

Oracle Database: Introduction to SQL

Duration: 5 Days

What you will learn

Understanding the basic concepts of relational databases ensure refined code by developers. This course helps the participants to write subqueries, combine multiple queries into a single query using SET operators and report aggregated data using group functions. Controlling privileges at the object and system level are also dealt with in detail. This course covers creating indexes and constraints, and altering existing schema objects. Additionally, participants learn how to create and query external tables. In order to query and manipulate data within the database, to use the dictionary views to retrieve metadata and create reports about their schema objects, participants get to understand the advanced features of SQL. Some of the date-time functions available in the Oracle Database are also covered. This course also discusses how to use the regular expression support in SQL.

This course is a combination of Oracle Database: SQL Fundamentals I and Oracle Database: SQL Fundamentals II courses.

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.

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.

Audience

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

Prerequisites

Required Prerequisites

Familiarity with data processing concepts and techniques

Course Objectives

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.

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.

Course Topics

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

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