
SQL

1. Introduction To SQL & RDMS

- What Is SQL?
- RDMS Vs DBMS
- Popular RDMS: MYSQL, PostgreSQL, Oracle, SQL Server
- Basic SQL Syntax & Structure
- SQL Data Types
- Tables, Rows, Columns, Primary Key, Foreign Key



2. Data Definition Language(DDL)

- CREATE TABLE
- ALTER TABLE (Add, Drop, Modify Columns)
- DROP TABLE
- RENAME TABLE
- Constraints:
 - PRIMARY KEY, FOREIGN KEY
 - NOT NULL, UNIQUE, DEFAULT, CHECK

3. Data Manipulation Language (DML)

- INSERT INTO
- UPDATE
- DELETE
- Inserting Multiple Rows
- NULL Values Handling

4. Data Query Language (DQL) – SELECT Statements

- SELECT Basics
- WHERE Clause
- Comparison Operators (=, >, <, !=, BETWEEN, IN, LIKE)
- Logical Operators (AND, OR, NOT)
- ORDER BY
- DISTINCT

5. Functions In SQL

- Aggregate Functions: COUNT(), SUM(), AVG(), MIN(), MAX()
- String Functions: CONCAT(), LENGTH(), LOWER(), UPPER(), SUBSTRING()
- Date / Time Functions: NOW(), CURDATE, DATEDIFF(), DATE_FORMAT()
- Mathematical Functions: ROUND(), FLOOR(), CEIL(), MOD()

6. Grouping & Filtering

- GROUP BY
- HAVING Clause
- Grouping With Aggregate Functions
- Difference Between WHERE & HAVING

7. Joins (Combining Tables)

- INNER JOIN
- LEFT JOIN / LEFT OUTER JOIN
- RIGHT JOIN
- FULL OUTER JOIN
- CROSS JOIN
- Self Joins

8. Subqueries & Nested Queries

- Scalar Subqueries
- Correlated Vs Non-Correlated Subqueries
- IN, EXISTS, ANY, ALL In Subqueries

9. Set Operations

- UNION, UNION ALL
- INTERSECT (if supported)
- MINUS / EXCEPT

10. Views, Indexes & Transactions

- Views: CREATE VIEW, ALTER, DROP VIEW
- Indexes: CREATE INDEX, UNIQUE INDEX, DROP INDEX
- Transactions:
 - BEGIN, COMMIT, ROLLBACK
 - SAVEPOINT

- ACID Properties

11. SQL Constraints & Keys

- Primary Key, Foreign Key
- Unique, Not Null, Default, Check
- Composite Key
- Referential Integrity

12. Normalization (Theory)

- 1NF, 2NF, 3NF (Basic Understanding)
- Functional Dependencies
- Denormalization (For Performance Tuning)

13. SQL Interview & Practice Topics

- Top 50 Practice Queries (real-world)
- Join-based queries
- Aggregate + GROUP BY Challenges
- Window Functions (optional)
- Schema-based query challenges

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