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FOR TRAINING

Comprehensive Structured Query Language (SQL)

Cairo (Egypt)

5 - 16 October 2025

UK Traininig
PARTNER

Comprehensive Structured Query Language (SQL)

Code: IT28 From: 5 - 16 October 2025 City: Cairo (Egypt) Fees: 6800 Pound

Introduction

In today's data-centric landscape, Structured Query Language SQL is an essential tool for managing and analyzing data effectively. This comprehensive course provides an introduction to SQL, advancing to intermediate and advanced topics, enabling participants to efficiently create, manipulate, and query databases. Through practical exercises and real-world scenarios, attendees will develop robust SQL skills, empowering them for data analysis, database management, and software development.

Course Objectives

- Understand the core concepts and fundamentals of SQL and its applications.
- Create, manage, and query relational databases using SQL.
- Utilize SQL functions and operators for advanced data analysis.
- Optimize database performance and ensure data integrity.
- Implement intermediate SQL techniques, including advanced querying, transactions, and database security.
- Apply SQL skills to solve real-world problems and case studies.

Course Outlines

Day 1: Introduction to Databases and SQL

- What is SQL and its Importance: Understanding the definition and role of Structured Query Language in database management.
- Types of Relational Databases: Overview of database structures and their functions.
- Setting Up a Database Environment: Installation and configuration basics.
- SQL Basics: Introduction to SQL fundamentals and writing basic queries.
- Creating and Managing Tables: Hands-on practice with basic table management.

Day 2: SQL Data Retrieval and Manipulation

- Writing Basic SQL Queries: Exploring SQL commands such as SELECT, FROM, WHERE, and ORDER BY.
- Filtering Data with WHERE Clauses: Advanced filtering techniques for data extraction.
- Sorting and Limiting Results: Methods for sorting and limiting query results.
- Inserting, Updating, and Deleting Data: Practical examples of data manipulation.
- Practical Examples and Exercises.

Day 3: Advanced SQL Query Techniques

- Using Joins to Combine Data: Learning the use of joins such as inner joins, outer joins, and self-joins.

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- Grouping and Aggregating Data with GROUP BY and HAVING: How to group and aggregate data effectively.
- Subqueries and Nested Queries: Understanding and implementing subqueries.
- Common SQL Functions: Using functions like COUNT, SUM, AVG, MIN, MAX for data analysis.
- Case Studies and Hands-on Practice.

Day 4: Database Design and Optimization

- Principles of Database Design: Introduction to relational database design concepts.
- Normalization and Denormalization: Strategies for structuring database schemas.
- Creating and Using Indexes: Optimizing query performance through indexing.
- Analyzing and Optimizing Query Performance: Tools and techniques for efficient querying.
- Using Views and Stored Procedures: Practical exercises on database optimization.

Day 5: SQL in Practice and Database Security

- Implementing Transactions and Data Integrity: Applying commands like COMMIT, ROLLBACK, and SAVEPOINT.
- Database Security and Permissions: Controlling access to data and applying best security practices.
- Backup and Recovery Strategies: Understanding data protection strategies.
- Introduction to Advanced Topics: Exploring triggers, user-defined functions, and their use cases.
- Problem-Solving through Real-World Scenarios.

Day 6: Advanced Data Retrieval and Functions

- Advanced SELECT Statements: Techniques for complex data retrieval.
- Window Functions: Learning functions like RANK, DENSE_RANK, ROW_NUMBER.
- Advanced String and Date/Time Functions: Manipulating strings and date/time data.
- Using CASE Statements for Conditional Logic: Applying conditional statements in SQL.
- Hands-on Exercises.

Day 7: Complex Joins and Subqueries

- Advanced Join Techniques: Understanding cross joins, self-joins, and other complex joins.
- Advanced Subquery Techniques: Exploring correlated subqueries.
- Common Table Expressions CTEs: Creating and using CTEs for improved query readability.
- Recursive Queries: Implementing recursive queries for complex data retrieval.
- Practical Examples and Case Studies.

Day 8: Performance Tuning and Optimization

- Analyzing Query Performance: Using tools to measure and improve query efficiency.
- Indexing Strategies for Performance: Techniques for using indexes effectively.
- Understanding Query Execution Plans: Analyzing and optimizing execution paths.
- Tips for Writing Efficient SQL Queries: Best practices for performance optimization.
- Database Maintenance Tasks: Hands-on optimization exercises.

Day 9: Transactions and Concurrency Control

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- Understanding Transactions and ACID Properties: Key principles of transaction management.
- Transaction Control Commands: Implementing COMMIT, ROLLBACK, and SAVEPOINT.
- Managing Concurrency with Locks and Isolation Levels: Techniques to avoid concurrency issues.
- Deadlocks: Identifying and resolving deadlock situations.
- Practical Exercises on Transaction Management.

Day 10: Advanced Database Management and Security

- Advanced Security Practices: Managing roles and privileges for data security.
- Data Encryption and Secure Access: Implementing secure data protection methods.
- Automating Tasks with Triggers and Scheduled Jobs: Streamlining operations.
- Advanced Stored Procedures and User-Defined Functions: Enhancing database capabilities.
- Final Project: Developing and managing a secure and optimized database.
- Review and Q&A.

Conclusion

This course is ideal for professionals looking to gain SQL certification and enhance their skills in Structured Query Language through SQL best practices and advanced data analysis. Participants will be empowered to apply the knowledge gained to implement effective database solutions and contribute to high-level database management and performance optimization.

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