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| **Aspect** | **Temp Table** | **CTE (Common Table Expression)** | **View** | **Materialized View** |
| **Definition** | A temporary table to store data during a session. | A temporary, named result set within a query. | A virtual table based on a stored query. | A physical copy of a query result stored in the database. |
| **Data Storage** | Physically stores data in tempdb. | No physical storage; exists in memory. | No physical storage; only query definition. | Physically stores data like a table. |
| **Refresh/Update** | Automatically updated within the session. | Automatically reflects changes in the query. | Always shows the latest data from the base tables. | Needs manual or scheduled refresh. |
| **Indexes** | Can have indexes. | Cannot have indexes. | Cannot have indexes. | Can have indexes for faster access. |
| **Use Case** | Best for intermediate data storage in large queries or batch processes. | Ideal for simplifying complex queries within a single execution. | Useful for reusing complex queries and simplifying access to data. | Ideal for improving performance in repeated queries with large datasets. |
| **Advantages** | Good for large, complex data operations. | Simplifies complex queries, recursion. | Simplifies access to data, encapsulates logic. | Faster retrieval of data, especially for large datasets. |
| **Disadvantages** | Consumes resources in tempdb. | Limited to a single query's context. | Cannot include ORDER BY unless TOP is used. | Requires extra storage space for the materialized data. |
| **Example** | CREATE TEMP TABLE STAFF (ID INT) | WITH MyCTE AS (SELECT \* FROM Table) | CREATE VIEW MyView AS SELECT \* FROM Table | CREATE MATERIALIZED VIEW MyMatView AS SELECT \* FROM Table |