



# CoolTShirts: Attribution Queries

Learn SQL from Scratch

Alexey Taranov

11/05/2018

# Table of Contents

- **Get familiar with CoolTShirts**
- **What is the user journey?**
- **First/Last touches for every campaign**
- **Optimize the campaign budget**

# 1. Get familiar with CoolTShirts

CoolTShirts sells shirts of all kinds, as long as they are T-shaped and cool. CoolTShirts is using 8 unique marketing campaigns to increase sales and is targeting visitors from 6 unique sources. Their website is very simple – only 4 pages! **1 - landing\_page, 2 - shopping\_cart 3 – checkout and 4 – purchase.**

The database we are working with, page\_visits contains 5692 entries (rows)

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

# 1.1 Campaigns and Sources

We only need 3 queries to figure out the number of distinct campaigns, number of distinct sources and how these are related.

```
select utm_campaign
from page_visits
group by utm_campaign;
```

```
select count(distinct utm_campaign) as 'number of campaigns'
from page_visits;
```

```
select utm_source
from page_visits
group by utm_source;
```

```
select count(distinct utm_source) as 'number of sources'
from page_visits;
```

```
select utm_source, utm_campaign
from page_visits
group by 2
order by 1 asc;
```

Query Results	
utm_campaign	
cool-tshirts-search	
getting-to-know-cool-tshirts	
interview-with-cool-tshirts-founder	
paid-search	
retargetting-ad	
retargetting-campaign	
ten-crazy-cool-tshirts-facts	
weekly-newsletter	
number of campaigns	
8	
utm_source	
buzzfeed	
email	
facebook	
google	
medium	
nytimes	
number of sources	
6	
utm_source	utm_campaign
buzzfeed	ten-crazy-cool-tshirts-facts
email	retargetting-campaign
email	weekly-newsletter
facebook	retargetting-ad
google	cool-tshirts-search
google	paid-search
medium	interview-with-cool-tshirts-founder
nytimes	getting-to-know-cool-tshirts

## 2. Pages on the Website and User Journey

There are 4 pages on CoolTShirts website. Each visit to a page (a row in `page_visits` table) contains user id, visited page name, time visited, campaign that attracted that user and source of the partner website that user was visiting before going to CoolTShirts website. A typical user that makes a purchase (on page 4) will go through all pages of the website – attracted by the campaign onto the landing page, then cart and checkout, and then purchase confirmation. Not every user however will buy right away – some go back and forward on pages or abandon the process completely. It often takes more than one advertisement to entice a purchase. To evaluate the effectiveness of campaigns and provide insights on the user journey first and last touch (first ad campaign the user saw before entering the website and last before making a purchase) are recorded.

### Query Results

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

```
SELECT DISTINCT page_name
from page_visits
;
```

## 3.1 First Touch for Every Campaign

There are only 4 campaigns that generate all of the first touches, the first interaction of user with the website. A good way to check these numbers would be to find number of unique users (1979), there should be 1 first touch per user

Query Results		
source	campaign	# of first touch
medium	interview-with-cool-tshirts-founder	622
nytimes	getting-to-know-cool-tshirts	612
buzzfeed	ten-crazy-cool-tshirts-facts	576
google	cool-tshirts-search	169

```
WITH first_touch AS (  
  SELECT user_id,  
         MIN(timestamp) as first_touch_at  
  FROM page_visits  
  GROUP BY user_id),  
ft_attr AS (  
  SELECT ft.user_id,  
         ft.first_touch_at,  
         pv.utm_source,  
         pv.utm_campaign  
  FROM first_touch as ft  
  JOIN page_visits as pv  
    ON ft.user_id = pv.user_id  
    AND ft.first_touch_at = pv.timestamp  
)  
SELECT ft_attr.utm_source as "source",  
       ft_attr.utm_campaign as "campaign",  
       COUNT(*) as "# of first touch"  
FROM ft_attr  
GROUP BY 2  
ORDER BY 3 DESC;
```

## 3.2 Last Touch for Every Campaign

All 8 campaigns generate last touches, the last ad interaction with the user. While not all ads are convincing enough to entice a purchase, other ads may remind the user to go back and finish the process. A good way to check these numbers would be to find number of unique users (1979), there should be 1 last touch per user

Query Results		
source	campaign	# of last touch
email	weekly-newsletter	447
facebook	retargeting-ad	443
email	retargeting-campaign	245
nytimes	getting-to-know-cool-tshirts	232
buzzfeed	ten-crazy-cool-tshirts-facts	190
medium	interview-with-cool-tshirts-founder	184
google	paid-search	178
google	cool-tshirts-search	60

```
WITH last_touch AS (  
  SELECT user_id,  
         max(timestamp) as last_touch_at  
  FROM page_visits  
  GROUP BY user_id),  
lt_attr AS (  
  SELECT lt.user_id,  
         lt.last_touch_at,  
         pv.utm_source,  
         pv.utm_campaign  
  FROM last_touch as lt  
  JOIN page_visits as pv  
    ON lt.user_id = pv.user_id  
    AND lt.last_touch_at = pv.timestamp  
)  
SELECT lt_attr.utm_source as "source",  
       lt_attr.utm_campaign as "campaign",  
       COUNT(*) as "# of last touch"  
FROM lt_attr  
GROUP BY 2  
ORDER BY 3 DESC;
```

## 3.3 How many visitors make a purchase

Not every visitor makes a purchase. Out of 1979 unique visitors only 361 made a purchase. The queries first count, then list out every purchase

Query Results			
visitors that made a purchase			
361			
page_name	timestamp	user_id	utm_campaign
4 - purchase	2018-01-28 13:38:02	10030	retargetting-campai
4 - purchase	2018-01-04 08:13:01	10069	retargetting-ad
4 - purchase	2018-02-01 04:26:10	10162	weekly-newslette
4 - purchase	2018-01-22 16:35:25	10329	retargetting-campai
4 - purchase	2018-01-22 02:00:29	10354	paid-search
4 - purchase	2018-02-03 19:11:12	10656	retargetting-campai
4 - purchase	2018-01-20 23:10:54	11140	retargetting-ad
4 - purchase	2018-01-02 18:10:53	11214	retargetting-ad
4 - purchase	2018-02-01 10:56:32	12072	retargetting-campai

```
select count(*) as "visitors that made a purchase"
from page_visits
where page_name = '4 - purchase'
;
```

```
select *
from page_visits
where page_name = '4 - purchase'
;
```



## 3.4 Last Touch on Purchase Page

All 8 campaigns generate last touches on the purchase page, but much less than visits, the last ad interaction with the user before purchase. A good way to check these numbers would be to find number of users that made a purchase (361). In this example it is clear that while a weekly newsletter does not draw the most users to the website, it is popular and brings the most sales, and while cost is not part of this exercise it is probably cheaper to send emails to an existing customer list than advertise on Facebook.

Query Results		
lt_attr.utm_source	lt_attr.utm_campaign	COUNT(*)
email	weekly-newsletter	115
facebook	retargetting-ad	113
email	retargetting-campaign	54
google	paid-search	52
nytimes	getting-to-know-cool-tshirts	9
buzzfeed	ten-crazy-cool-tshirts-facts	9
medium	interview-with-cool-tshirts-founder	7
google	cool-tshirts-search	2

```
WITH last_touch AS (  
    SELECT user_id,  
           max(timestamp) as last_touch_at  
    FROM page_visits  
    WHERE page_name = '4 - purchase'  
    GROUP BY user_id),  
lt_attr AS (  
    SELECT lt.user_id,  
           lt.last_touch_at,  
           pv.utm_source,  
           pv.utm_campaign  
    FROM last_touch as lt  
    JOIN page_visits as pv  
      ON lt.user_id = pv.user_id  
      AND lt.last_touch_at = pv.timestamp  
    )  
SELECT lt_attr.utm_source,  
       lt_attr.utm_campaign,  
       COUNT(*)  
FROM lt_attr  
GROUP BY 2  
ORDER BY 3 DESC;
```

## 4. Optimize the campaign budget

To maximize the return on the investment CoolTShirts should reinvest into the following 5 campaigns:

- interview-with-cool-tshirts-founder
- getting-to-know-cool-tshirts
- ten-crazy-cool-tshirts-facts
  - While these don't make much sales by themselves, these bring the most (over 90%) users to the website
- weekly-newsletter
- retargeting-ad
  - These 2 campaigns don't bring much users but are the last touch for over 60% of all sales