Problems with Subqueries

- Cannot reuse the result
- Scope is very limited
- Code readability is poor
- Becomes complex when nested
- Hard to maintain

CTE (Common Table Expression)

CTE is a temporary result set created inside a query using WITH.

It improves readability and structure of the query.

Why we use CTE

- Makes complex queries easy to read
- Breaks big query into logical steps
- Helps replace nested subqueries
- Improves reusability **within the same query**

CTE Scope

- CTE exists **only for that single SELECT statement**
- Cannot be reused in another query
- Not stored in database

Recursive CTE

Recursive CTE is used when the output depends on previous rows.

Example use:

- Generate numbers
- Generate dates (last 10 days)

Recursive CTE has:

1. Anchor query (starting row)
2. Recursive query (next rows)

CTE Limitations

- Scope limited to the query
- Cannot be accessed outside the query
- Cannot be shared between users

Temporary Tables

Temporary table is a table that exists only for the session.

Temporary Table Scope

- Exists for the entire session
- Can be reused across multiple queries in same session
- Stored in system memory
- Automatically dropped when session ends
  (or manually dropped)

What we can do with Temporary Tables

- SELECT
- INSERT
- UPDATE
- DELETE
- JOIN

- WHERE conditions

Session-Level Limitation

- Only the creator can access it
- Other users cannot see it
- Even if they use same database
- Data exists only on creator's system

Disadvantages of Temporary Tables

- Data is duplicated
- Uses extra memory
- Not accessible outside session

Views

View is a virtual table created using a stored SQL query.

Why we use Views

- Simplifies complex queries
- Improves readability
- No data duplication
- Query is stored, not data

View Scope

- Stored in database schema
- Can be accessed outside session
- Multiple users can use it

Security and Abstraction (Very Important)

- Original table columns can be hidden
- Users see only selected columns
- Column names can be aliased
- Helps protect sensitive data

Real-Time Use of Views

- Healthcare: hide patient sensitive data
- Finance: hide credit card numbers, PINs
- Any confidential data scenario