SQL Querying
(Fundamentals + Advanced)

Days: 2

Prerequisites: To ensure your success in this course, you should have at least basic experience with SQL querying, including selecting data using conditions, working with functions, organizing data, and retrieving data from multiple tables.

Audience: This course is intended for individuals with basic computer skills and some familiarity with database concepts who want to build and expand their SQL querying skills—from foundational to advanced applications.

Description: Organizations store critical operational data within databases, and the ability to retrieve, analyze, and manage that data is essential to business success. Structured Query Language (SQL) is the primary tool used to interact with databases and extract meaningful insights.

In this two-day course, participants will build a strong foundation in SQL querying and expand into advanced techniques used for real-world data analysis and database management. Beginning with core query skills, learners will progress to more complex concepts such as nested queries, data manipulation, views, indexing, and transaction management.

By the end of this course, participants will be equipped to write efficient queries, manage and transform data, and support data-driven decision-making within their organization.

Course Objectives: In this course, you will compose SQL queries to retrieve desired information from a database, work with advanced queries to manipulate and index tables, and create transactions so that you can choose to save or cancel the data entry process. You will:

- Connect to a SQL database and execute queries
- Apply conditional logic to filter results
- Use functions to perform calculations and manipulate data
- Organize and summarize query results
- Retrieve and combine data from multiple tables
- Export query results
- Construct nested and correlated queries
- Insert, update, and delete data in tables
- Create and modify database tables and structures
- Use views to simplify data access
- Apply indexing to improve query performance
- Manage transactions to ensure data integrity

OUTLINE:

DAY 1

LESSON 1: EXECUTING A SIMPLE QUERY

- Topic A: Connect to the SQL Database
- Topic B: Query a Database
- Topic C: Save a Query
- Topic D: Modify and Execute a Saved Query

LESSON 2: PERFORMING A CONDITIONAL SEARCH

- Topic A: Search Using One or More Conditions
- Topic B: Search for a Range of Values and NULL Values

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- Topic C: Search Data Based on Patterns

LESSON 3: WORKING WITH FUNCTIONS

- Topic A: Perform Date Calculations
- Topic B: Calculate Data Using Aggregate Functions
- Topic C: Manipulate String Values

LESSON 4: ORGANIZING DATA

- Topic A: Sort Data
- Topic B: Rank Data
- Topic C: Group Data
- Topic D: Filter Grouped Data
- Topic E: Summarize Grouped Data
- Topic F: Use PIVOT and UNPIVOT Operators

LESSON 5: RETRIEVING DATA FROM MULTIPLE TABLES

- Topic A: Combine the Results of Two Queries
- Topic B: Compare the Results of Two Queries
- Topic C: Retrieve Data by Joining Tables

LESSON 6: EXPORTING QUERY RESULTS

- Topic A: Generate a Text File
- Topic B: Generate an XML File

APPENDIX A: THE PUB1 DATABASE

DAY 2

LESSON 7: USING NESTED QUERIES

- Topic A: Search Based on Values from a Subquery
- Topic B: Compare Values from a Subquery
- Topic C: Search Based on the Existence of Records
- Topic D: Generate Output Using Correlated Subqueries
- Topic E: Filter Grouped Data Within Subqueries
- Topic F: Perform Multiple-Level Subqueries

LESSON 8: MANIPULATING TABLE DATA

- Topic A: Insert Data
- Topic B: Modify and Delete Data

LESSON 9: MANIPULATING THE TABLE STRUCTURE

- Topic A: Create a Table
- Topic B: Create a Table with Constraints
- Topic C: Modify a Table's Structure
- Topic D: Back Up Tables
- Topic E: Delete Tables

LESSON 10: WORKING WITH VIEWS

- Topic A: Create a View
- Topic B: Manipulate Data in Views
- Topic C: Create Aliases
- Topic D: Modify and Delete Views

LESSON 11: INDEXING DATA

- Topic A: Create Indexes
- Topic B: Drop Indexes

LESSON 12: MANAGING TRANSACTIONS

- Topic A: Create Transactions
- Topic B: Commit Transactions

APPENDIX A: THE FULLERACKERMAN DATABASE