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1

Introduction

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Lesson Objectives

After completing this lesson, you should be able to do the following:

- Discuss the goals of the course
- Describe the `HR` database schema that is used in the course
- Identify the available user interface environments that can be used in this course
- Reference the available appendixes, documentation, and other resources

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This lesson gives you a high-level overview of the course and its flow. You learn about the database schema and the tables that the course uses. The course introduces you to components such as SQL, PL/SQL, compilation features and also tools such as SQL Developer used in this course.

Course Objectives

After completing this course, you should be able to do the following:

- Identify the programming extensions that PL/SQL provides to SQL
- Write PL/SQL code to interface with the database
- Design PL/SQL anonymous blocks that execute efficiently
- Use PL/SQL programming constructs and conditional control statements
- Handle run-time errors
- Describe stored procedures and functions

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This course presents the basics of PL/SQL. You learn about PL/SQL syntax, blocks, and programming constructs and also about the advantages of integrating SQL with those constructs. You learn how to write PL/SQL program units and execute them efficiently. In addition, you learn how to use SQL Developer as a development environment for PL/SQL. You also learn how to design reusable program units such as procedures and functions.

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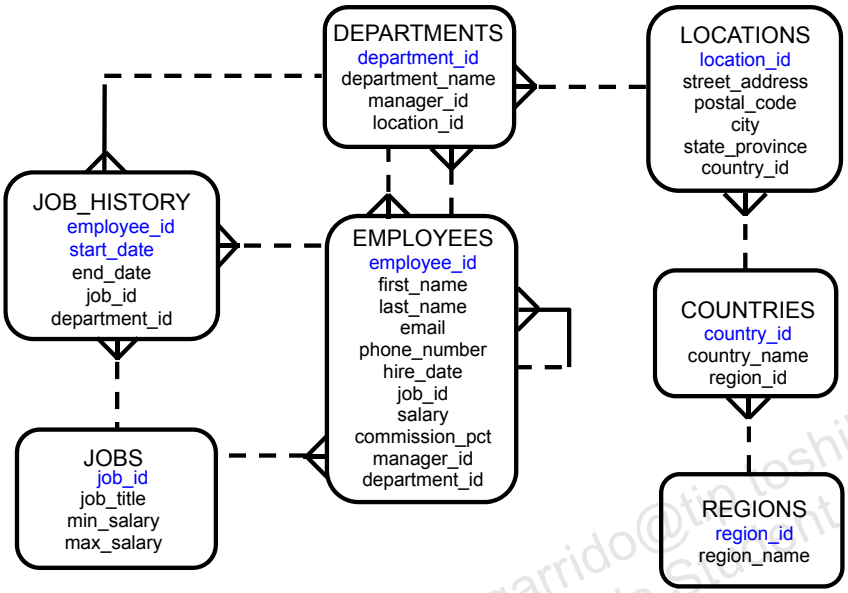
Human Resources (HR) Schema for This Course



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The Human Resources (HR) schema is part of the Oracle Sample Schemas that can be installed in an Oracle database. The practice sessions in this course use data from the HR schema.

Table Descriptions

- REGIONS contains rows that represent a region such as the Americas or Asia.
- COUNTRIES contains rows for countries, each of which is associated with a region.
- LOCATIONS contains the specific address of a specific office, warehouse, or production site of a company in a particular country.
- DEPARTMENTS shows details about the departments in which employees work. Each department may have a relationship representing the department manager in the EMPLOYEES table.
- EMPLOYEES contains details about each employee working for a department. Some employees may not be assigned to any department.
- JOBS contains the job types that can be held by each employee.
- JOB_HISTORY contains the job history of the employees. If an employee changes departments within a job or changes jobs within a department, a new row is inserted into this table with the old job information of the employee.

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Course Agenda

- Day 1:
  1. Introduction
  2. Introduction to PL/SQL
  3. Declaring PL/SQL Variables
  4. Writing Executable Statements
  5. Interacting with Oracle Database Server: SQL Statements in PL/SQL Programs
  6. Writing Control Structures
- Day 2:
  7. Working with Composite Data Types
  8. Using Explicit Cursors
  9. Handling Exceptions
  10. Introducing Stored Procedures and Functions

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Class Account Information

- A cloned `HR` account ID is set up for you.
- Your account ID is `ora41`.
- The password matches your account ID.
- Each machine has its own complete environment, and is assigned the same account.
- The instructor has a separate ID.

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Appendixes and Practices Used in This Course

- Appendix A: Table Descriptions and Data
- Appendix B: Using SQL Developer
- Appendix C: Using SQL*Plus
- Appendix D: Using JDeveloper
- Appendix E: REF Cursors
- Activity Guide: Practices and Solutions

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PL/SQL Development Environments

This course setup provides the following tools for developing PL/SQL code:

- Oracle SQL Developer (used in this course)
- Oracle SQL*Plus
- Oracle JDeveloper IDE

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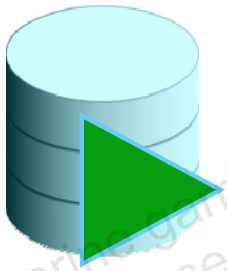
Oracle provides several tools that can be used to write PL/SQL code. Some of the development tools that are available for use in this course:

- **Oracle SQL Developer:** A graphical tool
- **Oracle SQL*Plus:** A window or command-line application
- **Oracle JDeveloper:** A window-based integrated development environment (IDE)

Note: The code and screen examples presented in the course notes were generated from output in the SQL Developer environment.

What Is Oracle SQL Developer?

- Oracle SQL Developer is a free graphical tool that enhances productivity and simplifies database development tasks.
- You can connect to any target Oracle database schema using standard Oracle database authentication.
- You will use SQL Developer in this course.
- Appendix C contains details on using SQL Developer.



SQL Developer

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Oracle SQL Developer is a free graphical tool designed to improve your productivity and simplify the development of everyday database tasks. With just a few clicks, you can easily create and maintain stored procedures, test SQL statements, and view optimizer plans.

SQL Developer, the visual tool for database development, simplifies the following tasks:

- Browsing and managing database objects
- Executing SQL statements and scripts
- Editing and debugging PL/SQL statements
- Creating reports

You can connect to any target Oracle database schema by using standard Oracle database authentication. When you are connected, you can perform operations on objects in the database.

Appendix B

Appendix B of this course provides an introduction on using the SQL Developer interface. Refer to the appendix for information about creating a database connection, interacting with data using SQL and PL/SQL, and more.

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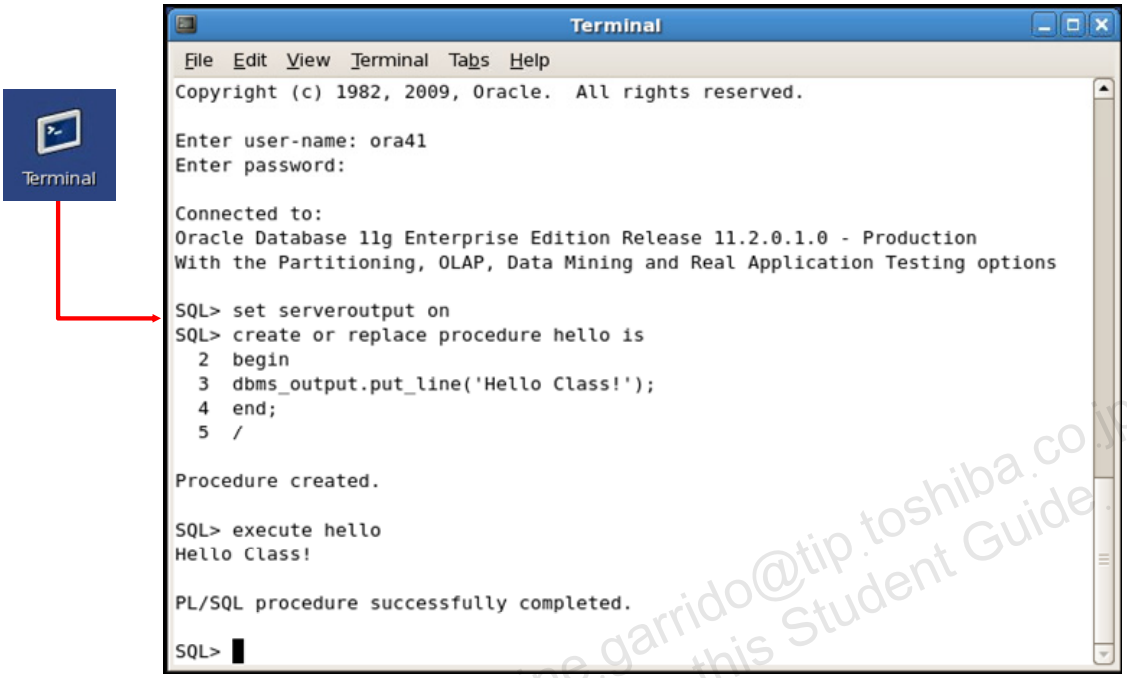
Coding PL/SQL in SQL*Plus



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Oracle SQL*Plus is a command-line interface that enables you to submit SQL statements and PL/SQL blocks for execution and receive the results in an application or a command window.

SQL*Plus is:

- Shipped with the database
- Installed on a client and on the database server system
- Accessed using an icon or the command line

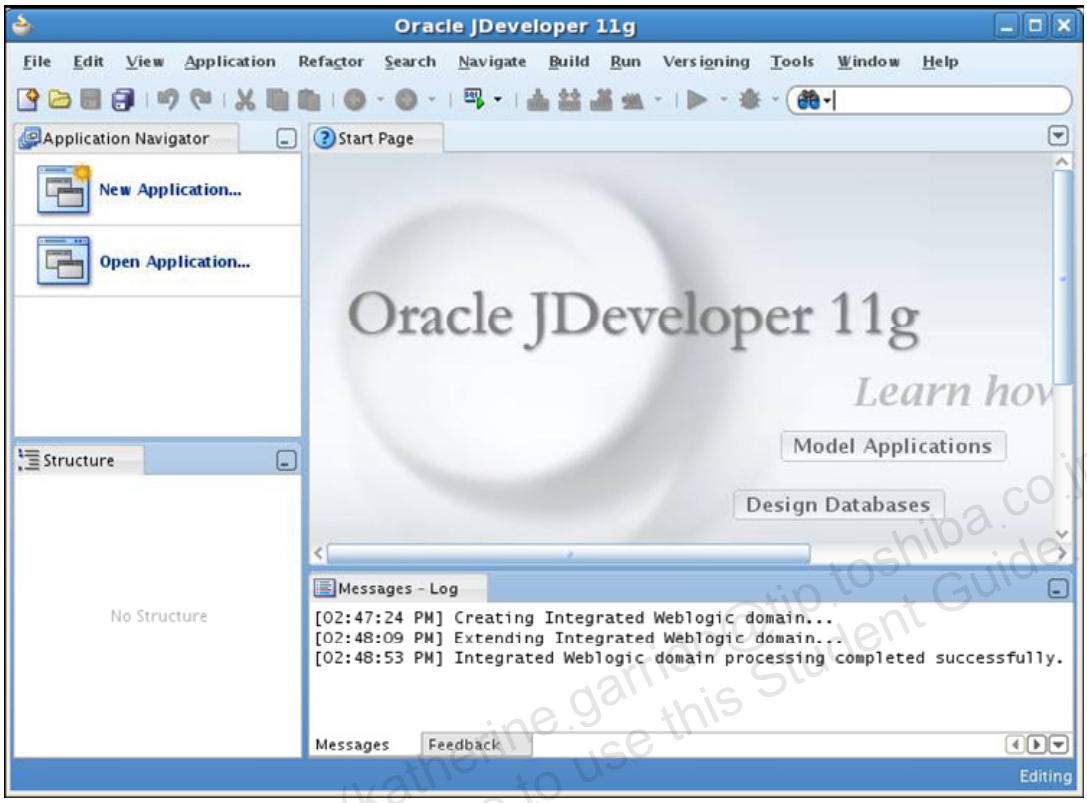
When you code PL/SQL subprograms using SQL*Plus, remember the following:

- You create subprograms by using the `CREATE SQL` statement.
- You execute subprograms by using either an anonymous PL/SQL block or the `EXECUTE` command.
- If you use the `DBMS_OUTPUT` package procedures to print text to the screen, you must first execute the `SET SERVEROUTPUT ON` command in your session.

Note

- To launch SQL*Plus in Linux environment, open a Terminal window and enter the command: `sqlplus`.
- For more information about using SQL*Plus, see Appendix C.

Coding PL/SQL in Oracle JDeveloper



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Oracle JDeveloper allows developers to create, edit, test, and debug PL/SQL code by using a sophisticated GUI. Oracle JDeveloper is a part of Oracle Developer Suite and is also available as a separate product.

When you code PL/SQL in JDeveloper, consider the following:

- You first create a database connection to enable JDeveloper to access a database schema owner for the subprograms.
- You can then use the JDeveloper context menus on the Database connection to create a new subprogram construct using the built-in JDeveloper Code Editor.
- You invoke a subprogram by using a Run command on the context menu for the named subprogram. The output appears in the JDeveloper Log Message window, as shown in the lower portion of the screenshot.

Note

- JDeveloper provides color-coding syntax in the JDeveloper Code Editor and is sensitive to PL/SQL language constructs and statements.
- For more information about using JDeveloper, see Appendix D.

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Oracle SQL and PL/SQL Documentation

- *Oracle Database New Features Guide*
- *Oracle Database PL/SQL Language Reference*
- *Oracle Database Reference*
- *Oracle Database SQL Language Reference*
- *Oracle Database Concepts*
- *Oracle Database PL/SQL Packages and Types Reference*
- *Oracle Database Advanced Application Developer's Guide 11g*
- *Oracle Database SQL Developer User's Guide Release 3.1*

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Navigate to http://www.oracle.com/pls/db112/homepage to access the Oracle Database 11*g* documentation library.

Navigate to http://www.oracle.com/pls/db102/homepage to access the Oracle Database 10*g* documentation library.

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Summary

In this lesson, you should have learned how to:

- Discuss the goals of the course
- Describe the `HR` database schema that is used in the course
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- Reference the available appendixes, documentation, and other resources

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Practice 1 Overview: Getting Started

This practice covers the following topics:

- Starting SQL Developer
- Creating a new database connection
- Browsing the `HR` schema tables
- Setting a SQL Developer preference

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In this practice, you use SQL Developer to execute SQL statements to examine data in the `HR` schema. You also create a simple anonymous block.

Note: All written practices use SQL Developer as the development environment. Although it is recommended that you use SQL Developer, you can also use the SQL*Plus or JDeveloper environments that are available in this course.