```python
# Import the required libraries
import pandas as pd
from sqlalchemy import create_engine

import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt

username = 'postgres'
password = '#########'
hostname = 'localhost'
dbname = 'Target_AirFryer_Project'

connection_string = f'postgresql://{username}:{password}@{hostname}/{dbnam
```

```python
%load_ext sql
```

```python
%sql $connection_string
```

Competitve Analysis

Scenario: I'm a data analyst at a AirFryer company in the Boston area. The company wants me to do competitve analysis.

Step 1: Define competitors

```sql
%%sql
SELECT DISTINCT brand
FROM product_infor
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
34 rows affected.
```

brand
Calphalon
Wolfgang Puck
Blue Jean Chef
Uber Appliance
CRUXGG
Instant Pot
Homcom
Curtis Stone
Gourmia
Dash
Nutrichef
NuWave
MegaChef
Cuisinart
Salton
Cosori
KitchenIQ
Kalorik
Proctor Silex
Ninja
SoYoung
Westinghouse
Classic Cuisine
Juvale
Cooks Essentials
PowerXL
Chefman
Oster
Frigidaire
Cyetus
Hamilton Beach
Brentwood
Better Chef
MasterChef

Step 2: Define Metrics for Comparison

There are three main metrics: average rating, price, sentiment of the reviews

Compare Average Rating

What are the top 10 brands that have the highest average rating?

```
%%sql
SELECT
    item_id,
    title,
    brand,
    avg_rating
FROM product_infor
ORDER BY avg_rating DESC
LIMIT 10
```

item_id	title	brand	avg_rating
83368549	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control in White	Brentwood	5.0
87417728	Kalorik MAXX Plus 6qt Digital Air Fryer	Kalorik	5.0
79606396	MegaChef Multipurpose Air Fryer Oven - White	MegaChef	5.0
82278497	MegaChef 3.5 Quart Airfryer/Multicooker with 7 Pre-programmed Settings - Red	MegaChef	5.0
88258211	CYETUS Smart 6-in-1 Air Fryer, with 2 Independent Frying Baskets, Match Cook & Smart Finish to Roast, Broil, Dehydrate and More, 8QT, 1560W, Wifi	Cyetus	5.0
87763661	Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	4.9
86908904	NuWave NW38008R 14 Qt Air Fryer - Certified Refurbished	NuWave	4.89
83952864	Instant Vortex Plus 6qt Air Fryer with ClearCook - Black	Instant Pot	4.89
88698566	Cosori Pro II 5.8qt Smart Air Fryer - Red	Cosori	4.88
88698563	Cosori Pro II 5.8qt Smart Air Fryer - White	Cosori	4.88

Which brands appear most frequently in this top 10 list?

```
%%sql
SELECT
    brand,
    COUNT(brand) as num_times
FROM
(
    SELECT
        item_id,
        title,
        brand,
        avg_rating
FROM product_infor
ORDER BY avg_rating DESC
LIMIT 10
) AS top10
GROUP BY brand
ORDER BY num_times DESC
```

brand	num_times
MegaChef	2
Cosori	2
Cyetus	1
Brentwood	1
Kalorik	1
NuWave	1
SoYoung	1
Instant Pot	1

What is the highest rating product of each brand?

```sql
%%sql
WITH rating AS
(
    SELECT
            RANK() OVER
                    (PARTITION BY brand
                                        ORDER BY avg_rating DESC) as rank_
            item_id,
            title,
            brand,
            avg_rating,
            price
        FROM product_infor
        WHERE avg_rating != '0.0'
)
SELECT *
FROM rating
WHERE rank_column = 1
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
26 rows affected.

rank_column	item_id	title	brand	avg_rating	price
1	83368549	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control in White	Brentwood	5.0	89.99
1	79767657	Calphalon Precision Control Air Fryer Toaster Oven - Black	Calphalon	3.7	219.99
1	81324238	Chefman 8qt Digital Air Fryer - Silver	Chefman	4.57	99.99
1	88698566	Cosori Pro II 5.8qt Smart Air Fryer - Red	Cosori	4.88	149.99
1	88698563	Cosori Pro II 5.8qt Smart Air Fryer - White	Cosori	4.88	149.99
1	88698564	Cosori Pro II 5.8qt Smart Air Fryer - Dark Gray	Cosori	4.88	149.99
1	87991215	CRUXGG 6qt Touchscreen Air Fryer	CRUXGG	4.79	79.99
1	82568675	Cuisinart Digital Air Fryer Toaster Oven - Stainless Steel - TOA-95	Cuisinart	4.63	329.99
1	88258211	CYETUS Smart 6-in-1 Air Fryer, with 2 Independent Frying Baskets, Match Cook & Smart Finish to Roast, Broil, Dehydrate and More, 8QT, 1560W, Wifi	Cyetus	5.0	159.99
1	86293796	Gourmia 2qt Compact Air Fryer with Nonstick Basket	Gourmia	4.67	35.99
1	79835740	Hamilton Beach 3L Digital Air Fryer - Black	Hamilton Beach	4.83	89.99
1	87232556	Hamilton Beach 16qt Digital Air Fryer Toaster Oven 31220	Hamilton Beach	4.83	199.99

rank_column	item_id	title	brand	avg_rating	price
1	86200333	HOMCOM 10.5 Quart Air Fryer Oven with 8 Preset Cooking Menus, Airfryer Baker Oven with 9 Tool Accessories, Non-Stick Coating for Baking, Black	Homcom	4.33	138.59
1	83952864	Instant Vortex Plus 6qt Air Fryer with ClearCook - Black	Instant Pot	4.89	89.99
1	87417728	Kalorik MAXX Plus 6qt Digital Air Fryer	Kalorik	5.0	149.99
1	79606396	MegaChef Multipurpose Air Fryer Oven - White	MegaChef	5.0	66.99
1	82278497	MegaChef 3.5 Quart Airfryer/Multicooker with 7 Pre-programmed Settings - Red	MegaChef	5.0	89.99
1	86510518	Ninja Speedi Rapid Cooker & Air Fryer, SF301, 6qt., 12-in-1 Functionality, 15-Minute Meals, Sea Salt Gray	Ninja	4.79	129.99
1	88543334	NutriChef Digital Air Fryer, Electric Oil-Free Air Frying Cooker	Nutrichef	4.0	59.99
1	86908904	NuWave NW38008R 14 Qt Air Fryer - Certified Refurbished	NuWave	4.89	99.99
1	81615442	Oster Extra Large French Door Air Fryer Toaster Oven	Oster	3.91	194.99
1	86311159	PowerXL Vortex Pro Air Fryer 8qt - Black	PowerXL	4.56	79.99
1	79318253	Proctor Silex Air Fryer - Black	Proctor Silex	4.84	99.99
1	87763661	Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	4.9	237.99
1	89265975	Uber Appliance 5qt 8-Function Guided Digital Air Fryer - Black	Uber Appliance	4.62	109.99
1	86532196	Wolfgang Puck 310oz Stainless Steel Air Fryer, Large Single Basket Design, Simple Dial Controls	Wolfgang Puck	4.6	109.99

Compare price

What are the top 10 brands that have most expensive air fryer?

```
%%sql
SELECT
    item_id,
    title,
    brand,
    price
FROM product_infor
ORDER BY price DESC
LIMIT 10
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
10 rows affected.

item_id	title	brand	price
85963338	NuWave Bravo iQ360 Smart Air Fryer/Grill/Convection Oven - Stainless Steel	NuWave	349.99
82568675	Cuisinart Digital Air Fryer Toaster Oven - Stainless Steel - TOA-95	Cuisinart	329.99
87763661	Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	237.99
83612539	Instant Pot 8qt Pro Crisp EPC and Air Fryer	Instant Pot	229.99
87405690	Kalorik MAXX 26qt Digital Air Fryer Oven Grill	Kalorik	229.99
79991383	Ninja Foodi 10-in-1 XL Pro Air Fry Oven - DT201	Ninja	229.99
82551562	Cuisinart Air Fryer Toaster Oven w/Grill - Stainless Steel - TOA-70	Cuisinart	229.99
79767657	Calphalon Precision Control Air Fryer Toaster Oven - Black	Calphalon	219.99
87802807	Frigidaire Frigidaire 25-Liter 1,700-Watt Air Fryer Oven	Frigidaire	214.99
54637571	Ninja Foodi Digital Air Fry Oven with Convection - SP101	Ninja	199.99

Which brands appear most frequently in the top 10 list?

```
%%sql
SELECT brand, COUNT(brand) as num_times
FROM
(
    SELECT
        item_id,
        title,
        brand,
        price
    FROM product_infor
    ORDER BY price DESC
    LIMIT 10
) AS top10
GROUP BY brand
ORDER BY num_times DESC
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
8 rows affected.

brand	num_times
Cuisinart	2
Ninja	2
Instant Pot	1
Kalorik	1
Calphalon	1
NuWave	1
SoYoung	1
Frigidaire	1

Are there any products both in the top10 most expensive and top 10 highest ratings?

```
%%sql
SELECT r.title, r.brand, p.price, r.avg_rating
FROM
(SELECT
    item_id,
    title,
    brand,
    avg_rating
FROM product_infor
ORDER BY avg_rating DESC
LIMIT 10) AS r
INNER JOIN
(
    SELECT
        item_id,
        title,
        brand,
        price
    FROM product_infor
    ORDER BY price DESC
    LIMIT 10
) AS p
ON p.item_id = r.item_id
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
1 rows affected.
```

title	brand	price	avg_rating
Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	237.99	4.9

Compare sentiment of reviews

classify reviews based on the score sentiment

```
%%sql
ALTER TABLE no_promotion
ADD column review_sentiment VARCHAR(10)
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
Done.
```

```
[]
```

```sql
%%sql
UPDATE no_promotion
SET review_sentiment =
CASE
    WHEN sentiment_score > 0 THEN 'positive'
    WHEN sentiment_score = 0 THEN 'neutral'
    ELSE 'negative'
END;
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
9980 rows affected.

[]

what are the products with postive reviews?

```sql
%%sql
SELECT
    item_id,
    title,
    brand,
    SUM(CASE WHEN review_sentiment = 'positive' THEN 1 ELSE 0 END) as numb
    SUM(CASE WHEN review_sentiment = 'neutral' THEN 1 ELSE 0 END) AS numbe
    SUM(CASE WHEN review_sentiment = 'negative' THEN 1 ELSE 0 END) AS numb
FROM no_promotion p
INNER JOIN product_infor i
USING (item_id)
GROUP BY item_id, title, brand
ORDER BY number_positive_review DESC;
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
84 rows affected.

item_id	title	brand	number_positive_review	number_ne
82551562	Cuisinart Air Fryer Toaster Oven w/Grill - Stainless Steel - TOA-70	Cuisinart	376	13
53649826	Ninja 4qt Air Fryer - Black AF101	Ninja	364	13
79991380	Ninja Foodi 8qt Original Dualzone 2 Basket Air Fryer with 6 functions - DZ201	Ninja	361	12
88687226	Cuisinart Air Fryer Toaster Oven	Cuisinart	358	21
80137210	Gourmia 5qt 12-Function Guided Cook Digital Air Fryer - Black	Gourmia	348	23
80137212	Gourmia Digital Stainless Steel Toaster Oven Air Fryer – Stainless Steel	Gourmia	348	12
54637571	Ninja Foodi Digital Air Fry Oven with Convection - SP101	Ninja	319	9
89265975	Uber Appliance 5qt 8-Function Guided Digital Air Fryer -	Uber Appliance	309	11

item_id	title	brand	number_positive_review	number_n...
79910186	PowerXL 5qt Single Basket Air Fryer - Black	PowerXL	306	38
54643374	Instant Vortex 6 qt 4-in-1 Air Fryer	Instant Pot	291	18
54381590	Chefman 2.1qt Analog Air Fryer - Black/Silver	Chefman	287	9
54643423	Instant Vortex Plus 10qt 7-in-1 Air Fryer Toaster Oven Combo - Black	Instant Pot	266	10
79991383	Ninja Foodi 10-in-1 XL Pro Air Fry Oven - DT201	Ninja	264	6
87405686	Kalorik 26qt Digital MAXX Air Fryer Oven	Kalorik	239	19
79786472	PowerXL Grill Air Fryer Combo - Silver	PowerXL	238	23
86736580	Ninja 5.5qt EzView 7 Function Air Fryer Max XL - AF171	Ninja	225	9
84300214	PowerXL 3qt Vortex Air Fryer - Red	PowerXL	220	15
85963338	NuWave Bravo iQ360 Smart Air Fryer/Grill/Convection Oven - Stainless Steel	NuWave	213	11
86908904	NuWave NW38008R 14 Qt Air Fryer - Certified Refurbished	NuWave	203	2
79991382	Ninja Foodi Programmable 10-in-1 5qt Pressure Cooker and Air Fryer - FD101	Ninja	185	12
82780907	Gourmia 9-Slice Digital Air Fryer Oven with 14 One-Touch Cooking Functions and Auto French Doors	Gourmia	178	9
82551560	Cuisinart Compact Air Fryer Toaster Oven - Stainless Steel - TOA-26TG	Cuisinart	174	13
82780906	Gourmia FoodStation 5-in-1 Smokeless Grill & Air Fryer with Smoke-Extracting Technology	Gourmia	145	3
54643330	Instant Pot 8 qt 11-in-1 Air Fryer Duo Crisp + Electric Pressure Cooker	Instant Pot	141	6
86311150	PowerXL 5qt Vortex Classic Air Fryer - Black	PowerXL	134	111
82546304	PowerXL 10qt Dual Basket Air Fryer -	PowerXL	125	22

item_id	Black title	brand	number_positive_review	number_n...
86311151	Gourmia 14qt All-in-One Digital Air Fryer, Oven, Rotisserie & Dehydrator	Gourmia	116	7
79767657	Calphalon Precision Control Air Fryer Toaster Oven - Black	Calphalon	114	11
82809461	Ninja Foodi 10qt XL Dualzone 2 Basket Air Fryer with 6 functions - DZ401	Ninja	106	4
82568675	Cuisinart Digital Air Fryer Toaster Oven - Stainless Steel - TOA-95	Cuisinart	100	3
86311159	PowerXL Vortex Pro Air Fryer 8qt - Black	PowerXL	91	6
82780909	Gourmia 8-Quart Digital Air Fryer, with 12 One-Touch Functions & Guided Cooking - Stainless Steel	Gourmia	85	12
86510518	Ninja Speedi Rapid Cooker & Air Fryer, SF301, 6qt., 12-in-1 Functionality, 15-Minute Meals, Sea Salt Gray	Ninja	80	2
80207602	Instant Vortex Pro 10 qt 9-in-1 Air Fryer Toaster Oven	Instant Pot	70	3
86311158	Gourmia 2qt Digital Air Fryer With 10 Presets & Guided Cooking	Gourmia	61	2
87255384	Cosori 6.8qt DualBlaze Air Fryer with Skewer Rack - Gray	Cosori	61	1
86510517	Ninja Foodi 6qt 5-in-1 2-Basket Air Fryer with DualZone Technology - DZ090	Ninja	53	5
82780910	Gourmia 9-Quart Dual Basket Digital Air Fryer, with 7 Functions, Smart Finish and Match Cook	Gourmia	52	0
88698565	COSORI Pro Gen II 5.8qt Air Fryer - Light Gray	Cosori	51	0
86311154	PowerXL Vortex Pro Air Fryer 4qt - Black	PowerXL	44	4
81615442	Oster Extra Large French Door Air Fryer Toaster Oven	Oster	35	10
82617044	Oster XL Digital Air Fryer Toaster Oven	Oster	34	6

item_id	title	brand	number_positive_review	number_ne
88698563	Cosori Pro II 5.8qt Smart Air Fryer - White	Cosori	33	0
79318273	Hamilton Beach Electric Air Fryer Oven - Silver	Hamilton Beach	32	0
54639246	Hamilton Beach 2.5L Air Fryer	Hamilton Beach	32	1
87405690	Kalorik MAXX 26qt Digital Air Fryer Oven Grill	Kalorik	31	1
84673121	Proctor Silex 3.7qt Air Fryer	Proctor Silex	29	0
87991215	CRUXGG 6qt Touchscreen Air Fryer	CRUXGG	27	0
86293796	Gourmia 2qt Compact Air Fryer with Nonstick Basket	Gourmia	26	1
80888303	Dash Express Tasti-Crisp 2.6qt Air Fryer - Aqua	Dash	22	3
79318253	Proctor Silex Air Fryer - Black	Proctor Silex	22	0
87991216	CRUXGG 12 Cup Programmable Coffee Maker	CRUXGG	22	0
82667189	Dash 2.6 qt Express Digital Tasti-Crisp Nonstick Air Fryer	Dash	20	2
81324238	Chefman 8qt Digital Air Fryer - Silver	Chefman	18	1
81300304	Cosori Pro XLS II Smart 5.8qt Digital Air Fryer with Pizza Pan	Cosori	16	0
88698562	COSORI Pro Gen II 5.8qt Smart Air Fryer - Black	Cosori	15	0
81300306	Cosori Deluxe XL Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	13	0
83952864	Instant Vortex Plus 6qt Air Fryer with ClearCook - Black	Instant Pot	8	0
79606401	MegaChef Multipurpose Countertop Air Fryer Oven - Black	MegaChef	7	0
81300308	Cosori Deluxe XLS Smart Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	6	0
87405683	Kalorik MAXX 16qt Air Fryer Oven	Kalorik	6	0
83612539	Instant Pot 8qt Pro Crisp EPC and Air Fryer	Instant Pot	5	0
83692835	Power XL 7-qt 10-in-1 1700W Air Fryer Steamer with Muffin	PowerXL	5	2

item_id	title	brand	number_positive_review	number_n...
	Steamer with Muffin Pan Slate			
87252788	PowerXL 8qt Vortex Pro Air Fryer - Slate	PowerXL	4	0
79835740	Hamilton Beach 3L Digital Air Fryer - Black	Hamilton Beach	4	3
87417728	Kalorik MAXX Plus 6qt Digital Air Fryer	Kalorik	3	1
81324241	Chefman 20L Air Fryer Toaster Oven - RJ50-SS-M20	Chefman	3	0
86532196	Wolfgang Puck 310oz Stainless Steel Air Fryer, Large Single Basket Design, Simple Dial Controls	Wolfgang Puck	2	0
86263903	Cuisinart TOA-60FR Air Fryer Toaster Oven Silver - Certified Refurbished	Cuisinart	2	0
82621607	Curtis Stone Dura-Electric 1700-Watt 22L Air Fryer Oven with Rotisserie Model 698-469 Stainless Steel Refurbished	Curtis Stone	2	1
82278497	MegaChef 3.5 Quart Airfryer/Multicooker with 7 Pre-programmed Settings - Red	MegaChef	1	0
85320449	Cook's Essentials Air Fryer Lid for Pots, Pans & Pressure Cooker Refurbished Black	Cooks Essentials	1	1
87835995	PowerXL 8qt Vortex Pro Smart Air Fryer - Slate	PowerXL	1	0
88258211	CYETUS Smart 6-in-1 Air Fryer, with 2 Independent Frying Baskets, Match Cook & Smart Finish to Roast, Broil, Dehydrate and More, 8QT, 1560W, Wifi	Cyetus	1	0
87252783	PowerXL 6qt Vortex Pro Air Fryer - Smart - Slate	PowerXL	1	1
86200333	HOMCOM 10.5 Quart Air Fryer Oven with 8 Preset Cooking Menus, Airfryer Baker Oven with 9 Tool Accessories, Non-Stick Coating for Baking, Black	Homcom	1	0
53766317	Chefman 6.3qt Rotisserie Air Fryer	Chefman	1	0
87232556	Hamilton Beach 16qt Digital Air Fryer	Hamilton	1	0

item_id	title	brand	number_positive_review	number_ne...
87232556	Digital Air Fryer Toaster Oven 31220	Bench	1	0
88543334	NutriChef Digital Air Fryer, Electric Oil-Free Air Frying Cooker	Nutrichef	1	0
87112899	Cuisinart Digital Air Fryer Oven CTOA-130PC2FR - Certified Refurbished	Cuisinart	1	0
88122664	Kitchen HQ 7-in-1 Air Fryer Grill with Accessories Refurbished Black	KitchenIQ	1	0
86311156	PowerXL Vortex Dual Basket Air Fryer Pro 9qt - Black	PowerXL	1	0
87477462	PowerXL 7-qt Classic Digital Air Fryer K51836 Refurbished Black	PowerXL	0	1
83703997	Curtis Stone 6.9-Quart Dura-Pan Air Fryer and Steamer Combo Refurbished Black	Curtis Stone	0	0

◄ ► |

The strenghts of the top 10 products with most positve reviews

```sql
%%sql
WITH sentiment_ranking AS
(
        SELECT
            item_id,
            title,
            brand,
            SUM(CASE WHEN review_sentiment = 'positive' THEN 1 ELSE 0 END)
            SUM(CASE WHEN review_sentiment = 'neutral' THEN 1 ELSE 0 END)
            SUM(CASE WHEN review_sentiment = 'negative' THEN 1 ELSE 0 END)
        FROM no_promotion p
        INNER JOIN product_infor i
        USING (item_id)
        GROUP BY item_id, title, brand
        ORDER BY number_positive_review DESC
        LIMIT 10
    ),
group_aspect as
(

    SELECT item_id, 'design' AS aspect, AVG(design) rating FROM no_promoti
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and design != '0.0'
    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'quality' AS aspect, AVG(quality) AS rating FROM no_pr
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and quality != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'easy_of_use' AS aspect, AVG(easy_of_use) AS rating FR
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and easy_of_use != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'value_rating' AS aspect, AVG(value_rating) AS rating
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and value_rating != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'easy_to_clean' AS aspect, AVG(easy_to_clean) AS ratin
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and easy_to_clean != '0.0'
    GROUP BY item_id
    ORDER BY item_id DESC, rating DESC
),
aspect_rank AS
(
    SELECT item_id, aspect, rating,
RANK() OVER (PARTITION BY item_id ORDER BY rating DESC) AS rank_column
FROM group_aspect
)
SELECT item_id, aspect, rating
FROM aspect_rank
WHERE rank_column = 1
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
9 rows affected.

item_id	aspect	rating
53649826	easy_of_use	4.824468085106383
54637571	easy_of_use	4.2631578947368425
54643374	easy_of_use	4.6075949367088604
79910186	easy_of_use	4.3125
79991380	design	4.794117647058823
80137210	design	4.69811320754717
80137212	easy_of_use	4.366071428571429
82551562	easy_of_use	5.0
88687226	easy_of_use	4.0

The weaknesses of the top 10 products with most positve reviews

item_id	aspect	rating
53649826	easy_of_use	4.824468085106383
54637571	easy_of_use	4.2631578947368425

```sql
%%sql
WITH sentiment_ranking AS
(
        SELECT
            item_id,
            title,
            brand,
            SUM(CASE WHEN review_sentiment = 'positive' THEN 1 ELSE 0 END)
            SUM(CASE WHEN review_sentiment = 'neutral' THEN 1 ELSE 0 END)
            SUM(CASE WHEN review_sentiment = 'negative' THEN 1 ELSE 0 END)
        FROM no_promotion p
        INNER JOIN product_infor i
        USING (item_id)
        GROUP BY item_id, title, brand
        ORDER BY number_positive_review DESC
        LIMIT 10
    ),
group_aspect as
(

    SELECT item_id, 'design' AS aspect, AVG(design) rating FROM no_promoti
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and design != '0.0'
    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'quality' AS aspect, AVG(quality) AS rating FROM no_pr
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and quality != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'easy_of_use' AS aspect, AVG(easy_of_use) AS rating FR
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and easy_of_use != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'value_rating' AS aspect, AVG(value_rating) AS rating
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and value_rating != '0.0'

    GROUP BY item_id

    UNION ALL

    SELECT item_id, 'easy_to_clean' AS aspect, AVG(easy_to_clean) AS ratin
    WHERE item_id IN (SELECT item_id FROM sentiment_ranking)
    and easy_to_clean != '0.0'
    GROUP BY item_id
    ORDER BY item_id DESC, rating DESC
),
aspect_rank AS
(
    SELECT item_id, aspect, rating,
RANK() OVER (PARTITION BY item_id ORDER BY rating DESC) AS rank_column
FROM group_aspect
)
SELECT item_id, aspect, rating
FROM aspect_rank
WHERE rank_column = 5
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
9 rows affected.

item_id	aspect	rating
53649826	value_rating	4.44385026737968
54637571	easy_to_clean	3.412280701754386
54643374	quality	4.066390041493776
79910186	quality	3.664615384615385
79991380	value_rating	4.584795321637427
80137210	quality	4.46749226006192
80137212	quality	3.9088235294117646
82551562	quality	3.8333333333333335
88687226	quality	2.857142857142857

Price Segmentation and Performance Analysis

Define the price brackets

Percentile-based bracket:

Bottom 25%: The lowest 25% of product prices

Middle 50%: The middle 50% of product prices

Top 25%: The highest 25% of product prices

```
%%sql
SELECT
        PERCENTILE_DISC(0.75) WITHIN GROUP (ORDER BY price DESC) AS price_
        PERCENTILE_DISC(0.5) WITHIN GROUP (ORDER BY price DESC) AS price_5
        PERCENTILE_DISC(0.25) WITHIN GROUP (ORDER BY price DESC) AS price_
FROM product_infor
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
1 rows affected.

price_75th	price_50th	price_25th
79.99	109.99	149.99

Assign price brackets to product

```
%%sql
ALTER TABLE product_infor
ADD COLUMN price_segment VARCHAR(10);
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
126 rows affected.

index	item_id	title	brand	avg_rating	rating_count
0	79991380	Ninja Foodi 8qt Original Dualzone 2 Basket Air Fryer with 6 functions - DZ201	Ninja	4.59	807.0
2	86311159	PowerXL Vortex Pro Air Fryer 8qt - Black	PowerXL	4.56	379.0
3	80137210	Gourmia 5qt 12-Function Guided Cook Digital Air Fryer	Gourmia	4.63	1363.0

index	item_id	title	brand	avg_rating	rating_count
4	87991215	- Black CRUXGG 6qt Touchscreen Air Fryer	CRUXGG	4.79	29.0
5	86311158	Gourmia 2qt Digital Air Fryer With 10 Presets & Guided Cooking	Gourmia	4.54	221.0
6	53649826	Ninja 4qt Air Fryer - Black AF101	Ninja	4.58	1063.0
7	54637571	Ninja Foodi Digital Air Fry Oven with Convection - SP101	Ninja	4.05	928.0
8	86311151	Gourmia 14qt All-in-One Digital Air Fryer, Oven, Rotisserie & Dehydrator	Gourmia	3.88	208.0
9	80137212	Gourmia Digital Stainless Steel Toaster Oven Air Fryer – Stainless Steel	Gourmia	4.08	735.0
10	86293796	Gourmia 2qt Compact Air Fryer with Nonstick Basket	Gourmia	4.67	61.0
11	86510517	Ninja Foodi 6qt 5-in-1 2-Basket Air Fryer with DualZone Technology - DZ090	Ninja	4.64	254.0
12	86736580	Ninja 5.5qt EzView 7 Function Air Fryer Max XL - AF171	Ninja	4.44	312.0
13	82546304	PowerXL 10qt Dual Basket Air Fryer - Black	PowerXL	4.21	564.0
14	86311150	PowerXL 5qt Vortex Classic Air Fryer - Black	PowerXL	2.17	1624.0
15	54643374	Instant Vortex 6 qt 4-in-1 Air Fryer	Instant Pot	4.29	848.0
16	88687226	Cuisinart Air Fryer Toaster Oven	Cuisinart	4.44	5505.0
17	82551560	Cuisinart Compact Air Fryer Toaster Oven - Stainless Steel - TOA-26TG	Cuisinart	4.17	259.0
19	82551562	Cuisinart Air Fryer Toaster Oven w/Grill - Stainless Steel - TOA-70	Cuisinart	4.61	884.0
20	82780909	Gourmia 8-Quart Digital Air Fryer, with 12 One-Touch Functions & Guided Cooking - Stainless Steel	Gourmia	4.42	253.0
21	82568675	Cuisinart Digital Air Fryer Toaster Oven - Stainless Steel - TOA-95	Cuisinart	4.63	145.0
		Gourmia 9-Slice			

index	item_id	title	brand	avg_rating	rating_count
22	82780907	Digital Air Fryer Oven with 14 One-Touch Cooking Functions and Auto French Doors	Gourmia	4.17	360.0
23	54643423	Instant Vortex Plus 10qt 7-in-1 Air Fryer Toaster Oven Combo - Black	Instant Pot	3.95	753.0
24	83952864	Instant Vortex Plus 6qt Air Fryer with ClearCook - Black	Instant Pot	4.89	72.0
25	81300304	Cosori Pro XLS II Smart 5.8qt Digital Air Fryer with Pizza Pan	Cosori	4.86	73.0
26	87405686	Kalorik 26qt Digital MAXX Air Fryer Oven	Kalorik	4.28	860.0
27	87255384	Cosori 6.8qt DualBlaze Air Fryer with Skewer Rack - Gray	Cosori	4.73	78.0
28	82780910	Gourmia 9-Quart Dual Basket Digital Air Fryer, with 7 Functions, Smart Finish and Match Cook	Gourmia	4.56	78.0
30	87991216	CRUXGG 12 Cup Programmable Coffee Maker	CRUXGG	4.5	22.0
31	79991383	Ninja Foodi 10-in-1 XL Pro Air Fry Oven - DT201	Ninja	4.09	460.0
32	79786472	PowerXL Grill Air Fryer Combo - Silver	PowerXL	4.13	835.0
33	82809461	Ninja Foodi 10qt XL Dualzone 2 Basket Air Fryer with 6 functions - DZ401	Ninja	4.6	252.0
34	86311156	PowerXL Vortex Dual Basket Air Fryer Pro 9qt - Black	PowerXL	4.52	23.0
35	86510518	Ninja Speedi Rapid Cooker & Air Fryer, SF301, 6qt., 12-in-1 Functionality, 15-Minute Meals, Sea Salt Gray	Ninja	4.79	254.0
38	53766317	Chefman 6.3qt Rotisserie Air Fryer	Chefman	4.0	4.0
39	81300308	Cosori Deluxe XLS Smart Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	4.75	51.0
40	54381590	Chefman 2.1qt Analog Air Fryer - Black/Silver	Chefman	4.36	764.0
41	79910186	PowerXL 5qt Single Basket Air Fryer - Black	PowerXL	4.36	1896.0

index	item_id	title	brand	avg_rating	rating_count
44	81324238	Chefman 8qt Digital Air Fryer, Silver	Chefman	4.57	37.0
45	86908904	NuWave NW38008R 14 Qt Air Fryer - Certified Refurbished	NuWave	4.89	211.0
47	87710220	Joyoung JY-570 5.8 Quart Stainless Steel Multi Tasker Detachable Double Basket Air Fryer with LED Touchscreen and 8 Built In Smart Programs, Black	SoYoung	4.71	21.0
48	79835740	Hamilton Beach 3L Digital Air Fryer - Black	Hamilton Beach	4.83	47.0
49	88543334	NutriChef Digital Air Fryer, Electric Oil-Free Air Frying Cooker	Nutrichef	4.0	1.0
50	87405683	Kalorik MAXX 16qt Air Fryer Oven	Kalorik	4.88	34.0
51	86532196	Wolfgang Puck 310oz Stainless Steel Air Fryer, Large Single Basket Design, Simple Dial Controls	Wolfgang Puck	4.6	5.0
52	79606401	MegaChef Multipurpose Countertop Air Fryer Oven - Black	MegaChef	4.4	10.0
53	87405690	Kalorik MAXX 26qt Digital Air Fryer Oven Grill	Kalorik	4.62	253.0
54	79606396	MegaChef Multipurpose Air Fryer Oven - White	MegaChef	5.0	1.0
55	87841248	Joyoung JY-590 5.8 Quart Stainless Steel Multi Tasker Detachable Double Basket Air Fryer with LED Touchscreen and 13 Built In Smart Programs, Black	SoYoung	4.76	21.0
56	82780906	Gourmia FoodStation 5-in-1 Smokeless Grill & Air Fryer with Smoke-Extracting Technology	Gourmia	4.18	217.0
57	86194460	HOMCOM Air Fryer, 1700W 6.9 Quart Air Fryers Oven with Digital Display, 360° Air Circulation, Adjustable Temperature, Timer, Nonstick Basket, Black	Homcom	0.0	0.0
59	79318253	Proctor Silex Air Fryer - Black	Proctor Silex	4.84	25.0
		HOMCOM 10.5 Quart Air Fryer Oven with 8			

index	item_id	title	brand	avg_rating	rating_count
60	86200333	Air Fryer Oven with 8 Preset Cooking Menus, Airfryer Baker Oven with 9 Tool Accessories, Non-Stick Coating for Baking, Black	Homcom	4.33	3.0
61	79991382	Ninja Foodi Programmable 10-in-1 5qt Pressure Cooker and Air Fryer - FD101	Ninja	4.62	565.0
62	54643330	Instant Pot 8 qt 11-in-1 Air Fryer Duo Crisp + Electric Pressure Cooker	Instant Pot	4.37	346.0
63	79767657	Calphalon Precision Control Air Fryer Toaster Oven - Black	Calphalon	3.7	209.0
64	87763661	Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	4.9	10.0
65	82617044	Oster XL Digital Air Fryer Toaster Oven	Oster	3.71	119.0
66	81300306	Cosori Deluxe XL Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	4.62	71.0
67	88698563	Cosori Pro II 5.8qt Smart Air Fryer - White	Cosori	4.88	58.0
68	88698564	Cosori Pro II 5.8qt Smart Air Fryer - Dark Gray	Cosori	4.88	58.0
69	88698566	Cosori Pro II 5.8qt Smart Air Fryer - Red	Cosori	4.88	58.0
71	88698562	COSORI Pro Gen II 5.8qt Smart Air Fryer - Black	Cosori	4.33	49.0
72	88698565	COSORI Pro Gen II 5.8qt Air Fryer - Light Gray	Cosori	4.56	91.0
73	80207602	Instant Vortex Pro 10 qt 9-in-1 Air Fryer Toaster Oven	Instant Pot	4.2	205.0
74	89162599	Instant Vortex 6qt Slim 5-in-1 Air Fryer Black	Instant Pot	4.83	30.0
75	88258211	CYETUS Smart 6-in-1 Air Fryer, with 2 Independent Frying Baskets, Match Cook & Smart Finish to Roast, Broil, Dehydrate and More, 8QT, 1560W, Wifi	Cyetus	5.0	2.0
77	87417728	Kalorik MAXX Plus 6qt Digital Air Fryer	Kalorik	5.0	4.0

index	item_id	title	brand	avg_rating	rating_count
79	87042757	Juvale 4 Piece Set Silicone Pot Basket with Handles, Brush & Tongs for Air Fryer Liner, Kitchen Accessories, Gray, 7.5 in	Juvale	0.0	0.0
81	79318273	Hamilton Beach Electric Air Fryer Oven - Silver	Hamilton Beach	4.43	35.0
82	83369999	Brentwood 2 Quart Small Electric Air Fryer with Timer and Temp Control- White	Brentwood	0.0	0.0
83	83368549	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control in White	Brentwood	5.0	1.0
84	84673121	Proctor Silex 3.7qt Air Fryer	Proctor Silex	4.73	33.0
86	86194495	HOMCOM Air Fryer, 1700W 6.9 Quart Air Fryers Oven with 360° Air Circulation, Adjustable Temperature, Timer and Nonstick Basket for Oil Fat Cooking	Homcom	0.0	0.0
87	82343246	Brentwood 3.7 Quart Electric Air Fryer in White with Timer and Temperature Control	Brentwood	0.0	0.0
89	83369998	Brentwood AF-202BL 2 Quart Small Electric Air Fryer Blue with Timer and Temp Control	Brentwood	0.0	0.0
90	87802791	Brentwood Brentwood Select 24-Qt. 1,700-Watt Stainless Steel Convection Air Fryer Toaster Oven	Brentwood	0.0	0.0
91	83369992	Brentwood AF-202BK 2 Quart Small Electric Air Fryer Black with Timer and Temp Control	Brentwood	0.0	0.0
92	88757085	Air Fryer - 2.3-Quart Electric Fryer for Healthier Cooking - Compact Appliance with Nonstick Interior - Kitchen Gadgets by Classic Cuisine (Black)	Classic Cuisine	0.0	0.0
93	83368552	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control- Black and Bronze	Brentwood	0.0	0.0
		Uber Appliance 5qt 8-Function Guided	Uber		

index	item_id	title	brand	avg_rating	rating_count
94	89265975	Function Guided Digital Air Fryer - Black	Uber Appliance	4.62	340.0
95	83368560	Bretnwood 1 Quart Small Electric Air Fryer with 60min Timer and Temp Control in Black	Brentwood	2.0	1.0
96	82022682	Brentwood 3.7 Quart Electric Air Fryer in Black with Timer and Temperature Control	Brentwood	0.0	0.0
97	86194603	HOMCOM Air Fryer 4.7Qt, 4-in-1 Hot Oven w/ Air Fry, Roast, Broil, Crisp, Bake Function, Digital Touchscreen, 60 Min Timer, 8 Preset, Nonstick Basket	Homcom	0.0	0.0
98	83369997	Brentwood AF-202BK 2 Quart Small Electric Air Fryer Copper with Timer and Temp Control	Brentwood	0.0	0.0
99	83368562	Brentwood 1 Quart Small Electric Air Fryer with 60min Timer and Temp Control in White	Brentwood	0.0	0.0
100	87802801	Frigidaire Frigidaire 1.8-Quart 800-Watt Countertop Electric Air Fryer with Timer (White)	Frigidaire	0.0	0.0
101	89448051	Salton Flip and Cook 3-in-1 Air Fryer, Grill & Dehydrator Silver	Salton	0.0	0.0
102	86926927	Better Chef 4.5 Liter Air Fryer in Black	Better Chef	0.0	0.0
103	54639246	Hamilton Beach 2.5L Air Fryer	Hamilton Beach	4.33	43.0
104	89441962	Salton Digital Air Fryer XL 5L Black	Salton	0.0	0.0
105	86388475	Brentwood Select 3.4 Quart Rapid Electric Air Fryer in Stainless Steel	Brentwood	0.0	0.0
106	87674156	Brentwood Extra Large 1400 Watt 5 Quart Electric Digital Air Fryer with Temperature Control in Black	Brentwood	0.0	0.0
107	89448050	Salton Air Fryer XXL with Viewing Window - 8L	Salton	0.0	0.0
108	87802790	MasterChef MasterChef 4.75-Qt. 1,400-Watt Air Fryer	MasterChef	0.0	0.0
109	89265973	Uber Appliance 5qt 8-function digital touch screen air fryer XL	Uber	0.0	0.0

index	item_id	title	brand	avg_rating	rating_count
109	89265973	screen Air Fryer XL Premium - Stainless Steel	Applica	0.0	0.0
110	87802802	Frigidaire Frigidaire 8.5-Quart 1,700-Watt Digital Air Fryer	Frigidaire	0.0	0.0
111	87802807	Frigidaire Frigidaire 25-Liter 1,700-Watt Air Fryer Oven	Frigidaire	0.0	0.0
112	88189468	Kalorik 2-in-1 Digital Air and Deep Fryer, Black	Kalorik	0.0	0.0
113	85963338	NuWave Bravo iQ360 Smart Air Fryer/Grill/Convection Oven - Stainless Steel	NuWave	4.84	1001.0
114	81324241	Chefman 20L Air Fryer Toaster Oven - RJ50-SS-M20	Chefman	4.29	7.0
115	87280664	Instant Brands 4qt Air Fryer - Target Certified Refurbished	Instant Pot	0.0	0.0
116	83612539	Instant Pot 8qt Pro Crisp EPC and Air Fryer	Instant Pot	4.88	69.0
117	81615442	Oster Extra Large French Door Air Fryer Toaster Oven	Oster	3.91	90.0
118	87232556	Hamilton Beach 16qt Digital Air Fryer Toaster Oven 31220	Hamilton Beach	4.83	18.0
120	88963449	MegaChef Multifunction Air Fryer Toaster Oven with 21 Presets	MegaChef	0.0	0.0
121	88362018	Westinghouse Dual Zone Air Fryer - Handcrafted with 2 Independent Baskets, Separate Heater and Control, 12 Preset Programs, and Adjustable Temperature	Westinghouse	0.0	0.0
122	87644942	Brentwood 1700w 24 Quart Stainless Steel Convection Air Fryer Toaster Oven	Brentwood	0.0	0.0
123	82278497	MegaChef 3.5 Quart Airfryer/Multicooker with 7 Pre-programmed Settings - Red	MegaChef	5.0	1.0
124	86263903	Cuisinart TOA-60FR Air Fryer Toaster Oven Silver - Certified Refurbished	Cuisinart	2.8	5.0
125	87112899	Cuisinart Digital Air Fryer Oven CTOA-130PC2FR - Certified Refurbished	Cuisinart	1.0	1.0
1	86311154	PowerXL Vortex Pro	PowerXL	0.0	0.0

index	item_id	title	brand	avg_rating	rating_count
1	86311154	Air Fryer 4qt - Black	PowerXL	0.0	0.0
18	80888303	Dash Express Tasti-Crisp 2.6qt Air Fryer - Aqua	Dash	0.0	0.0
29	87252783	PowerXL 6qt Vortex Pro Air Fryer - Smart - Slate	PowerXL	0.0	0.0
36	87252788	PowerXL 8qt Vortex Pro Air Fryer - Slate	PowerXL	0.0	0.0
37	87835995	PowerXL 8qt Vortex Pro Smart Air Fryer - Slate	PowerXL	0.0	0.0
42	84300214	PowerXL 3qt Vortex Air Fryer - Red	PowerXL	0.0	0.0
43	83692835	Power XL 7-qt 10-in-1 1700W Air Fryer Steamer with Muffin Pan Slate	PowerXL	0.0	0.0
46	82667189	Dash 2.6 qt Express Digital Tasti-Crisp Nonstick Air Fryer	Dash	0.0	0.0
58	82621607	Curtis Stone Dura-Electric 1700-Watt 22L Air Fryer Oven with Rotisserie Model 698-469 Stainless Steel Refurbished	Curtis Stone	0.0	0.0
70	86882068	PowerXL 2qt Vortex Pro Air Fryer - Black	PowerXL	0.0	0.0
76	87477462	PowerXL 7-qt Classic Digital Air Fryer K51836 Refurbished Black	PowerXL	0.0	0.0
78	85320449	Cook's Essentials Air Fryer Lid for Pots, Pans & Pressure Cooker Refurbished Black	Cooks Essentials	0.0	0.0
80	88122664	Kitchen HQ 7-in-1 Air Fryer Grill with Accessories Refurbished Black	KitchenIQ	0.0	0.0
85	83703997	Curtis Stone 6.9-Quart Dura-Pan Air Fryer and Steamer Combo Refurbished Black	Curtis Stone	0.0	0.0
88	87674151	Brentwood Small 1400 Watt 4 Quart Electric Digital Air Fryer with Temperature Control in White	Brentwood	0.0	0.0
119	88862383	Blue Jean Chef 777 Ounces Digital Air Fryer Toaster Oven Refurbished Silver	Blue Jean Chef	0.0	0.0

```sql
%%sql
UPDATE product_infor
SET price_segment =
CASE
    WHEN price >= '149.99' THEN 'High'
    WHEN price <= '79.99' THEN 'Low'
    WHEN price < '149.99' AND price > '79.99' THEN 'Medium'
END;
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
126 rows affected.

[]

```sql
%%sql
SELECT *
FROM product_infor
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
126 rows affected.

index	item_id	title	brand	avg_rating	rating_count
0	79991380	Ninja Foodi 8qt Original Dualzone 2 Basket Air Fryer with 6 functions - DZ201	Ninja	4.59	807.0
2	86311159	PowerXL Vortex Pro Air Fryer 8qt - Black	PowerXL	4.56	379.0
3	80137210	Gourmia 5qt 12-Function Guided Cook Digital Air Fryer - Black	Gourmia	4.63	1363.0
4	87991215	CRUXGG 6qt Touchscreen Air Fryer	CRUXGG	4.79	29.0
5	86311158	Gourmia 2qt Digital Air Fryer With 10 Presets & Guided Cooking	Gourmia	4.54	221.0
6	53649826	Ninja 4qt Air Fryer - Black AF101	Ninja	4.58	1063.0
59	79318253	Proctor Silex Air Fryer - Black	Proctor Silex	4.84	25.0
60	86200333	HOMCOM 10.5 Quart Air Fryer Oven with 8 Preset Cooking Menus, Airfryer Baker Oven with 9 Tool Accessories, Non-Stick Coating for Baking, Black	Homcom	4.33	3.0
61	79991382	Ninja Foodi Programmable 10-in-1 5qt Pressure Cooker and Air Fryer - FD101	Ninja	4.62	565.0
62	54643330	Instant Pot 8 qt 11-in-1 Air Fryer Duo Crisp + Electric Pressure Cooker	Instant Pot	4.37	346.0
		Calphalon Precision			

index	item_Id	title	brand	avg_rating	rating_count
63	79767657	Control Air Fryer Toaster Oven - Black	Calphalon	3.7	200.0
64	87763661	Joyoung 25 Quart 1700 W Air Fryer Toaster Convection Oven with 14 Presets for Cooking, Frying, Baking, Roasting, Defrosting, & More, Stainless Steel	SoYoung	4.9	10.0
110	87802802	Frigidaire Frigidaire 8.5-Quart 1,700-Watt Digital Air Fryer	Frigidaire	0.0	0.0
7	54637571	Ninja Foodi Digital Air Fry Oven with Convection - SP101	Ninja	4.05	928.0
8	86311151	Gourmia 14qt All-in-One Digital Air Fryer, Oven, Rotisserie & Dehydrator	Gourmia	3.88	208.0
9	80137212	Gourmia Digital Stainless Steel Toaster Oven Air Fryer – Stainless Steel	Gourmia	4.08	735.0
10	86293796	Gourmia 2qt Compact Air Fryer with Nonstick Basket	Gourmia	4.67	61.0
11	86510517	Ninja Foodi 6qt 5-in-1 2-Basket Air Fryer with DualZone Technology - DZ090	Ninja	4.64	254.0
12	86736580	Ninja 5.5qt EzView 7 Function Air Fryer Max XL - AF171	Ninja	4.44	312.0
13	82546304	PowerXL 10qt Dual Basket Air Fryer - Black	PowerXL	4.21	564.0
14	86311150	PowerXL 5qt Vortex Classic Air Fryer - Black	PowerXL	2.17	1624.0
111	87802807	Frigidaire Frigidaire 25-Liter 1,700-Watt Air Fryer Oven	Frigidaire	0.0	0.0
112	88189468	Kalorik 2-in-1 Digital Air and Deep Fryer, Black	Kalorik	0.0	0.0
113	85963338	NuWave Bravo iQ360 Smart Air Fryer/Grill/Convection Oven - Stainless Steel	NuWave	4.84	1001.0
114	81324241	Chefman 20L Air Fryer Toaster Oven - RJ50-SS-M20	Chefman	4.29	7.0
115	87280664	Instant Brands 4qt Air Fryer - Target Certified Refurbished	Instant Pot	0.0	0.0
116	83612539	Instant Pot 8qt Pro Crisp EPC and Air Fryer	Instant Pot	4.88	69.0
117	81615442	Oster Extra Large French Door Air	Oster	3.81	80.0

index	item_id	title	brand	avg_rating	rating_count
117	81615442	French Door Air Fryer Toaster Oven	Oster	3.91	90.0
118	87232556	Hamilton Beach 16qt Digital Air Fryer Toaster Oven 31220	Hamilton Beach	4.83	18.0
120	88963449	MegaChef Multifunction Air Fryer Toaster Oven with 21 Presets	MegaChef	0.0	0.0
121	88362018	Westinghouse Dual Zone Air Fryer - Handcrafted with 2 Independent Baskets, Separate Heater and Control, 12 Preset Programs, and Adjustable Temperature	Westinghouse	0.0	0.0
122	87644942	Brentwood 1700w 24 Quart Stainless Steel Convection Air Fryer Toaster Oven	Brentwood	0.0	0.0
123	82278497	MegaChef 3.5 Quart Airfryer/Multicooker with 7 Pre-programmed Settings - Red	MegaChef	5.0	1.0
124	86263903	Cuisinart TOA-60FR Air Fryer Toaster Oven Silver - Certified Refurbished	Cuisinart	2.8	5.0
125	87112899	Cuisinart Digital Air Fryer Oven CTOA-130PC2FR - Certified Refurbished	Cuisinart	1.0	1.0
15	54643374	Instant Vortex 6 qt 4-in-1 Air Fryer	Instant Pot	4.29	848.0
16	88687226	Cuisinart Air Fryer Toaster Oven	Cuisinart	4.44	5505.0
17	82551560	Cuisinart Compact Air Fryer Toaster Oven - Stainless Steel - TOA-26TG	Cuisinart	4.17	259.0
19	82551562	Cuisinart Air Fryer Toaster Oven w/Grill - Stainless Steel - TOA-70	Cuisinart	4.61	884.0
20	82780909	Gourmia 8-Quart Digital Air Fryer, with 12 One-Touch Functions & Guided Cooking - Stainless Steel	Gourmia	4.42	253.0
21	82568675	Cuisinart Digital Air Fryer Toaster Oven - Stainless Steel - TOA-95	Cuisinart	4.63	145.0
22	82780907	Gourmia 9-Slice Digital Air Fryer Oven with 14 One-Touch Cooking Functions and Auto French	Gourmia	4.17	360.0

index	item_id	title	brand	avg_rating	rating_count
23	54643423	Instant Vortex Plus 10qt 7-in-1 Air Fryer Toaster Oven Combo - Black	Instant Pot	3.95	753.0
24	83952864	Instant Vortex Plus 6qt Air Fryer with ClearCook - Black	Instant Pot	4.89	72.0
25	81300304	Cosori Pro XLS II Smart 5.8qt Digital Air Fryer with Pizza Pan	Cosori	4.86	73.0
26	87405686	Kalorik 26qt Digital MAXX Air Fryer Oven	Kalorik	4.28	860.0
27	87255384	Cosori 6.8qt DualBlaze Air Fryer with Skewer Rack - Gray	Cosori	4.73	78.0
28	82780910	Gourmia 9-Quart Dual Basket Digital Air Fryer, with 7 Functions, Smart Finish and Match Cook	Gourmia	4.56	78.0
30	87991216	CRUXGG 12 Cup Programmable Coffee Maker	CRUXGG	4.5	22.0
31	79991383	Ninja Foodi 10-in-1 XL Pro Air Fry Oven - DT201	Ninja	4.09	460.0
32	79786472	PowerXL Grill Air Fryer Combo - Silver	PowerXL	4.13	835.0
33	82809461	Ninja Foodi 10qt XL Dualzone 2 Basket Air Fryer with 6 functions - DZ401	Ninja	4.6	252.0
34	86311156	PowerXL Vortex Dual Basket Air Fryer Pro 9qt - Black	PowerXL	4.52	23.0
35	86510518	Ninja Speedi Rapid Cooker & Air Fryer, SF301, 6qt., 12-in-1 Functionality, 15-Minute Meals, Sea Salt Gray	Ninja	4.79	254.0
38	53766317	Chefman 6.3qt Rotisserie Air Fryer	Chefman	4.0	4.0
39	81300308	Cosori Deluxe XLS Smart Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	4.75	51.0
40	54381590	Chefman 2.1qt Analog Air Fryer - Black/Silver	Chefman	4.36	764.0
41	79910186	PowerXL 5qt Single Basket Air Fryer - Black	PowerXL	4.36	1896.0
44	81324238	Chefman 8qt Digital Air Fryer - Silver	Chefman	4.57	37.0
45	86908904	NuWave NW38008R 14 Qt Air Fryer -	NuWave	4.89	211.0

index	item_id	title	brand	avg_rating	rating_count
47	87710220	Certified Refurbished Joyoung JY-570 5.8 Quart Stainless Steel Multi Tasker Detachable Double Basket Air Fryer with LED Touchscreen and 8 Built In Smart Programs, Black	SoYoung	4.71	21.0
48	79835740	Hamilton Beach 3L Digital Air Fryer - Black	Hamilton Beach	4.83	47.0
49	88543334	NutriChef Digital Air Fryer, Electric Oil-Free Air Frying Cooker	Nutrichef	4.0	1.0
50	87405683	Kalorik MAXX 16qt Air Fryer Oven	Kalorik	4.88	34.0
51	86532196	Wolfgang Puck 310oz Stainless Steel Air Fryer, Large Single Basket Design, Simple Dial Controls	Wolfgang Puck	4.6	5.0
52	79606401	MegaChef Multipurpose Countertop Air Fryer Oven - Black	MegaChef	4.4	10.0
53	87405690	Kalorik MAXX 26qt Digital Air Fryer Oven Grill	Kalorik	4.62	253.0
54	79606396	MegaChef Multipurpose Air Fryer Oven - White	MegaChef	5.0	1.0
55	87841248	Joyoung JY-590 5.8 Quart Stainless Steel Multi Tasker Detachable Double Basket Air Fryer with LED Touchscreen and 13 Built In Smart Programs, Black	SoYoung	4.76	21.0
56	82780906	Gourmia FoodStation 5-in-1 Smokeless Grill & Air Fryer with Smoke-Extracting Technology	Gourmia	4.18	217.0
57	86194460	HOMCOM Air Fryer, 1700W 6.9 Quart Air Fryers Oven with Digital Display, 360° Air Circulation, Adjustable Temperature, Timer, Nonstick Basket, Black	Homcom	0.0	0.0
65	82617044	Oster XL Digital Air Fryer Toaster Oven	Oster	3.71	119.0
66	81300306	Cosori Deluxe XL Digital Air Fryer Toaster Oven with Bonus Rack	Cosori	4.62	71.0
67	88698562	Cosori Pro II 5.8qt Smart Air Fryer	Cosori	4.88	58.0

index	item_id	title	brand	avg_rating	rating_count
67	88698563	Smart Air Fryer - White	Cosori	4.88	58.0
68	88698564	Cosori Pro II 5.8qt Smart Air Fryer - Dark Gray	Cosori	4.88	58.0
69	88698566	Cosori Pro II 5.8qt Smart Air Fryer - Red	Cosori	4.88	58.0
71	88698562	COSORI Pro Gen II 5.8qt Smart Air Fryer - Black	Cosori	4.33	49.0
72	88698565	COSORI Pro Gen II 5.8qt Air Fryer - Light Gray	Cosori	4.56	91.0
73	80207602	Instant Vortex Pro 10 qt 9-in-1 Air Fryer Toaster Oven	Instant Pot	4.2	205.0
74	89162599	Instant Vortex 6qt Slim 5-in-1 Air Fryer Black	Instant Pot	4.83	30.0
75	88258211	CYETUS Smart 6-in-1 Air Fryer, with 2 Independent Frying Baskets, Match Cook & Smart Finish to Roast, Broil, Dehydrate and More, 8QT, 1560W, Wifi	Cyetus	5.0	2.0
77	87417728	Kalorik MAXX Plus 6qt Digital Air Fryer	Kalorik	5.0	4.0
79	87042757	Juvale 4 Piece Set Silicone Pot Basket with Handles, Brush & Tongs for Air Fryer Liner, Kitchen Accessories, Gray, 7.5 in	Juvale	0.0	0.0
81	79318273	Hamilton Beach Electric Air Fryer Oven - Silver	Hamilton Beach	4.43	35.0
82	83369999	Brentwood 2 Quart Small Electric Air Fryer with Timer and Temp Control- White	Brentwood	0.0	0.0
83	83368549	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control in White	Brentwood	5.0	1.0
84	84673121	Proctor Silex 3.7qt Air Fryer	Proctor Silex	4.73	33.0
86	86194495	HOMCOM Air Fryer, 1700W 6.9 Quart Air Fryers Oven with 360° Air Circulation, Adjustable Temperature, Timer and Nonstick Basket for Oil Fat Cooking	Homcom	0.0	0.0
87	82343246	Brentwood 3.7 Quart Electric Air Fryer in White with Timer and Temperature Control	Brentwood	0.0	0.0
		Brentwood AF-202BL			

index	item_id	title	brand	avg_rating	rating_count
89	83369998	2 Quart Small Electric Air Fryer Blue with Timer and Temp Control	Brentwood	0.0	0.0
90	87802791	Brentwood Brentwood Select 24-Qt. 1,700-Watt Stainless Steel Convection Air Fryer Toaster Oven	Brentwood	0.0	0.0
91	83369992	Brentwood AF-202BK 2 Quart Small Electric Air Fryer Black with Timer and Temp Control	Brentwood	0.0	0.0
92	88757085	Air Fryer - 2.3-Quart Electric Fryer for Healthier Cooking - Compact Appliance with Nonstick Interior - Kitchen Gadgets by Classic Cuisine (Black)	Classic Cuisine	0.0	0.0
93	83368552	Brentwood 3.2 Quart Electric Air Fryer with Timer and Temp Control- Black and Bronze	Brentwood	0.0	0.0
94	89265975	Uber Appliance 5qt 8-Function Guided Digital Air Fryer - Black	Uber Appliance	4.62	340.0
95	83368560	Bretnwood 1 Quart Small Electric Air Fryer with 60min Timer and Temp Control in Black	Brentwood	2.0	1.0
96	82022682	Brentwood 3.7 Quart Electric Air Fryer in Black with Timer and Temperature Control	Brentwood	0.0	0.0
97	86194603	HOMCOM Air Fryer 4.7Qt, 4-in-1 Hot Oven w/ Air Fry, Roast, Broil, Crisp, Bake Function, Digital Touchscreen, 60 Min Timer, 8 Preset, Nonstick Basket	Homcom	0.0	0.0
98	83369997	Brentwood AF-202BK 2 Quart Small Electric Air Fryer Copper with Timer and Temp Control	Brentwood	0.0	0.0
99	83368562	Brentwood 1 Quart Small Electric Air Fryer with 60min Timer and Temp Control in White	Brentwood	0.0	0.0
100	87802801	Frigidaire Frigidaire 1.8-Quart 800-Watt Countertop Electric Air Fryer with Timer	Frigidaire	0.0	0.0

index	item_id	title	brand	avg_rating	rating_count
		Air Fryer with Timer (White)			
101	89448051	Salton Flip and Cook 3-in-1 Air Fryer, Grill & Dehydrator Silver	Salton	0.0	0.0
102	86926927	Better Chef 4.5 Liter Air Fryer in Black	Better Chef	0.0	0.0
103	54639246	Hamilton Beach 2.5L Air Fryer	Hamilton Beach	4.33	43.0
104	89441962	Salton Digital Air Fryer XL 5L Black	Salton	0.0	0.0
105	86388475	Brentwood Select 3.4 Quart Rapid Electric Air Fryer in Stainless Steel	Brentwood	0.0	0.0
106	87674156	Brentwood Extra Large 1400 Watt 5 Quart Electric Digital Air Fryer with Temperature Control in Black	Brentwood	0.0	0.0
107	89448050	Salton Air Fryer XXL with Viewing Window - 8L	Salton	0.0	0.0
108	87802790	MasterChef MasterChef 4.75-Qt. 1,400-Watt Air Fryer	MasterChef	0.0	0.0
109	89265973	Uber Appliance 5qt 8-function digital touch screen Air fryer XL Premium - Stainless Steel	Uber Appliance	0.0	0.0
1	86311154	PowerXL Vortex Pro Air Fryer 4qt - Black	PowerXL	0.0	0.0
18	80888303	Dash Express Tasti-Crisp 2.6qt Air Fryer - Aqua	Dash	0.0	0.0
29	87252783	PowerXL 6qt Vortex Pro Air Fryer - Smart - Slate	PowerXL	0.0	0.0
36	87252788	PowerXL 8qt Vortex Pro Air Fryer - Slate	PowerXL	0.0	0.0
37	87835995	PowerXL 8qt Vortex Pro Smart Air Fryer - Slate	PowerXL	0.0	0.0
42	84300214	PowerXL 3qt Vortex Air Fryer - Red	PowerXL	0.0	0.0
43	83692835	Power XL 7-qt 10-in-1 1700W Air Fryer Steamer with Muffin Pan Slate	PowerXL	0.0	0.0
46	82667189	Dash 2.6 qt Express Digital Tasti-Crisp Nonstick Air Fryer	Dash	0.0	0.0
58	82621607	Curtis Stone Dura-Electric 1700-Watt 22L Air Fryer Oven with Rotisserie Model 698-469 Stainless Steel Refurbished	Curtis Stone	0.0	0.0
70	86882068	PowerXL 2qt Vortex Pro Air Fryer - Black	PowerXL	0.0	0.0

index	item_id	title	brand	avg_rating	rating_count
		Pro Air Fryer - Black PowerXL 7-qt Classic			
76	87477462	Digital Air Fryer K51836 Refurbished Black	PowerXL	0.0	0.0
78	85320449	Cook's Essentials Air Fryer Lid for Pots, Pans & Pressure Cooker Refurbished Black	Cooks Essentials	0.0	0.0
80	88122664	Kitchen HQ 7-in-1 Air Fryer Grill with Accessories Refurbished Black	KitchenIQ	0.0	0.0
85	83703997	Curtis Stone 6.9-Quart Dura-Pan Air Fryer and Steamer Combo Refurbished Black	Curtis Stone	0.0	0.0
88	87674151	Brentwood Small 1400 Watt 4 Quart Electric Digital Air Fryer with Temperature Control in White	Brentwood	0.0	0.0
119	88862383	Blue Jean Chef 777 Ounces Digital Air Fryer Toaster Oven Refurbished Silver	Blue Jean Chef	0.0	0.0

Calculate performance metrics

Calculate average rating of each price segment

```
%%sql
SELECT price_segment, ROUND(AVG(avg_rating)) as avg_rating
FROM product_infor
GROUP BY price_segment
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
3 rows affected.

price_segment	avg_rating
High	4.0
Medium	3.0
Low	2.0

Calculate the average number of positve, negative, and neutral reviews of each price segment

```
%%sql
WITH total_reviews AS
(
    SELECT
        price_segment,
        SUM(CASE WHEN review_sentiment = 'positive' THEN 1 ELSE 0 END) AS
        SUM(CASE WHEN review_sentiment = 'neutral' THEN 1 ELSE 0 END) AS n
        SUM(CASE WHEN review_sentiment = 'negative' THEN 1 ELSE 0 END) AS
    FROM product_infor i
    INNER JOIN no_promotion p USING (item_id)
    GROUP BY price_segment
)
SELECT
    price_segment,
    number_positive_review::float / SUM(number_positive_review + number_ne
    number_negative_review::float / SUM(number_positive_review + number_ne
    number_neutral_review::float / SUM(number_positive_review + number_neu
FROM total_reviews
GROUP BY price_segment, number_positive_review, number_neutral_review, num
```

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
3 rows affected.

price_segment	positive_percent	negative_percent	neutral_percent
High	84.09409129095492	11.677401288154579	4.228507420890507
Low	73.11271975180972	17.47673216132368	9.410548086866598
Medium	84.46927374301676	10.793296089385475	4.737430167597766

The strengths of each price segment

```sql
%%sql
WITH group_aspect AS
(
SELECT
        price_segment,
        'design' AS aspect,
        ROUND(AVG(design::numeric),2) rating
    FROM no_promotion p inner join product_infor i using(item_id)
    WHERE design != '0.0'
    GROUP BY price_segment

UNION ALL

SELECT
        price_segment,
        'quality' AS aspect,
        ROUND(AVG(quality::numeric),2) rating
    FROM no_promotion p inner join product_infor i using(item_id)
    WHERE quality != '0.0'
    GROUP BY price_segment

UNION ALL

SELECT
        price_segment,
        'easy_of_use' AS aspect,
        ROUND(AVG(easy_of_use::numeric),2) rating
    FROM no_promotion p inner join product_infor i using(item_id)
    WHERE easy_of_use != '0.0'
    GROUP BY price_segment

UNION ALL

SELECT
        price_segment,
        'value_rating' AS aspect,
        ROUND(AVG(value_rating::numeric),2) rating
    FROM no_promotion p inner join product_infor i using(item_id)
    WHERE value_rating != '0.0'
    GROUP BY price_segment

UNION ALL

SELECT
        price_segment,
        'easy_to_clean' AS aspect,
        ROUND(AVG(easy_to_clean::numeric),2) rating
    FROM no_promotion p inner join product_infor i using(item_id)
    WHERE easy_to_clean != '0.0'
    GROUP BY price_segment
    ORDER BY aspect DESC, rating DESC
),
ranking AS
(
SELECT *,
RANK() OVER(PARTITION BY aspect ORDER BY rating DESC) AS ranking_col
FROM group_aspect
)
SELECT price_segment, aspect, rating
FROM ranking
WHERE ranking_col = 1

 * postgresql://postgres:***@localhost/Target_AirFryer_Project
5 rows affected.
```

price_segment	aspect	rating
Medium	design	4.29
High	easy_of_use	4.48
Low	easy_to_clean	4.35
High	quality	4.12
High	value_rating	4.08

```
%%sql
SELECT *
FROM no_promotion
LIMIT 1
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
1 rows affected.
```

index	item_id	review	rating	design	quality	easy_of_use	value_rati
8	79991380	10/10 would recommend	5	5.0	5.0	5.0	4.0

Analyze the correlation between overal rating and other aspects

```
%%sql
ALTER TABLE no_promotion
ALTER COLUMN rating TYPE NUMERIC,
ALTER COLUMN design TYPE NUMERIC,
ALTER COLUMN quality TYPE NUMERIC,
ALTER COLUMN easy_of_use TYPE NUMERIC,
ALTER COLUMN value_rating TYPE NUMERIC,
ALTER COLUMN easy_to_clean TYPE NUMERIC;
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
Done.
```

```
[]
```

```
rating_score =  %sql SELECT * FROM no_promotion WHERE rating IS NOT NULL O
```

```
 * postgresql://postgres:***@localhost/Target_AirFryer_Project
9980 rows affected.
```

```
ratings = pd.DataFrame(rating_score)
ratings.head()
```

	index	item_id	review	rating	design	quality	easy_of_use	value
0	8	79991380	10/10 would recommend	5	5	5	5	4
1	116	79991380	perfect loved	5	5	5	5	5
2	182	79991380	amazing	5	5	5	5	5
3	258	86311154	easy use buy …	5	5	5	5	5
4	1266	80137212	sold used item	1	4	4	4	1

```
rating_stat = ratings[['rating', 'design', 'quality', 'easy_of_use', 'valu
```

```
rating_stat['quality'] = pd.to_numeric(rating_stat['quality'], errors='coe
rating_stat['easy_of_use'] = pd.to_numeric(rating_stat['easy_of_use'], err
rating_stat['value_rating'] = pd.to_numeric(rating_stat['value_rating'], e
rating_stat['easy_to_clean'] = pd.to_numeric(rating_stat['easy_to_clean'],
rating_stat['rating'] = pd.to_numeric(rating_stat['rating'], errors='coerc
rating_stat['design'] = pd.to_numeric(rating_stat['design'], errors='coerc
```

```
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['quality'] = pd.to_numeric(rating_stat['quality'],
errors='coerce')
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['easy_of_use'] = pd.to_numeric(rating_stat['easy_of_use'],
errors='coerce')
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:3:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['value_rating'] = pd.to_numeric(rating_stat['value_rating'],
errors='coerce')
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:4:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['easy_to_clean'] =
pd.to_numeric(rating_stat['easy_to_clean'], errors='coerce')
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:5:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['rating'] = pd.to_numeric(rating_stat['rating'],
errors='coerce')
C:\Users\Admin\AppData\Local\Temp\ipykernel_15040\1931484573.py:6:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  rating_stat['design'] = pd.to_numeric(rating_stat['design'],
errors='coerce')

correlation_matrix = rating_stat.corr()

print(correlation_matrix)

                 rating    design   quality  easy_of_use  value_rating  \
rating         1.000000  0.145884  0.272174     0.118054      0.254685
design         0.145884  1.000000  0.929501     0.955155      0.932184
quality        0.272174  0.929501  1.000000     0.925953      0.976150
easy_of_use    0.118054  0.955155  0.925953     1.000000      0.927258
value_rating   0.254685  0.932184  0.976150     0.927258      1.000000
easy_to_clean  0.107871  0.891985  0.869293     0.907715      0.872856

               easy_to_clean
rating              0.107871
design              0.891985
quality             0.869293
easy_of_use         0.907715
value_rating        0.872856
easy_to_clean       1.000000
```
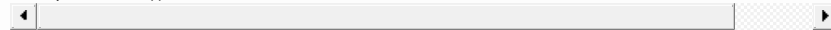
```python
correlation_matrix.to_csv(r"C:\Users\Admin\Downloads\correlation.csv")

sns.heatmap(rating_stat.corr(), vmin=-1, vmax=1,
annot=True,cmap="rocket_r")
plt.show()
```

png

```python
for aspect in ['quality','value_rating']:
    sns.lmplot(x='rating', y=aspect, data=rating_stat, line_kws={'color':
    plt.title(f"Correlation between 'rating' and {aspect}")
    plt.xlabel('Rating')
    plt.ylabel(aspect)
    plt.show()
```

png

png