

Course Title: Oracle SQL and PL/SQL (10g, 9i)

Duration: 5 days

This training program introduces the programmers to working with Oracle, the leading ORDBMS product. It covers the important concepts of working with Oracle, as well as all the commonly used features of SQL and PL/SQL in Oracle.

Program Objectives

On completion of the program, the participants should be able to do the following:

- Create tables and manipulate data in them
- Retrieve data from one or more tables using simple and complex queries
- Work with views, indexes, sequences, etc.
- Write code using PL/SQL
- Work with cursors, triggers, packages, exceptions, etc. in PL/SQL code
- Work with PL/SQL records, VARRAYs, nested tables, etc.
- Have an understanding of the object-oriented concepts and features in Oracle

Audience

This program is intended for software professionals who will be working with applications requiring databases. No prior knowledge of Oracle or any other database is required. However, a familiarity with the basic RDBMS concepts would be an advantage to have.

If the participants have at least a basic exposure to some programming language, it will make it easier for them to understand the PL/SQL coding part.

Set-up Requirements

The participants' machines should have the following installed:

- Oracle (10g or 9i) server and client software, with at least one database already created.

Course Summary

Day	Module	Topic
Day 1	Module 1	Getting Started with Oracle
	Module 2	Data Retrieval and Ordering the Output
	Module 3	Creating Tables
	Module 4	Inserting, Modifying and Deleting Data
	Module 5	Modifying Table Structures
	Module 6	Editing SQL Commands
	Module 7	Integrity Constraints
	Module 8	Sequences and Synonyms
Day 2	Module 9	Overview of Oracle Architecture
	Module 10	Built-in Functions

	Module 11	Indexes
	Module 12	Views
	Module 13	Advanced Queries
Day 3	Module 14	Other Advanced Queries
	Module 15	Transactions
	Module 16	Introduction to PL/SQL
	Module 17	PL/SQL Data Types
	Module 18	Records and Collections
	Module 19	Looping Constructs
Day 4	Module 20	Cursors
	Module 21	Bulk Binds
	Module 22	Exception Handling
	Module 23	Stored Procedures
Day 5	Module 24	Packages
	Module 25	Triggers
	Module 26	ORDBMS Features of Oracle
	Module 27	VARRAYs and Nested Tables

Course Outline

Module 1: Getting Started with Oracle

- Overview of SQL and PL/SQL
- Logging in to SQL* Plus
- Exiting SQL*Plus

Module 2: Data Retrieval and Ordering the Output

- Simple data retrieval (SELECT)
- Describing table structures
- Conditional retrieval of data using operators
- Ordering on single and multiple columns

Module 3: Creating Tables

- Defining table structures
- Data types

Module 4: Inserting, Modifying and Deleting Data

- Inserting records in a table
- Inserting data for selected columns
- Inserting the output of a query into another table
- Updating records
- Deleting records

Module 5: Modifying Table Structures

- Adding, modifying and dropping columns to existing tables
- Dropping tables

Module 6: Editing SQL Commands

- Difference between SQL and SQL*PLUS commands
- Setting page and line size
- Viewing the SQL*Plus environment variables
- Viewing and editing the SQL buffer
- Editing the last command
- Saving and SQL commands in files
- Executing commands from files
- Spooling the output of commands

Module 7: Integrity Constraints

- Understanding table and column constraints
- Creating, modifying and dropping column level constraints
- Creating, modifying and dropping table level constraints
- Getting information about constraints from data dictionary views
- Enabling and disabling constraints
- Dropping columns and tables having constraints

Module 8: Sequences and Synonyms

- Creating, altering, dropping, using sequences
- Creating, dropping and using synonyms
- Retrieving information about sequences, views and synonyms

Module 9: Overview of Oracle Architecture

- Memory structure of an Oracle instance
- Tablespaces and segments

Module 10: Built-in Functions

- Numeric functions
- Character and date functions
- Conversion functions

Module 11: Indexes

- Understanding indexes
- Creating indexes
- Unique and non-unique indexes
- Dropping indexes
- Getting index information from data dictionary views
- Creating index as a primary key constraint

Module 12: Views

- Understanding views
- Creating views
- Altering and dropping views
- Manipulating data using views

Module 13: Advanced Queries

- Table joins including ANSI join syntax
- Grouping information using aggregate functions
- Using ROLLUP, CUBE and GROUPING keywords
- Computing column values at breaks in SQL*Plus
- Sub queries

Module 14: Other Advanced Queries

- Set operations
- Hierarchical retrieval
- Multi table inserts
- Simultaneous update and insert operations on tables (the MERGE keyword)
- Conditional evaluation of values (the CASE, DECODE keywords)

Module 15: Transactions

- Understanding transactions
- Committing transactions (COMMIT)
- Rolling the transactions back (ROLLBACK)
- Truncating tables
- Locking tables
- Locking behavior with the UPDATE clause

Module 16: Introduction to PL/SQL

- Understanding PL/SQL
- PL/SQL block structures
- Nesting PL/SQL blocks
- Selecting and updating rows from PL/SQL code

Module 17: PL/SQL Data Types

- Data types
- Declaring variables
- Visibility and scope of variables
- Autonomous transactions
- Conditional constructs
- Anchored data types

Module 18: Records and Collections

- PL/SQL records
- Defining and declaring PL/SQL records
- Initializing, referencing, assigning and comparing records
- Inserting and updating data using records
- Associative arrays, nested table and VARRAYs
- Declaring collections
- Assigning values to collections
- Referencing collections
- PL/SQL tables of records

Module 19: Looping Constructs

- Basic loop structure
- WHILE loops
- FOR loops

Module 20: Cursors

- Types of cursors
- Implicit and explicit cursors
- Cursor operations
- Cursor attributes
- Locking result sets using FOR UPDATE
- Parameterized cursors
- Cursor variables
- Strong and weak cursor variables
- Benefits of cursors
- Differences between cursors and cursor variables

Module 21: Bulk Binds

- Improving performance using bulk binds
- Querying data into collections of records
- Using DML on collections with deleted elements
- Using DML on selected elements in collections
- Effects of rollback on FORALL

Module 22: Exception Handling

- Named system exceptions
- Unnamed system exceptions
- Named programmer-defined exceptions
- Unnamed programmer-defined exceptions

Module 23: Stored Procedures

- Understanding procedure execution
- Creating stored procedures
- Creating stored functions
- Parameter modes
- Differences between procedures and functions

Module 24: Packages

- Introduction to packages
- Package specification and body
- Overloading feature
- Advantages of Packages

Module 25: Triggers

- Understanding triggers
- DML triggers
- Privileges required to create triggers
- Types of triggers
- Using autonomous transactions

Module 26: ORDBMS Features of Oracle

- Features of object-oriented programming
- Advantages of object orientation
- Creating abstract data types using NOT FINAL
- Creating methods
- Retrieving information about objects
- Type inheritance using subtypes
- Creating tables using an abstract data types
- Inserting records into tables
- Constructor methods
- Selecting columns, object attributes, and methods from object tables
- Polymorphism
- Comparing objects with map and order methods
- Inserting data using constructor methods

Module 27: VARRAYs and Nested Tables

- Creating VARRAYs
- Creating nested tables
- Manipulating data using VARRAYs and nested tables
- Specifying the tablespace to store nested tables while creating them
- Altering VARRAYs and nested tables