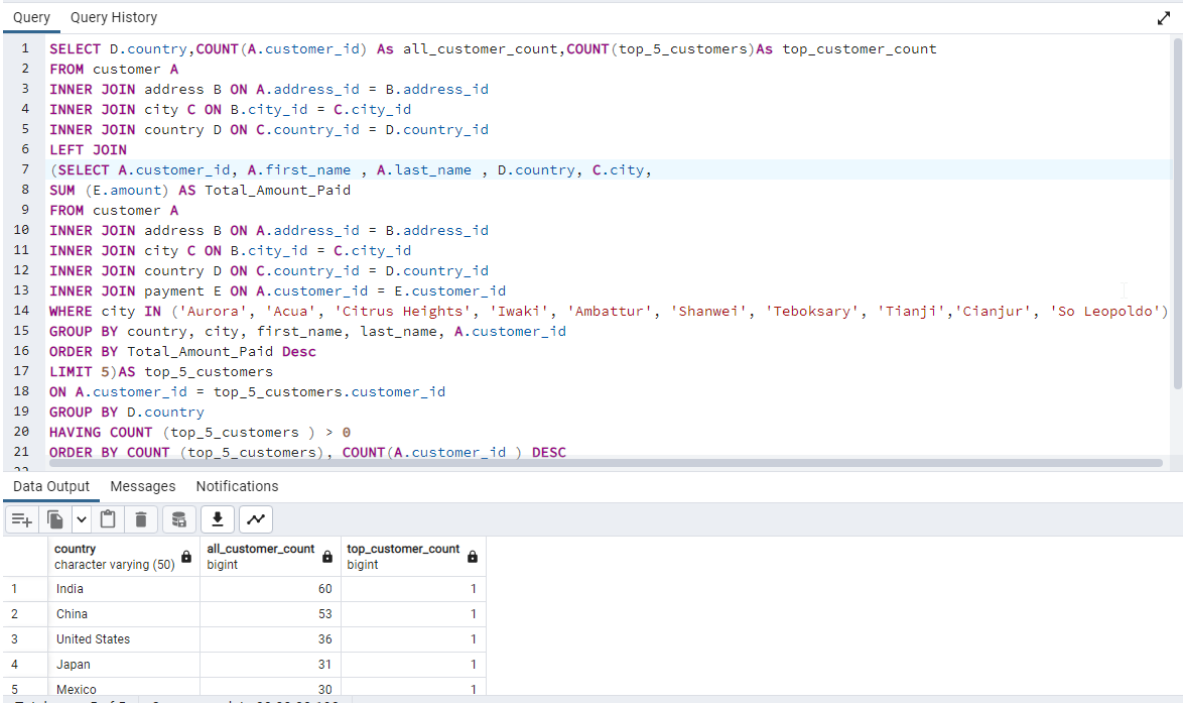
Exercise 3.8 Performing Subqueries

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

```
SELECT AVG(total_amount_paid)AS average
FROM
(SELECT A.customer_id, A.first_name , A.last_name , D.country, C.city,
SUM (E.amount) AS Total_Amount_Paid
FROM customer A
INNER JOIN address B ON A.address_id = B.address_id
INNER JOIN city C ON B.city_id = C.city_id
INNER JOIN country D ON C.country_id = D.country_id
INNER JOIN payment E ON A.customer_id = E.customer_id
WHERE city IN ('Aurora', 'Acua', 'Citrus Heights', 'Iwaki', 'Ambattur', 'Shanwei', 'Teboksary', 'Tianji',
'Cianjur', 'So Leopoldo')
GROUP BY country, city, first_name, last_name, A.customer_id
ORDER BY Total_Amount_Paid Desc
LIMIT 5)AS total_amount_paid
```

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

SELECT D.country,COUNT(A.customer_id) As all_customer_count,COUNT(top_5_customers)As top_customer_count
FROM customer A
INNER JOIN address B ON A.address_id = B.address_id
INNER JOIN city C ON B.city_id = C.city_id
INNER JOIN country D ON C.country_id = D.country_id
LEFT JOIN
(SELECT A.customer_id, A.first_name , A.last_name , D.country, C.city,
SUM (E.amount) AS Total_Amount_Paid
FROM customer A
INNER JOIN address B ON A.address_id = B.address_id
INNER JOIN city C ON B.city_id = C.city_id
INNER JOIN country D ON C.country_id = D.country_id
INNER JOIN payment E ON A.customer_id = E.customer_id
WHERE city IN ('Aurora', 'Acua', 'Citrus Heights', 'Iwaki', 'Ambattur', 'Shanwei', 'Teboksary', 'Tianji','Cianjur', 'So Leopoldo')
GROUP BY country, city, first_name, last_name, A.customer_id
ORDER BY Total_Amount_Paid Desc
LIMIT 5)AS top_5_customers
ON A.customer_id = top_5_customers.customer_id
GROUP BY D.country
HAVING COUNT (top_5_customers) > 0
ORDER BY COUNT (top_5_customers), COUNT(A.customer_id) DESC



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?

      Yes ,we can achieve the same results without a subquery, may be we can join the payment table to get an average.

    - When do you think subqueries are useful?

      Depending on what you want to achieve, subqueries can be used within the `SELECT`, `FROM`, or `WHERE` clauses. They can also be used as part of a `JOIN` statement. May use in big dataset. But before making that decision, however, it's always worth making a query plan to test the relative cost of two queries.