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Database Programming with SQL

1-1

Oracle Application Express

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Objectives

- This lesson covers the following objectives:
 - Distinguish between application software and system software and give an example of each
 - Log-in to the Oracle Application Express practice environment
 - Execute a simple query to retrieve information from the Database
 - Apply the rules of SQL to display all columns and a subset of columns specified by criteria

Purpose

- Every day, in one way or another, we come in contact with computer applications
- If you checked your email today, it was probably done using an application
- If you bought an item at a grocery store, the clerk scanned the item using an application that calculated your bill and updated the store inventory
- In this course, you will learn the syntax of SQL using the application called Oracle Application Express

Application Programs

- Although computers have been around for a very long time (possibly before you were born), their use for business and personal computing didn't take place until application software programs were developed
- Application programs allowed the end user—people like you and me—to be able to buy fully developed, ready-to-use programs
- It was no longer necessary to know how the program worked, just that it did work and accomplished what we wanted it to do

Application Programs

- Application program software is different from system software
- System software consists of low-level programs designed to interact with the computer hardware
- Operating systems, compilers, and system utilities are examples of system software
- In contrast, application software includes programs for word processing, databases, gaming, email, and graphics

Application software: Program that gives computer instructions that provide the user with tools to accomplish a task.

System software: Programs that interact with the computer hardware.

Application Programs

- Yahoo.com uses the Oracle database to store data
- Rather than having everyone who wants to search the database or retrieve email learn SQL, an application has all of the SQL (and other coding languages) pre-programmed into it
- With a few mouse clicks, users have access to all of the information they need

Using Applications

- An application is like a car
- To drive a car, you need to know enough to make it work
- It has a friendly "shell" to hide all the things that you don't need to know, such as how the transmission works or how fuel like petrol or diesel is used to power the engine
- Could you ever get your driver's license if you had to demonstrate an understanding of every system—electrical, powertrain, hydraulic, fuel, etc.—used to make the car run?

Oracle Application Express

- In this course, you will use Oracle Application Express
- This application enables many developers to build and access applications as if they were running in separate databases
- With built-in features such as design themes, navigational controls, form handlers, and flexible reports, Oracle Application Express accelerates the application development process

Oracle Application Express

- Two components in Oracle Application Express are:
 - SQL Workshop
 - Application Builder
- To learn SQL, you will use the SQL Workshop component
- To design an application, you use Application Builder

Oracle Application Express

- Oracle Application Express (APEX) is the tool that we will use to allow you to build tables and retrieve information from an Oracle database
- When retrieving information from a database, you will often have to find a subset of the data based on specific search criteria
- Becoming familiar with SQL will help you more quickly find the information that you need

iAcademy APEX Learner Guide is located in Section 0, Course Resources of the Database Programming with SQL Course. This document will help you become familiar with how to use Oracle Application Express and each of its components from an end user's perspective.

Oracle Application Express

- Oracle Application Express (APEX) accounts are supplied without tables or data
- To obtain the script file go to the Section 0 – Course Resources of the Learner – Learning Path for the course and select the desired script.
- On running the Script, the tables and data used throughout the course, will be added to your schema
- For more information on using APEX see the iAcademy APEX Learner and Instructor Guides

Basic SELECT Statement

- The SELECT * command returns all the rows in a table
- The syntax is:

```
SELECT *  
FROM <table name>;
```

- For example:

```
SELECT *  
FROM employees;
```

Syntax: The rules governing the formation of statements in a programming language.

Students should enter the above example into APEX to see the results output.

SELECT Statement with a Condition

- To return a subset of the data, modify the SELECT statement
- The syntax is:

```
SELECT <column name 1, column name 2, etc.>  
FROM <table name>  
WHERE <condition>;
```

- For example:

```
SELECT first_name, last_name, job_id  
FROM employees  
WHERE job_id = 'SA_REP';
```

The <condition> starts with the word WHERE followed by a <column name> and a Comparison Operator (=, >, <, etc.) followed by a value or IS NULL, IS NOT NULL.

Subset: a part of a larger group of related things.

Comparison Operator: used in conditions that compare one expression with another expression or value.

The syntax of SELECT statements and operators are discussed in more detail in subsequent lessons.

Correcting errors

- When entering SQL commands, it is important to use the correct spelling, otherwise you will get an error message
- For example (SELECT: spelling incorrect):

```
SELCT *  
FROM employees;
```

- Would result in the error message:

```
ORA-00900: invalid SQL statement
```

- To rectify, simply correct the spelling and run again

When learning to write SQL statements, it is normal to make mistakes in the beginning. With practice and experience, you make less mistakes, and are able to rectify errors more easily.

Correcting errors

- It is also important to use the correct names and spelling for columns and tables
- For example (employees table name - spelling incorrect):

```
SELECT *  
FROM employee;
```

– Would result in the error message:



ORA-00942: table or view does not exist

- To rectify, simply correct the spelling and run again

Your teacher will show you the tables that have been created in your database schema using the Object Browser.

Correcting errors

- For example (first_name column - entered incorrectly):

```
SELECT name  
FROM employees;
```

- Would result in the error message:



ORA-00904: "NAME": invalid identifier

- To rectify, simply enter the correct column name and run again

Terminology

- Key terms used in this lesson included:
 - Application software
 - System software
 - Oracle Application Express
 - Syntax
 - Subset
 - Comparison Operator

Summary

- In this lesson, you should have learned how to:
 - Distinguish between application software and system software and give an example of each
 - Log-in to the Oracle Application Express practice environment
 - Execute a simple query to retrieve information from the Database
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