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Assignment : **3**

Instructor: **Sir Mohammad Ali**

Course: **Database Management System**

```sql
Create table departments(
dept_id int primary key,
dept_name varchar(40),
location varchar(20));

INSERT INTO departments (dept_id, dept_name, location) VALUES
(1, 'HR', 'Lahore'),
(2, 'Finance', 'Karachi'),
(3, 'IT', 'Islamabad'),
(4, 'Marketing', 'Lahore'),
(5, 'Operations', 'Karachi'),
(6, 'R&D', 'Islamabad'),
(7, 'Legal', 'Multan'),
(8, 'Admin', 'Peshawar'),
(9, 'Support', 'Quetta'),
(10, 'Training', 'Faisalabad');

Create table employees(
emp_id int primary key,
emp_name varchar(50),
salary int,
dept_id int,
hire_date date
);
INSERT INTO employees (emp_id, emp_name, salary, dept_id, hire_date) VALUES
(101, 'Ali Khan', 50000, 1, '2020-01-15'),
(102, 'Sara Ahmed', 60000, 2, '2019-03-12'),
(103, 'Bilal Iqbal', 55000, 3, '2021-07-01'),
(104, 'Hina Tariq', 45000, 4, '2022-05-10'),
(105, 'Usman Malik', 70000, 3, '2018-11-20'),
(106, 'Ayesha Noor', 40000, 5, '2021-09-25'),
(107, 'Omar Farooq', 80000, 2, '2017-06-17'),
(108, 'Fatima Ali', 52000, NULL, '2023-02-05'),
(109, 'Imran Khan', 47000, NULL, '2022-12-01'),
(110, 'Nida Bukhari', 58000, 6, '2020-10-10');

Create table projects(
project_id int primary key,
project_name varchar(40),
budget int,
start_date Date,
end_date Date
);
```

```sql
INSERT INTO projects (project_id, project_name, budget, start_date, end_date) VALUES
(201, 'ERP System', 2000000, '2021-01-01', '2022-12-31'),
(202, 'HR Portal', 800000, '2022-05-01', '2023-04-30'),
(203, 'Marketing Campaign', 500000, '2022-09-01', '2023-01-31'),
(204, 'Mobile App', 1500000, '2021-06-15', '2022-12-15'),
(205, 'Financial Audit', 600000, '2023-03-01', '2023-06-30'),
(206, 'AI Research', 2500000, '2022-01-01', '2024-01-01'),
(207, 'Customer Support Upgrade', 300000, '2023-02-15', '2023-08-15'),
(208, 'Admin Automation', 400000, '2022-08-01', '2023-05-01'),
(209, 'Operations Efficiency', 900000, '2021-09-01', '2023-09-01'),
(210, 'Training Program', 350000, '2023-04-01', '2023-07-01');

create table employee_projects(
emp_id int,
project_id int,
hours_worked int
);

INSERT INTO employee_projects (emp_id, project_id, hours_worked) VALUES
(101, 202, 120),
(102, 205, 200),
(103, 201, 150),
(104, 203, 90),
(105, 204, 300),
(106, 209, 100),
(107, 205, 250),
(110, 206, 400),
(101, 204, 80),
(102, 201, 140),
(103, 206, 220),
(105, 207, 50);

-- Part 1 Basic Joins
Select emp_name,dept_name from employees as e left join departments as d on e.dept_id
=d.dept_id;

Select dept_name,emp_name from departments as d left join employees as e on d.dept_id =
e.dept_id;

Select emp_name from employees where dept_id is null;


--  Part 2 Complex Joins
Select p.project_name,e.emp_name from projects as p left join employee_projects as ep on
ep.project_id = p.project_id left join employees as e on e.emp_id =ep.emp_id;

Select d.dept_name,sum(ep.hours_worked) from departments as d left join employees as e on
e.dept_id = d.dept_id left join employee_projects as ep on ep.emp_id = e.emp_id group by
dept_name;

Select e.emp_name from employees as e left join employee_projects as ep on e.emp_id =
ep.emp_id where ep.project_id is null;
```

Part 3:

- What's the difference between INNER JOIN and LEFT JOIN? When would you use each?

Ans: "INNER JOIN" combines two tables and returns only the rows with matching values in both. While "LEFT JOIN" returns all rows from the left table along with the matching rows from the right table.

- Why might a RIGHT JOIN be less commonly used than a LEFT JOIN?

Ans A RIGHT JOIN is less used because people usually start with the main table on the left, so LEFT JOIN is easier to understand.