Types of Data

Structured Data

- Organized in a predefined schema (rows and columns)
- Easily stored and queried using SQL
- Examples: Relational databases, Excel tables

Semi-Structured Data

- Does not follow a rigid schema but has identifiable structure
- Examples: JSON, XML, Avro, Parquet

Unstructured Data

- No predefined format or structure
- Difficult to analyze using traditional tools
- Examples: Text documents, emails, images, videos, audio

Database

A Database is an organized collection of data stored electronically and structured for efficient access, management, and updates.

DBMS (Database Management System)

A DBMS is software that allows users and applications to create, read, update, delete, and manage databases.

Example: MYSQL, PostgreSQL, Snowflake

SQL (Structured Query Language)

SQL is a standard programming language used to communicate with relational databases.

Schema

A Schema is a logical container or blueprint that organizes database objects such as tables, views, functions, and procedures.

SQL Commands

SQL commands are categorized based on the operations they perform.

1)DDL (Data Definition Language)

- Used to define and modify database structures.
  (Create, Alter, Drop, Truncate)

2) DML (Data Manipulation Language)

- Used to manipulate data inside tables.
  (Insert, Update, Delete)

3) DQL (Data Query Language)

- Used to retrieve data.
  (Select)

4) DCL (Data Control Language)

- Used to control access to data.
  (Grant, Revoke)

5) TCL (Transaction Control Language)

- Used to manage transactions.
  (Commit, Roleback, Savepoint)

Constraints

Constraints are rules enforced on database tables to maintain data accuracy, consistency, and integrity.

1**.Not Null**

- Ensures a column **cannot contain NULL values**.

2. **UNIQUE**

- Ensures all values in a column are **distinct**.

3. **PRIMARY KEY**

- Uniquely identifies each record
- Combines UNIQUE & NOT NULL
- One primary key per table

4. **FOREIGN KEY**

- Creates a relationship between two tables
- Enforces referential integrity

5. **CHECK**

- Ensures values satisfy a **specific condition**.

6. **DEFAULT**

- Assigns a **default value** if none is provided.