Attribution Queries

CoolTShirts

Analyze Data with SQL
Attribution Queries
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Date: 04/10/2020

CoolTShirts

CoolTShirts, an innovative apparel shop, is running a bunch of marketing campaigns. In this project, you'll be helping them answer these questions about their campaigns:

1 Get familiar with the company.

How many campaigns and sources does CoolTShirts use and how are they related? Be sure to explain the difference between utm_campaign and utm_source.

What pages are on their website?

2. What is the user journey?

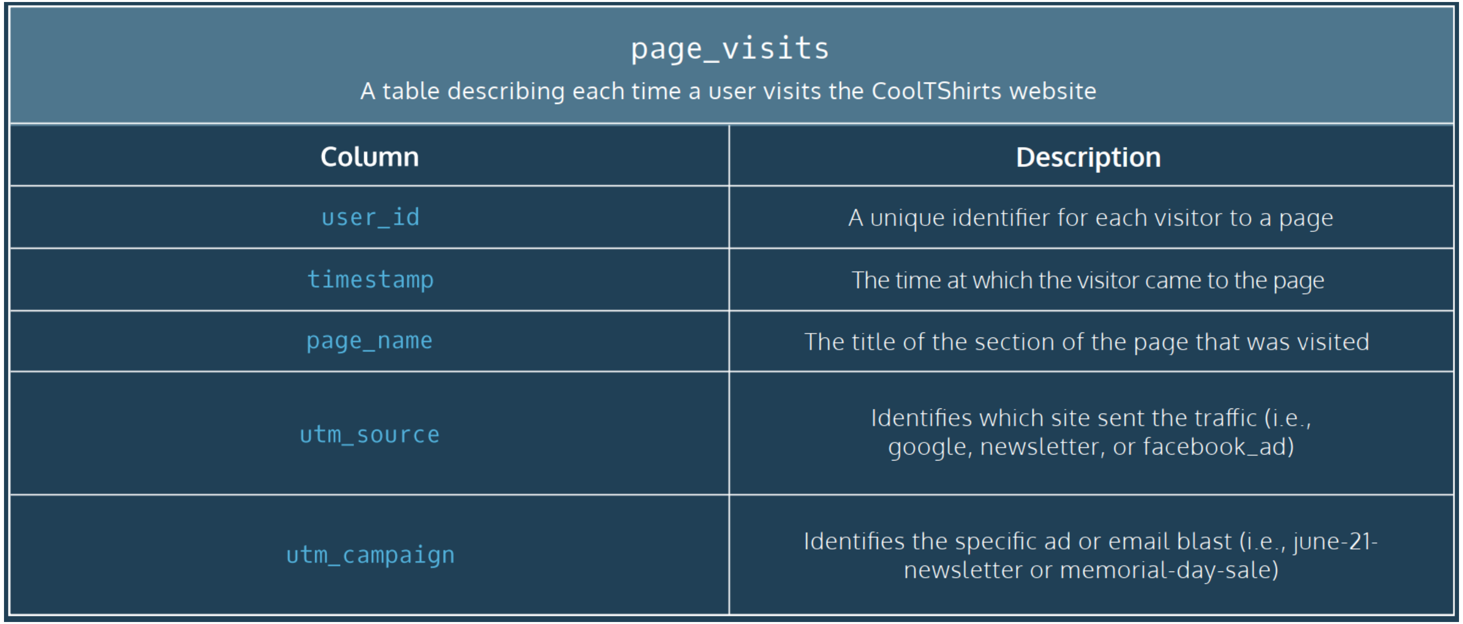
- How many first touches is each campaign responsible for?
- How many last touches is each campaign responsible for?
- How many visitors make a purchase?
- How many last touches on the purchase page is each campaign responsible for?

What is the typical user journey?

3. Optimize the campaign budget.

CoolTShirts can re-invest in 5 campaigns. Which should they pick and why?

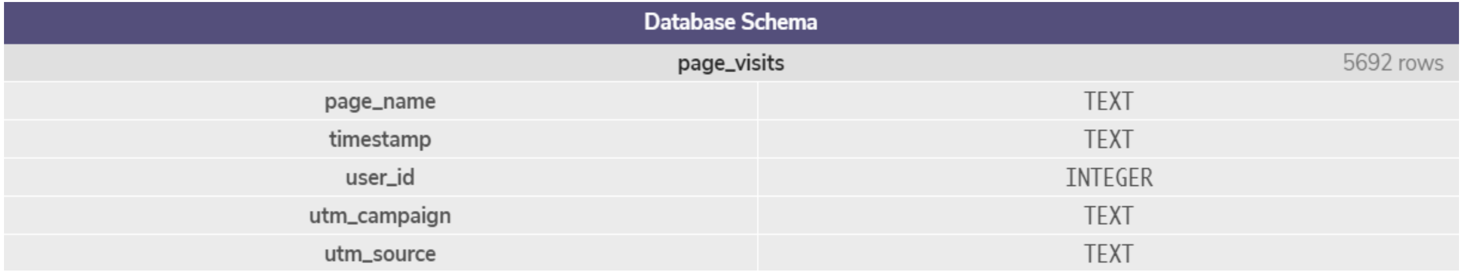
CoolTShirts Project Database Schema:



page_visits

A table describing each time a user visits the CoolTShirts website

Column	Description
user_id	A unique identifier for each visitor to a page
timestamp	The time at which the visitor came to the page
page_name	The title of the section of the page that was visited
utm_source	Identifies which site sent the traffic (i.e., google, newsletter, or facebook_ad)
utm_campaign	Identifies the specific ad or email blast (i.e., june-21-newsletter or memorial-day-sale)



Database Schema	
page_visits	5692 rows
page_name	TEXT
timestamp	TEXT
user_id	INTEGER
utm_campaign	TEXT
utm_source	TEXT

Project Tasks:

Get familiar with CoolTShirts

1. How many campaigns and sources does CoolTShirts use? Which source is used for each campaign?
2. What pages are on the CoolTShirts website?

What is the user journey?

3. How many first touches is each campaign responsible for?
4. How many last touches is each campaign responsible for?
5. How many visitors make a purchase?
6. How many last touches on the purchase page is each campaign responsible for?
7. CoolTShirts can re-invest in 5 campaigns. Given your findings in the project, which should they pick and why?number of segments?

1. Project Task:
How many campaigns and sources

1.1 Description of the task

How many campaigns and sources does CoolTShirts use?

Which source is used for each campaign?

Use three queries:

- one for the number of distinct campaigns,
- one for the number of distinct sources,
- one to find how they are related.

1.2 How many campaigns and sources does CoolTShirts use?

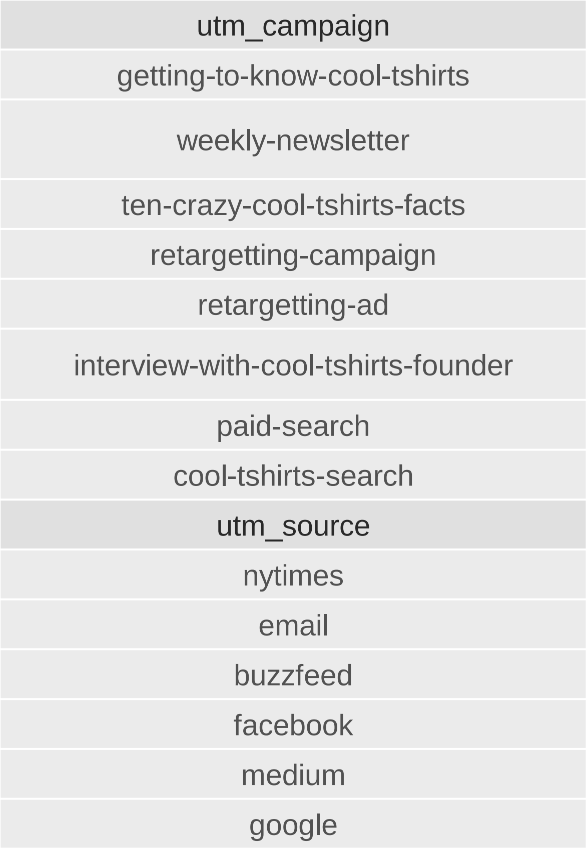
CoolTShirts uses 8 campaigns:

- getting-to-know-cool-tshirts
- weekly-newsletter
- ten-crazy-cool-tshirts-facts
- retargetting-campaign
- retargetting-ad
- interview-with-cool-tshirts-founder
- paid-search
- cool-tshirts-search

CoolTShirts uses 6 sources:

- nytime
- email
- buzzfeed
- facebook
- medium
- google

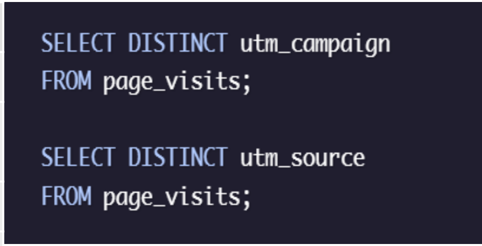
Queries



utm_campaign
getting-to-know-cool-tshirts
weekly-newsletter
ten-crazy-cool-tshirts-facts
retargetting-campaign
retargetting-ad
interview-with-cool-tshirts-founder
paid-search
cool-tshirts-search

utm_source
nytimes
email
buzzfeed
facebook
medium
google

Query code



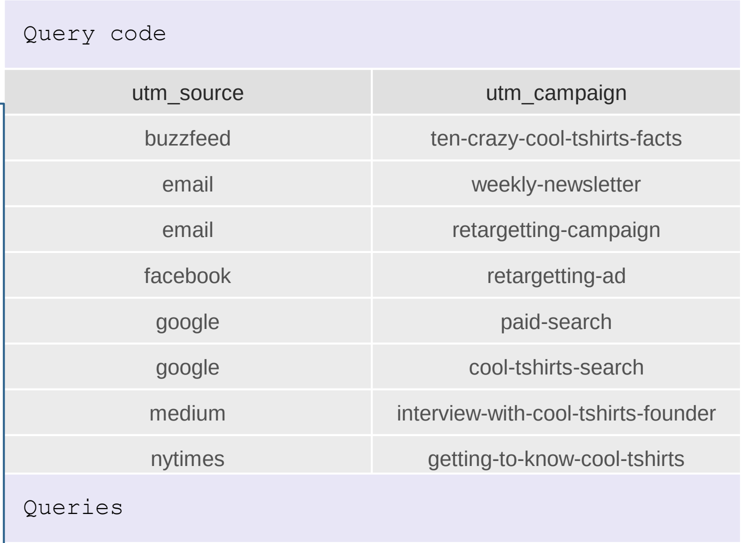
```
SELECT DISTINCT utm_campaign
FROM page_visits;

SELECT DISTINCT utm_source
FROM page_visits;
```

1.3 Which source is used for each campaign?

CoolTShirts sources and campaigns connection:

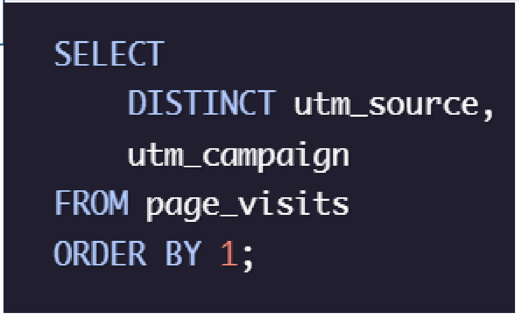
- buzzfeed → ten-crazy-cool-tshirts-facts
- email → weekly-newsletter
- email → retargetting-campaign
- facebook → retargetting-ad
- google → paid-search
- google → cool-tshirts-search
- medium → interview-with-cool-tshirts-founder
- nytime → getting-to-know-cool-tshirts



Query code

utm_source	utm_campaign
buzzfeed	ten-crazy-cool-tshirts-facts
email	weekly-newsletter
email	retargetting-campaign
facebook	retargetting-ad
google	paid-search
google	cool-tshirts-search
medium	interview-with-cool-tshirts-founder
nytimes	getting-to-know-cool-tshirts

Queries



```
SELECT
    DISTINCT utm_source,
    utm_campaign
FROM page_visits
ORDER BY 1;
```

2. Project Task:
The page_name column

2.1 Description of the task

What pages are on the CoolTShirts website?

Find the distinct values of the page_name column.

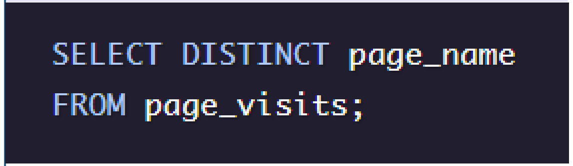
2.2 What pages are on the CoolTShirts website?

Values of the page_name column :

1 - landing_page
2 - shopping_cart
3 - checkout
4 - purchase

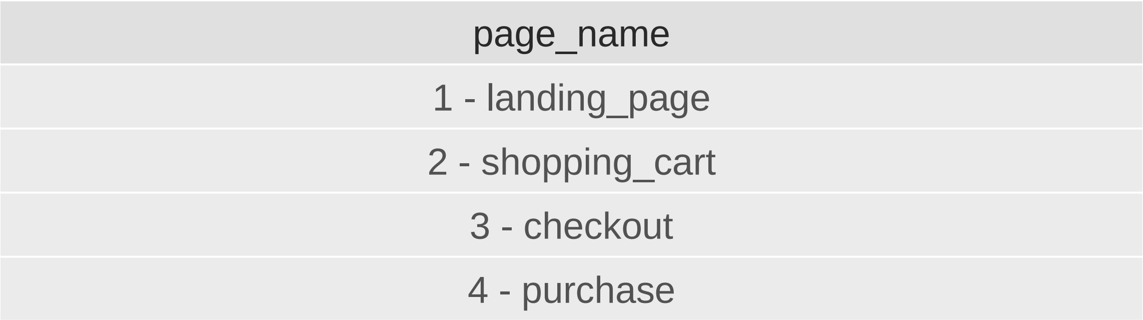
The page_name column is a marketing Funnel from landing page to purchase.

Query code



```
SELECT DISTINCT page_name
FROM page_visits;
```

Queries



page_name
1 - landing_page
2 - shopping_cart
3 - checkout
4 - purchase

3. Project Task:

How many first touches is each campaign responsible for?

3.1 Description of the task

How many first touches is each campaign responsible for?

Group by campaign and count the number of first touches for each.

3.2 How many first touches is each campaign responsible for?

Number of first touches for each campaign:

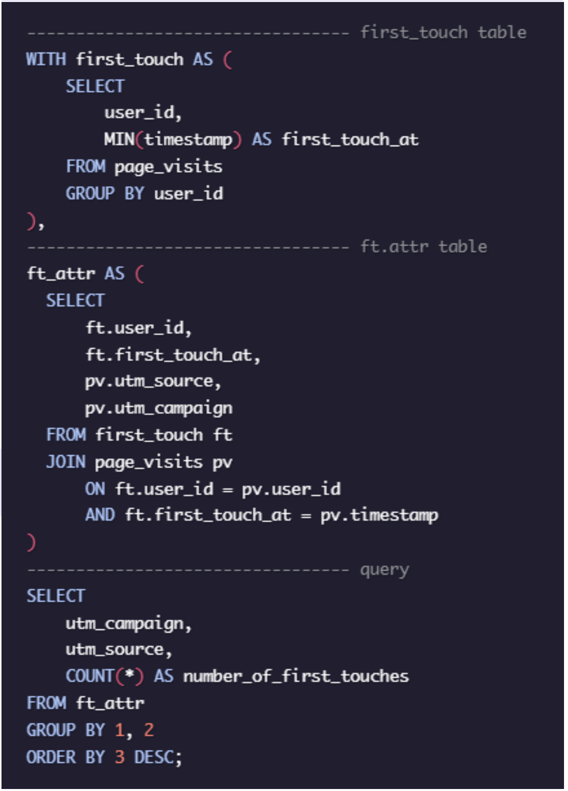
interview-with-cool-tshirts-founder	622
getting-to-know-cool-tshirts	612
ten-crazy-cool-tshirts-facts	576
cool-tshirts-search	169

I created a temporary first_touch table storing the user_is and first_touch_at, and a second temporary ft_attr join table of the temporary first_touch table and the page_visits table, to query the number of first touches for each campaign.

Queries

utm_campaign	utm_source	number_of_first_touches
interview-with-cool-tshirts-founder	medium	622
getting-to-know-cool-tshirts	nytimes	612
ten-crazy-cool-tshirts-facts	buzzfeed	576
cool-tshirts-search	google	169

Query code



```
-------------------------------- first_touch table
WITH first_touch AS (
    SELECT
        user_id,
        MIN(timestamp) AS first_touch_at
    FROM page_visits
    GROUP BY user_id
),
-------------------------------- ft.attr table
ft_attr AS (
  SELECT
      ft.user_id,
      ft.first_touch_at,
      pv.utm_source,
      pv.utm_campaign
  FROM first_touch ft
  JOIN page_visits pv
      ON ft.user_id = pv.user_id
      AND ft.first_touch_at = pv.timestamp
)
-------------------------------- query
SELECT
    utm_campaign,
    utm_source,
    COUNT(*) AS number_of_first_touches
FROM ft_attr
GROUP BY 1, 2
ORDER BY 3 DESC;
```

4. Project Task:

Create a temporary table cross_join

4.1 Description of the task

How many last touches is each campaign responsible for?

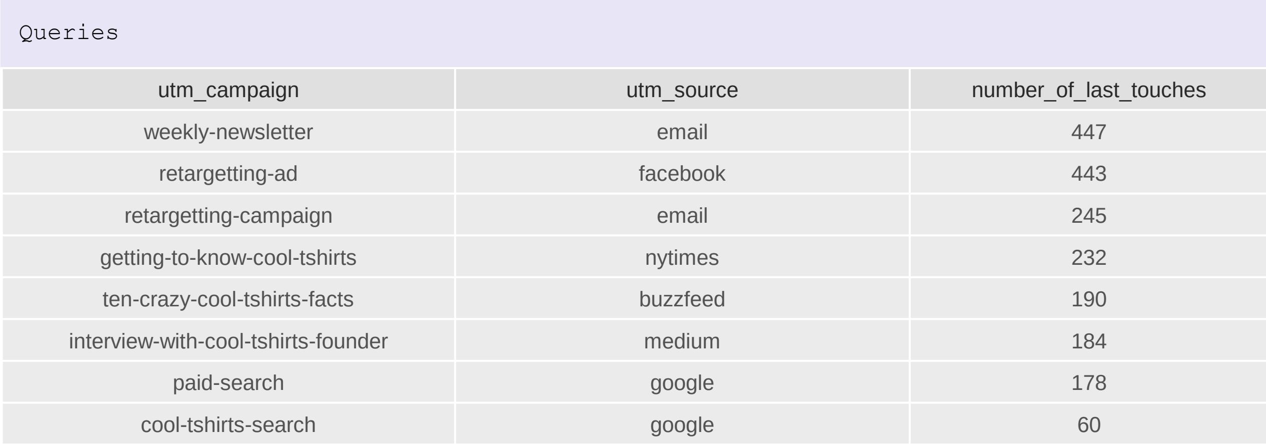
Group by campaign and count the number of last touches for each.

4.2 Group by campaign and count the number of last touches for each.

Number of last touches for each campaign:

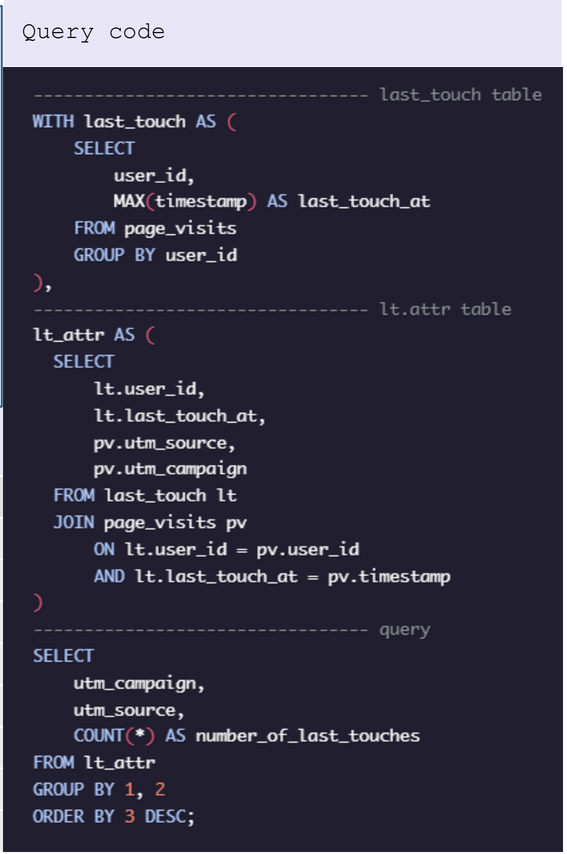
weekly-newsletter	447
retargetting-ad	443
retargetting-campaign	245
getting-to-know-cool-tshirts	232
ten-crazy-cool-tshirts-facts	190
interview-with-cool-tshirts-founder	184
paid-search	178
cool-tshirts-search	60

I created a temporary last_touch table storing the user_is and last_touch_at, and a second temporary lt_attr join table of the temporary last_touch table and the page_visits table, to query the number of last touches for each campaign.



Queries

utm_campaign	utm_source	number_of_last_touches
weekly-newsletter	email	447
retargetting-ad	facebook	443
retargetting-campaign	email	245
getting-to-know-cool-tshirts	nytimes	232
ten-crazy-cool-tshirts-facts	buzzfeed	190
interview-with-cool-tshirts-founder	medium	184
paid-search	google	178
cool-tshirts-search	google	60



Query code

```
--------------------------------- last_touch table
WITH last_touch AS (
    SELECT
        user_id,
        MAX(timestamp) AS last_touch_at
    FROM page_visits
    GROUP BY user_id
),
--------------------------------- lt.attr table
lt_attr AS (
  SELECT
      lt.user_id,
      lt.last_touch_at,
      pv.utm_source,
      pv.utm_campaign
  FROM last_touch lt
  JOIN page_visits pv
      ON lt.user_id = pv.user_id
      AND lt.last_touch_at = pv.timestamp
)
--------------------------------- query
SELECT
    utm_campaign,
    utm_source,
    COUNT(*) AS number_of_last_touches
FROM lt_attr
GROUP BY 1, 2
ORDER BY 3 DESC;
```

5. Project Task:

Create a temporary table status

5.1 Description of the task

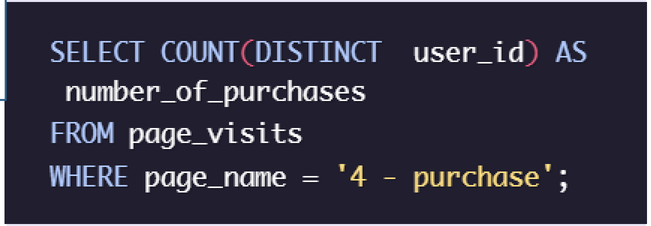
How many visitors make a purchase?

Count the distinct users who visited the page named 4 - purchase.

5.2 How many visitors make a purchase?

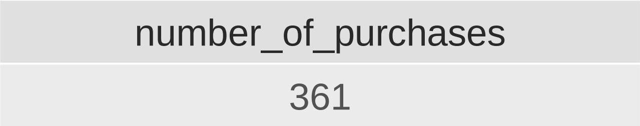
361 visitors made a purchase.

Query output



```
SELECT COUNT(DISTINCT  user_id) AS
 number_of_purchases
FROM page_visits
WHERE page_name = '4 - purchase';
```

Query code



number_of_purchases
361

6. Project Task:
How many last touches on the purchase page is each campaign responsible for?

6.1 Description of the task

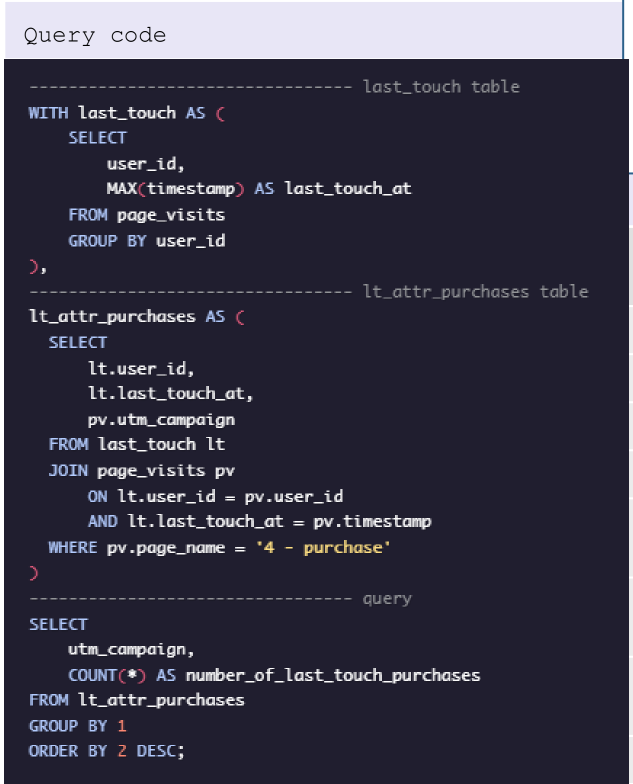
How many last touches on the purchase page is each campaign responsible for?

This query will look similar to your last-touch query, but with an additional WHERE clause.

6.2 How many last touches on the purchase page is each campaign responsible for?

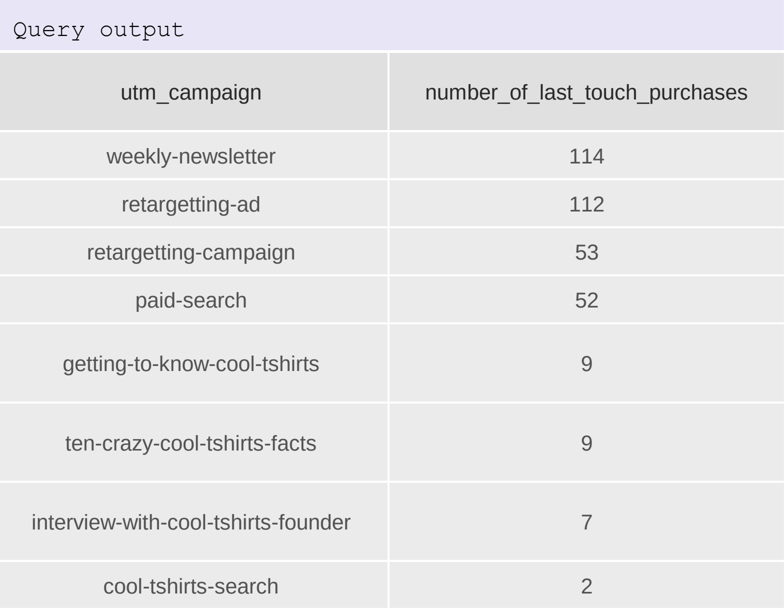
Number of last touch purchases for each campaign:

weekly-newsletter	114
retargetting-ad	112
retargetting-campaign	53
paid-search	52
getting-to-know-cool-tshirts	9
ten-crazy-cool-tshirts-facts	9
interview-with-cool-tshirts-founder	7
cool-tshirts-search	2



Query code

```
---------------------------------- last_touch table
WITH last_touch AS (
    SELECT
        user_id,
        MAX(timestamp) AS last_touch_at
    FROM page_visits
    GROUP BY user_id
),
---------------------------------- lt_attr_purchases table
lt_attr_purchases AS (
  SELECT
      lt.user_id,
      lt.last_touch_at,
      pv.utm_campaign
  FROM last_touch lt
  JOIN page_visits pv
      ON lt.user_id = pv.user_id
      AND lt.last_touch_at = pv.timestamp
  WHERE pv.page_name = '4 - purchase'
)
---------------------------------- query
SELECT
    utm_campaign,
    COUNT(*) AS number_of_last_touch_purchases
FROM lt_attr_purchases
GROUP BY 1
ORDER BY 2 DESC;
```



Query output

utm_campaign	number_of_last_touch_purchases
weekly-newsletter	114
retargetting-ad	112
retargetting-campaign	53
paid-search	52
getting-to-know-cool-tshirts	9
ten-crazy-cool-tshirts-facts	9
interview-with-cool-tshirts-founder	7
cool-tshirts-search	2

7. Project Task: CoolTShirts can re-invest in 5 campaigns.

7.1 Description of the task

CoolTShirts can re-invest in 5 campaigns.

Given your findings in the project, which should they pick and why?

7.2 First five campaigns with the highest number of purchases

When taking a quick look at the query from slide 6.3, we can see, that the 5 first campaigns with the highest numbers of last touches purchases are:

1. weekly-newsletter
2. retargetting-ad
3. retargetting-campaign
4. paid-search

With a tie for the 5th position between

5. getting-to-know-cool-tshirts
5. ten-crazy-cool-tshirts-facts

It seems that CoolTShirts should re-invest in the first 4 campaigns, but with a better understanding of UTM attribution, we will find out that the first 4 campaigns are retargeting campaigns, they are not first touch campaigns. Let’s analyze the data further before making a recommendation.

`Query output from slide 6.3`

utm_campaign	number_of_last_touch_purchases
weekly-newsletter	114
retargetting-ad	112
retargetting-campaign	53
paid-search	52
getting-to-know-cool-tshirts	9
ten-crazy-cool-tshirts-facts	9
interview-with-cool-tshirts-founder	7
cool-tshirts-search	2

7.3 The costumer journey from first touch to purchase

The campaigns:

- weekly-newsletter
- retargetting-ad
- retargetting-campaign
- paid-search

They are retargeting campaigns, meaning they target a potential costumer after a first touch happened.

The campaigns: see query output from slide 32 and slide 6.3

- interview-with-cool-tshirts-founder
- getting-to-know-cool-tshirts
- ten-crazy-cool-tshirts-facts
- cool-tshirts-search

They are first touch campaigns having a last touch purchase outcome, with no retargeting campaign involvement.
Going forward, I will define those campaigns results as *first-last touch purchases*.

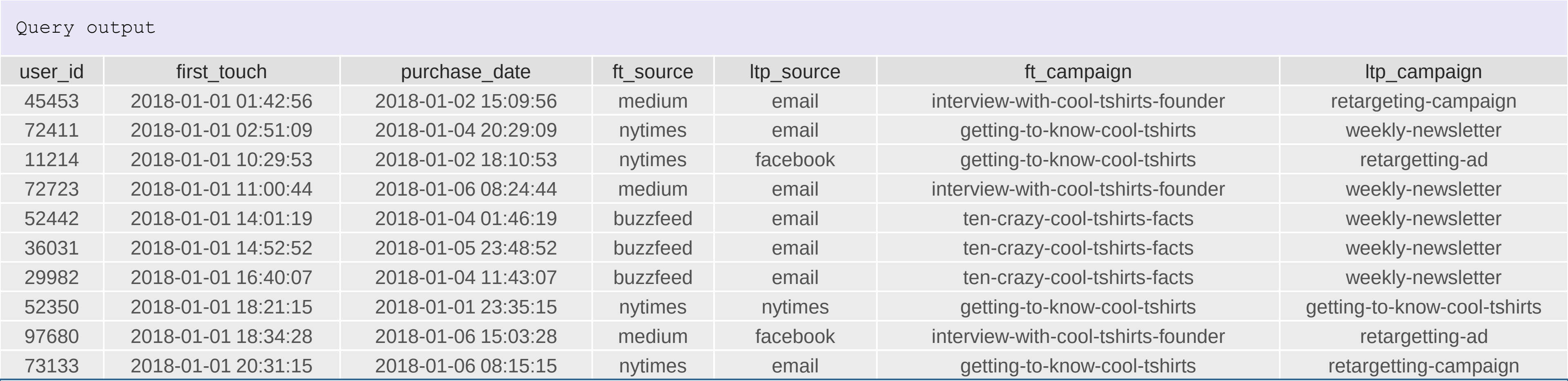
```
Query output slide 6.3
```

utm_campaign	number_of_last_touch_purchases
weekly-newsletter	114
retargetting-ad	112
retargetting-campaign	53
paid-search	52
getting-to-know-cool-tshirts	9
ten-crazy-cool-tshirts-facts	9
interview-with-cool-tshirts-founder	7
cool-tshirts-search	2

```
Query output slide 3.2
```

utm_campaign	utm_source	number_of_first_touches
interview-with-cool-tshirts-founder	medium	622
getting-to-know-cool-tshirts	nytimes	612
ten-crazy-cool-tshirts-facts	buzzfeed	576
cool-tshirts-search	google	169

7.4 The costumer journey from first touch to purchase, Table query results



Query output

user_id	first_touch	purchase_date	ft_source	ltp_source	ft_campaign	ltp_campaign
45453	2018-01-01 01:42:56	2018-01-02 15:09:56	medium	email	interview-with-cool-tshirts-founder	retargeting-campaign
72411	2018-01-01 02:51:09	2018-01-04 20:29:09	nytimes	email	getting-to-know-cool-tshirts	weekly-newsletter
11214	2018-01-01 10:29:53	2018-01-02 18:10:53	nytimes	facebook	getting-to-know-cool-tshirts	retargetting-ad
72723	2018-01-01 11:00:44	2018-01-06 08:24:44	medium	email	interview-with-cool-tshirts-founder	weekly-newsletter
52442	2018-01-01 14:01:19	2018-01-04 01:46:19	buzzfeed	email	ten-crazy-cool-tshirts-facts	weekly-newsletter
36031	2018-01-01 14:52:52	2018-01-05 23:48:52	buzzfeed	email	ten-crazy-cool-tshirts-facts	weekly-newsletter
29982	2018-01-01 16:40:07	2018-01-04 11:43:07	buzzfeed	email	ten-crazy-cool-tshirts-facts	weekly-newsletter
52350	2018-01-01 18:21:15	2018-01-01 23:35:15	nytimes	nytimes	getting-to-know-cool-tshirts	getting-to-know-cool-tshirts
97680	2018-01-01 18:34:28	2018-01-06 15:03:28	medium	facebook	interview-with-cool-tshirts-founder	retargetting-ad
73133	2018-01-01 20:31:15	2018-01-06 08:15:15	nytimes	email	getting-to-know-cool-tshirts	retargetting-campaign

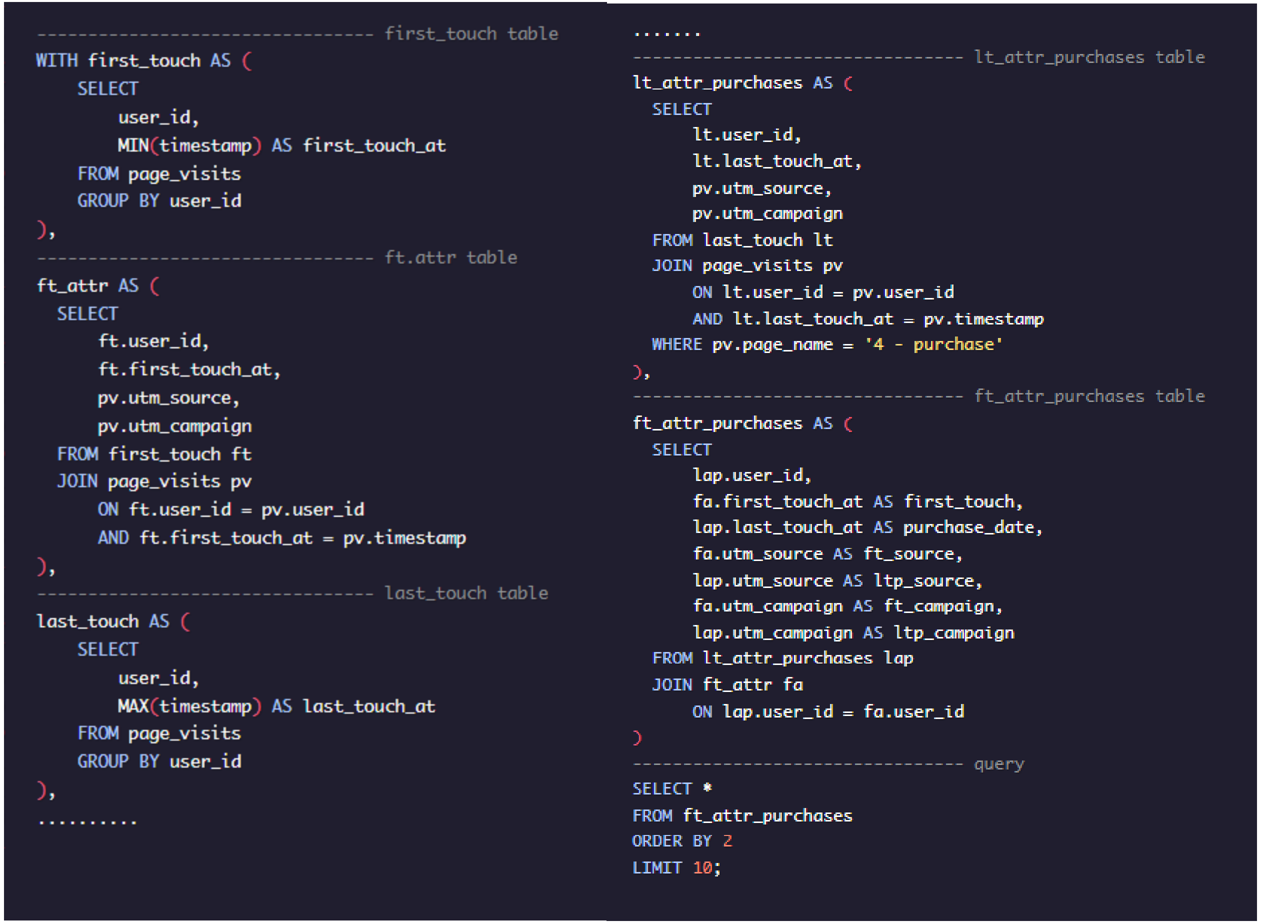
I made a query outputting the first and last touch attributions for every costumer that made a purchase.

When taking a quick look at the query rows:

- We can see that most of the first touch campaigns, ft_campaign, have a different result than the last touch purchases campaigns, ltp_campaign. Meaning that those costumers were retargeted, with a different campaign before making the purchase.

- We can also see that a few first touch campaigns, ft_campaign, have the same result than the last touch purchases campaigns, ltp_campaign. Meaning that those costumers were not retargeted, and they made a purchase directly from a first touch campaign. I define the purchases results of first touch campaigns having a last touch purchase outcome, with no retargeting campaign involvement, as ***first-last touch purchases results***.

7.4.1 The costumer journey from first touch to purchase, Table results query code



```
--------------------------------- first_touch table
WITH first_touch AS (
    SELECT
        user_id,
        MIN(timestamp) AS first_touch_at
    FROM page_visits
    GROUP BY user_id
),
--------------------------------- ft.attr table
ft_attr AS (
  SELECT
      ft.user_id,
      ft.first_touch_at,
      pv.utm_source,
      pv.utm_campaign
  FROM first_touch ft
  JOIN page_visits pv
      ON ft.user_id = pv.user_id
      AND ft.first_touch_at = pv.timestamp
),
--------------------------------- last_touch table
last_touch AS (
    SELECT
        user_id,
        MAX(timestamp) AS last_touch_at
    FROM page_visits
    GROUP BY user_id
),
.........
```

```
.......
--------------------------------- lt_attr_purchases table
lt_attr_purchases AS (
  SELECT
      lt.user_id,
      lt.last_touch_at,
      pv.utm_source,
      pv.utm_campaign
  FROM last_touch lt
  JOIN page_visits pv
      ON lt.user_id = pv.user_id
      AND lt.last_touch_at = pv.timestamp
  WHERE pv.page_name = '4 - purchase'
),
--------------------------------- ft_attr_purchases table
ft_attr_purchases AS (
  SELECT
      lap.user_id,
      fa.first_touch_at AS first_touch,
      lap.last_touch_at AS purchase_date,
      fa.utm_source AS ft_source,
      lap.utm_source AS ltp_source,
      fa.utm_campaign AS ft_campaign,
      lap.utm_campaign AS ltp_campaign
  FROM lt_attr_purchases lap
  JOIN ft_attr fa
      ON lap.user_id = fa.user_id
)
--------------------------------- query
SELECT *
FROM ft_attr_purchases
ORDER BY 2
LIMIT 10;
```

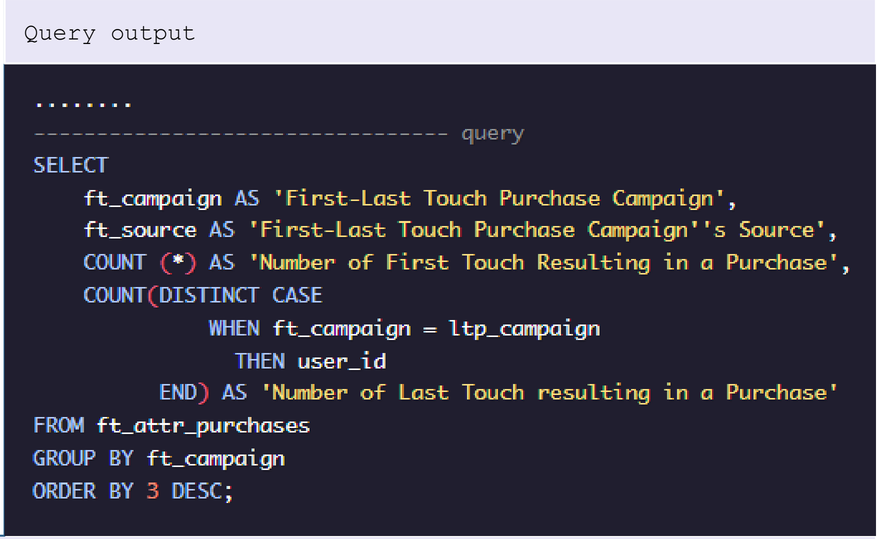
7.5 Purchase numbers for first touch campaigns

First-last touch purchases results, are the results from first touch campaigns having a last touch purchase outcome, with no retargeting campaign involvement.

When taking a quick look at the query:

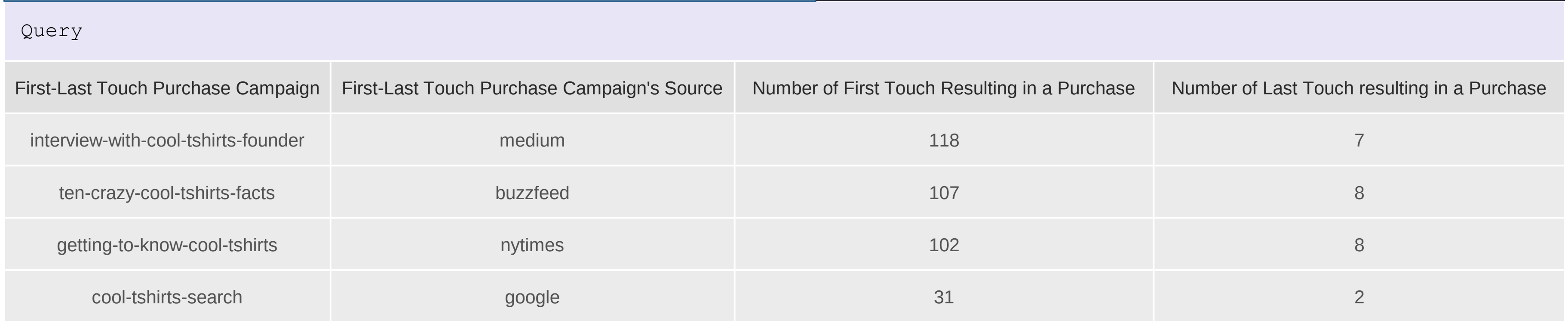
We can see that the results of the Numbers of Last Touch resulting in a Purchase are lower compared to the Numbers of First Touch Resulting in a Purchase (First-last touch purchases results).

Even if it is a helpful comparison, a more interesting comparison will be to compare the Numbers of First Touch Resulting in a Purchase from the first touch campaigns and the number_of_last_touch_purchases from the retargeting campaigns.



Query output

```
........
--------------------------------- query
SELECT
    ft_campaign AS 'First-Last Touch Purchase Campaign',
    ft_source AS 'First-Last Touch Purchase Campaign''s Source',
    COUNT (*) AS 'Number of First Touch Resulting in a Purchase',
    COUNT(DISTINCT CASE
              WHEN ft_campaign = ltp_campaign
                THEN user_id
          END) AS 'Number of Last Touch resulting in a Purchase'
FROM ft_attr_purchases
GROUP BY ft_campaign
ORDER BY 3 DESC;
```



Query

First-Last Touch Purchase Campaign	First-Last Touch Purchase Campaign's Source	Number of First Touch Resulting in a Purchase	Number of Last Touch resulting in a Purchase
interview-with-cool-tshirts-founder	medium	118	7
ten-crazy-cool-tshirts-facts	buzzfeed	107	8
getting-to-know-cool-tshirts	nytimes	102	8
cool-tshirts-search	google	31	2

7.6 Purchase numbers for last touch campaigns.

Last touch purchases results, can be the results from first touch campaigns having a last touch purchase outcome, with no retargeting campaign involvement, but more often than not, last touch purchases results are from retargeting campaigns.

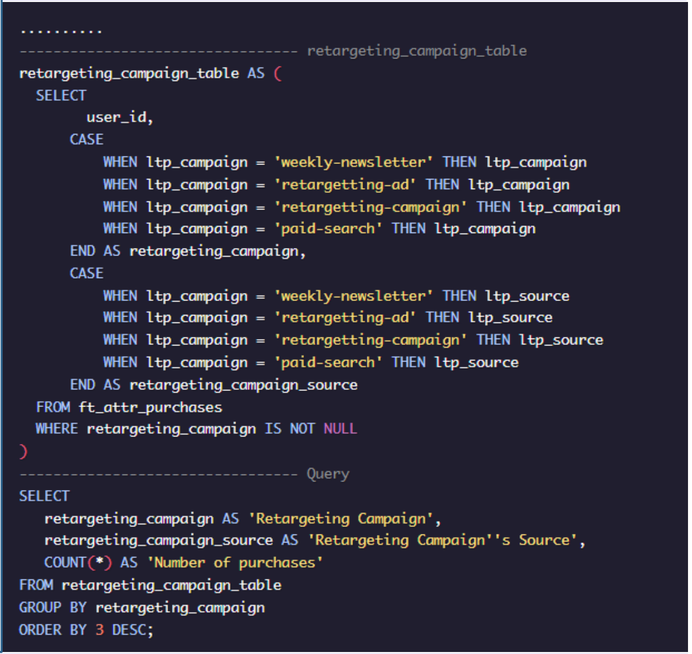
I created a temporary table, retargeting_campaign_table, to isolate the targeting campaigns from the first touch campaigns and created a query to output the Number of purchases for each campaign.

We can see from the output query, that the weekly-newsletter campaign and retargetting-campaign campaign have email as a utm source.
Next step is to compare the Number of purchases from Retargeting Campaigns and from First Touch Campaigns.

Retargeting Campaigns:

weekly-newsletter
retargetting-ad
retargetting-campaign
paid-search

Query



```
..........
-------------------------------- retargeting_campaign_table
retargeting_campaign_table AS (
  SELECT
        user_id,
      CASE
          WHEN ltp_campaign = 'weekly-newsletter' THEN ltp_campaign
          WHEN ltp_campaign = 'retargetting-ad' THEN ltp_campaign
          WHEN ltp_campaign = 'retargetting-campaign' THEN ltp_campaign
          WHEN ltp_campaign = 'paid-search' THEN ltp_campaign
      END AS retargeting_campaign,
      CASE
          WHEN ltp_campaign = 'weekly-newsletter' THEN ltp_source
          WHEN ltp_campaign = 'retargetting-ad' THEN ltp_source
          WHEN ltp_campaign = 'retargetting-campaign' THEN ltp_source
          WHEN ltp_campaign = 'paid-search' THEN ltp_source
      END AS retargeting_campaign_source
  FROM ft_attr_purchases
  WHERE retargeting_campaign IS NOT NULL
)
-------------------------------- Query
SELECT
   retargeting_campaign AS 'Retargeting Campaign',
   retargeting_campaign_source AS 'Retargeting Campaign''s Source',
   COUNT(*) AS 'Number of purchases'
FROM retargeting_campaign_table
GROUP BY retargeting_campaign
ORDER BY 3 DESC;
```

Query output

Retargeting Campaign	Retargeting Campaign's Source	Number of purchases
weekly-newsletter	email	114
retargetting-ad	facebook	112
retargetting-campaign	email	53
paid-search	google	52

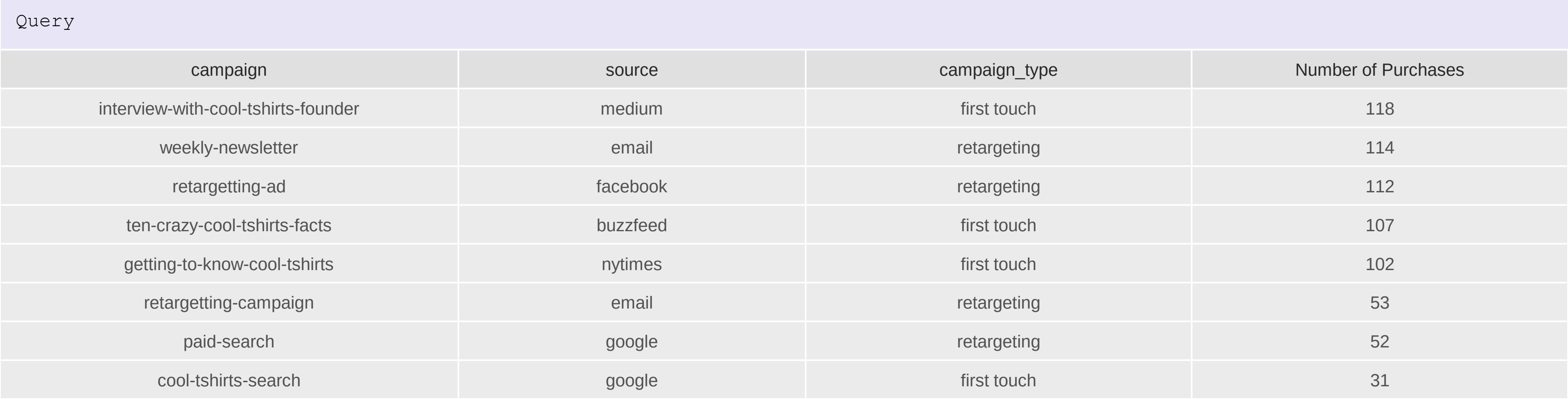
7.7 Number of purchases outcomes for each campaign

The following query outputs the number of purchases outcomes for each campaign, it also assign to the campaign a type, first touch or retargeting.

the 5 first campaigns with the highest number of purchase outcomes are:

• interview-with-cool-tshirts-founder	first touch campaign
• weekly-newsletter	retargeting campaign
• retargetting-ad	retargeting campaign
• ten-crazy-cool-tshirts-facts	first touch campaign
• getting-to-know-cool-tshirts	first touch campaign

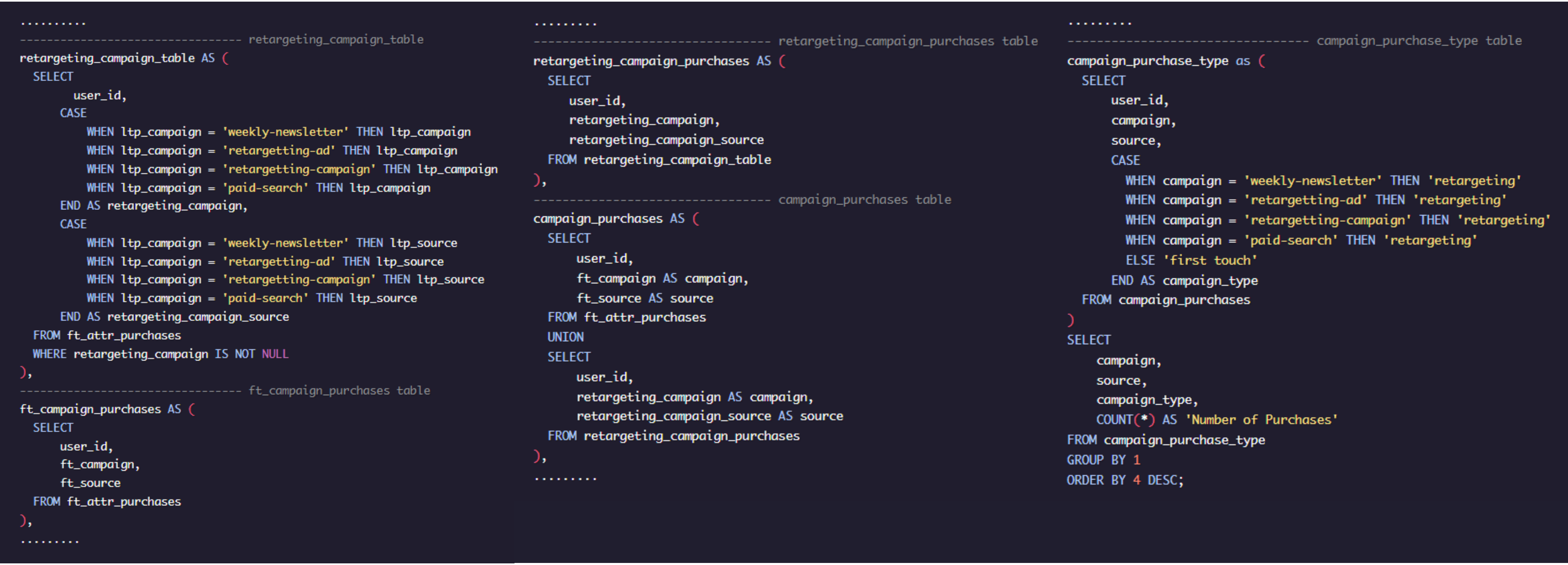
I will recommend CoolTShirts to re-invest in all five of them, together they strike a good balance between first touch and retargeting campaigns



Query

campaign	source	campaign_type	Number of Purchases
interview-with-cool-tshirts-founder	medium	first touch	118
weekly-newsletter	email	retargeting	114
retargetting-ad	facebook	retargeting	112
ten-crazy-cool-tshirts-facts	buzzfeed	first touch	107
getting-to-know-cool-tshirts	nytimes	first touch	102
retargetting-campaign	email	retargeting	53
paid-search	google	retargeting	52
cool-tshirts-search	google	first touch	31

7.7.1 Number of purchases outcomes for each campaign, Table results query code



```sql
..........
--------------------------------- retargeting_campaign_table
retargeting_campaign_table AS (
  SELECT
        user_id,
      CASE
          WHEN ltp_campaign = 'weekly-newsletter' THEN ltp_campaign
          WHEN ltp_campaign = 'retargetting-ad' THEN ltp_campaign
          WHEN ltp_campaign = 'retargetting-campaign' THEN ltp_campaign
          WHEN ltp_campaign = 'paid-search' THEN ltp_campaign
      END AS retargeting_campaign,
      CASE
          WHEN ltp_campaign = 'weekly-newsletter' THEN ltp_source
          WHEN ltp_campaign = 'retargetting-ad' THEN ltp_source
          WHEN ltp_campaign = 'retargetting-campaign' THEN ltp_source
          WHEN ltp_campaign = 'paid-search' THEN ltp_source
      END AS retargeting_campaign_source
  FROM ft_attr_purchases
  WHERE retargeting_campaign IS NOT NULL
),
--------------------------------- ft_campaign_purchases table
ft_campaign_purchases AS (
  SELECT
      user_id,
      ft_campaign,
      ft_source
  FROM ft_attr_purchases
),
.........
```

```sql
.........
--------------------------------- retargeting_campaign_purchases table
retargeting_campaign_purchases AS (
  SELECT
     user_id,
     retargeting_campaign,
     retargeting_campaign_source
  FROM retargeting_campaign_table
),
--------------------------------- campaign_purchases table
campaign_purchases AS (
  SELECT
      user_id,
      ft_campaign AS campaign,
      ft_source AS source
  FROM ft_attr_purchases
  UNION
  SELECT
      user_id,
      retargeting_campaign AS campaign,
      retargeting_campaign_source AS source
  FROM retargeting_campaign_purchases
),
.........
```

```sql
.........
--------------------------------- campaign_purchase_type table
campaign_purchase_type as (
  SELECT
      user_id,
      campaign,
      source,
      CASE
        WHEN campaign = 'weekly-newsletter' THEN 'retargeting'
        WHEN campaign = 'retargetting-ad' THEN 'retargeting'
        WHEN campaign = 'retargetting-campaign' THEN 'retargeting'
        WHEN campaign = 'paid-search' THEN 'retargeting'
        ELSE 'first touch'
      END AS campaign_type
  FROM campaign_purchases
)
SELECT
    campaign,
    source,
    campaign_type,
    COUNT(*) AS 'Number of Purchases'
FROM campaign_purchase_type
GROUP BY 1
ORDER BY 4 DESC;
```