Oracle Database: PL/SQL Workshop Training

Duration: **5 Day**

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Overview

{*training} is a comprehensive training program designed for professionals who want to master **PL/SQL**, Oracle's powerful procedural programming language. This course goes beyond basic SQL by introducing participants to the world of procedural logic, automation, data integrity control, and performance optimization within Oracle databases.

By the end of this course, participants will be able to design scalable, maintainable, and secure database programs that run efficiently in real-world, enterprise-level systems.

Prerequisites

Requirement	Explanation
SQL Fundamentals	Familiarity with SQL commands like SELECT, INSERT, UPDATE, DELETE
Relational Database Concepts	Understanding tables, data types, relationships, and constraints
Oracle SQL Developer (Recommended)	Prior use is helpful but not mandatory for this course

Who Should Attend

Audience	Description
Database Developers	Professionals building PL/SQL-based applications on Oracle databases
Application Developers	Those integrating PL/SQL logic into enterprise software solutions
IT Professionals	Anyone managing Oracle systems or aiming to automate database workflows
SQL-Skilled Individuals	SQL users ready to elevate their database skills with procedural power

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What You Will Learn

By the end of this {*training}, you will have gained knowledge and skills in the following areas:

- Understand the limitations of standard SQL and the advantages of PL/SQL
- Develop anonymous blocks and manage variable scope
- Use SQL inside PL/SQL for powerful database interaction
- Control logic flow with conditionals and loops
- Implement robust error-handling systems
- Write reusable and modular subprograms (procedures/functions)
- Use packages, triggers, and dynamic SQL to build complex applications
- Debug and optimize PL/SQL code for maximum performance

Outline

1. Introduction to PL/SQL Architecture

- What is PL/SQL and why is it superior to plain SQL?
- Understanding the runtime architecture of Oracle PL/SQL
- Block structure: DECLARE → BEGIN → EXCEPTION → END
- Benefits of using PL/SQL: security, maintainability, performance

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2. Declaring Variables and Data Types

- Declaring variables: VARCHAR2, NUMBER, BOOLEAN
- Using %TYPE and %ROWTYPE for flexible data types
- Working with composite data types: RECORD, TABLE, VARRAY
- Understanding scope: global vs local variables in blocks

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3. Writing Executable Code in PL/SQL

- PL/SQL syntax and lexical units
- Writing clean, readable, and modular code
- Standards for naming, formatting, and commenting

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□ 4. Using SQL Inside PL/SQL

- Embedding SELECT INTO, INSERT, UPDATE, DELETE
- Managing implicit and explicit cursors
- Using cursor attributes: %FOUND, %NOTFOUND, %ROWCOUNT
- Avoiding name conflicts and managing variable bindings

□ 5. Control Structures and Flow Logic

- Conditional logic: IF, ELSIF, CASE statements
- Looping structures: BASIC LOOP, WHILE, FOR
- Nested and labeled loops with proper scope management
- Use cases for each loop type with real-world examples

□ 6. Exception Handling and Error Management

- Predefined Oracle exceptions: NO_DATA_FOUND, TOO_MANY_ROWS
- User-defined exceptions for custom logic
- Using RAISE and RAISE_APPLICATION_ERROR
- Logging and documenting errors for maintainability

□ 7. Subprograms: Procedures and Functions

- Key differences between procedures and functions
- Parameter types: IN, OUT, IN OUT
- Returning values from functions
- Designing reusable components with clean modular code

□ 8. Advanced PL/SQL: Triggers, Packages, Dynamic SQL

- Creating and using PACKAGE structures (spec and body)
- Writing triggers: BEFORE, AFTER, INSTEAD OF
- Using EXECUTE IMMEDIATE for dynamic SQL
- Creating flexible, parameter-driven logic at runtime

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□ 9. Debugging and Performance Tuning

- Step-by-step debugging with Oracle SQL Developer
- Managing code dependencies and recompilation
- Using BULK COLLECT, FORALL, and compiler warnings
- Profiling and testing PL/SQL programs for scalability