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Usage Funnels with Warby Parker

Learn SQL from Scratch

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1. Get familiar with Warby Parker

1.1 Get familiar with Warby Parker

- Warby Parker is an online retailer of glasses and sunglasses.
- Users can take a Style Quiz, chose 3 or 5 pairs of glasses to try on at home, then purchase the pair of glasses that they want.
- Warby Parker stores their information in the following tables:
  - Quiz Funnel results are stored in the `survey` table
  - The Home Try-On Funnel is stored across 3 tables
    - `Quiz` table – contains the user's responses
    - `Home_try_On` table– contains the number of pairs that users received, along with their address
    - `Purchase` table- Includes product_id, style, model_name, color, price, of users' purchases.

2. What is the Quiz Funnel

2.1 What is the Quiz Funnel

A funnel is a marketing models that illustrates the theoretical customer journey towards the purchase of a product or service.
Generally we want to know:

1) The number of users in each step of the funnel
2) Percentage of users who complete each step

2.2 What is the Quiz Funnel

Warby Parker has a Style Quiz that has 5 questions users answer to find frames to try on at home. The answers to each question are stored in the `survey` table.

Get a feel for the `survey` table

```
SELECT *
FROM survey
LIMIT 10;
```

survey table		
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

2.3 What is the Quiz Funnel

STEP 1: build a query that tell us the total number of distinct users that complete each step of the funnel.

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 1;
```

2.4 What is the Quiz Funnel

STEP 2: using excel calculate the percentage of users who answer each question.

Question 3 and 5 have lower completion rates. Why?

3. Which shapes do you like?

- It might be helpful for people to see the shapes of the frames on the face shape the user chose.
- It also might be helpful to show real examples of the frame shapes. It might be hard for users to visualize the shapes by the sketches alone.

5. When was your last eye exam?

- It's possible that users aren't serious or don't want to commit, they just wanted to go through the funnel to see what options are available.
- Reinforcing that you don't have to purchase frames might give users more confidence in completing the funnel.

```
SELECT question, Count(DISTINCT user_id)
FROM survey
GROUP BY 1;
```

question	Count(DISTINCT user_id)	Completion %
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	74.49%

3. A/B Testing with Home Try-On Funnel

3.1 A/B Testing with Home Try-On Funnel

During the Home Try-On state, Warby Parker is conducting an A/B Test. Within this test:

1) 50% of the users will receive 3 pairs to try on
2) 50% of the users will get 5 pairs to try on

This test will determine whether or not users who get more pairs to try on at home will be more likely to make a purchase.

Data from the A/B test are distributed across three tables:

- `quiz` table
- `home_try_on` table
- `purchase` table

3.2a A/B Testing with Home Try-On Funnel

Get a feel for the `quiz` table, `home_try_on` table, and `purchase` table.

Quiz Table				
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

```
SELECT *
FROM quiz
LIMIT 5;
```

3.2b A/B Testing with Home Try-On Funnel

Get a feel for the `quiz` table, `home_try_on` table, and `purchase` table.

home_try_on table		
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

```
SELECT *
FROM home_try_on
LIMIT 5;
```

3.2c A/B Testing with Home Try-On Funnel

Get a feel for the `quiz` table, `home_try_on` table, and `purchase` table.

purchase table					
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

```
SELECT *
FROM purchase
LIMIT 5;
```

3.3 A/B Testing with Home Try-On Funnel

Create a new table with the layout to the right.

- Each row represents 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'*.

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

3.3a A/B Testing with Home Try-On Funnel

STEP 1: use `LEFT JOIN` combine the 3 tables.

- Using **`Left Join`** so we don't lose any info from users who doesn't have a row in **`home_try_on`** or **`purchase`** tables
- The result of this query gives us a large table with lots of columns

```
SELECT *
FROM quiz AS 'q'
LEFT JOIN home_try_on AS 'h' ON h.user_id =
q.user_id
LEFT JOIN purchase AS 'p' ON p.user_id =
h.user_id
LIMIT 5;
```

user_id	style	fit	shape	color	user_id	number_of_pairs	address	user_id	product_id	style	model_name	color	price
4e8118dc-bb3d-49bf-85fc-cca8d83232ac	Women's Styles	Medium	Rectangular	Tortoise	4e8118dc-bb3d-49bf-85fc-cca8d83232ac	3 pairs	14 Milligan Pl						
291f1cca-e507-48be-b063-002b14906468	Women's Styles	Narrow	Round	Black	291f1cca-e507-48be-b063-002b14906468	3 pairs	318 Macombs Pl	291f1cca-e507-48be-b063-002b14906468	10	Women's Styles	Eugene Narrow	Rosewood Tortoise	95
75122300-0736-4087-b6d8-c0c5373a1a04	Women's Styles	Wide	Rectangular	Two-Tone									
75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	Women's Styles	Narrow	Square	Two-Tone	75bc6ebd-40cd-4e1d-a301-27ddd93b12e2	5 pairs	492 Bank St						
ce965c4d-7a2b-4db6-9847-601747fa7812	Women's Styles	Wide	Rectangular	Black	ce965c4d-7a2b-4db6-9847-601747fa7812	3 pairs	72 Centre St	ce965c4d-7a2b-4db6-9847-601747fa7812	9	Women's Styles	Eugene Narrow	Rose Crystal	95

3.3b A/B Testing with Home Try-On Funnel

STEP 3: select the following columns instead:

- DISTINCT q.user_id
- NOT EMPTY h.user_id
- h.number_of_pairs
- NOT EMPTY p.user_id

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

```
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 AS 'q'
LEFT JOIN home_try_on AS 'h'
  ON h.user_id = q.user_id
LEFT JOIN purchase AS 'p'
  ON p.user_id = h.user_id
LIMIT 5;
```

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

3.3c A/B Testing with Home Try-On Funnel

STEP 4: Take the query in STEP 3 and make it a temporary table.

```
WITH FUNNEL 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 AS 'q'
LEFT JOIN home_try_on AS ‘h’
  ON h.user_id = q.user_id
LEFT JOIN purchase AS 'p’
  ON p.user_id = h.user_id
  )
```

4. Analysis

4.1 Analysis

```
WITH FUNNEL 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 AS 'q'
LEFT JOIN home_try_on AS 'h' ON h.user_id =
q.user_id
LEFT JOIN purchase AS 'p' ON p.user_id =
h.user_id
  )
SELECT
SUM(CASE WHEN number_of_pairs = '3 pairs' THEN
is_purchase end) AS
  'three_purchase',
COUNT (DISTINCT CASE WHEN number_of_pairs = '3
pairs' THEN user_id END) AS 'three_pair',
   SUM(CASE
    WHEN number_of_pairs = '5 pairs' THEN
is_purchase end) AS 'five_purchase',
  COUNT (DISTINCT CASE
             WHEN number_of_pairs = '5 pairs'
THEN user_id END) AS 'five_pair'
FROM FUNNEL;
```

This query shows us the following:

- Number of users who received 3 pairs of glasses
- Number of users who received 5 pairs of glasses
- Number of users who received 3 pairs of glasses then made a purchase
- Number of users who received 5 pairs of glasses then made a purchase

These numbers show that 53.03% of users that received 3 pairs of glasses made a purchase. Compare this to 79.24% of users that received 5 pairs of glasses ended up making a purchase.
It would be in the companies interest to look into sending 5 pairs of glasses to users to try on.

three_purchase	three_pair	five_purchase	five_pair
201	379	294	371

4.2 Analysis

```
WITH FUNNEL 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 AS 'q'
LEFT JOIN home_try_on AS 'h' ON h.user_id =
q.user_id
LEFT JOIN purchase AS 'p' ON p.user_id =
h.user_id
  )
SELECT COUNT(*) AS 'users', SUM(is_home_try_on)
AS 'is_home_try_on', SUM(is_purchase) AS
'is_purchase',
  1.0 * SUM(is_home_try_on) / COUNT(*) AS
'home',
  1.0 * SUM(is_purchase) / SUM(is_home_try_on)
AS 'purchase'
FROM FUNNEL;
```

This query shows us the following:

- 1000 users took the quiz
- 750 of the users that took the quiz, chose to try pairs of glasses at home
- 495 of the users that chose to try pairs of glasses at home ended up making a purchase
- 75% of users proceeded from the quiz to the home try on step
- 66% of users proceeded from home try on step to the purchase

users	is_home_try_on	is_purchase	home	purchase
1000	750	495	0.75	0.66

4.3 Analysis

```
WITH FUNNEL 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 AS 'q'
LEFT JOIN home_try_on AS 'h' ON h.user_id =
q.user_id
LEFT JOIN purchase AS 'p' ON p.user_id =
h.user_id
  )
SELECT Count(*), style, model_name, price
FROM purchase
GROUP BY 3
ORDER BY 1 DESC;
```

Count(*)	model_name	style	price
116	Eugene Narrow	Women's Styles	95
107	Dawes	Men's Styles	150
95	Brady	Men's Styles	95
86	Lucy	Women's Styles	150
50	Olive	Women's Styles	95
41	Monocle	Men's Styles	50

This query shows us the following:

- The model name, style, and price of purchased lenses

4.4 Analysis

```
WITH FUNNEL 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 AS 'q'
LEFT JOIN home_try_on AS 'h' ON h.user_id =
q.user_id
LEFT JOIN purchase AS 'p' ON p.user_id =
h.user_id
  )
SELECT Count(*), style
FROM purchase
GROUP BY 2
ORDER BY 1 DESC;
```

This query shows us the following:

- The number of purchases

Count(*)	style
252	Women's Styles
243	Men's Styles