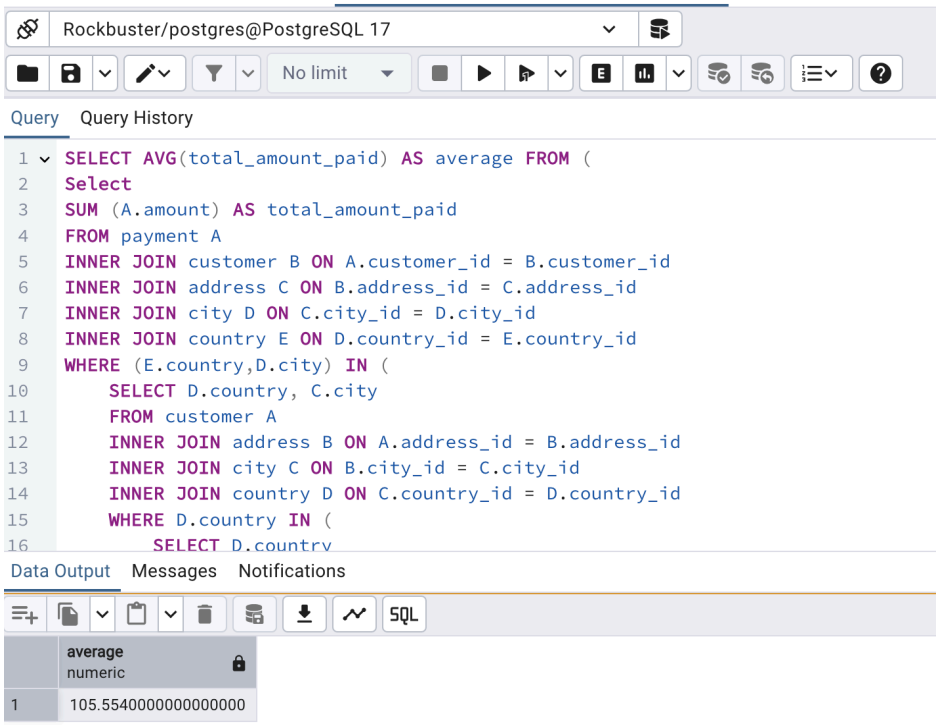
Data Immersion
Exercise 3.8
Performing Subqueries

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

Query →

```
SELECT country,  AVG(total_amount_paid) AS average FROM (
Select
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 (E.country,D.city) IN (
        SELECT D.country, C.city
        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
        WHERE D.country IN (
                SELECT D.country
                FROM customer A
                JOIN address B ON A.address_id = B.address_id
                JOIN city C ON B.city_id = C.city_id
                JOIN country D ON C.country_id = D.country_id
                GROUP BY D.country
                ORDER BY COUNT(A.customer_id) DESC
                LIMIT 10 )
                GROUP BY D.country, C.city
                ORDER BY COUNT (A.customer_id) DESC
                LIMIT 10 )
                GROUP BY B.customer_id, B.first_name, B.last_name, D.city, E.country
                ORDER BY total_amount_paid DESC
                LIMIT 5) AS total_amount_paid;
```

Output:



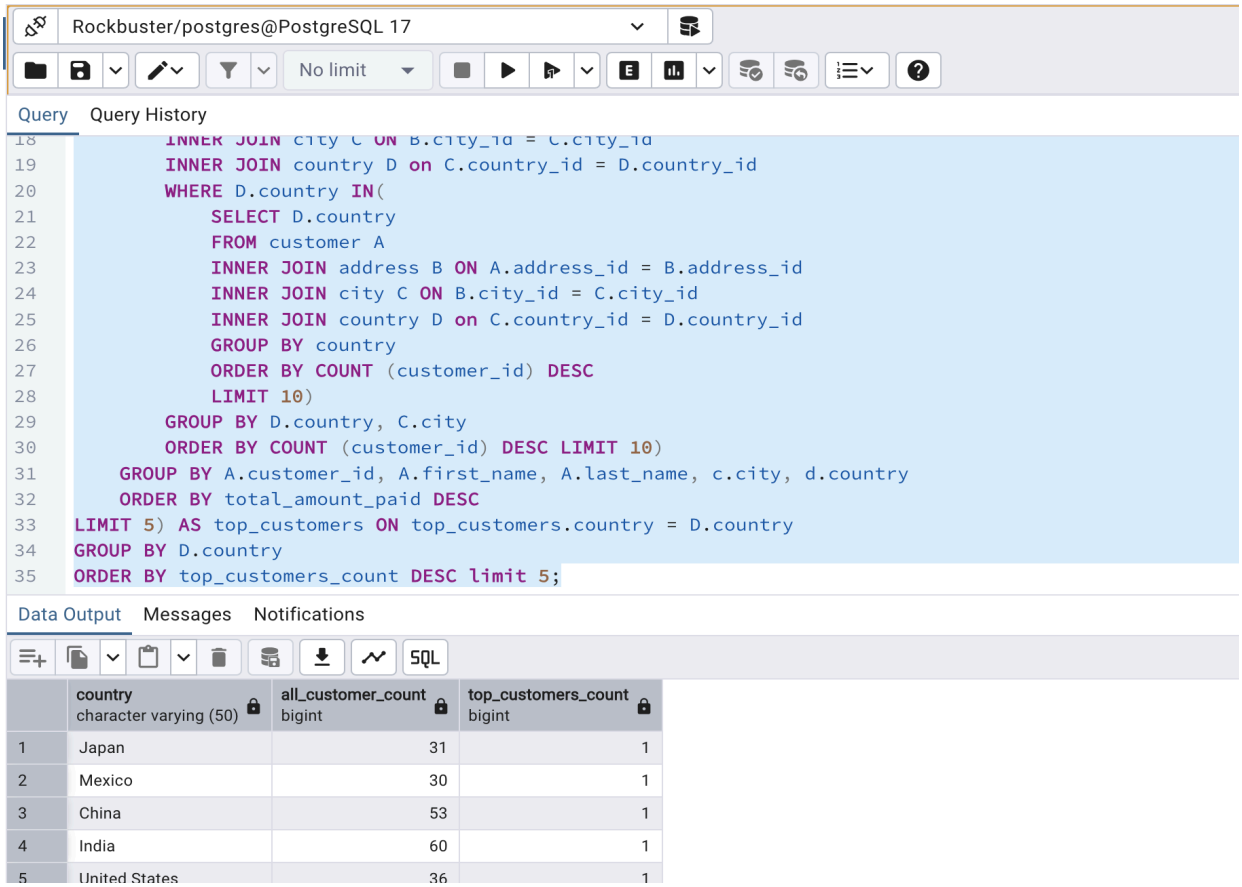
Step 2: Find out how many of the top 5 customers you identified in step 1 are based within each country

Query:

SELECT D.country, COUNT(DISTINCT A.customer_id) AS all_customer_count,
COUNT(DISTINCT top_customers.customer_id) AS top_customers_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, c.city, d.country, SUM(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 c.city IN(
        SELECT C.city
        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
WHERE D.country IN(
SELECT D.country
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
GROUP BY country
ORDER BY COUNT (customer_id) DESC
LIMIT 10)
GROUP BY D.country, C.city
ORDER BY COUNT (customer_id) DESC LIMIT 10)
GROUP BY A.customer_id, A.first_name, A.last_name, c.city, d.country
ORDER BY total_amount_paid DESC
LIMIT 5) AS top_customers ON top_customers.country = D.country
GROUP BY D.country
ORDER BY top_customers_count DESC limit 5;

Output:



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

Do you think steps 1 and step 2 could be done without using subqueries?
→ Technically, steps 1 and 2 can be completed without subqueries. I could have used a **VIEW** table to handle these steps instead. The choice depends on how frequently these steps will be needed. If it's a one-time task, using subqueries might be more convenient, but if they are used repeatedly, a **VIEW** table would be a better option.
When do you think are subqueries useful?
→ I believe subqueries are more useful when working with smaller datasets since, with larger datasets, the query might need to run multiple times, slowing down the process. Subqueries also help simplify complex queries by breaking them into manageable parts, making them easier to read and understand.