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Task 2 : Data analysis using complex Queries (Subqueries, CTEs, and window functions)

Table : Employee

| Empld | Name | Department | Salary | JoinDate |
|-------|--------|------------|--------|------------|
| 101 | Aakash | HR | 50000 | 2021-01-15 |
| 102 | Neha | IT | 70000 | 2020-12-10 |
| 103 | Rohan | Finance | 45000 | 2022-05-05 |
| 104 | Shreya | IT | 80000 | 2019-07-25 |
| 105 | Manish | HR | 52000 | 2021-03-10 |
| 106 | Priya | IT | 72000 | 2022-01-18 |

Complex SQL Queries:

1. Subqueries - Highest salary in each department.

Code :

```
SELECT Name, Department, Salary
FROM Employee
WHERE Salary = (
    SELECT MAX(Salary)
    FROM Employee e2
    WHERE e2.Department = Employee.Department
);
```

Output:

| Name | Department | Salary |
|--------|------------|--------|
| Manish | HR | 52000 |
| Shreya | IT | 80000 |
| Rohan | Finance | 45000 |

Explanation:

This Subquery find the employee(s) who earn the maximum salary in their department.

2. CTE(Common Table Expression) - Employees with above average salary .

Code :

```
WITH AvgSalary AS (  
    SELECT Department, AVG(Salary) AS DeptAvg  
    FROM Employee  
    GROUP BY Department  
)  
SELECT e.Name, e.Department, e.Salary  
FROM Employee e  
JOIN AvgSalary a ON e.Department = a.Department  
WHERE e.Salary > a.DeptAvg;
```

Output:

| Name | Department | Salary |
|--------|------------|--------|
| Manish | HR | 52000 |
| Shreya | IT | 80000 |
| Priya | IT | 72000 |

Explanation:

This CTE calculates the average salary per department and then filters out employees who earn more than that average.

3. Window Functions - Salary Rank within Department

Code :

```
SELECT Name, Department, Salary,  
    RANK() OVER (PARTITION BY Department ORDER BY Salary DESC) AS SalaryRank  
FROM Employee;
```

Output:

| Name | Department | Salary | SalaryRank |
|--------|------------|--------|------------|
| Manish | HR | 52000 | 1 |
| Aakash | HR | 50000 | 2 |
| Shreya | IT | 80000 | 1 |
| Priya | IT | 72000 | 2 |

| | | | |
|-------|---------|-------|---|
| Neha | IT | 70000 | 3 |
| Rohan | Finance | 45000 | 1 |

Explanation:

This window function ranks employees by salary within their department, without grouping.

Conclusion :

In this task, I practiced writing advanced SQL queries using:

- Subqueries
- Common Table Expressions (CTEs)
- Window functions

These queries helped analyze trends and patterns such as top earners, salary rankings, and average comparisons within departments.