WARBY PARKER

codecademy

Usage Funnels:

Analysis of Quiz and Purchase Data with SQL

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1. Quiz Funnel

1.1 What is the number of responses for each question?

To help users find their perfect frame, Warby Parker has a Style Quiz with the following questions:

1. “What are you looking for?”
2. “What’s your fit?”
3. “Which shapes do you like?”
4. “Which colors do you like?”
5. “When was your last eye exam?”

question	num_users
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

Upon initial inspection, nearly half of all users fail to complete the survey.

1.2 Which questions have lower completion rates?

The query to the right aliases the counts from the previous slide as q_funnel, and performs two calculations:

1. What percentage of users moves from one question to the next? (perc_from_prev)
2. What percentage of users who *started* the survey make it to each question? (perc_from_start)

question	perc_from_prev	perc_from_start
1. What are you looking for?	∅	100
2. What's your fit?	95	95
3. Which shapes do you like?	80	76
4. Which colors do you like?	95	72.2
5. When was your last eye exam?	74.79224377	54

```
-- Calculate the percentage of users who respond to each
question of the survey
WITH q_funnel AS
(
  SELECT question,
       COUNT(DISTINCT user_id) as num_users
  FROM survey
  GROUP BY question
  ORDER BY question ASC
)
SELECT question,
       (100.0*num_users) / LAG(num_users)
       OVER (ORDER BY question)
       AS perc_from_prev,
       (100.0*num_users) / FIRST_VALUE(num_users)
       OVER (ORDER BY question)
       AS perc_from_start
FROM q_funnel
```

Questions 3 and 5 have the lowest completion rates.
Question 3 stops 20% of its users from continuing.
Question 5 stops 25.2% of its users from finishing.

1.2.1 What could be the reason?

question	perc_from_prev	perc_from_start
1. What are you looking for?	∅	100
2. What's your fit?	95	95
3. Which shapes do you like?	80	76
4. Which colors do you like?	95	72.2
5. When was your last eye exam?	74.79224377	54

Question 3 asks users to *choose* the shape of their frames, but this is a survey to help users *find* their perfect frame. Many users likely started taking this quiz because *they do not know* what kinds of frames they want.

Question 5 asks users to recall *specific* information about their last eye exam. Some users may not have that information readily available. Others may be hesitant to provide any sort of personal medical history for an online quiz.

2. Purchase Funnel

2.1 What is the number of users at each stage in the purchase funnel?

Warby Parker's purchase funnel is:

Take the Style Quiz ⟶ Home Try-On ⟶ Purchase the Perfect Pair of Glasses

took_quiz	tried_on	made_purchase
1000	750	495

perc_quiz_to_try	perc_try_to_buy
75.0	66.0

Fewer than half of those who took the styles quiz end up making a purchase.

A greater percentage of users is lost between trying on glasses and making a purchase.

2.2 Are users that try on more pairs at home more likely to make a purchase?

During the Home Try-On stage, there was an A/B Test:

- ~50% of the users had 3 pairs to try on
- ~50% of the users had 5 pairs to try on

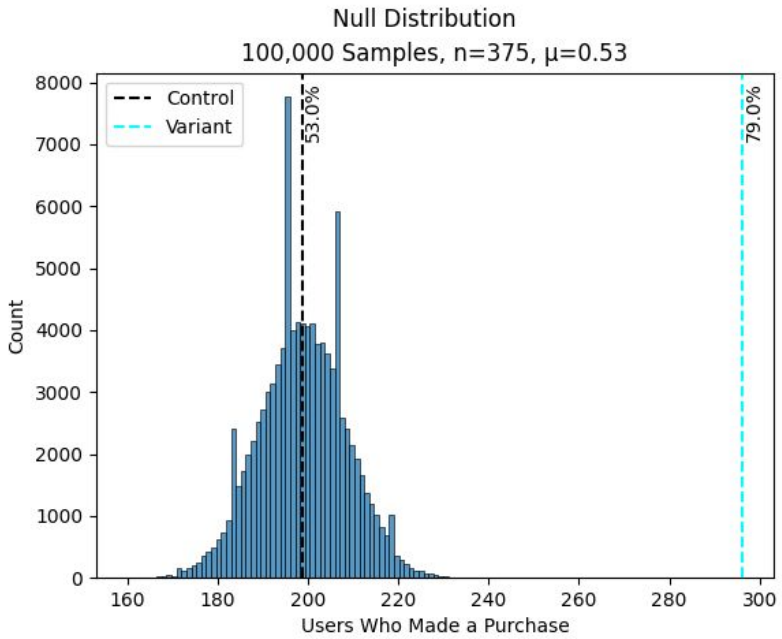
tried_on	number_of_pairs	made_purchase
379	3 pairs	201
371	5 pairs	294

- 53% of users who tried on 3 pairs made a purchase.
- 79% of users who tried on 5 pairs made a purchase.
- This is a 49% increase in sales for users sent more pairs to try on.

```
-- Count the number of users on both sides of the A/B test.
WITH quiz_try_buy_funnel AS
(
  SELECT quiz.user_id,
        home_try_on.user_id IS NOT NULL AS is_home_try_on,
        home_try_on.number_of_pairs,
        purchase.user_id IS NOT NULL AS is_purchase
  FROM quiz
  LEFT JOIN home_try_on
       ON quiz.user_id = home_try_on.user_id
  LEFT JOIN purchase
       ON quiz.user_id = purchase.user_id
)
SELECT SUM(is_home_try_on) as tried_on,
       number_of_pairs,
       SUM(is_purchase) as made_purchase
FROM quiz_try_buy_funnel
GROUP BY number_of_pairs
HAVING SUM(is_home_try_on) > 0;
```

2.2 Are users that try on more pairs at home more likely to make a purchase?

Null hypothesis: The number of glasses tried on at home has no effect on the chance of purchase.
Alternative hypothesis: Users who try on more pairs at home have a greater chance of making a purchase.



Control Group – 3 Pairs
In a sample of 379 users, we observed that 53% of all users that tried on glasses made a purchase. Suppose this is the population mean.

Variant Group – 5 Pairs
In a sample of 371 users, we observed that 79% of all users that tried on glasses made a purchase.

Under the null hypothesis, in a distribution with 100,000 samples of 375 users the p-value of an observation where at least 79% of users make a purchase is p=0.0. We should reject the null hypothesis in favor of the alternative hypothesis.

3. User and Style Preferences

3.1 Are men's styles or women's styles more popular?

Looking at the purchases, there is a very slight favor towards women's styles, but the distribution in near-equal.

style	num_purchased	perc_of_purchased
Men's Styles	243	49.0909090909091
Women's Styles	252	50.9090909090909

Looking at the quiz results, there is a greater preference towards women's styles.

style	num_preferred	perc_of_preferred
I'm not sure. Let's skip it.	99	9.9
Men's Styles	432	43.2
Women's Styles	469	46.9

3.1 Are men's styles or women's styles more popular?

Are the quiz results indicative of the purchases?
How do those that were 'unsure' affect the purchases?

quiz_preference	style_purchased	num_users
I'm not sure. Let's skip it.	No Purchase	99
Men's Styles	No Purchase	189
Men's Styles	Men's Styles	243
Women's Styles	No Purchase	217
Women's Styles	Women's Styles	252

```
--Join the quiz responses to the purchases made and group
quiz preferences with purchase styles to see each
combination.
SELECT quiz.style AS quiz_preference,
       IFNULL(purchase.style, 'No Purchase')
                  AS style_purchased,
       COUNT(*) as num_users
FROM quiz
LEFT JOIN purchase on quiz.user_id = purchase.user_id
GROUP BY quiz.style, purchase.style
```

We see that *no user purchased against their stated preferences* (i.e. stated a preference in men's styles, but purchased women's styles). Also, *no user who stated an uncertainty of preference made a purchase*.

Also note that 56.25% of men finalized their purchase after the quiz, but only 53.73% of women finalized their purchase.

3.1 How are the preferences and purchases of frame shape distributed?

Looking at the quiz results, there is a notable preference towards square and rectangular frames.

shape	num_preferred	perc_of_preferred
No Preference	97	9.7
Rectangular	397	39.7
Round	180	18.0
Square	326	32.6

Looking at the purchases, there is a slight preference towards the Eugene Narrow and Dawes frames.
The Monocle and Olive Styles are the least popular.

model	num_purchased	perc_of_purchased
Brady	95	19.1919191919192
Dawes	107	21.6161616161616
Eugene Narrow	116	23.4343434343434
Lucy	86	17.3737373737374
Monocle	41	8.28282828282828
Olive	50	10.1010101010101

Note: The quiz data lists general shapes, while purchase data lists specific models.
Without access to a database for product details, it is difficult to know which shapes correspond to which models.

Actionable Insights

Quiz

- Question 5 from the quiz should be heavily modified, or removed.
  - 25.2% of users that make it to question 5 do not finish the quiz.
  - The date of a users last eye exam was is unrelated to style recommendations.

- Question 3 from the quiz should be adjusted.
  - 20% of users that make it to question 3 do not continue the quiz.
  - Many users likely started taking this quiz because they do not know what kinds of frames they want.
  - Rather than directly asking which shape they like, perhaps show photos of a few glasses models in each shape and ask users to rate each one.
    - I like those!, I dislike those!, I am neutral towards those.
    - Their ratings can be scored to understand their shape preferences.

Quiz ⟶Try-on ⟶ Purchases

- The greatest area of loss in the funnel is between trying glasses on, and making a purchase.
  - Only 66% of all users who try glasses on make a purchase.
  - The date of a users last eye exam was is unrelated to style recommendations.

- The results of the A/B Test strongly indicate that users who try on 5 pairs of glasses are more likely to make a purchase than those who only try on 3.
  - Users who complete the quiz should receive 5 pairs to try on.

User Preferences

- Current survey data indicates that 3.7% more women are taking the survey than men.
- 56.25% of men made a purchase after the quiz.
- Only 53.73% of women made a purchase after the quiz.

We should modify our outreach and marketing strategies to potential male users to increase male interaction with the quiz. This will likely increase sales.