Cleaning a PostgreSQL Database

In this project, you will work with data from a hypothetical Super Store to challenge and enhance your SQL skills in data cleaning. This project will engage you in identifying top categories based on the highest profit margins and detecting missing values, utilizing your comprehensive knowledge of SQL concepts.

Data Dictionary:

`orders`:

Column	Definition	Data type	Comments
`row_id`	Unique Record ID	`INTEGER`	
`order_id`	Identifier for each order in table	`TEXT`	Connects to `order_id` in `returned_orders` table
`order_date`	Date when order was placed	`TEXT`	
`market`	Market order_id belongs to	`TEXT`	
`region`	Region Customer belongs to	`TEXT`	Connects to `region` in `people` table
`product_id`	Identifier of Product bought	`TEXT`	Connects to `product_id` in `products` table
`sales`	Total Sales Amount for the Line Item	`DOUBLE PRECISION`	
`quantity`	Total Quantity for the Line Item	`DOUBLE PRECISION`	
`discount`	Discount applied for the Line Item	`DOUBLE PRECISION`	
`profit`	Total Profit earned on the Line Item	`DOUBLE PRECISION`	

`returned_orders`:

Column	Definition	Data type
`returned`	Yes values for Order / Line Item Returned	`TEXT`
`order_id`	Identifier for each order in table	`TEXT`
`market`	Market order_id belongs to	`TEXT`

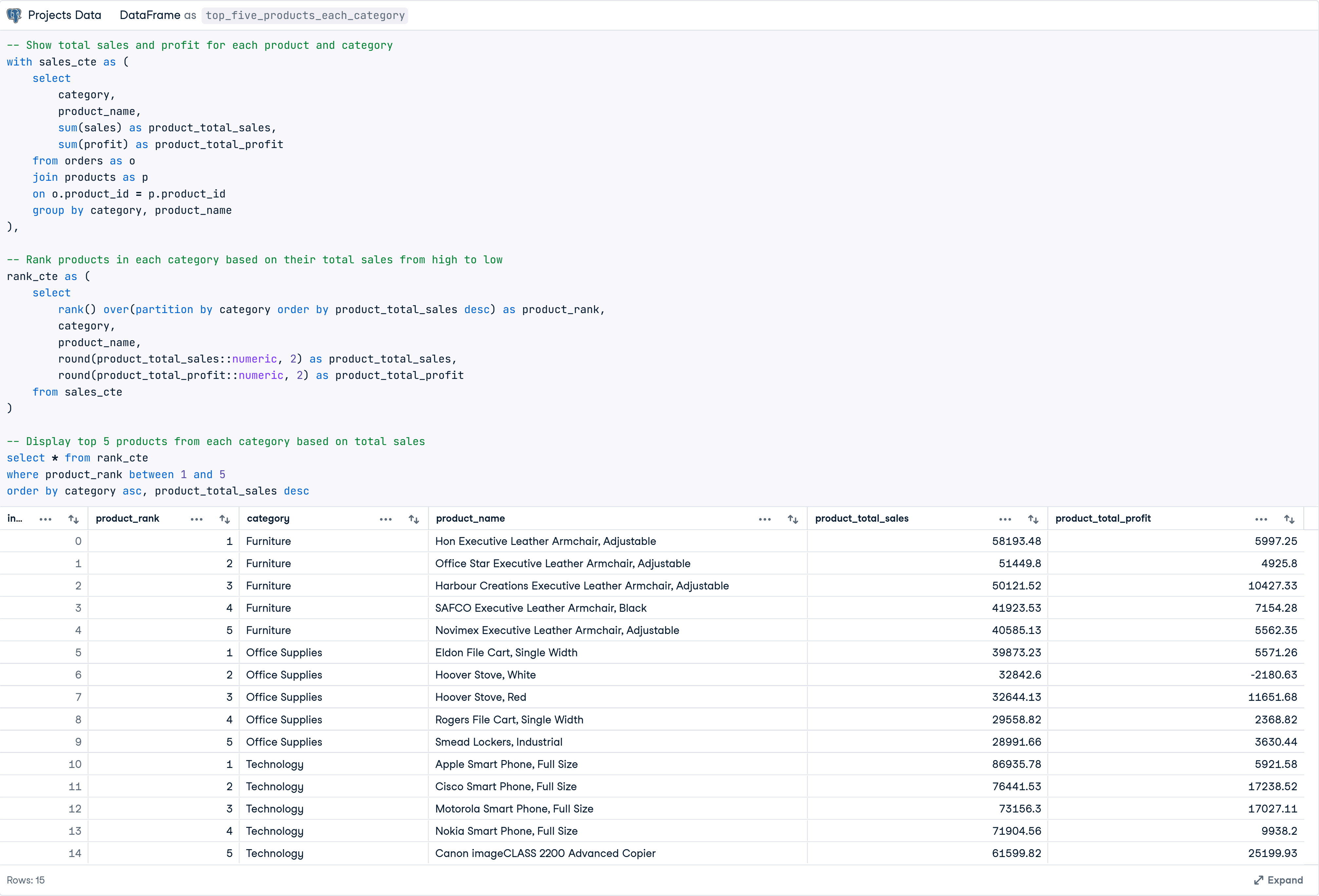
`people`:

Column	Definition	Data type
`person`	Name of Salesperson credited with Order	`TEXT`
`region`	Region Salesperson in operating in	`TEXT`

`products`:

Column	Definition	Data type
`product_id`	Unique Identifier for the Product	`TEXT`
`category`	Category Product belongs to	`TEXT`
`sub_category`	Sub Category Product belongs to	`TEXT`
`product_name`	Detailed Name of the Product	`TEXT`

As you can see in the Data Dictionary above, date fields have been written to the `orders` table as `TEXT` and numeric fields like sales, profit, etc. have been written to the `orders` table as `Double Precision`. You will need to take care of these types in some of the queries. This project is an excellent opportunity to apply your SQL skills in a practical setting and gain valuable experience in data cleaning and analysis. Good luck, and happy querying!



Projects Data DataFrame as `top_five_products_each_category`

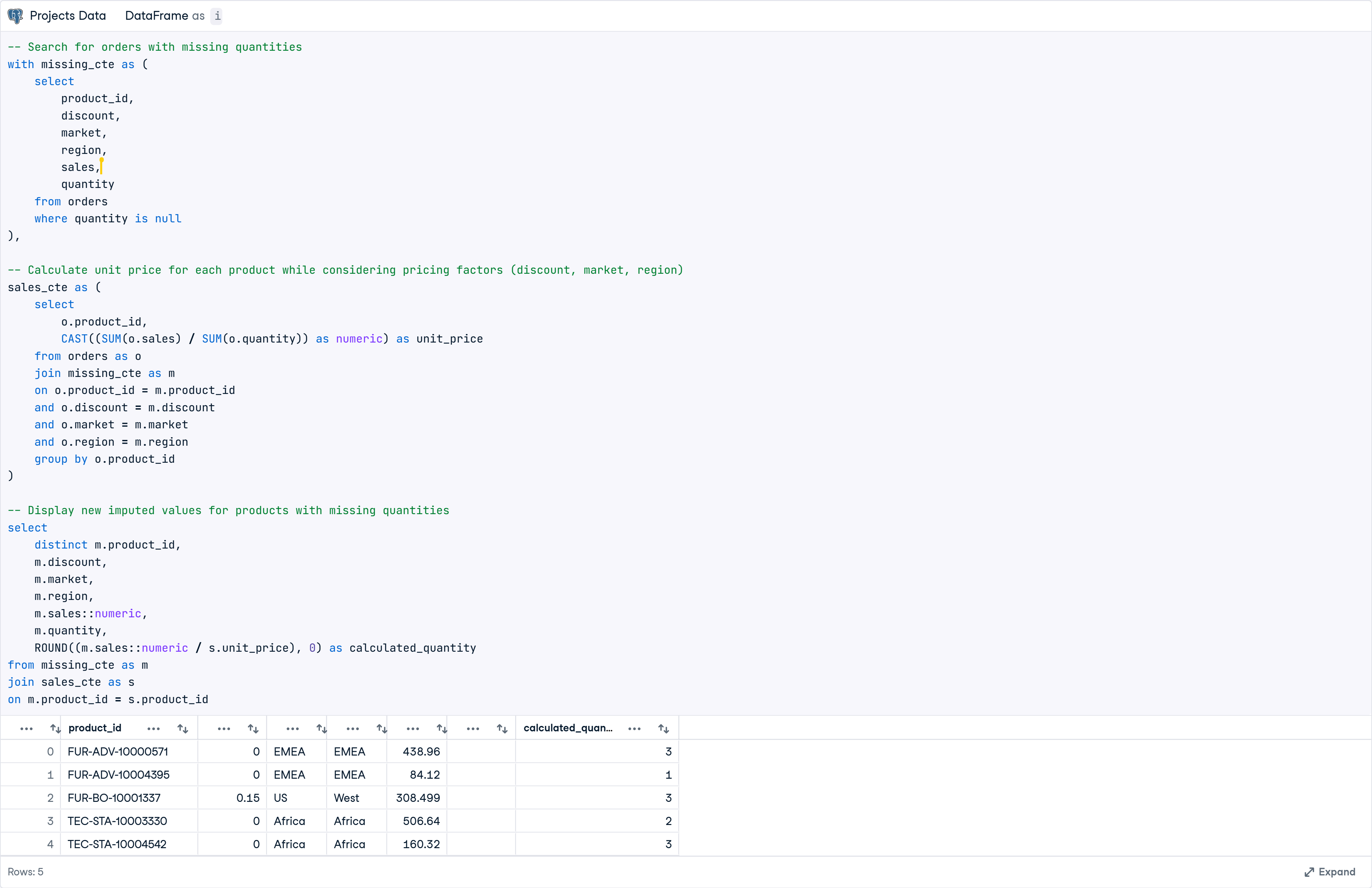
```sql
-- Show total sales and profit for each product and category
with sales_cte as (
    select
        category,
        product_name,
        sum(sales) as product_total_sales,
        sum(profit) as product_total_profit
    from orders as o
    join products as p
    on o.product_id = p.product_id
    group by category, product_name
),

-- Rank products in each category based on their total sales from high to low
rank_cte as (
    select
        rank() over(partition by category order by product_total_sales desc) as product_rank,
        category,
        product_name,
        round(product_total_sales::numeric, 2) as product_total_sales,
        round(product_total_profit::numeric, 2) as product_total_profit
    from sales_cte
)

-- Display top 5 products from each category based on total sales
select * from rank_cte
where product_rank between 1 and 5
order by category asc, product_total_sales desc
```

in...	product_rank	category	product_name	product_total_sales	product_total_profit
0	1	Furniture	Hon Executive Leather Armchair, Adjustable	58193.48	5997.25
1	2	Furniture	Office Star Executive Leather Armchair, Adjustable	51449.8	4925.8
2	3	Furniture	Harbour Creations Executive Leather Armchair, Adjustable	50121.52	10427.33
3	4	Furniture	SAFCO Executive Leather Armchair, Black	41923.53	7154.28
4	5	Furniture	Novimex Executive Leather Armchair, Adjustable	40585.13	5562.35
5	1	Office Supplies	Eldon File Cart, Single Width	39873.23	5571.26
6	2	Office Supplies	Hoover Stove, White	32842.6	-2180.63
7	3	Office Supplies	Hoover Stove, Red	32644.13	11651.68
8	4	Office Supplies	Rogers File Cart, Single Width	29558.82	2368.82
9	5	Office Supplies	Smead Lockers, Industrial	28991.66	3630.44
10	1	Technology	Apple Smart Phone, Full Size	86935.78	5921.58
11	2	Technology	Cisco Smart Phone, Full Size	76441.53	17238.52
12	3	Technology	Motorola Smart Phone, Full Size	73156.3	17027.11
13	4	Technology	Nokia Smart Phone, Full Size	71904.56	9938.2
14	5	Technology	Canon imageCLASS 2200 Advanced Copier	61599.82	25199.93

Rows: 15



```sql
-- Search for orders with missing quantities
with missing_cte as (
    select
        product_id,
        discount,
        market,
        region,
        sales,
        quantity
    from orders
    where quantity is null
),

-- Calculate unit price for each product while considering pricing factors (discount, market, region)
sales_cte as (
    select
        o.product_id,
        CAST((SUM(o.sales) / SUM(o.quantity)) as numeric) as unit_price
    from orders as o
    join missing_cte as m
    on o.product_id = m.product_id
    and o.discount = m.discount
    and o.market = m.market
    and o.region = m.region
    group by o.product_id
)

-- Display new imputed values for products with missing quantities
select
    distinct m.product_id,
    m.discount,
    m.market,
    m.region,
    m.sales::numeric,
    m.quantity,
    ROUND((m.sales::numeric / s.unit_price), 0) as calculated_quantity
from missing_cte as m
join sales_cte as s
on m.product_id = s.product_id
```

	product_id						calculated_quan...
0	FUR-ADV-10000571	0	EMEA	EMEA	438.96		3
1	FUR-ADV-10004395	0	EMEA	EMEA	84.12		1
2	FUR-BO-10001337	0.15	US	West	308.499		3
3	TEC-STA-10003330	0	Africa	Africa	506.64		2
4	TEC-STA-10004542	0	Africa	Africa	160.32		3

Rows: 5