

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



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Course Duration: 5 days

## Description

This textbook 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 textbook 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 textbook 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.

## Contents

### Introducing Database-Resident Program Units

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

### Advanced Package Capabilities

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

### Creating Stored Procedures & 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

### Advanced Cursor Techniques

- USING CURSOR VARIABLES
- Using SYS\_REFCURSOR
- Using CURSOR Expressions

### Using System-Supplied Packages

- DBMS\_OUTPUT()
- UTL\_FILE()
- FOPEN() Example

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## Executing Stored Procedures & 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 Program Units

- Recompiling Programs
- Mass Recompilation Using UTL\_RECOMP()
- Dropping Procedures & Functions
- DROP Procedure / Function
- Data Dictionary Metadata
- Using USER\_OBJECTS
- Using USER\_SOURCE
- Using USER\_ERRORS
- 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 Packages

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

## Database Trigger Concepts

- About Database Triggers
- DML EVENT TRIGGER Sub-Types
- DATABASE TRIGGER Scenario
- TRIGGER Execution Mechanisms
- TRIGGERS Within SQL Worksheet

## 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 An 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

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