

Advanced SQL Course

Module 1: Introduction and Overview -

SQL fundamentals

- Why SQL can be both easy and difficult
- Recommendations for thorough testing

Retrieving data with SELECT

- Expressions
- Literals
- Handling NULLs properly

Executing queries

- Analysing query plans
- Enhancing query performance
- Retrieving partly results with FETCH and OFFSET
- Selecting the best alternatives
- Avoiding errors and pitfalls

Module 2: Querying Multiple Tables –

Implementing various types of joins

- Inner joins
- Cross joins
- Left, right and full outer joins
- Equijoins vs theta joins
- The performance implications of joins
- Adding filter conditions to outer joins

Writing self joins

- Joining a table to itself
- Chaining self joins
- Solving time-interval problems





Combining queries with set operators

- UNION
- UNION ALL
- INTERSECT
- EXCEPT

Module 3: Aggregate Functions –

Summarising data with aggregate functions

- COUNT
- SUM
- AVG
- MIN
- MAX
- Managing NULLs
- Identifying duplicates

Grouping data

- GROUP BY
- Applying conditions with HAVING
- Calculating moving averages
- Building crosstab reports

Extending group queries

- Nesting grouped aggregates
- Joins and grouping
- Introducing subtotals with CUBE and ROLLUP

Module 4: Performing Extensive Analysis with Analytic Functions –

The OVER clause

- Specifying the ordering before applying the function
- Splitting the result set into logical partitions

Calculating ranks

- RANK and DENSE_RANK
- ROW_NUMBER with ordered sets
- Calculating percentiles

Extending the use of aggregates

- Partitioning in multiple levels
- Computing running totals
- Comparing row and aggregate values
- Top-N queries
- Defining sliding window boundaries

Module 5: Building Subqueries –

Self-contained subqueries

- Subqueries in conditions and column expressions
- Creating multilevel subqueries
- Avoiding problems when subqueries return NULLs
- Handling multirow subquery results
- Finding gaps in number series

Correlated subqueries

- Accessing values from the outer query
- EXISTS vs IN
- Identifying duplicates
- Avoiding accidental correlation

Common table expressions

- Reusable subqueries
- Recursive subqueries
- Traversing hierarchies

Module 6: Breaking Down Complex Queries –

- Overcoming SQL limitations
- Reducing complexity and improving performance