Part - 3

Data Analysis Interview Q & A !!!

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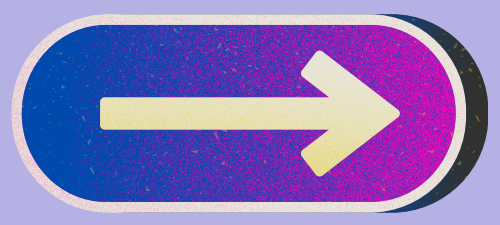
What is a CTE, and what are the benefits of using it?



CTE:

➡ **A Common Table Expression (CTE) is a temporary result set that can be referenced within a SQL statement such as**

- **SELECT,**
- **INSERT,**
- **UPDATE, or DELETE.**

CTEs make queries more readable and easier to manage by breaking them into simpler parts. They are defined using the WITH keyword.

How Do You Write a CTE?

Syntax:

The basic syntax for a CTE is as follows:

```sql
WITH cte_name AS (
    SELECT column1, column2
    FROM table_name
    WHERE condition
)
SELECT *
FROM cte_name;
```

Example:

Let's say we need to find the average salary for employees in each department and then filter out only those departments where the average salary exceeds 5000.

```sql
WITH AvgSalaryByDept AS (
    SELECT DepartmentID, AVG(Salary) AS AvgSalary
    FROM Employees
    GROUP BY DepartmentID
)
SELECT DepartmentID, AvgSalary
FROM AvgSalaryByDept
WHERE AvgSalary > 5000;
```

What Are the Benefits of Using CTEs?

Benefits of Using CTEs

Readability and Maintainability: **CTEs make complex queries more readable by allowing you to break down lengthy nested subqueries into simpler, manageable parts.**

Avoiding Redundancy: **If a subquery is needed multiple times within a main query, using a CTE avoids writing the same logic repeatedly, making the code cleaner and easier to update.**

Recursive Queries: **CTEs support recursion, which is helpful for querying hierarchical data like organizational charts, tree structures, or family trees.**

Temporary Scope: **CTEs exist only during the execution of the query, so they do not affect the database schema.**

Performance Improvements: **Breaking a complex query into smaller CTEs can sometimes help the query planner optimize execution.**

Simplifies Nested Queries: **They reduce the need for subqueries, resulting in cleaner and more maintainable code.**

Swipe right for the jackpot of the day 😉

wanna see some

Counter Questions

1. How do CTEs compare to temporary tables?

➥ **CTEs are temporary and exist only during the query execution,**

whereas temporary tables persist until they are explicitly dropped or the session ends.

CTEs are often simpler and cleaner for modularizing complex queries.

2. What are some limitations of CTEs?

➡ **Some databases have limits on recursion depth for recursive CTEs to prevent infinite loops.**

Additionally, CTEs do not inherently optimize performance; the database's query optimizer determines the execution plan.

3. How do CTEs affect performance?

➡ **While CTEs can improve the readability and maintainability of queries,**

they do not inherently optimize performance. The performance impact depends on the database engine's query optimizer.

4. How does recursion work in CTEs?

- **Recursion in CTEs involves an initial anchor member and a recursive member that refers to the CTE itself.**

The recursion terminates when no more rows are returned by the recursive member.

5. Can a CTE be referenced multiple times in the same query?

➡ **Yes, a CTE can be referenced multiple times in a single query,**

allowing for the reuse of the defined result set without rewriting the query logic.

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