codecademy

Usage Funnels

Learn SQL from Scratch

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1. Getting Familiar

WARBY PARKER
eyewear

1.1 Who is Warby Parker?

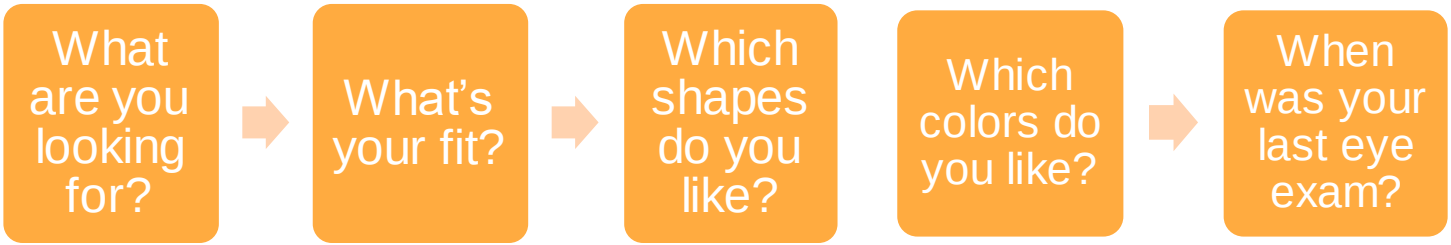
- Warby Parker is an innovative eyeglass retailer based in New York City
- They have a unique retail model called the 'Home Try On Program'
- This program allows customers to choose five frames from the website which they receive to try on for five days free of charge.

2. Quiz Funnel

2.1 Quiz Funnel

The Warby Parker Quiz Funnel helps users find their perfect frame by having them take a style quiz.
The quiz contains the following questions:

- What are you looking for?
- What's your fit?
- Which shapes do you like?
- Which colors do you like?
- When was your last eye exam?



2.2 Understanding the survey table

Selecting the first 10 rows of the ‘survey’ table

- This gave me a good understanding of what the table contained

```
SELECT *
FROM quiz
LIMIT 10;
```

Question	User_id	response
1. What are you looking for?	005e7f99-d48c-4fce-b605-10506c85aaf7	Women's Styles
2. What's your fit?	005e7f99-d48c-4fce-b605-10506c85aaf7	Medium
3. Which shapes do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Round
4. Which colors do you like?	00a556ed-f13e-4c67-8704-27e3573684cd	Two-Tone

2.3 Analyzing Question Completion Percentage

Figuring out how far users get into the survey can be beneficial in understanding what questions work and which questions to tweak.

- We can see that as users take the quiz, the completion rate drops off after each question

Question	COUNT(DISTINCT user_id)
1. What are you looking for?	500
2. What's your fit?	475
3. Which shapes do you like?	380
4. Which colors do you like?	361
5. When was your last eye exam?	270

```
SELECT question, COUNT(DISTINCT user_id)
FROM survey
GROUP BY question;
```

2.4 Analyzing Question Completion Percentage

To further understand the rate we can calculate the percentage of users that complete each question .

- We can see that there is a large drop off from question 4 to question 5
- One reason could be because people don't remember when their last eye exam was or because they feel you might need to have had an eye exam before continuing with the process.

Question	COUNT(DISTINCT user_id)	% of users who complete
1. What are you looking for?	500	1.0
2. What's your fit?	475	0.95
3. Which shapes do you like?	380	0.76
4. Which colors do you like?	361	0.722
5. When was your last eye exam?	270	0.54

```
WITH quiz_funnel AS (
SELECT question, COUNT(DISTINCT user_id) AS 'user_id'
FROM survey
GROUP BY question)

SELECT question, user_id,
              user_id*1.0 / (SELECT max(user_id)
                 FROM quiz_funnel)
  AS 'completion %'
FROM quiz_funnel
GROUP BY question;
```

3. Home Try-On Funnel

3.1 Home Try on Funnel AB analysis

- First we need to understand the three tables used in the AB analysis. To understand the column names, we simply selected the first few rows from each table with:

SELECT * FROM quiz LIMIT 5;
SELECT * FROM home_try_on LIMIT 5;
SELECT * FROM purchase LIMIT 5;

Query Results

user_id	style	fit	shape	color
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	Women's Styles	Medium	Rectangular	Tortoise
291f1cca-e507-48be-b063-002b14906468	Women's Styles	Narrow	Round	Black
75122300-0736-4087-b6d8-c0c5373a1a04	Women's Styles	Wide	Rectangular	Two-Tone
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	Women's Styles	Narrow	Square	Two-Tone
ce965c4d-7a2b-4db6-9847-601747fa7812	Women's Styles	Wide	Rectangular	Black

user_id	number_of_pairs	address
d8addd87-3217-4429-9a01-d56d68111da7	5 pairs	145 New York 9a
f52b07c8-abe4-4f4a-9d39-ba9fc9a184cc	5 pairs	383 Madison Ave
8ba0d2d5-1a31-403e-9fa5-79540f8477f9	5 pairs	287 Pell St
4e71850e-8bbf-4e6b-accc-49a7bb46c586	3 pairs	347 Madison Square N
3bc8f97f-2336-4dab-bd86-e391609dab97	5 pairs	182 Cornelia St

user_id	product_id	style	model_name	color	price
00a9dd17-36c8-430c-9d76-df49d4197dcf	8	Women's Styles	Lucy	Jet Black	150
00e15fe0-c86f-4818-9c63-3422211baa97	7	Women's Styles	Lucy	Elderflower Crystal	150
017506f7-aba1-4b9d-8b7b-f4426e71b8ca	4	Men's Styles	Dawes	Jet Black	150
0176bfb3-9c51-4b1c-b593-87edab3c54cb	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95
01fdf106-f73c-4d3f-a036-2f3e2ab1ce06	8	Women's Styles	Lucy	Jet Black	150

3.2 Funnel Analysis

It looks like the funnel is Quiz → Home Try-On → Purchase

Looking at the overall funnel we can see that of the 1000 users who took the quiz, 750 moved on to the home try on and of that 750, 495 completed a purchase. This might mean that WP needs to adjust their home try on program as 75% of users would like to participate in the program, but only 66% of that 75% go through with a purchase.

Note: this is including both 3 pair home try on and 5 pair. We will dig deeper into this on the next slide

quiz_users	Num_home_try_on	Num_purcahsed
1000	750	495

```
WITH funnels AS (
 SELECT DISTINCT q.user_id,
   h.user_id IS NOT NULL AS 'is_home_try_on',
   p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz q
LEFT JOIN home_try_on h
   ON q.user_id = h.user_id
LEFT JOIN purchase p
   ON p.user_id = q.user_id
  )

SELECT COUNT(*) AS 'quiz_users',
             COUNT (CASE
             WHEN is_home_try_on = 1 THEN user_id
        ELSE NULL
        END) AS 'num_home_try_on',
  COUNT (CASE
        WHEN is_purchase = 1 THEN user_id
        ELSE NULL
        END) AS 'num_purchased'
  FROM funnels;
```

3.3 A/B Analysis New Table

- WP decided to test if more people bought when they received 3 pairs to try or 5 pairs.
- In order to understand the data further we created a new table.
- We did this by using joins
- The tables we joined were quiz, home_try_on, and purchase.
- We did this with:

```
SELECT DISTINCT q.user_id,
  h.user_id IS NOT NULL AS 'is_home_try_on',
  h.number_of_pairs,
  p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz q
LEFT JOIN home_try_on h
  ON q.user_id = h.user_id
LEFT JOIN purchase p
  ON p.user_id = q.user_id
LIMIT 10;
```

- This creates a new table view that shows the user ID, weather or not they were involved with the home try on(1 = TRUE, 0 = FALSE), and the number of pairs they received to try on.
- Finally, it shows if they purchased or not.

Query Results

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	1	3 pairs	0
291f1cca-e507-48be-b063-002b14906468	1	3 pairs	1
75122300-0736-4087-b6d8-c0c5373a1a04	0	Ø	0
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	1	5 pairs	0
ce965c4d-7a2b-4db6-9847-601747fa7812	1	3 pairs	1

3.4 A/B Analysis Review

Reviewing the data using additional queries lets us provide more insight.

- This quarry counts the number of purchases there were for each amount the users received.
- We know there were 750 users in the home_try_on table. We also know 50% received 3 pairs and 50% received 5 pairs
- That means there was 375 users in each group
- 54% who received 3 pairs purchased
- 78% who received 5 pairs purchased
- WP received almost a 25% higher purchase rate when shipping 5 pairs for users to try on
- We can conclude that 5 pairs is definitely more effective than 3 pairs.

```
WITH AB_analysis AS (
  SELECT DISTINCT q.user_id,
   h.user_id IS NOT NULL AS 'is_home_try_on',
   h.number_of_pairs,
   p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz q
LEFT JOIN home_try_on h
   ON q.user_id = h.user_id
LEFT JOIN purchase p
   ON p.user_id = q.user_id
)
SELECT number_of_pairs,
            COUNT(CASE
        WHEN is_purchase = 1 THEN user_id
       END) AS 'purchased'
FROM AB_analysis
GROUP BY number_of_pairs;
```

Number_of_pairs	purchased
NULL	0
3 pairs	201
5 pairs	294

3.5 A/B Analysis Review

To double check our math. I added another column to validate the percentages

Number_of_pairs	purchased	% who purchased
NULL	0	0.0
3 pairs	201	0.536
5 pairs	294	0.784

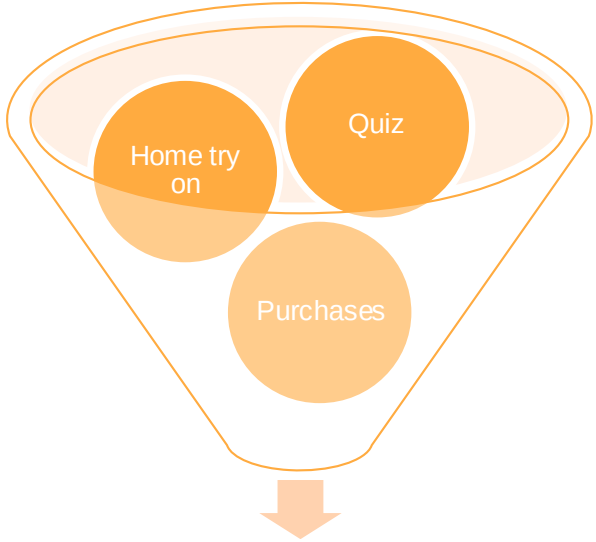
```
WITH AB_analysis AS (
  SELECT DISTINCT q.user_id,
   h.user_id IS NOT NULL AS 'is_home_try_on',
   h.number_of_pairs,
   p.user_id IS NOT NULL AS 'is_purchase'
FROM quiz q
LEFT JOIN home_try_on h
   ON q.user_id = h.user_id
LEFT JOIN purchase p
   ON p.user_id = q.user_id
)
SELECT number_of_pairs,
             COUNT(CASE
        WHEN is_purchase = 1 THEN user_id
       END) AS 'purchased',
  COUNT(CASE
        WHEN is_purchase = 1 THEN user_id
       END) *1.0 /
 ((SELECT COUNT(DISTINCT user_id) FROM
home_try_on)*.50) AS '% who purchased'
FROM AB_analysis
GROUP BY number_of_pairs;
```

3.6 Usage Funnel

Comparing the two tables we can speculate that if WB only sent 5 pairs for customers to try on they would have received 18% more purchased.

Their purchases could have theoretically been 585 from the 750 who tried the program. That is a 78% conversion rate.

Perhaps the next step is to do an additional AB analysis with 6 pairs vs 5. The more pairs user have to try could lead to an even higher purchase rate.



Revenue

quiz_users	Num_home_try_on	Num_purcahsed
1000	750	495

Number_of_pairs	purchased
NULL	0
3 pairs	201
5 pairs	294