Oracle 21c PL/SQL - Course Details

Course Objective

To enable learners to develop robust, secure, and optimized stored procedures and database programs using Oracle PL/SQL, leveraging new features introduced in Oracle 21c.

Target Audience

- Developers working with Oracle Databases
- Database Administrators (DBAs)
- Application Programmers
- Students of Computer Science / IT
- Professionals preparing for Oracle Certification (OCP/OCA)

Prerequisites

Basic knowledge of Oracle SQL (DML, DDL, Joins, Subqueries)

Learning Outcomes

Understand PL/SQL architecture and block structure.

Write modular and efficient PL/SQL code using procedures, functions, packages.

Handle exceptions and manage transactions.

Create and use triggers.

Apply PL/SQL best practices and tuning techniques.

Use Oracle 21c-specific enhancements.

Course Content

Introduction to PL/SQL

What is PL/SQL?

Differences between SQL and PL/SQL

PL/SQL block structure: Anonymous blocks

Benefits of using PL/SQL

Using SQL Developer / Live SQL for PL/SQL programming

PL/SQL Language Fundamentals

Data types: Scalar, Composite, Reference, LOB.

Variable declaration and initialization.

Constants and Anchored Data Types.

Operators and expressions.

Input/output with DBMS_OUTPUT.

Control Structures

Conditional control: IF, ELSIF, CASE.

Iterative control: LOOP, WHILE, FOR.

Nested blocks and variable scope.

Cursors in PL/SQL

Implicit vs Explicit cursors.

Cursor attributes: %FOUND, %ROWCOUNT, etc.

Parameterized cursors.

FOR loop cursor processing.

Cursor FOR UPDATE.

Exception Handling

Types of exceptions: Predefined and user-defined.

WHEN OTHERS, RAISE_APPLICATION_ERROR.

Exception propagation.

Best practices in exception handling.

Stored Procedures and Functions

Creating and calling stored procedures.

Parameter modes: IN, OUT, IN OUT.

Creating and using functions.

Differences between procedures and functions.

Function calls in SQL statements.

Packages

Creating packages: Specification and body.

Public vs private procedures/functions.

Benefits of using packages.

Overloading procedures and functions.

Package initialization.

Triggers

Types of triggers: DML, INSTEAD OF, Compound triggers.

Row-level vs Statement-level triggers.

Trigger events: BEFORE, AFTER, INSERT, UPDATE, DELETE.

Managing recursive and mutating triggers.

Security and usage considerations.

Collections and Records

RECORD types (user-defined and %ROWTYPE).

Associative arrays (Index-by tables), Nested tables, VARRAYs.

Collection methods: EXTEND, DELETE, FIRST, LAST, etc.

Looping through collections.

Dynamic SQL

Introduction to EXECUTE IMMEDIATE.

Using DBMS_SQL for dynamic queries.

Binding variables in dynamic SQL.

Error handling with dynamic code.

Transaction Management

Explicit transactions: COMMIT, RO`LLBACK, SAVEPOINT.

Autonomous transactions.

Locking behavior and consistency.

Oracle 21c Enhancements in PL/SQL

Improved support for JSON operations.

Native Data Types Enhancements.

New built-in functions.

Result cache improvements.

Blockchain tables.

Performance and Best Practices

PL/SQL tuning basics.

Use of BULK COLLECT and FORALL for performance.

Avoiding context switches.

Managing dependencies and compilation.

Capstone Project

- End-to-end project:
    - Create schema → Implement logic using PL/SQL → Test procedures and triggers
    - Example: Order Management Logic, HRMS Payroll Engine, Inventory Management Logic.
- Code documentation and best practices.

Total Duration of the Course

- Total duration: 1.5 months
- Days: Monday to Friday (1 hr daily)
- Mode: Online

Certificate

A course completion certificate will be awarded once you have successfully completed this course.

Wishing you a Smooth Coding ahead!
