

### Directions

Create a new text document and call it “Answers 3.8.” You’ll be copy-pasting your queries, outputs, and written answers into this document, as you’ve done in previous tasks.

**Step 1: Find the average amount paid by the top 5 customers.**

1. Copy the query you wrote in step 3 of the task from Exercise 3.7: Joining Tables of Data into the Query Tool. This will be your subquery, so give it an alias, “total\_amount\_paid,” and add parentheses around it.
2. Write an outer statement to calculate the average amount paid.
3. Add your subquery to the outer statement. It will go in either the **SELECT**, **WHERE**, or **FROM** clause. (Hint: When referring to the subquery in your outer statement, make sure to use the subquery’s alias, “total\_amount\_paid”.)
4. If you've done everything correctly, pgAdmin 4 will require you to add an alias after the subquery. Go ahead and call it “average”.
5. Copy-paste your queries and the final data output from pgAdmin 4 into your answers document.

No limit

Query   Query History

```

1 SELECT AVG(total_amount_paid) AS average
2 FROM
3     (SELECT B.customer_id, B.first_name, B.last_name, D.city, E.country,
4         SUM(A.amount) AS total_amount_paid
5      FROM payment A
6      INNER JOIN customer B ON A.customer_id = B.customer_id
7      INNER JOIN address C ON B.address_id = C.address_id
8      INNER JOIN city D ON C.city_id = D.city_id
9      INNER JOIN country E ON D.country_ID = E.country_ID
10     WHERE city IN ('Aurora', 'Atlixco','Xintai','Adoni', 'Dhule (Duhlia)',
11                   'Kursahiki','Pingxiang', 'Sivas','Celaya','So Leopoldo')
12    GROUP BY B.customer_id, B.first_name, B.last_name, D.City, E.country
13   ORDER BY total_amount_paid DESC
14   LIMIT 5) AS total_amount_paid

```

Data Output   Messages   Notifications

	average numeric	
1	107.354000000000000000	

## Step 2: Find out how many of the top 5 customers are based within each country.

Your final output should include 3 columns:

- “country”
- “all\_customer\_count” with the total number of customers in each country
- “top\_customer\_count” showing how many of the top 5 customers live in each country

You'll notice that this step is quite difficult. We've broken down each part and provided you with some helpful hints below:

1. Copy the query from step 3 of task 3.7 into the Query Tool and add parentheses around it. This will be your inner query.
2. Write an outer statement that counts the number of customers living in each country. You'll need to refer to your entity relationship diagram or data dictionary in order to do this. The information you need is in different tables, so you'll have to use a join. To get the count for each country, use `COUNT(DISTINCT)` and `GROUP BY`. Give your second column the alias “all\_customer\_count” for readability.
3. Place your inner query in the outer query. Since you want to merge the entire output of the outer query with the information from your inner query, use a left join to connect the two queries on the “country” column.
4. Add a left join after your outer query, followed by the subquery in parentheses.
5. Give your subquery an alias so you can refer to it in your outer query, for example, “top\_5\_customers”.
6. Remember to specify which columns to join the two tables on using `ON`. Both `ON` and the column names should follow the alias.
7. Count the top 5 customers for the third column using `GROUP BY` and `COUNT(DISTINCT)`. Give this column the alias “top\_customer\_count”.
8. Copy-paste your query and the data output into your “Answers 3.8” document.

The screenshot shows a SQL Query Tool interface. The left pane displays a SQL query with line numbers 1 through 35. The query is a complex nested query using multiple joins and subqueries to calculate the total number of customers per country and the number of top 5 customers per country. The right pane shows the 'Data Output' tab with a table of results.

```
1 SELECT D.country,
2 COUNT(DISTINCT A.customer_id) AS all_customer_count,
3 COUNT(DISTINCT top_5_customers.customer_id) AS top_customer_count
4 FROM country D
5 INNER JOIN city C ON D.country_id = C.country_id
6 INNER JOIN address B ON C.city_id = B.city_id
7 INNER JOIN customer A ON B.address_id = A.address_id
8 LEFT JOIN (SELECT A.customer_id, A.first_name, A.last_name, c.city, d.country, SUM(amount) AS total_amount_paid
9 FROM customer A
10 INNER JOIN address B ON A.address_id = B.address_id
11 INNER JOIN city C ON B.city_id = C.city_id
12 INNER JOIN country D ON C.country_id = D.country_id
13 INNER JOIN payment E ON A.customer_id = E.customer_id
14 WHERE c.city IN (SELECT C.city
15 FROM customer A
16 INNER JOIN address B ON A.address_id = B.address_id
17 INNER JOIN city C ON B.city_id = C.city_id
18 INNER JOIN country D ON C.country_id = D.country_id
19 WHERE D.country IN (SELECT D.country
20 FROM customer A
21 INNER JOIN address B ON A.address_id = B.address_id
22 INNER JOIN city C ON B.city_id = C.city_id
23 INNER JOIN country D ON C.country_id = D.country_id
24 GROUP BY country
25 ORDER BY COUNT (customer_id) DESC
26 LIMIT 10)
27 GROUP BY D.country, C.city
28 ORDER BY COUNT (customer_id) DESC
29 LIMIT 10)
30 GROUP BY A.customer_id, A.first_name, A.last_name, c.city, d.country
31 ORDER BY total_amount_paid DESC
32 LIMIT 5) AS top_5_customers ON D.country = top_5_customers.country
33 GROUP BY D.country, top_5_customers.country
34 ORDER BY top_customer_count DESC
35 LIMIT 5
```

	country character varying (50)	all_customer_count bigint	top_customer_count bigint
1	Japan	31	1
2	Mexico	30	1
3	China	53	1
4	India	60	1
5	United States	36	1

**Step 3:**

1. Write 1 to 2 short paragraphs on the following:

- Do you think steps 1 and 2 could be done without using subqueries?
- When do you think subqueries are useful?

Yes, it can be done without utilizing subqueries, but it would take a longer code (query) to do so, and each step must be written individually. Subqueries are always useful when dealing with a lot of data. Specially, when data is updated frequently is better to use subqueries rather than doing everything manually (which will take longer)

**Step 4:**

Save your “Answers 3.8” document as a PDF and upload it here for your tutor to review.