

# Oracle Database 10g: Introduction to SQL

## What you will learn:

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This course offers students an introduction to Oracle Database 10g database technology. In this class students learn the concepts of relational databases and the powerful SQL programming language. This course provides the essential SQL skills that allow developers to write queries against single and multiple tables, manipulate data in tables, create database objects, and query meta data.

In addition, the advanced features of SQL in order to query and manipulate data within the database are taught. Advanced querying and reporting techniques are explained. Schema objects that are useful for data warehousing and other application areas are discussed in detail. Students learn about manipulating large data sets and storing and retrieving dates according to different time zones.

### Learn to:

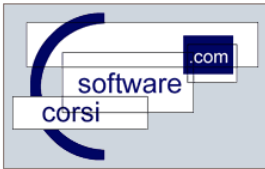
- Use SQL Statements to retrieve data from tables
- Create and manage tables, and other schema objects
- Employ SQL functions to generate and retrieve customized data
- Control privileges at the object and system level
- Run data manipulation statements (DML) to update data in the Oracle Database 10g
- Search data using Advanced Sub queries, and retrieve hierarchical data

### Audience:

Application Developers  
Business Intelligence Developer  
Database Administrators  
End Users  
Forms Developer  
PL/SQL Developer  
Portal Developer

### Prerequisites:

### Required Prerequisites:



Familiarity with Data Processing Concepts and Techniques  
Ability to use a graphical user interface (GUI)

## Course Objectives:

Retrieve row and column data from tables with the SELECT statement.  
Employ SQL functions to generate and retrieve customized data.  
Run data manipulation statements (DML) to update data in the Oracle Database 10g.  
Control user access and manage schema objects  
Search data using advanced sub queries

## Course Topics:

### Introduction

List the Oracle Database 10g Main Features  
An Overview of: components, internet platform, apps server and developer suite  
Describe Relational and Object Relational Database Designs  
Review the System Development Life Cycle  
Define the term Data Models  
Describe different means of Sorting Data  
Show how Multiple Tables can be related  
Describe how SQL Communicates to the Database

### Writing SQL SELECT Statements

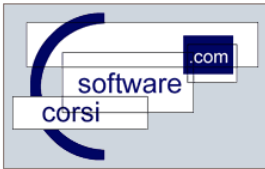
Define projection, selection, and join terminology  
Review the basic SQL SELECT statement syntax  
Select all columns using a wildcard notation from a table  
State simple rules and guidelines for writing SQL statements  
Write a query containing the arithmetic operators  
Create a character expression with the concatenation operator  
Using the iSQL\*Plus Environment  
SQL statements versus iSQL\*Plus commands

### Restricting and Sorting Data

Limit rows using a selection  
Using the WHERE clause to retrieve specific rows  
Using the comparison conditions in the WHERE clause  
Use the LIKE condition to compare literal values  
List the logical conditions AND, OR, NOT  
Describe the rules of precedence for the conditions  
Sort rows with the ORDER BY clause  
Use ampersand substitution in iSQL\*Plus to restrict and sort output at run time

### Using Single-Row Functions to Customize Output

Show the differences between single row and multiple row SQL functions  
Categorize the character functions into case manipulation and character manipulation types



Use the character manipulation functions in the SELECT and WHERE clauses  
Explain and use the DATE and numeric functions  
Use the SYSDATE function to retrieve the current date in the default format  
Introduce the DUAL table as a means to view function results  
List the rules for applying the arithmetic operators on dates  
Use the arithmetic operators with dates in the SELECT clause

## Reporting Aggregated Data Using the Group Functions

Describe and categorize the group functions  
Use the group functions  
Utilize the DISTINCT keyword with the group functions  
Describe how nulls are handled with the group functions  
Create groups of data with the GROUP BY clause  
Group data by more than one column  
Avoid illegal queries with the group functions  
Exclude groups of data with the HAVING clause

## Displaying Data from Multiple Tables

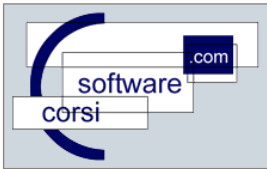
Identify Types of Joins  
Retrieve Records with Natural Joins  
Use Table Aliases to write shorter code and explicitly identify columns from multiple tables  
Create a Join with the USING clause to identify specific columns between tables  
Use the ON clause to specify arbitrary conditions or specify columns to Join  
Create a Three-way join with the ON clause to retrieve information from 3 tables  
List the Types of Outer Joins LEFT, RIGHT, and FULL  
Generating a Cartesian Product

## Using Sub queries to Solve Queries

List the syntax for sub queries in a SELECT statements WHERE clause  
List the guidelines for using sub queries  
Describe the types of sub queries  
Execute single row sub queries and use the group functions in a sub query  
Identify illegal statements with sub queries  
Execute multiple row sub queries  
Analyze how the ANY and ALL operators work in multiple row sub queries

## Using the SET Operators

Use the UNION operator to return all rows from multiple tables and eliminate any duplicate rows  
Use the UNION ALL operator to return all rows from multiple tables  
Describe the INTERSECT operator  
Use the INTERSECT operator  
Explain the MINUS operator  
Use the MINUS operator  
List the SET operator guidelines  
Order results when using the UNION operator



## Manipulating Data

- Write INSERT statements to add rows to a table
- Copy rows from another table
- Create UPDATE statements to change data in a table
- Generate DELETE statements to remove rows from a table
- Use a script to manipulate data
- Save and discard changes to a table through transaction processing
- Show how read consistency works
- Describe the TRUNCATE statement

## Using DDL Statements to Create and Manage Tables

- List the main database objects and describe the naming rules for database objects
- Introduce the schema concept
- Display the basic syntax for creating a table and show the DEFAULT option
- Explain the different types of constraints
- Show resulting exceptions when constraints are violated with DML statements
- Create a table with a sub query
- Describe the ALTER TABLE functionality
- Remove a table with the DROP statement and Rename a table

## Creating Other Schema Objects

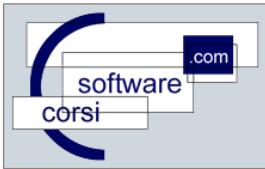
- Categorize simple and complex views and compare them
- Create a view
- Retrieve data from a view
- Explain a read-only view
- List the rules for performing DML on complex views
- Create a sequence
- List the basic rules for when to create and not create an index
- Create a synonym

## Managing Objects with Data Dictionary Views

- Describe the structure of each of the dictionary views
- List the purpose of each of the dictionary views
- Write queries that retrieve information from the dictionary views on the schema objects
- Use the COMMENT command to document objects

## Controlling User Access

- Controlling User Access
- System versus Objects Privileges
- Using Roles to define user groups
- Changing Your Password
- Granting Object Privileges
- Confirming Privileges Granted
- Revoking Object Privileges
- Using Database Links



## Manage Schema Objects

Using the ALTER TABLE statement  
Adding a Column  
Modifying a Column  
Dropping a Column, Set Column UNUSED  
Adding, Enabling and Disabling Constraints  
Creating Function-Based Indexes  
Performing FLASHBACK operations  
External Tables

## Manipulating Large Data Sets

Using the MERGE Statement  
Performing DML with Sub queries  
Performing DML with a RETURNING Clause  
Overview of Multi-table INSERT Statements  
Tracking Changes in DML

## Generating Reports by Grouping Related Data

Overview of GROUP BY Clause  
Overview of Having Clause  
Aggregating data with ROLLUP and CUBE Operators  
Determine subtotal groups using GROUPING Functions  
Compute multiple groupings with GROUPING SETS  
Define levels of aggregation with Composite Columns  
Create combinations with Concatenated Groupings

## Managing Data in Different Time Zones

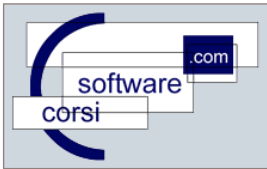
Time Zones  
Using date and time functions  
Identifying TIMESTAMP Data Types  
Differentiating between DATE and TIMESTAMP  
Performing Conversion Operations

## Searching Data Using Advanced Sub queries

Sub query Overview  
Using a Sub query  
Comparing several columns using Multiple-Column Sub queries  
Defining a Data source Using a Sub query in the FROM Clause  
Returning one Value using Scalar Sub query Expressions  
Performing ROW by-row processing with Correlated Sub queries  
Reusing query blocks using the WITH Clause

## Hierarchical Retrieval

Sample Data from the EMPLOYEES Table  
The Tree Structure of Employee data



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Hierarchical Queries  
Ranking Rows with LEVEL  
Formatting Hierarchical Reports Using LEVEL and LPAD  
Pruning Branches with the WHERE and CONNECT BY clauses

## Regular Expression Support

Regular Expression Support Overview  
Describing simple and complex patterns for searching and manipulating data