Welcome! You are now in DataLab.

You successfully completed your project and are looking for some additional related challenges. This DataLab workbook contains the official solution from our curriculum staff, along with Additional Challenges at the bottom. If you would like a quick overview of DataLab, please refer to the help menu. You can easily share your project with your friends and colleagues when you're done.

Good luck with your additional challenges!

You're working for a company that sells motorcycle parts, and they've asked for some help in analyzing their sales data!

They operate three warehouses in the area, selling both retail and wholesale. They offer a variety of parts and accept credit cards, cash, and bank transfer as payment methods. However, each payment type incurs a different fee.

The board of directors wants to gain a better understanding of wholesale revenue by product line, and how this varies month-to-month and across warehouses. You have been tasked with calculating net revenue for each product line and grouping results by month and warehouse. The results should be filtered so that only `"Wholesale"` orders are included.

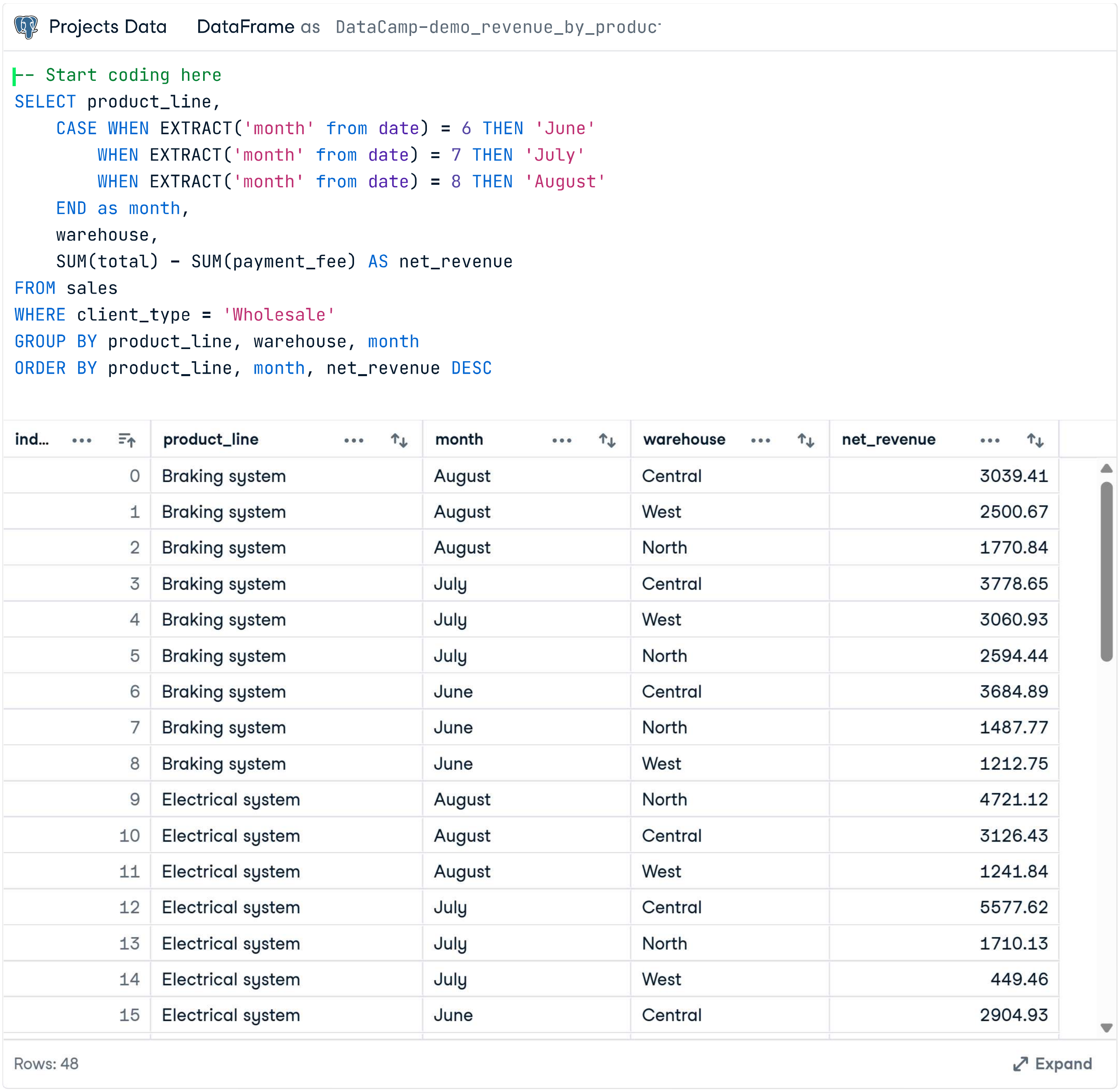
They have provided you with access to their database, which contains the following table called `sales`:

Sales

Column	Data type	Description
`order_number`	`VARCHAR`	Unique order number.
`date`	`DATE`	Date of the order, from June to August 2021.
`warehouse`	`VARCHAR`	The warehouse that the order was made from— `North`, `Central`, or `West`.
`client_type`	`VARCHAR`	Whether the order was `Retail` or `Wholesale`.
`product_line`	`VARCHAR`	Type of product ordered.
`quantity`	`INT`	Number of products ordered.
`unit_price`	`FLOAT`	Price per product (dollars).
`total`	`FLOAT`	Total price of the order (dollars).
`payment`	`VARCHAR`	Payment method— `Credit card`, `Transfer`, or `Cash`.
`payment_fee`	`FLOAT`	Percentage of `total` charged as a result of the `payment` method.

Your query output should be presented in the following format:

`product_line`	`month`	`warehouse`	`net_revenue`
product_one	---	---	---
product_one	---	---	---
product_one	---	---	---
product_one	---	---	---
product_one	---	---	---
product_one	---	---	---
product_two	---	---	---
...	...	...	...



```sql
-- Start coding here
SELECT product_line,
    CASE WHEN EXTRACT('month' from date) = 6 THEN 'June'
        WHEN EXTRACT('month' from date) = 7 THEN 'July'
        WHEN EXTRACT('month' from date) = 8 THEN 'August'
    END as month,
    warehouse,
    SUM(total) - SUM(payment_fee) AS net_revenue
FROM sales
WHERE client_type = 'Wholesale'
GROUP BY product_line, warehouse, month
ORDER BY product_line, month, net_revenue DESC
```

ind...	product_line	month	warehouse	net_revenue
0	Braking system	August	Central	3039.41
1	Braking system	August	West	2500.67
2	Braking system	August	North	1770.84
3	Braking system	July	Central	3778.65
4	Braking system	July	West	3060.93
5	Braking system	July	North	2594.44
6	Braking system	June	Central	3684.89
7	Braking system	June	North	1487.77
8	Braking system	June	West	1212.75
9	Electrical system	August	North	4721.12
10	Electrical system	August	Central	3126.43
11	Electrical system	August	West	1241.84
12	Electrical system	July	Central	5577.62
13	Electrical system	July	North	1710.13
14	Electrical system	July	West	449.46
15	Electrical system	June	Central	2904.93

Projects Data DataFrame as `revenue_by_product_line`

```
WITH month_etc AS (
    SELECT order_number, date_part('month', date) AS month_start
    FROM sales
)
SELECT product_line,
    CASE WHEN month_start = 6 THEN 'June'
    WHEN month_start = 7 THEN 'July'
    ELSE 'August' END AS month,
    warehouse,
    SUM(total-payment_fee) AS net_revenue
FROM sales s LEFT JOIN month_etc m ON s.order_number = m.order_number
WHERE client_type = 'Wholesale'
GROUP BY product_line, month, warehouse
ORDER BY product_line ASC, month DESC, net_revenue DESC;
```

in...	product_line	month	warehouse	net_revenue
0	Braking system	June	Central	36
1	Braking system	June	North	14
2	Braking system	June	West	12
3	Braking system	July	Central	37
4	Braking system	July	West	30
5	Braking system	July	North	25
6	Braking system	August	Central	30
7	Braking system	August	West	25
8	Braking system	August	North	17
9	Electrical system	June	Central	29
10	Electrical system	June	North	2
11	Electrical system	July	Central	55
12	Electrical system	July	North	17
13	Electrical system	July	West	4
14	Electrical system	August	North	47
15	Electrical system	August	Central	31

Rows: 48

Expand

Extended Project below

The finance team is exploring ways to reduce transaction costs and improve profitability. They've asked you to determine the most profitable payment method for each warehouse in each month. Calculate the net revenue for each payment method, grouped by warehouse and month, and identify the top payment method for each combination.

Projects Data   DataFrame as `top_payment_by_warehouse_month`

```sql
WITH payment_summary AS (
SELECT payment,
    CASE
    WHEN EXTRACT('month' FROM date) = 6 THEN 'June'
    WHEN EXTRACT('month' FROM date) = 7 THEN 'July'
    ELSE 'August' END AS month,
    warehouse,
    SUM(total-payment_fee) AS net_revenue
FROM sales
GROUP BY payment, month, warehouse)

(
    SELECT * FROM payment_summary
    WHERE month = 'June' AND warehouse = 'Central'
    ORDER BY net_revenue DESC
    LIMIT 1
    )
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'June' AND warehouse = 'North'
    ORDER BY net_revenue DESC
    LIMIT 1
)
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'June' AND warehouse = 'West'
    ORDER BY net_revenue DESC
    LIMIT 1
)
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'July' AND warehouse = 'Central'
    ORDER BY net_revenue DESC
    LIMIT 1
    )
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'July' AND warehouse = 'North'
    ORDER BY net_revenue DESC
    LIMIT 1
)
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'July' AND warehouse = 'West'
    ORDER BY net_revenue DESC
    LIMIT 1
)
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'August' AND warehouse = 'Central'
    ORDER BY net_revenue DESC
    LIMIT 1
    )
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'August' AND warehouse = 'North'
    ORDER BY net_revenue DESC
    LIMIT 1
)
UNION
(
    SELECT * FROM payment_summary
    WHERE month = 'August' AND warehouse = 'West'
    ORDER BY net_revenue DESC
    LIMIT 1
)
ORDER BY month DESC, warehouse
```

in...	payment	month	warehouse	net_revenue
0	Transfer	June	Central	23453.08
1	Transfer	June	North	17000.12
2	Transfer	June	West	8645.98
3	Transfer	July	Central	23893.59
4	Transfer	July	North	17585.25
5	Transfer	July	West	7606.51
6	Transfer	August	Central	31509
7	Transfer	August	North	23480.13
8	Transfer	August	West	6466.42

Rows: 9

Expand

Projects Data DataFrame as `net_revenue_by_warehouse_month`

```sql
SELECT payment,
    CASE
    WHEN EXTRACT('month' FROM date) = 6 THEN 'June'
    WHEN EXTRACT('month' FROM date) = 7 THEN 'July'
    ELSE 'August' END AS month,
    warehouse,
    SUM(total-payment_fee) AS net_revenue
FROM sales
GROUP BY payment, month, warehouse
ORDER BY month DESC, warehouse, net_revenue DESC
```

index	payment	month	warehouse	net_revenue
0	Transfer	June	Central	234
1	Credit card	June	Central	18
2	Cash	June	Central	1
3	Transfer	June	North	17
4	Credit card	June	North	13
5	Cash	June	North	3
6	Transfer	June	West	8
7	Credit card	June	West	6
8	Cash	June	West	2
9	Transfer	July	Central	23
10	Credit card	July	Central	21
11	Cash	July	Central	3
12	Transfer	July	North	17
13	Credit card	July	North	10
14	Cash	July	North	1
15	Transfer	July	West	7

Rows: 27 Expand

The marketing team is planning a targeted campaign and wants to know the most popular product lines for retail and wholesale customers.

They have given you the task to find the top 3 most ordered product lines for each client type.

Projects Data   DataFrame as top_3_most_ordered_product_line

```
(
    SELECT client_type, product_line, COUNT(order_number) AS total_order
    FROM sales
    WHERE client_type = 'Retail'
    GROUP BY client_type, product_line
    ORDER BY client_type, total_order DESC
    LIMIT 3
)
UNION
(
    SELECT client_type, product_line, COUNT(order_number) AS total_order
    FROM sales
    WHERE client_type = 'Wholesale'
    GROUP BY client_type, product_line
    ORDER BY client_type, total_order DESC
    LIMIT 3
)
ORDER BY client_type, total_order DESC
```

in...	client_type	product_line	total_order
0	Retail	Suspension & traction	177
1	Retail	Braking system	175
2	Retail	Electrical system	155
3	Wholesale	Braking system	55
4	Wholesale	Suspension & traction	51
5	Wholesale	Electrical system	38

Rows: 6   Expand

Projects Data DataFrame as `order_quanity_by_product_line_c`

```sql
SELECT client_type, product_line, COUNT(order_number) AS total_order
FROM sales
GROUP BY client_type, product_line
ORDER BY client_type, total_order DESC
```

i…	client_type	product_line	total_order
0	Retail	Suspension & traction	177
1	Retail	Braking system	175
2	Retail	Electrical system	155
3	Retail	Frame & body	128
4	Retail	Miscellaneous	92
5	Retail	Engine	48
6	Wholesale	Braking system	55
7	Wholesale	Suspension & traction	51
8	Wholesale	Frame & body	38
9	Wholesale	Electrical system	38
10	Wholesale	Miscellaneous	30
11	Wholesale	Engine	13

Rows: 12 Expand