

# SQL FOR DATA ANALYSIS

## Edition 2025

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SQL plays a pivotal role in data analytics for data analysts, serving as an essential tool for working with relational databases. SQL (Structured Query Language) is a powerful and widely adopted language that provides a standardized way to interact with databases, making it indispensable in the field of data analytics.

With SQL, data analysts can efficiently query, retrieve, and manipulate large datasets, enabling them to extract meaningful insights. It allows for complex operations such as filtering, sorting, aggregating, and joining data from multiple tables, which are critical for comprehensive analysis. Additionally, SQL supports data cleansing, transformation, and preparation processes, ensuring data is accurate and ready for analysis.

**\*Important Note:** There are multiple databases available for SQL, such as MS SQL, MySQL, Oracle, PostgreSQL, and others. You can choose to study any one database using the roadmap/syllabus provided below. However, keep in mind that some functions may vary slightly across different databases.

SQL and its various databases are accurate. SQL is a standardized language, but each database management system (DBMS) like MS SQL, MySQL, Oracle, and PostgreSQL may implement certain features or functions differently. This means while the core SQL syntax remains consistent, specific functions, data types, or performance optimizations might vary between databases.

- Introduction to SQL and its importance in data analytics.
- Understanding RDBMS (Relational Database Management Systems).
- DQL (Data Query Language): SELECT, WHERE, GROUP BY, ORDER BY, HAVING, DISTINCT, LIMIT, etc.
- DML (Data Manipulation Language): INSERT, UPDATE, DELETE, LOCK, MERGE, etc.
- DDL (Data Definition Language): CREATE, DROP, ALTER, TRUNCATE, RENAME, etc.
- DCL (Data Control Language): GRANT, REVOKE, DENY, etc.
- TCL (Transaction Control Language): COMMIT, SAVEPOINT, ROLLBACK, etc.

## **Operators in SQL:**

- Arithmetic Operators
- Comparison Operators
- Logical Operators
- String Operators

## **SQL Functions:**

- **Aggregate Functions:** SUM, AVG, MIN, MAX, COUNT, COUNTD, PCT, etc.
- **Analytical Functions:** RANK, DENSE\_RANK, ROW\_NUMBER, etc.
- **Date Functions:** DATEADD, DATEDIFF, DATEPART, DATENAME, GETDATE, NOW, SYSDATE, CURRENT\_DATE, CURRENT\_TIMESTAMP, EXTRACT, TO\_CHAR, TO\_DATE, DATE\_TRUNC, LAST\_DAY, NEXT\_DAY, ADD\_MONTHS, MONTHS\_BETWEEN, ROUND (For Dates), TRUNC (For Dates).
- **String Functions:** UPPER, LOWER, CONCAT, SUBSTRING, TRIM, LTRIM, RTRIM, LENGTH, REPLACE, INSTR, LEFT, RIGHT.
- **Numeric Functions:** ROUND, CEIL, FLOOR, ABS, POWER, SQRT, MOD, SIGN.
- **Conversion Functions:** CAST, CONVERT, TO\_NUMBER, TO\_CHAR, TO\_DATE.

## **Joins and Subqueries:**

- **Joins:** Inner Join, Left Join, Right Join, Outer Join, Self Join, Cross Join.
- **Subqueries:** Correlated Subquery, Nested Subquery, etc.

## **Advanced SQL Topics:**

- Window Functions: RANK, DENSE\_RANK, ROW\_NUMBER, NTILE, LEAD, LAG, FIRST\_VALUE, LAST\_VALUE, CUME\_DIST, PERCENT\_RANK.
- Introduction to Stored Procedures: Writing, executing, and managing stored procedures.
- Using Stored Procedures for automating repetitive tasks.
- Indexing in SQL: Creating, modifying, and dropping indexes for performance optimization.
- Views in SQL: Creating, managing, and utilizing views to simplify complex queries.
- Materialized Views: Introduction and use cases for performance improvement.
- Recursive Queries using Common Table Expressions (CTEs).
- Advanced filtering techniques with CASE and subqueries.

- Working with Triggers
- Handling Null Values: Using ISNULL, COALESCE, and NULLIF effectively.
- Writing advanced and complex queries.

### **Practical Applications:**

- Creating interactive reports using SQL queries.
- Implementing data cleaning and transformation tasks.
- Optimizing SQL queries for better database performance.

### **SQL Query Writing (Basic to Advanced):**

- Hands-on query writing for different domains and databases to gain real-time application experience and practice all the functions you have learned.

### **SQL Projects:**

3 SQL Projects End to End

### **Interview Questions/ Scenario Based/ Notes/ PPT's/ Formulae's/ Quick Notes:**

Refer to the SQL material you purchased from the website to access comprehensive **Interview Questions, Scenario-Based Examples, Notes, PPTs, Key Formulae, Advanced SQL Queries, Real time Q&A**. This material is designed to help you master SQL concepts, build real-world expertise, and get fully prepared for interviews with confidence.

### **Course/ Study Links:**

#### **SQL Complete Course Database:**

- ❖ **MS SQL Server Complete Tutorial:** <https://www.youtube.com/watch?v=wI4HWGII6gM&t=10772s>
- ❖ **My SQL Complete Tutorial:** <https://www.youtube.com/watch?v=oxNMMvjFY40>
- ❖ **Postgres SQL Complete Tutorial:** <https://www.youtube.com/watch?v=SpfIwlAYaKk>
- ❖ **Oracle SQL Complete Tutorial:** <https://www.udemy.com/course/oracle-19c-sql/?couponCode=NEWYEARCAREER>

### **SQL Projects:**

- ❖ **Bank Loan Analysis:** <https://www.youtube.com/watch?v=bakn6HGemyM>
- ❖ **Coffee Sales Analysis:** <https://www.youtube.com/watch?v=hgz0msTZtX8&t=2880s>

❖ **India Elections Results Analysis (*Multiple Tables*) | Must Watch and Important:**

<https://www.youtube.com/watch?v=ymHc66aSOUU&t=2s>

**SQL Query Writing Practice:**

- ❖ **W3 resource basic to advanced query writing:** <https://www.w3resource.com/sql-exercises/>
- ❖ **Leetcode SQL query writing:** <https://leetcode.com/studyplan/top-sql-50/>
- ❖ **Hacker Rank:** <https://www.hackerrank.com/domains/sql>

**Interview Questions/ Scenario Based/ Notes/ PPT's/ Formulae's/ Quick Notes:**

- ❖ **Data Analyst Complete Material:**
  - If already purchased please refer to SQL Folder in the link you received.
  - If not purchased use below link: [https://topmate.io/data\\_tutorials/498634](https://topmate.io/data_tutorials/498634).
  - This material contains important e-books for different databases, printed and hand written notes, quick ppt's, interview ready materials for quick revisions, advanced projects, cheat sheets, etc.
- ❖ **1:1/ career guidance, mock interviews -** [https://topmate.io/data\\_tutorials](https://topmate.io/data_tutorials)
- ❖ **Data Analyst Complete Material - 2025 Edition -** [https://topmate.io/data\\_tutorials/498634](https://topmate.io/data_tutorials/498634)
- ❖ **Power BI Projects - 17 Unique Projects -** [https://topmate.io/data\\_tutorials/868486](https://topmate.io/data_tutorials/868486)
- ❖ **Tableau Projects - 16 Unique Projects -** [https://topmate.io/data\\_tutorials/923950](https://topmate.io/data_tutorials/923950)
- ❖ **Excel Projects - 10 Unique Projects -** [https://topmate.io/data\\_tutorials/108...](https://topmate.io/data_tutorials/108...)
- ❖ **Power BI Material - 2025 Edition -** [https://topmate.io/data\\_tutorials/536295](https://topmate.io/data_tutorials/536295)
- ❖ **Tableau Material - 2025 Edition -** [https://topmate.io/data\\_tutorials/492381](https://topmate.io/data_tutorials/492381)
- ❖ **SQL Material - 2025 Edition -** [https://topmate.io/data\\_tutorials/492624](https://topmate.io/data_tutorials/492624)

The expert in anything was once a beginner