Advanced SQL Programming - TTSQL005

Explore Advanced Querying Techniques, Manipulating Table Data with DML, Stored Procedures, Triggers & More

Duration: 2 Days
Skill Level: Intermediate
Available Format: Instructor-Led Online; Instructor-Led, Onsite In Person ; Blended; On Public Schedule

This advanced SQL course is designed to strengthen your expertise in managing and analyzing relational databases. You will begin with a focus on relational database concepts, including the Entity-Relationship Model and key modeling conventions.

What You'll Learn

Overview

This **Advanced SQL Programming** course is designed to strengthen your expertise in managing and analyzing relational databases. You will begin with a focus on relational database concepts, including the Entity-Relationship Model and key modeling conventions. Understanding these fundamentals will prepare you for applying more complex techniques in real-world scenarios, using practical examples from the tables provided throughout the course.

From there, the course will explore essential SQL functions for grouping and aggregating data, such as the MIN and MAX functions. You'll learn how to use the GROUP BY and HAVING clauses effectively, work with nested functions, and handle null values in your queries. The course also covers various join types, allowing you to retrieve data from multiple tables, manage ambiguous column names, and create efficient queries with inner, outer, and cross joins.

In the final sections, the focus shifts to more advanced SQL topics like subqueries and set operators, as well as data manipulation and table management techniques. You'll gain hands-on experience executing subqueries, using set operators like UNION and MINUS, and managing data through DML and DDL statements. By the end, you will be fully prepared to implement advanced SQL solutions, manage database objects, and perform complex data manipulation tasks with confidence.

NOTE: This course uses Oracle SQL Developer in the labs, however the tooling is just the means used to teach SQL. This is not a SQL Developer focused course, and prior SQL Developer knowledge is not required. The course focuses on skills and concepts that can be applied to other databases and platforms. If you need a specific alternate database, please inquire for details and options.

Objectives

Working in a hands-on environment led by an expert instructor, attendees will explore:

- Understand the relational database model and apply entity-relationship modeling conventions
- Utilize group functions to aggregate data, handle null values, and nest functions
- Implement advanced queries with joins, including natural, outer, and cross joins
- Execute subqueries, including single-row, multiple-row, and multiple-column subqueries
- Use set operators like UNION, INTERSECT, and MINUS to combine queries
- Perform DML operations like inserting, updating, and deleting rows, with real-world applications
- Understand DDL statements for creating and managing database schema objects
- Implement and enforce constraints such as NOT NULL, PRIMARY KEY, and FOREIGN KEY

Audience

This intermediate-to-advanced course is ideal for SQL developers, database professionals, data analysts, and IT professionals who work with databases and seek to advance their skills in complex data manipulation, analysis, and management.

Pre-Requisites

To ensure a smooth learning experience and maximize the benefits of attending this course, you should have the following prerequisite skills:

- Basic SQL Programming experience is required. This course is not intended for beginners.

Take Before: Students should have incoming practical skills aligned with those in the course(s) below, or should have attended the following course(s) as a pre-requisite:

TTSQL002   Introduction to SQL Programming Basics
TTSQL003   Introduction to Writing SQL Queries

Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill level, interests and participation.

1. **Introduction**
    - Relational Database Concept
    - Entity Relationship Model
    - Relationship Modeling Conventions
    - Tables used in this course

2. **Group Functions**
    - Types of Group Functions
    - Using the MIN and MAX Functions
    - Group Functions and Null Values
    - Using the GROUP BY Clause
    - Illegal Queries Using Group
    - Using the HAVING Clause
    - Nesting Group Functions

3. **Displaying Data from Multiple Tables Using Joins**

- Types of Joins
- Retrieving Records with Natural Joins
- Retrieving Records with the USING Clause
- Qualifying Ambiguous Column Names
- Creating Joins with the ON Clause
- Retrieving Records with Nonequijoins
- LEFT/RIGHT OUTER JOIN
- Creating Cross Joins

4. Using Subqueries to Solve Queries
- Subquery Syntax
- Types of Subqueries
- Executing Single-Row Subqueries
- HAVING Clause with Subqueries
- No Rows Returned by the Inner Query
- Using the ALL Operator in Multiple-Row Subqueries
- Multiple-Column Subquery
- Null Values in a Subquery

5. Using Set Operators
- Set Operator Rules
- UNION Operator
- Using the INTERSECT Operator
- Using the MINUS Operator
- Matching SELECT Statements
- Using the ORDER BY Clause in Set

6. Managing Tables Using DML Statements
- HR Application Scenario
- Data Manipulation Language
- Inserting New Rows
- Inserting Specific Date and Time Values
- UPDATE Statement Syntax
- Updating Two Columns with a Subquery
- Deleting Rows from a Table
- TRUNCATE Statement
- Committing Data
- Implementing Read Consistency

7. **Introduction to Data Definition Language**
- Database objects
- Naming rules
- Data types
- CREATE TABLE statement
- Overview of constraints: NOT NULL, UNIQUE, PRIMARY KEY, FOREIGN KEY, CHECK constraints
- Creating a table using a subquery
- ALTER TABLE statement
- DROP TABLE statement

Related Courses

TTOR12019	Oracle 19c PL/SQL Fundamentals
TTOR20719	Oracle 19c Database Multitenant Architecture
TTSQL002	Introduction to SQL Programming Basics
TTSQL003	Introduction to Writing SQL Queries

All applicable course software, digital courseware files or course notes, labs, data sets and solutions, live coaching support channels and rich extended learning and post training resources are provided for you in our "easy access, no install required" online **Learning Experience Platform (LXP),** remote lab and content environment. Access periods vary by course. We'll collaborate with you to ensure your team is set up and ready to go well in advance of the class. Please inquire about set up details and options for your specific course of interest.

For More Information

Please contact us or call 844-475-4559 toll free for more information about our training services (instructor-led, self-paced or blended), coaching and mentoring services, public course enrollment or questions, partner programs, courseware licensing options and more.