BLACKBIRD FOR TRAINING

Comprehensive Structured Query Language (SQL)

10 – 21 October 2027
Cairo (Egypt)



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Introduction

In today's data-centric world, Structured Query Language SQL is the cornerstone of data management and analysis, enabling professionals to interact with and optimize relational databases effectively. This Structured Query Language course introduces participants to SQL fundamentals and progresses into advanced concepts, such as SQL functions, query optimization, and database security. Through hands-on practice, real-world case studies, and interactive exercises, participants will gain the skills needed to excel in data analysis, database management, and SQL-based application development.

This course is designed to cater to both beginners and experienced professionals looking to enhance their SQL skills, earn SQL certification, and master structured query language techniques to solve real-world challenges.

Course Objectives

By the end of this course, participants will be able to:

- Understand Structured Query Language: Define what SQL is and explore its applications in database management.
- Master SQL Basics: Learn the core concepts and basics of structured query language for data querying and manipulation.
- Implement Advanced SQL Techniques: Gain proficiency in complex queries, SQL functions, and database optimization.
- Optimize Database Performance: Apply performance tuning techniques to improve query efficiency and data retrieval.
- Ensure Database Security: Learn best practices for securing databases and managing access control.
- Prepare for SQL Certification: Build a strong foundation for earning structured query language certification and advancing your career.



Course Outlines

Day 1: Introduction to Databases and SQL

- What is Structured Query Language? Definition, history, and role of SQL in relational database management.
- Types of Structured Query Language: Exploring popular SQL variants such as MySQL, PostgreSQL, and SQL Server.
- Setting Up the SQL Environment: Installation and configuration for database development.
- Basics of Structured Query Language: Writing basic queries using SELECT, FROM, and WHERE.
- Creating and Managing Tables: Hands-on practice for basic table creation and management.

Day 2: SQL Data Retrieval and Manipulation

- SQL Basics in Action: Practical application of SELECT, INSERT, UPDATE, and DELETE commands.
- Filtering and Sorting Data: Using WHERE clauses, ORDER BY, and LIMIT statements for data retrieval.
- SQL Functions: Introduction to aggregate functions like COUNT, AVG, and SUM.
- Real-World Examples and Exercises: Hands-on practice with basic data manipulation.

Day 3: Advanced SQL Query Techniques

- Using Joins to Combine Data: Exploring INNER, OUTER, and SELF-JOINS.
- Grouping and Aggregation: Using GROUP BY and HAVING clauses for data grouping.
- Nested Queries: Building and implementing subqueries for advanced data extraction.
- SQL Functions in Depth: Practical use of MAX, MIN, and custom SQL functions.

Day 4: Database Design and Optimization

- Principles of Database Design: Understanding normalization and schema structuring.
- Using Indexes for Optimization: Techniques to improve query performance.
- Database Views: Creating and managing views for simplified query management.
- Performance Analysis Tools: Introduction to execution plans and query profiling.

Day 5: SQL in Practice and Database Security

- Transaction Management: Using COMMIT, ROLLBACK, and SAVEPOINT for data integrity.
- Database Security Best Practices: Managing roles, permissions, and secure data access.
- Data Backup and Recovery: Strategies for database protection.
- Advanced Topics: Triggers, stored procedures, and user-defined functions.



Day 6: Advanced Data Retrieval and SQL Functions

- Advanced SELECT Techniques: Writing complex SELECT queries for specific scenarios.
- Window Functions: Applying RANK, ROW_NUMBER, and DENSE_RANK for data analysis.
- Conditional Logic in SQL: Using CASE statements for conditional operations.
- Date and String Functions: Advanced manipulation of string and date data.

Day 7: Complex Joins and Subqueries

- Mastering Advanced Joins: Cross joins, full joins, and recursive joins for complex relationships.
- Common Table Expressions CTEs: Creating readable and reusable queries.
- Correlated Subqueries: Writing and optimizing correlated subqueries for dynamic datasets.
- Practical Case Studies: Applying advanced techniques to real-world problems.

Day 8: Performance Tuning and Optimization

- Analyzing Query Performance: Identifying and resolving performance bottlenecks.
- Efficient Query Writing: Tips and tricks for writing optimized SQL queries.
- Using Execution Plans: Interpreting and improving execution paths.
- Database Maintenance: Routine tasks for maintaining high-performance databases.

Day 9: Transactions and Concurrency Control

- Understanding Transactions: Key principles of ACID properties in transaction management.
- Concurrency Control: Managing locks and isolation levels to avoid conflicts.
- Deadlocks: Identifying and resolving deadlock situations in concurrent environments.
- Practical Exercises: Hands-on application of concurrency and transaction control.

Day 10: Advanced Database Management and Security

- Data Encryption Techniques: Implementing secure access to sensitive information.
- Automating Database Operations: Using triggers and scheduled jobs to streamline tasks.
- Advanced Stored Procedures: Developing dynamic and reusable database procedures.
- Capstone Project: Building a fully optimized and secure database solution.

Why Attend This Course? Wins & Losses!

- Master SQL Skills: From SQL basics to advanced concepts, build expertise in structured query language certification.
- Enhance Career Prospects: Gain in-demand skills and prepare for roles in data analysis, database administration, and software development.
- Learn Real-World Applications: Apply SQL to solve practical business challenges through hands-on projects.
- Boost Productivity: Use SQL query language training to streamline database management and improve data-driven decision-making.



Conclusion

This Structured Query Language SQL course is a comprehensive program tailored for professionals aiming to excel in database management and SQL certification. With an emphasis on practical applications and real-world scenarios, participants will leave equipped with SQL skills to manage, optimize, and secure databases effectively.

Enroll now to master SQL and take the first step toward becoming a certified SQL professional!

