

Well Woven

Wayfair Campaign Product Report Data Analysis

Yilin Huang

Content:

1. Introduction

Sponsored Products is Wayfair's newest media opportunity, a program to offer a paid solution for suppliers seeking greater visibility of their products on wayfair.com.

It is an opportunity for boosted product placement on-site through a proprietary bid management system. Winning products will be pushed into high-performing slots on browse pages, positioned directly in front of customers.

The goal for Well Woven is to understand that what kind attributes for products will satisfied the target customers and will have the potential to boost the sales on the Wayfair in the future.

2. Problem_Statement

In order to find out what kind of attributes for products will have good return performance in Wayfair, the Wayfair Competitors Analytics scraped dataset from Wayfair official website to analyze the competitors' products performance and to gain insights to support decision making process for future new campaigns.

3. Data_Description

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 1600 entries, 0 to 236
Data columns (total 16 columns):
Product_Name      1600 non-null object
Shop_Name         1600 non-null object
Description        1600 non-null object
Sponsor           1600 non-null object
Type              1600 non-null object
Product_C-href    1600 non-null object
Page              1600 non-null category
Size_num          1600 non-null float64
Sale_Price        1600 non-null float64
Original_Price    1600 non-null float64
Discount          1600 non-null float64
Review_Numbers    1600 non-null float64
Customer_Rating_Total 1600 non-null float64
Size_Rating       1600 non-null float64
Material_Rating   1600 non-null float64
Color_Rating      1600 non-null float64
dtypes: category(1), float64(9), object(6)
memory usage: 201.8+ KB
```

Dataset Description

This project dataset was scraped from Wayfair official website include the information for the Area Rug (size 5x8, 8x11) and all sizes for Hallway/Doormat/Kids/Round/Shag/Oriental. This dataset has 1600 records (products information) and 16 features.

◆	Shop_Name ◆	Sponsor ◆	Type ◆
0	Mercury Row	Non_Sponsored	Area
1	Andover Mills	Non_Sponsored	Area
2	Bungalow Rose	Non_Sponsored	Area
3	Three Posts	Non_Sponsored	Area
4	Mistana	Non_Sponsored	Area
...
232	Bungalow Rose	Non_Sponsored	Shag
233	Glamour Home Decor	Non_Sponsored	Shag
234	Ebern Designs	Non_Sponsored	Shag
235	Viv + Rae	Non_Sponsored	Shag

Categorical Data

Page ↕	Size_num ↕	Sale_Price ↕	Original_Price ↕	Discount ↕	Review_Numbers ↕	Customer_Rating_Total ↕	Size_Rating ↕	Material_Rating ↕	Color_Ratir
0	11.0	77.99	180.00	57.0	8574.0	4.6	4.7	4.5	
3	9.0	58.68	199.99	71.0	5180.0	4.7	4.8	4.8	
2	6.0	125.99	315.00	60.0	1417.0	4.8	4.6	4.6	
5	2.0	63.99	163.14	61.0	607.0	4.8	4.9	4.7	
3	24.0	91.99	365.70	75.0	12136.0	4.7	4.4	4.7	

Numerical Data

Description ↕	Product_Name ↕
Tastefully tousled, this shag area rug showcas...	Colona Shag White Area Rug
Warm-up hardwood and tiles floors while provid...	Shifflett Gray Area Rug
Soft to the touch and alluring with a distinct...	Fontanne Pink/White Area Rug
More than anything else, area rugs are art for...	Acton Ivory Indoor/Outdoor Area Rug
With bright tones and a distressed Persian-ins...	Tsukiji Orange Area Rug
...	...
0	Cawley Hand-Knotted Wool Gray Area Rug
Wanting the luxury of sheep hide but not likin...	Shag and flokati Faux Sheepskin White Area Rug
This multi-textured shag area rug lends a retr...	Lilia Handmade Shag and Flokati Wool Ivory Are...
Ready to stand up to high foot traffic in the ...	Ivory Area Rug
0	Vosburg Ivory Area Rug

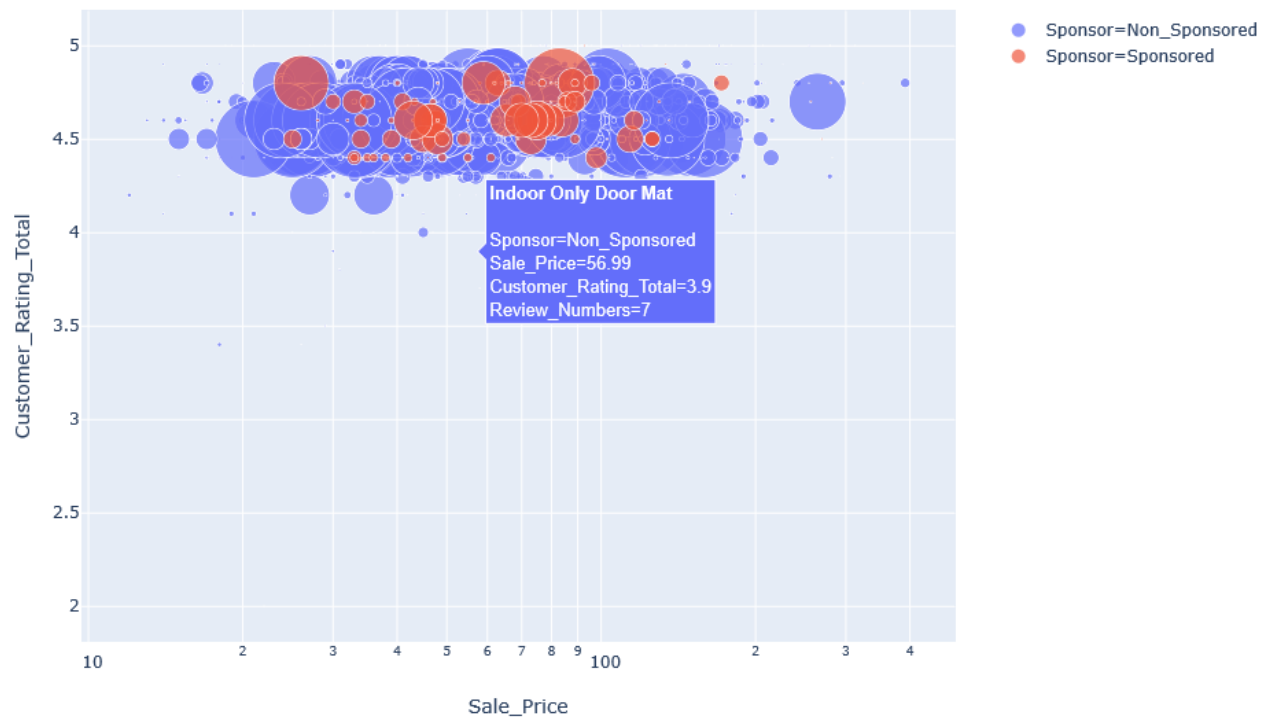
Text Data

There are three different types of features in this dataset, including categorical data, numerical data and text data.

For the reason that we can not get the most important data such as sales and returns for our competitors' products in the website, this project regards reviews for different product on Wayfair that we could scrape from the website as our target to evaluate the products' performance.

4. Exploratory Data Analytics

4.1 Sponsor Product Analytics



Description:

This chart describes the products information about sale prices (X axis), customer rating (Y axis), sponsor or not (color) and review numbers (Size).

Question:

Does sponsor products have higher reviews than non-sponsor products?

Answer:

No.

From this chart, we could see that the red bubbles are much smaller than the blue bubble, and from the information that Wayfair (<https://www.rsgsales.com/new-blog/wayfairsponsoredproducts>) provided, the sponsored product usually focus on:

1. New products
2. Best Sellers
3. Products you want to gain more traction
4. Products that have great merchandising,
5. Products with good reviews
6. Products that are in-stock

These products usually are regarded by our competitors as products have will good performance in the future.

Insights:

1. We could find that the big bubbles usually scatter around the review 4.5. We may assume that the people will prefer to buy products with good rating and then good rating attract more customers.
2. Sales prices for competitors scatter around the price between \$20 and \$130 in the first 5 pages for these different products.

4.2 Competitors sponsored products Analytics

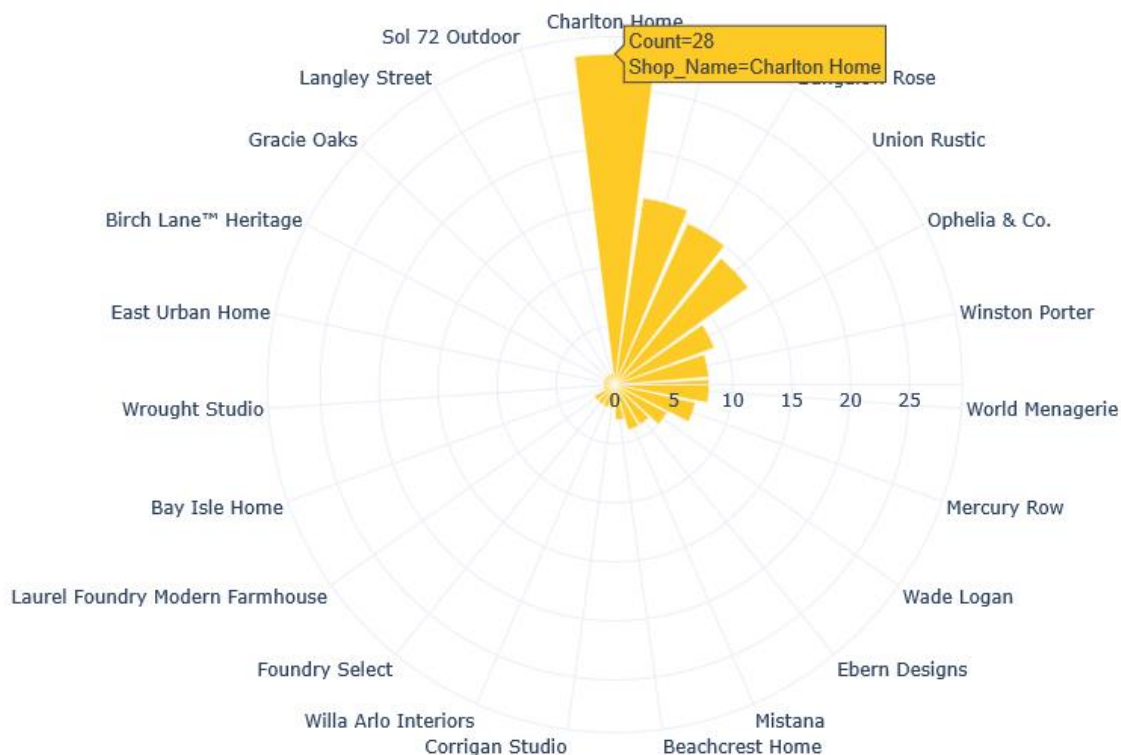
This analytics will dig more into the competitors' products with sponsor to find out what kind of products they selected to sponsor.

```
<class 'pandas.core.frame.DataFrame'>
Int64Index: 136 entries, 15 to 236
Data columns (total 20 columns):
 Product_Name      136 non-null object
 Shop_Name         136 non-null object
 Description       136 non-null object
 Sponsor           136 non-null object
 Type              136 non-null object
 Product_C-href    136 non-null object
 Page             136 non-null category
 Size_num          136 non-null float64
 Sale_Price        136 non-null float64
 Original_Price    136 non-null float64
 Discount          136 non-null float64
 Review_Numbers    136 non-null float64
 Customer_Rating_Total 136 non-null float64
 Size_Rating       136 non-null float64
 Material_Rating   136 non-null float64
 Color_Rating      136 non-null float64
 Sale_Price_Range  136 non-null category
 Original_Price_Range 136 non-null category
 Discount_Range    136 non-null category
 Review_Range      136 non-null category
 dtypes: category(5), float64(9), object(6)
memory usage: 19.2+ KB
```

After filtering out the product without sponsor, the dataset got 136 records which is around 8.5% (136/1600) total records in this raw data.

From this small dataset, we could try to explore products that preferred for our competitors to sponsor.

4.2.1 Sponsored Shop Name



Description:

This chart shows that how many products sponsored in different shop.

Question:

What kind of shops preferred to be sponsored by our competitors?

Answer:

Charlton Home (28 counts)

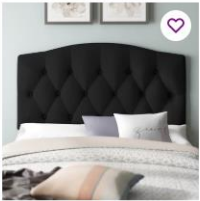



Insights:

Charlton Home is a shop sells traditional American design furniture. Maybe in the future, we could sponsor the products which belong to traditional pattern.

Appendix:

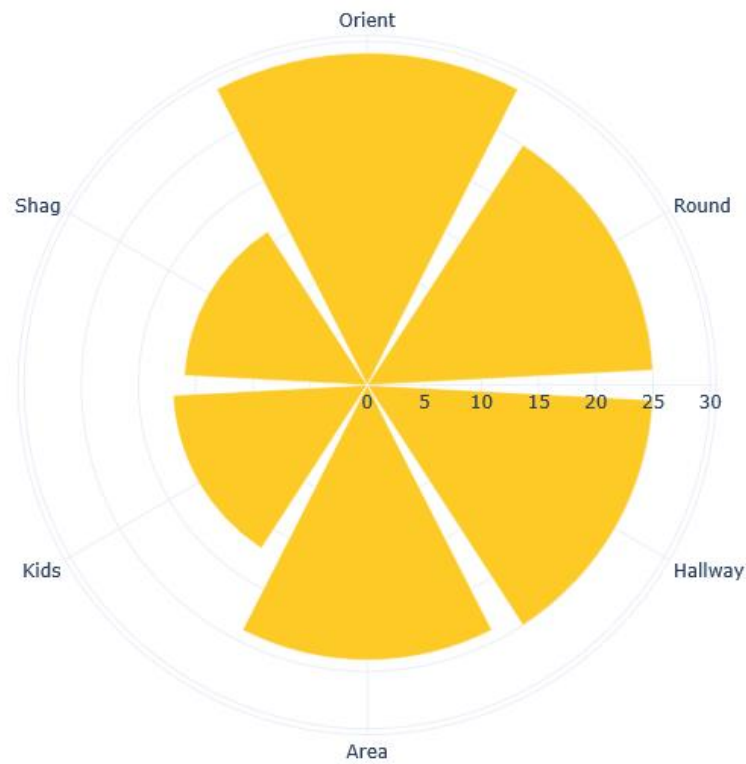
About Charlton Home

Showcasing traditional American design with versatility in mind, Charlton Home puts timeless looks within reach.

 <p>Fitz Upholstered Panel Headboard</p> <p>from \$77.28</p>	 <p>Arend Medallion Navy Blue Area Rug</p> <p>\$22.99 - \$189.99</p>	 <p>Porath Tufted Upholstered Platform Bed</p> <p>from \$223.74</p>	 <p>Adda 5 Piece Dining Set</p> <p>\$299.99</p>
---	---	---	--

<https://www.wayfair.com/brand/bnd/charlton-home-b36986.html?rtype=9&redir=charlton+home>

4.2.2 Sponsored Type



Description:

Question:

What kind of Types prefer by the customers in Wayfair?

Answer:

Orient/Round/Hallway/Area

Less Shag/Kids

Insights:


From this chart, we could find that our competitors may not prefer to sponsor the products which are belongs to Shag and Kids.

Appendix:

Shaggy Rugs

Pile Height (Thickness): Shag X [Clear All](#)

Sale




+4 Sizes

Ambriz Microfiber Turquoise Area Rug by Harriet Bee


\$37.99 - \$399.99 ~~\$55.99~~

★★★★★ 2

 2-Day Shipping

Get it by Fri, Nov 8

Sale




+7 Sizes

San Francisco Shag Blue Area Rug by Well Woven


\$79.99 - \$649.99 ~~\$597.00~~

★★★★★ 25

 FREE 2-Day Shipping

Get it by Fri, Nov 8

Sale




+7 Sizes

San Francisco Shag Blue/Gray Area Rug by Well Woven

\$68.02 - \$515.06 ~~\$597.00~~

★★★★★ 25

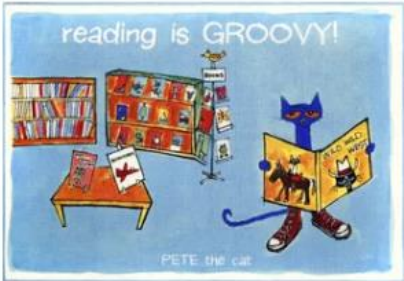
 FREE 2-Day Shipping

Get it by Fri, Nov 8

https://www.wayfair.com/keyword.php?keyword=shaggy+rug&command=dosearch&new_keyword_search=true&class_id=

Kids Rugs

Sale



+3 Sizes


Home Dynamix Reading Is Groovy Blue/Red Area Rug by Pete The Cat

\$38.99 - \$98.99 ~~\$40.04~~

★★★★★ 12

[ip/pete-the-cat-home-dynamix-reading-is-groovy-bluered-area-rug-ptca1005.html](https://www.wayfair.com/rugs/sb0/kids-rugs-c1834363.html)

Sale




+3 Sizes

Ambriz Microfiber Ultra Soft Shag Light Yellow Area Rug by Harriet Bee

\$43.99 - \$157.99 ~~\$69.99~~

★★★★★ 22

Sale



+2 Sizes

Value Plus World Map Area Rug by Carpets for Kids

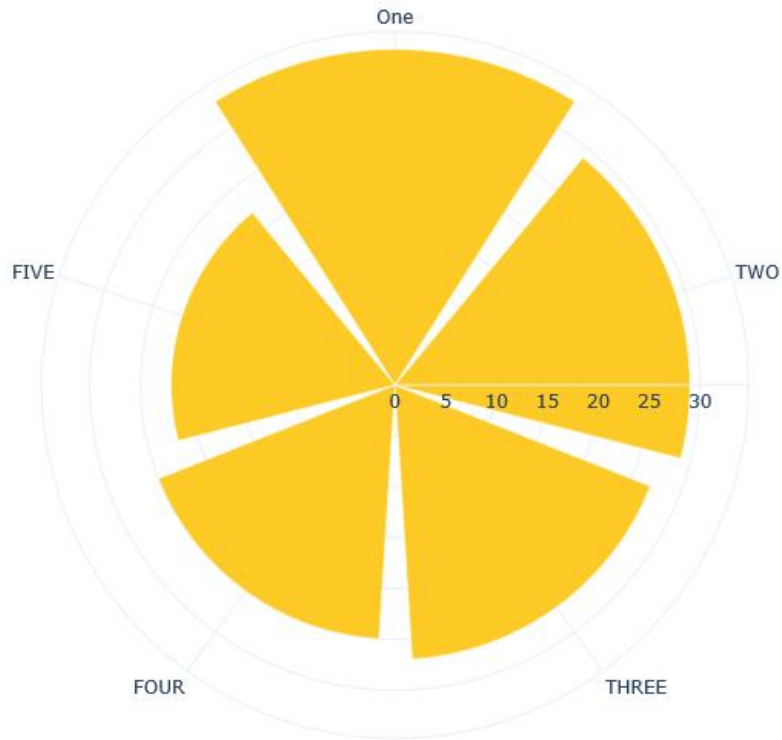
\$182.99 - \$305.99 ~~\$199.95~~

★★★★★ 22

FREE Shipping

<https://www.wayfair.com/rugs/sb0/kids-rugs-c1834363.html>

4.2.3 Sponsored Page



Description:

This chart describes how many products sponsored in different pages?

Question:

Does our competitor will sponsor the product rank in the higher?

Answer:

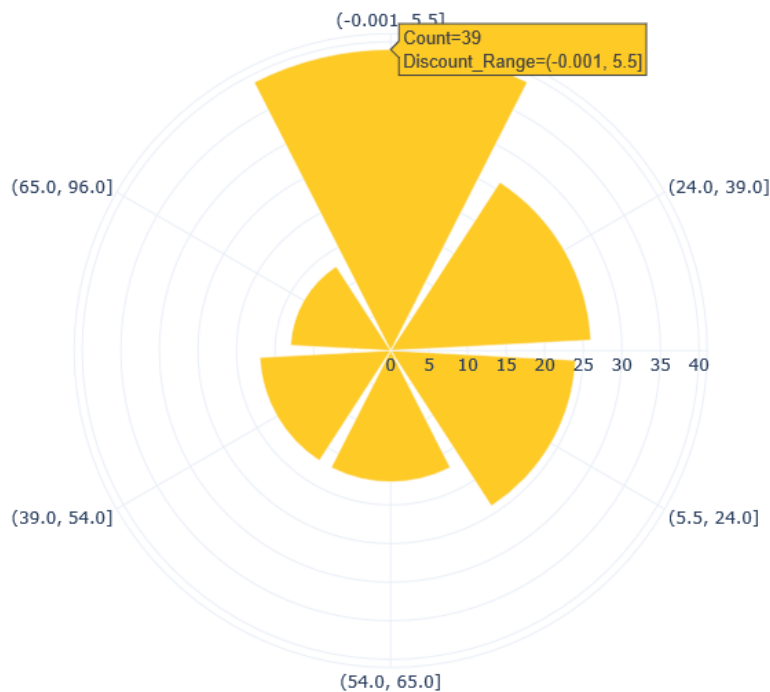
No.

From this chart, we could observe that these product scatter equally in different page, they do not have the preference to sponsor the products in different page.

Insights:

We could assume that they may select the products they think will boost the sales and for the potential future in the higher rank, but not have good performance currently.

4.2.3 Sponsored Discount Range



Description:

This chart describes sponsored product discount range.

Question:

What discount ranges for products are preferred to be sponsored by our competitors?

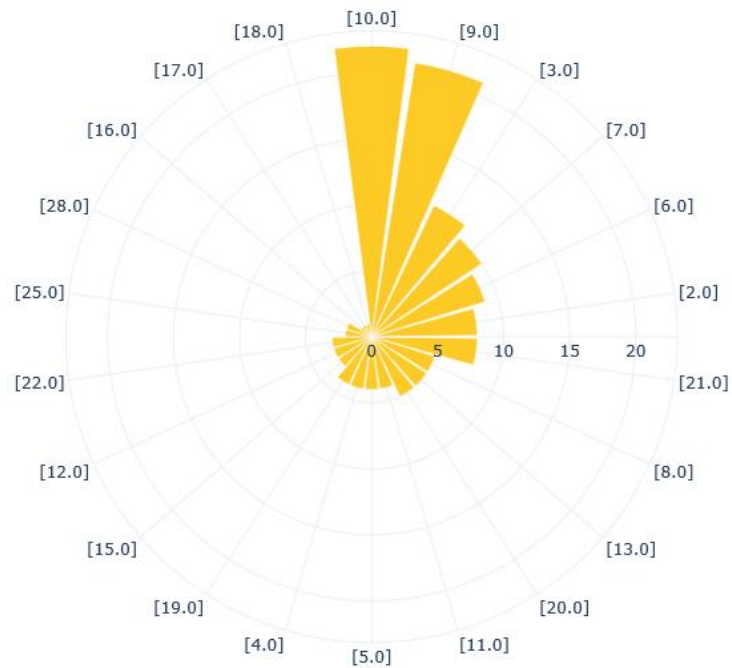
Answer:

$(-0.001, 5.5]$

Insight:

From this chart, we could observe that our competitors do have the preference for the discount range to sponsor and these products do not have too much discounts.

4.2.4 Sponsored Size num



Description:

This chart describes sponsored product size num range.

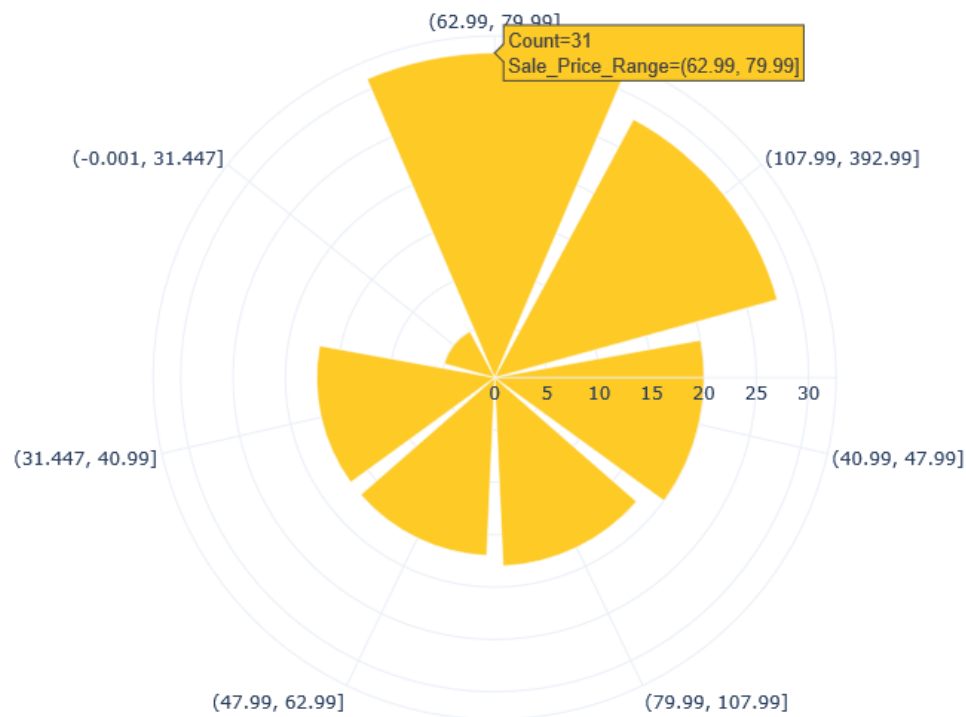
Question:

How many sizes for products are preferred to be sponsored by our competitors?

Answer:

10, 9

4.2.5 Sponsored Sale Price Range



Description:

This chart describes sponsored product sale price range.

Question:

What is the price range for products are preferred to be sponsored by our competitors?

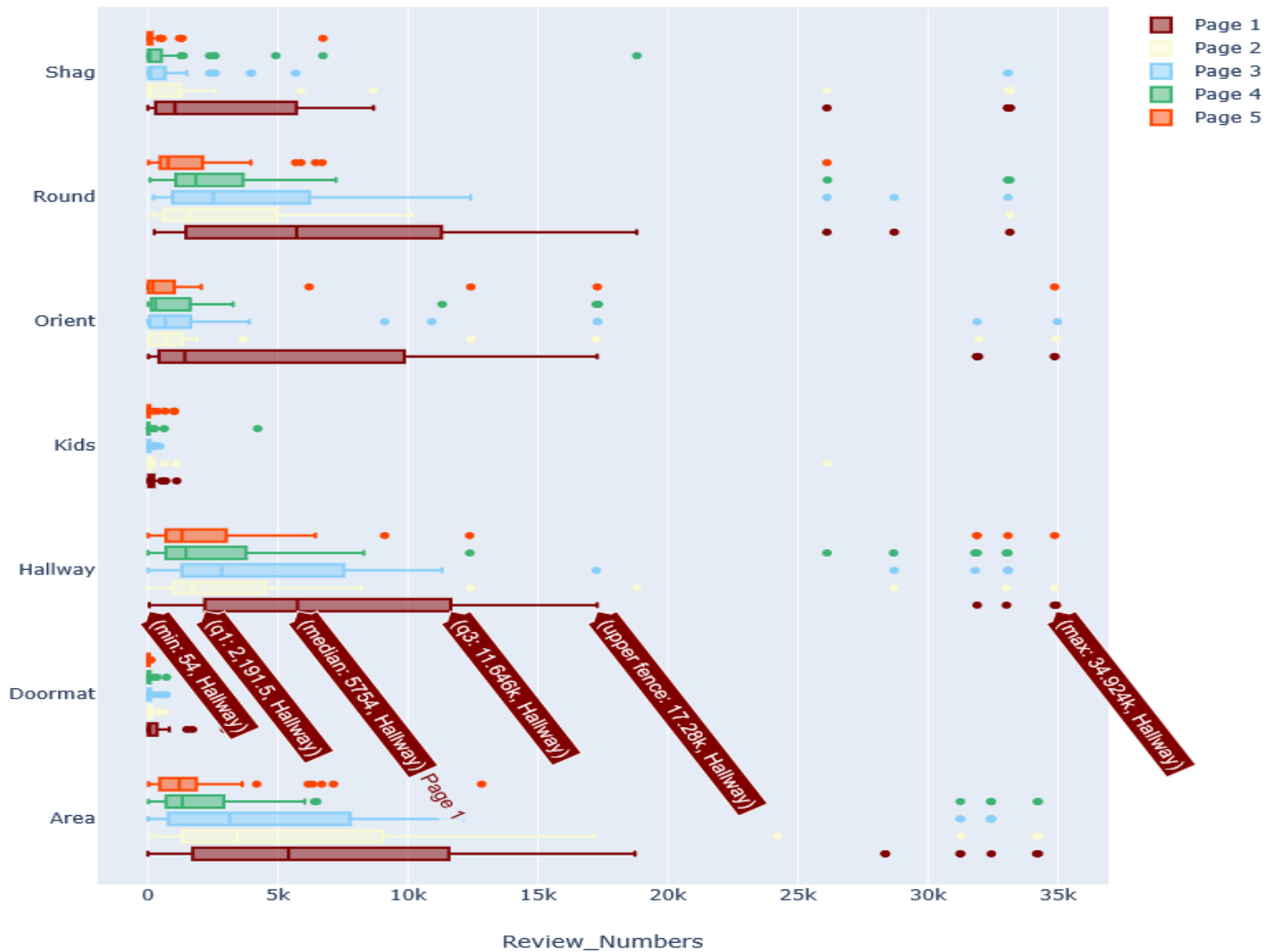
Answer:

(69.99,79.99] / (107.99,79.99]

Insight:

It difficult to tell that whether or not they have the preference of the price range to sponsor. But our competitor barely to sponsor the lower price product.

4.3 Page/Type/Reviews Analytics



Description:

This boxplot includes the information about page, Type of product and Review Numbers.

Question:

Q1: Does page rank higher means have higher reviews?

Q2: What kind of type of product have higher reviews?

Answer:

Q1: Yes. The higher rank means customer's preference. If you sponsor the product does not have prefer by customers, the rank will be lower even if you invest money on this product.

Q2: Area/Hallway/Round

4.4 Shop Name Analytics



Description:

This boxplot describes the review distribution of review for different shop.

Question:

Which shops have higher review?

Answer:

Andover Mills/Mistana/Hashtag Home

Insights:

The Andover Mills provide budget friendly furniture, At Mistana, provide Pacific coast–inspired boho furniture and Charlton Home is a shop sells traditional American design furniture.

From the information above, we may assume that our customers in wayfair prefer the product which are boho and traditional style with lower budget.

Appendix:

andover mills

Save This Shop

Andover Mills

4.5 ★★★★★

Curate a unique and budget-friendly home with Andover Mills. Blending traditional appeal, bold patterns, and clean-lined silhouettes, we exist to complement your individual style.

<https://www.wayfair.com/brand/bnd/andover-mills-b30808.html>

MISTANA

Save This Shop

Mistana

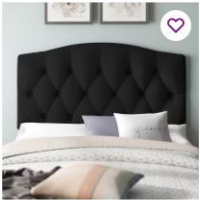
4.6 ★★★★★

At Mistana, Pacific coast-inspired boho furniture and decor celebrate the individuality of your home, where beautiful and bold designs share a unique story. Start your journey here.

<https://www.wayfair.com/brand/bnd/mistana-b44356.html>


About Charlton Home

Showcasing traditional American design with versatility in mind, Charlton Home puts timeless looks within reach.




Fitz Upholstered Panel Headboard

from \$77.28




Arend Medallion Navy Blue Area Rug

\$22.99 - \$189.99



Porath Tufted Upholstered Platform Bed

from \$223.74

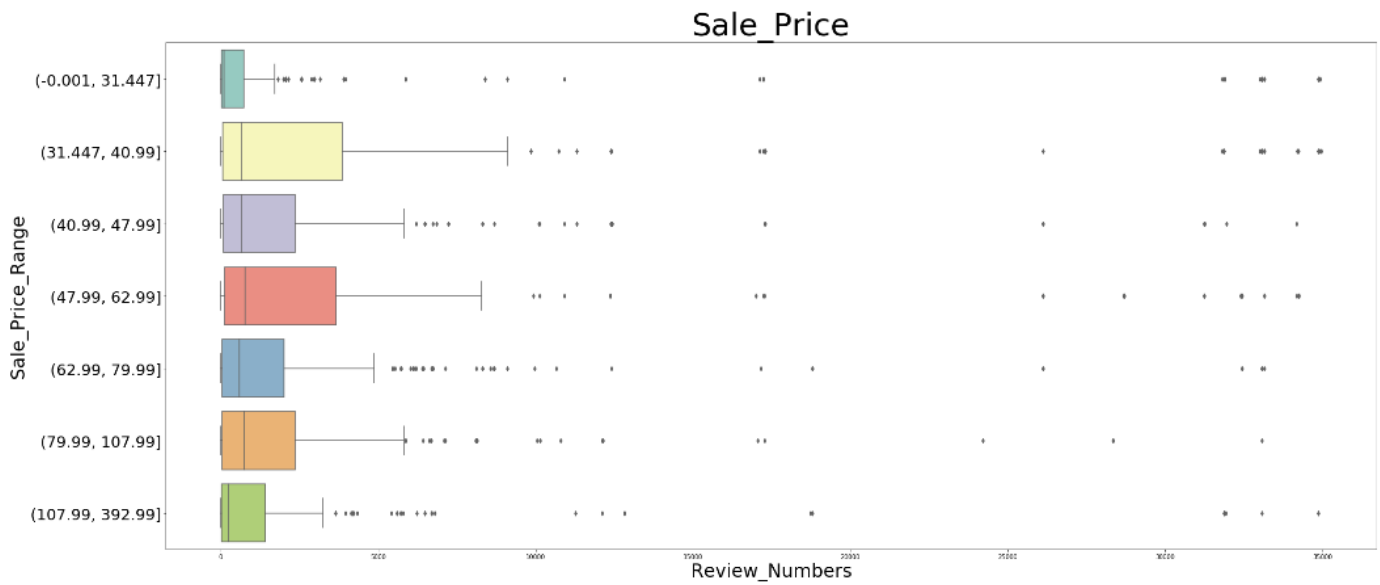


Adda 5 Piece Dining Set

\$299.99

<https://www.wayfair.com/brand/bnd/charlton-home-b36986.html?rtype=9&redir=charlton+home>

4.5 Sale_Price Analytics



Description:

This boxplot describe the review for different sale price range.

Question:

What kind of pricing range prefer by the customers in Wayfair?

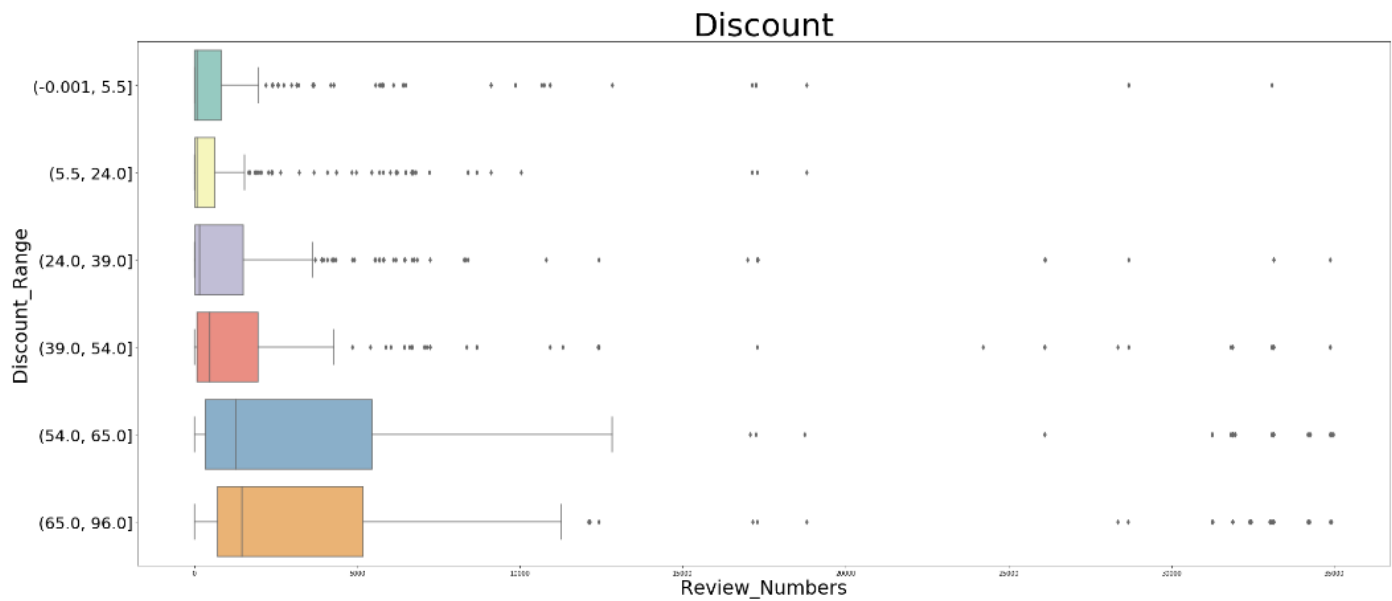
Answer:

(31.447, 40.99]' / (47.99, 62.99]')

Insights:

We could observe from this chart that the price setting in the top 5 pages are not very high, from\$ 0 to \$400 around. The customers may prefer rugs not too much expensive around \$30 to \$60.

4.6 Discount Analytics



Description:

This boxplot describes the reviews for discount range.

Question:

What kind of discount range prefer by the customers in Wayfair?

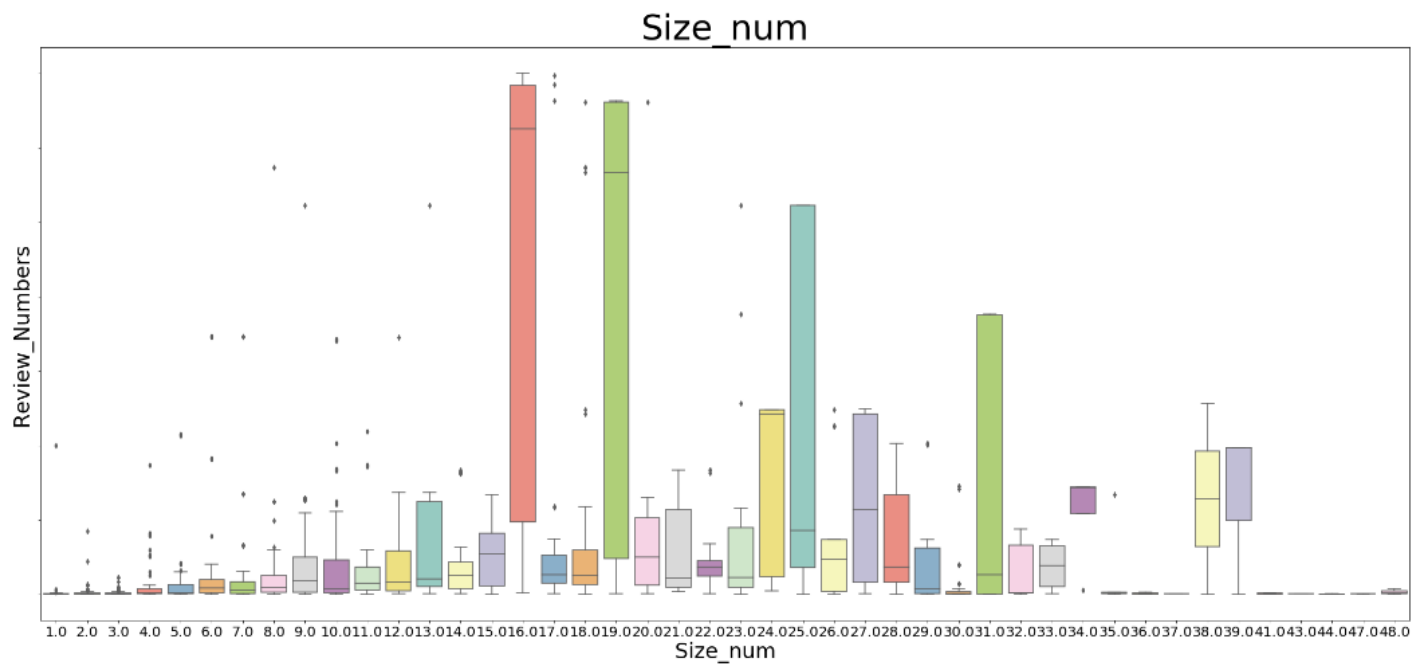
Answer:

(54.0, 65.0]/ (65.0, 96.0]

Insights:

The customers may prefer the products shows with higher discount. For the reason that, the higher discount for the product will make them feel pay less money buy the good products.

4.7 Discount Analytics



Description:

This boxplot describes the reviews number for different sizes for products.

Question:

How many sizes for products prefer by the customers in Wayfair?

Answer:

16/19

Insights:

Customers may prefer the products that could provide them more choice for the size. But doesn't mean the more the better, sizes better to be 16 and 19.

5 Text Analytics

5.1 Valuable keywords

index	Description	Review_Numbers	
0	tast,tousl,shag,area,rug,showcas,geometr,diamo...	8574.0	
1	warm-up,hardwood,tile,floor,provid,stylish,acc...	5180.0	
2	soft,touch,allur,distinct,high-low,textur,rayo...	1417.0	
3	anyth,el,area,rug,art,floor,creat,mood,decor,g...	607.0	
4	bright,tone,distress,persian-inspir,pattern,ar...	12136.0	
...	
1595	232	n/a 20.0	
1596	233	want,luxuri,sheep,hide,like,anim,product,faux,...	54.0
1597	234	multi-textur,shag,area,rug,lend,retro,vibe,mod...	9.0
1598	235	readi,stand,high,foot,traffic,entryway,take,oc...	284.0
1599	236	n/a 9.0	

The product description has been tokenized, filtered out stopwords and punctuation, conducted stemming and lemitization (<https://nlp.stanford.edu/IR-book/html/htmledition/stemming-and-lemmatization-1.html>)

keywords	Review_Numbers_Mean	Review_Numbers_Count	Log_value
lilah	32935.176471	17	170433.593532
brandt	28116.720930	43	119407.010743
indira	10283.666667	12	56797.988770
burgundi	10342.461538	13	56294.881641
black	11344.814815	27	53458.990775
blue/ivori	7387.454545	11	41444.636323
orang	7051.416667	12	38945.864119
bright	7336.600000	15	38883.852680
dark	8350.795918	49	34373.650952
hillsbi	7051.448276	29	32723.917037
ivory/gray	5171.133333	15	27406.916926
light	6788.636364	55	27159.295204
silver	4503.461538	13	24512.717146
floral	4310.125000	16	22565.418608
beig	4818.028571	35	21453.162516
kati	3521.250000	12	19448.308122
brown	4224.031250	32	19186.804239
medallion	3652.941176	17	18903.311243
red	3954.666667	30	18218.498653
loom	3324.562500	16	17405.561208
power	3324.562500	16	17405.561208
vintag	2886.000000	13	15708.738951
green	3034.368421	19	15364.809329
shag	4391.780000	100	14944.624177
yellow	2765.117647	17	14308.984728
gray	4706.436709	158	13862.516651

This table shows valuable words for the product description. Each word I took its average review value and count how many times this word appeared in the dataset. For the Log_value, I punished the words appeared too much time on the dataset to avoid the table to appear non valuable words appear too much time on the description and with higher value such as rug.

The words with higher count and Log_Value are the most valuable words.

Insights:

From this list, we could observe what kind of rug type/color/words for products may have potential have higher reviewr.

Rug Type: Lilah/Brandt/Indira/Burgundi/hillsby

Color:Black/Blue/Ivory/Orange/Bright/Dark

Other words: Power-Loom

Make customer feel like the products are durable. We could use this word more often to describe our products in future.

Lay an effortlessly on-trend foundation for your stylish space with this shaggy vanilla area rug. Machine made in Turkey, this rug is **power loomed** from stain and fade-resistant polypropylene over a jute backing in thick 1" pile—perfect for laying out in a high-traffic living room or digging your toes into right out of bed in the morning. Available in a curated selection of sizes to best suit your style, this rug works best when paired with a rug pad to prevent shifting and sliding.

<https://www.wayfair.com/>

5.1.2 Words Cloud



Description: This wordcloud describe words that our competitors usually used to describe their product.

Insight: Except Area rug, made turkey, design, words to describe products that how it look like and come from. They also use power-loom, resist, easy clean to emphasize the product's function with good quality.

5.1.3 Model Building (Optional)

```

NB, Count Vectors: [0.75221239 0.53508772 0.80237154]
NB, WordLevel TF-IDF: [0.7079646 0.38596491 0.84189723]
NB, N-Gram Vectors: [0.68141593 0.5877193 0.82608696]
NB, CharLevel Vectors: [0.61061947 0.28947368 0.86956522]

```

Deployment:

This model build based on the dataset come from out competitor. The first model has better result, and the accuracy is 75%, 53% and 80%. For the future product description, we may deploy this model to know that whether or not the product description will have Weak/Neutral/High reviews.

6. Limitations:

For the sponsored product analytics, we only get 136 records, this dataset is too small to generate strong conclusion that what kind of product that our competitors may prefer to sponsor.

7. Results

Assume that the data did not have the limitation, we could get a clear direction that what kind of products that our competitors may prefer to sponsor, what kind of products may satisfy our target customers.

what kind of products that our competitors may prefer to sponsor:

1. Traditional Pattern Rug
2. Type: More Orient/Round/Hallway/Area
Less Shag/Kids
3. Discount Range: (-0.001,5.5]
4. Size Num: 10, 9
5. Sale Price Range: (69.99,79.99] / (107.99,79.99]

what kind of products may satisfy our target customers:

1. Type: Area/Hallway/Round
2. Attributes of product from Shop Name Analytics:
product which are boho and traditional style with lower budget
3. Price: prefer rugs not too much expensive around \$30 to \$60.
4. Discount Range: (54.0, 65.0]/ (65.0, 96.0]
5. Size Num: 16/19
6. Rug Collection(?): Lilah/Brandt/Indira/Burgundi/hillsby
7. Color: Black/Blue/Ivory/Orange/Bright/Dark
8. With description Word: Power-Loom