

SQL Fundamentals

SQL Fundamentals

Introduction to SQL:

- SQL (Structured Query Language) is a standard language for accessing and manipulating databases.
- It allows users to interact with databases to retrieve, update, and manage data efficiently.

Key Concepts:

1. **Database:** A structured collection of data organized for easy access, management, and updating.
2. **Table:** A collection of related data entries organized in rows and columns.
3. **Query:** A request for information from a database using SQL commands.
4. **CRUD Operations:**
 - **Create (INSERT):** Adds new data to a table.
 - **Read (SELECT):** Retrieves data from a table.
 - **Update (UPDATE):** Modifies existing data in a table.
 - **Delete (DELETE):** Removes data from a table.

Basic SQL Commands:

1. **SELECT:** Retrieves data from one or more tables.
 - Example: `SELECT column1, column2 FROM table_name WHERE condition;`
2. **INSERT INTO:** Adds new records to a table.
 - Example: `INSERT INTO table_name (column1, column2) VALUES (value1, value2);`
3. **UPDATE:** Modifies existing records in a table.
 - Example: `UPDATE table_name SET column1 = value1 WHERE condition;`
4. **DELETE:** Removes records from a table.
 - Example: `DELETE FROM table_name WHERE condition;`

Filtering Data:

- **WHERE Clause:** Used to filter records based on specified conditions.
 - Example: `SELECT * FROM table_name WHERE condition;`

Sorting Data:

SQL Fundamentals

- **ORDER BY Clause:** Sorts the result set in ascending or descending order.
 - Example: `SELECT * FROM table_name ORDER BY column_name ASC|DESC;`

Grouping Data:

- **GROUP BY Clause:** Groups rows that have the same values into summary rows.
 - Example: `SELECT column_name, COUNT(*) FROM table_name GROUP BY column_name;`

Joining Tables:

- **JOIN Clause:** Combines rows from two or more tables based on a related column.
 - Types of Joins: INNER JOIN, LEFT JOIN, RIGHT JOIN, FULL JOIN.

Conclusion:

- SQL is a powerful language for managing and querying databases efficiently.
- Understanding SQL fundamentals is essential for anyone working with databases or data analysis.