

# Amazon Product Data Aanalysis

## Project Overview

This project involves EDA on an Amazon Product dataset , focusing on understanding product pricing, rating patterns,discout percentage strategies, review sentiments and customer behaviour across various product categories

The cleaned dataset includes key information such as

- Product name and categories
- Actual and Discounted prices
- Rating and number of reviews
- Discount Percentage
- Review Category
- Review Content and sentiment classifications

using libraries such as - pandas - Numpy - Matplotlib - Seaborn

GOALS - Identify top-rated and most reviwed produts - Understand the impact of pricing and discounting on rating - Explore review sentiments across categories

### *#Importing Libraries*

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

### *#Read CSV File*

```
df = pd.read_csv("amazon_sales_dataset.csv")
```

### *#First few Rows*

```
df.head()
```

	product_id	product_name \
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...

	category	discounted_price
0	Computers&Accessories Accessories&Peripherals ...	₹399
1	Computers&Accessories Accessories&Peripherals ...	₹199

2	Computers&Accessories Accessories&Peripherals ...	₹199
3	Computers&Accessories Accessories&Peripherals ...	₹329
4	Computers&Accessories Accessories&Peripherals ...	₹154

	actual_price	discount_percentage	rating	rating_count	\
0	₹1,099	64%	4.2	24,269	
1	₹349	43%	4.0	43,994	
2	₹1,899	90%	3.9	7,928	
3	₹699	53%	4.2	94,363	
4	₹399	61%	4.2	16,905	

	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
1	Compatible with all Type C enabled devices, be...	
2	【 Fast Charger& Data Sync】-With built-in safet...	
3	The boAt Deuce USB 300 2 in 1 cable is compati...	
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRAOLODSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZ086XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
1	A Good Braided Cable for Your Type C Device,Go...	
2	Good speed for earlier versions,Good Product,W...	
3	Good product,Good one,Nice,Really nice product...	
4	As good as original,Decent,Good one for second...	

review\_content \

```

0 Looks durable Charging is fine tooNo complains...
1 I ordered this cable to connect my phone to An...
2 Not quite durable and sturdy,https://m.media-a...
3 Good product,long wire,Charges good,Nice,I bou...
4 Bought this instead of original apple, does th...

```

```

                                img_link \
0 https://m.media-amazon.com/images/W/WEBP_40237...
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...

```

```

                                product_link
0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnnect-POR-1...

```

### #Info about Data

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 1465 entries, 0 to 1464
```

```
Data columns (total 16 columns):
```

#	Column	Non-Null Count	Dtype
0	product_id	1465 non-null	object
1	product_name	1465 non-null	object
2	category	1465 non-null	object
3	discounted_price	1465 non-null	object
4	actual_price	1465 non-null	object
5	discount_percentage	1465 non-null	object
6	rating	1465 non-null	object
7	rating_count	1463 non-null	object
8	about_product	1465 non-null	object
9	user_id	1465 non-null	object
10	user_name	1465 non-null	object
11	review_id	1465 non-null	object
12	review_title	1465 non-null	object
13	review_content	1465 non-null	object
14	img_link	1465 non-null	object
15	product_link	1465 non-null	object

```
dtypes: object(16)
```

```
memory usage: 183.3+ KB
```

```
df.shape
```

```
(1465, 16)
```

```
#Check duplicated rows
```

```
df[df.duplicated()]
```

```
Empty DataFrame
```

```
Columns: [product_id, product_name, category, discounted_price,
actual_price, discount_percentage, rating, rating_count,
about_product, user_id, user_name, review_id, review_title,
review_content, img_link, product_link]
```

```
Index: []
```

```
#Basic describe
```

```
df.describe()
```

	product_id	product_name
\		
count	1465	1465
unique	1351	1337
top	B07JW9H4J1	Fire-Boltt Ninja Call Pro Plus 1.83" Smart Wat...
freq	3	5

	category
discounted_price \	
count	1465
1465	
unique	211
550	
top	Computers&Accessories Accessories&Peripherals ...
₹199	
freq	233
53	

	actual_price	discount_percentage	rating	rating_count	\
count	1465	1465	1465	1463	
unique	449	92	28	1143	
top	₹999	50%	4.1	9,378	
freq	120	56	244	9	

	about_product	\
count		1465
unique		1293
top	[CHARGE & SYNC FUNCTION]- This cable comes wit...	
freq		6

	user_id	\
count		1465
unique		1194
top	AHIKJUDTVJ4T6DV6IUGFYZ5LXMPA,AE55KTFVNXYFD5FPY...	

```

freq                                                    10

count                                                    user_name \
unique                                                    1465
top                                                    1194
top      $@|\|T0$|-|,Sethu madhav,Akash Thakur,Burger P...
freq                                                    10

count                                                    review_id \
unique                                                    1465
top                                                    1194
top      R3F4T5TRYPTMIG,R3DQIEC603E7AY,R104Z15FD40PV5,R...
freq                                                    10

count                                                    review_title \
unique                                                    1465
top                                                    1194
top      Worked on iPhone 7 and didn't work on XR,Good ...
freq                                                    10

count                                                    review_content \
unique                                                    1465
top                                                    1212
top      I am not big on camera usage, personally. I wa...
freq                                                    8

count                                                    img_link \
unique                                                    1465
top                                                    1412
top      https://m.media-amazon.com/images/I/413sCRKobN...
freq                                                    3

count                                                    product_link
unique                                                    1465
top                                                    1465
top      https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
freq                                                    1

```

*#Check product\_id*

```
df[df.duplicated(subset='product_id',keep=False)].head(5)
```

```

product_id      product_name \
0  B07JW9H4J1  Wayona Nylon Braided USB to Lightning Fast Cha...
1  B098NS6PVG  Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2  B096MSW6CT  Source Fast Phone Charging Cable & Data Sync U...
3  B08HJDJ86NZ  boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4  B08CF3B7N1  Portronics Konnect L 1.2M Fast Charging 3A 8 P...

```

```

category discounted_price
\

```

0	Computers&Accessories Accessories&Peripherals ...	₹399
1	Computers&Accessories Accessories&Peripherals ...	₹199
2	Computers&Accessories Accessories&Peripherals ...	₹199
3	Computers&Accessories Accessories&Peripherals ...	₹329
4	Computers&Accessories Accessories&Peripherals ...	₹154

	actual_price	discount_percentage	rating	rating_count	\
0	₹1,099	64%	4.2	24,269	
1	₹349	43%	4.0	43,994	
2	₹1,899	90%	3.9	7,928	
3	₹699	53%	4.2	94,363	
4	₹399	61%	4.2	16,905	

	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
1	Compatible with all Type C enabled devices, be...	
2	【 Fast Charger& Data Sync】-With built-in safet...	
3	The boAt Deuce USB 300 2 in 1 cable is compati...	
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
1	A Good Braided Cable for Your Type C Device,Go...	
2	Good speed for earlier versions,Good Product,W...	

```
3 Good product,Good one,Nice,Really nice product...
4 As good as original,Decent,Good one for second...
```

```
review_content \
0 Looks durable Charging is fine tooNo complains...
1 I ordered this cable to connect my phone to An...
2 Not quite durable and sturdy,https://m.media-a...
3 Good product,long wire,Charges good,Nice,I bou...
4 Bought this instead of original apple, does th...
```

```
img_link \
0 https://m.media-amazon.com/images/W/WEBP_40237...
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...
```

```
product_link
0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnnect-POR-1...
```

*#Values count of duplicated entries*

```
df['product_id'].value_counts()
```

```
product_id
B07JW9H4J1    3
B085DTN6R2    3
B07XLCFSSN    3
B077Z65HSD    3
B09W5XR9RT    3
..
B0BNVBJW2S    1
B09VZBGL1N    1
B01F262EUU    1
B0BBFJLP21    1
B01486F4G6    1
```

```
Name: count, Length: 1351, dtype: int64
```

*#Randomly check*

```
df[df['product_id']=='B07JW9H4J1']
```

```
product_id product_name \
0 B07JW9H4J1 Wayona Nylon Braided USB to Lightning Fast Cha...
369 B07JW9H4J1 Wayona Nylon Braided USB to Lightning Fast Cha...
614 B07JW9H4J1 Wayona Nylon Braided USB to Lightning Fast Cha...
```

```
category
discounted_price \
```

0	Computers&Accessories Accessories&Peripherals ...			
₹399				
369	Computers&Accessories Accessories&Peripherals ...			
₹399				
614	Computers&Accessories Accessories&Peripherals ...			
₹399				

	actual_price	discount_percentage	rating	rating_count	\
0	₹1,099	64%	4.2	24,269	
369	₹1,099	64%	4.2	24,270	
614	₹1,099	64%	4.2	24,269	

	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
369	High Compatibility : Compatible With iPhone 12...	
614	High Compatibility : Compatible With iPhone 12...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
369	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
614	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
369	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
614	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHFO,R6AQJGUP6P86,R1K...	
369	R3HXWT0LRP0NMF,R2AJM3LFTLZHFO,R6AQJGUP6P86,R1K...	
614	R3HXWT0LRP0NMF,R2AJM3LFTLZHFO,R6AQJGUP6P86,R1K...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
369	Satisfied,Charging is really fast,Value for mo...	
614	Satisfied,Charging is really fast,Value for mo...	

	review_content	\
0	Looks durable Charging is fine tooNo complains...	
369	Looks durable Charging is fine tooNo complains...	
614	Looks durable Charging is fine tooNo complains...	

	img_link	\
0	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>	
369	<a href="https://m.media-amazon.com/images/I/51UsScvHQN...">https://m.media-amazon.com/images/I/51UsScvHQN...</a>	
614	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>	

	product_link
0	<a href="https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...">https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...</a>



```
369 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
614 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
```

*#Drop duplicates but keep first of all of them*

```
df.drop_duplicates(subset='product_id',keep='first',inplace=True)
```

```
df.head(5)
```

	product_id	product_name \
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...

	category	discounted_price
0	Computers&Accessories Accessories&Peripherals ...	₹399
1	Computers&Accessories Accessories&Peripherals ...	₹199
2	Computers&Accessories Accessories&Peripherals ...	₹199
3	Computers&Accessories Accessories&Peripherals ...	₹329
4	Computers&Accessories Accessories&Peripherals ...	₹154

	actual_price	discount_percentage	rating	rating_count \
0	₹1,099	64%	4.2	24,269
1	₹349	43%	4.0	43,994
2	₹1,899	90%	3.9	7,928
3	₹699	53%	4.2	94,363
4	₹399	61%	4.2	16,905

	about_product \
0	High Compatibility : Compatible With iPhone 12...
1	Compatible with all Type C enabled devices, be...
2	【 Fast Charger& Data Sync】-With built-in safet...
3	The boAt Deuce USB 300 2 in 1 cable is compati...
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...

	user_id \
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...
1	AECPFYFQVRUWC3KGNLJI0REFP5LQ,AGYYVPDD7YG7FYNBX...
2	AGU3BBQ2V2DDAM0AKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...
3	AEWAZDZZJLQYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...
4	AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...

	user_name \
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...

```

1 ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...
2 Kunal,Himanshu,viswanath,sai niharka,saqib mal...
3 Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...
4 rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...

```

```

                                review_id \
0 R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...
1 RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...
2 R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...
3 R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...
4 R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...

```

```

                                review_title \
0 Satisfied,Charging is really fast,Value for mo...
1 A Good Braided Cable for Your Type C Device,Go...
2 Good speed for earlier versions,Good Product,W...
3 Good product,Good one,Nice,Really nice product...
4 As good as original,Decent,Good one for second...

```

```

                                review_content \
0 Looks durable Charging is fine tooNo complains...
1 I ordered this cable to connect my phone to An...
2 Not quite durable and sturdy,https://m.media-a...
3 Good product,long wire,Charges good,Nice,I bou...
4 Bought this instead of original apple, does th...

```

```

                                img_link \
0 https://m.media-amazon.com/images/W/WEBP_40237...
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...

```

```

                                product_link
0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...

```

*#No. of unique entries check*

```
df['category'].nunique()
```

```
211
```

*#Chech category*

```
df[df.duplicated(subset='category')].head(5)
```

```

                                product_id                                product_name \
1 B098NS6PVG  Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2 B096MSW6CT  Sounce Fast Phone Charging Cable & Data Sync U...

```

3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...
5	B08Y1TFSP6	pTron Solero TB301 3A Type-C Data and Fast Cha...

	category	discounted_price
1	Computers&Accessories Accessories&Peripherals ...	₹199
2	Computers&Accessories Accessories&Peripherals ...	₹199
3	Computers&Accessories Accessories&Peripherals ...	₹329
4	Computers&Accessories Accessories&Peripherals ...	₹154
5	Computers&Accessories Accessories&Peripherals ...	₹149

	actual_price	discount_percentage	rating	rating_count
1	₹349	43%	4.0	43,994
2	₹1,899	90%	3.9	7,928
3	₹699	53%	4.2	94,363
4	₹399	61%	4.2	16,905
5	₹1,000	85%	3.9	24,871

	about_product
1	Compatible with all Type C enabled devices, be...
2	【Fast Charger& Data Sync】-With built-in safet...
3	The boAt Deuce USB 300 2 in 1 cable is compati...
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...
5	Fast Charging & Data Sync: Solero TB301 Type-C...

	user_id
1	AECPFYFQVRUWC3KGNLJI0REFP5LQ,AGYYVPDD7YG7FYNBX...
2	AGU3BBQ2V2DDAM0AKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...
4	AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...
5	AEQ2YMXSZWE0HK2EHTNLOS56YTZQ,AGRVINWECNY7323CW...

	user_name
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...
5	Jayesh,Rajesh k.,Soopy,amazon customer,Aman,Sh...

	review_id
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...

```
5 R7S8ANNSDPR40,R3CLZFLHVJU26P,RFF7U7MPQFUGR,R1M...
```

```
review_title \
1 A Good Braided Cable for Your Type C Device,Go...
2 Good speed for earlier versions,Good Product,W...
3 Good product,Good one,Nice,Really nice product...
4 As good as original,Decent,Good one for second...
5 It's pretty good,Average quality,very good and...
```

```
review_content \
1 I ordered this cable to connect my phone to An...
2 Not quite durable and sturdy,https://m.media-a...
3 Good product,long wire,Charges good,Nice,I bou...
4 Bought this instead of original apple, does th...
5 It's a good product.,Like,Very good item stron...
```

```
img_link \
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...
5 https://m.media-amazon.com/images/I/31w0PjcSxl...
```

```
product_link
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...
5 https://www.amazon.in/Solero-TB301-Charging-48...
```

```
df['product_name'].nunique()
```

```
1337
```

```
#Randomly check
```

```
df[df['product_id']==df['product_name']]
```

```
Empty DataFrame
```

```
Columns: [product_id, product_name, category, discounted_price,
actual_price, discount_percentage, rating, rating_count,
about_product, user_id, user_name, review_id, review_title,
review_content, img_link, product_link]
Index: []
```

```
#Convert ₹ and , into ''
```

```
df.replace({'discounted_price' :
{'₹':'',' ',' ':''}} ,regex=True,inplace=True)
```

```
#Then we can convert datatype
```

```
df['discounted_price']=df['discounted_price'].astype(float)
```

```
df.head(5)
```

	product_id	product_name	\
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...	
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...	
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...	
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...	
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...	

	category	discounted_price
0	Computers&Accessories Accessories&Peripherals ...	399.0
1	Computers&Accessories Accessories&Peripherals ...	199.0
2	Computers&Accessories Accessories&Peripherals ...	199.0
3	Computers&Accessories Accessories&Peripherals ...	329.0
4	Computers&Accessories Accessories&Peripherals ...	154.0

	actual_price	discount_percentage	rating	rating_count	\
0	₹1,099	64%	4.2	24,269	
1	₹349	43%	4.0	43,994	
2	₹1,899	90%	3.9	7,928	
3	₹699	53%	4.2	94,363	
4	₹399	61%	4.2	16,905	

	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
1	Compatible with all Type C enabled devices, be...	
2	【 Fast Charger& Data Sync】-With built-in safet...	
3	The boAt Deuce USB 300 2 in 1 cable is compati...	
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHFO,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

```

                                review_title \
0  Satisfied,Charging is really fast,Value for mo...
1  A Good Braided Cable for Your Type C Device,Go...
2  Good speed for earlier versions,Good Product,W...
3  Good product,Good one,Nice,Really nice product...
4  As good as original,Decent,Good one for second...

```

	review_content \
0	Looks durable Charging is fine tooNo complains...
1	I ordered this cable to connect my phone to An...
2	Not quite durable and sturdy,https://m.media-a...
3	Good product,long wire,Charges good,Nice,I bou...
4	Bought this instead of original apple, does th...

	img_link
0	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>
1	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>
2	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>
3	<a href="https://m.media-amazon.com/images/I/41V5FtEWPk...">https://m.media-amazon.com/images/I/41V5FtEWPk...</a>
4	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>

```

                                product_link
0  https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1  https://www.amazon.in/Ambrane-Unbreakable-Char...
2  https://www.amazon.in/Source-iPhone-Charging-C...
3  https://www.amazon.in/Deuce-300-Resistant-Tang...
4  https://www.amazon.in/Portronics-Konnect-POR-1...

```

```
##Convert ₹ and , into ''
```

```
df.replace({'actual_price' : {'₹': '', ',': ''}}, regex=True, inplace=True)
```

```
df['actual price']=df['actual price'].astype(float)
```

```
df.head(5)
```

	product_id	product_name
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...
3	B08HJDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...

	category	discounted_price
--	----------	------------------

0	Computers&Accessories Accessories&Peripherals ...	399.0
1	Computers&Accessories Accessories&Peripherals ...	199.0
2	Computers&Accessories Accessories&Peripherals ...	199.0
3	Computers&Accessories Accessories&Peripherals ...	329.0
4	Computers&Accessories Accessories&Peripherals ...	154.0

	actual_price	discount_percentage	rating	rating_count	\
0	1099.0	64%	4.2	24,269	
1	349.0	43%	4.0	43,994	
2	1899.0	90%	3.9	7,928	
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	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
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3	The boAt Deuce USB 300 2 in 1 cable is compati...	
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
1	A Good Braided Cable for Your Type C Device,Go...	
2	Good speed for earlier versions,Good Product,W...	

```
3 Good product,Good one,Nice,Really nice product...
4 As good as original,Decent,Good one for second...
```

```
review_content \
0 Looks durable Charging is fine tooNo complains...
1 I ordered this cable to connect my phone to An...
2 Not quite durable and sturdy,https://m.media-a...
3 Good product,long wire,Charges good,Nice,I bou...
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```

```
img_link \
0 https://m.media-amazon.com/images/W/WEBP_40237...
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...
```

```
product_link
0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...
```

```
##Convert % into ''
df['discount_percentage'] =
df['discount_percentage'].str.replace('%','').astype(float)
df.head(5)
```

```
product_id product_name \
0 B07JW9H4J1 Wayona Nylon Braided USB to Lightning Fast Cha...
1 B098NS6PVG Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2 B096MSW6CT Sounce Fast Phone Charging Cable & Data Sync U...
3 B08HDJ86NZ boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4 B08CF3B7N1 Portronics Konnect L 1.2M Fast Charging 3A 8 P...
```

```
category discounted_price \
0 Computers&Accessories|Accessories&Peripherals|... 399.0
1 Computers&Accessories|Accessories&Peripherals|... 199.0
2 Computers&Accessories|Accessories&Peripherals|... 199.0
3 Computers&Accessories|Accessories&Peripherals|... 329.0
4 Computers&Accessories|Accessories&Peripherals|... 154.0
```

```
actual_price discount_percentage rating rating_count \
```



0	1099.0	64.0	4.2	24,269
1	349.0	43.0	4.0	43,994
2	1899.0	90.0	3.9	7,928
3	699.0	53.0	4.2	94,363
4	399.0	61.0	4.2	16,905

about\_product \

0	High Compatibility : Compatible With iPhone 12...
1	Compatible with all Type C enabled devices, be...
2	【 Fast Charger& Data Sync】 -With built-in safet...
3	The boAt Deuce USB 300 2 in 1 cable is compati...
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...

user\_id \

0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...
3	AEWAZDZZJLQUYV0VGBEUKSLXHQA,AG5HTSFRRE6NL3M5S...
4	AE3Q6KSUK5P75D5HFYHCRAOLODSA,AFUGIFH5ZAFXRDSZH...

user\_name \

0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...

review\_id \

0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...

review\_title \

0	Satisfied,Charging is really fast,Value for mo...
1	A Good Braided Cable for Your Type C Device,Go...
2	Good speed for earlier versions,Good Product,W...
3	Good product,Good one,Nice,Really nice product...
4	As good as original,Decent,Good one for second...

review\_content \

0	Looks durable Charging is fine tooNo complains...
1	I ordered this cable to connect my phone to An...
2	Not quite durable and sturdy,https://m.media-a...
3	Good product,long wire,Charges good,Nice,I bou...
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img\_link \

0	<a href="https://m.media-amazon.com/images/W/WEBP_40237...">https://m.media-amazon.com/images/W/WEBP_40237...</a>
---	---

```

1 https://m.media-amazon.com/images/W/WEBP_40237...
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3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...

```

```

                                product_link
0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...
1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...

```

*#Unique values check*

```
df['rating'].unique()
```

```

array(['4.2', '4.0', '3.9', '4.1', '4.3', '4.4', '4.5', '3.7', '3.3',
       '3.6', '3.4', '3.8', '3.5', '4.6', '3.2', '5.0', '4.7', '3.0',
       '2.8', '4', '3.1', '4.8', '2.3', '|', '2', '3', '2.6', '2.9'],
      dtype=object)

```

*#Replace | into NaN value*

```
df['rating'] = df['rating'].replace('|', np.nan)
```

*#Then fill with median value of column*

```
df['rating'] = df['rating'].fillna(df['rating'].median)
```

```
df['rating'] = pd.to_numeric(df['rating'], errors='coerce')
```

```
df['rating'] = df['rating'].astype(float)
```

*#Fill NaN values with median*

```

df['rating_count'] =
df['rating_count'].fillna(df['rating_count'].median)

```

```
df.head(5)
```

	product_id	product_name \
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...

	category	discounted_price
0	Computers&Accessories Accessories&Peripherals ...	399.0
1	Computers&Accessories Accessories&Peripherals ...	199.0
2	Computers&Accessories Accessories&Peripherals ...	199.0
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4 Computers&Accessories|Accessories&Peripherals|... 154.0

	actual_price	discount_percentage	rating	rating_count	\
0	1099.0	64.0	4.2	24,269	
1	349.0	43.0	4.0	43,994	
2	1899.0	90.0	3.9	7,928	
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	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
1	Compatible with all Type C enabled devices, be...	
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	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAM0AKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRAOLODSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
1	A Good Braided Cable for Your Type C Device,Go...	
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3	Good product,Good one,Nice,Really nice product...	
4	As good as original,Decent,Good one for second...	

	review_content	\
0	Looks durable Charging is fine tooNo complains...	
1	I ordered this cable to connect my phone to An...	
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```
3 Good product,long wire,Charges good,Nice,I bou...
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```

```
img_link \
0 https://m.media-amazon.com/images/W/WEBP_40237...
1 https://m.media-amazon.com/images/W/WEBP_40237...
2 https://m.media-amazon.com/images/W/WEBP_40237...
3 https://m.media-amazon.com/images/I/41V5FtEWPk...
4 https://m.media-amazon.com/images/W/WEBP_40237...
```

```
product_link
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1 https://www.amazon.in/Ambrane-Unbreakable-Char...
2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...
```

```
df['rating_count'] =
df['rating_count'].str.replace(',','').astype(float)
df.head(5)
```

```
product_id product_name \
0 B07JW9H4J1 Wayona Nylon Braided USB to Lightning Fast Cha...
1 B098NS6PVG Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2 B096MSW6CT Sounce Fast Phone Charging Cable & Data Sync U...
3 B08HDJ86NZ boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4 B08CF3B7N1 Portronics Konnect L 1.2M Fast Charging 3A 8 P...
```

```
category discounted_price
\
0 Computers&Accessories|Accessories&Peripherals|... 399.0
1 Computers&Accessories|Accessories&Peripherals|... 199.0
2 Computers&Accessories|Accessories&Peripherals|... 199.0
3 Computers&Accessories|Accessories&Peripherals|... 329.0
4 Computers&Accessories|Accessories&Peripherals|... 154.0
```

```
actual_price discount_percentage rating rating_count \
0 1099.0 64.0 4.2 24269.0
1 349.0 43.0 4.0 43994.0
2 1899.0 90.0 3.9 7928.0
3 699.0 53.0 4.2 94363.0
4 399.0 61.0 4.2 16905.0
```

```
about_product \
0 High Compatibility : Compatible With iPhone 12...
```

1 Compatible with all Type C enabled devices, be...  
2 【Fast Charger& Data Sync】 -With built-in safet...  
3 The boAt Deuce USB 300 2 in 1 cable is compati...  
4 [CHARGE & SYNC FUNCTION]- This cable comes wit...

user\_id \

0 AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...  
1 AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...  
2 AGU3BBQ2V2DDAM0AKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...  
3 AEWAZDZZJLQYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...  
4 AE3Q6KSUK5P75D5HFYHCRA0LODSA,AFUGIFH5ZAFXRDSZH...

user\_name \

0 Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...  
1 ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...  
2 Kunal,Himanshu,viswanath,sai niharka,saqib mal...  
3 Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...  
4 rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...

review\_id \

0 R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...  
1 RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...  
2 R3J3EQ09TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...  
3 R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...  
4 R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...

review\_title \

0 Satisfied,Charging is really fast,Value for mo...  
1 A Good Braided Cable for Your Type C Device,Go...  
2 Good speed for earlier versions,Good Product,W...  
3 Good product,Good one,Nice,Really nice product...  
4 As good as original,Decent,Good one for second...

review\_content \

0 Looks durable Charging is fine tooNo complains...  
1 I ordered this cable to connect my phone to An...  
2 Not quite durable and sturdy,https://m.media-a...  
3 Good product,long wire,Charges good,Nice,I bou...  
4 Bought this instead of original apple, does th...

img\_link \

0 https://m.media-amazon.com/images/W/WEBP\_40237...  
1 https://m.media-amazon.com/images/W/WEBP\_40237...  
2 https://m.media-amazon.com/images/W/WEBP\_40237...  
3 https://m.media-amazon.com/images/I/41V5FtEWPk...  
4 https://m.media-amazon.com/images/W/WEBP\_40237...

product\_link

0 https://www.amazon.in/Wayona-Braided-WN3LG1-Sy...  
1 https://www.amazon.in/Ambrane-Unbreakable-Char...

```

2 https://www.amazon.in/Sounce-iPhone-Charging-C...
3 https://www.amazon.in/Deuce-300-Resistant-Tang...
4 https://www.amazon.in/Portronics-Konnect-POR-1...

#Drop columns
df.drop(columns=['img_link', 'product_link'], inplace=True)

positive_keywords =
['good', 'excellent', 'amazing', 'awesome', 'perfect', 'nice', 'love', 'best',
 'satisfied', 'great', 'worth', 'fantastic', 'happy', 'useful', 'recommend',
 'comfortable', 'affordable', 'reliable', 'brilliant', 'liked']
negative_keywords =
['bad', 'poor', 'worst', 'disappointed', 'waste', 'terrible', 'hate', 'broken',
 'cheap', 'problem', 'issue', 'damaged', 'unhappy', 'delay', 'uncomfortable',
 'not working', "doesn't working", 'fake', 'low quality']

#Category conditions
def check(text):
    text = str(text).lower()
    pos = sum(1 for word in positive_keywords if word in text)
    neg = sum(1 for word in negative_keywords if word in text)

    if pos > neg:
        return 'Positive'
    elif neg > pos:
        return "Negative"

    elif pos==0 and neg==0:
        return 'Neutral'
    else:
        return 'Neutral'

df['review_category'] = df['review_title'].apply(check)

df.head(5)

```

	product_id	product_name \
0	B07JW9H4J1	Wayona Nylon Braided USB to Lightning Fast Cha...
1	B098NS6PVG	Ambrane Unbreakable 60W / 3A Fast Charging 1.5...
2	B096MSW6CT	Sounce Fast Phone Charging Cable & Data Sync U...
3	B08HDJ86NZ	boAt Deuce USB 300 2 in 1 Type-C & Micro USB S...
4	B08CF3B7N1	Portronics Konnect L 1.2M Fast Charging 3A 8 P...

	category	discounted_price
0	Computers&Accessories Accessories&Peripherals ...	399.0
1	Computers&Accessories Accessories&Peripherals ...	199.0
2	Computers&Accessories Accessories&Peripherals ...	199.0

3	Computers&Accessories Accessories&Peripherals ...	329.0
4	Computers&Accessories Accessories&Peripherals ...	154.0

	actual_price	discount_percentage	rating	rating_count	\
0	1099.0	64.0	4.2	24269.0	
1	349.0	43.0	4.0	43994.0	
2	1899.0	90.0	3.9	7928.0	
3	699.0	53.0	4.2	94363.0	
4	399.0	61.0	4.2	16905.0	

	about_product	\
0	High Compatibility : Compatible With iPhone 12...	
1	Compatible with all Type C enabled devices, be...	
2	【 Fast Charger& Data Sync】 -With built-in safet...	
3	The boAt Deuce USB 300 2 in 1 cable is compati...	
4	[CHARGE & SYNC FUNCTION]- This cable comes wit...	

	user_id	\
0	AG3D604STAQKAY2UVGEUV46KN35Q,AHMY5CWJMMK5BJRBB...	
1	AECPFYFQVRUWC3KGNLJIOREFP5LQ,AGYYVPDD7YG7FYNBX...	
2	AGU3BBQ2V2DDAMOAKGFAWDDQ6QHA,AESFLDV2PT363T2AQ...	
3	AEWAZDZZJLQUYV0VGBEUKSLXHQ5A,AG5HTSFRRE6NL3M5S...	
4	AE3Q6KSUK5P75D5HFYHCRAOL0DSA,AFUGIFH5ZAFXRDSZH...	

	user_name	\
0	Manav,Adarsh gupta,Sundeep,S.Sayeed Ahmed,jasp...	
1	ArdKn,Nirbhay kumar,Sagar Viswanathan,Asp,Plac...	
2	Kunal,Himanshu,viswanath,sai niharka,saqib mal...	
3	Omkar dhale,JD,HEMALATHA,Ajwadh a.,amar singh ...	
4	rahuls6099,Swasat Borah,Ajay Wadke,Pranali,RVK...	

	review_id	\
0	R3HXWT0LRP0NMF,R2AJM3LFTLZHF0,R6AQJGUP6P86,R1K...	
1	RGIQEG07R9HS2,R1SMWZQ86XIN8U,R2J3Y1WL29GWDE,RY...	
2	R3J3EQQ9TZI5ZJ,R3E7WBGK7ID0KV,RWU79XKQ6I1QF,R2...	
3	R3EEUZKKK9J36I,R3HJVYCLY0Y554,REDECAZ7AMPQC,R1...	
4	R1BP4L2HH9TFUP,R16PVJEXKV6QZS,R2UPDB81N66T4P,R...	

	review_title	\
0	Satisfied,Charging is really fast,Value for mo...	
1	A Good Braided Cable for Your Type C Device,Go...	
2	Good speed for earlier versions,Good Product,W...	
3	Good product,Good one,Nice,Really nice product...	
4	As good as original,Decent,Good one for second...	

	review_content	review_category
0	Looks durable Charging is fine tooNo complains...	Positive
1	I ordered this cable to connect my phone to An...	Neutral

2	Not quite durable and sturdy,https://m.media-a...	Positive
3	Good product,long wire,Charges good,Nice,I bou...	Positive
4	Bought this instead of original apple, does th...	Positive

*#Randomly check*

```
df[df["review_category"]=="Negative"].tail(3)
```

	product_id	product_name
1243	B0BFBNX594	Personal Size Blender, Portable Blender, Batte...
1255	B0B2DD8BQ8	Wipro Vesta Grill 1000 Watt Sandwich Maker  Du...
1359	B09MB3DKG1	KHAITAN AVAANTE KA-2013 1200 Watt 3-Rod Haloge...

	category	discounted_price
1243	Home&Kitchen Kitchen&HomeAppliances SmallKitch...	669.0
1255	Home&Kitchen Kitchen&HomeAppliances SmallKitch...	2079.0
1359	Home&Kitchen Heating,Cooling&AirQuality RoomHe...	2199.0

	actual_price	discount_percentage	rating	rating_count
1243	1499.0	55.0	2.3	13.0
1255	3099.0	33.0	4.1	282.0
1359	3999.0	45.0	3.5	340.0

	about_product
1243	✓【Easy to carry around】- This handheld blender...
1255	Truly multifunctional Grill Sandwich Maker whi...
1359	3 Rod Halogen tube element Instant heating Coo...

	user_id
1243	AHRDA66X063XYCBZJMW4EUJN3BFQ,AELE2S007LBNHXU7U...
1255	AGT6US6YWB52FSW73Z6GUN4YKLMA,AHNK645M7U3NYPVYH...
1359	AHR5L5KIBZTD0004PR5ZHTTVTZGA,AGYBZE2DXTN0FDZSS...

	user_name
1243	Manya,Been,Podili Parasuram,Rejoy Jacob,Priya
1255	Vaibhav G.,Archana A.,Tech & IoT savvy,SM Huss...
1359	Amazon Customer,sunil,pankaj kumar gupta,Air C...

	review_id
1243	R1WJ8T3U9P42IU,RM9RH8FX9U95D,R31M8UXT7NLOMY,R1...
1255	R21N00SUPFUA05,R2GPXUN1093HXF,R1DWVFYYKKIK74,R...
1359	R1DID47Y3SOM8N,RDR64CJXIU14Q,R35FYRYXQJUQKR,R2...

	review_title
1243	Nice product i recommend to buy,Do not buy!! D...
1255	Good!!,Came with a small scratch on the casing...
1359	Broken product,working related issue,Satisfact...



```

review_content
review_category
1243 I liked that it is so convenient to carry,Wast...
Negative
1255 A great product of convenience. The only drawb...
Negative
1359 ,after 15 days uts 2 tubes not working...waste...
Negative

#Extract Main category
df['main_category'] = df['category'].astype(str).str.split('|').str[0]
df['main_category']

0      Computers&Accessories
1      Computers&Accessories
2      Computers&Accessories
3      Computers&Accessories
4      Computers&Accessories
...
1460      Home&Kitchen
1461      Home&Kitchen
1462      Home&Kitchen
1463      Home&Kitchen
1464      Home&Kitchen
Name: main_category, Length: 1351, dtype: object

#Average rating of Main category
rating = df.groupby('main_category')
['rating'].mean().reset_index().sort_values('rating').head(20)
rating

   main_category  rating
0    Car&Motorbike  3.800000
6  MusicalInstruments  3.900000
3  Health&PersonalCare  4.000000
4      Home&Kitchen  4.040716
2      Electronics  4.077755
1  Computers&Accessories  4.153867
5      HomeImprovement  4.250000
8      Toys&Games  4.300000
7      OfficeProducts  4.309677

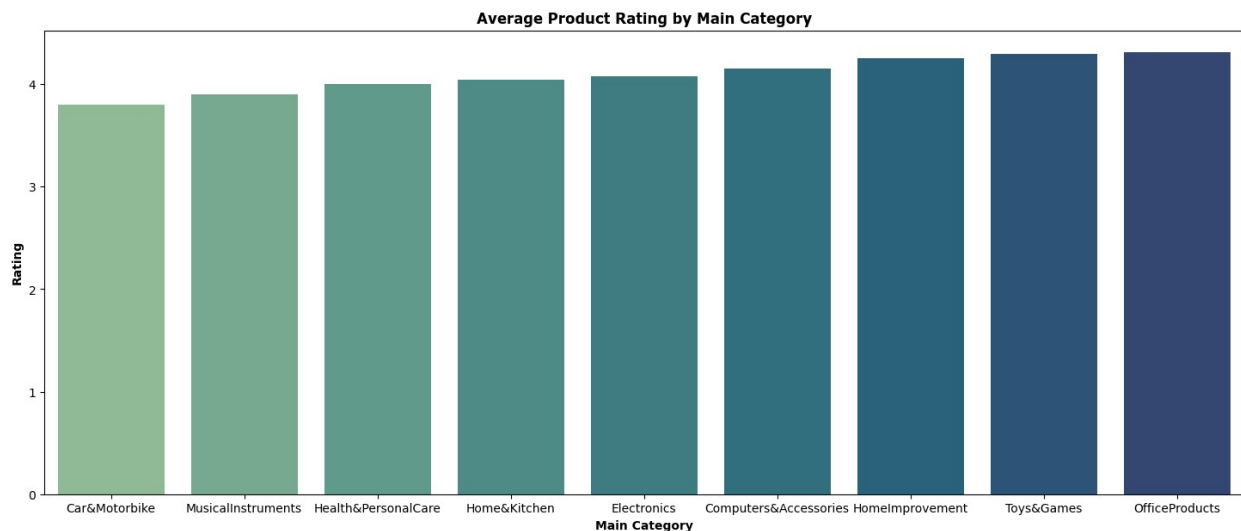
#Made barplot using previous condition
plt.figure(figsize=(18,7))
sns.barplot(x='main_category',y='rating',data=rating,palette='crest')
plt.xlabel('Main Category',fontweight = 'bold')
plt.ylabel("Rating",fontweight = 'bold')
plt.title("Average Product Rating by Main Category",fontweight =
'bold',fontname="Verdana")

```

```
C:\Users\karan\AppData\Local\Temp\ipykernel_12156\924889167.py:3:
FutureWarning:
```

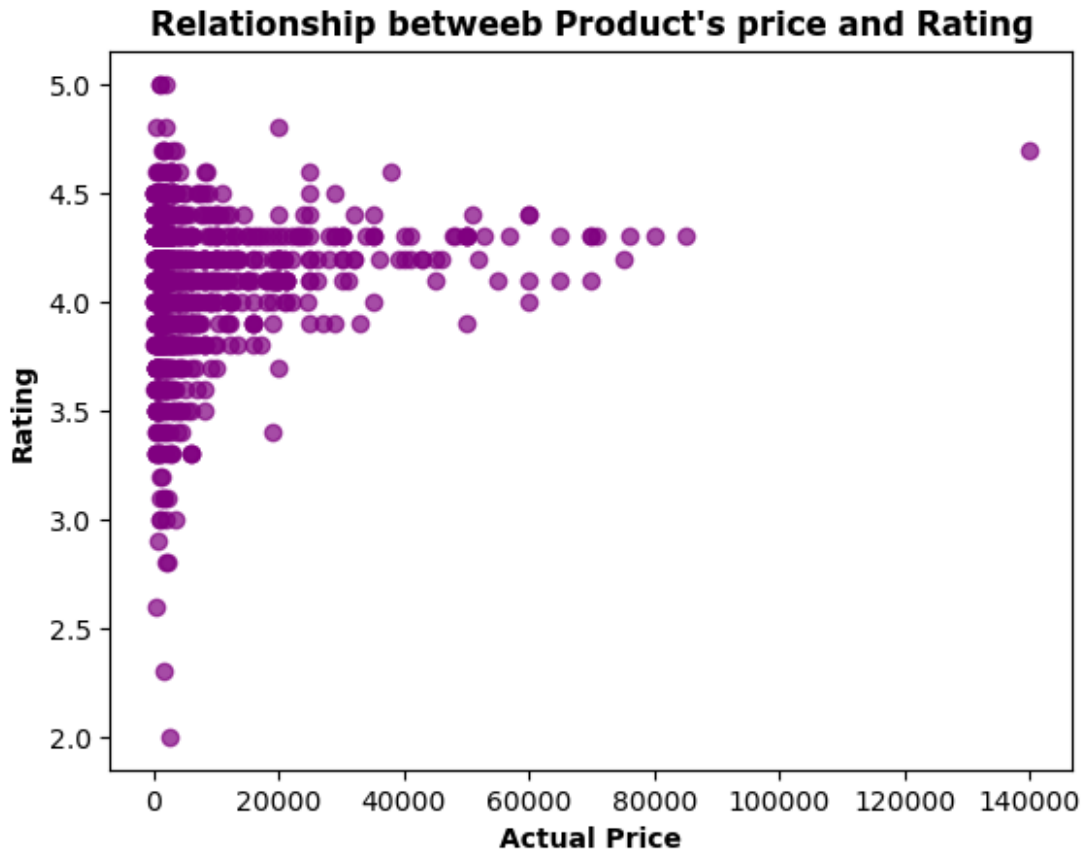
```
Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.
```

```
sns.barplot(x='main_category',y='rating',data=rating,palette='crest')
Text(0.5, 1.0, 'Average Product Rating by Main Category')
```



```
plt.scatter(data=df,x='actual_price',y='rating',alpha=0.7,color='purple')
plt.xlabel('Actual Price',fontweight = 'bold')
plt.ylabel("Rating",fontweight = 'bold')
plt.title("Relationship between Product's price and Rating",fontweight
= 'bold',fontname='Verdana')
```

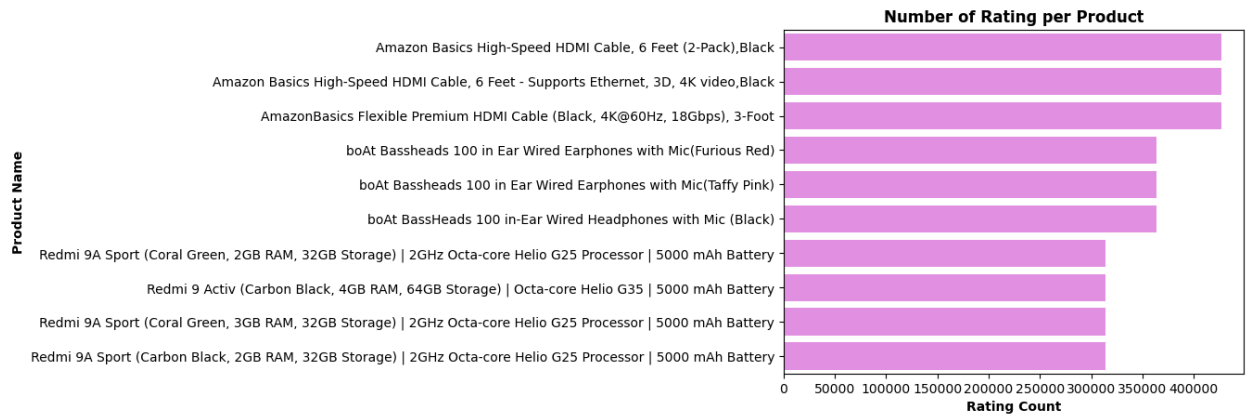
```
Text(0.5, 1.0, "Relationship between Product's price and Rating")
```



```
top =
df[['product_name','rating_count']].sort_values(by='rating_count',ascending=False).head(10)

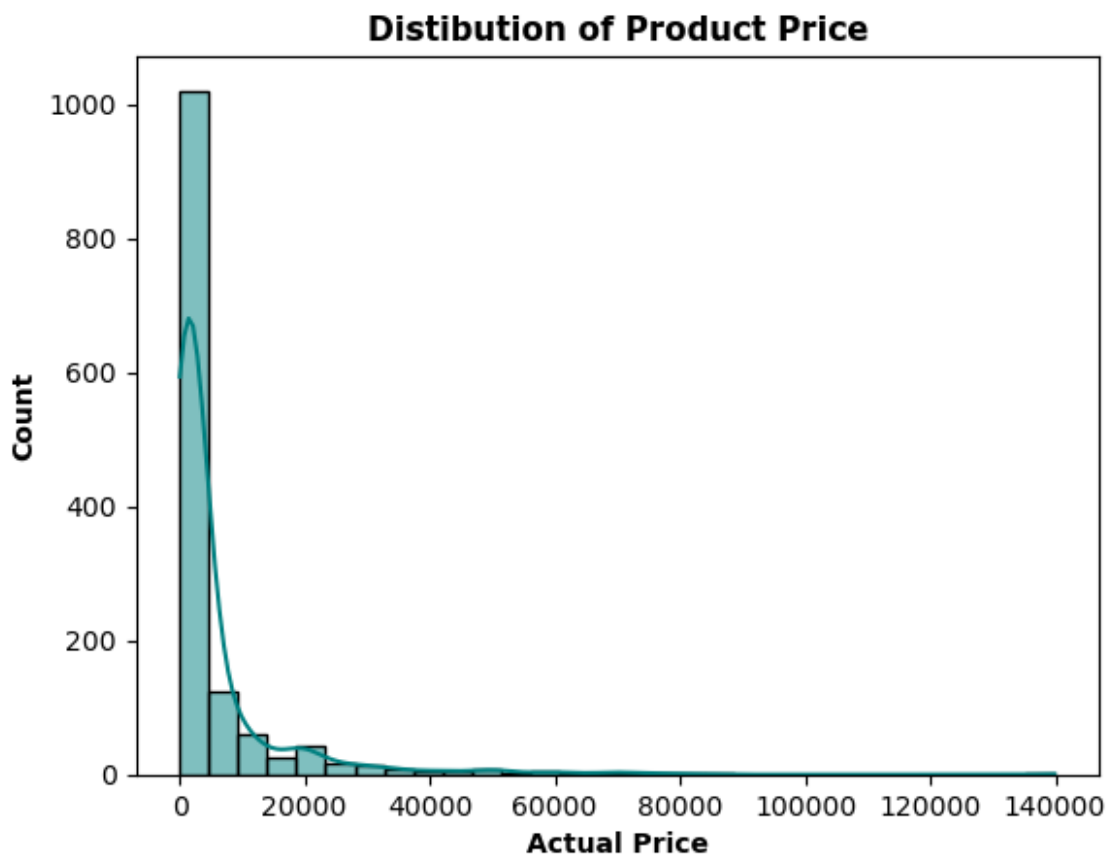
sns.barplot(data=top,x='rating_count',y='product_name',color='violet')
plt.xlabel('Rating Count',fontweight = 'bold')
plt.ylabel("Product Name",fontweight = 'bold')
plt.title("Number of Rating per Product",fontweight =
'bold',fontname='Verdana')

Text(0.5, 1.0, 'Number of Rating per Product')
```



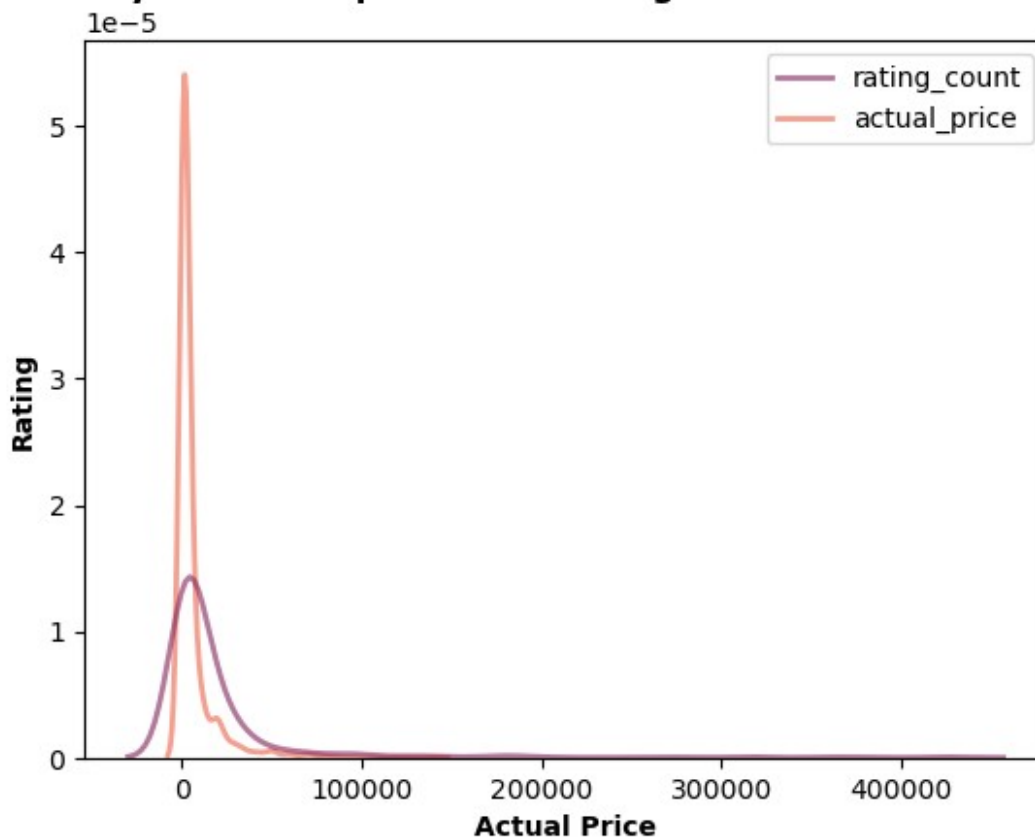
```
sns.histplot(df['actual_price'], bins=30, kde=True, color='teal')
plt.xlabel('Actual Price', fontweight = 'bold')
plt.ylabel('Count', fontweight = 'bold')
plt.title("Distribution of Product Price", fontweight =
'bold', fontname='Verdana')
```

```
Text(0.5, 1.0, 'Distribution of Product Price')
```

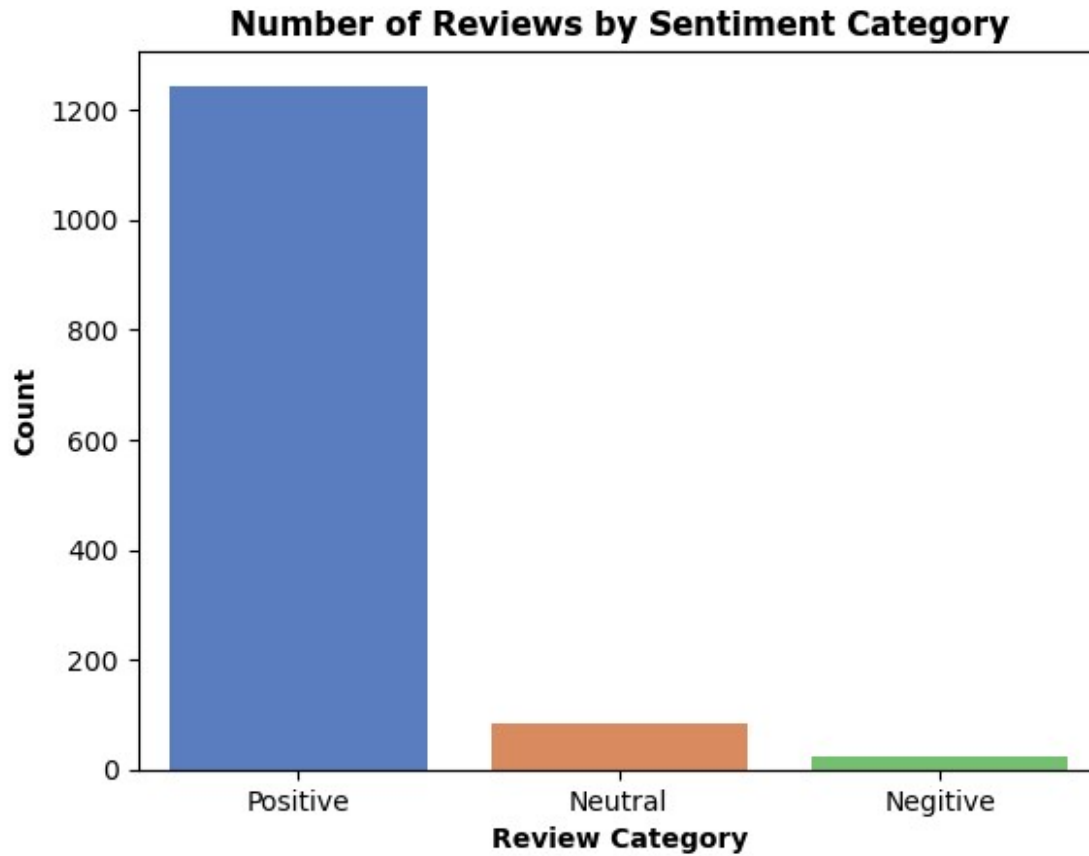


```
sns.kdeplot(data=(df[['rating_count','actual_price']]),palette='rocket',alpha=0.6,linewidth=2)
plt.xlabel('Actual Price',fontweight = 'bold')
plt.ylabel("Rating",fontweight = 'bold')
plt.title("Density relationship between Rating count and Product Price",fontweight = 'bold',fontname='Verdana')
Text(0.5, 1.0, 'Density relationship between Rating count and Product Price')
```

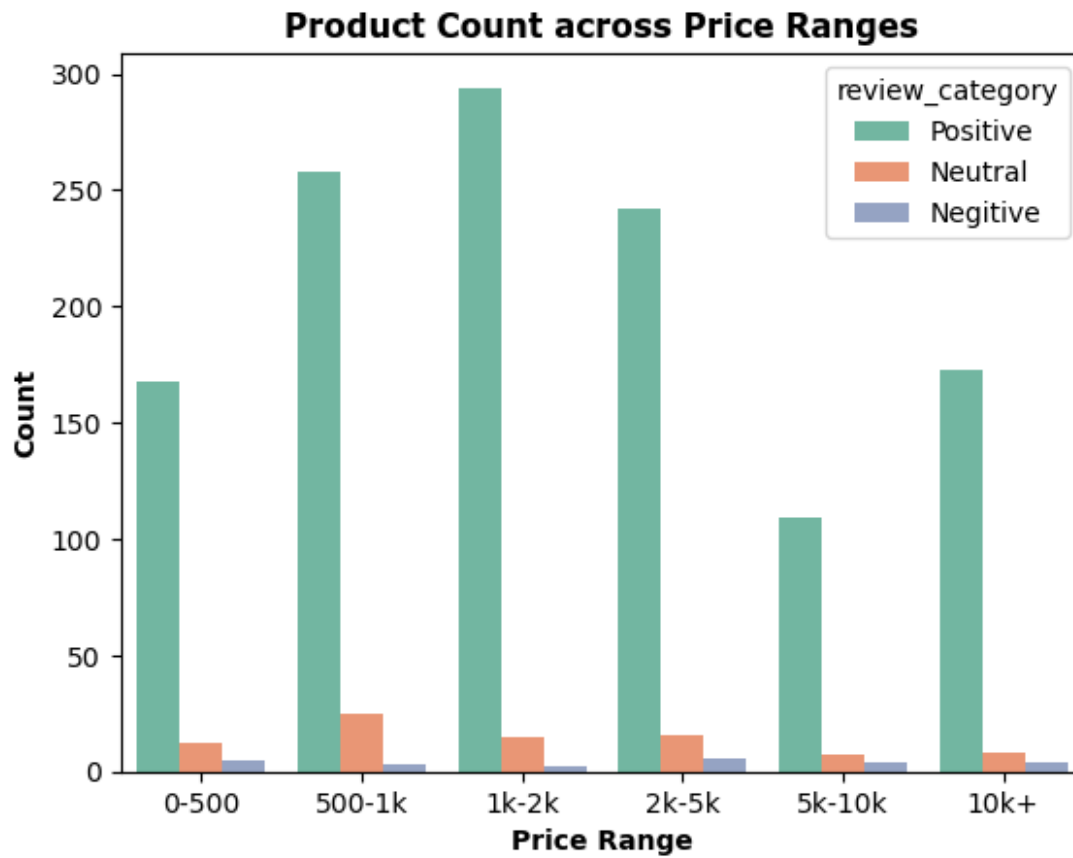
### Density relationship between Rating count and Product Price



```
sns.countplot(data=df,x='review_category',order = ['Positive','Neutral',"Negative"],hue='review_category',palette='muted')
plt.xlabel('Review Category',fontweight = 'bold')
plt.ylabel("Count",fontweight = 'bold')
plt.title("Number of Reviews by Sentiment Category",fontweight = 'bold',fontname='Verdana')
Text(0.5, 1.0, 'Number of Reviews by Sentiment Category')
```

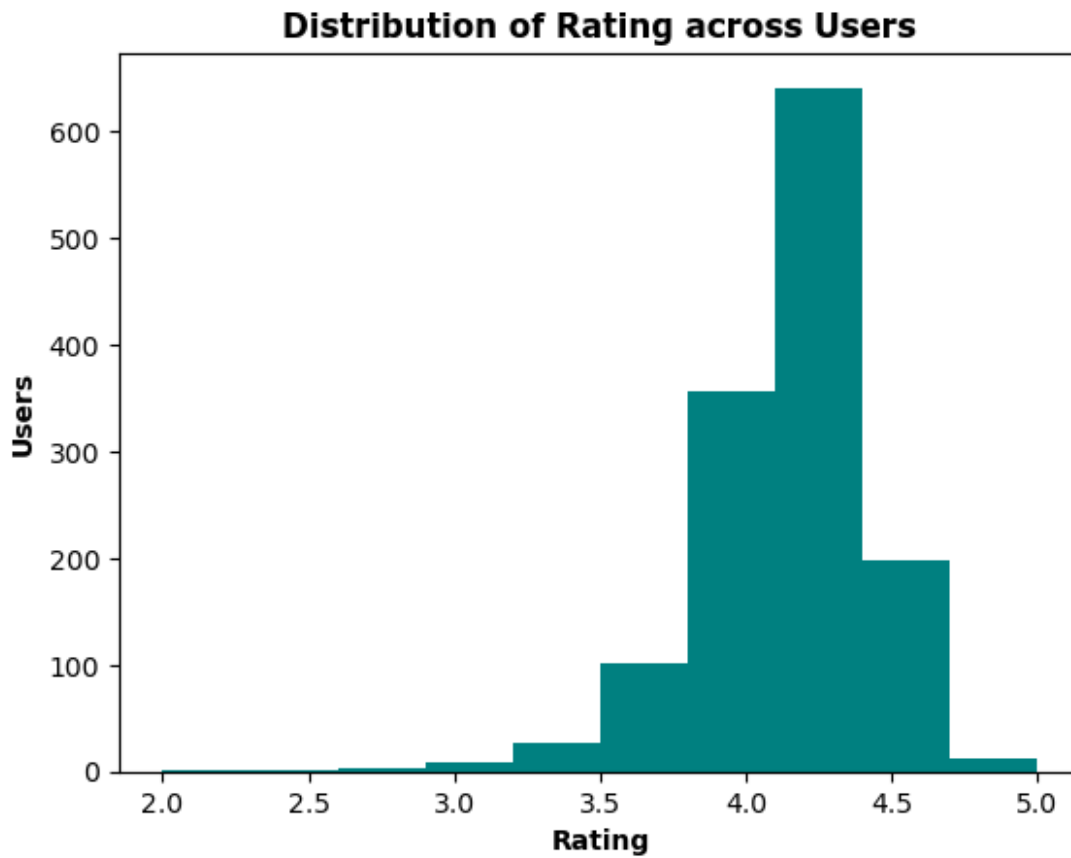


```
df['price_range'] =  
pd.cut(df['actual_price'],bins=[0,500,1000,2000,5000,10000,df['actual_  
price'].max()],labels=['0-500','500-1k','1k-2k','2k-5k','5k-  
10k','10k+'])  
sns.countplot(data=df,x='price_range',hue='review_category',palette='S  
et2')  
plt.xlabel('Price Range',fontweight = 'bold')  
plt.ylabel("Count",fontweight = 'bold')  
plt.title("Product Count across Price Ranges",fontweight =  
'bold',fontname='Verdana')  
Text(0.5, 1.0, 'Product Count across Price Ranges')
```



```
plt.hist(df['rating'],color='teal')
plt.xlabel('Rating',fontweight = 'bold')
plt.ylabel("Users",fontweight = 'bold')
plt.title("Distribution of Rating across Users",fontweight =
'bold',fontname='Verdana')
```

```
Text(0.5, 1.0, 'Distribution of Rating across Users')
```

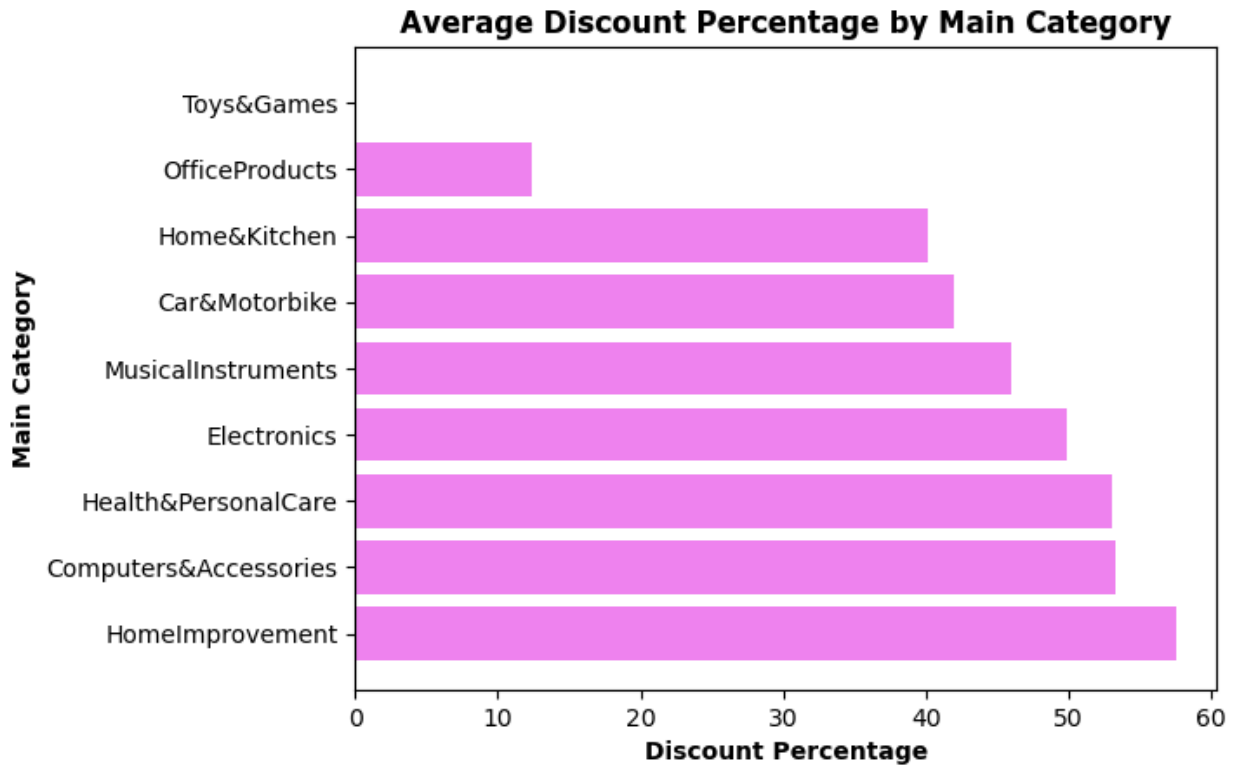


```
dis = df.groupby('main_category')
['discount_percentage'].mean().sort_values(ascending=False)

plt.barh(dis.index,dis.values,color='violet')
plt.xlabel('Discount Percentage',fontweight = 'bold')
plt.ylabel("Main Category",fontweight = 'bold')
plt.title("Average Discount Percentage by Main Category",fontweight =
'bold',fontname='Verdana')

Text(0.5, 1.0, 'Average Discount Percentage by Main Category')
```





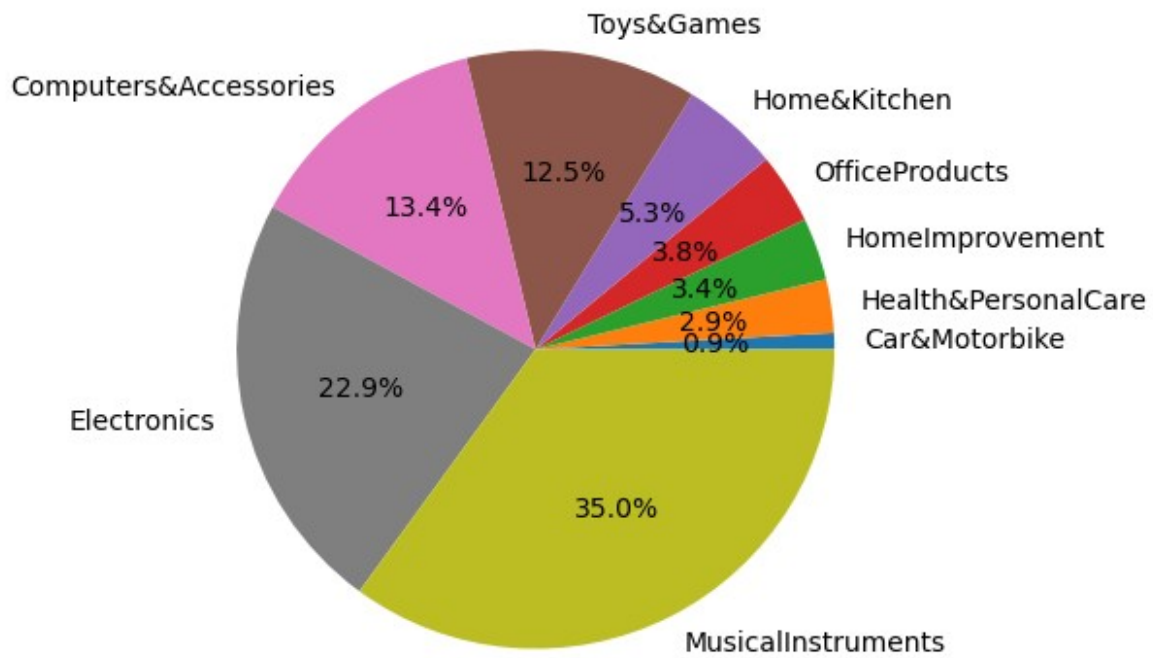
```
top_10 = df.groupby('main_category')
['rating_count'].mean().sort_values(ascending=True)
top_10
```

```
main_category
Car&Motorbike      1118.000000
Health&PersonalCare  3663.000000
HomeImprovement    4283.000000
OfficeProducts     4828.225806
Home&Kitchen       6676.493304
Toys&Games         15867.000000
Computers&Accessories  16984.388740
Electronics        28996.746939
MusicalInstruments  44441.000000
Name: rating_count, dtype: float64
```

```
plt.figure(figsize=(10,5))
plt.pie(top_10.values,labels=top_10.index,autopct='%0.1f%%')
plt.title("Average rating count Distribution by Main category",fontweight = 'bold',fontname='Verdana')
```

```
Text(0.5, 1.0, 'Average rating count Distribution by Main category')
```

## Average rating count Distribution by Main category



```
df.to_csv('Updated_Amazon_dataset.csv')
```

THANK YOU...