

Oracle Database 12c: PL/SQL II – Intermediate: Develop Program Units

Course Summary

Description

This course is intended for those who have already learned the basics of the Oracle PL/SQL database programming language and its syntax, and who are now ready to employ the language in the development of database applications. In particular, the focus of this course will be on the use of database-resident stored program units such as procedures, functions, packages and database triggers. New features introduced with the Oracle 12c release of the database are also explained and demonstrated.

Objectives

This course explains how database-resident program units can be used as part of the overall database application architecture and the benefits realized by doing so. It then builds upon one's knowledge of database-resident program units and applies these to the development of PL/SQL packages. In a production environment most PL/SQL program units should be packaged, and these advanced database programming capabilities along with the benefits of using these are discussed. It concludes with extensive demonstrations on how a particular type of database-resident program unit known as a database trigger can be used as part of an advanced database application design.

Topics

- Introducing Database-Resident Program Units
- Creating Stored Procedures & Functions
- Executing Stored Procedures & Functions
- Maintaining Stored Program Units
- Managing Dependencies
- Creating & Maintaining Packages
- Advanced Package Capabilities
- Advanced Cursor Techniques
- Using System-Supplied Packages
- Database Trigger Concepts
- Creating Database Triggers
- Maintaining Database Triggers
- Implementing System Event Triggers

Audience

- Application designers and database developers
- Database administrators
- Web server administrators

Prerequisites

Either of the courses *Oracle Database 12c: SQL Fundamentals (Levels I & II)* or *Oracle Database 12c: SQL Complete Library (Levels I, II, & III)* are recommended.

Duration

Three days

Oracle Database 12c: PL/SQL II – Intermediate: Develop Program Units

Course Outline

I. Introducing Database-Resident Program Units

- A. About Database-Resident Programs
- B. Physical Storage & Execution
- C. Types Of Stored Program Units
- D. Stored Program Unit Advantages
- E. Modular Design Principles

II. Creating Stored Procedures & Functions

- A. Stored Procedures & Functions
- B. Create Procedure / Create Function
- C. Creating Procedures & Functions
- D. RAISE_SALARY() Procedure
- E. SALARY_VALID() Function
- F. The Parameter Specification
- G. DEFAULT Clause
- H. System & Object Privileges
- I. Using The Development Tools

III. Executing Stored Procedures & Functions

- A. Calling Procedures & Functions
- B. Unit Testing With Execute
- C. Anonymous Block Unit Testing
- D. Specifying A Parameter Notation
- E. SQL Worksheet Unit Testing
- F. Calling Functions From SQL

IV. Maintaining Stored Program Units

- A. Recompiling Programs
- B. Mass Recompilation Using UTL_RECOMP()
- C. Dropping Procedures & Functions
- D. Drop Procedure / Function
- E. Data Dictionary Metadata
- F. Using USER_OBJECTS
- G. Using USER_SOURCE
- H. Using USER_ERRORS
- I. Using USER_OBJECT_SIZE
- J. Using USER_DEPENDENCIES

V. Managing Dependencies

- A. Dependency Internals
- B. Tracking Dependencies
- C. The Dependency Tracking Utility
- D. SQL Developer Dependency Info
- E. Dependency Strategy Checklists

VI. Creating & Maintaining Packages

- A. About Packages
- B. Creating Packages
- C. Maintaining Packages
- D. Performance Considerations

VII. Advanced Package Capabilities

- A. Definer & Invoker Rights
- B. White Lists & Accessible By
- C. Persistent Global Objects
- D. Defining Initialization Logic
- E. Object Orientation Support

VIII. Advanced Cursor Techniques

- A. Using Cursor Variables
- B. Using SYS_REFCURSOR
- C. Using Cursor Expressions

IX. Using System-Supplied Packages

- A. DMBS_OUTPUT()
- B. UTL_FILE()
- C. FOPEN() Example

X. Database Trigger Concepts

- A. About Database Triggers
- B. DML Event Trigger Sub-Types
- C. Database Trigger Scenario
- D. Trigger Execution Mechanisms
- E. Triggers Within SQL Worksheet

**Oracle Database 12c: PL/SQL II – Intermediate:
Develop Program Units**

Course Outline (con't)

XI. Creating Database Triggers

- A. Statement-Level Triggers
- B. Using RAISE_APPLICATION_ERROR()
- C. Row-Level Triggers
- D. Examples Of Triggers
- E. EMPLOYEE_SALARY_CHECK Example
- F. EMPLOYEE_JOURNAL Example
- G. BUDGET_EVENT Example
- H. Instead Of Triggers
- I. Triggers Within An Application

XII. Maintaining Database Triggers

- A. Call Syntax
- B. Trigger Maintenance Tasks
- C. Show Errors Trigger
- D. Drop Trigger
- E. Alter Trigger
- F. Multiple Triggers For A Table
- G. Handling Mutating Table Issues

XIII. Implementing System Event Triggers

- A. What Are System Event Triggers?
- B. Defining the Scope
- C. Available System Events
- D. System Event Attributes