1. In your own words, what is a subquery?
   * A subquery is another set of query within a query. It’s an inner query to perform before evaluating the outer query to properly get the result.
2. In your own words, what is a self-contained subquery?
   * Self-contained queries are independent from its outer query. It is easier to debug since you can highlight and run it first to ensure that it does what it’s supposed to do before running the whole query.
3. In your own words, what is a correlated subquery?
   * Correlated subquery are dependent to its outer query, meaning you can’t invoke to run it by itself to debug before running the whole query as you will run into an error.
4. Give an example of a subquery that returns a single value. When would you use this kind of subquery?

select a.ShipperID,

a.CompanyName,

b.Freight

from shippers as a

inner join orders as b

on a.ShipperID=b.ShipVia

where b.Freight = (select max(Freight) from orders);

This query uses the northwind database. You would only use this query if you want to populate a specific result from another table within your database.

Reference:

<https://www.geeksengine.com/database/subquery/return-single-value.php>

1. Give an example of a subquery that returns multiple values. When would you use this kind of subquery?

SELECT orderid, orderdate, custid, empid

FROM Sales.Orders

WHERE orderdate =

(SELECT MAX(O.orderdate) FROM Sales.Orders AS O);

This query would help you get multiple results from different tables within your database in specific conditions.

Reference:

T-SQL Fundamentals by Itzik Ben-Gan

1. Give an example of a subquery that returns table values. When would you use this kind of subquery?

SELECT custid, orderid, orderdate, empid

FROM Sales.Orders

WHERE custid IN

(SELECT TOP (1) WITH TIES O.custid

FROM Sales.Orders AS O

GROUP BY O.custid

ORDER BY COUNT(\*) DESC);

This subquery can be used to return only certain table values that meets the condition within the query.

1. What does the exists predicate do? Give an example.
   * EXISTS predicate is a logic to define whether the subquery exists within the database to return TRUE otherwise, FALSE.

SELECT firstname ,lastname

FROM HR.Employees AS F

WHERE firstname = N'FLorabel'

AND EXISTS

(SELECT \* FROM Sales.Customers AS S

WHERE F.empid = S.custid);

This query returns FALSE since ‘Florabel’ doesn’t exists in the Sales.Customers table only in the HR.Employees. Because of using the AND clause, it has to satisfy both conditions to return TRUE.

1. What happens if we use the not operator before a predicate? Give an example.
   * Not operator is to give condition to a query to never return the value after the NOT condition.

SELECT \* FROM Customers  
WHERE NOT firstname ='Florabel';

In this query it would return only the values that doesn’t include the name “Florabel”

1. When you use exists or not exists with respect to a row in a database, does it return two or three values? Explain your answer.
   * It only returns 2 values which is either TRUE or FALSE if the data exists or do not exists in the database.
2. How would you a subquery to calculate aggregates? For example, you want to calculate yearly sales of a product, and you also want to keep a running sum of total sales. Explain how you would use a subquery to do this.
   * You would use a subquery to specify different conditions within your query. In this case, we need to use a subquery to calculate aggregates by using the function SUM to return the yearly sales of product after running the total amount of values within the column.