



# Capstone – CoolTShirts

Learn SQL from Scratch

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8/13/18

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# **1. Getting to Know CoolTShirts**

# 1.1 CoolTShirts Campaigns in the page\_visits Database

CoolTShirts is a t-shirt company that runs a variety of advertising campaigns with different advertising sources designed to result in product purchase.

- To track the campaigns and their results on the company website, there is a table called page\_visits, which captures the following fields: page\_name, timestamp, user\_id, utm\_campaign, utm\_source.
- The page\_name field tracks each page the user lands on, and the timestamp field records the time of the page views.
- Some sample lines are included below

page_name	timestamp	user_id	utm_campaign	utm_source
1 - landing_page	1/24/2018 3:12	10006	getting-to-know-cool-tshirts	nytimes
2 - shopping_cart	1/24/2018 4:04	10006	getting-to-know-cool-tshirts	nytimes
3 - checkout	1/25/2018 23:10	10006	weekly-newsletter	email
1 - landing_page	1/25/2018 20:32	10030	ten-crazy-cool-tshirts-facts	buzzfeed

## 1.2 UTM Campaign

- UTM campaign and UTM source use bits of UTM code in the links to the website to associated the actions related to a particular campaign from a particular source with the resultant page visits by each user, denoted by user\_id.
- Unique values for UTM Campaign below can be found with the query to the right; some examples are included below:

Campaign
getting-to-know-cool-tshirts
weekly-newsletter
ten-crazy-cool-tshirts-facts
retargetting-campaign
retargetting-ad

```
SELECT DISTINCT utm_campaign as 'Campaign'  
FROM page_visits;
```

## 1.3 UTM Source

- Just like UTM Campaign, UTM source use bits of UTM code in the links to the website to associate the actions with a particular source.
- Unique values for UTM Source below can be found with the query to the right; some examples are included below:

Source
nytimes
email
buzzfeed
facebook
medium
google

```
SELECT DISTINCT utm_source as 'Source'  
FROM page_visits;
```

## 1.3 UTM Campaign and Source Relationship

- UTM campaign and UTM source have a relationship to each other that can be found by running the query at right.
- Some examples of results are below

```
SELECT DISTINCT utm_campaign AS 'Campaign', utm_source  
AS 'Source'  
FROM page_visits  
ORDER by 1 ASC;
```

Campaign	Source
cool-tshirts-search	google
getting-to-know-cool-tshirts	nytimes
interview-with-cool-tshirts-founder	medium
paid-search	google
retargeting-ad	facebook

## 1.4 Page Name

- There are several unique pages the visitor can reach
- Unique values for page names can be found with the query to the right; some examples are included below:

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

```
SELECT DISTINCT page_name as 'Page Name'  
FROM page_visits;
```



## **2. What is the user journey?**

## 2.1 First Touches By Campaign

- Each source and associated campaign can be identified with a specific number of first touches.
- The query to the right will find this result and the results can be found below

Source	Campaign	First Touches
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 ft  
    JOIN page_visits 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 'First Touches'  
FROM ft_attr  
GROUP BY 2,1  
ORDER BY 3 DESC;
```

## 2.2 Last Touches By Campaign

- Each source and associated campaign can also be identified with a specific number of last touches.
- The query to the right will find this result and the results can be found below
- As can be seen there are more source/campaign associations

Source	Campaign	Last Touches
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 lt  
    JOIN page_visits 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 'Last Touches'  
FROM lt_attr  
GROUP BY 2,1  
ORDER BY 3 DESC;
```

## 2.3 Purchases by Visitor

- A number of visitors have made purchases.
- These can be determined by finding the total number of visits to the purchase page.
- The query to the right will find this result and the results can be found below.

Page Name	Visits
4 - purchase	361

```
SELECT page_name AS 'Page Name', COUNT(*) AS 'Visits'  
FROM page_visits  
WHERE page_name = '4 - purchase';
```

## 2.4 Last Touches on Purchase Page By Campaign

- Some campaigns results in a number of last touches on the purchase page
- This shows the number of visitor purchases associated with each campaign
- The query to the right will find this result and the results can be found below

Campaign	Page Name	Last Touches
weekly-newsletter	4 - purchase	114
retargeting-ad	4 - purchase	112
retargeting-campaign	4 - purchase	53
paid-search	4 - purchase	52
getting-to-know-cool-tshirts	4 - purchase	9
ten-crazy-cool-tshirts-facts	4 - purchase	9
interview-with-cool-tshirts-founder	4 - purchase	7
cool-tshirts-search	4 - purchase	2

```
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.last_touch_at,  
           pv.utm_campaign,  
           pv.page_name  
    FROM last_touch lt  
    JOIN page_visits pv  
      ON lt.user_id = pv.user_id  
      AND lt.last_touch_at = pv.timestamp  
)  
SELECT lt_attr.utm_campaign AS 'Campaign',  
       lt_attr.page_name AS 'Page Name',  
       COUNT(*) AS 'Last Touches'  
FROM lt_attr  
WHERE page_name = '4 - purchase'  
GROUP BY 2,1  
ORDER BY 3 DESC;
```

## 2.5 The Typical User Journey

- From the above data on First and Last Touch attribution, we can see that the user is generally first exposed to CoolTShirts via ads on web pages, such as Medium, The New York Times, or BuzzFeed.
- Many First Touches also come from search campaigns on Google, the cool-t-shirts-search.
- The user may spend some time on the CoolTShirts site, but most purchases are made through follow-up campaigns, such as retargeting, newsletter, or email. The exception is the search campaigns on Google which account both for first touches and last touches, but it is the paid search on Google that accounts for most.

### **3. Optimizing the campaign budget**

## 3.1 How to decide the campaigns?

- Choosing which 5 campaigns to invest in can be difficult.
- The choice should be based on an optimal combination of first touch and last touch campaigns.
- The first touch campaigns are need for the initial exposure to the site.
- The last touch campaigns should be chosen based on which last touches drive purchases.
- Most of the last touch campaigns are not also first touch campaigns, and those that are do not drive many purchases.
- Some of the last touch campaigns that drive the highest sales are retargeting campaigns that therefore derived first touch from another campaign.
- The highest purchase driver among last touches is not a retargeting campaign, but the next two are. So we should select the top 3 last touch purchase campaigns.
- Since two of the top three last touch campaigns are retargeting campaigns, we need a high volume of first touches, so we should choose the top 2 first touch campaigns to get adequate visitor segments for retargeting.
- Therefore the **5 recommended campaigns** are as follows: First Touch Campaigns: (1) interview-with-cool-tshirts-founder (in Medium), (2) getting-to-know-cool-tshirts (in NY Times); Last Touch Campaigns: (3) weekly-newsletter (by Email), (4) retargeting-ad (Facebook), (5) retargeting-campaign (by Email).