Course Outline

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COURSE NAME

Oracle 12c SQL Programming

Objectives

All students will learn to:

- Use SQL Developer and other available SQL interfaces.
- Write simple SQL queries and format & sort the data as needed.
- Write moderately complex SQL queries using various join techniques.
- Supplement SQL code with references to pseudo columns and system functions.
- Summarize, group, and combine data to obtain more meaningful query results.
- Draw conclusions and make business decisions based upon the data processed.
- Learn advanced query techniques such as set operations, sub-queries, and summary functions.
- Create and maintain database tables using the SQL Data Definition Language (DDL).
- Manage data within tables using the SQL Data Manipulation Language (DML).
- Take advantage of regular expressions and support for international data and time zones.
- Understand the environment and context in which SQL operates.
- Consider the advantages and benefits of SQL within a database environment.
- Declare program variables and complex data types.
- Develop logic within SQL program blocks.
- Fetch data from the database into program variables.
- Return program output to users.
- Handle program exceptions.
- Use explicit and implicit database cursors.
- Maintain and implement triggers.

DURATION

5 Days

COURSE CONTENT

Outline

- Introduction
- Relational Databases & Data Models
  - About Data Models
  - About the Relational Model
  - the Electronics Data Model
  - About the Relational DBMS
- Selection & Setup of the Database Interface
  - Considering Available tools
  - Selecting the Appropriate tool
  - Oracle Net Database Connections
  - Oracle Paas Database Connections
  - Setup SQL Developer
  - Setup SQL*Plus
  - Setup JDeveloper
- Using the Database Interface
  - About Bind & Substitution Variables
  - Using SQL Developer
  - Using SQL*Plus
- Introduction to the SQL Language
  - About the SQL Language
  - Characteristics of SQL
  - Introducing SQL Using Select
  - SQL Rules
- the Select Statement
  - Distinct / Unique Keyword
  - Using Alias Names
  - Restricting Results With the Where Clause
  - About Logical Operators
  - Equality Operator
  - Boolean Operators
  - Regexp_Like()
  - In Operator
- Sorting Data with the Order By Clause
  - About the Order By Clause
  - Multiple Column Sorts
  - Specify the Sort Sequence
  - About Null Values Within Sorts
  - Using Column Aliases
- Pseudo Columns, Functions & top-N Queries
  - Rowid Pseudo Column
  - Ora_Rowscn Pseudo Column
  - Rownum Pseudo Column
  - About the Built-In Functions

    - Sysdate
    - User & Uid
    - Sessiontimezone Function
    - Using the Dual Table
    - Row Limiting & Top-N Queries
    - Fetch First X Rows only Clause
    - offset X Rows Clause
    - Fetch - Percent Clause
    - The With Ties Option
- Joining Tables
    - About Joins
    - Inner Join
    - Reflexive Join
    - Non-Key Join
    - Outer Join
- Using the Set Operators
    - About the Set Operators
    - SQL Set Operator Examples
    - Union Example
    - Intersect Example
    - Minus Example
    - Union All
    - Summary Functions
- Using Sub-Queries
    - Finding Data With Sub-Queries
    - Standard Sub-Queries
    - Correlated Sub-Queries
    - The Exists Operator
- Aggregating Data Within Groups
    - About Summary Groups
    - Find Groups Within the Tables
    - Select Data from the Base Tables
    - Select Groups from the Results
- Use DDL to Create & Manage Tables
    - Create Table Statement
    - Column Data Types
    - Not Null
    - Default
    - Describe
    - Alter Table Statement
    - Drop Table Statement
    - Table DDL Using SQL Developer
    - Alter User Statement
    - Alter Session Statement
    - Nls_Language
    - Nls_Date

- Use DML to Manipulate Data
  - The Insert Statement
  - The Delete Statement
  - The Update Statement
  - About Transactions
  - Transaction Rollback
  - Transaction Commit
  - Transaction Savepoint
  - The Set Transaction Statement
  - Set Transaction Read only Statement Rules
- Understanding the Data Models
  - The Company Data Model
  - The Electronics Data Model
- About the SQL- Standard
  - SQL-92 & SQL-
  - Cross Joins
  - Natural Joins
  - Inner Joins
  - Implicit Inner Join
  - Outer Joins
  - Anti Joins
  - Named Sub-Queries
- Enhancing Groups with Rollup & Cube
  - Using Rollup
  - The Grouping() Function
  - Using Cube
- Using the Case Expression
- SQL Functions: Character Handling
  - What Are the SQL Functions?
  - String Formatting Functions
  - Upper(), Lower() Example
  - Initcap() Example
  - Character Codes Functions
  - Chr(), Ascii() Examples
  - Pad & Trim Functions
  - Rpad() Example
  - Rtrim() Example
  - Trim() Example
  - String Manipulation Functions
  - Decode() Example
  - Substr() Example
  - Instr() Example
  - Translate() Example
  - Replace() Example
  - String Comparison Functions

    - Least() Example
    - Phonetic Search Function
    - Soundex() Example
- SQL Functions: Numeric Handling
    - About the Numeric Data Functions
    - Greatest() Example
    - Abs() Example
    - Round() Example
    - Trunc() Example
    - Sign() Example
    - to_Number() Example & Data Type Conversions
    - Null Values Functions
    - Nvl() & Nvl2() Function
    - Nvl() Example (Character)
    - Nvl() Example (Numeric Loss of Data)
    - Nvl() Example (Numeric Output)
    - Nvl2() Example
    - Coalesce() Function
    - Nullif() Function
- SQL Functions: Date Handling
    - Date Formatting Functions
    - to_Char() & to_Date() Format Patterns
    - to_Char() Examples
    - to_Date() Examples
    - Extract() Example
    - Date Arithmetic Functions
    - Months_Between() Example
    - Add_Months() Example
    - Last_Day() Example
    - Next_Day() Example
    - Trunc(), Round() Dates Example
    - New_Time() Example
    - About V$Timezone_Names
    - Cast() Function & Time Zones
- Database Objects: About Database Objects
    - About Database Objects
    - About Schemas
    - Making Object References
- Database Objects: Relational Views
    - About Relational Views
    - The Create View Statement
    - Why Use Views?
    - Accessing Views with DML
    - Maintaining View Definitions
    - Alter View
    - Drop View
    - DDL Using SQL Developer

- Database Objects: Indexes
  - About Indexes
  - Create & Drop Index Statements
  - Indexes & Performance
  - Data Dictionary Storage
- Database Objects: Creating Other Objects
  - About Sequences
  - Referencing Nextval
  - Referencing Currval
  - Within the Default Clause
  - Alter Sequence & Drop Sequence
  - Alter Sequence
  - Drop Sequence
  - About Identity Columns
  - Create Table - Generated as Identity
  - Alter Table - Generated as Identity
  - Start With Limit Value
  - Alter Table - Drop Identity
  - About Synonyms
  - Create & Drop Synonym Statements
  - Create Synonym
  - Drop Synonym
  - Public versus Private Synonyms
  - Create Schema Authorization
- Database Objects: Object Management Using DDL
  - The Rename Statement
  - Tablespace Placement
  - Create Table -Tablespace
  - The Comment Statement
  - The Truncate Table Statement
- Database Objects: Security
  - About Object Security
  - Grant Object Privileges
  - Revoke Object Privileges
  - Object Privileges & SQL Developer
- Data Integrity Using Constraints
  - About Constraints
  - Not Null Constraint
  - Not Null Example
  - Check Constraint
  - Unique Constraint
  - Primary Key Constraint
  - References Constraint
  - on Delete Cascade Example
  - On Delete Set Null Example

- Constraints on Existing Tables
- Constraints & SQL Developer

- Managing Constraint Definitions
  - Renaming & Dropping Constraints
  - Enabling & Disabling Constraints
  - Deferred Constraint Enforcement
  - Set Constraints
  - Handling Constraint Exceptions
  - Constraints with Views
  - Data Dictionary Storage