Oracle Database 19c: Advanced PL/SQL

Course Duration: 24 Hours **Course code:D1101121**

1. Course Overview

The Oracle Database 19c: Advanced PL/SQL course is designed for experienced PL/SQL developers aiming to master advanced features and best practices. It covers complex programming concepts, including Collections, handling large objects, JSON data, and advanced interfaces. Learners gain expertise in performance tuning, caching strategies, and code analysis to optimize applications. Security is emphasized, with training on preventing SQL injection and implementing advanced protection mechanisms. The course also explores cloud-based solutions using Exadata Express Cloud Service. Overall, it equips developers with the skills to build robust, efficient, and secure PL/SQL applications.

2. What you'll learn?

By the end of the course, you should be able to:

- Implement advanced PL/SQL constructs and best practices
- Work with collections, records, and object types efficiently
- Use dynamic SQL and PL/SQL packages
- Optimize PL/SQL code for performance and scalability
- Apply exception handling and logging strategies
- Integrate PL/SQL with triggers, cursors, and external procedures

3. Target Audience

- PL/SQL Developers
- Database Administrators (DBAs) with development responsibilities
- Application Developers working with Oracle Databases
- IT Professionals seeking advanced Oracle PL/SQL expertise

4. Pre-Requisites

Familiarity with:

- Oracle Database Administration and PL/SQL basics
- SQL and PL/SQL programming fundamentals
- Understanding of database objects and schema design

5. Course content

Module 1: Course Introduction

- Introduction
- Course contents

Module 2: Advanced PL/SQL Program Units

- Packages, procedures, and functions
- Modular programming best practices
- Package specification vs. body

Module 3: Working with Collections and Records

- Associative arrays, nested tables, and VARRAYs
- Records and %ROWTYPE
- Using collections for efficient data processing

Module 4: Cursors and Cursor Variables

- Explicit and implicit cursors
- Cursor FOR loops and parameterized cursors
- REF CURSORs and cursor variables

Module 5: Dynamic SQL and PL/SQL

- Introduction to dynamic SQL
- DBMS_SQL vs. EXECUTE IMMEDIATE
- Handling dynamic queries safely

Module 6: Exception Handling and Logging

- Predefined and user-defined exceptions
- Exception propagation and nested blocks
- Logging strategies for error monitoring

Module 7: Bulk Processing and Performance Tuning

- FORALL and BULK COLLECT
- Reducing context switches and improving performance
- Profiling PL/SQL code with DBMS_PROFILER

Module 8: Advanced Triggers and Dependencies

- Row-level vs. statement-level triggers
- Compound triggers
- Avoiding mutating table errors

Module 9: Working with Object Types

- Creating and using object types
- Methods, attributes, and collections
- Integrating object types with PL/SQL logic

Module 10: Security and Best Practices

- Using AUTHID CURRENT_USER vs. DEFINER
- Securing PL/SQL code
- Best practices for maintainable and efficient PL/SQL

Module 11: Real-World Development Scenarios

- Hands-on labs and practical exercises
- Complex business logic implementation
- Optimizing PL/SQL for enterprise applications

Module 12: Wrap-Up and Next Steps

- Summary of advanced PL/SQL techniques

- Performance and maintainability checklist
- Q&A and further learning paths