codecademy

Warby Parker's Marketing Funnels

Learn SQL from Scratch

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1.1 What is the Quiz Funnel

Q1. 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`.

What columns does the table have?

The table called “survey” has
3 columns; **question, user_id, and response.**

Each row shows a question, which is one of the five questions listed on the left, response to it, and the user’s ID who answered the question.

Let's see what the table looks like

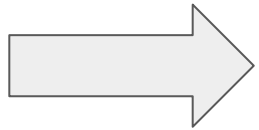


Table “Survey” looks like this.

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	Narrow
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

1.2 What is the Quiz Funnel

Q2. Users will "give up" at different points in the survey. Let's analyze how many users move from Question 1 to Question 2, etc.

Create a quiz funnel using the `GROUP BY` command.

What is the number of responses for each question?

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

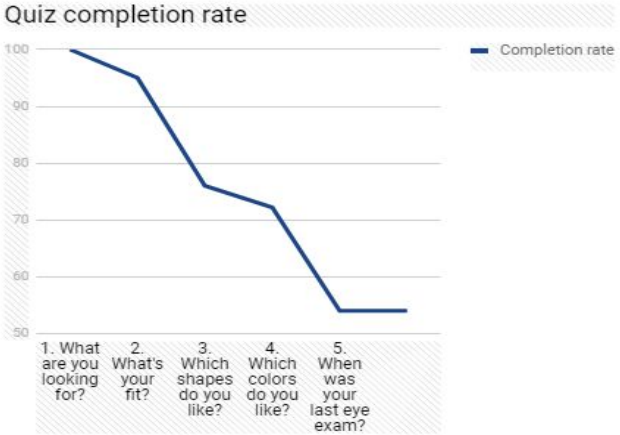
question	COUNT(DISTINCT user_id)
1. What are you looking for?	500
2. What's your fit?	475
3. Which shapes do you like?	380
4. Which colors do you like?	361
5. When was your last eye exam?	270

1.3 What is the Quiz Funnel

Q3. Using a spreadsheet program like Excel or Google Sheets, calculate the percentage of users who answer each question.: *Which question(s) of the quiz have a lower completion rates?*

The percentage of users who answer each question

question	COUNT(DISTINCT user_id)	Completion rate (%)
1. What are you looking for?	500	100
2. What's your fit?	475	95
3. Which shapes do you like?	380	76
4. Which colors do you like?	361	72.2
5. When was your last eye exam?	270	54



- The percentage of users who answer each question show only about half of the users complete all questions.
- The completion rates drops when moving from Q2 to Q3, and from Q4 to Q5. As Q3 and Q4 ask details of the design users want, these might have been difficult questions for those who were not sure about what they want or what may look good on them. Q5 requires users to remember when they last took eye exam, therefore some might have felt lazy to check.
- From these results, we can tell that some users do not know what kind of style they want although they are interested in buying glasses. Perhaps, a quiz to find out the recommended glasses for particular face shape, lifestyle, skin tone and etc. may help those users who gave up on the current quiz to get more interested in buying a pair.

2.1 A/B Testing with Home Try-On Funnel

Q4. 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

Let's find out whether or not users who get more pairs to try on at home will be more likely to make a purchase.

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?

- The table called "quiz" has 5 columns; **user_id, style, fit, shape, color.**
- The table called "home_try_on" has 3 columns; **user_id, number_of_pairs, address.**
- The table called "purchase" has 6 columns; **user_id, product_id, style, model_name, color, price.**
- ALL tables have a column **user_id.**

```
SELECT *
FROM quiz
LIMIT 5;

SELECT *
FROM home_try_on
LIMIT 5;

SELECT *
FROM purchase
LIMIT 5;
```

Let's see what the table looks like

"quiz", "home_try_on", and "purchase" tables look like this.

quiz

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

home_try_on

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

purchase

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

2.2 A/B Testing with Home Try-On Funnel

Q5. We'd like to create a new 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

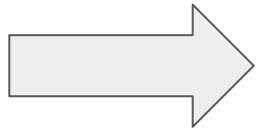
Each row will represent a single user from the browse table:

- If the user has any entries in `home_try_on`, then `is_home_try_on` will be 'True'.
- `number_of_pairs` comes from `home_try_on` table
- If the user has any entries in `is_purchase`, then `is_purchase` will be 'True'.

Use a `LEFT JOIN` to combine the three tables, starting with the top of the funnel (browse) and ending with the bottom of the funnel (purchase).

```
SELECT 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 AS 'q'
LEFT JOIN home_try_on AS 'h'
ON q.user_id = h.user_id
LEFT JOIN purchase AS 'p'
on q.user_id = p.user_id
LIMIT 10;
```

Let's see what the table looks like



When joining the three tables using `LEFT JOIN`, the table looks like this.

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
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
0143cb8b-bb81-4916-9750-ce956c9f9bd9	0		0
a4ccc1b3-cbb6-449c-b7a5-03af42c97433	1	5 pairs	0
b1dded76-cd60-4222-82cb-f6d464104298	1	3 pairs	0

3. 1. Extra Insights

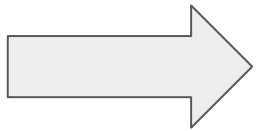
Q6. Once we have the data in this format, we can analyze it in several ways;

- We can calculate overall conversion rates by aggregating across all rows.
- We can compare conversion from `quiz`→`home_try_on` and `home_try_on`→`purchase`.
- We can calculate the difference in purchase rates between customers who had 3 `number_of_pairs` with ones who had 5, and etc.

We can also use the original tables to calculate things like:

- The most common results of the style `quiz`.
- The most common types of `purchase` made, and etc.

Let's see what we found out from the data



3.2 Overall conversion rates (Q6.1)

```
WITH funnels AS
(SELECT 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 AS 'q'
LEFT JOIN home_try_on AS 'h'
ON q.user_id = h.user_id
LEFT JOIN purchase AS 'p'
on q.user_id = p.user_id)
SELECT COUNT(*)
AS 'num_browse', SUM(is_purchase),
1.0 * SUM(is_purchase) / COUNT(user_id) AS 'conversion rate'
FROM funnels;
```

num_browse	SUM(is_purchase)	conversion rate
1000	495	0.495

Overall conversion rate is

49.5%.

3.3 Compare conversion from quiz→home_try_on and home_try_on→purchase.(Q6.2)

```
WITH funnels AS
(SELECT 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 AS 'q'
LEFT JOIN home_try_on AS 'h'
ON q.user_id = h.user_id
LEFT JOIN purchase AS 'p' on q.user_id = p.user_id)
SELECT COUNT(*)
AS 'num_quiz', SUM(is_home_try_on),
SUM(is_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 purchase'
FROM funnels;
```

num_quiz	SUM(is_home_try_on)	SUM(is_purchase)	quiz to home_try_on	home_try_on to purchase
1000	750	495	0.75	0.66

- 75% of users who took the quiz proceed to home try-on.
- 66% of those who tried home try-on end up purchasing.

We might be able to improve the overall conversion rate by improving the content of the quiz and the user experience during the home try-on stage.

3.4 The difference in purchase rates between customers who had 3 number_of_pairs with ones who had 5. (Q6.3)

```
WITH funnels AS (
SELECT 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 AS 'q'
LEFT JOIN home_try_on AS 'h' ON q.user_id = h.user_id
LEFT JOIN purchase AS 'p' ON  q.user_id = p.user_id)
SELECT is_purchase,
COUNT(DISTINCT CASE WHEN number_of_pairs = '3
pairs' THEN user_id END) AS '3 pairs',
COUNT(DISTINCT CASE WHEN number_of_pairs = '5
pairs' THEN user_id END) AS '5 pairs'
FROM funnels
GROUP BY 1
ORDER BY 1;
```

is_purchase	3 pairs	5 pairs
0	178	77
1	201	294

	3 pairs	5 pairs
Purchase rate	53.03	79.25

- The purchase rate is about **26% higher** for the customers who had 5 pairs of home try-on than ones who had 3 pairs.
- Nearly **80%** of customers who tried 5 pairs ended up purchasing a pair, while only a half did for those tried only 3 pairs.

This shows that customers need to try on as many styles as possible before making a decision. As the purchase rate for ones who had 5 pairs is very high, it is worth considering providing 5 pairs to all customers.

3.5 What are the popular styles? Find out from the most common results of the style quiz. (Q6.4)

Top 3 Colors

	Women	Men
1	Tortoise	Tortoise
2	Black	Black
3	Crystal	Crystal

Top 3 Fit

	Women	Men
1	Narrow	Narrow
2	Medium	Medium
3	Wide	Wide

Top 3 Shape

	Women	Men
1	Rectangular	Rectangular
2	Square	Square
3	Round	Round

Here, the results for Women and Men's are counted separately to see if there were significant difference, however, the top 3 choices for colors, fit, and shape before purchasing were exactly the **SAME** for the both gender.

Are the results different from the results of actual purchase made?

3.6 What are the top 3 common types of purchase made for model_name, color, and price? Find out from the most common results of purchase.(Q6.5)

	model_name	color	price
1	Eugene Narrow (23.43%)	Jet Black (17.37%)	95 (52.73%)
2	Dawes (21.62%)	Driftwood Fade (12.73%)	150 (38.99%)
3	Brady (19.19%)	Rosewood Tortoise (12.53%)	50 (8.28%)

- The best price range for a pair of glasses would be $95-150.
- As there is no model or color that are significantly popular, it seems having a variety of style for customers to choose from is important.

4. Summary of Actionable Insights

1. Improve the quiz

Create a quiz to make recommendations for users who are not sure about what they want; a quiz to find out the recommended glasses for particular face shape, lifestyle, skin tone and etc.

2. Provide 5 pairs to everyone for home try-on

As the purchase rate for ones who had 5 pairs is very high (around 80%), it is worth considering providing 5 pairs to all customers.

3. Create products with prices between $95-150

Over 50% of the customers purchase a pair for $95, and about 40% for $150.

4. Continue creating variety of styles

There are no colors or models that are significantly popular. Having variety of styles may be the strong point of Warby Parker.

5. Develop a signature product

Although it may sound the opposite from what mentioned in no.4 above, as there isn't a model at this time that is significantly popular, developing a signature model of Warby Parker may be important for the brand.