

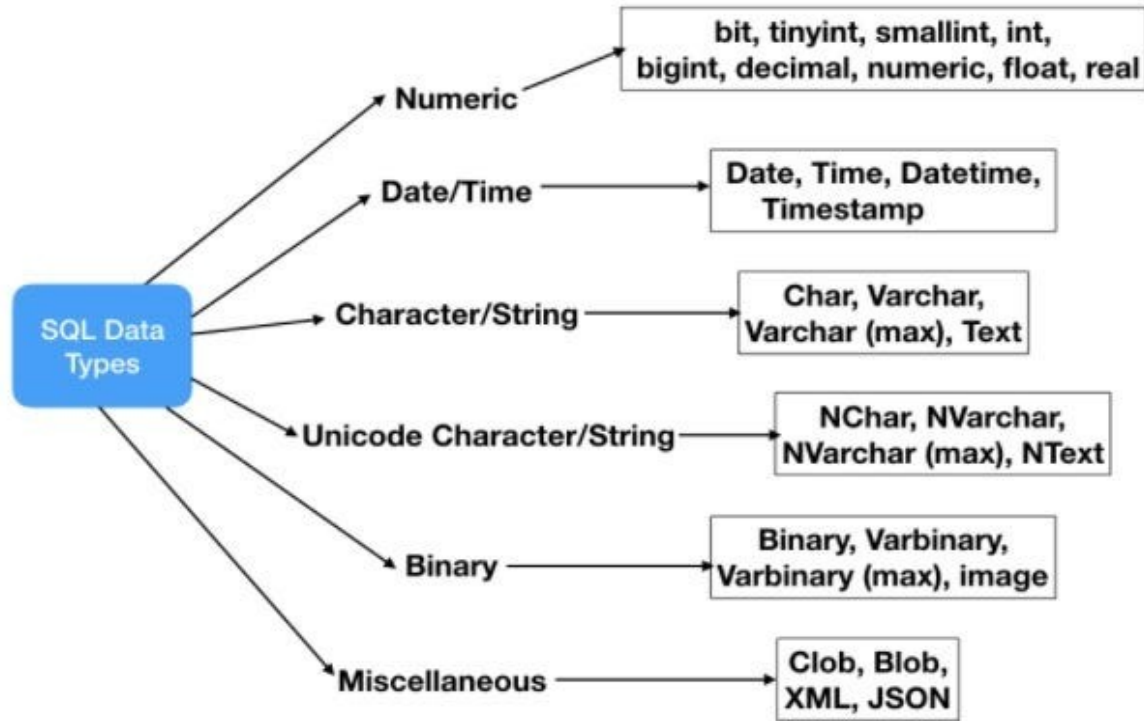
SQL BASICS



DATA TYPES IN SQL



- SQL specifies various types of data that can be stored in a SQL-based database and manipulated by the SQL language.





- **INT** or **INTEGER**: Used to store whole numbers. For example, you can use **INT** to represent a person's age.
- **CHAR(n)**: Used to store fixed-length character strings with a specified length (n). eg : someones NAME
- **VARCHAR(n)**: Used to store variable-length character strings with a maximum length (n). eg: address
- **Date and Time Data Types**:
 - DATE**: Used to store date values (year, month, day).
 - TIMESTAMP** or **DATETIME**: Used to store date and time values, including the year, month, day, hour, minute, and second.

```
CREATE TABLE Persons (  
    age INT,  
    name CHAR(50),  
    address VARCHAR(100),  
    date_of_birth DATE,  
    arrival_time TIMESTAMP  
);
```

Statements



- In **SQL (Structured Query Language)**, statements are a collection of individual commands that are used to interact with a database.
- Each statement requests a specific action from the DBMS, such as creating a new table, retrieving data, or inserting new data into the database.
- All SQL statements have the same basic form.

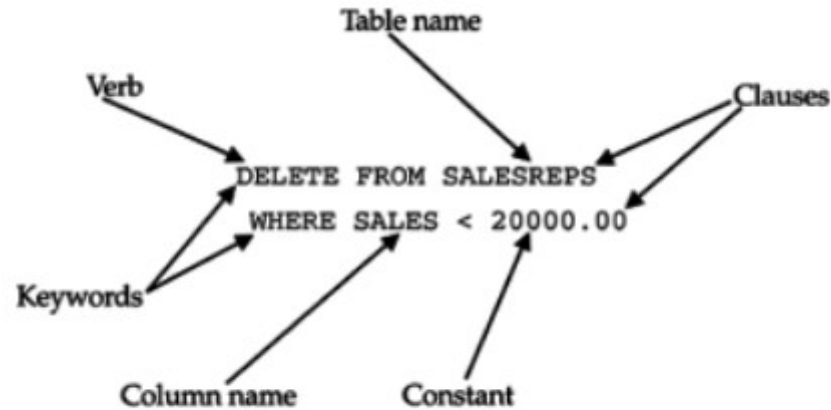


Figure 5-1: The structure of a SQL statement

Every SQL statement begins with a verb, a keyword that describes what the statement Does.

CREATE, INSERT, DELETE, and COMMIT are all examples.

The statement continues with one or more clauses.

Every clause begins with a keyword, such as WHERE, FROM, INTO, and HAVING.

A clause may specify the data to be acted upon by the statement or provide more detail about what the statement is supposed to do.

DDL ,DML, DCL



- SQL commands are divided into 3 major categories:
 - DDL - Data Definition Language
 - DML - Data Manipulation Language
 - DCL – Data Control Language

1.DDL - Data Definition Language

DDL ,is a subset of SQL commands that define the structure or schema of the database.

- It includes commands such as CREATE, ALTER, and DROP
- DDL statements focus on defining the database structure and schema

- The list of DDL commands in SQL:

- 1) The **CREATE** command creates database objects, tables, and triggers.
- 2) The **ALTER** command alters the database structure by adding, deleting, and modifying columns of the already existing tables, like renaming and changing the data type and size of the columns.
- 3) The **DROP** command deletes the defined table with all the table data, associated indexes, constraints, triggers, and permission specifications.
- 4) The **TRUNCATE** command deletes all the data and records from an existing table, including the allocated spaces for the records. Unlike the **DROP** command, it does not delete the table from the database. It works similarly to the DELETE statement without a WHERE clause.
- 5) The **RENAME** command changes the table name when the user or administrator wants to give a more relevant name to it.



2. DML- Data Manipulation Language.



- Data Manipulation Language - comprises of commands in SQL language that deal with managing and manipulating data in the database.
- It allows you to perform operations such as inserting, updating, and deleting data from database tables.
- It enables you to perform operations like storing data in database tables, modifying and deleting existing rows, retrieving data, or updating data.
- The most commonly used commands are :
- **SELECT**: fetches records from one or more tables in the database.
- **INSERT INTO**: Inserts new records into a table in the database
- **UPDATE**: Modifies/Updates existing data in a table within the database.
- **DELETE**: Removes/Deletes an existing record from a table in the database.

3. DCL - Data Control Language.



- Data Control Language - DCL, is comprised of the commands in SQL that deal with controls, rights, and permission in the database system.
- These commands are used to set user permissions, manage user roles, and control data security and integrity within the database.
- These commands include :
- **GRANT**: Gives specific permissions to users or user roles.
- **REVOKE**: Revokes previously granted permissions given with the GRANT command.
- **DENY**: Explicitly denies certain permissions.
- **ALTER USER**: Modifies user properties or settings.

DDL -(Data Definition Language) Example:



- We can use the **CREATE** command which is a DDL command to create a new database in SQL.

CREATE Database Books;

- The above SQL query creates a database named Books in our MySQL database.
- We can also use the **CREATE** command to create a new table in SQL.

```
CREATE TABLE Student
(
    Roll_No. INT,
    First_Name VARCHAR(20),
    Last_Name VARCHAR(20),
    Age INT,
    Marks INT,
);
```

- The query above creates a table in our database named **student** with the given five columns in the SQL database.

DML(Data Manipulation Language) Example :



- Let's take the example of INSERT, which is a DML command. The INSERT command inserts data into the table in the SQL database.
- consider a Student table in a SQL database having fields names as : **stdnt_id**, **name** , and **age**.
- We can insert a new record into the Student table using the INSERT command.

INSERT INTO Student VALUES(105, 'Nisha', 30);

DCL – Data Control Language Commands Examples:



GRANT SELECT, UPDATE ON Student TO Nisha

- In the above SQL Query, we use the **GRANT** command to give permission.
- Using this command, the user gets the **SELECT** and **UPDATE** privileges.
- The **SELECT** command gives access to view the record, and **UPDATE** gives **access to modify the record**.
- The control works on the table Student, which is the object here. Nisha is the username of the person getting permission to view and modify the Student table.