Oracle Database: Introduction to SQL
Course 74799 – 40 Hours

Overview

It's important for developers to understand the basic concepts of relational databases. This course helps you write subqueries, combine multiple queries into a single query using SET operators and report aggregated data using group functions.

Learn To:
- Create reports of sorted and restricted data.
- Run data manipulation statements (DML).
- Control database access to specific objects.
- Manage schema objects.
- Manage objects with data dictionary views.
- Retrieve row and column data from tables.

Learn Advanced Features of SQL

You'll also learn to create indexes and constraints, while altering existing schema objects. Expert instructors will teach you how to create and query external tables, along with the advanced features of SQL.

Expression Support in SQL

This course also discusses how to use the regular expression support in SQL. Learn to query and manipulate data within the database, use the dictionary views to retrieve metadata and create reports about their schema objects. You'll also explore some of the date-time functions available in the Oracle Database.

Note:

Controlling privileges at the object and system level are also dealt with in detail. This course is a combination of Oracle Database: SQL Fundamentals I and Oracle Database: SQL Fundamentals II courses.

Development Tools Used

For this course, the main development tool used is Oracle SQL Developer. SQL*Plus is available as an optional development tool. This is appropriate for a 10g and 11g audience. There are minor changes between 10g and 11g features in SQL.

On Completion, Delegates will be able to

- Display data from multiple tables using the ANSI SQL 99 JOIN syntax.
- Identify the major structural components of the Oracle Database 11g.
- Create reports of aggregated data.
- Write SELECT statements that include queries.
- Retrieve row and column data from tables.
- Run data manipulation statements (DML) in Oracle Database 11g.
- Create tables to store data.
- Utilize views to display data.

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- Control database access to specific objects.
- Manage schema objects.
- Manage objects with data dictionary views.
- Write multiple-column sub-queries.
- Employ SQL functions to retrieve customized data.
- Use scalar and correlated sub-queries.
- Use the regular expression support in SQL.
- Create reports of sorted and restricted data.

Who Should Attend

- Application Developers
- Business Analysts
- Data Warehouse Administrator
- Developer
- Forms Developer
- PL/SQL Developer
- System Analysts

Prerequisites

- Familiarity with data processing concepts and techniques
- Data processing

Course Contents

Introduction to Oracle Database
- List the features of Oracle Database 11g
- Discuss the basic design, theoretical, and physical aspects of a relational 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
- Generate a report of data from the output of a basic SELECT statement
- Select All Columns
- Select Specific Columns
- Use Column Heading Defaults
- Use Arithmetic Operators
- Understand Operator Precedence
- Learn the DESCRIBE command to display the table structure

Learn to Restrict and Sort Data
- Write queries that contain a WHERE clause to limit the output retrieved
- List the comparison operators and logical operators that are used in a WHERE clause
- Describe the rules of precedence for comparison and logical operators

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- Use character string literals in the WHERE clause
- Write queries that contain an ORDER BY clause to sort the output of a SELECT statement
- Sort output in descending and ascending order

Usage of Single-Row Functions to Customize Output
- Describe the 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 generally does not meet a 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
- Use a SET operator to combine multiple queries into a single query
- 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
- Categorize the main database objects
- Review the table structure
- List the data types available for columns
- Create a simple table
- Decipher how constraints can be created at table creation
- Describe how schema objects work

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

Control User Access
- Differentiate system privileges from object privileges
- Create Users
- Grant System Privileges
- Create and Grant Privileges to a Role
- Change Your Password
- Grant Object Privileges
- How to pass on privileges?
- Revoke Object Privileges

Management of Schema Objects
- Add, Modify, and Drop a Column
- Add, Drop, and Defer a Constraint
- How to enable and Disable a Constraint?
- Create and Remove Indexes
- Create a Function-Based Index
- Perform Flashback Operations
- Create an External Table by Using ORACLE_LOADER and by Using ORACLE_DATAPUMP
- Query External Tables

Manage Objects with Data Dictionary Views
- Explain the data dictionary
- Use the Dictionary Views
- USER_OBJECTS and ALL_OBJECTS Views
- Table and Column Information
- Query the dictionary views for constraint information
- Query the dictionary views for view, sequence, index and synonym information
- Add a comment to a table
- Query the dictionary views for comment information

Manipulate Large Data Sets
- Use Subqueries to Manipulate Data
- Retrieve Data Using a Subquery as Source
- Insert Using a Subquery as a Target
- Usage of the WITH CHECK OPTION Keyword on DML Statements
- List the types of Multitable INSERT Statements
- Use Multitable INSERT Statements
- Merge rows in a table
- Track Changes in Data over a period of time

Data Management in different Time Zones
- Time Zones
- CURRENT_DATE, CURRENT_TIMESTAMP, and LOCALTIMESTAMP
- Compare Date and Time in a Session's Time Zone
- DBTIMEZONE and SESSIONTIMEZONE
- Difference between DATE and TIMESTAMP
- INTERVAL Data Types
- Use EXTRACT, TZ_OFFSET and FROM_TZ
- Invoke TO_TIMESTAMP,TO_YMINTERVAL and TO_DSINTERVAL

Retrieve Data Using Sub-queries
- Multiple-Column Subqueries
- Pairwise and Nonpairwise Comparison
- Scalar Subquery Expressions
- Solve problems with Correlated Subqueries
- Update and Delete Rows Using Correlated Subqueries
- The EXISTS and NOT EXISTS operators
- Invoke the WITH clause
- The Recursive WITH clause

Regular Expression Support
- Use the Regular Expressions Functions and Conditions in SQL
- Use Meta Characters with Regular Expressions
- Perform a Basic Search using the REGEXP_LIKE function
- Find patterns using the REGEXP_INSTR function
- Extract Substrings using the REGEXP_SUBSTR function
- Replace Patterns Using the REGEXP_REPLACE function
- Usage of Sub-Expressions with Regular Expression Support
- Implement the REGEXP_COUNT function