

Chapter 2 Solutions

Review Questions

1. *What is a data dictionary?* A collection of objects the DBMS manages to maintain information about the database, such as table names, column names, and column data types. This information is often referred as metadata.
2. *What are the two required clauses for a SELECT statement?* SELECT and FROM
3. *What is the purpose of the SELECT statement?* It's used to retrieve data from database tables.
4. *What does the use of an asterisk (*) in the SELECT clause of a SELECT statement represent?* All columns in the referenced table
5. *What is the purpose of a column alias?* Provides another name for a column that's displayed as the column heading in the output
6. *How do you indicate that a column alias should be used?* Include the AS keyword followed by the alias, or list the alias immediately after the column name without a separating comma.
7. *When is it appropriate to use a column alias?* To provide a more descriptive column heading
8. *What are the guidelines to keep in mind when using a column alias?* If the column alias includes a blank space or special symbols, or should retain the specified letter case, it must be enclosed in quotation marks.
9. *How can you concatenate columns in a query?* Separate the column names with two vertical bars (||) rather than a comma.
10. *What is a NULL value?* A NULL value indicates an absence of value. If no value was placed in a field of a row, the field value is empty or NULL.

Multiple Choice

1. c
2. d
3. d
4. b
5. b
6. c
7. c
8. c
9. d
10. d
11. a
12. c
13. d

14. d

15. c

16. a

17. a

18. b

19. d

20. b

Hands-On Assignments

1.

```
SELECT *  
FROM books;
```

2.

```
SELECT title  
FROM books;
```

3.

```
SELECT title, pubdate "Publication Date"  
FROM books;
```

4.

```
SELECT customer#, city, state  
FROM customers;
```

5.

```
SELECT name, contact "Contact Person", phone  
FROM publisher;
```

6.

```
SELECT DISTINCT category  
FROM books;
```

or

```
SELECT UNIQUE category  
FROM books;
```

7.

```
SELECT DISTINCT customer#  
FROM orders;
```

or

```
SELECT UNIQUE customer#  
FROM orders;
```

8.

```
SELECT category, title  
FROM books;
```

9.

```
SELECT lname || ', ' || fname  
FROM author;
```

10.

```
SELECT order#, item#, isbn, quantity, paideach, quantity*paideach "Item Total"  
FROM orderitems;
```

Advanced Challenge

1.

```
SELECT lastname || ', ' || firstname "Name", address, city || ', ' || state "Location", zip  
FROM customers;
```

2.

```
SELECT title, (retail-cost)/cost*100 "Profit %"  
FROM books;
```

Case Study: *City Jail*

Resumes in Chapter 3.

Chapter 2

Basic SQL SELECT Statements

At a Glance

Instructor's Notes

- ◆ *Chapter Overview*
- ◆ *Chapter Objectives*
- ◆ *Instructor Notes*
- ◆ *Troubleshooting Tips*
- ◆ *Quick Quizzes*
- ◆ *Discussion Questions*
- ◆ *Key Terms*

Chapter Overview

The purpose of this chapter is to learn the basic SELECT statement used to retrieve data from a database table. The students will learn to use the SELECT clause to retrieve all columns, one column, and multiple columns from a table specified in the FROM clause. In addition, students learn how to perform simple arithmetic operations and concatenation in the SELECT clause.

Students will need to execute the JLDB_Build.sql script file. Each student should be assigned a different user name so the generated tables will be located in a different schema for each student. Each student must be granted sufficient privileges to execute statements to create tables and execute queries.

Chapter Objectives

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

- ◆ Identify keywords, mandatory clauses, and optional clauses in a SELECT statement
- ◆ Select and view all columns of a table
- ◆ Select and view one column of a table
- ◆ Display multiple columns of a table
- ◆ Use a column alias to clarify the contents of a particular column
- ◆ Perform basic arithmetic operations in the SELECT clause
- ◆ Remove duplicate lists using either the DISTINCT or UNIQUE keyword
- ◆ Use concatenation to combine fields, literals, and other data

Instructor Notes

SELECT Statement Syntax

Every SELECT statement is required to have a SELECT and FROM clause. Each statement clause begins with a keyword. The SELECT clause is used to identify the column or columns to be retrieved from a table. The name of the table is identified in the FROM clause. The structure of the SELECT statement is depicted in Figure 2-2. This chapter only addresses the SELECT and FROM clauses. Later chapters will address all of the remaining clauses.

```
SELECT  [DISTINCT | UNIQUE] (*, columnname [ AS alias], ...)  
FROM    tablename  
[WHERE  condition]  
[GROUP BY group_by_expression]  
[HAVING group_condition]  
[ORDER BY columnname];
```

Quick Quiz

1. How do you retrieve all columns from a table without listing the column names?

ANSWER: Use an asterisk in the SELECT clause

2. How do you separate multiple columns listed in a SELECT statement?

ANSWER: Use commas

3. Are keywords case sensitive?

ANSWER: No

4. Are column names case sensitive?

ANSWER: No

5. Where do you identify the table containing the specified columns?

ANSWER: In the FROM clause

Troubleshooting Tip

Demonstrate that SQL is not case sensitive in terms of the command keywords or column/table names when a command is executed. Also demonstrate the various methods of executing an SQL statement.

Troubleshooting Tip

Identify the two different Oracle SQL tool interfaces: the client SQL*Plus and SQL Developer. Appendix B introduces these interfaces.

Selecting All Data in a Table

The asterisk is used to represent all columns in a table. The asterisk is not a wildcard in the traditional sense. It has a specific use in SQL commands. If the asterisk is used in the SELECT clause, the clause can contain no other column references.

Selecting One Column from a Table

To select a specific column from a table, list the name of the column after the SELECT keyword. Note that the column name can be entered in uppercase, lowercase, or mixed case. However, the column name is displayed in uppercase characters by default.

Selecting Multiple Columns from a Table

If more than one column name is specified in the SELECT clause of the SELECT statement, they must be separated by a comma. Spaces between the column names and commas will not affect the results of the statement.

Troubleshooting Tip

For practice, have the students retrieve data from various tables. Start with selecting all of the columns from a table, then just one, and then several columns.

Operations within the SELECT Statement

Using Column Aliases

A column alias can be used to give a more descriptive heading to a column of data. It should be listed directly after the column name, without a comma. If the alias consists of spaces or special symbols, or to retain the case, enclose the alias in double-quotation marks. Otherwise, simply list the column alias. The optional keyword AS can be used to denote the column alias.

Using Arithmetic Operations

Any basic arithmetic operation can be performed, with the exception of exponential operations. Oracle11g follows the standard order of operations, which can be overridden using parentheses. The operation can be specified in the column list just like a column name. However, a column alias should be assigned or the column heading will display the express in the output.

Troubleshooting Tip

For practice, have the students calculate the profit, profit margin %, etc. and include a column alias.

Using DISTINCT and UNIQUE

To suppress duplicate rows in the output, enter the DISTINCT or UNIQUE keyword after the SELECT command. The keyword will apply to all columns listed in the SELECT clause, even though it is entered only once in the clause.

Troubleshooting Tip

Select a couple of columns from the BOOKS table and include the DISTINCT or UNIQUE keyword. Demonstrate that unless the entire row being displayed is identical, the same category name will be listed several times.

Creating Concatenation

Columns can be combined through the use of the concatenation operator. However, to include spaces or string literals, they must be enclosed in single quotation marks. Commas cannot be used in front of the concatenation operator or an error message will be returned.

Quick Quiz

1. What is required if a column alias contains a blank space?

ANSWER: The alias must be enclosed in double quotation marks.

2. What symbol is used for concatenation?

ANSWER: Two vertical bars, ||

3. What arithmetic operations can be used in a SELECT statement?

ANSWER: *, /, +, -

4. How can Oracle11g identify a column alias without the AS keyword?

ANSWER: There is no comma separating the column name from its alias.

5. Why use a column alias?

ANSWER: To provide a more descriptive column heading

Discussion Questions

1. Discuss the link(s) between the SELECT and FROM clauses.

2. Discuss case sensitivity and how it relates to the SELECT statement.

Key Terms

character field — A field composed of nonnumeric data. This field will not display a heading longer than the width of the data stored in the field.

clause — Each section of a statement that begins with a keyword (SELECT clause, FROM clause, WHERE clause, etc.).

column alias — Another name substituted for a column name. A column alias is created in a query and displayed in the results.

concatenation — The combining the contents of two or more columns or character strings. Two vertical bars, or pipes (||), instruct Oracle 11g to concatenate the output of a query.

keywords — Words used in a SQL query that have a predefined meaning to Oracle9i. Common keywords include SELECT, FROM, and WHERE.

numeric column — A column composed of only numeric data. In output, the column will display the entire column heading, regardless of the width of the field. (Also known as a *numeric field*.)

projection — Choosing specific column(s) in a SELECT statement.

query — A question posed to the database.

relational database management system (RDBMS) — A software program used to create a relational database. It has functions that allow users to enter, manipulate, and retrieve data.

string literal — Alphanumeric data, enclosed within single quotation marks, that instructs the software to interpret “literally” exactly what has been entered and to show it in the resulting display.

syntax — The basic structure, pattern, or rules, for an SQL statement. For an SQL statement to execute properly, the correct syntax must be used.