

## FIRST QUERY FROM EXERCISE 3.8 – Rewritten with CTE

Building blocks in this query:

1. Top 10 countries by customer count (top\_countries) — CTE 1
  2. Top 10 cities within those top countries by customer count (top\_cities) — CTE 2 (builds on CTE 1)
  3. Total amount spent by each customer in those top cities (customer\_payments) — CTE 3 (builds on CTE 2)
  4. Top 5 customers in those cities (top\_five\_customers)– CTE 4 (builds on CTE 3)
  5. Final query giving us the average total paid of those top 5 customers
- 

--Average amount spent by top 5 highest-paying customers located in top 10 cities within top 10 countries(both by customer count)

WITH top\_countries AS (

SELECT cntry.country

FROM customer cust

INNER JOIN address addr ON cust.address\_id = addr.address\_id

INNER JOIN city cty ON addr.city\_id = cty.city\_id

INNER JOIN country cntry ON cty.country\_id = cntry.country\_id

GROUP BY cntry.country

ORDER BY COUNT(cust.customer\_id) DESC

LIMIT 10

),

top\_cities AS (

SELECT cty.city

FROM customer cust

INNER JOIN address addr ON cust.address\_id = addr.address\_id

INNER JOIN city cty ON addr.city\_id = cty.city\_id

INNER JOIN country cntry ON cty.country\_id = cntry.country\_id

WHERE cntry.country IN (SELECT country FROM top\_countries)

GROUP BY cntry.country, cty.city

ORDER BY COUNT(cust.customer\_id) DESC

```
LIMIT 10
),
customer_payments AS (
  SELECT
    cust.customer_id,
    cust.first_name,
    cust.last_name,
    cty.city,
    cntry.country,
    SUM(pmt.amount) AS total_amount_paid
  FROM customer cust
  INNER JOIN address addr ON cust.address_id = addr.address_id
  INNER JOIN city cty ON addr.city_id = cty.city_id
  INNER JOIN country cntry ON cty.country_id = cntry.country_id
  INNER JOIN payment pmt ON cust.customer_id = pmt.customer_id
  WHERE cty.city IN (SELECT city FROM top_cities)
  GROUP BY cust.customer_id, cust.first_name, cust.last_name, cty.city, cntry.country
),
top_five_customers AS (
  SELECT *
  FROM customer_payments
  ORDER BY total_amount_paid DESC
  LIMIT 5
)
SELECT AVG(total_amount_paid) AS average_top_five
FROM top_five_customers;
```

Query Query History

```
1  --Average amount spent by top 5 highest-paying customers located in top 10 cities within top 10 countries(both by customer count)
2  v WITH top_countries AS (
3      SELECT cntry.country
4      FROM customer cust
5      INNER JOIN address addr ON cust.address_id = addr.address_id
6      INNER JOIN city cty ON addr.city_id = cty.city_id
7      INNER JOIN country cntry ON cty.country_id = cntry.country_id
8      GROUP BY cntry.country
9      ORDER BY COUNT(cust.customer_id) DESC
10     LIMIT 10
11 ),
12 top_cities AS (
13     SELECT cty.city
14     FROM customer cust
15     INNER JOIN address addr ON cust.address_id = addr.address_id
16     INNER JOIN city cty ON addr.city_id = cty.city_id
17     INNER JOIN country cntry ON cty.country_id = cntry.country_id
18     WHERE cntry.country IN (SELECT country FROM top_countries)
19     GROUP BY cntry.country, cty.city
20     ORDER BY COUNT(cust.customer_id) DESC
21     LIMIT 10
22 ),
23 customer_payments AS (
24     SELECT
25         cust.customer_id,
26         cust.first_name,
27         cust.last_name,
28         cty.city,
29         cntry.country,
30         SUM(pmt.amount) AS total_amount_paid
31     FROM customer cust
32     INNER JOIN address addr ON cust.address_id = addr.address_id
33     INNER JOIN city cty ON addr.city_id = cty.city_id
34     INNER JOIN country cntry ON cty.country_id = cntry.country_id
35     INNER JOIN payment pmt ON cust.customer_id = pmt.customer_id
36     WHERE cty.city IN (SELECT city FROM top_cities)
37     GROUP BY cust.customer_id, cust.first_name, cust.last_name, cty.city, cntry.country
38 ),
```

```

38 ),
39 top_five_customers AS (
40     SELECT *
41     FROM customer_payments
42     ORDER BY total_amount_paid DESC
43     LIMIT 5
44 )
45 SELECT AVG(total_amount_paid) AS average_top_five
46 FROM top_five_customers;
47

```

Data Output Messages Notifications



|   | average_top_five<br>numeric |
|---|-----------------------------|
| 1 | 105.5540000000000000        |

## SECOND QUERY FROM EXERCISE 3.8 – Rewritten with CTE

There are five building blocks to this:

1. All countries' total customer count (CTE 1)
2. Top 10 countries by customer count (CTE 2)

3. Top 10 cities in those top 10 countries by customer count (CTE 3 building on CTE 2)
  4. Top 5 customers in those top cities (in those top 10 countries) by total amount paid (CTE 4 building on CTE 3)
  5. The final query combining everything: lists all countries, the total customer count from CTE 1, and the top 5 customer count from CTE 4, matched for all countries (that's why a LEFT JOIN, not INNER JOIN)
- 

--all countries' total customer count

WITH all\_countries AS (

SELECT

country.country,

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

FROM customer

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

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

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

GROUP BY country.country

),

--top 10 countries by customer count

top\_10\_countries AS (

SELECT

country.country

FROM customer

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

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

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

GROUP BY country.country

ORDER BY COUNT(customer.customer\_id) DESC

```
LIMIT 10
),
--top 10 cities in top 10 countries
top_10_cities AS (
SELECT
    city.city
FROM customer
INNER JOIN address ON customer.address_id = address.address_id
INNER JOIN city ON address.city_id = city.city_id
INNER JOIN country ON city.country_id = country.country_id
WHERE country.country IN (SELECT country FROM top_10_countries)
GROUP BY country.country, city.city
ORDER BY COUNT(customer.customer_id) DESC
LIMIT 10
),
--top 5 customers in top 10 cities by total amount paid
top_5_customers AS (
SELECT
    customer.customer_id,
    country.country
FROM customer
INNER JOIN address ON customer.address_id = address.address_id
INNER JOIN city ON address.city_id = city.city_id
INNER JOIN country ON city.country_id = country.country_id
INNER JOIN payment ON customer.customer_id = payment.customer_id
WHERE city.city IN (SELECT city FROM top_10_cities)
GROUP BY customer.customer_id, country.country
```

```
ORDER BY SUM(payment.amount) DESC
LIMIT 5
)
SELECT
  all_countries.country,
  all_countries.all_customer_count,
  COUNT(top_5_customers.customer_id) AS top_5_customer_count
FROM all_countries
LEFT JOIN top_5_customers
  ON all_countries.country = top_5_customers.country
GROUP BY all_countries.country, all_countries.all_customer_count
ORDER BY all_countries.all_customer_count DESC;
```

---

```
1  WITH all_countries AS (  
2      SELECT  
3          country.country,  
4          COUNT(DISTINCT customer.customer_id) AS all_customer_count  
5      FROM customer  
6      INNER JOIN address ON customer.address_id = address.address_id  
7      INNER JOIN city ON address.city_id = city.city_id  
8      INNER JOIN country ON city.country_id = country.country_id  
9      GROUP BY country.country  
10 ),  
11 --top 10 countries by customer count  
12 top_10_countries AS (  
13     SELECT  
14         country.country  
15     FROM customer  
16     INNER JOIN address ON customer.address_id = address.address_id  
17     INNER JOIN city ON address.city_id = city.city_id  
18     INNER JOIN country ON city.country_id = country.country_id  
19     GROUP BY country.country  
20     ORDER BY COUNT(customer.customer_id) DESC  
21     LIMIT 10  
22 ),  
23 --top 10 cities in top 10 countries  
24 top_10_cities AS (  
25     SELECT  
26         city.city  
27     FROM customer  
28     INNER JOIN address ON customer.address_id = address.address_id  
29     INNER JOIN city ON address.city_id = city.city_id  
30     INNER JOIN country ON city.country_id = country.country_id  
31     WHERE country.country IN (SELECT country FROM top_10_countries)  
32     GROUP BY country.country, city.city  
33     ORDER BY COUNT(customer.customer_id) DESC  
34     LIMIT 10  
35 ),
```



```
36 --top 5 customers in top 10 cities by total amount paid
37 top_5_customers AS (
38     SELECT
39         customer.customer_id,
40         country.country
41     FROM customer
42     INNER JOIN address ON customer.address_id = address.address_id
43     INNER JOIN city ON address.city_id = city.city_id
44     INNER JOIN country ON city.country_id = country.country_id
45     INNER JOIN payment ON customer.customer_id = payment.customer_id
46     WHERE city.city IN (SELECT city FROM top_10_cities)
47     GROUP BY customer.customer_id, country.country
48     ORDER BY SUM(payment.amount) DESC
49     LIMIT 5
50 )
51 SELECT
52     all_countries.country,
53     all_countries.all_customer_count,
54     COUNT(top_5_customers.customer_id) AS top_5_customer_count
55 FROM all_countries
56 LEFT JOIN top_5_customers
57     ON all_countries.country = top_5_customers.country
58 GROUP BY all_countries.country, all_countries.all_customer_count
59 ORDER BY all_countries.all_customer_count DESC;
60
```

Data Output Messages Notifications



|    | country<br>character varying (50) | all_customer_count<br>bigint | top_5_customer_count<br>bigint |
|----|-----------------------------------|------------------------------|--------------------------------|
| 1  | India                             | 60                           | 1                              |
| 2  | China                             | 53                           | 1                              |
| 3  | United States                     | 36                           | 1                              |
| 4  | Japan                             | 31                           | 1                              |
| 5  | Mexico                            | 30                           | 1                              |
| 6  | Brazil                            | 28                           | 0                              |
| 7  | Russian Federation                | 28                           | 0                              |
| 8  | Philippines                       | 20                           | 0                              |
| 9  | Turkey                            | 15                           | 0                              |
| 10 | Indonesia                         | 14                           | 0                              |
| 11 | Argentina                         | 13                           | 0                              |
| 12 | Nigeria                           | 13                           | 0                              |
| 13 | South Africa                      | 11                           | 0                              |
| 14 | Taiwan                            | 10                           | 0                              |
| 15 | United Kingdom                    | 9                            | 0                              |
| 16 | Iran                              | 8                            | 0                              |
| 17 | Poland                            | 8                            | 0                              |
| 18 | Germany                           | 7                            | 0                              |
| 19 | Italy                             | 7                            | 0                              |
| 20 | Venezuela                         | 7                            | 0                              |