# Additional Practices and Solutions

Additional Practices and Solutions: Overview

Practices Overview

In these practices, you will be working on extra exercises that are based on the following topics:

Basic SQL SELECT statement

Basic SQL Developer commands

SQL functions

Practice 0-1: Additional Practice

Overview

In this practice, exercises have been designed to be worked on after you have discussed the following topics: basic SQL SELECT statement, basic SQL Developer commands, and SQL functions.

Tasks

The HR department needs to find data for all the clerks who were hired after 2010.

The HR department needs a report of employees who earn a commission. Show the last name, job, salary, and commission of these employees. Sort the data by salary in descending order.

For budgeting purposes, the HR department needs a report on projected raises. The report should display those employees who have no commission, but who have a 10% raise in salary (round off the salaries).

Create a report of employees and their duration of employment. Show the last names of all the employees together with the number of years and the number of completed months that they have been employed. Order the report by the duration of their employment. The employee who has been employed the longest should appear at the top of the list.

Show those employees who have a last name starting with the letters “K,” “L,” or “M.”

Create a report that displays all employees, and indicate whether they receive a commission by using the words *Yes* or *No*. Use the DECODE expression in your query.

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statements, basic SQL Developer commands, SQL functions, joins, and group functions.

Create a report that displays the department name, location ID, last name, job ID, and salary of those employees who work in a specific location. Prompt the user for a location. For example, if the user enters 1800, results are as follows:

Find the number of employees who have a last name that ends with the letter “n.” Create two possible solutions.

Create a report that shows the name, location, and number of employees for each department. Make sure that the report also includes department\_IDs without employees.

The HR department needs to find the job IDs in departments 10 and 20. Create a report to display the job IDs for those departments.

Create a report that displays the jobs that are found in the Administration and Executive departments. Also display the number of employees for these jobs. Show the job with the highest number of employees first.

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statements, basic SQL Developer commands, SQL functions, joins, group functions, and subqueries.

Show all the employees who were hired in the first half of the month (before the 16th of the month, irrespective of the year).

Create a report that displays the following for all employees: last name, salary, and salary expressed in terms of thousands of dollars.

Show all the employees who have managers with a salary higher than $15,000. Show the following data: employee name, manager name, manager salary, and salary grade of the manager.

Show the department number, department name, number of employees, and average salary of all the departments, together with the employee names, salaries, and jobs of the employees working in each department.

Create a report to display the department number and lowest salary of the department with the highest average salary.

Create a report that displays departments where no sales representatives work. Include the department number, department name, manager ID, and location in the output.

Create the following statistical reports for the HR department. Include the department number, department name, and the number of employees working in each department that:

Employs fewer than three employees:

Has the highest number of employees:

Has the lowest number of employees:

Create a report that displays the employee number, last name, salary, department number, and the average salary in their department for all employees.

Create an anniversary overview based on the hire date of the employees. Sort the anniversaries in ascending order.

Solution 0-1: Additional Practice

Overview

Solutions to Additional Practice 1-1 are given as follows.

Tasks

The HR department needs to find data for all the clerks who were hired after 2010.

The HR department needs a report of employees who earn a commission. Show the last name, job, salary, and commission of these employees. Sort the data by salary in descending order.

For budgeting purposes, the HR department needs a report on projected raises. The report should display those employees who do not get a commission but who have a 10% raise in salary (round off the salaries).

Create a report of employees and the duration of their employment. Show the last names of all employees, together with the number of years and the number of completed months that they have been employed. Order the report by the duration of their employment. The employee who has been employed the longest should appear at the top of the list.

Show those employees who have a last name that starts with the letters “K,” “L,” or “M.”

Create a report that displays all employees, and indicate whether they receive a commission by using the words *Yes* or *No*. Use the DECODE expression in your query.

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statement, basic SQL Developer commands, SQL functions, joins, and group functions.

Create a report that displays the department name, location ID, last name, job ID, and salary of those employees who work in a specific location. Prompt the user for a location.

Enter 1800 for location\_id when prompted.

Find the number of employees who have a last name that ends with the letter “n.” Create two possible solutions.

Create a report that shows the name, location, and number of employees for each department. Make sure that the report also includes department\_IDs without employees.

The HR department needs to find the job IDs in departments 10 and 20. Create a report to display the job IDs for these departments.

Create a report that displays the jobs that are found in the Administration and Executive departments. Also display the number of employees for these jobs. Show the job with the highest number of employees first.

These exercises can be used for extra practice after you have discussed the following topics: basic SQL SELECT statements, basic SQL Developer commands, SQL functions, joins, group functions, and subqueries.

Show all employees who were hired in the first half of the month (before the 16th of the month, irrespective of the year).

Create a report that displays the following for all employees: last name, salary, and salary expressed in terms of thousands of dollars.

Show all employees who have managers with a salary higher than $15,000. Show the following data: employee name, manager name, manager salary, and salary grade of the manager.

Show the department number, department name, number of employees, and average salary of all departments, together with the employee names, salaries, and jobs of the employees working in each department.

Create a report to display the department number and lowest salary of the department with the highest average salary.

Create a report that displays the departments where no sales representatives work. Include the department number, department name, manager ID, and location in the output.

Create the following statistical reports for the HR department. Include the department number, department name, and the number of employees working in each department that:

Employs fewer than three employees:

Has the highest number of employees:

Has the lowest number of employees:

Create a report that displays the employee number, last name, salary, department number, and the average salary in their department for all employees.

Create an anniversary overview based on the hire date of employees. Sort the anniversaries in ascending order.

Case Study: Online Book Store

Overview

In this case study, you build a set of database tables for an online book store (E-Commerce Shopping Cart). After you create the tables, you insert, update, and delete records in the book store database and generate a report. The database contains only the essential tables.

The following is a diagram of the table and columns for the online book store application:

**Note:** If you want to build the tables, you can execute the commands in the Online\_Book\_Store\_Create\_Table.sql script in SQL Developer. If you want to drop the tables, you can execute the commands in the Online\_Book\_Store\_Drop\_Tables.sql script in SQL Developer. Then you can execute the commands in the

<<Online\_Book\_Store\_Populate.sql>> script in SQL Developer to create and populate the tables.

All the three SQL scripts are present in the /home/oracle/labs/sql1\_oracle/labs

folder.

If you use the Online\_Book\_Store\_Create\_Table.sql script to build the tables, start with step 2.

If you use the Online\_Book\_Store\_Drop\_Tables.sql script to remove the tables, start with step 1.

If you use the Online\_Book\_Store\_Populate.sql script to build and populate the tables, start with step 6.

Practice 0-2

Overview

In this practice, you create the tables based on the following table instance charts. Select the appropriate data types and be sure to add integrity constraints.

Tasks

Table Details

Table Name: AUTHOR

Table Name: BOOKS

Table Name: CUSTOMER

CREDIT\_CARD\_DETAILS

Table Name: ORDER\_DETAILS

Table Name: PUBLISHER

Table Name: PURCHASE\_HISTORY

Table Name: SHIPPING\_TYPE

Table Name: SHOPPING\_CART

Add additional Referential Integrity constraints to the tables created.

Verify that the tables were created properly by checking in the Connections Navigator in SQL Developer.

Create a sequence to uniquely identify each row in the ORDER\_DETAILS table.

Start with 100; do not allow caching of the values. Name the sequence

ORDER\_ID\_SEQ.

Verify the existence of the sequences in the Connections Navigator in SQL Developer.

Add data to the tables. Create a script for each set of data to be added. Add data to the following tables:

AUTHOR

PUBLISHER

SHIPPING\_TYPE

CREDIT\_CARD\_DETAILS

CUSTOMER

BOOKS

SHOPPING\_CART

ORDER\_DETAILS

PURCHASE\_HISTORY

Create a view named CUSTOMER\_DETAILS to show the Customer Name, Customer Address, and the details of the order placed by the customer. Order the results by Customer ID.

Make changes to the data in the tables.

Add a new book detail. Verify if the author detail for the book is available in the AUTHOR

table. If not, make an entry in the AUTHOR table.

Enter a shopping cart detail for the book details that you just entered in 7(a).

Create a report that contains each customer’s history of purchasing books. Be sure to include the customer name, customer ID, book ID, date of purchase, and shopping cart ID. Save the commands that generate the report in a script file named lab\_apcs\_8.sql.

**Note:** Your results may be different.

Solution 0-3

Overview

The solution to Practice 1-2 is given as follows.

Tasks

Table Details

AUTHOR

BOOKS

CUSTOMER

CREDIT\_CARD\_DETAILS

ORDER\_DETAILS

PUBLISHER

PURCHASE\_HISTORY

SHIPPING\_TYPE

SHOPPING \_CART

Adding Additional Referential Integrity Constraints to the Table Created

Include a Foreign Key constraint in the CUSTOMER table.

Include a Foreign Key constraint in the BOOKS table.

Include a Foreign Key constraint in the ORDER\_DETAILS table.

Include a Foreign Key constraint in the PURCHASE\_HISTORY table.

Include a Foreign Key constraint in the SHOPPING\_CART table.

Verify that the tables were created properly by checking in the Connections Navigator in SQL Developer. In the Connections Navigator, expand Connections > myconnection > Tables.

Create a sequence to uniquely identify each row in the ORDER\_DETAILS table.

Start with 100; do not allow caching of the values. Name the sequence ORDER\_ID\_SEQ.

Verify the existence of the sequences in the Connections Navigator in SQL Developer.

In the Connections Navigator, assuming that the myconnection node is expanded, expand Sequences.

Alternatively, you can also query the user\_sequences data dictionary view:

Add data to the tables.

AUTHOR

PUBLISHER

SHIPPING \_TYPE

CREDIT\_CARD\_DETAILS

CUSTOMER

BOOKS

SHOPPING\_CART

ORDER \_DETAILS

PURCHASE\_HISTORY

Create a view named CUSTOMER\_DETAILS to show the Customer Name, Customer Address, and details of the order placed by the customer. Order the results by Customer ID.

Make changes to the data in the tables.

Add a new book detail. Verify if the author detail for the book is available in the AUTHOR

table. If not, make an entry in the AUTHOR table.

Enter a shopping cart detail for the book details that you just entered in 7(a).

Create a report that contains each customer’s history of purchasing books. Be sure to include the customer name, customer ID, book ID, date of purchase, and shopping cart ID. Save the commands that generate the report in a script file named lab\_apcs\_8.sql.

**Note:** Your results may be different.

Additional Practices and Solutions: Overview

Practices Overview

You will be working on extra practices that are based on the following topics:

Data manipulation language (DML) statements

Data definition language (DDL) statements

Datetime functions

Advanced subqueries

Practice 2-4: Additional Practices

Overview

The following exercises can be used for extra practice after you have discussed DML and DDL statements in the lessons titled “Managing Schema Objects” and “Manipulating Data Using Advanced Queries.”

**Note:** Run the lab\_ap\_cre\_special\_sal.sql, lab\_ap\_cre\_sal\_history.sql, and lab\_ap\_cre\_mgr\_history.sql scripts in the labs folder to create the SPECIAL\_SAL, SAL\_HISTORY, and MGR\_HISTORY tables.

Tasks

The Human Resources department wants to get a list of underpaid employees, salary history of employees, and salary history of managers based on an industry salary survey. So they have asked you to do the following:

Write a statement to do the following:

Retrieve details such as the employee ID, hire date, salary, and manager ID of those employees whose employee ID is more than or equal to 200 from the EMPLOYEES table.

If the salary is less than $5,000, insert details such as the employee ID and salary into the SPECIAL\_SAL table.

Insert details such as the employee ID, hire date, and salary into the SAL\_HISTORY

table.

Insert details such as the employee ID, manager ID, and salary into the

MGR\_HISTORY table.

Query the SPECIAL\_SAL, SAL\_HISTORY, and MGR\_HISTORY tables to view the inserted records.

Nita, the DBA, needs you to create a table that has a primary key constraint, but she wants the index to have a different name than the constraint. Create the LOCATIONS\_NAMED\_INDEX table based on the following table instance chart. Name the index for the PRIMARY KEY column as LOCATIONS\_PK\_IDX.

Query the USER\_INDEXES table to display the INDEX\_NAME for the

LOCATIONS\_NAMED\_INDEX table.

The following exercises can be used for extra practice after you have discussed datetime functions.

You work for a global company and the new vice president of operations wants to know the different time zones of all the company branches. The new vice president has requested the following information:

Alter the session to set the NLS\_DATE\_FORMAT to DD-MON-YYYY HH24:MI:SS. 6.

Write queries to display the time zone offsets (TZ\_OFFSET) for the following time zones:

Australia/Sydney

Chile/Easter Island

**Note:** The results are based on a different date, and in some cases, they will not match the actual results that the students get. In addition, the time zone offset of the various countries may differ, based on daylight saving time.

Alter the session to set the TIME\_ZONE parameter value to the time zone offset of Australia/Sydney.

Display SYSDATE, CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP

for this session.

**Note:** The output may be different based on the date when the command is executed.

Alter the session to set the TIME\_ZONE parameter value to the time zone offset of Chile/Easter Island.

**Note:** The results of the preceding question are based on a different date, and in some cases, they will not match the actual results that the students get. In addition, the time zone offset of the various countries may differ, based on daylight saving time.

Display SYSDATE, CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP

for this session.

**Note:** The output may be different based on the date when the command is executed.

Alter the session to set NLS\_DATE\_FORMAT to DD-MON-YYYY.

Note

Observe in the preceding question that CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP are all sensitive to the session time zone. Observe that SYSDATE is not sensitive to the session time zone.

The Human Resources department wants a list of employees who are up for review in January, so the department has requested you to do the following:

Write a query to display the last names, month of the date of hire, and hire date of those employees who have been hired in the month of January, irrespective of the year of hire.

The following exercises can be used for extra practice after you have discussed advanced subqueries.

The CEO needs a report on the top three earners in the company for profit sharing. You are responsible to provide the CEO with a list. Write a query to display the top three earners in the EMPLOYEES table. Display their last names and salaries.

The benefits for the state of California have been changed based on a local ordinance. So the benefits representative has asked you to compile a list of the people who are affected. Write a query to display the employee ID and last names of the employees who work in the state of California.

**Hint:** Use scalar subqueries.

…

Nita, the DBA, wants to remove old information from the database. One of the things she thinks is unnecessary is the old employment records. She has asked you to do the following:

Write a query to delete the oldest JOB\_HISTORY row of an employee by looking up the JOB\_HISTORY table for the MIN(START\_DATE) for the employee. Delete the records of *only* those employees who have changed at least two jobs.

**Hint:** Use a correlated DELETE command.

The vice president of Human Resources needs the complete employment records for the annual employee recognition banquet speech. The vice president makes a quick phone call to stop you from following the DBA’s orders.

Roll back the transaction.

The sluggish economy is forcing management to take cost-reduction actions. The CEO wants to review the highest-paid jobs in the company. You are responsible to provide the CEO with a list based on the following specifications:

Write a query to display the job IDs of those jobs whose maximum salary is above half the maximum salary in the entire company. Use the WITH clause to write this query. Name the query MAX\_SAL\_CALC.

Additional Practices Solutions

Solutions

The following exercises can be used for extra practice after you have discussed DML and DDL statements in the lessons titled “Managing Schema Objects” and “Manipulating Data Using Advanced Queries.”

**Note:** Run the lab\_ap\_cre\_special\_sal.sql, lab\_ap\_cre\_sal\_history.sql, and lab\_ap\_cre\_mgr\_history.sql scripts in the labs folder to create the SPECIAL\_SAL, SAL\_HISTORY, and MGR\_HISTORY tables

The Human Resources department wants to get a list of underpaid employees, salary history of employees, and salary history of managers based on an industry salary survey. So, the department has asked you to do the following:

Write a statement to do the following:

Retrieve details such as the employee ID, hire date, salary, and manager ID of those employees whose employee ID is more than or equal to 200 from the EMPLOYEES table.

If the salary is less than $5,000, insert details such as the employee ID and salary into the SPECIAL\_SAL table.

Insert details such as the employee ID, hire date, and salary into the SAL\_HISTORY table.

Insert details such as the employee ID, manager ID, and salary into the

MGR\_HISTORY table.

Query the SPECIAL\_SAL, SAL\_HISTORY, and the MGR\_HISTORY tables to view the inserted records.

Nita, the DBA, needs you to create a table that has a primary key constraint, but she wants the index to have a different name than the constraint. Create the LOCATIONS\_NAMED\_INDEX table based on the following table instance chart. Name the index for the PRIMARY KEY column as LOCATIONS\_PK\_IDX.

Query the USER\_INDEXES table to display the INDEX\_NAME for the

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**Note:** The results are based on a different date, and in some cases, they will not match the actual results that the students get. In addition, the time zone offset of the various countries may differ, based on daylight saving time.

Alter the session to set the TIME\_ZONE parameter value to the time zone offset of Australia/Sydney.

Display SYSDATE, CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP

for this session.

**Note:** The output may be different based on the date when the command is executed.

Alter the session to set the TIME\_ZONE parameter value to the time zone offset of Chile/Easter Island.

**Note:** The results of the preceding question are based on a different date, and in some cases, they will not match the actual results that the students get. In addition, the time zone offset of the various countries may differ, based on daylight saving time.

Display SYSDATE, CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP

for this session.

**Note:** The output may be different based on the date when the command is executed.

Alter the session to set NLS\_DATE\_FORMAT to DD-MON-YYYY.

Note

Observe in the preceding question that CURRENT\_DATE, CURRENT\_TIMESTAMP, and LOCALTIMESTAMP are all sensitive to the session time zone. Observe that SYSDATE is not sensitive to the session time zone.

The Human Resources department wants a list of employees who are up for review in January, so the department has requested you to do the following:

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The benefits for the state of California have been changed based on a local ordinance. So the benefits representative has asked you to compile a list of the people who are affected. Write a query to display the employee ID and last names of the employees who work in the state of California.

**Hint:** Use scalar subqueries.

Nita, the DBA, wants to remove old information from the database. One of the things she thinks is unnecessary is the old employment records. She has asked you to do the following:

Write a query to delete the oldest JOB\_HISTORY row of an employee by looking up the JOB\_HISTORY table for the MIN(START\_DATE) for the employee. Delete the records of *only* those employees who have changed at least two jobs.

**Hint:** Use a correlated DELETE command.

The vice president of Human Resources needs the complete employment records for the annual employee recognition banquet speech. The vice president makes a quick phone call to stop you from following the DBA’s orders.

Roll back the transaction.

The sluggish economy is forcing management to take cost-reduction actions. The CEO wants to review the highest-paid jobs in the company. You are responsible to provide the CEO with a list based on the following specifications:

Write a query to display the job IDs of those jobs whose maximum salary is above half the maximum salary in the entire company. Use the WITH clause to write this query. Name the query MAX\_SAL\_CALC.

Additional Practices: Case Study

In the case study for the *SQL WORKSHOP I* course, you built a set of database tables for an Online Book Store application. In addition, you inserted, updated, and deleted records in an online book store database and generated a report.

The following is a diagram of the tables and columns that you created for the video application:

**Note:** First, run the Online\_Book\_Store\_Drop\_Tables.sql script in the labs folder to drop tables if they already exist. Then run the Online\_Book\_Store\_Populate.sql script in the labs folder to create and populate the tables.

Verify that the tables were created properly by running a report to show the list of tables and their column definitions.

Verify the existence of the ORDER\_ID\_SEQ sequence in the data dictionary.

You want to create some users who have access only to their purchase history. Create a user called Carmen and grant her the privilege to select from the PURCHASE\_HISTORY table.

Add an edition column (varchar2 (6)) to the BOOKS table to store the book edition information.

Add a CREDIT\_CARD\_TYPE table to store CREDIT\_CARD\_TYPE and CREDIT\_CARD\_DESCRIPTION. The table has a foreign key with the CREDIT\_CARD\_TYPE column in the CREDIT\_CARD\_DETAILS table.

Select all the tables from the data dictionary.

Create a SHOPPING\_HISTORY table to store the details of purchase history of the customers.

**Hint:** You can copy the PURCHASE\_HISTORY table.

Display the customer details of the first 10 customers who have placed orders in the last month. Order the records based on the customer ID.

Show a list of customers who have placed an order more than once.

Additional Practices Solution: Case Study

Solution

First, run the Online\_Book\_Store\_Drop\_Tables.sql script in the labs folder to drop tables if they already exist. Then run the Online\_Book\_Store\_Populate.sql script in the labs folder to create and populate the tables.

Verify that the tables were created properly by running a report to show the list of tables and their column definitions.

Verify the existence of the ORDER\_ID\_SEQ sequences in the data dictionary.

You want to create some users who have access only to their purchase history. Create a user called Carmen and grant her the privilege to select from the PURCHASE\_HISTORY table.

Add an edition column (varchar2 (6)) to the BOOKS table to store the book edition information.

Add a CREDIT\_CARD\_TYPE table to store CREDIT\_CARD\_TYPE and CREDIT\_CARD\_DESCRIPTION. The table has a foreign key with the CREDIT\_CARD\_TYPE column in the CREDIT\_CARD\_DETAILS table.

Select all the tables from the data dictionary.

Create a SHOPPING\_HISTORY table to store the details of a purchase history of customers.

**Hint:** You can copy the PURCHASE\_HISTORY table.

Display the customer details of the first 10 customers who have placed orders in the last month. Order the records based on the customer ID.

Show a list of customers who have placed an order more than once.