



Learn SQL from Scratch

Capstone Project

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5.1 SQL Code

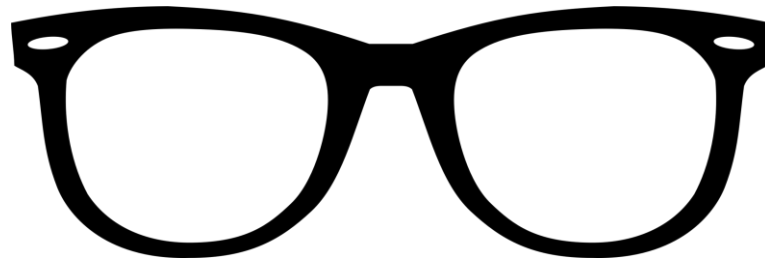
5.2 Questions?



Section 1

Get Familiar with Warby Parker

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.





Section 2

What is the quiz funnel?

2.1 Quiz Funnel

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

What's your fit? ➡ Which shapes do you like? ➡ Which colors do you like? ➡ When was your last eye exam?

The results of Warby Parker's style quiz are stored in a table called **survey**, which has the following columns:

- Question
- User ID
- Response

Users "give up" at different points in the survey. By creating a funnel, we can see how many people answered each question in the style quiz.

```
1 select question, count (distinct user_id)
2 from survey
3 group by 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

2.2 Quiz Response Rate by Question

- We have calculated the percentage of users who answered each question. The question **“When was your last eye exam?”** yielded the lowest completion rate, with only 74.79% of users responding to that question.
- This question likely yielded a lower completion rate for a number of reasons
 - Users are unable to recall the date of their last eye exam
 - Users are easily able to answer questions about their aesthetic preferences (shape, color, etc.) but more hesitant to answer questions about their personal health history

Question	Distinct Responses	Response Rate
1. What are you looking for?	500	100.00%
2. What's your fit?	475	95.00%
3. Which shapes do you like?	380	80.00%
4. Which colors do you like?	361	95.00%
5. When was your last eye exam?	270	74.79%



Section 3

Home Try-On Funnel

3.1 Home Try-On Funnel

Warby Parker's purchase funnel is:

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

Data for the purchase funnel is stored across three tables:

- quiz
- home_try_on
- purchase

In order to analyze conversation rates throughout different steps in the funnel, we created a new table which combined the three tables above using “left join.”

```
SELECT DISTINCT q.user_id,  
    h.user_id IS NOT NULL AS 'is_home_try_on',  
    h.number_of_pairs as "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 new table, titled “funnel” for future queries, combines data from all steps of the purchase funnel (quiz, home try on, purchase). Each row in this table represents a single user

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	0	0
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	1	5 pairs	0
ce965c4d-7a2b-4db6-9847-601747fa7812	1	3 pairs	1
28867d12-27a6-4e6a-a5fb-8bb5440117ae	1	5 pairs	1
5a7a7e13-fbcf-46e4-9093-79799649d6c5	0	0	0
0143cb8b-bb81-4916-9750-ce956c9f9bd9	0	0	0
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	1	5 pairs	0
b1dded76-cd60-4222-82cb-f6d464104298	1	3 pairs	0

3.2 Purchase Funnel Insights

- The data stored in the 3 tables of the purchase funnel (quiz, home_try_on, purchase) gives us valuable insight into consumer preferences and behavior.
- For example, we are able to see that slightly more users were searching for women's styles, and "Eugene Narrow" and "Dawes" were the most popular models purchased.

```
select style, count(*)  
from quiz  
group by style;  
select model_name, count(*)  
from purchase  
group by model_name  
order by 2 desc;
```

style	count(*)
I'm not sure. Let's skip it.	99
Men's Styles	432
Women's Styles	469
model_name	count(*)
Eugene Narrow	116
Dawes	107
Brady	95
Lucy	86
Olive	50
Monocle	41

3.3 Home Try-On Funnel: A/B Test

To determine whether or not users who get more pairs to try on at home will be more likely to make a purchase, Warby Parker conducted 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 code shown here was written to display the number of individuals who received 3 pairs vs. 5 pairs and the number of individuals from those groups who purchased glasses.

number_of_pairs	sent home
3 pairs	379
5 pairs	371
number_of_pairs	purchased
3 pairs	201
5 pairs	294

```
with funnel as
(SELECT DISTINCT q.user_id,
 h.user_id IS NOT NULL AS 'is_home_try_on',
 h.number_of_pairs as '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, sum(is_home_try_on) as 'sent home'
from funnel
where number_of_pairs is not null
group by number_of_pairs;

with funnel as
(SELECT DISTINCT q.user_id,
 h.user_id IS NOT NULL AS 'is_home_try_on',
 h.number_of_pairs as '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(*) as purchased
from funnel
where is_purchase = 1
group by number_of_pairs;
```

3.4 A/B Test Conversion Rates

We are also able to code for conversion rate from each test population.

From this, we are able to determine an important conclusion:

Individuals who receive 5 pairs of glasses to try on at home are more likely to make a purchase.

try on - 3 pairs	purchase - 3 pairs	try on to purchase rate - 3 pairs
379	201	0.530343007915567
try on - 5 pairs	purchase - 5 pairs	try on to purchase rate - 5 pairs
371	294	0.792452830188679

```
with funnel as
(SELECT DISTINCT q.user_id,
 h.user_id IS NOT NULL AS 'is_home_try_on',
 h.number_of_pairs as '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 sum(is_home_try_on) as 'try on - 3 pairs', sum(is_purchase) as
'purchase - 3 pairs', 1.0 * sum(is_purchase) / sum(is_home_try_on) as
'try on to purchase rate - 3 pairs'
from funnel
where number_of_pairs = '3 pairs';
```

```
with funnel as
(SELECT DISTINCT q.user_id,
 h.user_id IS NOT NULL AS 'is_home_try_on',
 h.number_of_pairs as '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 sum(is_home_try_on) as 'try on - 5 pairs', sum(is_purchase) as
'purchase - 5 pairs', 1.0 * sum(is_purchase) / sum(is_home_try_on) as
'try on to purchase rate - 5 pairs'
from funnel
where number_of_pairs = '5 pairs';
```

3.5 Purchase Funnel Rates

Using the “funnel” table we created previous, we are able to aggregate user data and calculate important findings, like the overall conversion rate, the rate of people who started the quiz and then received glasses to try on, and the rate of individuals who made a purchase after trying on glasses.

```
with funnel as
(SELECT DISTINCT q.user_id,
  h.user_id IS NOT NULL AS 'is_home_try_on',
  h.number_of_pairs as '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 count(*) as 'total quiz',
sum(is_purchase) as 'purchased', 1.0 *
sum(is_purchase) / (count(*)) as 'overall
conversion rate'
from funnel;
```

```
with funnel as
(SELECT DISTINCT q.user_id,
  h.user_id IS NOT NULL AS 'is_home_try_on',
  h.number_of_pairs as '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 count(*) as 'total quiz',
sum(is_home_try_on) as 'home try on', 1.0 *
sum(is_home_try_on) / (count(*)) as 'quiz to
try on rate'
from funnel;
```

```
with funnel as
(SELECT DISTINCT q.user_id,
  h.user_id IS NOT NULL AS 'is_home_try_on',
  h.number_of_pairs as '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 sum(is_home_try_on) as 'home try on',
sum(is_purchase) as purchase, 1.0 *
sum(is_purchase) / sum(is_home_try_on) as 'try
on to purchase rate'
from funnel;
```

total quiz	purchased	overall conversion rate
1000	495	0.495
total quiz	home try on	quiz to try on rate
1000	750	0.75
home try on	purchase	try on to purchase rate
750	495	0.66



Section 4

Actionable Insights

4.1 Actionable Insights

The data collected by Warby Parker's marketing team has provided valuable insight. In order to increase sales, the following recommendations were made to the company's CEO:

- ❖ Simplify the style quiz by removing questions that deter users from completing the quiz. The questions with the lowest response rates are "Which shapes do you like?" (80% response rate) and "When was your last eye exam?" (75% response rate). A three-question style quiz will result in more completions, and more individuals moving to the 'home try-on' step of the purchase funnel.
- ❖ Send all individuals 5 pairs of glasses to try on. The A/B test showed that individuals who received 5 pairs to try on purchased at a much higher rate (79% purchased) than those who received 3 pairs to try on (53% purchased). This is an easy way to increase sales.
- ❖ Data showed that the most popular models purchased were "Eugene Narrow" and "Dawes." We recommend including at least one of these models in the try-on package of every individual.



Section 5

Project Wrap Up

5.1 SQL Code

Code used to create tables, analyze insights, and answer questions in this presentation can be found at:

<https://gist.github.com/7d00d3822842ad058b1c55c149e90ca8>



QUESTIONS?

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