Day82 Intro. to SQL

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SQL (Structured Query Language) is a computer language used for storing, manipulating, and retrieving data in a relational database. It's the standard language for Relational Database Management Systems (RDMS) like MySQL, MS Access, Oracle, Sybase, Informix, Postgres, and SQL Server

Why SQL?

- Access data in relational database management systems.
- Describe and define data in a database.
- Manipulate data and create or drop databases and tables.
- Create views, stored procedures, and functions in a database.
- Set permissions on tables, procedures, and views.
- Embed within other languages using SQL modules, libraries, and pre-compilers.

DDL - Data Definition Language

- CREATE Creates a new table, a view of a table, or other object in the
- database.
- ALTER Modifies an existing database object, such as a table.
- DROP Deletes an entire table, a view of a table or other objects in the
- database.

DML - Data Manipulation Language

- SELECT Retrieves certain records from one or more tables.
- INSERT Creates a record.
- UPDATE Modifies records.
- DELETE Deletes records.

DCL - Data Control Language

- GRANT Gives a privilege to user.
- REVOKE Takes back privileges granted from user.

Components of SQL:

a. Tables:

- Fundamental structures that store data in rows and columns.
- Each column has a specific data type, such as INTEGER, VARCHAR, DATE, etc.

b. Indexes:

- Improve the performance of queries by facilitating faster data retrieval.
- They are created on columns in tables to speed up data retrieval operations.

c. Views:

- Virtual tables derived from one or more tables.
- They can simplify complex queries by presenting data in a predefined way.

d. Stored Procedures:

- Predefined SQL queries stored in the database for reuse.
- Enhance performance and security while reducing redundancy in code.

SQL Clauses:

a. WHERE:

- Filters data based on specified conditions.

b. ORDER BY:

- Sorts the result set in ascending or descending order.

c. GROUP BY:

- Groups rows with the same values into summary rows.

d. HAVING:

- Filters groups based on specified conditions (used with GROUP BY).

SQL Constraints

Constraints are the rules enforced on data columns on a table. These are used to limit the type of data that can go into a table. This ensures the accuracy and reliability of the data in the database. Constraints can either be column level or table level. Following are some of the most commonly used constraints available in SQL:

• **NOT NULL Constraint:** Ensures that a column cannot have a NULL value.

• **DEFAULT Constraint:** Provides a default value for a column when none is specified.

• **UNIQUE Constraint:** Ensures that all the values in a column are different.

- **PRIMARY Key:** Uniquely identifies each row/record in a database table.
- **FOREIGN Key:** Uniquely identifies a row/record in any another database table.
- **CHECK Constraint:** The CHECK constraint ensures that all values in a column satisfy certain conditions.
- **INDEX:** Used to create and retrieve data from the database very quickly.