Programming 10, 11

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10.1

Vocabulary

Identify the vocabulary word for each definition below.

Correlated Subquery - It accepts a value from the inner query to complete its SELECT statement.

Multi-Row Subquery - An inner query that returns one or more rows to the outer query

Subquery - An inner query that is nested within an outer query

Multiple - Column Subquery - An inner query that compares multiple columns at the same time

Single-Row Subquery - An inner query that returns only one row to the outer query

Multiple-column Subquery with Multiple Conditions - An inner query that compares the multiple columns one at a time in different subqueries

Inner Query - Another name for a subquery

Try It / Solve It

1. What is the purpose of using a subquery?

A subquery is used to provide data that will be used by the main query. It allows you to perform additional data filtering, conditional logic, and intermediate calculations, often used in WHERE, SELECT, and FROM clauses.

2. What is a subquery?

A subquery, or inner query, is a query nested within another SQL query. It returns data that can be used by the outer query to complete its operation.

3. What DJs on Demand d\_play\_list\_items song\_id’s have the same event\_id as song\_id 45?

SELECT song\_id

FROM d\_play\_list\_items

WHERE event\_id = (SELECT event\_id FROM d\_play\_list\_items WHERE song\_id = 45);

4. Which events in the DJs on Demand database cost more than event\_id = 100?

SELECT \*

FROM events

WHERE cost > (SELECT cost FROM events WHERE event\_id = 100);

5. Find the track number of the song that has the same CD number as “Party Music for All Occasions.”

SELECT track\_number

FROM songs

WHERE cd\_number = (SELECT cd\_number FROM cds WHERE cd\_name = 'Party Music for All Occasions');

6. List the DJs on Demand events whose theme code is the same as the code for “Tropical.”

SELECT \*

FROM events

WHERE theme\_code = (SELECT theme\_code FROM themes WHERE theme\_name = 'Tropical');

7. What are the names of the Global Fast Foods staff members whose salaries are greater than the staff member whose ID is 12?

SELECT staff\_name

FROM staff

WHERE salary > (SELECT salary FROM staff WHERE staff\_id = 12);

8. What are the names of the Global Fast Foods staff members whose staff types are not the same as Bob Miller’s?

SELECT staff\_name

FROM staff

WHERE staff\_type <> (SELECT staff\_type FROM staff WHERE staff\_name = 'Bob Miller');

9. Which Oracle employees have the same department ID as the IT department?

SELECT employee\_name

FROM employees

WHERE department\_id = (SELECT department\_id FROM departments WHERE department\_name = 'IT');

10.What are the department names of the Oracle departments that have the same location ID as Seattle?

SELECT department\_name

FROM departments

WHERE location\_id = (SELECT location\_id FROM locations WHERE city = 'Seattle');

11.Indicate whether the statement regarding subqueries is True or False.

True a. It is good programming practice to place a subquery on the right side of the comparison operator.

True b. A subquery can reference a table that is not included in the outer query’s FROM clause.

False c. Single-row subqueries can return multiple values to the outer query.

10.2

1. Write a query to return all those employees who have a salary greater than that of Lorentz and are in the same department as Abel.

SELECT employee\_name

FROM employees

WHERE salary > (SELECT salary FROM employees WHERE employee\_name = 'Lorentz')

AND department\_id = (SELECT department\_id FROM employees WHERE employee\_name = 'Abel');

2. Write a query to return all those employees who have the same job id as Rajs and were hired after Davies.

SELECT employee\_name

FROM employees

WHERE job\_id = (SELECT job\_id FROM employees WHERE employee\_name = 'Rajs')

AND hire\_date > (SELECT hire\_date FROM employees WHERE employee\_name = 'Davies');

3. What DJs on Demand events have the same theme code as event ID = 100?

SELECT \*

FROM events

WHERE theme\_code = (SELECT theme\_code FROM events WHERE event\_id = 100);

4. What is the staff type for those Global Fast Foods jobs that have a salary less than those of any Cook staff-type jobs?

SELECT staff\_type

FROM jobs

WHERE salary < ANY (SELECT salary FROM jobs WHERE staff\_type = 'Cook');

5. Write a query to return a list of department id’s and average salaries where the department’s average salary is greater than Ernst’s salary.

SELECT department\_id, AVG(salary) AS avg\_salary

FROM employees

GROUP BY department\_id

HAVING AVG(salary) > (SELECT salary FROM employees WHERE employee\_name = 'Ernst');

6. Return the department ID and minimum salary of all employees, grouped by department ID, having a minimum salary greater than the minimum salary of those employees whose department ID is not equal to 50.

SELECT department\_id, MIN(salary) AS min\_salary

FROM employees

GROUP BY department\_id

HAVING MIN(salary) > (SELECT MIN(salary) FROM employees WHERE department\_id <> 50);

10.3

1. What will be returned by a query if it has a subquery that returns a null ?

If a subquery returns a NULL, the main query will not match any rows when using comparison operators like = or <. In cases where a NULL is returned, IN or IS NULL may be required to handle NULL values appropriately, or no rows will be returned if the outer query depends on the subquery’s result for matching.

2. Write a query that returns jazz and pop songs. Write a multi-row subquery and use the d\_songs and d\_types tables. Include the id, title, duration, and the artist name.

SELECT s.song\_id, s.title, s.duration, s.artist\_name

FROM d\_songs s

WHERE s.type\_id IN (SELECT type\_id FROM d\_types WHERE type\_name IN ('Jazz', 'Pop'));

3. Find the last names of all employees whose salaries are the same as the minimum salary for any department.

SELECT last\_name

FROM employees

WHERE salary IN (SELECT MIN(salary) FROM employees GROUP BY department\_id);

4. Which Global Fast Foods employee earns the lowest salary? Hint: You can use either a single-row or a multiple-row subquery.

SELECT employee\_name

FROM employees

WHERE salary = (SELECT MIN(salary) FROM employees);

5. Place the correct multiple-row comparison operators in the outer query WHERE clause of each of the following:

a. Which CDs in our d\_cds collection were produced before “Carpe Diem” was produced?

WHERE year \_\_\_\_\_\_\_\_\_\_ (SELECT year …

WHERE year < ANY (SELECT year FROM d\_cds WHERE title = 'Carpe Diem');

b. Which employees have salaries lower than any one of the programmers in the IT department?

WHERE salary \_\_\_\_\_\_\_\_\_\_(SELECT salary …

WHERE salary < ANY (SELECT salary FROM employees WHERE job\_title = 'Programmer' AND department\_id = (SELECT department\_id FROM departments WHERE department\_name = 'IT'));

c. What CD titles were produced in the same year as “Party Music for All Occasions” or “Carpe Diem”?

WHERE year \_\_\_\_\_\_\_\_\_\_(SELECT year …

WHERE year IN (SELECT year FROM d\_cds WHERE title IN ('Party Music for All Occasions', 'Carpe Diem'));

d. What song title has a duration longer than every type code 77 title?

WHERE duration \_\_\_\_\_\_\_\_\_(SELECT duration …

WHERE duration > ALL (SELECT duration FROM d\_songs WHERE type\_code = 77);

6. If each WHERE clause is from the outer query, which of the following are true?

True. WHERE size > ANY -- If the inner query returns sizes ranging from 8 to 12, the value 9 could be returned in the outer query.

False. WHERE book\_number IN -- If the inner query returns books numbered 102, 105, 437, and 225 then 325 could be returned in the outer query.

False. WHERE score <= ALL -- If the inner query returns the scores 89, 98, 65, and 72, then 82 could be returned in the outer query.

True . WHERE color NOT IN -- If the inner query returns red, green, blue, black, and then the outer query could return white.

False. WHERE game\_date = ANY -- If the inner query returns 05-Jun-1997, 10-Dec-2002, and 2-Jan-2004, then the outer query could return 10-Sep-2002.

7. The goal of the following query is to display the minimum salary for each department whose minimum salary is less than the lowest salary of the employees in department 50. However, the subquery does not execute because it has five errors. Find them, correct them, and run the query.

SELECT department\_id

FROM employees

WHERE MIN(salary)

HAVING MIN(salary) >

GROUP BY department\_id

SELECT MIN(salary)

WHERE department\_id < 50;

* WHERE cannot be used with aggregate functions like MIN. Aggregate functions should be used in the HAVING clause after the GROUP BY clause.
* The HAVING clause should contain a complete condition and be placed after GROUP BY. Here, it should be HAVING MIN(salary) <.
* The subquery must be complete within parentheses and use an appropriate comparison operator.
* GROUP BY should come before HAVING.
* The subquery must select the minimum salary from department 50 as a single value.

Corrected Query:

SELECT department\_id, MIN(salary) AS min\_salary

FROM employees

GROUP BY department\_id

HAVING MIN(salary) < (SELECT MIN(salary) FROM employees WHERE department\_id = 50);

8. Which statements are true about the subquery below?

SELECT employee\_id, last\_name

FROM employees

WHERE salary =

(SELECT MIN(salary)

FROM employees

GROUP BY department\_id);

False a. The inner query could be eliminated simply by changing the WHERE clause to WHERE MIN(salary).

True b. The query wants the names of employees who make the same salary as the smallest salary in any department.

False c. The query first selects the employee ID and last name, and then compares that to the salaries in every department.

True d. This query will not execute.

9. Write a pair-wise subquery listing the last\_name, first\_name, department\_id, and manager\_id for all employees that have the same department\_ id and manager\_id as employee 141. Exclude employee 141 from the result set.

10.Write a non-pair-wise subquery listing the last\_name, first\_name, department\_id, and manager\_id for all employees that have the same department\_ id and manager\_id as employee 141.

11

Ensuring Quality Query Results

Creating a query to produce specified data

Modifying a query to produce specified data