codecademy

CoolTShirts

First- & Last-Touch Attributions

Learn SQL from Scratch, Capstone Project

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Table of Contents

1. Get familiar with CoolTShirts

1. Get familiar with CoolTShirts (a)

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.

- CoolTShirts used 8 different campaigns and 6 different sources.
- utm_campaign is the label of creative that the company used.
- utm_source is the media channel that was used to deliver the campaign.
- For acquisition and initial exposure to the brand, Search (Paid or Organic) campaigns come from Google, Sponsored Content are in premium media (NYTimes, Buzzfeed, Medium).
- Database (DB) marketing is solely online (via email), and only retargeting/conversion ads are run on Facebook when the user has already been exposed to the brand.
- A unique Sponsored Content/media pair exists but does not have to (A/B testing possibilities).

Campaign	Source	Campaign Type
ten-crazy-cool-tshirts-facts	buzzfeed	Sponsored Content
weekly-newsletter	email	Periodical (DB)
retargetting-campaign	email	Conversion (DB)
retargetting-ad	facebook	Conversion (ad)
paid-search	google	Paid Search
cool-tshirts-search	google	Organic Search
interview-with-cool-tshirts-founder	medium	Sponsored Content
getting-to-know-cool-tshirts	nytimes	Sponsored Content

```
-- 1.a) query for number of distinct campaigns
SELECT COUNT(DISTINCT utm_campaign) AS '# of
Campaigns'
FROM page_visits;

-- 1.a) query for number of distinct sources
SELECT COUNT(DISTINCT utm_source) AS '# of Sources'
FROM page_visits;

-- 1.a) query for campaign and source relationship
SELECT DISTINCT utm_campaign AS 'Campaign',
       utm_source AS 'Source'
FROM page_visits
ORDER BY 2;
```

1. Get familiar with CoolTShirts (b)

What pages are on their website?

- There are 4 different pages:

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

```
-- 1.b) query for what pages are on website
SELECT DISTINCT page_name AS 'Page Type'
FROM page_visits;
```

2. What is the user journey?

2. What is the user journey? (a)

How many first touches is each campaign responsible for?

- Users overwhelmingly gravitate towards Sponsored Content campaigns than Organic Search. Paid search does not factor into first touch.

Campaign	# of 1st Touch	% of First Touch	Campaign Type
interview-with-cool-tshirts-founder	622	31%	Sponsored Content
getting-to-know-cool-tshirts	612	31%	Sponsored Content
ten-crazy-cool-tshirts-facts	576	29%	Sponsored Content
cool-tshirts-search	169	9%	Organic Search
Total	**1979**		

```
-- 2.a) query for first touch per campaign
WITH first_touch AS
  (
    SELECT user_id,
        MIN(timestamp) as first_touch_at
    FROM page_visits
    GROUP BY user_id
  )
SELECT pv.utm_campaign AS 'Campaign',
    COUNT(ft.first_touch_at) AS '# of 1st Touch'
FROM first_touch AS ft
JOIN page_visits AS pv
    ON ft.user_id = pv.user_id
    AND ft.first_touch_at = pv.timestamp
GROUP BY 1
ORDER BY 2 DESC;
```

2. What is the user journey? (a) (con.)

How many first touches is each campaign responsible for? (con.)

- For completeness, we made sure that the user experience only started (i.e. first touch) with the landing page:

user_id	# of Times First Page Visited
∅	0

```
-- 2.a) query for landing page proof
WITH first_touch AS
  (
    SELECT user_id,
        MIN(timestamp) as first_touch_at
    FROM page_visits
    GROUP BY user_id
  )
SELECT ft.user_id,
       COUNT(pv.page_name) AS '# of Times First Page
Visited'
FROM first_touch AS ft
JOIN page_visits AS pv
    ON ft.user_id = pv.user_id
    AND ft.first_touch_at = pv.timestamp
WHERE pv.page_name = '2 - shopping_cart' OR
      pv.page_name = '3 - checkout' OR
      pv.page_name = '4 - purchase';
```

2. What is the user journey? (a) (con.)

How many first touches is each campaign responsible for? (con.)

- Also for completeness, we found that a few users (21 total) visited the landing page more than once. Since the size is currently insignificant, for this presentation we will disregard the consequences of analyzing multiple landing page visits vs first touches (i.e. ***re-activating previous users***), though ***this is a query we need to periodically run for assumption purposes***. Sample of results below:

Query Results	
# of Landing Page Visits	
2000	
# of Unique Users	
1979	
USER	# of Landing Page Visits
21293	2
26279	2
29180	2
40713	2
41697	2
41883	2
42573	2
44110	2

```
-- 2.a) query for users who visited multiple times
SELECT COUNT(page_name) AS '# of Landing Page Visits'
FROM page_visits
WHERE page_name = '1 - landing_page';

SELECT COUNT(DISTINCT user_id) AS '# of Unique Users'
FROM page_visits;

SELECT user_id AS 'USER',
       COUNT(page_name) AS '# of Landing Page Visits'
FROM page_visits
WHERE page_name = '1 - landing_page'
GROUP BY 1
ORDER BY 2 DESC
LIMIT 50;
```

2. What is the user journey? (b)

How many last touches is each campaign responsible for?

- The email newsletter and Facebook ad are the last exposure to the brand for most users. However, there is a significant number of users where Sponsored Content is also their last exposure.

Campaign	# of Last Touch	% of Last Touch	Campaign Type
weekly-newsletter	447	23%	Periodical (DB)
retargetting-ad	443	22%	Conversion (ad)
retargetting-campaign	245	12%	Conversion (DB)
getting-to-know-cool-tshirts	232	12%	Sponsored Content
ten-crazy-cool-tshirts-facts	190	10%	Sponsored Content
interview-with-cool-tshirts-founder	184	9%	Sponsored Content
paid-search	178	9%	Paid Search
cool-tshirts-search	60	3%	Organic Search
Total	**1979**		

```
-- 2.b) query for last touch per campaign
WITH last_touch AS
  (
    SELECT user_id,
        MAX(timestamp) as last_touch_at
    FROM page_visits
    GROUP BY user_id
  )
SELECT pv.utm_campaign AS 'Campaign',
    COUNT(lt.last_touch_at) AS '# of Last Touch'
FROM last_touch AS lt
JOIN page_visits AS pv
    ON lt.user_id = pv.user_id
    AND lt.last_touch_at = pv.timestamp
GROUP BY 1
ORDER BY 2 DESC;
```

Campaign Type	% of Last Touch
Conversion (ad)	22%
Conversion (DB)	12%
Organic Search	3%
Paid Search	9%
Periodical (DB)	23%
Sponsored Content	31%

2. What is the user journey? (c)

How many visitors make a purchase?

- 361 visitors make a purchase, or 18% (361/1979).

Purchasing Users
361

Total # of Users
1979

```
-- 2.c) query for how many unique visitors make a
purchase
SELECT COUNT(DISTINCT user_id) AS 'Purchasing Users'
FROM page_visits
WHERE page_name = '4 - purchase';

-- 2.c) query for total # of unique visitors
SELECT COUNT(DISTINCT user_id) AS 'Total # of Users'
FROM page_visits;
```

2. What is the user journey? (d)

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

- The conversion and database periodical campaigns end up with the most amount of purchases. Paid Search also has a decent amount of purchases.

Campaign	# of Last Touch as Purchase	% of Last Touch as Purchase	Campaign Type
weekly-newsletter	115	32%	Periodical (DB)
retargetting-ad	113	31%	Conversion (ad)
retargetting-campaign	54	15%	Conversion (DB)
paid-search	52	14%	Paid Search
getting-to-know-cool-tshirts	9	2%	Sponsored Content
ten-crazy-cool-tshirts-facts	9	2%	Sponsored Content
interview-with-cool-tshirts-founder	7	2%	Sponsored Content
cool-tshirts-search	2	1%	Organic Search
Total	**361**		

*Percentages may not add up to 100% due to rounding.

```
-- 2.d) query for last touch on purchase page per
campaign
WITH last_touch_purchase AS
  (
    SELECT user_id,
        MAX(timestamp) as last_touch_at
    FROM page_visits
    WHERE page_name = '4 - purchase'
    GROUP BY user_id
  )
SELECT pv.utm_campaign AS 'Campaign',
    COUNT(ltp.last_touch_at) AS '# of Last Touch as
Purchase'
FROM last_touch_purchase AS ltp
JOIN page_visits AS pv
    ON ltp.user_id = pv.user_id
    AND ltp.last_touch_at = pv.timestamp
GROUP BY 1
ORDER BY 2 DESC;
```

2. What is the user journey? (e)

What is the typical user journey?

- Out of all unique visitors to CoolTShirts, 95% put something in their shopping cart. 76% of those users with something in their shopping cart get to the checkout page, and 25% of the users at checkout actually make a purchase.

Page Type	# of Unique Visitors	% to Next Step
1 - landing_page	1979	
2 - shopping_cart	1881	95%
3 - checkout	1431	76%
4 - purchase	361	25%

```
-- 2.e) query for user experience
SELECT page_name AS 'Page Type',
       COUNT(DISTINCT user_id) AS '# of Unique
Visitors'
FROM page_visits
GROUP BY 1;
```

2. What is the user journey? (e) (con.)

What is the typical user journey? (con.)

- From our work in 2.a), we know all users' experiences with the brand came from Sponsored Content or Organic Search, though primarily Sponsored Content (91%).
- From 2.d), we can see that it is the database and conversion marketing (78%) that brings the money home.

Campaign	# of 1st Touch	% of First Touch	Campaign Type
interview-with-cool-tshirts-founder	622	31%	Sponsored Content
getting-to-know-cool-tshirts	612	31%	Sponsored Content
ten-crazy-cool-tshirts-facts	576	29%	Sponsored Content
cool-tshirts-search	169	9%	Organic Search
Total	**1979**		

Campaign Type	% of First Touch
Sponsored Content	91%
Organic Search	9%
Conversion (ad)	0%
Conversion (DB)	0%
Paid Search	0%
Periodical (DB)	0%

*Percentages may not add up to 100% due to rounding.

Campaign	# of Last Touch as Purchase	% of Last Touch as Purchase	Campaign Type
weekly-newsletter	115	32%	Periodical (DB)
retargetting-ad	113	31%	Conversion (ad)
retargetting-campaign	54	15%	Conversion (DB)
paid-search	52	14%	Paid Search
getting-to-know-cool-tshirts	9	2%	Sponsored Content
ten-crazy-cool-tshirts-facts	9	2%	Sponsored Content
interview-with-cool-tshirts-founder	7	2%	Sponsored Content
cool-tshirts-search	2	1%	Organic Search
Total	**361**		

Campaign Type	% of Last Touch as Purchase
Periodical (DB)	32%
Conversion (ad)	31%
Conversion (DB)	15%
Paid Search	14%
Sponsored Content	7%
Organic Search	1%

2. What is the user journey? (e) (con.)

What is the typical user journey? (con.)

- What happens in-between page visits? It's rare that a user experiences one campaign from landing to purchase (25 users). Sample of the query results below:

Query Results		
# of Users With Complete Single Campaign/Purchase Exp		
25		
User	**Campaign**	**Page Type**
14770	interview-with-cool-tshirts-founder	1 - landing_page
14770	interview-with-cool-tshirts-founder	2 - shopping_cart
14770	interview-with-cool-tshirts-founder	3 - checkout
14770	interview-with-cool-tshirts-founder	4 - purchase
16778	interview-with-cool-tshirts-founder	1 - landing_page
16778	interview-with-cool-tshirts-founder	2 - shopping_cart
16778	interview-with-cool-tshirts-founder	3 - checkout
16778	interview-with-cool-tshirts-founder	4 - purchase
22224	ten-crazy-cool-tshirts-facts	1 - landing_page
22224	ten-crazy-cool-tshirts-facts	2 - shopping_cart
22224	ten-crazy-cool-tshirts-facts	3 - checkout
22224	ten-crazy-cool-tshirts-facts	4 - purchase

```
-- 2.e) query for users where one campaign takes them from landing to purchase
WITH last_touch_purchase AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '4 - purchase'
  ),
first_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '1 - landing_page'
  )
SELECT COUNT(DISTINCT ftc.user_id) AS '# of Users With Complete Single Campaign/Purchase Exp'
FROM last_touch_purchase AS ltp
LEFT JOIN first_touch_campaign AS ftc
     ON ltp.user_id = ftc.user_id
     AND ltp.utm_campaign = ftc.utm_campaign
LEFT JOIN page_visits AS pv
     ON ltp.user_id = pv.user_id
     AND ltp.utm_campaign = pv.utm_campaign
WHERE ftc.user_id IS NOT NULL; --AND

-- this is the underlying data for the above
WITH last_touch_purchase AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '4 - purchase'
  ),
first_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '1 - landing_page'
  )
SELECT ftc.user_id AS 'User',
       pv.utm_campaign AS 'Campaign',
       pv.page_name AS 'Page Type'
FROM last_touch_purchase AS ltp
LEFT JOIN first_touch_campaign AS ftc
     ON ltp.user_id = ftc.user_id
     AND ltp.utm_campaign = ftc.utm_campaign
LEFT JOIN page_visits AS pv
     ON ltp.user_id = pv.user_id
     AND ltp.utm_campaign = pv.utm_campaign
WHERE ftc.user_id IS NOT NULL;
```

2. What is the user journey? (e) (con.)

What is the typical user journey? (con.)

Conclusion – since only 25 out of 361 purchases (7%) came from exposure to a single campaign, the other 93% of purchases require a combination of:

1. Sponsored Content/Organic Search campaigns to drive traffic, along with
2. Reminders from database marketing campaigns (Periodical and targeted Conversion emails) and Facebook Conversion ad campaigns to bring the purchase home.

3. Optimize the campaign budget

3. Optimize the campaign budget

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

- Typically, a company should re-invest in campaigns from which you get your most loyal customers (i.e. users who make the most purchases). However, according the query on the right, each customer of CoolTShirts makes at most 1 purchase. Sample of results below:

Query Results	
User	# of Purchases
10030	1
10069	1
10162	1
10329	1
10354	1
10656	1
11140	1
11214	1
12072	1
12667	1
13318	1

```
-- 3. query for repeat customers
SELECT user_id AS "User",
       COUNT(page_name) AS '# of Purchases'
FROM page_visits
WHERE page_name = '4 - purchase'
GROUP BY 1
ORDER by 2 DESC;
```

3. Optimize the campaign budget (con.)

Because each visitor buys at most once from CoolTShirts, that leaves us with 2 measures of campaign success:

i. Campaigns most likely to attract purchasing visitors to the site (Acquisition Campaigns).
ii. Campaigns most likely to remind the user to purchase (Conversion Campaigns).

3. Optimize the campaign budget (con.)

Campaigns most likely to attract purchasing visitors to the site.

- Since we know the campaigns which drive the purchase action are not the same as the campaign that drive visitors, and the site experience funnel works linearly, we have to examine which Acquisition Campaigns are effective at going from landing to shopping cart, shopping cart to checkout, and checkout to purchase.
- We know from 2.a) which Acquisition Campaigns are effective in bringing in initial visitors. How do they do from there?

Acquisition Campaign	# of Users Taken from Landing to Shopping Cart
getting-to-know-cool-tshirts	549
interview-with-cool-tshirts-founder	515
ten-crazy-cool-tshirts-facts	500
cool-tshirts-search	133
Total	**1697**

*The difference between the 1697 figure here and the 1881 shopping cart page visits is that this only measures page visits where the utm_campaign on the shopping cart equals the utm_campaign on the landing page.

```
-- 3. query for which Acquisition Campaigns took users from
landing to shopping cart
WITH second_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '2 - shopping_cart'
  ),
first_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '1 - landing_page'
  )
SELECT pv.utm_campaign AS ‘Acquisition Campaign',
       COUNT(DISTINCT ftc.user_id) AS '# of Users Taken from
Landing to Shopping Cart'
FROM second_touch_campaign AS stc
LEFT JOIN first_touch_campaign AS ftc
     ON stc.user_id = ftc.user_id
     AND stc.utm_campaign = ftc.utm_campaign
LEFT JOIN page_visits AS pv
     ON stc.user_id = pv.user_id
     AND stc.utm_campaign = pv.utm_campaign
WHERE ftc.user_id IS NOT NULL
GROUP BY 1
ORDER BY 2 DESC;
```

3. Optimize the campaign budget (con.)

Campaigns most likely to attract purchasing visitors to the site. (con.)

- Which Acquisition Campaigns brought visitors from shopping cart to checkout?

Acquisition Campaign	# of Users Taken from Shopping Cart to Checkout
getting-to-know-cool-tshirts	41
ten-crazy-cool-tshirts-facts	32
interview-with-cool-tshirts-founder	31
cool-tshirts-search	7
Total	**111**

```
-- 3. query for which Acquisition Campaigns took users from
shopping cart to checkout
WITH second_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '2 - shopping_cart'
  ),
third_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '3 - checkout'
  )
SELECT pv.utm_campaign AS ‘Acquisition Campaign',
       COUNT(DISTINCT stc.user_id) AS '# of Users Taken from
Shopping Cart to Checkout'
FROM second_touch_campaign AS stc
LEFT JOIN third_touch_campaign AS ttc
     ON stc.user_id = ttc.user_id
     AND stc.utm_campaign = ttc.utm_campaign
LEFT JOIN page_visits AS pv
     ON stc.user_id = pv.user_id
     AND stc.utm_campaign = pv.utm_campaign
WHERE ttc.user_id IS NOT NULL
GROUP BY 1
ORDER BY 2 DESC;
```

3. Optimize the campaign budget (con.)

Campaigns most likely to attract purchasing visitors to the site. (con.)

- Which Acquisition Campaigns brought visitors from checkout to purchase?
  - What's interesting here is that all of the Conversion Campaigns (and Paid Search) start showing up at this stage of the user experience funnel.

Campaign	# of Users Taken from Checkout to Purchase
weekly-newsletter	115
retargetting-ad	113
retargetting-campaign	54
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
Total	**361**

Acquisition Campaign	# of Users Taken from Checkout to Purchase
getting-to-know-cool-tshirts	9
ten-crazy-cool-tshirts-facts	9
interview-with-cool-tshirts-founder	7
cool-tshirts-search	2
Total	**27**

```
-- 3. query for which campaigns took users from checkout to
purchase
WITH last_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '4 - purchase'
  ),
third_touch_campaign AS
  (
    SELECT user_id,
           utm_campaign
    FROM page_visits
    WHERE page_name = '3 - checkout'
  )
SELECT pv.utm_campaign AS 'Campaign',
       COUNT(DISTINCT ttc.user_id) AS '# of Users Taken from
Checkout to Purchase'
FROM third_touch_campaign AS ttc
LEFT JOIN last_touch_campaign AS ltc
     ON ltc.user_id = ttc.user_id
     AND ltc.utm_campaign = ttc.utm_campaign
LEFT JOIN page_visits AS pv
     ON ttc.user_id = pv.user_id
     AND ttc.utm_campaign = pv.utm_campaign
WHERE ltc.user_id IS NOT NULL
GROUP BY 1
ORDER BY 2 DESC;
```

3. Optimize the campaign budget (con.)

Which Acquisition Campaigns should we keep?

- In the absence of A/B testing of the effect of the campaign vs the source, especially since not all sources are priced the same, 2 Acquisition Campaigns stand out based on their conversion rate from landing to shopping cart:
    1. getting-to-know-cool-tshirts
    2. ten-crazy-cool-tshirts-facts
- If it means that CoolTShirts is only giving up 7 user purchases when they don't re-invest in the interview-with-cool-tshirts-founder Acquisition Campaign, that is acceptable when compared to not re-investing in a Conversion Campaign. ***Is this a correct conclusion? More on this later.***

Campaign	Source	# of 1st Touch	# of Users Taken from Landing to Shopping Cart	% Conversion from Landing to Shopping Cart	# of Users Taken from Shopping Cart to Checkout	% Conversion from Shopping Cart to Checkout	# of Users Taken from Checkout to Purchase	% Conversion from Checkout to Purchase
interview-with-cool-tshirts-founder	medium	622	515	83%	31	6%	7	23%
getting-to-know-cool-tshirts	nytimes	612	549	90%	41	7%	9	22%
ten-crazy-cool-tshirts-facts	buzzfeed	576	500	87%	32	6%	9	28%
cool-tshirts-search	google	169	133	79%	7	5%	2	29%
Total		**1979**	**1697**		**111**		**27**	

3. Optimize the campaign budget (con.)

Campaigns most likely to remind the user to purchase.

- The Conversion Campaigns (and Paid Search) only start showing up at the checkout stage of the user experience.

utm_campaign	page_name
cool-tshirts-search	1 - landing_page
getting-to-know-cool-tshirts	1 - landing_page
interview-with-cool-tshirts-founder	1 - landing_page
ten-crazy-cool-tshirts-facts	1 - landing_page
utm_campaign	**page_name**
cool-tshirts-search	2 - shopping_cart
getting-to-know-cool-tshirts	2 - shopping_cart
interview-with-cool-tshirts-founder	2 - shopping_cart
ten-crazy-cool-tshirts-facts	2 - shopping_cart

utm_campaign	page_name
cool-tshirts-search	3 - checkout
getting-to-know-cool-tshirts	3 - checkout
interview-with-cool-tshirts-founder	3 - checkout
paid-search	3 - checkout
retargetting-ad	3 - checkout
retargetting-campaign	3 - checkout
ten-crazy-cool-tshirts-facts	3 - checkout
weekly-newsletter	3 - checkout
utm_campaign	**page_name**
cool-tshirts-search	4 - purchase
getting-to-know-cool-tshirts	4 - purchase
interview-with-cool-tshirts-founder	4 - purchase
paid-search	4 - purchase
retargetting-ad	4 - purchase
retargetting-campaign	4 - purchase
ten-crazy-cool-tshirts-facts	4 - purchase
weekly-newsletter	4 - purchase

```
-- 3. this is to check what campaigns show up at which stage

SELECT utm_campaign, page_name
FROM page_visits
WHERE page_name = '1 - landing_page'
GROUP BY 1;

SELECT utm_campaign, page_name
FROM page_visits
WHERE page_name = '2 - shopping_cart'
GROUP BY 1;

SELECT utm_campaign, page_name
FROM page_visits
WHERE page_name = '3 - checkout'
GROUP BY 1;

SELECT utm_campaign, page_name
FROM page_visits
WHERE page_name = '4 - purchase'
GROUP BY 1;
```

3. Optimize the campaign budget (con.)

Campaigns most likely to remind the user to purchase. (con.)

- Since the Conversion Campaigns (and Paid Search) only start showing up at the checkout stage of the user experience, we only have to look at which Conversion Campaigns (incl. Paid Search) have the best rate of taking the user from checkout to purchase.

Campaign	# of Checkout Visits
weekly-newsletter	450
retargetting-ad	445
retargetting-campaign	246
paid-search	179
getting-to-know-cool-tshirts	41
ten-crazy-cool-tshirts-facts	32
interview-with-cool-tshirts-founder	31
cool-tshirts-search	7
Total	**1431**

```
-- 3. query for which campaign is responsible for the number
of checkout visits
SELECT utm_campaign AS 'Campaign',
       COUNT(user_id) AS '# of Checkout Visits'
FROM page_visits
WHERE page_name = '3 - checkout'
GROUP BY 1
ORDER BY 2 DESC;
```

3. Optimize the campaign budget (con.)

Which Conversion Campaigns should we keep?

- The 3 Conversion Campaigns with the highest conversion rates to purchase are:
    1. paid-search
    2. weekly-newsletter
    3. retargetting-ad
- Just from these numbers, there's a ***toss up between whether to keep paid-search or retargetting-campaign***, because while paid-search has a higher conversion rate, retargetting-campaign has a slightly higher number of purchases. ***One factor that might decide it is scalability of cost***, as paid-search cost moves linearly with # of Checkout Visits and is determined by Google, while retargetting-campaign cost is determined by CoolTShirts's email marketing vendor (if they manage it in-house, the cost is very stable). ***Did we analyze the data correctly, though?***

Conversion Campaign	# of Checkout Visits	# of Users Taken from Checkout to Purchase	% Conversion from Checkout to Purchase
weekly-newsletter	450	115	26%
retargetting-ad	445	113	25%
retargetting-campaign	246	54	22%
paid-search	179	52	29%
Total	**1320**	**334**	

3. Optimize the campaign budget (con.)

Did we do the right thing by not re-investing in the interview-with-cool-tshirts-founder Acquisition Campaign?

- Is it really just 7 purchasing users that we would lose? Let's see how many purchases would've been affected if that Acquisition Campaign never existed.

Query Results
of Purchasing Users Touched by the Interview Campaign
119

```
-- 3. query for how many purchasing users there are from the
interview-with-cool-tshirts-founder Acquisition Campaign

--list of of distinct users touched by the interview campaign
WITH interview_users AS
  (
  SELECT user_id,
         utm_campaign
  FROM page_visits
  WHERE utm_campaign = 'interview-with-cool-tshirts-founder'
  GROUP BY 1
  )
-- figuring out how many of those users finished a purchase
SELECT COUNT(*) AS '# of Purchasing Users Touched by the
Interview Campaign'
FROM interview_users AS iu
JOIN page_visits AS pv
     ON iu.user_id = pv.user_id
WHERE page_name = '4 - purchase';
```

3. Optimize the campaign budget (con.)

Wow! What does that mean for the other Acquisition Campaigns?

- It turns out, we have to reconfigure our table on what each campaign means in relation to the final purchasing customer. Last touch purchase is not the correct measurement for all campaigns, when counting how many purchases each campaign affects. Keep in mind each user buys at most once in this exercise.

Query Results
of Purchasing Users Touched by the Getting Campaign
134
of Purchasing Users Touched by the Ten Facts Campaign
130
of Purchasing Users Touched by the Organic Cool Search Campaign
31

```
-- 3. query for how many purchasing users there are from each other Acquisition Campaign

--# of distinct purchasers touched by the getting campaign
WITH getting_users AS
  (
  SELECT user_id,
         utm_campaign
  FROM page_visits
  WHERE utm_campaign = 'getting-to-know-cool-tshirts'
  GROUP BY 1
  )
SELECT COUNT(*) AS '# of Purchasing Users Touched by the Getting Campaign'
FROM getting_users AS gu
JOIN page_visits AS pv
     ON gu.user_id = pv.user_id
WHERE page_name = '4 - purchase';

--# of distinct purchasers touched by the ten facts campaign
WITH tenfacts_users AS
  (
  SELECT user_id,
         utm_campaign
  FROM page_visits
  WHERE utm_campaign = 'ten-crazy-cool-tshirts-facts'
  GROUP BY 1
  )
SELECT COUNT(*) AS '# of Purchasing Users Touched by the Ten Facts Campaign'
FROM tenfacts_users AS tu
JOIN page_visits AS pv
     ON tu.user_id = pv.user_id
WHERE page_name = '4 - purchase';

--# of distinct purchasers touched by the organic search campaign
WITH coolsearch_users AS
  (
  SELECT user_id,
         utm_campaign
  FROM page_visits
  WHERE utm_campaign = 'cool-tshirts-search'
  GROUP BY 1
  )
SELECT COUNT(*) AS '# of Purchasing Users Touched by the Organic Cool Search Campaign'
FROM coolsearch_users AS ou
JOIN page_visits AS pv
     ON ou.user_id = pv.user_id
WHERE page_name = '4 - purchase';
```

3. Optimize the campaign budget (con.)

Conclusion: Which 5 Campaigns Should CoolTShirts re-invest in?

- Based on the updated table below, there are **5 clear-cut campaigns in driving purchases to the site**:
  1. **getting-to-know-cool-tshirts**
  2. **ten-crazy-cool-tshirts-facts**
  3. **interview-with-cool-tshirts-founder**
  4. **weekly-newsletter**
  5. **retargetting-ad**
- Yes, there is still the question of whether the campaign or the source is the driver, but a little A/B testing will clear that up. It looks like CoolTShirts should continue to focus on Sponsored Content in the future!

Campaign	# of Purchasing Customers Affected	Campaign Type
getting-to-know-cool-tshirts	134	Sponsored Content
ten-crazy-cool-tshirts-facts	130	Sponsored Content
interview-with-cool-tshirts-founder	119	Sponsored Content
weekly-newsletter	115	Periodical (DB)
retargetting-ad	113	Conversion (ad)
retargetting-campaign	54	Conversion (DB)
paid-search	52	Paid Search
cool-tshirts-search	31	Organic Search

*A row totaling the 2nd column here is not appropriate because the measurements of success for Acquisition Campaigns are not the same as Conversion Campaigns.