SHI | TRAINING & ADOPTION

Course Outline

Oracle 19c PL/SQL Fundamentals
Course TTOR12019: 3 days Instructor Led

About this course

Oracle 19c PL/SQL Fundamentals is a three-day, hands-on technical course that introduces Oracle database programming using the PL/SQL programming language. Throughout the course students will explore the core syntax, structure and features of the language. This course will also lay the foundation for the entire Oracle PL/SQL programming series, allowing one to progress from introductory topics to advanced application design and programming and finally onto writing complex high-performance applications. The course also explores applying the newly learned skills to the development of database applications. Participants will learn how to use database-resident stored program units such as procedures, functions, packages and database triggers. Students will also learn about the latest features in Oracle 19c.

Audience profile

This course is geared for anyone needing to interface with an Oracle database such as end users, business analysts, application developers and database administrators / DBAs. **Attendees should have incoming basic SQL experience, as well as an understanding of databases (required to manipulate it with PL/SQL).**

At course completion

After completing this course, students will be able to:

- Using PL/SQL programming language for database applications and development
- incorporating PL/SQL modules within the application architecture from the initial design and planning phase
- The essentials of building executable PL/SQL program units
- Each of the major segments of a workin g program and how these interact with each other during program execution,
- Important error or exception handling capabilities of the language.
- How database-resident program units can be used as part of the overall database application architecture
- Applying these new skills to the development of PL/SQL packages.
- Advanced database programming capabilities and benefits
- How database triggers can be used as part of an advanced database application design

Course Outline

Selection & Setup of the Database Interface

- Considering Available Tools
- Selecting the Appropriate Tool
- Oracle Net Database Connections
- Oracle PAAS Database Connections
- Setup SQL Developer
- Setup SQL *Plus
- Setup JDeveloper
- About BIND and Substitution Variables
- Using SQL Developer
- Using SQL *Plus

Choosing a Database Programming Language

- What is Database Programming
- PL/SQL Programming
- PL/SQL Performance Advantages

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- Integration with Other Languages

PL/SQL Language Essentials

- PL/SQL Program Structure
- Language Syntax Rules
- Embedding SQL
- Writing Readable Code
- Generating Readable Code
- Generating Database Output
- SQL * Plus Input of Program Block

DECLARE Section

- About the Declare Section
- Declare Primitive Types
- Declaration Options
- Not Null
- Constant
- Data Dictionary Integration
- % Type
- Declare Simple User-Defined Types
- Type … Table
- Type … Record
- Extended User Defined Types

BEGIN Section

- About the Begin Section
- Manipulating Program Data
- Logic Control & Braching
- GOTO
- LOOP
- IF-THEN-ELSE
- CASE

EXCEPTION Section

- About the Exception Section
- Isolating the Specific Exception
- Pragma Exception_INIT
- SQLCODE &SQLERRM Example
- SQL%ROWCOUNT & Select … Into

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Beyond the Basics : Explicit Cursors

- About Explicit Cursors
- Extend Cursor Techniques
- For Update of Clause
- Where Current of Clause
- Using for … Loop Cursors

Introduction Database Resident Programming Units

- About Database – Resident Programs
- Physical Storage & Execution
- Types of Stored Program Units
- Stored Program Unit Advantages
- Modular Design Principles

Creating Stored Procedures and Functions

- Stored Procedures & Functions
- Create Procedure / Create Function
- Creating Procedures & Functions
- Raise_Salary() Procedure
- Salary_Valid() function
- The Parameter Specification
- Default Clause
- System & Object Privileges
- Using the Development Tools

Executing Stored Procedures and Functions

- Calling Procedures & Functions
- Unit Testing with Execute
- Anonymous Block Unit Testing
- Specifying a Parameter Notation
- SQL Worksheet Unit Testing
- Calling Functions from SQL

Maintaining Stored Programming Units

- Recompiling Programs
- Mass Recompilation Using UTL_RECOMP()
- Dropping Procedures & Functions
- Drop Procedures & Functions
- Drop Procedure / Function
- Data Dictionary Metadata
- Using USER_OBJECTS
- Using USER_SOURCE
- Using USER_ERRORS

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- Using USER_OBJECT_SIZE
- Using USER_DEPENDENCIES

Managing Dependencies

- Dependency Internals
- Tracking Dependencies
- The Dependency Tracking Utility
- SQL Developer Dependency Info
- Dependency Strategy Checklists

Creating & Maintaining

- About Packages
- Creating Packages
- Maintaining Packages
- Performance Considerations

Advanced Package Capabilities

- Definer & Invoker Rights
- White Lists & Accessible By
- Persistent Global Objects
- Defining Initilization Logic
- Object Orientation Support

Advanced Cursor Techniques

- Using Cursor Variables
- Using SYS_REFCURSOR
- Using_Cursor Expressions

Using System Supplied Packages

- DBMS_OUTPUT()
- UTL_FILE()
- FOPEN() Example

Database Trigger Concepts

- About Database Triggers
- DML Event Trigger Sub-Types
- Database Trigger Scenario
- Trigger Exhaustion Mechanisms
- Trigger within SQL Worksheet

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Creating Database Triggers

- Statement Level Triggers
- Using Raise Application_Error()
- Row-Level Triggers
- Examples of Triggers
- Employee_Salary_Check Example
- Employee_Journal Example
- Budget_Event Example
- Instead of Triggers
- Triggers within and Application

Maintaining Database Triggers

- Call Syntax
- Trigger Maintenance Tasks
- Show Errors Trigger
- Drop Trigger
- Alter Trigger
- Multiple Triggers for a Table
- Handling Mutating Table Issues

Implementing System Event Triggers

- What are System Event Triggers
- Defining the Scope
- Available System Events
- System Event Attributes