managed by that particular manager in descending order with respect to average report salary.

NOTE : Make sure to fulfill all the requirements to get full credit.