Day 1 : SQL Notes Basic to Advanced

Today Topics: Introduction to SQL

- What is SQL?
- History of SQL
- SQL Standards and Versions
- Types of SQL Statements: DDL, DML, DCL, TCL

What is SQL?

- SQL stands for Structured Query Language.
- Used for managing and manipulating databases.
- Can retrieve, insert, update, and delete data.
- Widely used because of its simplicity and efficiency.

History of SQL

- Developed in the early 1970s by Donald D. Chamberlin and Raymond F. Boyce at IBM.
- Originally called SEQUEL (Structured English Query Language).

- Name changed to SQL due to trademark issues.
- Became the standard language for relational databases (Oracle, MySQL, etc.).

SQL Standards and Versions

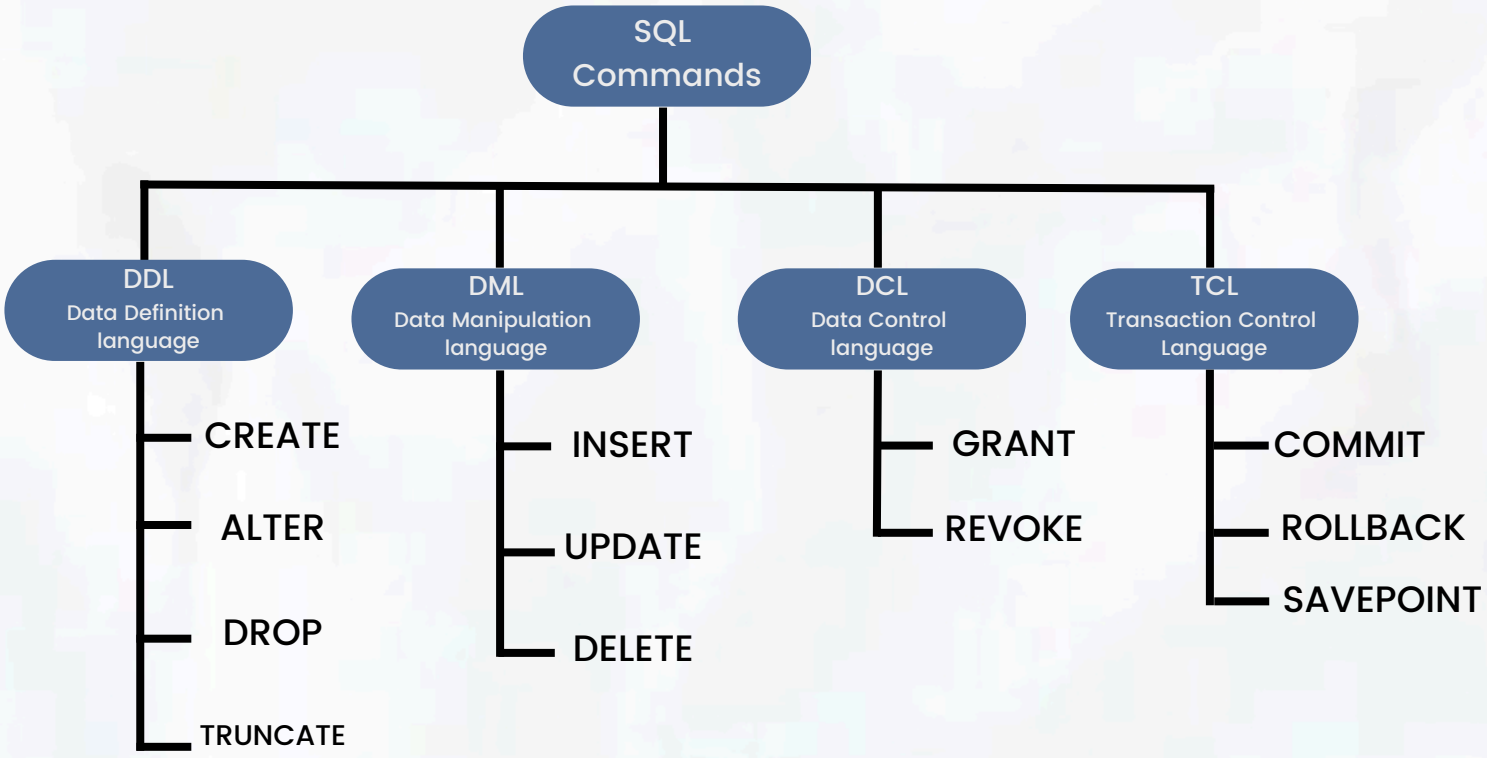
Standardized by ANSI (American National Standards Institute) and ISO (International Organization for Standardization).

Key versions:

- SQL-86
- SQL-89
- SQL-92
- SQL:1999
- SQL:2003
- SQL:2008
- SQL:2011
- SQL:2016

Each version adds new features and improvements.

Types of SQL Commands:



DDL COMMANDS:

- DDL (Data Definition Language) used to change the structure of the table Like creating the table, altering the table & Deleting the table.
- All the commands in the DDL are auto Committed that means it permanently saves all the changes in the database.
- DDL commands are essential for creating and managing the basic structure of a database.

Key DDL Commands

1. Create : Used to create new tables, views, or other database objects.

Syntax:

```
CREATE TABLE table_name (
column1 datatype [constraints],
column2 datatype [constraints],
... );
```


Example:

Creating a table for employee information:

```
CREATE TABLE employees (
employee_id INT PRIMARY KEY,
first_name VARCHAR(50),
department VARCHAR(50),
hire_date DATE
);
```

2. Alter

The ALTER TABLE statement in Structured Query Language allows you to add, modify, and delete columns of an existing table.

Syntax:

```
ALTER TABLE table_name

ADD column_name datatype;
```

Example:

```
ALTER TABLE Employee

ADD Email varchar(255);
```


3. Drop

The DROP TABLE statement is used to drop an existing table in a database. this command deletes both the structure & Records Stored in table.

Syntax:

```
DROP TABLE table_name;
```

4. TRUNCATE

A truncate SQL statement is used to remove all rows (complete data) from a table. It is similar to the DELETE statement with no WHERE clause.

Syntax:

```
TRUNCATE TABLE table_name;
```

Example:

```
TRUNCATE TABLE Employee;
```

DML COMMANDS:

1. INSERT

SQL INSERT statement is a SQL query. It is used to insert a single or a multiple records in a table.

Syntax:

```
INSERT INTO table_name

VALUES (value1, value2, value3....);
```

Example:

```
INSERT INTO STUDENTS (ROLL_NO, NAME, AGE, CITY)

VALUES (1, Yadnyesh , 19, PUNE);
```

2. UPDATE

The UPDATE statement is used to modify the existing records in a table.

Syntax:

```
UPDATE table_name

SET column1 = value1, column2 = value2, ...

WHERE condition;
```

Example:

```
UPDATE Customers

SET ContactName = 'Yadu', City= 'pune'

WHERE CustomerID = 101;
```

3. DELETE

The DELETE statement is used to delete existing records in a table.

Syntax:

DELETE FROM table_name [WHERE condition];

Example:

DELETE FROM Customers WHERE CustomerName='Yadu'';

DCL COMMANDS:

1. GRANT

It is used to give user access privileges to a database.

Syntax:

GRANT SELECT, UPDATE ON MY_TABLE TO SOME_USER, ANOTHER_USER;

2. REVOKE

GRANT SELECT, UPDATE ON MY_TABLE TO SOME_USER, ANOTHER_USER;

Syntax:

REVOKE SELECT, UPDATE ON MY_TABLE FROM USER1, USER2;

TCL COMMANDS:

1. COMMIT

Commits a Transaction. The COMMIT command saves all the transactions to the database since the last COMMIT or ROLLBACK command.

Syntax:

COMMIT;

Example:

DELETE FROM Student WHERE AGE = 20;

COMMIT;

2. ROLLBACK

If any error occurs with any of the SQL grouped statements, all changes need to be aborted. The process of reversing changes is called rollback

Syntax:


```
ROLLBACK;
```

Example:

```
DELETE FROM Student WHERE AGE = 20;

ROLLBACK;
```

DAY 2: SQL COMMANDS AND THEIR USE (VISIT TOMORROW)