Answers 3.9

**Step 1: Answer the business questions from step 1 and 2 of task 3.8 using CTEs**

1. **Rewrite your queries from steps 1 and 2 of task 3.8 as CTEs.**

**Find the average amount paid by the top 5 customers.**

WITH average\_cte (customer\_id, first\_name, last\_name, city, country) AS

(SELECT

B.customer\_id,

B.first\_name,

B.last\_name,

D.city,

E.country,

SUM(A.amount) AS total\_amount\_paid

FROM payment A

INNER JOIN customer B ON A.customer\_id = B.customer\_id

INNER JOIN address C ON B.address\_id = C.address\_id

INNER JOIN city D ON C.city\_id = D.city\_id

INNER JOIN country E ON D.country\_ID = E.country\_ID

WHERE city IN('Aurora', 'Atlixco', 'Xintai', 'Adoni', 'Dhule (Dhulia)', 'Kurashiki', 'Pingxiang', 'Sivas', 'Celaya', 'So Leopoldo')

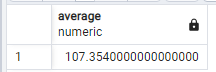
GROUP BY B.customer\_id, B.first\_name, B.last\_name, D.city, E.country

ORDER BY total\_amount\_paid DESC

LIMIT 5)

SELECT AVG(total\_amount\_paid) AS average\_amount\_paid

FROM average\_cte



**Find out how many of the top 5 customers are based within each country.**

WITH top\_customer\_count\_cte(customer\_id, first\_name, last\_name, city, country, total\_amount\_paid) AS

(SELECT

B.customer\_id,

B.first\_name,

B.last\_name,

D.city,

E.country,

SUM(A.amount) AS total\_amount\_paid

FROM payment A

INNER JOIN customer B ON A.customer\_id = B.customer\_id

INNER JOIN address C ON B.address\_id = C.address\_id

INNER JOIN city D ON C.city\_id = D.city\_id

INNER JOIN country E ON D.country\_ID = E.country\_ID

WHERE city IN('Aurora', 'Atlixco', 'Xintai', 'Adoni', 'Dhule (Dhulia)', 'Kurashiki', 'Pingxiang', 'Sivas', 'Celaya', 'So Leopoldo')

GROUP BY B.customer\_id, B.first\_name, B.last\_name, D.city, E.country

ORDER BY total\_amount\_paid DESC

LIMIT 5),

all\_customer\_count\_cte AS

(SELECT E.country,

COUNT(DISTINCT B.customer\_id) AS all\_customer\_count,

COUNT(DISTINCT E.country) AS top\_customer\_count

FROM country E

INNER JOIN city D ON E.country\_id = D.country\_id

INNER JOIN address C ON D.city\_id = C.city\_id

INNER JOIN customer B ON C.address\_id = B.address\_id

GROUP BY E.country)

SELECT E.country,

COUNT(DISTINCT B.customer\_id) AS all\_customer\_count,

COUNT(DISTINCT top\_customer\_count\_cte.customer\_id) AS top\_customer\_count

FROM country E

INNER JOIN city D ON E.country\_id = D.country\_id

INNER JOIN address C ON D.city\_id = C.city\_id

INNER JOIN customer B ON C.address\_id = B.address\_id

LEFT JOIN

Top\_customer\_count\_cte ON E.country = top\_customer\_count\_cte.country

GROUP BY E.country

ORDER BY top\_customer\_count DESC

LIMIT 5;

1. **Write 2 to 3 sentences explaining how you approached this step, for example, what you did first, second, and so on.**

First, I wrote the CTE query, then I added the original subquery in parentheses. Then, I moved the SELECT statement to the bottom, added an AS function and specified that it needs to be taken FROM the CTE.

**Step 2: Compare the performance of your CTEs and subqueries.**

1. **Which approach do you think will perform better and why?**

I think they will both perform almost the same however the CTE will be a bit more costly than the subquery.

1. **Compare the costs of all the queries by creating query plans for each one.**

**SUB QUERY COST CTE COST**

****

1. **Did the results surprise you? Write a few sentences to explain your answer.**

Their cost is identical. This surprised me a bit because the CTE is a bit longer.

**Step 3:**

**Write 1 to 2 paragraphs on the challenges you faced when replacing your subqueries with CTEs.**

This task was very challenging for me. Figuring out where to place the queries and how to rearrange them was the biggest challenge.