8 Week SQL Challenge

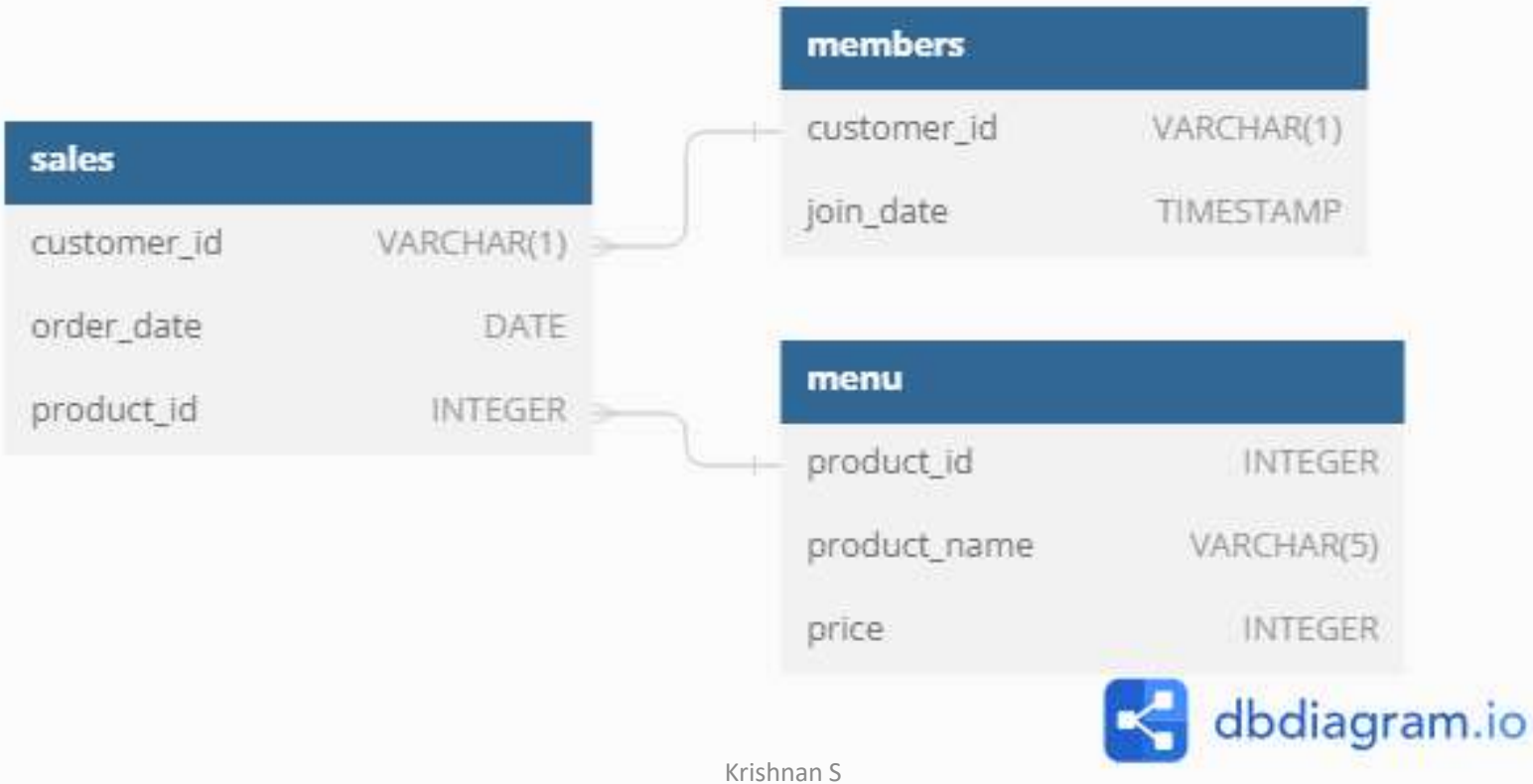
Case Study #1 - Danny's Diner

Problem Statement

- Danny wants to use the data to answer a few simple questions about his customers, especially about their visiting patterns, how much money they've spent and also which menu items are their favourite. Having this deeper connection with his customers will help him deliver a better and more personalised experience for his loyal customers.
- He plans on using these insights to help him decide whether he should expand the existing customer loyalty program - additionally he needs help to generate some basic datasets so his team can easily inspect the data without needing to use SQL.
- Danny has provided you with a sample of his overall customer data due to privacy issues - but he hopes that these examples are enough for you to write fully functioning SQL queries to help him answer his questions!
- Danny has shared with you 3 key datasets for this case study:

1. sales
2. menu
3. members

Entity Relationship Diagram



Case Study Questions

1. What is the total amount each customer spent at the restaurant?
2. How many days has each customer visited the restaurant?
3. What was the first item from the menu purchased by each customer?
4. What is the most purchased item on the menu and how many times was it purchased by all customers?
5. Which item was the most popular for each customer?
6. Which item was purchased first by the customer after they became a member?
7. Which item was purchased just before the customer became a member?
8. What is the total items and amount spent for each member before they became a member?
9. If each $1 spent equates to 10 points and sushi has a 2x points multiplier - how many points would each customer have?
10. In the first week after a customer joins the program (including their join date) they earn 2x points on all items, not just sushi - how many points do customer A and B have at the end of January?

ANSWER 1

1. What is the total amount each customer spent at the restaurant?

```
2  SELECT customer_id,
3      sum(price) as Total_amount
4  FROM sales as s
5  Inner Join menu as M
6      on s.product_id = M.product_id
7  GROUP BY customer_id
8  ORDER BY total_amount DESC;
9
```

Data Output | Messages | Notifications

	customer_id character varying (1)	total_amount bigint
1	A	76
2	B	74
3	C	36

ANSWER 2

2. How many days has each customer visited the restaurant?

```
11  SELECT customer_id,
12      COUNT(DISTINCT(order_date)) as visited_days
13  FROM sales
14  GROUP BY customer_id;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	visited_days bigint
1	A	4
2	B	6
3	C	2

ANSWER 3

3. What was the first item from the menu purchased by each customer?

```sql
WITH CTE as (
    SELECT customer_id,
    product_name,
    ROW_NUMBER () over(partition by customer_id order by order_date ASC) as rn
    FROM sales as s
    INNER JOIN menu as m
    on s.product_id = m.product_id
    )
SELECT customer_id,
    product_name
FROM CTE
WHERE rn = 1;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	product_name character varying (5)
1	A	curry
2	B	curry
3	C	ramen

ANSWER 4

4. What is the most purchased item on the menu and how many times was it purchased by all customers?

```
32  SELECT product_name,
33      count(order_date) as Orders
34  FROM sales as s
35  INNER JOIN menu as m
36  on s.product_id = m.product_id
37  GROUP BY product_name
38  LIMIT 1;
39
```

Data Output | Messages | Notifications

	product_name character varying (5)	orders bigint
1	ramen	8

ANSWER 5

5. Which item was the most popular for each customer?

```sql
WITH CTE as(
    SELECT product_name,
    customer_id,
    count(order_date) as Orders,
    RANK() OVER(PARTITION BY customer_id order by COUNT(order_date) DESC) as rnk
    FROM sales as s
    INNER JOIN menu as m
    on s.product_id = m.product_id
    GROUP BY product_name,
    customer_id
    ORDER BY customer_id
    )
SELECT product_name,
customer_id,
orders
from CTE
where rnk = 1
```

Data Output | Messages | Notifications

	product_name character varying (5)	customer_id character varying (1)	orders bigint
1	ramen	A	3
2	sushi	B	2
3	curry	B	2
4	ramen	B	2
5	ramen	C	3

ANSWER 6

6. Which item was purchased first by the customer after they became a member?

```sql
WITH CTE as(
    SELECT s.customer_id,
    order_date,
    product_name,
    join_date,
    RANK() OVER(PARTITION BY s.customer_id ORDER BY order_date) as rnk
    FROM sales as s
    INNER JOIN members as mem on s.customer_id = mem.customer_id
    INNER JOIN menu as m on s.product_id = m.product_id
    WHERE order_date >= join_date
    )
SELECT customer_id,
    product_name
FROM CTE
WHERE rnk = 1;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	product_name character varying (5)
1	A	curry
2	B	sushi

ANSWER 7

7. Which item was purchased just before the customer became a member?

```sql
-- 7. Which item was purchased just before the customer became a member?
WITH CTE as(
    SELECT s.customer_id,
    order_date,
    product_name,
    join_date,
    RANK() OVER(PARTITION BY s.customer_id ORDER BY order_date DESC) as rnk
    FROM sales as s
    INNER JOIN members as mem on s.customer_id = mem.customer_id
    INNER JOIN menu as m on s.product_id = m.product_id
    WHERE order_date < join_date
    )
SELECT customer_id,
    product_name
FROM CTE
WHERE rnk = 1;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	product_name character varying (5)
1	A	sushi
2	A	curry
3	B	sushi

ANSWER 8

8. What is the total items and amount spent for each member before they became a member?

```
92
93  -- 8. What is the total items and amount spent for each member before they became a member?
94  SELECT s.customer_id,
95      COUNT(product_name) as Total_items,
96      SUM(price) as Total_amount
97      FROM sales as s
98      INNER JOIN members as mem on s.customer_id = mem.customer_id
99      INNER JOIN menu as m on s.product_id = m.product_id
100     WHERE order_date < join_date
101     GROUP BY s.customer_id
102     ORDER BY s.customer_id
```

Data Output | Messages | Notifications

	customer_id character varying (1)	total_items bigint	total_amount bigint
1	A	2	25
2	B	3	40

ANSWER 9

9. If each $1 spent equates to 10 points and sushi has a 2x points multiplier how many points would each customer have?

```
106  SELECT customer_id,
107  SUM(CASE WHEN product_name = 'sushi' THEN price * 10 * 2 ELSE price * 10 END) as points
108  FROM menu as m
109  INNER JOIN sales as s on s.product_id = m.product_id
110  GROUP BY customer_id
111  ORDER BY customer_id;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	points bigint
1	A	860
2	B	940
3	C	360

ANSWER 10

10. In the first week after a customer joins the program (including their join date) they earn 2x points on all items, not just sushi how many points do customer A and B have at the end of January?

```sql
SELECT s.customer_id,
SUM(CASE
    WHEN order_date between mem.join_date and (SELECT mem.join_date + INT '6') THEN price * 10 * 2
    WHEN product_name = 'sushi' THEN price * 10 * 2 ELSE price * 10 END) as points
FROM menu as m
INNER JOIN sales as s on s.product_id = m.product_id
INNER JOIN members as mem on s.customer_id = mem.customer_id
WHERE DATE_TRUNC('month', order_date) = '2021-01-01'
GROUP BY s.customer_id
ORDER BY s.customer_id;
```

Data Output | Messages | Notifications

	customer_id character varying (1)	points bigint
1	A	1370
2	B	820

BONUS QUESTIONS

Join All The Things

```
SELECT s.customer_id,
order_date,
product_name,
price,
CASE
    WHEN join_date is null THEN 'N'
    WHEN order_date < join_date THEN 'N' ELSE 'Y'
    END as member
FROM sales as s
INNER JOIN menu m on s.product_id = m.product_id
LEFT JOIN members mem on mem.customer_id = s.customer_id
ORDER BY s.customer_id, order_date, price DESC
```

	customer_id character varying (1)	order_date date	product_name character varying (5)	price integer	member text
1	A	2021-01-01	curry	15	N
2	A	2021-01-01	sushi	10	N
3	A	2021-01-07	curry	15	Y
4	A	2021-01-10	ramen	12	Y
5	A	2021-01-11	ramen	12	Y
6	A	2021-01-11	ramen	12	Y
7	B	2021-01-01	curry	15	N
8	B	2021-01-02	curry	15	N
9	B	2021-01-04	sushi	10	N
10	B	2021-01-11	sushi	10	Y
11	B	2021-01-16	ramen	12	Y
12	B	2021-02-01	ramen	12	Y
13	C	2021-01-01	ramen	12	N
14	C	2021-01-01	ramen	12	N
15	C	2021-01-07	ramen	12	N

BONUS QUESTIONS

Rank All The Things

```sql
WITH CTE as(
    SELECT
    s.customer_id,
    order_date,
    product_name,
    price,
    CASE
    WHEN join_date is NULL THEN 'N'
    WHEN order_date < join_date THEN 'N' ELSE 'Y'
    END as member
    FROM sales as s
    INNER JOIN menu m on s.product_id = m.product_id
    LEFT JOIN members mem on mem.customer_id = s.customer_id
    ORDER BY s.customer_id, order_date, price DESC
)
SELECT *,
CASE
    WHEN member = 'N' THEN NULL
    ELSE RANK() OVER(PARTITION BY customer_id, member ORDER by order_date)
    END as ranking
FROM CTE;
```

customer_id character varying (1)	order_date date	product_name character varying (5)	price integer	member text	ranking bigint
A	2021-01-01	curry	15	N	[null]
A	2021-01-01	sushi	10	N	[null]
A	2021-01-07	curry	15	Y	1
A	2021-01-10	ramen	12	Y	2
A	2021-01-11	ramen	12	Y	3
A	2021-01-11	ramen	12	Y	3
B	2021-01-01	curry	15	N	[null]
B	2021-01-02	curry	15	N	[null]
B	2021-01-04	sushi	10	N	[null]
B	2021-01-11	sushi	10	Y	1
B	2021-01-16	ramen	12	Y	2
B	2021-02-01	ramen	12	Y	3
C	2021-01-01	ramen	12	N	[null]
C	2021-01-01	ramen	12	N	[null]
C	2021-01-07	ramen	12	N	[null]