

## Application Development and Tuning for Oracle® Databases: Hands-On - 5 Days

*Course 492 Overview*

- You Will Learn How To**
- Design and implement efficient applications while incorporating Oracle features
  - Load data into Oracle databases using SQL\*Loader or external tables
  - Maintain and secure the database with advanced application techniques
  - Enhance applications with key Oracle-provided packages
  - Improve query performance using the Oracle-provided toolset
  - Tune applications for optimal performance

**Course Benefits** Developing efficient, secure, high-performance database applications is essential to the effectiveness of an organisation's information structure. In this hands-on course, you gain the skills to create powerful and secure Oracle database applications, and tune them for optimal performance. You learn to load, maintain and secure your valuable data by leveraging advanced application techniques.

**Who Should Attend** Developers and others interested in increasing the performance and efficiency of their Oracle database applications. A working knowledge of SQL and PL/SQL as well as experience with a SQL-based RDBMS is assumed.

**Hands-On Training** A continuous case study provides experience building and tuning applications, including:

- Loading data into an Oracle database
- Automating processing with job scheduling
- Utilising LOBs
- Managing dependencies
- Generating optimiser statistics with DBMS\_STATS
- Using performance diagnostic tools
- Influencing the optimiser
- Implementing tuning techniques
- Enhancing performance with Real-Time SQL Monitoring

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## Course 492 Outline

### Introduction to the Application Environment

#### The Oracle database environment

- Reviewing basic architecture concepts
- Examining existing databases using the Data Dictionary

#### Database design considerations

- Managing basic storage structures
- Enhancing performance with optional storage structures

### Preparing the Database

#### Populating the database

- Loading data from other sources using SQL\*Loader or external tables
- Writing to external tables using Data Pump
- Upgrading Data Pump with legacy mode

#### Maintaining the application schema

- Implementing best practices for the PL/SQL development structures
- Managing dependencies
- Generating DDL for existing objects

### Exploiting Oracle Built-In Packages

#### Automating routine processing

- Scheduling routines with DBMS\_JOB or Oracle Scheduler
- Starting jobs based on system or application events
- Grouping scheduled jobs for program dependent scheduling

#### Handling other media types

- Programming with LOBs
- Providing transparent compression, encryption and deduplication with SecureFiles

### Maintaining the Database

#### Applying advanced programming techniques

- Developing modular code using packages
- Managing default, serialisable and autonomous transactions
- Resolving potential trigger problems

#### Securing the database

- Enforcing security using PL/SQL
- Implementing row-level security applications
- Controlling access with Oracle Label Security

#### Locking and read consistency

- Implicit vs. explicit locking
- Avoiding deadlocks
- Waiting for DML and DDL locking

#### Upgrading the application

- Building a new application version using Edition-Based Redefinition
- Implementing the new version

### Exploiting Oracle Built-In Packages

#### Handling other media types

- Accessing operating system files
- Programming with LOBs

#### Enhancing application capabilities

- Controlling the application schema with invoker's rights
- Generating DDL for existing objects

### Improving Query Performance

#### Identifying basic tuning techniques

- Developing a tuning methodology
- Planning and managing the tuning process

#### Employing tuning tools

- Running EXPLAIN PLAN and autotrace
- SQL Trace and TKPROF output

#### Query tuning techniques

- Optimising join operations
- Partitioning data to improve access to frequently used data
- Storing rows in sorted sequence with sorted hash clusters

### Deciphering and Controlling the Optimiser

#### Optimiser concepts

- Fundamentals of access paths
- Gathering object and system statistics with DBMS\_STATS
- Managing low-selectivity columns with histograms

#### Influencing the Optimiser

- Utilising hints and optimiser mode
- Determining the driving table

### Tuning the Application

#### Optimising performance

- Exploring B-Trees
- Bitmapped, function-based and other indexing options
- Partitioning indexes with virtual columns and other options
- Monitoring index usage with invisible indexes

### Tuning with the automated tools

- Tuning SQL with the SQL Tuning Advisor and the SQL Access ADVISOR
- Identifying real-time performance problems with Real-Time SQL Monitoring