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SQL CONCEPTS

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- **Primary Key** - A column that uniquely identifies each row in a table. No duplicates or empty values.
- **Foreign Key** - A column that links one table to another. It connects related data.
- **Unique** - Makes sure all values in a column are different.
- **Not Null** - The column must have a value. It can't be left empty.
- **Default** - Gives a column a value automatically if no value is provided.
- **Check** - Makes sure the data in a column meets a certain condition.
- **Index** - Speeds up searches in a table by quickly finding data.
- **View** - A virtual table that shows results of a stored SQL query. It doesn't store real data.
- **Stored Procedure** - A saved set of SQL commands that you can run whenever needed.
- **Trigger** - Automatically runs some SQL code when something changes in a table (like insert, update, delete).



- **Function** - A small piece of code that returns a result. Used inside queries.
- **Cursor** - Used to go through each row in a result, one by one.
- **Transaction** - A group of SQL operations that are done together. All succeed or all fail.
- **Commit** - Saves the changes made in a transaction.
- **Rollback** - Cancels changes if something goes wrong
- **Savepoint** - A marker inside a transaction to roll back to if needed.
- **Select** - Used to get data from a table.
- **Insert** - Adds new data into a table.
- **Update** - Changes existing data in a table.
- **Delete** - Removes data from a table.
- **Cross Join** - Returns every possible combination of rows from two tables.
- **Union** - Combines data from two queries and removes duplicates.



- **Union All** - Combines data from two queries and keeps all duplicates.
- **Exists** - Checks if a subquery returns any results.
- **In** - Checks if a value exists in a list of values.
- **Between** - Checks if a value is within a range.
- **Like** - Used for simple pattern matching (like searching names that start with 'A').
- **Is Null** - Checks if a value is missing.
- **Distinct** - Removes duplicate rows from the results.
- **Alias** - Gives a temporary name to a column or table.
- **Case** - Works like "if-else" to create conditions inside queries.
- **Rank** - Gives a rank to rows with possible gaps in the numbers.
- **Dense Rank** - Gives a rank without gaps in the numbers.
- **Row Number** - Gives a unique number to each row in the result.
- **Window Functions** - Do calculations across a group of rows without grouping them.



- **Schema** - The structure or blueprint of a database (tables, columns, types, etc.)
- **Normalization** - Organizing data to remove repetition and save space.
- **Denormalization** - Adding some repetition to improve speed of access.
- **Constraints** - Rules that protect the data (like primary key, foreign key, etc.)
- **Subquery** - A query inside another query. It helps in filtering calculating.
- **Data Definition Language (DDL)** - Commands that define the structure of the database (like CREATE, ALTER, DROP).
- **Data Manipulation Language (DML)** - Commands that deal with data changes (like INSERT, UPDATE, DELETE).
- **Data Query Language (DQL)** - Commands used to fetch data (SELECT is the main one).
- **Data Control Language (DCL)** - Commands that handle permissions
- **Truncate** - Removes all rows from a table quickly, but keeps the table structure.



- **Drop** - Deletes a table or database completely.
- **Alter** - Changes an existing table (like adding/removing columns).
- **Temporary Table** - A table that exists temporarily for one session or query.
- **Materialized View** - A view that stores data physically and updates i periodically.
- **Auto Increment** - Automatically increases a numeric column value for each new row.
- **Data Type** - Defines the type of data a column holds (e.g., INT, VARCHAR, DATE).
- **Metadata** - Data about data (like table name, column types, etc.)
- **Constraint Violation** - Happens when data breaks a rule (e.g., duplicate in a PRIMARY KEY).
- **Referential Integrity** - Ensures relationships between tables stay consistent.
- **Surrogate Key** - A unique identifier for a record, usually an auto-incremented number.



- **Composite Key** - A combination of two or more columns to make a unique key.
- **Derived Table** - A temporary result set created inside a query (like a subquery with an alias).
- **Scalar Subquery** - A subquery that returns only one value.
- **Correlated Subquery** - A subquery that uses values from the outer query.
- **Null Handling** - Special treatment for missing or unknown values.
- **Coalesce** - Returns the first non-null value from a list of inputs.
- **NVL (Oracle)** - Similar to Coalesce; replaces NULL with a given value.
- **IFNULL / ISNULL** - Functions that handle NULL values depending on the database.
- **Set Operators** - Commands like UNION, INTERSECT, EXCEPT that combine or compare results.
- **Execution Plan** - Shows how SQL will run a query behind the scenes (for performance tuning).





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- DBMS Fundamentals
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