Task 3.9 Common Table Expressions

By Lee Heng Chuah

In this task, you will convert your subqueries from task 3.8 into CTEs to make your code easier to read.

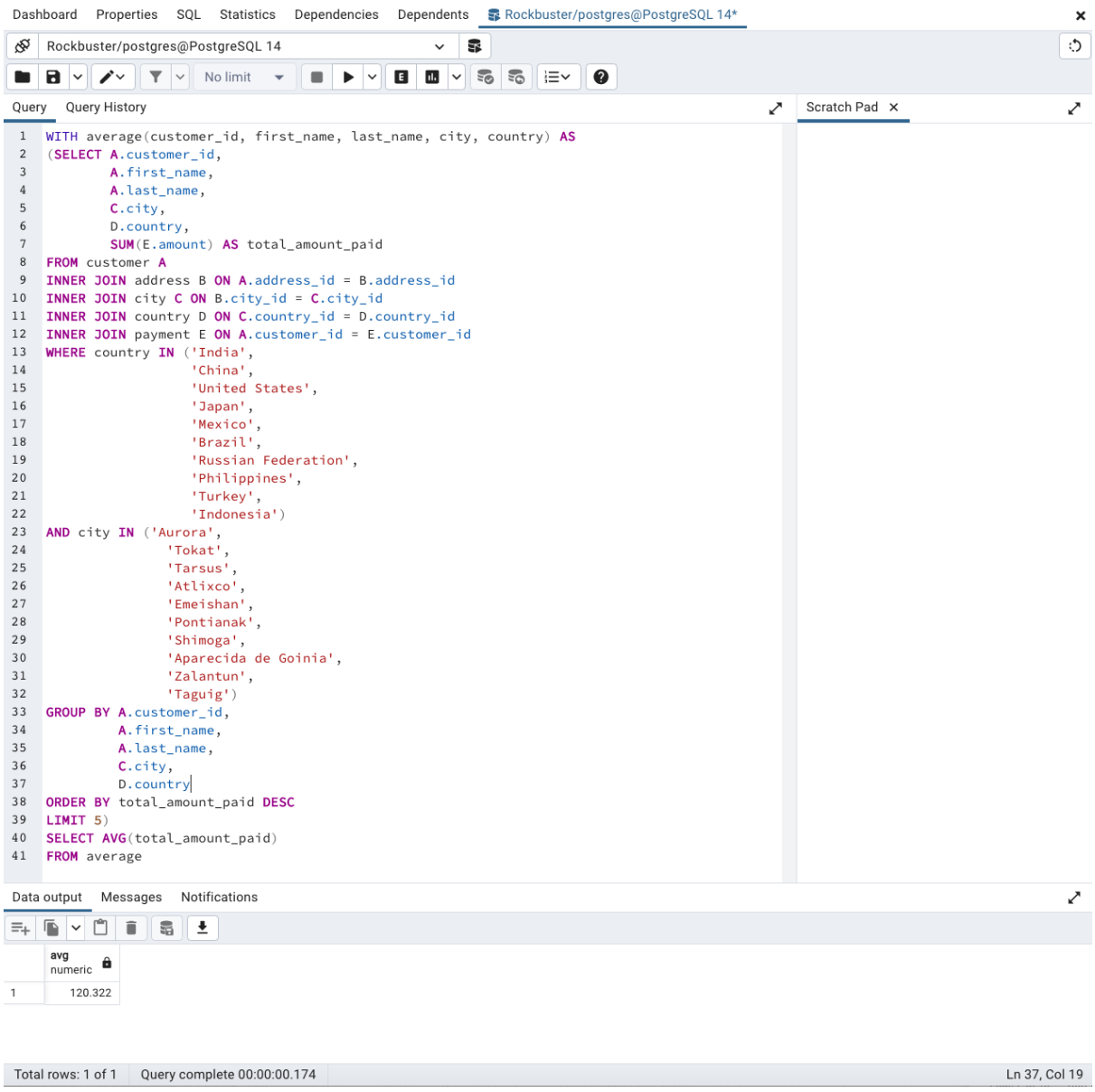
Directions:

Create a new text document and call it “Answers 3.9”. You will save your queries, outputs and written answers in this document.

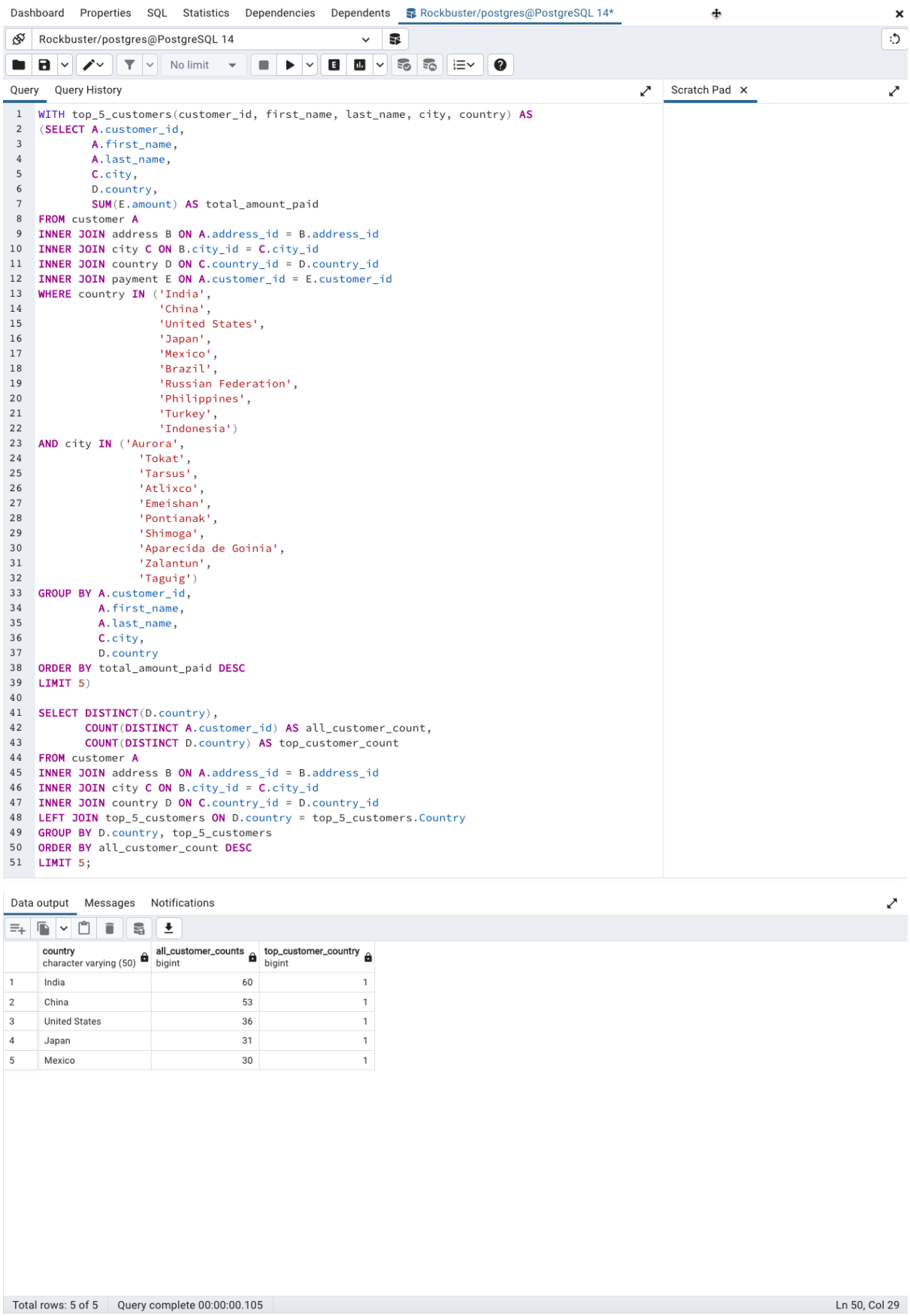
Step 1: Answer the business questions from step 1 and 2 of task 3.8 using CTEs

1. Rewrite your queries from steps 1 and 2 of task 3.8 as CTEs
2. Copy-paste your CTEs and their outputs into your answers document.

   Rewrite Step 1:



Rewrite Step 2:



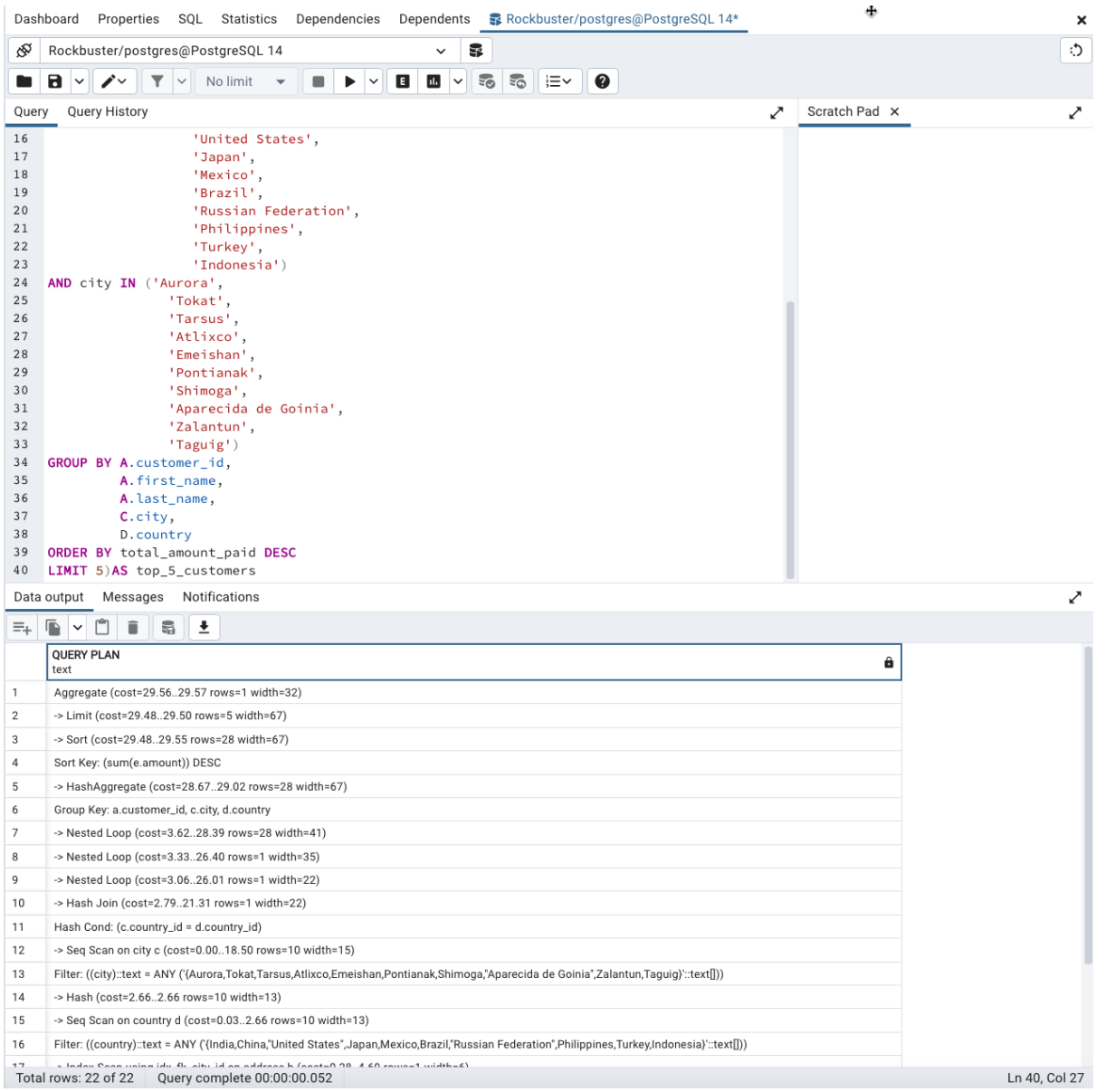
3. Write 2 to 3 sentences explaining how you approached this step, for example, what you did first, second and so on.
   I first define the database I required. And then, I run the query of total_amount_paid. After completing the query of total_amount_paid, I define the CTE using the WITH clause, give the CTE a name and provide the AS keyword. I finally add the total_amount_paid query into parentheses. I finish the main statement with SELECT, FROM CTE, GROUP BY, ORDER and LIMIT the results I need.

Step 2: Compare the performance of your CTEs and subqueries

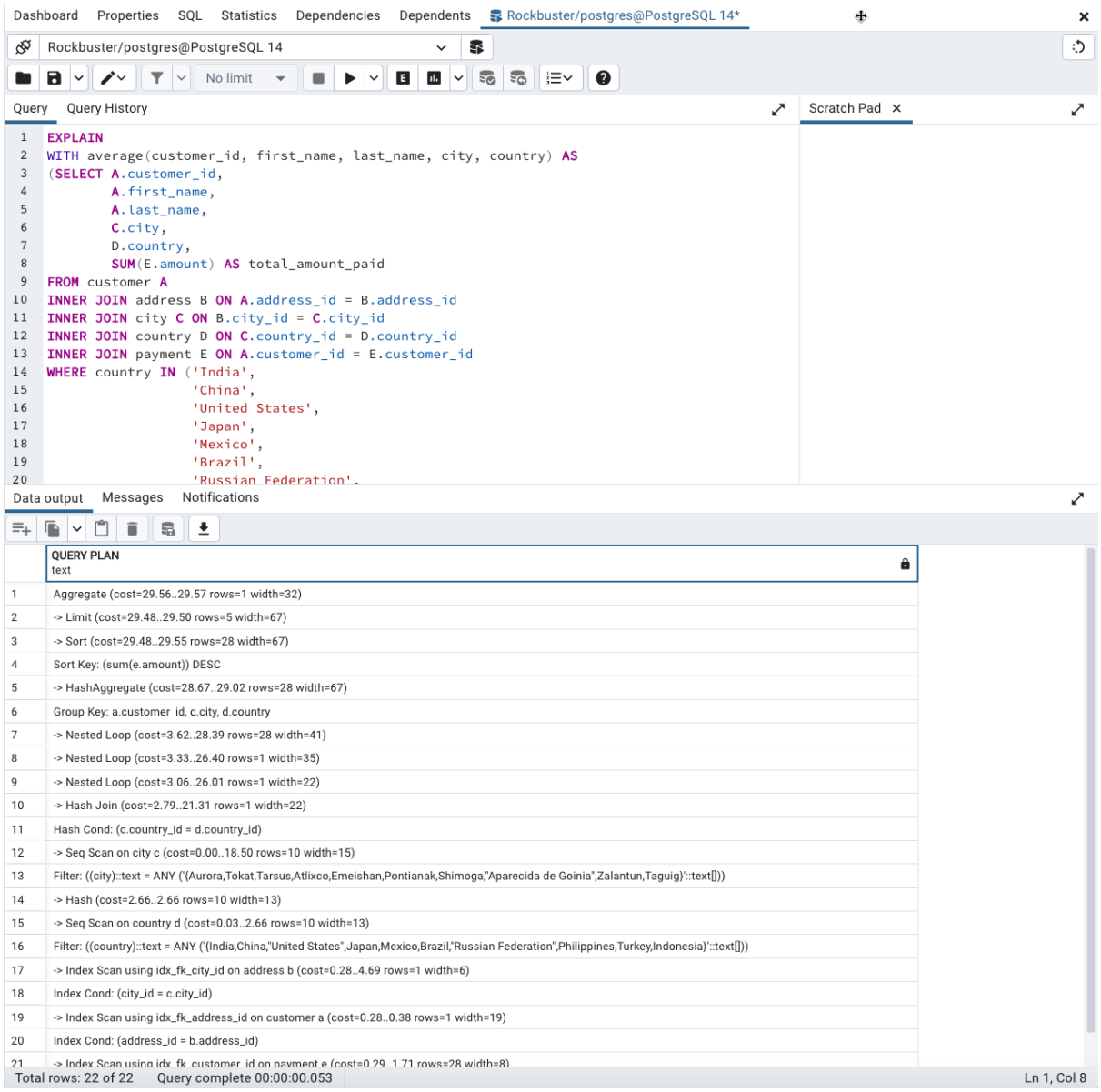
1. Which approach do you think will perform better and why?
   I personally think the CTE would perform better as CTE is defined at the start of the main query, which makes them easier to spot in the main query. As CTE is determined at the beginning of the main query, it makes the CTE can replace any subquery easily.

2. Compare the costs of all the queries by creating query plans for each one.
3. The EXPLAIN command gives you an estimated cost. To find out the actual speed of your queries, run them in PgAdmin 4. After each query has been run, a pop-up window will display its speed in milliseconds.

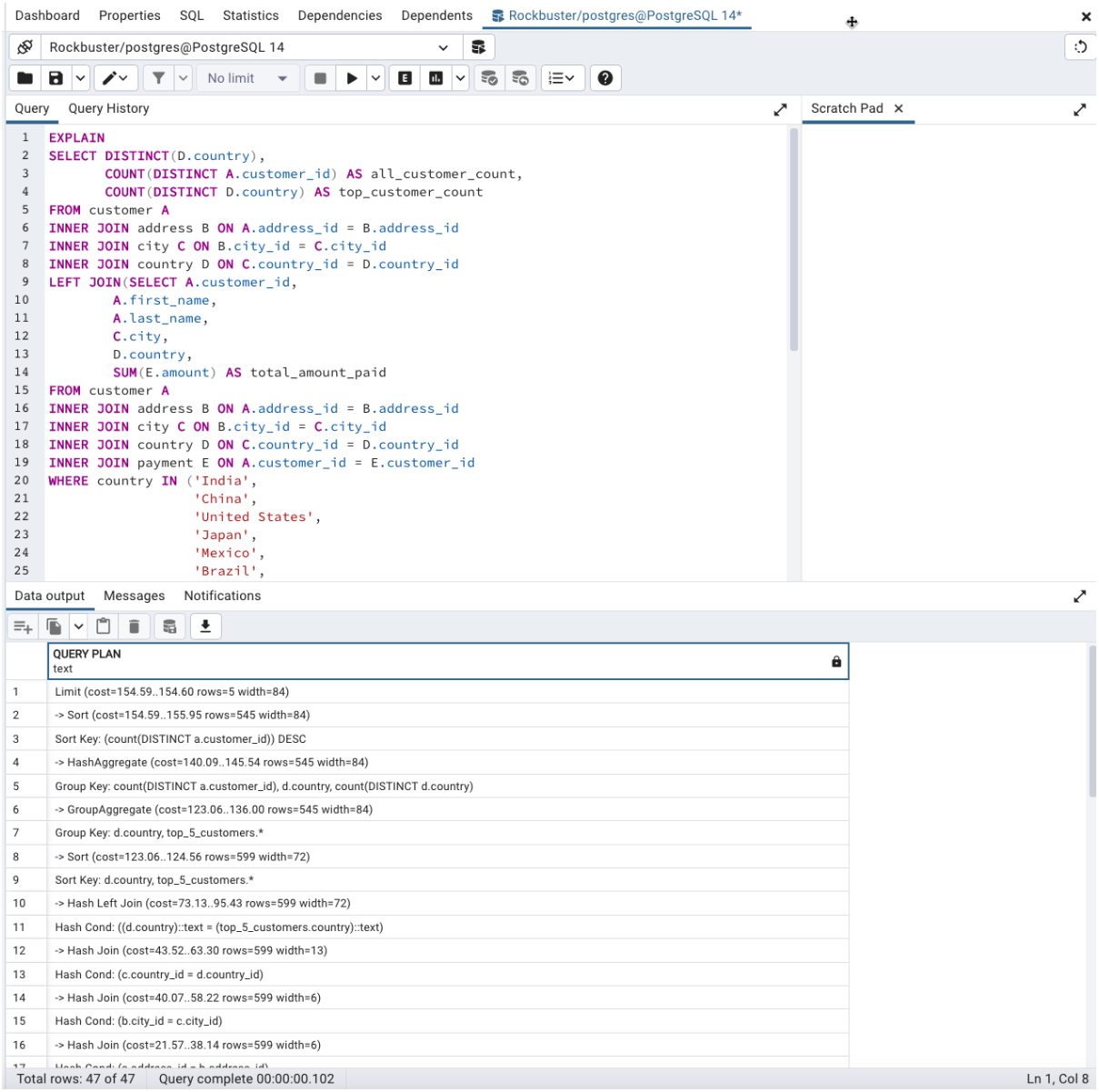
STEP 1: Exercise 3.8



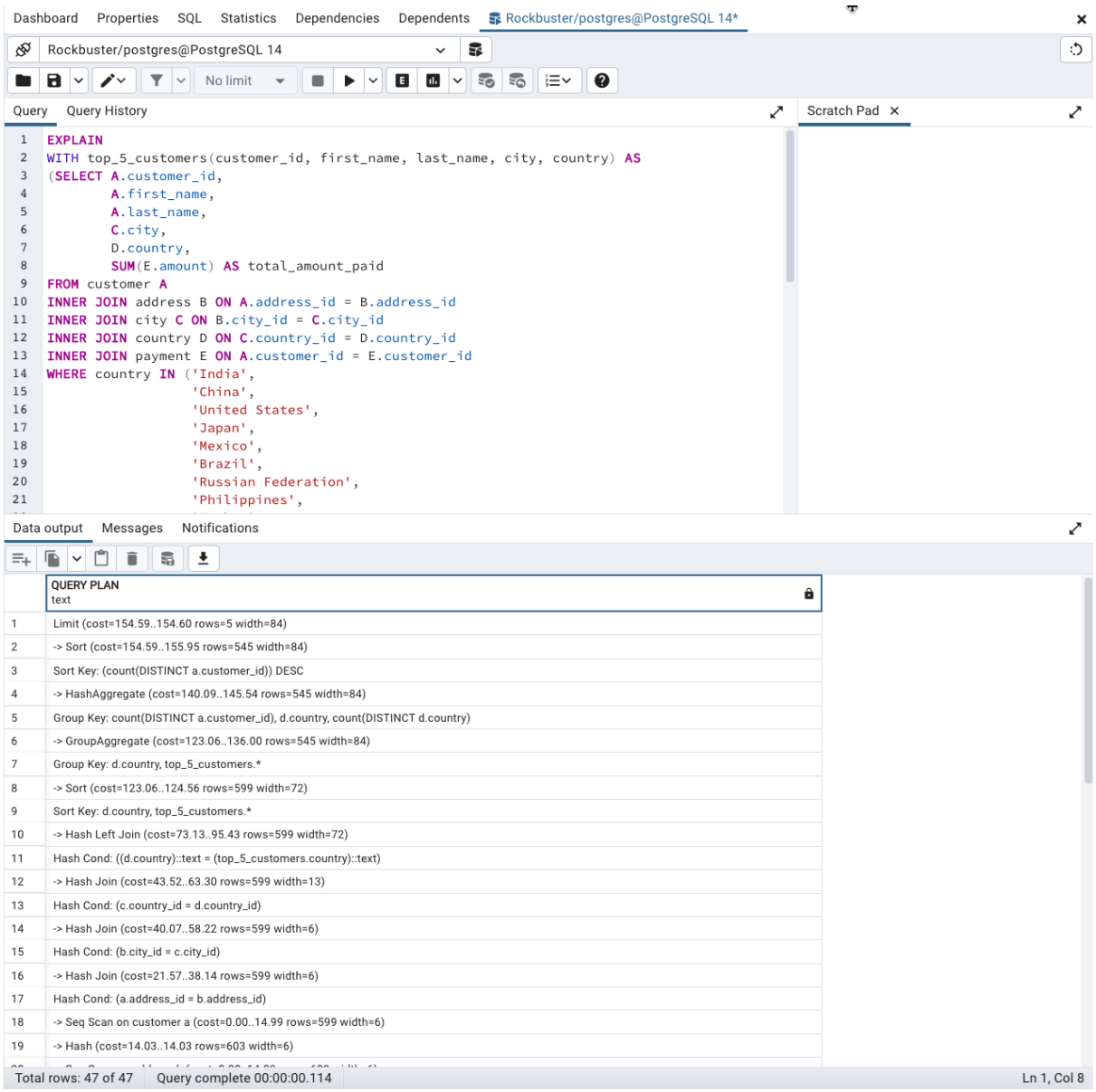
STEP 1: Exercise 3.9



STEP 2: Exercise 3.8



STEP 2: Exercise 3.9



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

   Yes, the results totally surprised me. Both STEP 1 & STEP 2 run the same costs, either subqueries or CTE. Both CTE and subquery achieved the same results. From an accessibility, readability, and performance perspective, CTE makes life much easier.

Step 3:

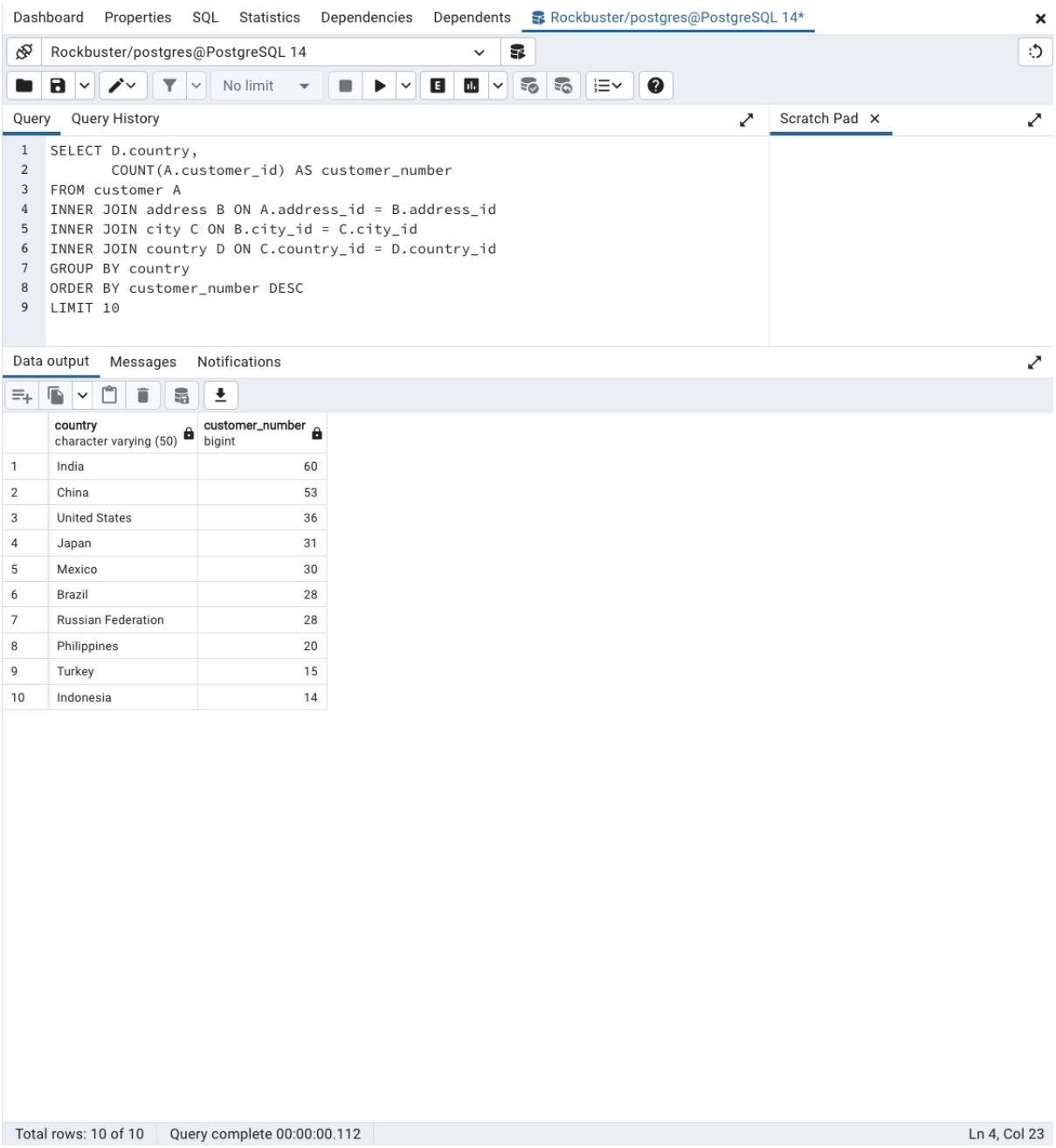
Write 1 to 2 short paragraphs on the challenges you faced when replacing your subqueries with CTEs.

Compared with subqueries, I found CTE is handy as it lets me create the query with the information I need at the start of the main query, making it easier to spot in the main query. I then just write the main query after the CTE. This makes my code much cleaner and easier to read than subqueries. While subquery could be challenged as these queries have been nesting or referenced in different statements under the main statement. I personally found subqueries are far more challenging than CTEs.

Step 4:

Save your “Answers 3.9” document as a PDF and upload it here for your tutor to review.

a. Copy-paste your query and its output into your answers document

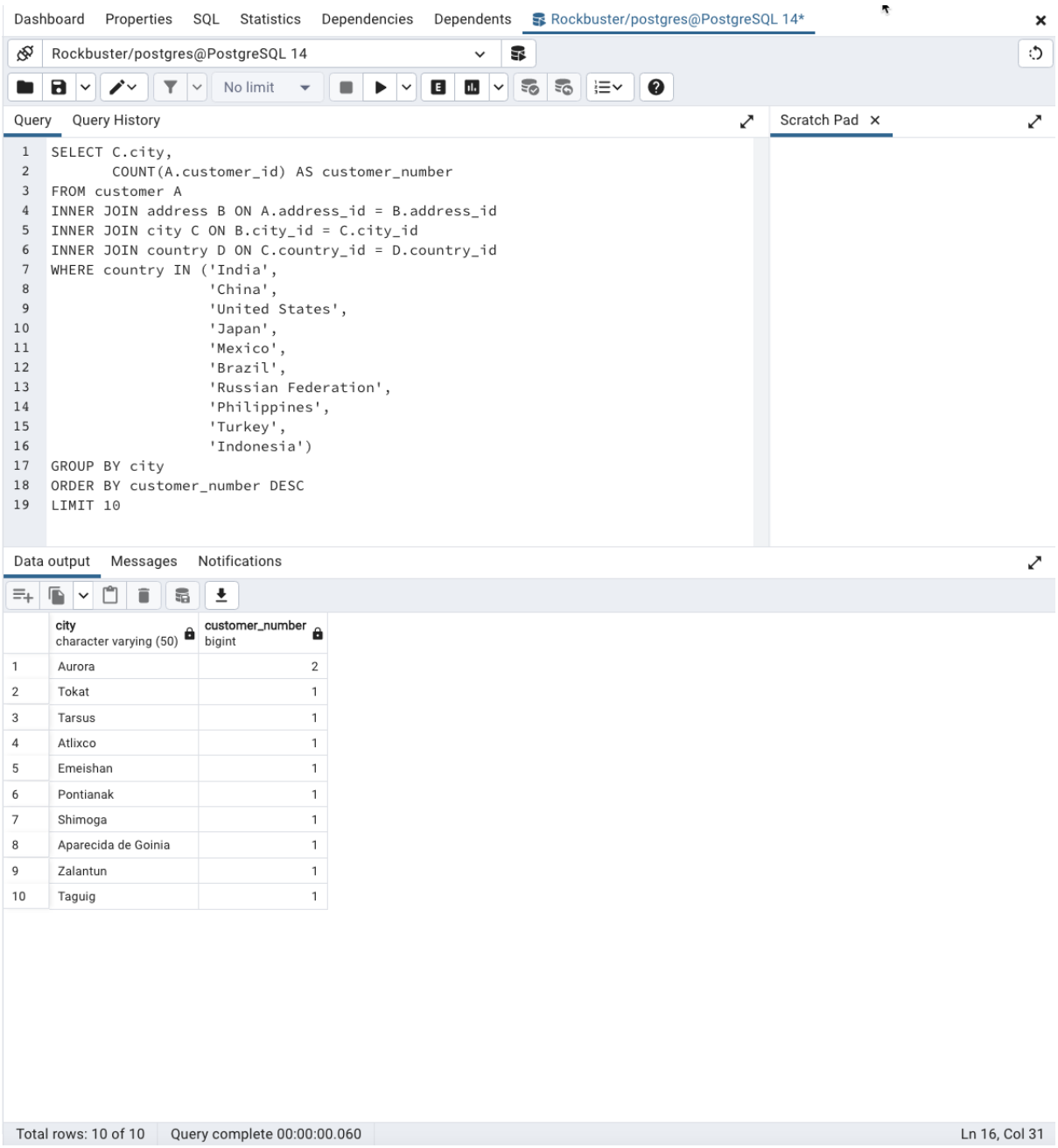


b. Write a few sentences on how you approached this query and why. It is important that you can explain your thought process when writing queries, especially for future interviews.

I revisited and understood the customer, address, city, and country data. I then joined the customer data with the address, city, and country data with the inner join query. I put the GROUP BY query and counted the customer based on country. Later, I put the ORDER BY command based on customer numbers from highest to lowest and LIMIT to 10.

2. Write a query to find the top 10 cities within the top 10 countries identified in step 1.

a. Copy-paste your query and its output into your answers document



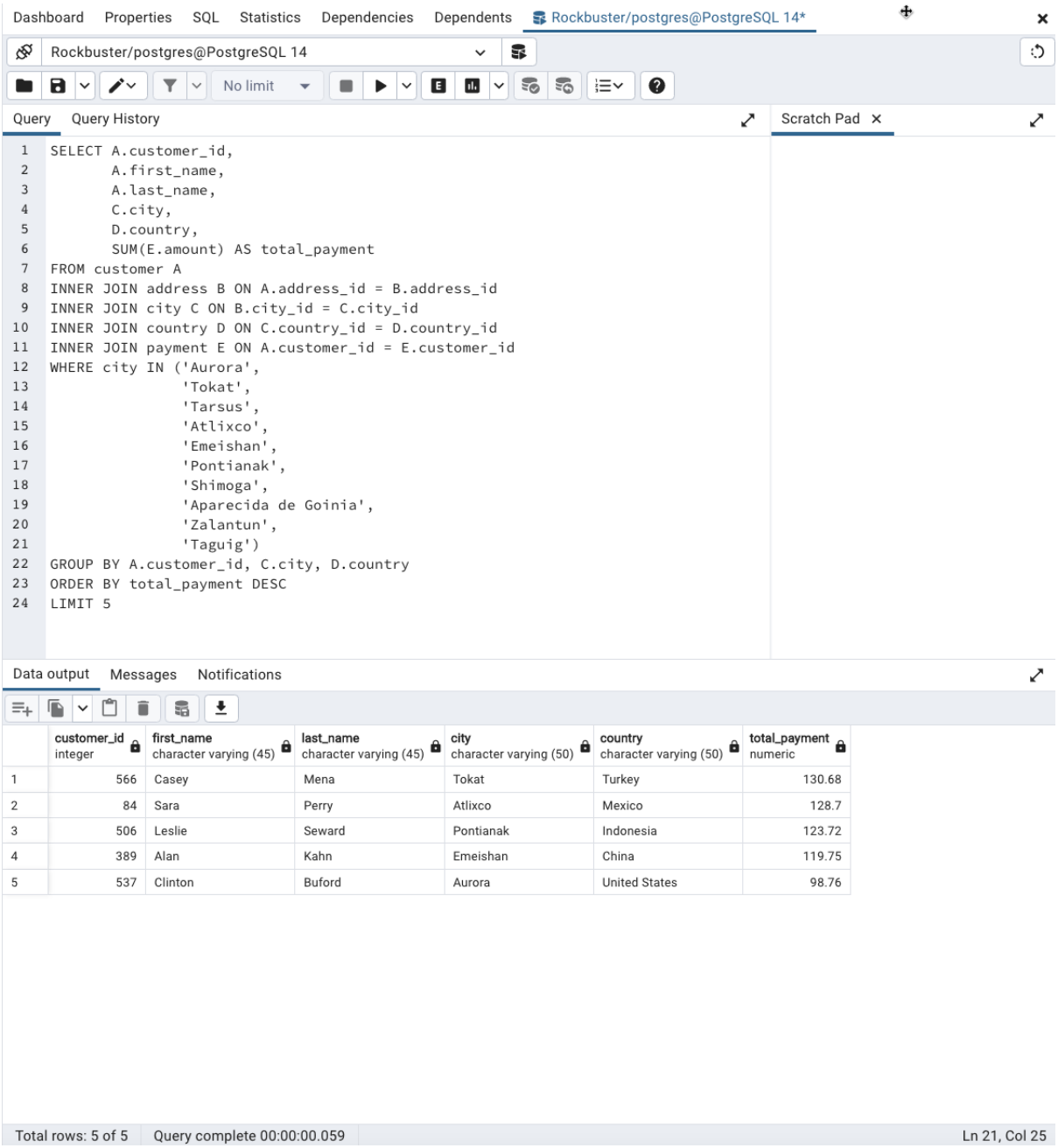
b. Write a short explanation of how you approached this query and why.

I revisited my existing query. I changed the SELECT from country to city. To find the top 10 cities within the top 10 countries, I listed out the top 10 countries by the WHERE query. Lastly, I changed the GROUP BY from country to city.

3. Write a query to find the top 5 customers in the top 10 cities who have paid the highest total amounts to Rockbuster. The customer team would like to reward them for their loyalty.

a. Tip: After the join syntax, you will need to use the WHERE clause with an operator, followed by GROUP BY and ORDER BY. Your output should include the following columns: Customer ID, Customer First Name and Last Name, Country, City, Total Amount Paid

b. Copy-past your query and its output into your answers document



4. Save your “Answer 3.7” document as a PDF and upload it here for your tutor to review.