**CTE ( common table expression)**

**Common table expression is used to generate a temporary data with the help of existing one, by retrieving it into a new table and working according to the requirements.**

**Cte has a timespan and gets deleted automatically after the query box gets closed by the user. Works only till the duration of the query .**

**It works with select, crate, update and delete expressions inside the table**

**The syntax of cte consists of with clause, although cte can be considered as a view but its maturity is only till the query box is in active state**

**We use cte when we want to work on a specific data from the entire table.**

**WITH CTE\_name AS ( SELECT column1, column2 FROM original\_table WHERE condition )**

**SELECT \* FROM CTE\_name WHERE additional\_condition;**

**Types of CTE:**

**Non-Recursive CTE: Used for one-time data extraction or manipulation.**

**WITH Sales\_CTE AS ( SELECT \* FROM Sales WHERE region = 'North')**

**SELECT \* FROM Sales\_CTE WHERE amount > 5000;**

**Recursive CTE: Used for hierarchical or iterative data processing.**

**Temporary table**

**Temp table is a physical data table generated in the database with the use od temp keyword during the generation of table.**

**It is used for the purpose of playing with multiple query and operations inside the table without causing any harm to the main**

**The timeline of this temporary data is till the session expires or the user explicitly dropped the table.**

**The temp data table is only visible to us and not on the pgsql table section.**

**CREATE TEMP TABLE temp\_table\_name ( column1 datatype, column2 datatype );**

**INSERT INTO temp\_table\_name (column1, column2) VALUES (value1, value2);**

**Types of Temporary Tables:**

1. **Local Temporary Table: Exists only during the session of the user who created it.**
2. **Global Temporary Table : Shared across sessions but data is isolated.**

**Difference between cte and temp table**

**CTE:**

**is used for the purpose of generating small data and working on it by retrieving it from a huge dataset without disturbing it orginal formats.**

**From large data, working with operations like select, create, alter, delete and understand the nature of that data.**

**1 table to multiple cte tables for working in a sessions.**

**Temp table :**

**Temp table is basically a temporary table generated for the purpose of doing as much as operations we are able to do in actual data set without any restrictions.**

**The only difference is that here the data is in temporary format and will expire as soon as the session ends**

**What is view:**

**A view in SQL is a virtual table that is created based on the result of a query. It does not store data itself but dynamically retrieves it from the underlying base tables whenever the view is queried. Views are used to simplify complex queries, enhance security by restricting access to certain columns or rows, and provide an abstraction layer over the underlying data structure.**

**Why Use Views?**

1. **Simplify Complex Queries: Encapsulate frequently used complex queries.**
2. **Data Abstraction: Hide details of the database schema.**
3. **Security: Provide restricted access to sensitive data.**
4. **Maintainability: Centralize business logic in one place.**

**Types of Views:**

**Simple View: Based on a single table and Does not use functions, groupings, or joins.**

**Complex View: Based on multiple tables, can include joins, aggregations, or functions.**

**Materialized View : Stores query results physically, improving performance for complex queries and Requires periodic refresh to stay updated.**