Introduction to SQL

What is SQL?

- **SQL** stands for **Structured Query Language**, and it is a programming language used to manage and manipulate relational databases.
- Relational databases consist of tables of data with related information stored in rows and columns. SQL allows you to perform operations on this data, such as inserting, updating, deleting, and querying data.
- SQL is the most widely used database language and is supported by almost all popular database systems, including MySQL, Oracle, Microsoft SQL Server, PostgreSQL, and SQLite.
- It consists of several components, including **commands, operators, and functions**, which are used to perform different operations on the database.

SQL Components

- SQL (Structured Query Language) consists of several components, including:

1. **Data Definition Language (DDL):** This component is used to define the structure of the database. It includes commands such as CREATE, ALTER, and DROP, which are used to create, modify, and delete database objects like tables, views, indexes, and stored procedures.
2. **Data Manipulation Language (DML):** This component is used to manipulate the data in the database. It includes commands such as INSERT, UPDATE, and DELETE, which are used to add, modify, and remove data from tables.
3. **Data Control Language (DCL):** This component is used to control the access to the database. It includes commands such as GRANT and REVOKE, which are used to give and revoke permissions to users for accessing database objects.
4. **Transaction Control Language (TCL):** This component is used to manage transactions in the database. It includes commands such as COMMIT and ROLLBACK, which are used to commit or undo changes made during a transaction.
5. **Query Language:** This component is used to retrieve data from the database. It includes commands such as SELECT, which is used to retrieve data from tables based on specified conditions.
6. **Functions and Operators:** SQL includes various built-in functions and operators that can be used to perform calculations, manipulate strings and dates, and compare values.

These components work together to manage and manipulate data in a relational database. They allow users to create, modify, and delete database objects, manipulate data, control access to the database, manage transactions, and retrieve data based on specific conditions.