Practice 14

Practice name	Using Set Operators to Solve Problems
Academic Program	Software Engineering
Subject name	Laboratory of Database Systems II
Unit	I. SQL.
Professor	Aldonso Becerra Sánchez
Due date	November 18, 2021
Due date with penality	November 19, 2021
Elaboration date	November 16, 2021

Practice objective	Use SQL SELECT statements for retrieving data from several sources using set operators.
Estimated time of completion	5 hours
Introduction	SQL language allows the realization of projection and selection of data from several tables 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 W**ork 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 THE SET OPERATORS

1. Which of these set operators will not sort the rows? (Choose the best answer.)

A. INTERSECT

B. MINUS

C. UNION

D. UNION ALL

2. Which of these operators will remove duplicate rows from the final result? (Choose all that apply.)

A. INTERSECT

B. MINUS

C. UNION

D. UNION ALL

USE A SET OPERATOR TO COMBINE MULTIPLE QUERIES INTO A SINGLE QUERY

3. If a compound query contains both a MINUS and an INTERSECT operator, which will be applied first? (Choose the best answer.)

A. The INTERSECT, because INTERSECT has higher precedence than MINUS.

B. The MINUS, because MINUS has a higher precedence than INTERSECT.

C. The precedence is determined by the order in which they are specified.

D. It is not possible for a compound query to include both MINUS and INTERSECT.

4. There are four rows in the REGIONS table. Consider the following statements and choose how many rows will be returned for each: 0, 4, 8, or 16.

A. select * from regions union select * from regions 4

B. select * from regions union all select * from regions 8

C. select * from regions minus select * from regions 0

D. select * from regions intersect select * from regions 4

5. Consider this compound query:

select empno, hired from emp

union all

select emp_id,hired,fired from ex_emp;

The columns EMP.EMPNO and EX_EMP.EMP_ID are integer; the column EMP.HIRED is timestamp; the columns EX_EMP.HIRED and EX_EMP.FIRED are date. Why will the statement fail? (Choose the best answer.)

A. Because the columns EMPNO and EMP_ID have different names

B. Because the columns EMP.HIRED and EX_EMP.HIRED are different data types

C. Because there are two columns in the first query and three columns in the second query

D. For all the reasons above

E. The query will succeed.

CONTROL THE ORDER OF ROWS RETURNED

6. Which line of this statement will cause it to fail? (Choose the best answer.)

A. select ename, hired from current_staff

B. order by ename

C. minus

D. select ename, hired from current staff

E. where deptno=10

F. order by ename;

7. Study this statement:

select ename from emp

union all

select ename from ex_emp;

In what order will the rows be returned? (Choose the best answer.)

A. The rows from each table will be grouped and within each group will be sorted on ENAME.

B. The rows from each table will be grouped but not sorted.

C. The rows will not be grouped but will all be sorted on ENAME.

D. The rows will be neither grouped nor sorted.

Activity 2:

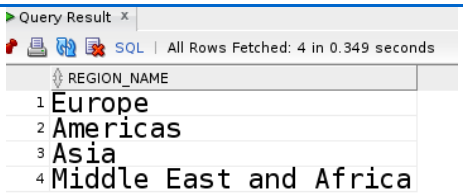
Propose an answer to the following issues:

- How can you present several tables with similar data as one table?
- Are there performance issues with compound queries?

Activity 3:

This exercise must be performed using HR schema.

a) In this exercise, you will see the effect of the set operators.
1. Connect to your database as user HR.
2. Run a query that consult the regions table (region_name):

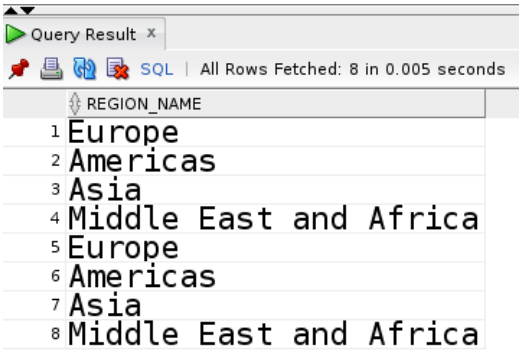


Note the result, in particular the order of the rows. If the table is as originally created, there will be four rows returned. The order will be Europe, America, Asia, Middle East.

3. Query the Regions table twice, using UNION:

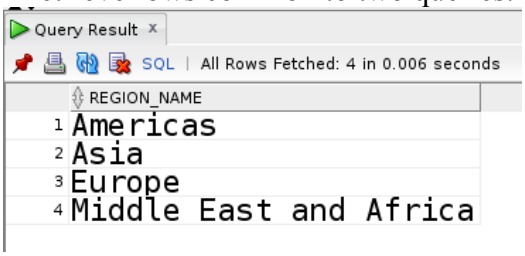
The rows returned will be as for step 1 but sorted alphabetically.

4. This time, use UNION ALL:



There will be double the number of rows, and they will not be sorted.

5. An intersection will retrieve rows common to two queries:



All four rows are common, and the result is sorted.

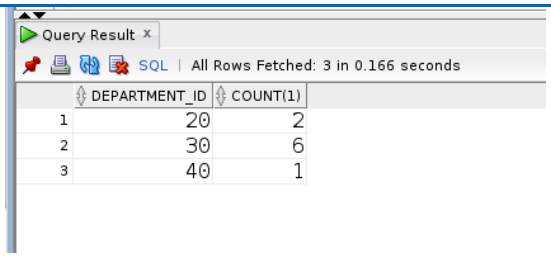
6. A MINUS will remove common rows:

The second query will remove all the rows in the first query. Result: no rows left.

7. Execute these statements and show results.

b) In this exercise, you will run more complex compound queries.

1. Connect to your database as user HR.
2. Run a simple query to count the employees in three departments (20,30,40), grouped by them:



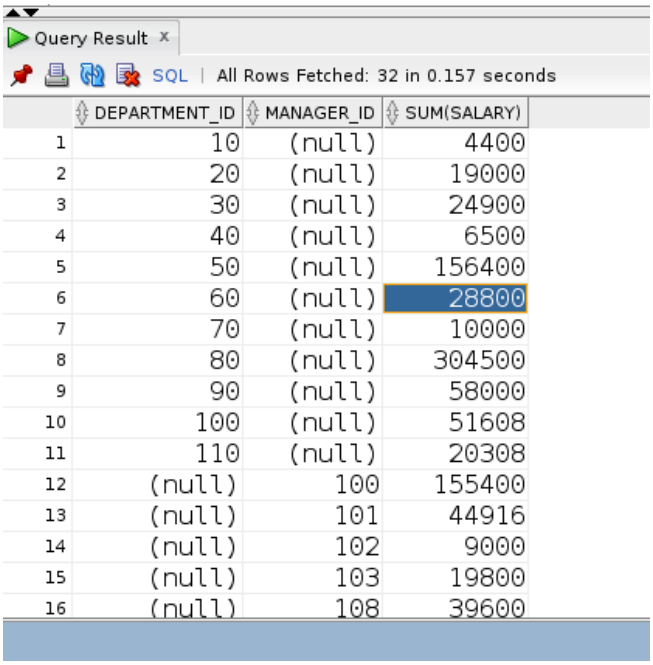
	DEPARTMENT_ID	COUNT(1)
1	20	2
2	30	6
3	40	1

3. Obtain the same result with a compound query:

4. Find out (using compound queries) if any managers manage staff in both departments 20 and 30, and exclude any managers with staff in department 40:

	MANAGER_ID
1	100

5. Use a compound query (3 sentences using two set operator) to report salaries (from employees) subtotaled by department (grouped by department_id), by manager (grouped by manager_id), and the overall total. Order the query:



	DEPARTMENT_ID	MANAGER_ID	SUM(SALARY)
1	10	(null)	4400
2	20	(null)	19000
3	30	(null)	24900
4	40	(null)	6500
5	50	(null)	156400
6	60	(null)	28800
7	70	(null)	10000
8	80	(null)	304500
9	90	(null)	58000
10	100	(null)	51608
11	110	(null)	20308
12	(null)	100	155400
13	(null)	101	44916
14	(null)	102	9000
15	(null)	103	19800
16	(null)	108	39600

6. Execute these statements and show results

c) Working in the HR schema, design some queries that will generate reports using the set operators. The reports required are as follows:

1. Employees have their current job (identified by JOB_ID) recorded in their EMPLOYEES row. Jobs they have held previously (but not their current job) are recorded in JOB_HISTORY. Which employees have never changed jobs? The listing should include the employees' EMPLOYEE_ID and LAST_NAME.

Script Output | Query Result

SQL | All Rows Fetched: 100 in 0.458 seconds

	EMPLOYEE_ID	LAST_NAME
1	100	King
2	103	Hunold
3	104	Ernst
4	105	Austin
5	106	Pataballa
6	107	Lorentz
7	108	Greenberg
8	109	Faviet
9	110	Chen
10	111	Sciarra
11	112	Urman
12	113	Popp
13	115	Khoo
14	116	Baida
15	117	Tobias
16	118	Himuro
17	119	Colmenares

2. Which employees were recruited into one job, then changed to a different job, but are now back in a job they held before? Again, you will need to construct a query that compares EMPLOYEES with JOB_HISTORY. The report should show the employees' names and the job titles. Job titles are stored in the table JOBS.

Query Result

SQL | All Rows Fetched: 2 in 0.181 seconds

	LAST_NAME	JOB_TITLE
1	Taylor	Sales Representative
2	Whalen	Administration Assistant

3. What jobs has any one employee held? This will be the JOB_ID for the employee's current job (in EMPLOYEES) and all previous jobs (in JOB_HISTORY). If the employee has held a job more than once, there is no need to list it more than once. Use a replacement variable to prompt for the EMPLOYEE_ID and display the job title(s). Employees 101 and 200 will be suitable employees for testing.

Employee 101:

Script Output | Query Result

SQL | All Rows Fetched: 3 in 0.135 seconds

	JOB_TITLE
1	Accounting Manager
2	Administration Vice President
3	Public Accountant

The NOTE: Capture an image for each statement output.

Activity 5:

In this activity you will write several queries using the set operators.

1. The HR department needs a list of department IDs for departments that do not contain the job ID ST_CLERK. Use the set operators to create this report.

	DEPARTMENT_ID
1	10
2	20
3	60
4	80
5	90
6	110
7	190

2. The HR department needs a list of countries that have no departments located in them. Display the country ID and the name of the countries. Use the set operators to create this report.

	COUNTRY_ID	COUNTRY_NAME
1	DE	Germany

3. Produce a list of jobs for departments 10, 50, and 20, in that order. Display the job ID and department ID by using the set operators.

	JOB_ID	DEPARTMENT_ID
1	AD_ASST	10
2	ST_MAN	50
3	ST_CLERK	50
4	MK_MAN	20
5	MK_REP	20

4. Create a report that lists the employee IDs and job IDs of those employees who currently have a job title that is the same as their job title when they were initially hired by the company (that is, they changed jobs but have now gone back to doing their original job).

	EMPLOYEE_ID	JOB_ID
1	176	SA_REP
2	200	AD_ASST

5. The HR department needs a report with the following specifications:
   - Last name and department ID of all employees from the EMPLOYEES table, regardless of whether or not they belong to a department
   - Department ID and department name of all departments from the DEPARTMENTS table, regardless of whether or not they have employees working in them

   Write a compound query to accomplish this.

	LAST_NAME	DEPARTMENT_ID	TO_CHAR(NULL)
1	Abel	80	(null)
2	Davies	50	(null)
3	De Haan	90	(null)
4	Ernst	60	(null)
5	Fay	20	(null)
6	Gietz	110	(null)
7	Grant	(null)	(null)
8	Hartstein	20	(null)
9	Higgins	110	(null)
10	Hunold	60	(null)
11	King	90	(null)
12	Kochhar	90	(null)
13	Lorentz	60	(null)
14	Matos	50	(null)
15	Mourgos	50	(null)
16	Rajs	50	(null)
17	Taylor	80	(null)
18	Vargas	50	(null)
19	Whalen	10	(null)
20	Zlotkey	80	(null)
21	(null)	10	Administration
22	(null)	20	Marketing
23	(null)	50	Shipping
24	(null)	60	IT
25	(null)	80	Sales
26	(null)	90	Executive
27	(null)	110	Accounting
28	(null)	190	Contracting

Activity 5:

Pre-assessment section.

Final activity:

Conclusion section.

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

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