Practice 9

Practice name	Data selection and projection: single row functions
Academic Program	Software Engineering
Subject name	Laboratory of Database Systems II
Unit	I. SQL.
Professor	Aldonso Becerra Sánchez
Due date	**October 14, 2021**
Due date with penalty	**October 15, 2021**
Elaboration date	**October 12, 2021**

Practice objective	Use SQL SELECT statements for retrieving data from database by means of different contexts using different Oracle functions.
Estimated time of completion	5 hours
Introduction	SQL language allows the realization of projection and selection of data to satisfy the needs of reports that may be required for a programmer, developer or end user.

Reference 1:

1. Oracle Database 11g: SQL Fundamentals.

Reference 2:

2. Oracle Database SQL Language Reference 11g.

Reference 3:

Initial Activity:

Read the whole practice before start it.

Write the corresponding report, starting with the **Introduction** section.

Activity 1:

Write the section that describes the **Work developed** in the following activities.

Read all the choices carefully because there might be more than one correct answer. Choose all the correct answers for each question.

Explain the reason for your answer.

DESCRIBE VARIOUS TYPES OF FUNCTIONS AVAILABLE IN SQL

1. Which statements regarding single-row functions are true? (Choose all that apply.)

A. They may return more than one result.

B. They execute once for each record processed.

C. They may have zero or more input parameters.

D. They must have at least one mandatory parameter.

2. Which of these are single-row character-case conversion functions? (Choose all that apply.)

A. LOWER

B. SMALLER

C. INITCASE

D. INITCAP

USE CHARACTER, NUMBER, AND DATE FUNCTIONS IN SELECT STATEMENTS

3. What value is returned after executing the following statement:

SELECT LENGTH('How_long_is_a_piece_of_string?') FROM DUAL; (Choose the best answer.)

A. 29

B. 30

C. 24

D. None of the above

4. What value is returned after executing the following statement:

SELECT SUBSTR('How_long_is_a_piece_of_string?', 5,4) FROM DUAL; (Choose the best answer.)

A. long

B. _long

C. string?

D. None of the above

5. What value is returned after executing the following statement?

SELECT INSTR('How_long_is_a_piece_of_string?','_',5,3) FROM DUAL; (Choose the best answer.)

A. 4

B. 14

C. 12

D. None of the above

6. What value is returned after executing the following statement?

SELECT REPLACE('How_long_is_a_piece_of_string?','_','') FROM DUAL; (Choose the best answer.)

A. How long is a piece of string?

B. How_long_is_a_piece_of_string?

C. Howlongisapieceofstring?

D. None of the above

7. What value is returned after executing the following statement?

SELECT MOD(14,3) FROM DUAL; (Choose the best answer.)

A. 3

B. 42

C. 2

D. None of the above

8. Assuming SYSDATE=07-JUN-1996 12:05pm, what value is returned after executing the following statement?

SELECT ADD_MONTHS(SYSDATE,-1) FROM DUAL; (Choose the best answer.)

A. 07-MAY-1996 12:05pm

B. 06-JUN-1996 12:05pm

C. 07-JUL-1996 12:05pm

D. None of the above

9. What value is returned after executing the following statement? Take note that 01-JAN-2009 occurs on a Thursday. (Choose the best answer.)

SELECT NEXT_DAY('01-JAN-2009','wed') FROM DUAL;

A. 07-JAN-2009

B. 31-JAN-2009

C. Wednesday

D. None of the above

10. Assuming SYSDATE=30-DEC-2007, what value is returned after executing the following statement?

SELECT TRUNC(SYSDATE,'YEAR') FROM DUAL; (Choose the best answer.)

A. 31-DEC-2007

B. 01-JAN-2008

C. 01-JAN-2007

D. None of the above

Activity 2:

Propose an answer to the following issues:

- You would like to search for a character string stored in the database. The case in which it is stored is unknown and there are potentially leading and trailing spaces surrounding the string. Can such a search be performed?
- You have been asked to extract the last three characters from the LAST_NAME column in the EMPLOYEES table. Can such a query be performed without using the LENGTH function?
- You would like to extract a consistent 11-character string based on the SALARY column in the EMPLOYEES table. If the SALARY value is less than 11 characters long, zeros must be added to the left of the value to yield a 11-character string. Is this possible?
- You wish to retrieve the duration of employment in days for each employee. Is it possible to perform such a calculation?
- You are tasked with identifying the date the end of year staff bonus will be paid. Bonuses are usually paid on the last Friday in December. Can the bonus date be computed using the NEXT_DAY function?
- Employees working in the IT department have moved to new offices and, although the last four digits of their phone numbers are the same, the set of the three digits 324 is changed to 326. A typical phone number of an IT staff member is 140-324-3489. You are required to provide a list of employees' names with their old and new phone numbers. Can this list be provided?

Activity 3:

Connect to the OE schema and complete the following tasks.

Several quotations were requested for prices on color printers. The supplier information is not available from the usual source, but you know that the supplier identification number is embedded in the CATALOG_URL column from the PRODUCT_INFORMATION table. You are required to retrieve the PRODUCT_NAME and CATALOG_URL values and to extract the supplier number from the CATALOG_URL column for all products which have both the words COLOR and PRINTER in the PRODUCT_DESCRIPTION column stored in any case.

NOTE: Capture an image for each statement output.

Activity 4:

This exercise must be performed using HR schema.

- Retrieve a list of all FIRST_NAME and LAST_NAME values from the EMPLOYEES table where FIRST_NAME contains the character string "li." 1. Start SQL Developer and connect to the HR schema. The data filter must compare the FIRST_NAME column values with a pattern of characters containing all possible case combinations of the string "li." Therefore, if the FIRST_NAME contains the character strings "LI," "Li," "lI," or "li," that row must be retrieved. The LIKE operator is used for character matching, and four combinations can be

extracted with four WHERE clauses separated by the OR keyword. However, the case conversion functions can simplify the condition.

- Envelope printing restricts the addressee field to 16 characters. Ideally, the addressee field contains employees' FIRST_NAME and LAST_NAME values separated by a single space. When the combined length of an employee's FIRST_NAME and LAST_NAME exceeds 15 characters, the addressee field should contain their formal name. An employee's formal name is made up of the first letter of their FIRST_NAME and the first 14 characters of their LAST_NAME. You are required to retrieve a list of FIRST_NAME and LAST_NAME values and formal names for employees where the combined length of FIRST_NAME and LAST_NAME exceeds 15 characters.
- You are required to obtain a list of EMPLOYEE_ID, LAST_NAME, and HIRE_DATE values (add the MONTHS WORKED by the employees) for the employees who have worked more than 90 months between the date they were hired and 01-JAN-2000.
- You are required to display employee first names and last names joined together, the length of the employee last name, and the numeric position of the letter "a" in the employee last name for all employees whose last names end with the letter "n." Use Oracle functions to perform the whole sentence.
- Display the employee number, hire date, number of months employed, six-month review date, first Friday after hire date, and the last day of the hire month for all employees who have been employed for fewer than 150 months.
- Compare the hire dates for all employees who started in 1997. Display the employee number and hire date.

NOTE: Capture an image for each statement output.

Activity 5:

This activity provides a variety of exercises using different functions that are available for character, number, and date data types.

Part 1

1. Write a query to display the system date. Label the column as `Date`.

   Note: If your database is remotely located in a different time zone, the output will be the date for the operating system on which the database resides.

Date
1 31-MAY-07

2. The HR department needs a report to display the employee number, last name, salary, and salary increased by 15.5% (expressed as a whole number) for each employee. Label the column `New Salary`. Save your SQL statement in a file named `lab_9_02.sql`.

3. Run your query in the `lab_9_02.sql` file.

	EMPLOYEE_ID	LAST_NAME	SALARY	New Salary
1	100	King	24000	27720
2	101	Kochhar	17000	19635
3	102	De Haan	17000	19635
4	103	Hunold	9000	10395
5	104	Ernst	6000	6930
6	107	Lorentz	4200	4851
7	124	Mourgos	5800	6699
8	141	Rajs	3500	4043
9	142	Davies	3100	3581
10	143	Matos	2600	3003

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	EMPLOYEE_ID	LAST_NAME	SALARY	New Salary
19	205	Higgins	12000	13860
20	206	Gietz	8300	9587

4. Modify your query `lab_9_02.sql` to add a column that subtracts the old salary from the new salary. Label the column `Increase`. Save the contents of the file as `lab_9_04.sql`. Run the revised query.

	EMPLOYEE_ID	LAST_NAME	SALARY	New Salary	Increase
1	100	King	24000	27720	3720
2	101	Kochhar	17000	19635	2635
3	102	De Haan	17000	19635	2635
4	103	Hunold	9000	10395	1395
5	104	Ernst	6000	6930	930

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	EMPLOYEE_ID	LAST_NAME	SALARY	New Salary	Increase
20	206	Gietz	8300	9587	1287

5. Write a query that displays the last name (with the first letter in uppercase and all the other letters in lowercase) and the length of the last name for all employees whose name starts with the letters "J," "A," or "M." Give each column an appropriate label. Sort the results by the employees' last names.

	Name	Length
1	Abel	4
2	Matos	5
3	Mourgos	7

Rewrite the query so that the user is prompted to enter a letter that the last name starts with. For example, if the user enters "H" (capitalized) when prompted for a letter, then the output should show all employees whose last name starts with the letter "H."

	Name	Length
1	Hartstein	9
2	Higgins	7
3	Hunold	6

Modify the query such that the case of the entered letter does not affect the output. The entered letter must be capitalized before being processed by the SELECT query.

Enter Substitution Variable ✕

START_LETTER:

h

OK   Cancel

	Name	Length
1	Hartstein	9
2	Higgins	7
3	Hunold	6

6. The HR department wants to find the duration of employment for each employee. For each employee, display the last name and calculate the number of months between today and the date on which the employee was hired. Label the column as MONTHS_WORKED. Order your results by the number of months employed. Round the number of months up to the closest whole number.

Note: Because this query depends on the date when it was executed, the values in the MONTHS_WORKED column will differ for you.

	LAST_NAME	MONTHS_WORKED
1	Zlotkey	88
2	Mourgos	90
3	Grant	96
4	Lorentz	100
5	Vargas	107
6	Taylor	110
7	Matos	111
8	Fay	117
9	Davies	124
10	Abel	133
11	Hartstein	135
12	Rajs	139
13	Higgins	156
14	Gietz	156
15	De Haan	173
16	Ernst	192
17	Hunold	209
18	Kochhar	212
19	Whalen	236
20	King	239

7. Create a query to display the last name and salary for all employees. Format the salary to be 15 characters long, left-padded with the $ symbol. Label the column as SALARY.

	LAST_NAME	SALARY
1	King	$$$$$$$$$$24000
2	Kochhar	$$$$$$$$$$17000

. . .

| 20 | Gietz | $$$$$$$$$$$8300 |

8. Create a query that displays the first eight characters of the employees' last names and indicates the amounts of their salaries with asterisks. Each asterisk signifies a thousand dollars. Sort the data in descending order of salary. Label the column as EMPLOYEES_AND_THEIR_SALARIES.

	EMPLOYEES_AND_THEIR_SALARIES
1	King *************************
2	Kochhar *****************
3	De Haan *****************
4	Hartstei *************
5	Higgins ************

. . .

19	Matos **
20	Vargas **

9. Create a query to display the last name and the number of weeks employed for all employees in department 90. Label the number of weeks column as TENURE. Truncate the number of weeks value to 0 decimal places. Show the records in descending order of the employee's tenure. **Note:** The TENURE value will differ as it depends on the date on which you run the query.

	LAST_NAME	TENURE
1	King	1041
2	Kochhar	923
3	De Haan	750

Activity 6:

Write the **Pre-assessment** section.

Final activity:

Write the **Conclusion** section.

Attached file that is required for this task (optional):

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