Database Programming with PL/SQL

Overview

This course of study introduces students to PL/SQL, Oracle’s procedural extension language for SQL and the Oracle relational database. Participants explore the differences between SQL and PL/SQL and explore how PL/SQL is used to extend and automate SQL in administering the Oracle database. Oracle Application Express (APEX) is utilized to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students will create and work with projects which challenge them to enhance the SQL of a database solution for a business or organization.

Duration

- Recommended total course time: 180 Hours*
- Professional education credit hours for educators who complete Oracle Academy training: 60

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

Target Audiences

Educators
- Technical, vocational or 2- or 4-year college and university faculty members who teach computer science, database administration, information communications technology (ICT), or a related subject
- Secondary school teachers who teach computer science, ICT, or a related subject

Students
- Students who wish to learn techniques beyond SQL to execute procedural logic on a database

Prerequisites

Required:
- High level knowledge of database design concepts
- High level knowledge of programming with SQL

Suggested
- Oracle Academy Course – Database Design and Programming with SQL

Suggested Next Courses

- Advanced Programming with PL/SQL
- Oracle Application Express Developer

Lesson-by-Lesson Topics

Fundamentals
- Introduction to PL/SQL
- Benefits of PL/SQL
- Creating PL/SQL blocks

Defining Variables and Datatypes
- Using variables in PL/SQL
- Recognizing PL/SQL lexical units
- Recognizing data types
- Using scalar data types
- Writing PL/SQL executable statements
- Nested blocks and variable scope
- Good programming practices
Using SQL in PL/SQL
- Review of SQL DML
- Retrieving data in PL/SQL
- Manipulating data in PL/SQL
- Using transaction control statements

Program Structures to Control Execution Flow
- Conditional control: IF statements
- Conditional control: CASE statements
- Iterative control: basic loops
- Iterative control: WHILE and FOR loops
- Iterative control: nested loops

Using Cursors and Parameters
- Introduction to explicit cursors
- Using explicit cursor attributes
- Cursor FOR loops
- Cursors with parameters
- Using cursors for UPDATE
- Using multiple cursors

Using Composite Datatypes
- User-defined records
- Indexing tables of records

Exception Handling
- Handling exceptions
- Trapping Oracle server exceptions
- Trapping user-defined exceptions
- Recognizing the scope of exceptions

Using and Managing Procedures
- Creating procedures
- Using parameters in procedures
- Passing parameters

Using and Managing Functions
- Creating functions
- Using functions in SQL statements
- Review of the data dictionary
- Managing procedures and functions
- Review of object privileges
- Using invoker's rights and autonomous transactions

Using and Managing Packages
- Creating packages
- Managing package concepts
- Advanced package concepts

Getting the Best out of Packages
- Persistent state of package variables
- Using Oracle-supplied packages

Improving PL/SQL Performance
- Using dynamic SQL
- Improving PL/SQL performance

Using and Managing Triggers
- Introduction to triggers
- Creating DML triggers, part I
- Creating DML triggers, part II
- Creating DDL and database event triggers
- Managing triggers

Recognizing and Managing Dependencies
• Introduction to dependencies
• Understanding remote dependencies

Using the PL/SQL Compiler
• Using PL/SQL initialization parameters
• Displaying compiler warning messages
• Using conditional compilation
• Hiding your source code

To search and register for events scheduled in your area, visit the Academy events calendar.