Database Programming with SQL – Course Description

Overview

This course engages students to implement database models by creating physical databases using SQL. Students will learn basic SQL syntax and the rules for constructing valid SQL statements to generate report-like output. Demonstrations and hands-on practice reinforce the fundamental concepts.

Available Curriculum Languages:

- English, Simplified Chinese, Brazilian Portuguese, Spanish, Indonesian

Duration

- Recommended total course time: 90 hours*
- Professional education credit hours for educators who complete Oracle Academy training: 30

** Course time includes instruction, self-study/homework, practices, projects, and assessment*

Target Audiences

Educators

- College/university faculty who teach computer programming, information communications technology (ICT), or a related subject
- Secondary school teachers who teach computer programming, ICT, or a related subject

Students

- Students who wish to learn the techniques and tools to design, guild and extract information from a database
- Students who possess basic mathematical, logical, and analytical problem-solving skills
- Novice programmers, as well as those at advanced levels, to learning the SQL Programming language to an advanced level

Prerequisites

Required

- Ease with using a computer
- General knowledge of databases and query activity

Suggested

- None

Suggested Next Courses

- Database Programming with PL/SQL

Lesson-by-Lesson Topics and Objectives

Introduction

- Oracle Application Express
- Relational Database Technology
- Anatomy of a SQL Statement

SELECT and WHERE

- Columns, Characters, and Rows
- Limit Rows Selected
- Comparison Operators

WHERE, ORDER BY, and Intro to Functions

- Logical Comparisons and Precedence Rules
- Sorting Rows
- Introduction to Functions

Single Row Functions Part I

- Case and Character Manipulation
- Number Functions
- Date Functions

Single Row Functions Part II

- Conversion Functions
- NULL Functions
- Conditional Expressions

JOINs Part I

- Cross Joins and Natural Joins
- Join Clauses
- Inner versus Outer Joins
- Self-Joins and Hierarchical Queries

JOINs Part II

- Oracle Equijoin and Cartesian Product
- Oracle Nonequijoins and Outer Joins

Group Functions Part I

- Group Functions
- COUNT, DISTINCT, NVL

Group Functions Part II

- Using Group By and Having Clauses
- Using Rollup and Cube Operations, and Grouping Sets
- Using Set Operators

Subqueries

- Fundamentals of Subqueries
- Single-Row Subqueries
- Multiple-Row Subqueries
- Correlated Subqueries

Ensuring Quality Queries Part I

- Ensuring Quality Query Results

DML

- INSERT Statements
- Updating Column Values and Deleting Rows
- DEFAULT Values, MERGE, and Multi-Table Inserts

DDL

- Creating Tables
- Using Data Types
- Modifying a Table

Constraints

- Intro to Constraints; NOT NULL and UNIQUE Constraints
- PRIMARY KEY, FOREIGN KEY, and CHECK Constraints
- Managing Constraints

Views

- Creating Views
- DML Operations and Views
- Managing Views

Sequences and Synonyms

- Working With Sequences
- Indexes and Synonyms

Privileges and Regular Expressions

- Controlling User Access
- Creating and Revoking Object Privileges
- Regular Expressions

TCL

- Database Transactions

Final Project and Exam Review

- Testing
- Final Project Database Creation
- Final Exam Review

Ensuring Quality Queries Part II

- Ensuring Quality Query Results - Advanced Techniques