



## CURRICULUM

6 WEEKS

### Introduction to SQL

#### » Introduction to Oracle Database

- List the features of Oracle Database 12c
- Discuss the basic design of Database
- Categorize the different types of SQL statements
- Describe the data set used by the course
- Log on to the database using SQL Developer environment
- Save queries to files and use script files in SQL Developer

#### » Retrieve Data using the SQL SELECT Statement

- List the capabilities of SQL SELECT statements
- Select Table Data With All Columns
- Select Table Data With Specific Columns
- Use Arithmetic Operators
- Use Concatenation Operators
- Learn the DESCRIBE command to display the table structure

#### » Learn to Restrict and Sort Data

- Use WHERE clause to limit the output retrieved
- List the comparison operators and logical operators
- Describe the rules of precedence for comparison and logical operators
- Use character string literals in the WHERE clause
- Write queries that contain an ORDER BY clause to sort Data
- SQL Row Limiting Clause (Fetch First, Offset and With Ties)

#### » Usage of Single-Row Functions to Customize Output

- Differences between single row and multiple row functions
- Manipulate strings with character function in the SELECT and WHERE clauses
- Manipulate numbers with the ROUND, TRUNC, and MOD functions
- Perform arithmetic with date data
- Manipulate dates with the DATE functions

#### » Invoke Conversion Functions and Conditional Expressions

- Describe implicit and explicit data type conversion
- Use the TO\_CHAR, TO\_NUMBER, and TO\_DATE conversion functions
- Nest multiple functions
- Apply the NVL, NULLIF, and COALESCE functions to data
- Use conditional IF THEN ELSE logic in a SELECT statement

#### » Aggregate Data Using the Group Functions

- Use the aggregation functions to produce meaningful reports
- Divide the retrieved data in groups by using the GROUP BY clause
- Exclude groups of data by using the HAVING clause

## » Display Data From Multiple Tables Using Joins

- Write SELECT statements to access data from more than one table
- View data that does not meet join condition by using outer joins
- Join a table to itself by using a self-join

## » Use Sub-queries to Solve Queries

- Describe the types of problem that sub-queries can solve
- Define sub-queries
- List the types of sub-queries
- Write single-row and multiple-row sub-queries

## » The SET Operators

- Describe the SET operators
- UNION and UNION ALL to Combine Result of Multiple Queries
- Use of INTERSECT
- Use of MINUS
- Control the order of rows returned

## » Data Manipulation Statements

- Describe each DML statement
- Insert rows into a table
- Change rows in a table by the UPDATE statement
- Delete rows from a table with the DELETE statement
- Save and discard changes with the COMMIT and ROLLBACK statements
- Explain read consistency

## » Use of DDL Statements to Create and Manage Tables

- Create a simple table
- Alter and Truncate Table
- Drop Table and Concept of Recyclebin
- Stop Entry of Invalid Data Through CONSTRAINTS
- Primary Key , Foreign Key
- Not Null , Unique and Check Constraints

## » Other Schema Objects

- Create a simple and complex view
- Retrieve data from views
- Create, maintain, and use sequences
- Create and maintain indexes
- Create private and public synonyms

# Oracle Database 12C : Administration

## Exploring the Oracle Database Architecture

- Oracle Database Architecture Overview
- Oracle Memory Architecture
- Oracle Process Architecture
- Oracle Storage Architecture
- Logical and physical storage
- In-Memory Column Store

## Installing your Oracle Software

- Installation: System Requirements
- Oracle Universal Installer (OUI)
- Installing Oracle Database Software
- Silent Install
- Using the DBCA to Create a Database
- Using the DBCA to Delete a Database

## Managing the Oracle Database Instance

- Start and stop the Oracle database and components
- Modify database installation parameters
- Describe the stages of database startup
- Describe database shutdown options
- View the alert log
- Administering the DDL Log File
- Understanding the Debug Log File
- Access dynamic performance views

## Configuring the Oracle Network Environment

- Oracle Net Services: Overview
- Oracle Net Listener: Overview
- Naming Methods
- Using Oracle Net Manager
- Using the Listener Control Utility
- Use tnsping to test Oracle Net connectivity
- Creating Database Link
- Identify when to use shared servers and when to use dedicated servers

## Managing Database Storage Structures

- How Table Data Is Stored
- Anatomy of a Database Block
- Types of Tablespaces
- Creating Tablespaces (Smallfile & Bigfile)
- Removing Tablespaces
- Actions with Tablespaces
- Oracle Managed Files (OMF)

## Administering User Security

- Database User Accounts
- Predefined Administrative Accounts
- Creating and Granting Privileges
- Benefits of Roles
- Predefined Roles
- Dropping Users and Roles
- Implementing Profiles for password Management

## Managing Data Concurrency

- Data Concurrency
- Enqueue Mechanism
- Resolving Lock Conflicts
- Deadlocks

## Backup and Recovery Concepts

- Part of Your Job
- Statement Failure
- User Error
- Understanding Instance Recovery
- Phases of Instance Recovery
- Using the MTTR Advisor
- Media Failure
- Archive Log Files

## Performing Database Backups

- Backup Solutions: Overview
- Oracle Secure Backup
- User-Managed Backup
- Terminology
- Recovery Manager (RMAN)

- Configuring Backup Settings
- Backing Up the Control File to a Trace File
- Monitoring the Flash Recovery Area

### Performing Database Recovery

- Loss of a Data File in NOARCHIVELOG Mode
- Noncritical Recovery in ARCHIVELOG Mode
- Critical Recovery in ARCHIVELOG Mode
- Loss of a Control File
- Loss of a Redo Log File

### Moving Data

- Describe ways to move data
- Create and use directory objects
- Use SQL\*Loader to move data
- Use external tables to move data
- General architecture of Oracle Data Pump
- Use Data Pump export and import to move data

## Oracle Database 12C : Administration

### Introduction Of RMAN

- Review of Oracle architecture
- Oracle Data Protection Solutions
- Advantages of Using RMAN
- Connecting to RMAN and a Target Database
- Connection types
- Oracle Secure Backup
- Oracle Data Guard: Overview
- Oracle Maximum Availability Architecture

### Configuring for Recoverability

- Purpose of Backup and Recovery, Typical Tasks and Terminology
- Using the Recovery Manager (RMAN)
- Configuring your Database for B&R Operations
- Configuring Archivelog Mode
- Configuring Backup Retention
- Configuring and Using a Flash Recovery Area (FRA)

### Using the RMAN Recovery Catalog

- RMAN Repository Data Storage
- Storing Information in the Recovery Catalog
- Reasons to Use a Recovery Catalog
- Creating the Recovery Catalog
- Recovery Catalog Resynchronization
- Using RMAN Stored Scripts
- Writing, Executing and Maintaining Stored Scripts
- Creating and Managing Virtual Private Catalog

### Backup Strategies and Terminology

- Backup Terminology
- Full and Incremental Backups
- Incrementally Updated Disk Backups
- Backing Up Read-Only Tablespaces
- Data Warehouse Backup and Recovery
- Difference Between Backupset and Image Copy

### Performing and Improving Backup

- RMAN Backup Types

- Incrementally Updated Backups
- Maintaining Block Change Tracking File
- Oracle-Suggested Backup
- Managing Backups: Cross-Checking and Deleting
- Using RMAN Backup Compression
- Configuring Backup and Restore for Very Large Files
- Creating Backups of Backup Sets
- Backing up Controlfile, Archivefile and Spfile
- Cataloging Additional Backup Files

### Using RMAN-Encrypted Backups

- Comparing OSB and RMAN Encryption
- What Is TDE?
- Configuring RMAN Encryption
- Creating RMAN-Encrypted Backups
- Restoring Encrypted Backups

### Restore and Recovery Task

- Restoring and Recovering
- Causes of File Loss
- Automatic Tempfile Recovery
- Recovering from the Loss of a Redo Log Group
- Recovering from a Lost Index Tablespace
- Re-creating a Password Authentication File
- Complete and Incomplete Recovery
- Other Recovery Operations

### Using RMAN to Perform Recovery

- Complete Recovery after Loss of a Critical or Noncritical Data File
- Recovering Image Copies and Switching Files
- Restore and Recovery of a Database in NOARCHIVELOG Mode
- Incomplete Recovery
- Performing Recovery with a Backup Control File
- Restoring from Autobackup: Server Parameter File and Control File
- Restoring and Recovering the Database on a New Host

### Monitoring and Tuning RMAN

- Monitoring RMAN Jobs
- Using the DEBUG Option
- Balance Between Speed of Backup Versus Speed of Recovery
- RMAN Multiplexing
- Setting LARGE\_POOL\_SIZE
- Synchronous and Asynchronous I/O
- Explaining Performance Impact of MAXPIECESIZE,
- FILESPERSET, MAXOPENFILES and BACKUP DURATION

### Diagnosing the Database

- Data Recovery Advisor (DRA)
- Block Corruption
- Automatic Diagnostic Repository (ADR)
- Health Monitor
- The ADR Command-Line Tool, ADRCI

### Using Flashback Technology I

- Flashback Technology: Overview and Setup
- Using Flashback Technology to Query Data
- Flashback Version Query
- Flashback Table
- Flashback Transaction Query
- Flashback drop

## Performing Flashback Database

- Configuring Flashback Database
- Performing Flashback Database Operations
- Monitoring Flashback Database
- Performing Flashback Transaction Backout
- Performing Flashback Data Archive

## Transporting Data

- Transporting Data Across Platforms
- Transporting a Tablespace with Image Copies
- Using the RMAN CONVERT Command
- Database Transportation Procedure
- Database Transport with Backup Sets
- Transporting Inconsistent Tablespaces

## Performing Point-in-Time Recovery

- When to Use TSPITR
- PITR Terminology
- Tablespace Point-in-Time Recovery: Architecture
- Performing RMAN TSPITR
- Performing Fully Automated TSPITR
- Troubleshooting RMAN TSPITR

## Duplicating a Database

- Choosing Database Duplication Techniques
- “Push” Versus “Pull” Methods of Duplication
- Duplicating a Database with a Target Connection
- Duplicating a Database with Recovery Catalog Without Target Connection
- Duplicating a Database Without Recovery Catalog or Target Connection
- Creating a Backup-Based Duplicate Database
- Understanding the RMAN Duplication Operation
- Using Additional DUPLICATE Command Options

## Basics of Multitenant Container Database and Pluggable Databases

- New Multitenant Architecture: Benefits
- Oracle Container Database
- Separating SYSTEM and User Data
- Provisioning a Pluggable Database
- Multitenant Container Database Architecture
- Common and Local Users
- Common and Local Privileges and Roles
- Shared and Non-shared Objects

## Creating a Multitenant CDB and PDB

- Steps to Create a Multitenant Container Database
- Data Dictionary Views: DBA\_ xxx
- Data Dictionary Views: CDB\_ xxx
- EM Cloud Control: Summary
- Creating A Pluggable Database
- Plug a Non-CDB into CDB
- Clone PDBs: Using SQL Developer
- Plug Unplugged PDB into CDB

## Managing a Multitenant CDB and PDB

- Connection with SQL\*Developer
- Creating Services
- Mounting and Opening CDB
- Opening and closing PDB
- Shutting Down a CDB Instance



- Modifying a PDB Settings
- Using ALTER SYSTEM Statement on PDB

### Managing Tablespace in CDB and PDB

- Tablespaces in PDBs
- Creating Permanent Tablespaces in a CDB
- Assigning Default Tablespaces
- Creating Local Temporary Tablespaces
- Assigning Default Temporary Tablespaces

### Managing Security in CDB and PDBs

- Users, Roles, and Privileges
- Local User and Common User
- Local and Common Schema
- Granting Common and Local Roles to Users
- Enabling Common Users to Access Data in Specific PDBs
- Creating Common and Local Profiles

### Backup, Recovery, Flashback CDB and PDBs

- CDB Backup: Whole or Partial CDB Backup
- PDB Backup: Whole or Partial PDB Backup
- Media Failure : Datafile, Controlfile and Redolog files
- Media Failure: PITR
- Flashback CDB
- Duplicating Pluggable Databases
- New Data Dictionary View and Column

### Performance

- Sizing the CDB
- Testing the Estimates
- Allocating Resources in the CDB
- Tuning CDB Memory
- Limiting PGA Usage
- AWR SQL Reports
- Use of Other Advisors

### Miscellaneous

- Using Oracle Data Pump with PDBs
- Full Transportable Export/Import
- Transporting a Database Over the Network
- Using SQL\*Loader with PDBs
- Auditing Actions in a CDB and PDBs
- Securing Data with Transparent Data Encryption
- Using Xstreams with a CDB and PDB
- Scheduling Operations in a PDB

# Oracle Database Program with PL/SQL

## Introduction to PL/SQL

- Overview of PL/SQL
- Identify the benefits of PL/SQL Subprograms
- Overview of the types of PL/SQL blocks
- Create a Simple Anonymous Block
- How to generate output from a PL/SQL Block?

## Declare PL/SQL Identifiers

- List the different Types of Identifiers in a PL/SQL subprogram
- Usage of the Declarative Section to Define Identifiers
- Use variables to store data

- Identify Scalar Data Types
- The %TYPE Attribute
- What are Bind Variables?
- Sequences in PL/SQL Expressions

## **Write Executable Statements**

- Describe Basic PL/SQL Block Syntax Guidelines
- Learn to Comment the Code
- Deployment of SQL Functions in PL/SQL
- How to convert Data Types?
- Describe Nested Blocks
- Identify the Operators in PL/SQL
- Understand the SQL Cursor concept
- Use SQL Cursor Attributes to Obtain Feedback on DML
- Save and Discard Transactions

## **Control Structures**

- Conditional processing using IF Statements
- Conditional processing using CASE Statements
- Describe simple Loop Statement
- Describe While Loop Statement
- Describe For Loop Statement
- Use the Continue Statement

## **Composite Data Types**

- Use PL/SQL Records
- The %ROWTYPE Attribute
- Insert and Update with PL/SQL Records

## **Overview of Collections**

- Index by table
- Clustered table
- Varray

## **Explicit Cursors**

- What are Explicit Cursors?
- Declare the Cursor
- Open the Cursor
- Fetch data from the Cursor
- Close the Cursor
- Cursor FOR loop
- The %NOTFOUND and %ROWCOUNT Attributes
- Describe the FOR UPDATE Clause and WHERE CURRENT Clause

## **Exception Handling**

- Understand Exceptions
- Handle Exceptions with PL/SQL
- Trap Predefined Oracle Server Errors
- Trap Non-Predefined Oracle Server Errors
- Trap User-Defined Exceptions
- Propagate Exceptions
- RAISE\_APPLICATION\_ERROR Procedure



## Stored Procedures

- Create a Modularized and Layered Subprogram Design
- Modularize Development With PL/SQL Blocks
- Understand the PL/SQL Execution Environment
- List the benefits of using PL/SQL Subprograms
- List the differences between Anonymous Blocks and Subprograms
- Create, Call, and Remove Stored Procedures
- Implement Procedures Parameters and Parameters Modes
- View Procedure Information

## Triggers

- Describe Triggers
- Identify the Trigger Event Types and Body
- Business Application Scenarios for Implementing Triggers
- Create DML Triggers using the CREATE TRIGGER Statement and SQL Developer
- Identify the Trigger Event Types, Body, and Firing (Timing)
- Differences between Statement Level Triggers and Row Level Triggers
- Create Instead of and Disabled Triggers
- How to Manage, Test and Remove Triggers?

# Oracle Fusion Middleware 11g: Build Applications with Oracle Forms

## Running a Forms Application

- Running a Form
- Identifying the Data Elements
- Navigating a Forms Application
- Using the Modes of Operation
- Querying Data
- Inserting, Updating, and Deleting Records
- Saving Changes
- Displaying Errors

## Working in the Forms Builder Environment

- Forms Builder Key Features
- Forms Builder Components
- Navigating the Forms Builder Interface
- Forms Builder Module Object Hierarchy
- Customizing Your Forms Builder Session
- Forms Executables and Module Types
- Defining Environment Variables
- Testing a Form with the Run Form Button

## Creating a Basic Form Module

- Creating a New Form Module
- Creating a New Data Block

- Using Template Forms
- Saving and Compiling a Form Module
- Module Types and Storage Formats
- Deploying a Form Module
- Producing Documentation

## **Creating a Master-Detail Form**

- Creating Data Blocks with Relationships
- Running a Master-Detail Form Module
- Modifying the Structure of a Data Block
- Modifying the Layout of a Data Block

## **Working Data Blocks and Frames**

- Managing Object Properties
- Creating Visual Attributes
- Controlling the Behavior and Appearance of Data Blocks
- Controlling Frame Properties
- Displaying Multiple Property Palettes
- Setting Properties on Multiple Objects
- Copying Properties
- Creating Control Blocks

## **Working with Text Items**

- Creating a Text Item
- Modifying the Appearance of a Text Item
- Controlling the Data of a Text Item
- Altering the Navigational Behavior of a Text Item
- Enhancing the Relationship between Text Item and Database
- Adding Functionality to a Text Item
- Displaying Helpful Messages

## **Creating LOVs and Editors**

- LOVs and Record Groups
- Creating an LOV Manually
- Using the LOV Wizard to Create an LOV
- Setting LOV Properties
- LOV Column Mapping
- Defining an Editor
- Setting Editor Properties
- Associating an Editor with a Text Item

## **Creating Additional Input Items**

- Input Items Overview
- Creating a Check Box
- Creating a List Item
- Creating a Radio Group

## **Creating Noninput Items**

- Noninput Items Overview
- Creating a Display Item
- Creating an Image Item
- Creating a Push Button
- Creating a Calculated Item
- Creating a Hierarchical Tree Item
- Creating a Bean Area Item

## Creating Windows and Content Canvases

- Displaying a Form Module in Multiple Windows
- Creating a New Window
- Displaying a Form Module on Multiple Layouts
- Creating a New Content Canvas

## Working with Other Canvas Types

- Overview of Canvas Types
- Creating a Stacked Canvas
- Creating a Toolbar
- Creating a Tab Canvas

## Producing and Debugging Triggers

- Trigger Overview
- Creating Triggers in Forms Builder
- Specifying Execution Hierarchy
- PL/SQL Editor Features
- Using the Database Trigger Editor
- Using Variables in Triggers
- Adding Functionality with Built-in Subprograms
- Using the Forms Debugger

## Adding Functionality to Items

- Coding Item Interaction Triggers
- Interacting with Noninput Items

## Displaying Run-Time Messages and Alerts

- Built-Ins and Handling Errors
- Controlling System Messages
- The `FORM_TRIGGER_FAILURE` Exception
- Triggers for Intercepting System Messages
- Creating and Controlling Alerts
- Handling Server Errors

## Validating User Input

- Validation Process
- Controlling Validation by Using Properties
- Controlling Validation by Using Triggers
- Performing Client-Side Validation with PJC's
- Tracking Validation Status
- Using Built-ins to Control When Validation Occurs

## Writing Flexible Code

- What is Flexible Code?
- Using System Variables for Flexible Coding
- Using Built-in Subprograms for Flexible Coding
- Copying and Subclassing Objects and Code
- Referencing Objects by Internal ID
- Referencing Items Indirectly

## Sharing Objects and Code

- Benefits of Reusable Objects and Code
- Working with Property Classes
- Working with Object Groups
- Copying and Subclassing Objects and Code
- Working with Object Libraries
- Working with SmartClasses

- Reusing PL/SQL
- Working with PL/SQL Libraries

## **Introducing Multiple Form Applications**

- Multiple Form Applications Overview
- Starting Another Form Module
- Defining Multiple Form Functionality
- Sharing Data among Modules

# **Oracle Reports Developer 11g: Build Reports**

## **Introduction to Oracle Reports Developer**

- Business Intelligence
- Enterprise Reporting
- Oracle Reports Developer
- Oracle Database 11g
- Oracle Developer Suite 11g
- Oracle Application Server 11g
- OracleAS Reports Services
- OracleAS Reports Services Architecture for the Web

## **Designing and Running Reports**

- Understanding User Requirements
- Designing Reports
- Tabular
- Master-Detail
- Master with Two Details
- Matrix
- Retrieving and Sharing Data
- Running a Report

## **Enhancing Reports Using the Data Model: Queries and Groups**

- The Data Model Objects
- Modifying Properties of a Query
- Applying Changes
- Changing the Group Structure
- Group Hierarchy
- Ordering Data in a Group
- Query Modifications
- Filtering Data in a Group

## **Enhancing Reports Using the Data Model: Creating Columns**

- Data Model Columns
- Maintaining Data Source Columns
- Producing File Content Output
- Creating a Column
- Creating Summary Columns
- Displaying Subtotals
- Displaying Percentages
- Creating a Formula Column

## **Controlling the Paper Layout: Common Properties**

- Modifying Paper Layout Object Properties
- Common Layout Properties

- Sizing Objects
- Anchors
- Layout Object Relationships
- Pagination Icons in the Paper Layout
- Controlling Print Frequency
- Using Format Triggers

## Controlling the Paper Layout: Specific Properties

- Properties of a Repeating Frame
- Specifying Print Direction
- Controlling the Number of Records per Page
- Controlling Spacing Between Records
- Minimum Widow Records
- System Variables
- Valid Source Columns
- Displaying File Contents

## Web Reporting

- Comparing Static and Dynamic Reporting
- Adding Dynamic Content
- Creating a Report Block
- Invoking the Report Block Wizard
- Examining the Web Source Code
- `rw:foreach` Tag
- `rw:field` Tag
- Customizing Reports JSPs

## Creating and Using Report Parameters

- Creating User Parameters
- Referencing Parameters in a Report Query
- Using Bind References
- Using Lexical References
- Hints and Tips When Referencing Parameters
- Creating a List of Values
- Referencing System Parameters
- Building a Paper Parameter Form

## Coding Reports triggers

- Types of Triggers in Reports
- Trigger Code
- Using Report Triggers
- Using Data Model Triggers: PL/SQL Group Filter
- Using Data Model Triggers: Parameter Validation
- Using Layout Triggers
- Using Format Triggers
- Event-Based Reporting

## Extending Functionality Using the SRW Package

- Contents of the SRW Package
- Outputting Messages
- Executing a Nested Report
- Restricting Data
- Initializing Fields
- Creating a Table of Contents
- Performing DDL Statements
- Setting Format Attributes

Partners :



edexcel

Java



development | consultancy | training

E-mail: [info@ducatindia.com](mailto:info@ducatindia.com)

Visit us: [www.ducatinidia.com](http://www.ducatinidia.com)

[www.facebook.com/ducateducation](http://www.facebook.com/ducateducation)

### NOIDA

A-43 & A-52, Sector-16,  
Noida - 201301, (U.P.) INDIA  
Ph. : 0120-4646464  
Mb. : 09871055180

### GURGAON

1808/2, 2nd floor old DLF,  
Near Honda Showroom,  
Sec.-14, Gurgaon (Haryana)  
Ph. : 0124-4219095-96-97-98  
Mb. : 09873477222-333

### GREATER NOIDA

F 205 Neelkanth Plaza Alpha 1  
commercial Belt Opposite to Alpha  
Metro Station Greater Noida  
Ph. : 0120-4345190-91-92 to 97  
Mb. : 09899909738, 09899913475

### GHAZIABAD

1, Anand Industrial Estate,  
Near ITS College, Mohan Nagar,  
Ghaziabad (U.P.)  
Ph. : 0120-4835400...98-99  
Mb. : 09810831363 / 9818106660  
: 08802288258 - 59-60

### FARIDABAD

SCO-32, 1st Floor, Sec.-16,  
Faridabad (HARYANA)  
Ph. : 0129-4150605-09  
Mb. : 09811612707