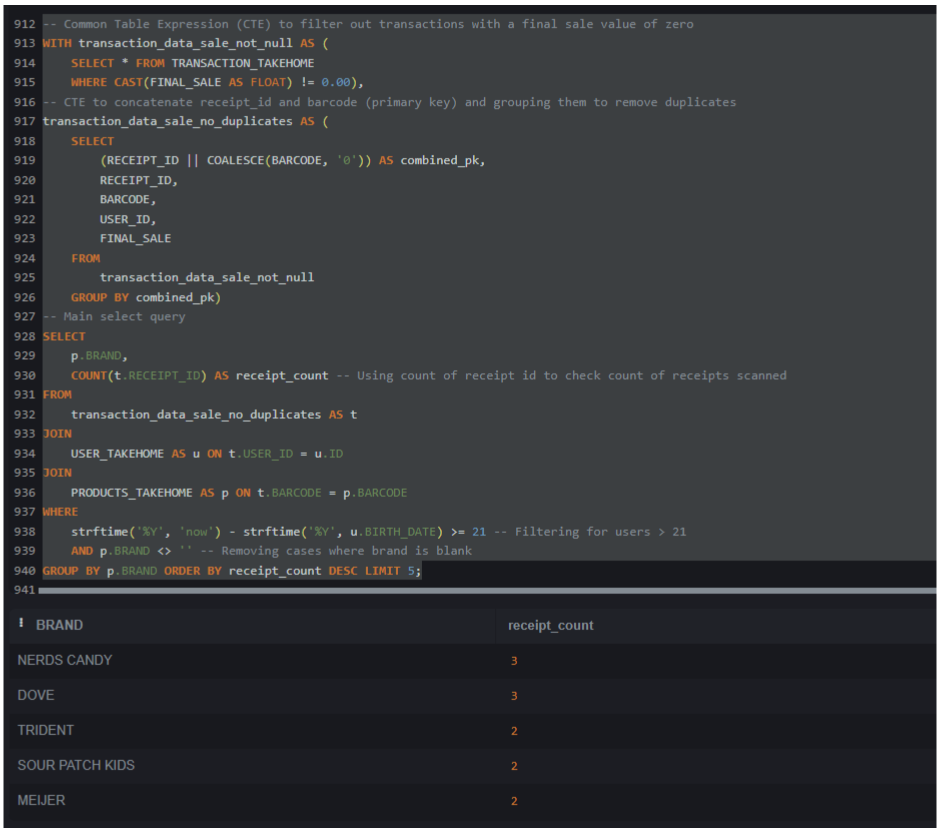
Q1 What are the top 5 brands by receipts scanned among users 21 and over?

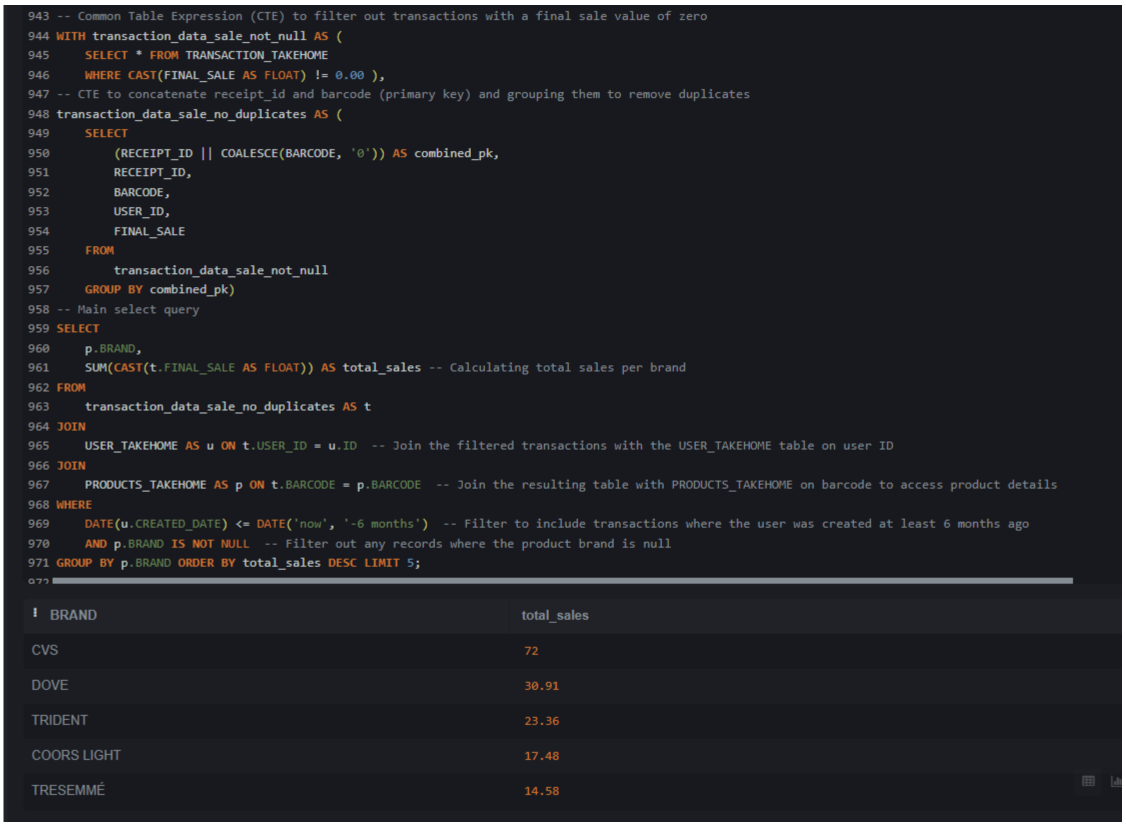


```sql
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT * FROM TRANSACTION_TAKEHOME
    WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE
    FROM
        transaction_data_sale_not_null
    GROUP BY combined_pk)
-- Main select query
SELECT
    p.BRAND,
    COUNT(t.RECEIPT_ID) AS receipt_count -- Using count of receipt id to check count of receipts scanned
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    USER_TAKEHOME AS u ON t.USER_ID = u.ID
JOIN
    PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE
WHERE
    strftime('%Y', 'now') - strftime('%Y', u.BIRTH_DATE) >= 21 -- Filtering for users > 21
    AND p.BRAND <> '' -- Removing cases where brand is blank
GROUP BY p.BRAND ORDER BY receipt_count DESC LIMIT 5;
```

BRAND	receipt_count
NERDS CANDY	3
DOVE	3
TRIDENT	2
SOUR PATCH KIDS	2
MEIJER	2

```
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
  SELECT * FROM TRANSACTION_TAKEHOME
  WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
  SELECT
    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,
    RECEIPT_ID,
    BARCODE,
    USER_ID,
    FINAL_SALE
  FROM
    transaction_data_sale_not_null
  GROUP BY combined_pk)
-- Main select query
SELECT
  p.BRAND,
  COUNT(t.RECEIPT_ID) AS receipt_count -- Using count of receipt id to check count of receipts scanned
FROM
  transaction_data_sale_no_duplicates AS t
JOIN
  USER_TAKEHOME AS u ON t.USER_ID = u.ID
JOIN
  PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE
WHERE
  strftime('%Y', 'now') - strftime('%Y', u.BIRTH_DATE) >= 21 -- Filtering for users > 21
  AND p.BRAND <> '' -- Removing cases where brand is blank
GROUP BY p.BRAND ORDER BY receipt_count DESC LIMIT 5;
```

Q2 What are the top 5 brands by sales among users that have had their account for at least six months?

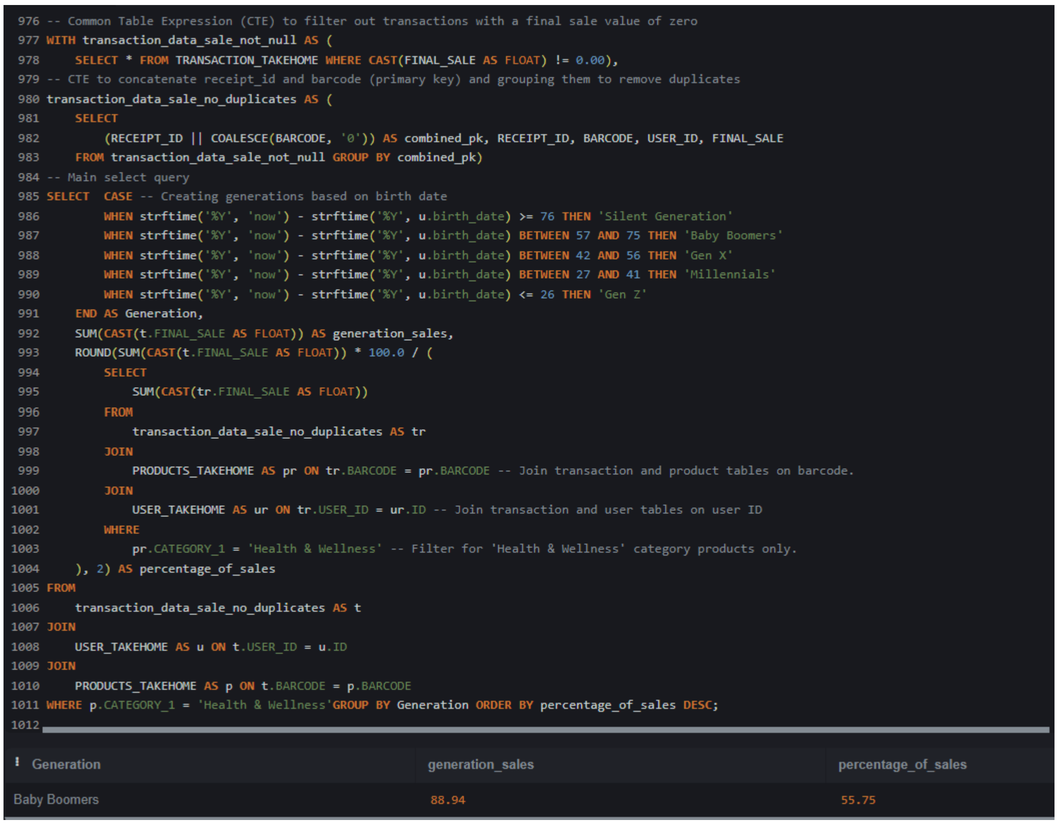


```sql
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT * FROM TRANSACTION_TAKEHOME
    WHERE CAST(FINAL_SALE AS FLOAT) != 0.00 ),
-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE
    FROM
        transaction_data_sale_not_null
    GROUP BY combined_pk)
-- Main select query
SELECT
    p.BRAND,
    SUM(CAST(t.FINAL_SALE AS FLOAT)) AS total_sales -- Calculating total sales per brand
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    USER_TAKEHOME AS u ON t.USER_ID = u.ID  -- Join the filtered transactions with the USER_TAKEHOME table on user ID
JOIN
    PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE  -- Join the resulting table with PRODUCTS_TAKEHOME on barcode to access product details
WHERE
    DATE(u.CREATED_DATE) <= DATE('now', '-6 months')  -- Filter to include transactions where the user was created at least 6 months ago
    AND p.BRAND IS NOT NULL  -- Filter out any records where the product brand is null
GROUP BY p.BRAND ORDER BY total_sales DESC LIMIT 5;
```

BRAND	total_sales
CVS	72
DOVE	30.91
TRIDENT	23.36
COORS LIGHT	17.48
TRESEMMÉ	14.58

```
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
  SELECT
    *
  FROM
    TRANSACTION_TAKEHOME
  WHERE
    CAST(FINAL_SALE AS FLOAT) != 0.00
),
-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
  SELECT
    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,
    RECEIPT_ID,
    BARCODE,
    USER_ID,
    FINAL_SALE
  FROM
    transaction_data_sale_not_null
  GROUP BY
    combined_pk
)
-- Main select query
SELECT
  p.BRAND,
  SUM(CAST(t.FINAL_SALE AS FLOAT)) AS total_sales -- Calculating total sales per brand
FROM
  transaction_data_sale_no_duplicates AS t
JOIN
  USER_TAKEHOME AS u ON t.USER_ID = u.ID  -- Join the filtered transactions with the USER_TAKEHOME table on user ID
JOIN
  PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE  -- Joining the table with PRODUCTS_TAKEHOME on barcode to access product details
WHERE
  DATE(u.CREATED_DATE) <= DATE('now', '-6 months')  -- Filter to include transactions where the user was created at least 6 months ago
  AND p.BRAND IS NOT NULL  -- Filter out any records where the product brand is null
GROUP BY
  p.BRAND
ORDER BY    total_sales DESC LIMIT 5;
```

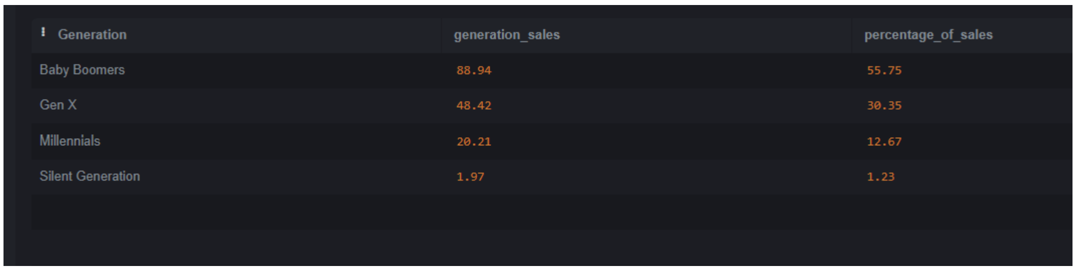
Q3 What is the percentage of sales in the Health & Wellness category by generation? – **I have defined generations based on age**



```sql
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT * FROM TRANSACTION_TAKEHOME WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, RECEIPT_ID, BARCODE, USER_ID, FINAL_SALE
    FROM transaction_data_sale_not_null GROUP BY combined_pk)
-- Main select query
SELECT  CASE -- Creating generations based on birth date
        WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) >= 76 THEN 'Silent Generation'
        WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 57 AND 75 THEN 'Baby Boomers'
        WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 42 AND 56 THEN 'Gen X'
        WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 27 AND 41 THEN 'Millennials'
        WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) <= 26 THEN 'Gen Z'
    END AS Generation,
    SUM(CAST(t.FINAL_SALE AS FLOAT)) AS generation_sales,
    ROUND(SUM(CAST(t.FINAL_SALE AS FLOAT)) * 100.0 / (
        SELECT
            SUM(CAST(tr.FINAL_SALE AS FLOAT))
        FROM
            transaction_data_sale_no_duplicates AS tr
        JOIN
            PRODUCTS_TAKEHOME AS pr ON tr.BARCODE = pr.BARCODE -- Join transaction and product tables on barcode.
        JOIN
            USER_TAKEHOME AS ur ON tr.USER_ID = ur.ID -- Join transaction and user tables on user ID
        WHERE
            pr.CATEGORY_1 = 'Health & Wellness' -- Filter for 'Health & Wellness' category products only.
    ), 2) AS percentage_of_sales
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    USER_TAKEHOME AS u ON t.USER_ID = u.ID
JOIN
    PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE
WHERE p.CATEGORY_1 = 'Health & Wellness'GROUP BY Generation ORDER BY percentage_of_sales DESC;
```

Generation	generation_sales	percentage_of_sales
Baby Boomers	88.94	55.75

Output:

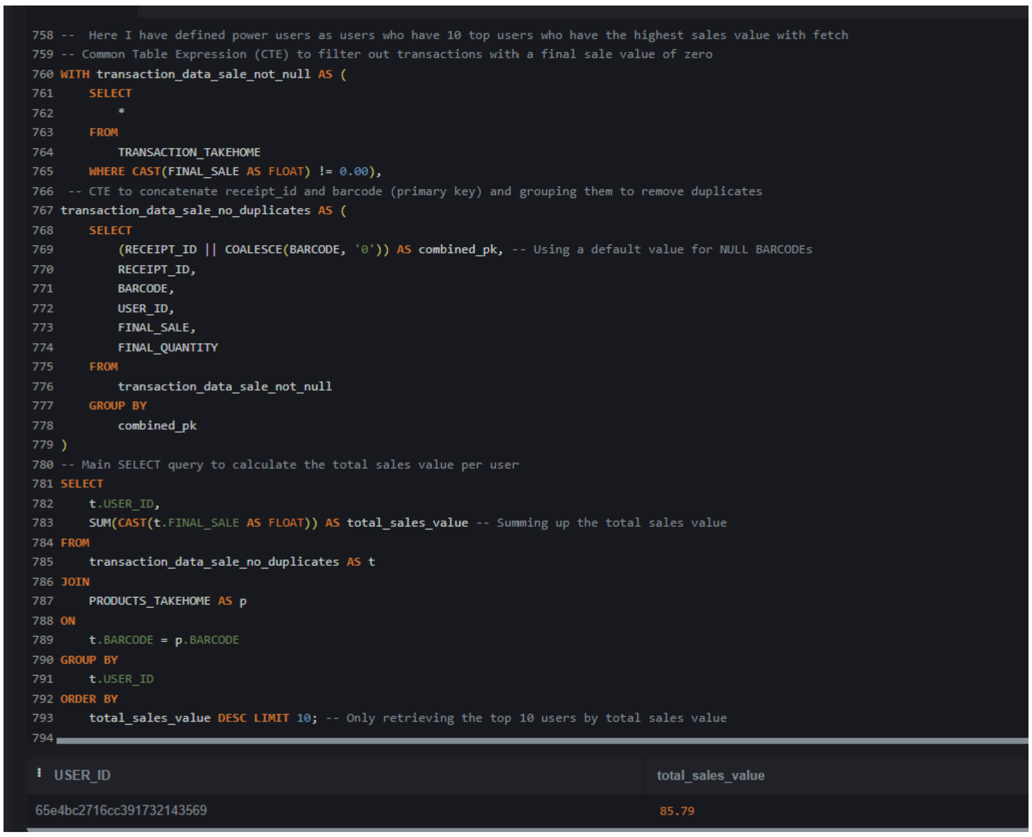


Generation	generation_sales	percentage_of_sales
Baby Boomers	88.94	55.75
Gen X	48.42	30.35
Millennials	20.21	12.67
Silent Generation	1.97	1.23

```
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero

WITH transaction_data_sale_not_null AS (

  SELECT * FROM TRANSACTION_TAKEHOME WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),

-- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates

transaction_data_sale_no_duplicates AS (

  SELECT

    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, RECEIPT_ID, BARCODE, USER_ID, FINAL_SALE

  FROM transaction_data_sale_not_null GROUP BY combined_pk)

-- Main select query

SELECT  CASE -- Creating generations based on birth date

    WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) >= 76 THEN 'Silent Generation'

    WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 57 AND 75 THEN 'Baby Boomers'

    WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 42 AND 56 THEN 'Gen X'

    WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) BETWEEN 27 AND 41 THEN 'Millennials'

    WHEN strftime('%Y', 'now') - strftime('%Y', u.birth_date) <= 26 THEN 'Gen Z'

  END AS Generation,

  SUM(CAST(t.FINAL_SALE AS FLOAT)) AS generation_sales,

  ROUND(SUM(CAST(t.FINAL_SALE AS FLOAT)) * 100.0 / (

    SELECT

      SUM(CAST(tr.FINAL_SALE AS FLOAT))

    FROM

      transaction_data_sale_no_duplicates AS tr

    JOIN

      PRODUCTS_TAKEHOME AS pr ON tr.BARCODE = pr.BARCODE -- Join transaction and product tables on barcode.

    JOIN

      USER_TAKEHOME AS ur ON tr.USER_ID = ur.ID -- Join transaction and user tables on user ID

    WHERE

      pr.CATEGORY_1 = 'Health & Wellness' -- Filter for 'Health & Wellness' category products only.

  ), 2) AS percentage_of_sales

FROM

  transaction_data_sale_no_duplicates AS t

JOIN

  USER_TAKEHOME AS u ON t.USER_ID = u.ID

JOIN

  PRODUCTS_TAKEHOME AS p ON t.BARCODE = p.BARCODE

WHERE p.CATEGORY_1 = 'Health & Wellness' GROUP BY Generation ORDER BY percentage_of_sales DESC;
```

Q4. Who are Fetch's power users?

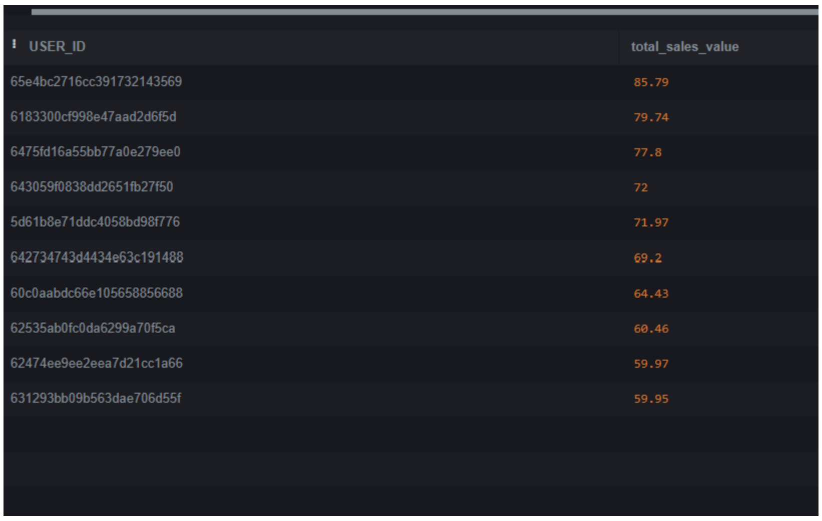
There are two ways to check power users and I have pasted results for both queries. In the first query I have defined power users as users who have 10 top users who have the highest sales value with fetch. In the second query I have defined power users as users who have 10 top users who have the most number of transactions with fetch



```sql
--  Here I have defined power users as users who have 10 top users who have the highest sales value with fetch
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT
        *
    FROM
        TRANSACTION_TAKEHOME
    WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
 -- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, -- Using a default value for NULL BARCODEs
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE,
        FINAL_QUANTITY
    FROM
        transaction_data_sale_not_null
    GROUP BY
        combined_pk
)
-- Main SELECT query to calculate the total sales value per user
SELECT
    t.USER_ID,
    SUM(CAST(t.FINAL_SALE AS FLOAT)) AS total_sales_value -- Summing up the total sales value
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    PRODUCTS_TAKEHOME AS p
ON
    t.BARCODE = p.BARCODE
GROUP BY
    t.USER_ID
ORDER BY
    total_sales_value DESC LIMIT 10; -- Only retrieving the top 10 users by total sales value
```

USER_ID	total_sales_value
65e4bc2716cc391732143569	85.79

Output:

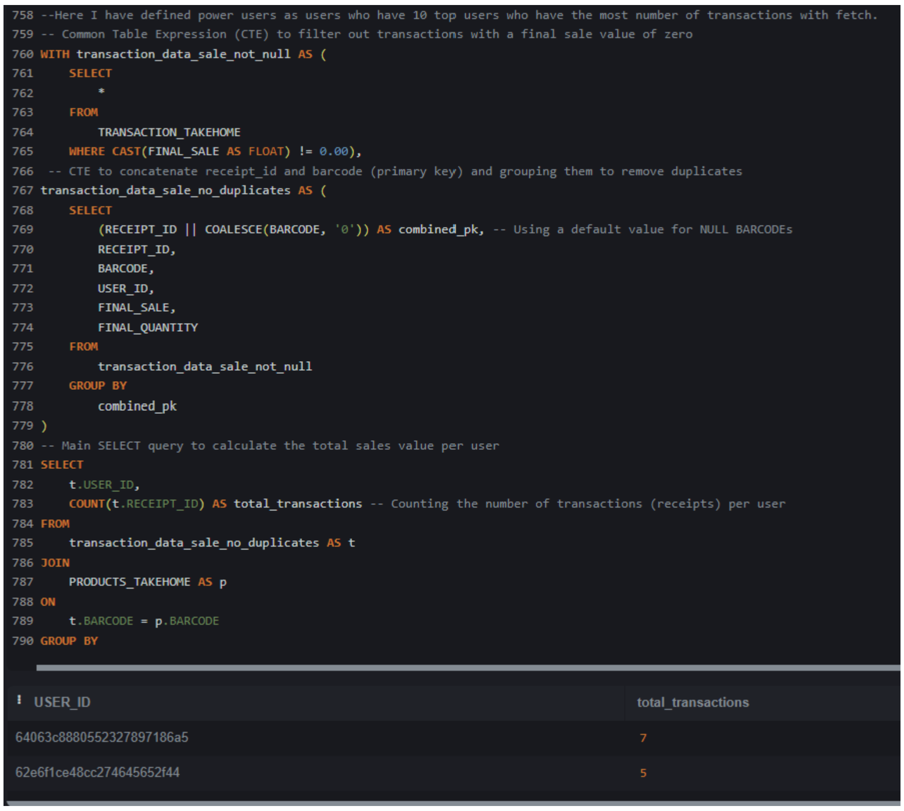


USER_ID	total_sales_value
65e4bc2716cc391732143569	85.79
6183300cf998e47aad2d6f5d	79.74
6475fd16a55bb77a0e279ee0	77.8
643059f0838dd2651fb27f50	72
5d61b8e71ddc4058bd98f776	71.97
642734743d4434e63c191488	69.2
60c0aabdc66e105658856688	64.43
62535ab0fc0da6299a70f5ca	60.46
62474ee9ee2eea7d21cc1a66	59.97
631293bb09b563dae706d55f	59.95

Query:

```
--  Here I have defined power users as users who have 10 top users who have the highest sales value with fetch

-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero

WITH transaction_data_sale_not_null AS (

  SELECT

    *

  FROM

    TRANSACTION_TAKEHOME

  WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),

 -- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates

transaction_data_sale_no_duplicates AS (

  SELECT

    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, -- Using a default value for NULL BARCODEs

    RECEIPT_ID,

    BARCODE,

    USER_ID,

    FINAL_SALE,

    FINAL_QUANTITY

  FROM

    transaction_data_sale_not_null

  GROUP BY

    combined_pk

)

-- Main SELECT query to calculate the total sales value per user

SELECT

  t.USER_ID,

  SUM(CAST(t.FINAL_SALE AS FLOAT)) AS total_sales_value -- Summing up the total sales value

FROM

  transaction_data_sale_no_duplicates AS t

JOIN

  PRODUCTS_TAKEHOME AS p

ON

  t.BARCODE = p.BARCODE

GROUP BY

  t.USER_ID

ORDER BY

  total_sales_value DESC LIMIT 10; -- Only retrieving the top 10 users by total sales value
```

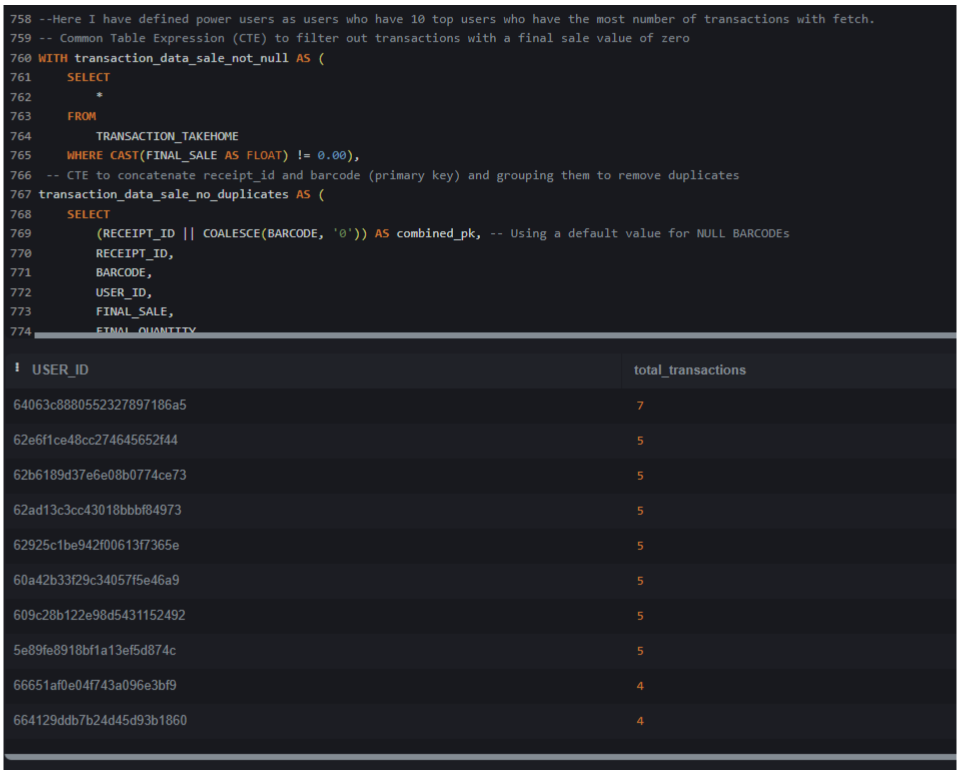
Here I have defined power users as users who have 10 top users who have the most number of transactions with fetch.



```sql
--Here I have defined power users as users who have 10 top users who have the most number of transactions with fetch.
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT
        *
    FROM
        TRANSACTION_TAKEHOME
    WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
 -- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, -- Using a default value for NULL BARCODEs
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE,
        FINAL_QUANTITY
    FROM
        transaction_data_sale_not_null
    GROUP BY
        combined_pk
)
-- Main SELECT query to calculate the total sales value per user
SELECT
    t.USER_ID,
    COUNT(t.RECEIPT_ID) AS total_transactions -- Counting the number of transactions (receipts) per user
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    PRODUCTS_TAKEHOME AS p
ON
    t.BARCODE = p.BARCODE
GROUP BY
```

USER_ID	total_transactions
64063c8880552327897186a5	7
62e6f1ce48cc274645652f44	5

Output:



```sql
--Here I have defined power users as users who have 10 top users who have the most number of transactions with fetch.
-- Common Table Expression (CTE) to filter out transactions with a final sale value of zero
WITH transaction_data_sale_not_null AS (
    SELECT
        *
    FROM
        TRANSACTION_TAKEHOME
    WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
 -- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, -- Using a default value for NULL BARCODEs
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE,
        FINAL_QUANTITY
```

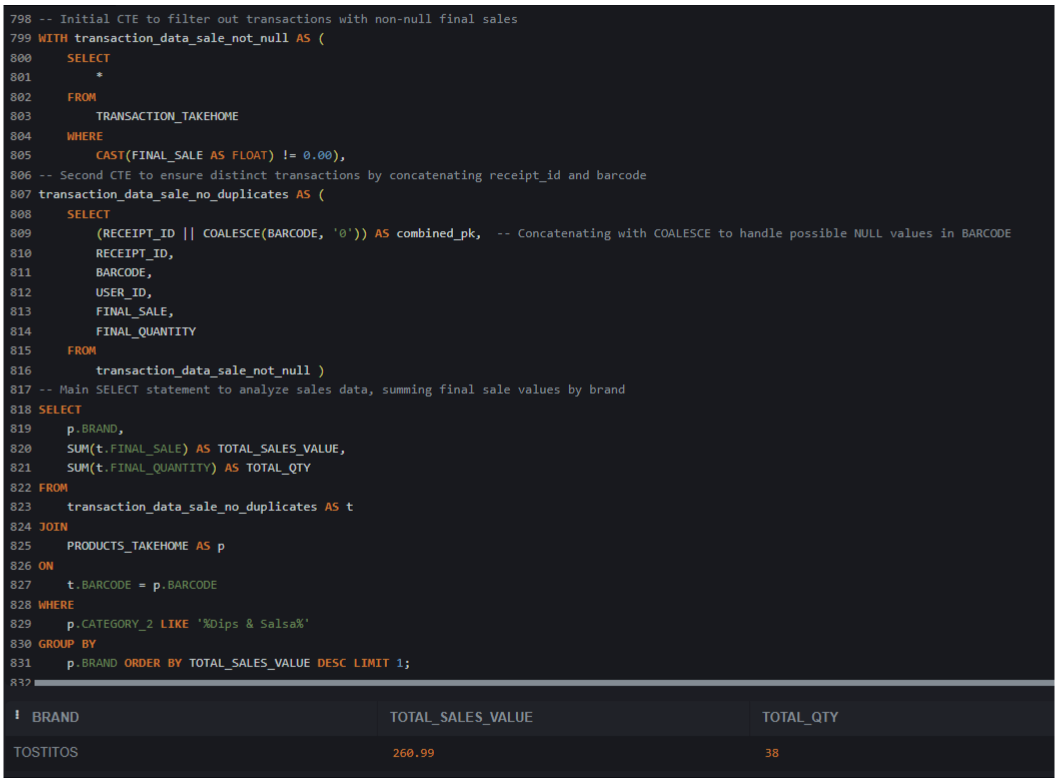
USER_ID	total_transactions
64063c8880552327897186a5	7
62e6f1ce48cc274645652f44	5
62b6189d37e6e08b0774ce73	5
62ad13c3cc43018bbbf84973	5
62925c1be942f00613f7365e	5
60a42b33f29c34057f5e46a9	5
609c28b122e98d5431152492	5
5e89fe8918bf1a13ef5d874c	5
66651af0e04f743a096e3bf9	4
664129ddb7b24d45d93b1860	4

Query:

```
WITH transaction_data_sale_not_null AS (
  SELECT
    *
  FROM
    TRANSACTION_TAKEHOME
  WHERE CAST(FINAL_SALE AS FLOAT) != 0.00),
 -- CTE to concatenate receipt_id and barcode (primary key) and grouping them to remove duplicates
transaction_data_sale_no_duplicates AS (
  SELECT
    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk, -- Using a default value for NULL BARCODEs
    RECEIPT_ID,
    BARCODE,
    USER_ID,
    FINAL_SALE,
    FINAL_QUANTITY
  FROM
    transaction_data_sale_not_null
  GROUP BY
    combined_pk
)
-- Main SELECT query to calculate the total sales value per user
SELECT
  t.USER_ID,
  count(t.RECEIPT_ID) as total_transactions -- Counting the number of transactions (receipts) per user
FROM
  transaction_data_sale_no_duplicates AS t
JOIN
  PRODUCTS_TAKEHOME AS p
ON
  t.BARCODE = p.BARCODE
GROUP BY
  t.USER_ID
ORDER BY
  total_transactions DESC LIMIT 10; -- Only retrieving the top 10 users by total sales value
```

Q5 Which is the leading brand in the Dips & Salsa category?

Here I have only considered sales which are > 0 and are unique, removing any double counting and have joined with the products table to get the brand. Category 2 had dips and salsa so I have used category 2 in the where clause.



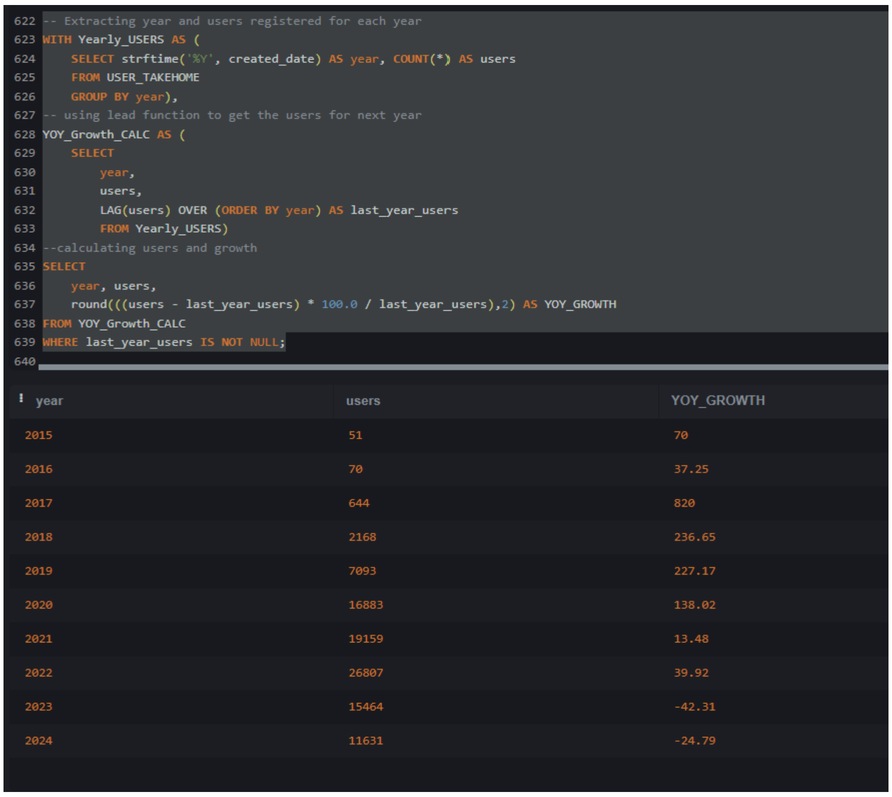
```sql
-- Initial CTE to filter out transactions with non-null final sales
WITH transaction_data_sale_not_null AS (
    SELECT
        *
    FROM
        TRANSACTION_TAKEHOME
    WHERE
        CAST(FINAL_SALE AS FLOAT) != 0.00),
-- Second CTE to ensure distinct transactions by concatenating receipt_id and barcode
transaction_data_sale_no_duplicates AS (
    SELECT
        (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,  -- Concatenating with COALESCE to handle possible NULL values in BARCODE
        RECEIPT_ID,
        BARCODE,
        USER_ID,
        FINAL_SALE,
        FINAL_QUANTITY
    FROM
        transaction_data_sale_not_null )
-- Main SELECT statement to analyze sales data, summing final sale values by brand
SELECT
    p.BRAND,
    SUM(t.FINAL_SALE) AS TOTAL_SALES_VALUE,
    SUM(t.FINAL_QUANTITY) AS TOTAL_QTY
FROM
    transaction_data_sale_no_duplicates AS t
JOIN
    PRODUCTS_TAKEHOME AS p
ON
    t.BARCODE = p.BARCODE
WHERE
    p.CATEGORY_2 LIKE '%Dips & Salsa%'
GROUP BY
    p.BRAND ORDER BY TOTAL_SALES_VALUE DESC LIMIT 1;
```

BRAND	TOTAL_SALES_VALUE	TOTAL_QTY
TOSTITOS	260.99	38

```
-- Initial CTE to filter out transactions with non-null final sales
WITH transaction_data_sale_not_null AS (
  SELECT
    *
  FROM
    TRANSACTION_TAKEHOME
  WHERE
    CAST(FINAL_SALE AS FLOAT) != 0.00),
-- Second CTE to ensure distinct transactions by concatenating receipt_id and barcode
transaction_data_sale_no_duplicates AS (
  SELECT
    (RECEIPT_ID || COALESCE(BARCODE, '0')) AS combined_pk,  -- Concatenating with COALESCE to handle possible NULL values in BARCODE
    RECEIPT_ID,
    BARCODE,
    USER_ID,
    FINAL_SALE,
                        FINAL_QUANTITY
  FROM
    transaction_data_sale_not_null )
-- Main SELECT statement to analyze sales data, summing final sale values by brand
SELECT
  p.BRAND,
  SUM(t.FINAL_SALE) AS TOTAL_SALES_VALUE,
  SUM(t.FINAL_QUANTITY) AS TOTAL_QTY
FROM
  transaction_data_sale_no_duplicates AS t
JOIN
  PRODUCTS_TAKEHOME AS p
ON
  t.BARCODE = p.BARCODE
WHERE
  p.CATEGORY_2 LIKE '%Dips & Salsa%'
GROUP BY
  p.BRAND ORDER BY TOTAL_SALES_VALUE DESC LIMIT 1;
```

Q6. At what percent has Fetch grown year over year? – **Answering based on YOY User Signup Growth**

Assumption: I have taken the users table to answer this question since the transactions table only had data for only 2024 year. Since we do not have complete data for 2024 yet (only until August), the number for 2024 can be misleading



```
-- Extracting year and users registered for each year
WITH Yearly_USERS AS (
    SELECT strftime('%Y', created_date) AS year, COUNT(*) AS users
    FROM USER_TAKEHOME
    GROUP BY year),
-- using lead function to get the users for next year
YOY_Growth_CALC AS (
    SELECT
        year,
        users,
        LAG(users) OVER (ORDER BY year) AS last_year_users
        FROM Yearly_USERS)
--calculating users and growth
SELECT
    year, users,
    round(((users - last_year_users) * 100.0 / last_year_users),2) AS YOY_GROWTH
FROM YOY_Growth_CALC
WHERE last_year_users IS NOT NULL;
```

```
year        users       YOY_GROWTH
2015        51          70
2016        70          37.25
2017        644         820
2018        2168        236.65
2019        7093        227.17
2020        16883       138.02
2021        19159       13.48
2022        26807       39.92
2023        15464       -42.31
2024        11631       -24.79
```

-- Extracting year and users registered for each year

WITH Yearly_USERS AS (

  SELECT strftime('%Y', created_date) AS year, COUNT(*) AS users

  FROM USER_TAKEHOME

  GROUP BY year),

-- using lead function to get the users for next year

YOY_Growth_CALC AS (

  SELECT

    year,

    users,

    LAG(users) OVER (ORDER BY year) AS last_year_users

                    FROM Yearly_USERS)

--calculating users and growth

SELECT

  year, users,

  round(((users - last_year_users) * 100.0 / last_year_users),2) AS YOY_GROWTH

FROM YOY_Growth_CALC

WHERE last_year_users IS NOT NULL;