



Warby Parker Analysis

Analyze Data with SQL

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1. Introduction

Project Outline and Goals

Warby Parker is a transformative lifestyle brand with a lofty objective: to offer designer eyewear at a revolutionary price while leading the way for socially conscious businesses. Founded in 2010 and named after two characters in an early Jack Kerouac journal, Warby Parker believes in creative thinking, smart design, and doing good in the world. For every pair of eyeglasses and sunglasses sold, a pair is distributed to someone in need.

In this project, you will analyze different Warby Parker marketing funnels in order to calculate conversion rates. Here are the funnels and the tables that you are given:

1. Quiz Funnel: survey
2. Home Try-On Funnel: quiz, home_try_on, purchase

This project was a collaboration with Warby Parker's Data Science team and uses fictional data.

2. Quiz Funnel

Question 1

To help users find their perfect frame, Warby Parker has a Style Quiz that has 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?"

The users' responses are stored in a table called survey. Select all columns from the first 10 rows. What columns does the table have?

```
-- SQL QUERY:

SELECT *
FROM survey
LIMIT 10;

-- Columns: question, user_id, response.
```

Query Results		
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
1. What are you looking for?	00a556ed-f13e-4c67-8704-27e3573684cd	I'm not sure. Let's skip it.
2. What's your fit?	00a556ed-f13e-4c67-8704-27e3573684cd	
5. When was your last eye exam?	00a556ed-f13e-4c67-8704-27e3573684cd	<1 Year
3. Which shapes do you like?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Square
5. When was your last eye exam?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	<1 Year
2. What's your fit?	00bf9d63-0999-43a3-9e5b-9c372e6890d2	Medium

Questions 2/3

Analyze how many users move from Q1 to Q2, Q2 to Q3, Q3 to Q4, and Q4 to Q5 in the survey.
Calculate percentage of users who answered each question compared to previous question. Which question(s) have lower completion rates? What do you think the reason is?

```
-- SQL QUERY:

SELECT question,
  COUNT(DISTINCT user_id) AS
'num_users'
FROM survey
GROUP BY 1;

-- Q1: 500 responses, Q2: 475
responses, Q3: 380 responses, Q4:
361 responses, Q5: 270 responses.
```

Query Results	
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

Percentage
100%
95%
80%
95%
75%

Questions 3 and 5 have the lowest completion rates.

- Q3: May have lower completion rate because it is hard to decide which shapes you like until after you try them on and assess how they look
- Q5: May have a lower completion rate because it involves giving out medical information, which users may not feel comfortable with

3. Home Try-On Funnel

Question 4

Warby Parker's purchase funnel is:

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

During the Home Try-On stage, we will be
conducting an A/B Test:

- 50% of the users will get 3 pairs to try on
- 50% of the users will get 5 pairs to try on

The data will be distributed across three
tables:

- quiz
- home_try_on
- purchase

Examine the first five rows of each table. What
are the column names?

-- SQL QUERY:

```
SELECT *  
FROM quiz  
LIMIT 5;  
-- Columns in table: user_id, style, fit, shape, color
```

```
SELECT *  
FROM home_try_on  
LIMIT 5;  
-- Columns in table: user_id, number_of_pairs, address
```

```
SELECT *  
FROM purchase  
LIMIT 5;  
-- Columns in table: user_id, product_id, style, model_name, color, price
```

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-a301-27dd93b12e2	Women's Styles	Narrow	Square	Two-Tone	
	ce965cd4d-7a2b-4db6-9847-601747fa7812	Women's Styles	Wide	Rectangular	Black	
➡	user_id	number_of_pairs	address			
	d8add87-3217-4429-9a01-d56d6811da7	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-acc0-49a7bb46c586	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-4818-9c63-342221bba997	7	Women's Styles	Lucy	Elderflower Crystal	150
	017506f7-abaf-4b9d-8b7b-f4426e71b8ca	4	Men's Styles	Dawes	Jet Black	150
	0176bfb3-9c5f-4b1c-b593-87edab3c54cb	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95
	01fd106-f73c-4d3f-a036-2f3e2ab1ce06	8	Women's Styles	Lucy	Jet Black	150

Question 5

Use a left join to combine the quiz, home_try_on and purchase tables to create a resulting table with the following layout:

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc	True	3	False
291f1cca	True	5	False
75122300	False	NULL	False

Query Results

user_id	is_home_try_on	number_of_pairs	is_purchase
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	True	3 pairs	FALSE
291f1cca-e507-48be-b063-002b14906468	True	3 pairs	True
75122300-0736-4087-b6d8-c0c5373a1a04	False	Ø	FALSE
75bc6ebd-40cd-4e1d-a301-27dd93b12e2	True	5 pairs	FALSE
ce965c4d-7a2b-4db6-9847-601747fa7812	True	3 pairs	True
28867d12-27a6-4e6a-a5fb-8bb5440117ae	True	5 pairs	True
5a7a7e13-fbcf-46e4-9093-79799649d6c5	False	Ø	FALSE
0143cb8b-bb81-4916-9750-ce956c9f9bd9	False	Ø	FALSE
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	True	5 pairs	FALSE
b1dded76-cd60-4222-82cb-f6d464104298	True	3 pairs	FALSE

-- SQL QUERY:

```
SELECT DISTINCT quiz.user_id,
  CASE
    WHEN home_try_on.user_id IS NOT NULL THEN 'True'
    ELSE 'False'
  END AS 'is_home_try_on',
  home_try_on.number_of_pairs,
  CASE
    WHEN purchase.user_id IS NOT NULL THEN 'True'
    ELSE 'FALSE'
  END AS 'is_purchase'
FROM quiz
LEFT JOIN home_try_on
  ON quiz.user_id = home_try_on.user_id
LEFT JOIN purchase
  ON home_try_on.user_id = purchase.user_id
LIMIT 10;
```

4. Actionable Insights

Question 6

-- SQL QUERY:

```
WITH funnel AS (  
  SELECT DISTINCT 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 home_try_on.user_id = purchase.user_id)  
SELECT COUNT(user_id) AS 'num_quiz',  
  SUM(is_home_try_on) AS 'num_is_home_try_on',  
  SUM(is_purchase) AS 'num_purchase',  
  1.0 * SUM(is_home_try_on) / COUNT(user_id) AS 'quiz_to_home_try_on',  
  1.0 * SUM(is_purchase) / SUM(is_home_try_on) AS 'home_try_on_to_purc  
hase'  
FROM funnel;
```

Calculate overall conversion rates by aggregating across all rows. Compare conversion from quiz --> home_try_on from and home_try_on --> purchase.

1000 users completed the quiz, 750 users did the home try-on, and 495 users made a purchase.

Therefore, **75%** of the users that completed the quiz did a home try-on and **66%** of the users who did the home try-on purchased glasses.

Query Results

num_quiz	num_is_home_try_on	num_purchase	quiz_to_home_try_on	home_try_on_to_purchase
1000	750	495	0.75	0.66

Question 6 (Continued)

Calculate difference in purchase rates between customers who had 3 number_of_pairs and 5 number_of_pairs (results of A/B test).

Query Results		
num_3_pairs	num_5_pairs	
379	371	
number_of_pairs	num_purchase	perc_purchase
3 pairs	201	0.530343007915567
5 pairs	294	0.792452830188679

Out of 750 users who did the at home try on, 379 users got 3 pairs of glasses and 371 users got 5 pairs of glasses.

53% of users who received 3 pairs to try on at home purchased glasses whereas **79%** of users who received 5 pairs to try on at home purchased glasses. Therefore, Warby Parker should send 5 pairs of glasses to potential buyers going forward.

-- SQL QUERY:

```
SELECT COUNT(DISTINCT
  CASE
    WHEN number_of_pairs = '3 pairs' THEN user_id
  END) AS 'num_3_pairs',
COUNT(DISTINCT
  CASE
    WHEN number_of_pairs = '5 pairs' THEN user_id
  END) AS 'num_5_pairs'
FROM home_try_on;
```

-- SQL QUERY:

```
WITH funnel AS (
  SELECT DISTINCT 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 home_try_on.user_id = purchase.user_id)
SELECT number_of_pairs,
  SUM(is_purchase) AS 'num_purchase',
  1.0 * SUM(is_purchase) / COUNT(number_of_pairs) AS '
  perc_purchase'
FROM funnel
WHERE number_of_pairs IS NOT NULL
GROUP BY 1;
```

Question 6 (Continued)

Find the most common results of the style quiz.

Q1: Men's Styles

Q2: Narrow

Q3: Rectangular

Q4: Tortoise

Q5: <1 Year

-- SQL QUERY:

```
SELECT question,  
       response,  
       COUNT(*) AS 'num_users'  
FROM survey  
GROUP BY 1, 2  
ORDER BY 1, 3 DESC;
```

Query Results		
question	response	num_users
1. What are you looking for?	Men's Styles	242
1. What are you looking for?	Women's Styles	209
1. What are you looking for?	I'm not sure. Let's skip it.	49
2. What's your fit?	Narrow	208
2. What's your fit?	Medium	132
2. What's your fit?	Wide	88
2. What's your fit?	I'm not sure. Let's skip it.	47
3. Which shapes do you like?	Rectangular	141
3. Which shapes do you like?	Square	119
3. Which shapes do you like?	Round	91
3. Which shapes do you like?	No Preference	29
4. Which colors do you like?	Tortoise	117
4. Which colors do you like?	Black	112
4. Which colors do you like?	Crystal	69
4. Which colors do you like?	Neutral	36
4. Which colors do you like?	Two-Tone	27
5. When was your last eye exam?	<1 Year	141
5. When was your last eye exam?	1-3 Years	56
5. When was your last eye exam?	3+ Years	37
5. When was your last eye exam?	Not Sure. Let's Skip It	36

Question 6 (Continued)

Find the most common types of purchases made.

Styles:

252 Women's Styles, 251 Men's Styles sold

Models:

116 Eugene Narrow, 107 Dawes, 95 Brady, 86 Lucy, 50 Olive, 41 Monocle models sold

Colors:

86 Jet Black, 63 Driftwood Fade, 62 Rosewood Tortoise, 54 Rose Crystal, 52 Layered Tortoise Matte, 50 Pearled Tortoise, 44 Elderflower Crystal, 43 Sea Glass Gray, 41 Endangered Tortoise colors sold

Model + Color Combo:

Men: Dawes Driftwood Fade (63 sold)
Women: Eugene Narrow Rosewood Tortoise (62 sold)

```
-- SQL QUERY:
```

```
-- Styles:
SELECT style,
       COUNT(*) AS 'num_sold'
FROM purchase
GROUP BY 1
ORDER BY 2 DESC;
```

```
-- Models:
SELECT style,
       model_name,
       COUNT(*) AS 'num_sold'
FROM purchase
GROUP BY 2
ORDER BY 1, 3 DESC;
```

```
-- Colors:
SELECT style,
       color,
       COUNT(*) AS 'num_sold'
FROM purchase
GROUP BY 2
ORDER BY 1, 3 DESC;
```

```
-- Model and color combo:
SELECT style,
       model_name,
       color,
       COUNT(color) AS 'num_sold'
FROM purchase
GROUP BY 2, 3
ORDER BY 1, 4 DESC;
```

Query Results

style	num_sold		
Women's Styles	252		
Men's Styles	243		
style	model_name	num_sold	
Men's Styles	Dawes	107	
Men's Styles	Brady	95	
Men's Styles	Monocle	41	
Women's Styles	Eugene Narrow	116	
Women's Styles	Lucy	86	
Women's Styles	Olive	50	
style	color	num_sold	
Men's Styles	Driftwood Fade	63	
Men's Styles	Layered Tortoise Matte	52	
Men's Styles	Sea Glass Gray	43	
Men's Styles	Endangered Tortoise	41	
Women's Styles	Jet Black	86	
Women's Styles	Rosewood Tortoise	62	
Women's Styles	Rose Crystal	54	
Women's Styles	Pearled Tortoise	50	
Women's Styles	Elderflower Crystal	44	
style	model_name	color	num_sold
Men's Styles	Dawes	Driftwood Fade	63
Men's Styles	Brady	Layered Tortoise Matte	52
Men's Styles	Dawes	Jet Black	44
Men's Styles	Brady	Sea Glass Gray	43
Men's Styles	Monocle	Endangered Tortoise	41
Women's Styles	Eugene Narrow	Rosewood Tortoise	62
Women's Styles	Eugene Narrow	Rose Crystal	54
Women's Styles	Olive	Pearled Tortoise	50
Women's Styles	Lucy	Elderflower Crystal	44
Women's Styles	Lucy	Jet Black	42