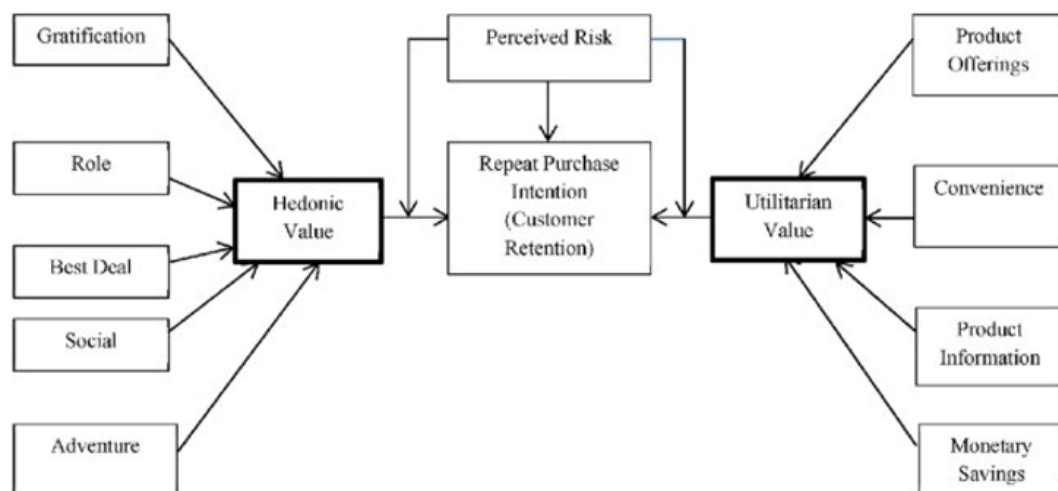


Customer Retention Case Study

Customer satisfaction has emerged as one of the most important factors that guarantee the success of online store; it has been posited as a key stimulant of purchase, repurchase intentions and customer loyalty. A comprehensive review of the literature, theories and models have been carried out to propose the models for customer activation and customer retention. Five major factors that contributed to the success of an e-commerce store have been identified as: service quality, system quality, information quality, trust and net benefit. The research furthermore investigated the factors that influence the online customers repeat purchase intention. The combination of both utilitarian value and hedonistic values are needed to affect the repeat purchase intention (loyalty) positively. The data is collected from the Indian online shoppers. Results indicate the e-retail success factors, which are very much critical for customer satisfaction.



Activ
Gate

In [1]: *# Importing necessary Libraries*

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

In [2]: *# in the above cell I have stored the excel file and then separated the spreadsheets in*

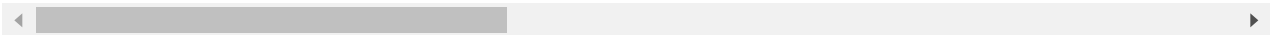
```
xls = pd.ExcelFile('E:\DS Intership projects\Project form Mentor\Cutomer retention\cust
df1 = pd.read_excel(xls, 'datasheet') # sheet 1
df2 = pd.read_excel(xls, 'codedsheet') # sheet 2
```

In [4]: df1.head(5)

Out[4]:

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	4 What is the Pin Code of where you shop online from?	5 Since How Long You are Shopping Online ?	6 How many times you have made an online purchase in the past 1 year?	7 How do you access the internet while shopping on-line?	8 Which device do you use to access the online shopping?	9 What is the screen size of your mobile device?	10
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others	Window
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	Wi-Fi	Smartphone	4.7 inches	
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobile Internet	Smartphone	5.5 inches	
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	
4	Female	21-30 years	Bangalore	530068	2-3 years	11-20 times	Wi-Fi	Smartphone	4.7 inches	

5 rows × 71 columns



```
In [5]: df1.tail(5)
```

Out[5]:

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	4 What is the Pin Code of where you shop online from?	5 Since How Long You are Shopping Online ?	6 How many times you have made an online purchase in the past 1 year?	7 How do you access the internet while shopping on-line?	8 Which device do you use to access the online shopping?	9 What is the screen size of your mobile device?	10
264	Female	21-30 years	Solan	173212	1-2 years	Less than 10 times	Mobile Internet	Smartphone	5.5 inches	
265	Female	31-40 years	Ghaziabad	201008	1-2 years	31-40 times	Mobile Internet	Smartphone	Others	
266	Female	41-50 yaers	Bangalore	560010	2-3 years	Less than 10 times	Mobile internet	Laptop	Others	Wi


```

',
    '17 Why did you abandon the “Bag”, “Shopping Cart”?\\t\\t\\t\\t\\t
',
    '18 The content on the website must be easy to read and understand',
    '19 Information on similar product to the one highlighted is important for produ
ct comparison',
    '20 Complete information on listed seller and product being offered is important
for purchase decision.',
    '21 All relevant information on listed products must be stated clearly',
    '22 Ease of navigation in website', '23 Loading and processing speed',
    '24 User friendly Interface of the website',
    '25 Convenient Payment methods',
    '26 Trust that the online retail store will fulfill its part of the transaction a
t the stipulated time',
    '27 Empathy (readiness to assist with queries) towards the customers',
    '28 Being able to guarantee the privacy of the customer',
    '29 Responsiveness, availability of several communication channels (email, online
rep, twitter, phone etc.)',
    '30 Online shopping gives monetary benefit and discounts',
    '31 Enjoyment is derived from shopping online',
    '32 Shopping online is convenient and flexible',
    '33 Return and replacement policy of the e-tailer is important for purchase decis
ion',
    '34 Gaining access to loyalty programs is a benefit of shopping online',
    '35 Displaying quality Information on the website improves satisfaction of custom
ers',
    '36 User derive satisfaction while shopping on a good quality website or applicat
ion',
    '37 Net Benefit derived from shopping online can lead to users satisfaction',
    '38 User satisfaction cannot exist without trust',
    '39 Offering a wide variety of listed product in several category',
    '40 Provision of complete and relevant product information',
    '41 Monetary savings',
    '42 The Convenience of patronizing the online retailer',
    '43 Shopping on the website gives you the sense of adventure',
    '44 Shopping on your preferred e-tailer enhances your social status',
    '45 You feel gratification shopping on your favorite e-tailer',
    '46 Shopping on the website helps you fulfill certain roles',
    '47 Getting value for money spent',
    'From the following, tick any (or all) of the online retailers you have shopped f
rom;
    'Easy to use website or application',
    'Visual appealing web-page layout', 'Wild variety of product on offer',
    'Complete, relevant description information of products',
    'Fast loading website speed of website and application',
    'Reliability of the website or application',
    'Quickness to complete purchase',
    'Availability of several payment options', 'Speedy order delivery ',
    'Privacy of customers' information',
    'Security of customer financial information',
    'Perceived Trustworthiness',
    'Presence of online assistance through multi-channel',
    'Longer time to get logged in (promotion, sales period)',
    'Longer time in displaying graphics and photos (promotion, sales period)',
    'Late declaration of price (promotion, sales period)',
    'Longer page loading time (promotion, sales period)',
    'Limited mode of payment on most products (promotion, sales period)',
    'Longer delivery period', 'Change in website/Application design',
    'Frequent disruption when moving from one page to another',
    'Website is as efficient as before',
    'Which of the Indian online retailer would you recommend to a friend?'],
dtype='object')

```

We need to arrange some standarized names for each columns so that we can visulize and understand in better way

```

In [8]: #Renaming column names
df1.rename(columns = {'1Gender of respondent':'Gender',
                      '2 How old are you? ':'Age',
                      '3 Which city do you shop online from?': 'City_Of_Shopping'
                      '4 What is the Pin Code of where you shop online from?':'Pi
                      '5 Since How Long You are Shopping Online ?':'Online_Shoppi
                      '6 How many times you have made an online purchase in the p
                      '7 How do you access the internet while shopping on-line?':
                      '8 Which device do you use to access the online shopping?':
                      '9 What is the screen size of your mobile device?\t\t\t\t\t
                      '10 What is the operating system (OS) of your device?\t\t\t\t
                      '11 What browser do you run on your device to access the we
                      '12 Which channel did you follow to arrive at your favorite
                      '13 After first visit, how do you reach the online retail s
                      '14 How much time do you explore the e- retail store before
                      '15 What is your preferred payment Option?\t\t\t\t\t\t\t
                      '16 How frequently do you abandon (selecting an items and 1
                      '17 Why did you abandon the “Bag”, “Shopping Cart”?\t\t\t\t\t
                      '18 The content on the website must be easy to read and und
                      '19 Information on similar product to the one highlighted
                      '20 Complete information on listed seller and product being
                      '21 All relevant information on listed products must be sta
                      '22 Ease of navigation in website': 'Website_Navigation_Eas
                      '23 Loading and processing speed': 'Loading_Processing_Spee
                      '24 User friendly Interface of the website': 'User_Friendly
                      '25 Convenient Payment methods':'Conveninet_Payment_Mode',
                      '26 Trust that the online retail store will fulfill its par
                      '27 Empathy (readiness to assist with queries) towards the
                      '28 Being able to guarantee the privacy of the customer':'C
                      '29 Responsiveness, availability of several communication c
                      '30 Online shopping gives monetary benefit and discounts':
                      '31 Enjoyment is derived from shopping online':'Online_Shop
                      '32 Shopping online is convenient and flexible':'Online_Sho
                      '33 Return and replacement policy of the e-tailer is import
                      '34 Gaining access to loyalty programs is a benefit of shop
                      '35 Displaying quality Information on the website improves
                      '36 User derive satisfaction while shopping on a good quali
                      '37 Net Benefit derived from shopping online can lead to us
                      '38 User satisfaction cannot exist without trust':'Users_Tr
                      '39 Offering a wide variety of listed product in several ca
                      '40 Provision of complete and relevant product information'
                      '41 Monetary savings':'Monetary_Savings',
                      '42 The Convenience of patronizing the online retailer':'Pa
                      '43 Shopping on the website gives you the sense of adventur
                      '44 Shopping on your preferred e-tailer enhances your socia
                      '45 You feel gratification shopping on your favorite e-tail
                      '46 Shopping on the website helps you fulfill certain roles
                      '47 Getting value for money spent':'Worth_of_Money',
                      'From the following, tick any (or all) of the online retail
                      'Easy to use website or application': 'Ease_Website_Applica
                      'Visual appealing web-page layout': 'Visually_Appealing_lay
                      'Wild variety of product on offer':'Product_Variety',
                      'Complete, relevant description information of products':'C
                      'Fast loading website speed of website and application': 'F
                      'Reliability of the website or application':'Reliable_Websi
                      'Quickness to complete purchase':'Quick_Purchase',
                      'Availability of several payment options':'Payment_Options'
                      'Speedy order delivery ':'Fast_Delivery',
                      'Privacy of customers' information':'Customer_Info_Privacy'

```

```

'Security of customer financial information': 'Customer_Fina
'Perceived Trustworthiness': 'Perceived_Trustworthiness',
'Presence of online assistance through multi-channel': 'Mul
'Longer time to get logged in (promotion, sales period)': 'L
'Longer time in displaying graphics and photos (promotion,
'Late declaration of price (promotion, sales period)': 'Late
'Longer page loading time (promotion, sales period)': 'Page_
'Limited mode of payment on most products (promotion, sales
'Longer delivery period': 'Late_Delivery',
'Change in website/Application design': 'Design_Change_of_W
'Frequent disruption when moving from one page to another':
'Website is as efficient as before': 'Website_Efficiency',
'Which of the Indian online retailer would you recommend to

df1.columns

```

```

Out[8]: Index(['Gender', 'Age', 'City_Of_Shopping', 'Pin_Code',
              'Online_Shopping_Since', 'Purchase_Frequency', 'Internet_Access_Mode',
              'Device_Used', 'Mobile_Screen_Size', 'Device_Operating_System',
              'Browser_Used', 'Channel_Followed', 'Login_Mode',
              'Exploring_Time_Spent', 'Payment_Mode',
              'Shopping_Cart_Abandon_Frequency', 'Bag_Abandon_Reason',
              'Content_Readability', 'Similar_Product_Info', 'Seller_Product_Info',
              'Product_Info_Clarity', 'Website_Navigation_Ease',
              'Loading_Processing_Speed', 'User_Friendly_Interface',
              'Conveninet_Payment_Mode', 'Timely_Fulfilment_Trust',
              'Customer_Empathy', 'Customer_Privacy_Guarantee',
              'Several_Channels_Responses', 'Discount_Benefit',
              'Online_Shopping_Enjoyment', 'Online_Shopping_Convenience_Flexibility',
              'Return_Replace_Policy', 'Loyalty_Program_Access',
              'Quality_Information_Satisfaction', 'Quality_Satisfaction',
              'Net_Benefit_Satisfaction', 'Users_Trust', 'Product_Categories',
              'Relevant_Product_Information', 'Monetary_Savings',
              'Patronizing_Convenience', 'Adventure_Sense', 'Enhances_Social_Status',
              'Shopping_Gratification', 'Role_Fulfilment', 'Worth_of_Money',
              'Shopped_From_Retailer', 'Ease_Website_Application',
              'Visually_Appealing_layout', 'Product_Variety',
              'Complete_Product_Information', 'Fast>Loading_Speed_Web_App',
              'Reliable_Website_Application', 'Quick_Purchase', 'Payment_Options',
              'Fast_Delivery', 'Customer_Info_Privacy',
              'Customer_Financial_Info_Security', 'Perceived_Trustworthiness',
              'Multi_Channel_Assistance', 'Loading_Logging_Time',
              'Loading_Graphics_Photo_Display_Time', 'Late_Price_Declare',
              'Page>Loading_Time', 'Limited_Payment_Mode', 'Late_Delivery',
              'Design_Change_of_Web_App', 'Page_Disruption', 'Website_Efficiency',
              'Recommend_to_Friend'],
              dtype='object')

```

```
In [9]: # Checking our columns namen after rename
```

```
df1.head()
```

```

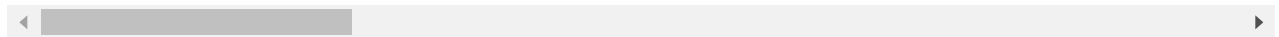
Out[9]:

```

	Gender	Age	City_Of_Shopping	Pin_Code	Online_Shopping_Since	Purchase_Frequency	Internet_Acc
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	
1	Female	21-30 years	Delhi	110030	Above 4 years	41 times and above	

	Gender	Age	City_Of_Shopping	Pin_Code	Online_Shopping_Since	Purchase_Frequency	Internet_Acc
2	Female	21-30 years	Greater Noida	201308	3-4 years	41 times and above	Mobi
3	Male	21-30 years	Karnal	132001	3-4 years	Less than 10 times	Mobi
4	Female	21-30 years	Bangalore	530068	2-3 years	11-20 times	

5 rows × 71 columns



```
In [35]: import pandas as pd
pd.set_option('display.max_rows', 500)
pd.set_option('display.max_columns', 500)
pd.set_option('display.width', 1000)
```

```
In [36]: #Checking data type

df1.dtypes
```

```
Out[36]: Gender                object
Age                object
City_Of_Shopping    object
Pin_Code            int64
Online_Shopping_Since  object
Purchase_Frequency  object
Internet_Access_Mode  object
Device_Used         object
Mobile_Screen_Size  object
Device_Operating_System  object
Browser_Used        object
Channel_Followed    object
Login_Mode          object
Exploring_Time_Spent  object
Payment_Mode        object
Shopping_Cart_Abandon_Frequency  object
Bag_Abandon_Reason  object
Content_Readability  object
Similar_Product_Info  object
Seller_Product_Info  object
Product_Info_Clarity  object
Website_Navigation_Ease  object
Loading_Processing_Speed  object
User_Friendly_Interface  object
Conveninet_Payment_Mode  object
Timely_Fulfilment_Trust  object
Customer_Empathy    object
Customer_Privacy_Guarantee  object
Several_Channels_Responses  object
Discount_Benefit    object
Online_Shopping_Enjoyment  object
Online_Shopping_Convenience_Flexibility  object
Return_Replace_Policy  object
Loyalty_Program_Access  object
Quality_Information_Satisfaction  object
```

```

Quality_Satisfaction      object
Net_Benefit_Satisfaction  object
Users_Trust               object
Product_Categories        object
Relevant_Product_Information  object
Monetary_Savings          object
Patronizing_Convenience   object
Adventure_Sense           object
Enhances_Social_Status    object
Shopping_Gratification     object
Role_Fulfilment           object
Worth_of_Money            object
Shopped_From_Retailer     object
Ease_Website_Application   object
Visually_Appealing_layout object
Product_Variety           object
Complete_Product_Information  object
Fast>Loading_Speed_Web_App  object
Reliable_Website_Application object
Quick_Purchase            object
Payment_Options           object
Fast_Delivery             object
Customer_Info_Privacy     object
Customer_Financial_Info_Security object
Perceived_Trustworthiness object
Multi_Channel_Assistance  object
Loading_Logging_Time      object
Loading_Graphics_Photo_Display_Time object
Late_Price_Declare        object
Page>Loading_Time         object
Limited_Payment_Mode       object
Late_Delivery             object
Design_Change_of_Web_App  object
Page_Disruption           object
Website_Efficiency        object
Recommend_to_Friend       object
dtype: object

```

We can see above only "pin code" Column is Int64 and countineous in nature and rest all are objects

In [37]: *#Checking for null values*

```
df1.isnull().sum()
```

```

Out[37]: Gender      0
Age      0
City_Of_Shopping    0
Pin_Code    0
Online_Shopping_Since 0
Purchase_Frequency  0
Internet_Access_Mode 0
Device_Used    0
Mobile_Screen_Size  0
Device_Operating_System 0
Browser_Used    0
Channel_Followed   0
Login_Mode    0
Exploring_Time_Spent 0
Payment_Mode    0
Shopping_Cart_Abandon_Frequency 0
Bag_Abandon_Reason  0
Content_Readability 0
Similar_Product_Info 0
Seller_Product_Info  0

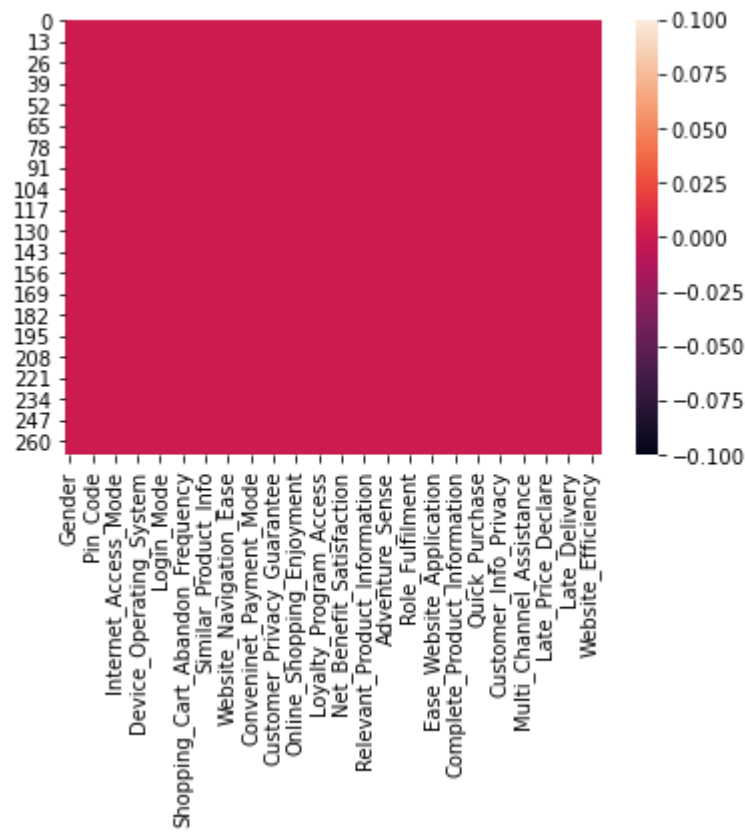
```


Product_Info_Clarity	0
Website_Navigation_Ease	0
Loading_Processing_Speed	0
User_Friendly_Interface	0
Conveninet_Payment_Mode	0
Timely_Fulfilment_Trust	0
Customer_Empathy	0
Customer_Privacy_Guarantee	0
Several_Channels_Responses	0
Discount_Benefit	0
Online_Shopping_Enjoyment	0
Online_Shopping_Convenience_Flexibility	0
Return_Replace_Policy	0
Loyalty_Program_Access	0
Quality_Information_Satisfaction	0
Quality_Satisfaction	0
Net_Benefit_Satisfaction	0
Users_Trust	0
Product_Categories	0
Relevant_Product_Information	0
Monetary_Savings	0
Patronizing_Convenience	0
Adventure_Sense	0
Enhances_Social_Status	0
Shopping_Gratification	0
Role_Fulfilment	0
Worth_of_Money	0
Shopped_From_Retailer	0
Ease_Website_Application	0
Visually_Appealing_layout	0
Product_Variety	0
Complete_Product_Information	0
Fast>Loading_Speed_Web_App	0
Reliable_Website_Application	0
Quick_Purchase	0
Payment_Options	0
Fast_Delivery	0
Customer_Info_Privacy	0
Customer_Financial_Info_Security	0
Perceived_Trustworthiness	0
Multi_Channel_Assistance	0
Loading_Logging_Time	0
Loading_Graphics_Photo_Display_Time	0
Late_Price_Declare	0
Page>Loading_Time	0
Limited_Payment_Mode	0
Late_Delivery	0
Design_Change_of_Web_App	0
Page_Disruption	0
Website_Efficiency	0
Recommend_to_Friend	0
dtype: int64	

No Null values are present in data set

```
In [38]: sns.heatmap(df1.isnull())
```

```
Out[38]: <AxesSubplot:>
```



We can see same result on heatmap

```
In [39]: # Lest check further details about dataset

df1.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 269 entries, 0 to 268
Data columns (total 71 columns):
#   Column                                     Non-Null Count  Dtype
---  -
0   Gender                                   269 non-null    object
1   Age                                     269 non-null    object
2   City_Of_Shopping                       269 non-null    object
3   Pin_Code                               269 non-null    int64
4   Online_Shopping_Since                  269 non-null    object
5   Purchase_Frequency                     269 non-null    object
6   Internet_Access_Mode                   269 non-null    object
7   Device_Used                            269 non-null    object
8   Mobile_Screen_Size                     269 non-null    object
9   Device_Operating_System                 269 non-null    object
10  Browser_Used                           269 non-null    object
11  Channel_Followed                       269 non-null    object
12  Login_Mode                             269 non-null    object
13  Exploring_Time_Spent                   269 non-null    object
14  Payment_Mode                           269 non-null    object
15  Shopping_Cart_Abandon_Frequency         269 non-null    object
16  Bag_Abandon_Reason                     269 non-null    object
17  Content_Readability                    269 non-null    object
18  Similar_Product_Info                   269 non-null    object
19  Seller_Product_Info                    269 non-null    object
20  Product_Info_Clarity                   269 non-null    object
21  Website_Navigation_Ease                 269 non-null    object
22  Loading_Processing_Speed                269 non-null    object
23  User_Friendly_Interface                 269 non-null    object
```

24	Conveninet_Payment_Mode	269	non-null	object
25	Timely_Fulfilment_Trust	269	non-null	object
26	Customer_Empathy	269	non-null	object
27	Customer_Privacy_Guarantee	269	non-null	object
28	Several_Channels_Responses	269	non-null	object
29	Discount_Benefit	269	non-null	object
30	Online_Shopping_Enjoyment	269	non-null	object
31	Online_Shopping_Convenience_Flexibility	269	non-null	object
32	Return_Replace_Policy	269	non-null	object
33	Loyalty_Program_Access	269	non-null	object
34	Quality_Information_Satisfaction	269	non-null	object
35	Quality_Satisfaction	269	non-null	object
36	Net_Benefit_Satisfaction	269	non-null	object
37	Users_Trust	269	non-null	object
38	Product_Categories	269	non-null	object
39	Relevant_Product_Information	269	non-null	object
40	Monetary_Savings	269	non-null	object
41	Patronizing_Convenience	269	non-null	object
42	Adventure_Sense	269	non-null	object
43	Enhances_Social_Status	269	non-null	object
44	Shopping_Gratification	269	non-null	object
45	Role_Fulfilment	269	non-null	object
46	Worth_of_Money	269	non-null	object
47	Shopped_From_Retailer	269	non-null	object
48	Ease_Website_Application	269	non-null	object
49	Visually_Appealing_layout	269	non-null	object
50	Product_Variety	269	non-null	object
51	Complete_Product_Information	269	non-null	object
52	Fast>Loading_Speed_Web_App	269	non-null	object
53	Reliable_Website_Application	269	non-null	object
54	Quick_Purchase	269	non-null	object
55	Payment_Options	269	non-null	object
56	Fast_Delivery	269	non-null	object
57	Customer_Info_Privacy	269	non-null	object
58	Customer_Financial_Info_Security	269	non-null	object
59	Perceived_Trustworthiness	269	non-null	object
60	Multi_Channel_Assistance	269	non-null	object
61	Loading_Logging_Time	269	non-null	object
62	Loading_Graphics_Photo_Display_Time	269	non-null	object
63	Late_Price_Declare	269	non-null	object
64	Page>Loading_Time	269	non-null	object
65	Limited_Payment_Mode	269	non-null	object
66	Late_Delivery	269	non-null	object
67	Design_Change_of_Web_App	269	non-null	object
68	Page_Disruption	269	non-null	object
69	Website_Efficiency	269	non-null	object
70	Recommend_to_Friend	269	non-null	object

dtypes: int64(1), object(70)
memory usage: 149.3+ KB

We can see multiple information of dataset from above chart as below

Numbers of columns Name of columns Missing data Data type of every column *Data is using 149.3 KB memory

```
In [40]: # Checking 0 values present in Dataset

(df1==' ?').sum()
```

```
Out[40]: Gender      0
Age      0
City_Of_Shopping    0
Pin_Code    0
Online_Shopping_Since 0
```

Purchase_Frequency	0
Internet_Access_Mode	0
Device_Used	0
Mobile_Screen_Size	0
Device_Operating_System	0
Browser_Used	0
Channel_Followed	0
Login_Mode	0
Exploring_Time_Spent	0
Payment_Mode	0
Shopping_Cart_Abandon_Frequency	0
Bag_Abandon_Reason	0
Content_Readability	0
Similar_Product_Info	0
Seller_Product_Info	0
Product_Info_Clarity	0
Website_Navigation_Ease	0
Loading_Processing_Speed	0
User_Friendly_Interface	0
Conveninet_Payment_Mode	0
Timely_Fulfilment_Trust	0
Customer_Empathy	0
Customer_Privacy_Guarantee	0
Several_Channels_Responses	0
Discount_Benefit	0
Online_Shopping_Enjoyment	0
Online_Shopping_Convenience_Flexibility	0
Return_Replace_Policy	0
Loyalty_Program_Access	0
Quality_Information_Satisfaction	0
Quality_Satisfaction	0
Net_Benefit_Satisfaction	0
Users_Trust	0
Product_Categories	0
Relevant_Product_Information	0
Monetary_Savings	0
Patronizing_Convenience	0
Adventure_Sense	0
Enhances_Social_Status	0
Shopping_Gratification	0
Role_Fulfilment	0
Worth_of_Money	0
Shopped_From_Retailer	0
Ease_Website_Application	0
Visually_Appealing_layout	0
Product_Variety	0
Complete_Product_Information	0
Fast>Loading_Speed_Web_App	0
Reliable_Website_Application	0
Quick_Purchase	0
Payment_Options	0
Fast_Delivery	0
Customer_Info_Privacy	0
Customer_Financial_Info_Security	0
Perceived_Trustworthiness	0
Multi_Channel_Assistance	0
Loading_Logging_Time	0
Loading_Graphics_Photo_Display_Time	0
Late_Price_Declare	0
Page>Loading_Time	0
Limited_Payment_Mode	0
Late_Delivery	0
Design_Change_of_Web_App	0
Page_Disruption	0
Website_Efficiency	0

```
Recommend_to_Friend
dtype: int64
```

0

Checking how much unique values are present in each columns

```
In [41]: df1.nunique()
```

```
Out[41]: Gender                2
Age                5
City_Of_Shopping    11
Pin_Code           39
Online_Shopping_Since  5
Purchase_Frequency  6
Internet_Access_Mode  4
Device_Used         4
Mobile_Screen_Size  4
Device_Operating_System  3
Browser_Used        4
Channel_Followed    3
Login_Mode          5
Exploring_Time_Spent  5
Payment_Mode        3
Shopping_Cart_Abandon_Frequency  4
Bag_Abandon_Reason  5
Content_Readability  4
Similar_Product_Info  4
Seller_Product_Info  5
Product_Info_Clarity  4
Website_Navigation_Ease  4
Loading_Processing_Speed  5
User_Friendly_Interface  5
Conveninet_Payment_Mode  3
Timely_Fulfilment_Trust  4
Customer_Empathy    4
Customer_Privacy_Guarantee  3
Several_Channels_Responses  4
Discount_Benefit    5
Online_Shopping_Enjoyment  5
Online_Shopping_Convenience_Flexibility  4
Return_Replace_Policy  3
Loyalty_Program_Access  5
Quality_Information_Satisfaction  3
Quality_Satisfaction  3
Net_Benefit_Satisfaction  4
Users_Trust         5
Product_Categories  4
Relevant_Product_Information  4
Monetary_Savings    4
Patronizing_Convenience  3
Adventure_Sense     5
Enhances_Social_Status  5
Shopping_Gratification  5
Role_Fulfilment     5
Worth_of_Money      3
Shopped_From_Retailer  9
Ease_Website_Application  10
Visually_Appealing_layout  10
Product_Variety     9
Complete_Product_Information  11
Fast>Loading_Speed_Web_App  10
Reliable_Website_Application  10
Quick_Purchase       9
Payment_Options      11
Fast_Delivery        6
Customer_Info_Privacy  11
```

Customer_Financial_Info_Security	11
Perceived_Trustworthiness	9
Multi_Channel_Assistance	10
Loading_Logging_Time	10
Loading_Graphics_Photo_Display_Time	10
Late_Price_Declare	8
Page_Loading_Time	11
Limited_Payment_Mode	8
Late_Delivery	6
Design_Change_of_Web_App	7
Page_Disruption	8
Website_Efficiency	8
Recommend_to_Friend	8

dtype: int64

Checking all value of each columns

```
In [43]: for i in df1.columns:
          print(df1[i].value_counts(), "\n\n", "-"*100, "\n\n")
```

```
Female    181
Male       88
Name: Gender, dtype: int64
```


```
31-40 years    81
21-30 years    79
41-50 yaers    70
Less than 20 years  20
51 years and above  19
Name: Age, dtype: int64
```


```
Delhi        58
Greater Noida 43
Noida        40
Bangalore    37
Karnal       27
Ghaziabad    18
Solan        18
Gurgaon      12
Merrut       9
Moradabad    5
Bulandshahr  2
Name: City_Of_Shopping, dtype: int64
```


```
201308    38
132001    19
201310    18
110044    16
173212     9
250001     9
173229     9
```

560037	8
132036	8
560010	8
122018	8
110011	7
201306	7
110008	7
110014	6
110018	6
244001	5
201312	5
530068	5
201305	5
201009	5
201008	5
201005	4
201001	4
201304	4
110039	4
110030	4
110009	4
560018	4
560003	4
122009	4
560002	4
110042	4
201303	4
560013	3
203001	2
560001	1
203207	1
203202	1

Name: Pin_Code, dtype: int64

Above 4 years	98
2-3 years	65
3-4 years	47
Less than 1 year	43
1-2 years	16

Name: Online_Shopping_Since, dtype: int64

Less than 10 times	114
31-40 times	63
41 times and above	47
11-20 times	29
21-30 times	10
42 times and above	6

Name: Purchase_Frequency, dtype: int64

Mobile internet	142
Wi-Fi	76
Mobile Internet	47
Dial-up	4

Name: Internet_Access_Mode, dtype: int64

Smartphone 141

Laptop 86

Desktop 30

Tablet 12

Name: Device_Used, dtype: int64

Others 134

5.5 inches 99

4.7 inches 29

5 inches 7

Name: Mobile_Screen_Size, dtype: int64

Window/windows Mobile 122

Android 85

IOS/Mac 62

Name: Device_Operating_System, dtype: int64

Google chrome 216

Safari 40

Opera 8

Mozilla Firefox 5

Name: Browser_Used, dtype: int64

Search Engine 230

Content Marketing 20

Display Adverts 19

Name: Channel_Followed, dtype: int64

Search Engine 87

Via application 86

Direct URL 70

E-mail 18

Social Media 8

Name: Login_Mode, dtype: int64

more than 15 mins	123
6-10 mins	71
11-15 mins	46
Less than 1 min	15
1-5 mins	14

Name: Exploring_Time_Spent, dtype: int64

Credit/Debit cards	148
Cash on delivery (CoD)	76
E-wallets (Paytm, Freecharge etc.)	45

Name: Payment_Mode, dtype: int64

Sometimes	171
Never	48
Frequently	35
Very frequently	15

Name: Shopping_Cart_Abandon_Frequency, dtype: int64

Better alternative offer	133
Promo code not applicable	54
Change in price	37
Lack of trust	31
No preferred mode of payment	14

Name: Bag_Abandon_Reason, dtype: int64

Strongly agree (5)	164
Agree (4)	80
Strongly disagree (1)	18
Indifferent (3)	7

Name: Content_Readability, dtype: int64

Strongly agree (5)	116
Agree (4)	92
Indifferent (3)	43
Dis-agree (2)	18

Name: Similar_Product_Info, dtype: int64

Agree (4)	101
Strongly agree (5)	87
Indifferent (3)	52
Dis-agree (2)	18

Strongly disagree (1) 11
Name: Seller_Product_Info, dtype: int64

Agree (4) 132
Strongly agree (5) 107
Strongly disagree (1) 18
Dis-agree (2) 12
Name: Product_Info_Clarity, dtype: int64

Strongly agree (5) 141
Agree (4) 105
Strongly disagree (1) 18
Dis-agree (2) 5
Name: Website_Navigation_Ease, dtype: int64

Strongly agree (5) 115
Agree (4) 112
Dis-agree (2) 18
Strongly disagree (1) 12
Indifferent (3) 12
Name: Loading_Processing_Speed, dtype: int64

Strongly agree (5) 189
Agree (4) 45
Strongly disagree (1) 18
Dis-agree (2) 12
Indifferent (3) 5
Name: User_Friendly_Interface, dtype: int64

Strongly agree (5) 159
Agree (4) 80
Dis-agree (2) 30
Name: Conveninet_Payment_Mode, dtype: int64

Strongly agree (5) 141
Agree (4) 86
Disagree (2) 30
indifferent (3) 12
Name: Timely_Fulfilment_Trust, dtype: int64

Strongly agree (5) 194
Agree (4) 42
Strongly disagree (1) 18
indifferent (3) 15
Name: Customer_Empathy, dtype: int64

Strongly agree (5) 185
Agree (4) 58
indifferent (3) 26
Name: Customer_Privacy_Guarantee, dtype: int64

Strongly agree (5) 149
Agree (4) 94
indifferent (3) 15
Strongly disagree (1) 11
Name: Several_Channels_Responses, dtype: int64

Strongly agree (5) 105
Agree (4) 85
indifferent (3) 50
Strongly disagree (1) 18
Dis-agree (2) 11
Name: Discount_Benefit, dtype: int64

Strongly agree (5) 86
indifferent (3) 75
Agree (4) 59
Strongly disagree (1) 30
Dis-agree (2) 19
Name: Online_Shopping_Enjoyment, dtype: int64

Strongly agree (5) 146
Agree (4) 78
indifferent (3) 33
Dis-agree (2) 12
Name: Online_Shopping_Convenience_Flexibility, dtype: int64

Strongly agree (5) 198

Agree (4) 51
Dis-agree (2) 20
Name: Return_Replace_Policy, dtype: int64

Strongly agree (5) 115
Agree (4) 64
indifferent (3) 64
Dis-agree (2) 15
Strongly disagree (1) 11
Name: Loyalty_Program_Access, dtype: int64

Strongly agree (5) 133
Agree (4) 80
indifferent (3) 56
Name: Quality_Information_Satisfaction, dtype: int64

Strongly agree (5) 175
Agree (4) 86
Dis-agree (2) 8
Name: Quality_Satisfaction, dtype: int64

Strongly agree (5) 164
Agree (4) 54
indifferent (3) 40
Dis-agree (2) 11
Name: Net_Benefit_Satisfaction, dtype: int64

Strongly agree (5) 122
Agree (4) 117
Strongly disagree (1) 18
Dis-agree (2) 7
indifferent (3) 5
Name: Users_Trust, dtype: int64

Strongly agree (5) 111
Agree (4) 94
indifferent (3) 57
Dis-agree (2) 7
Name: Product_Categories, dtype: int64

```
-----  
  
Strongly agree (5)    135  
Agree (4)             98  
indifferent (3)      31  
Disagree (2)         5  
Name: Relevant_Product_Information, dtype: int64  
  
-----  
-----
```

```
Strongly agree (5)    148  
Agree (4)             75  
Disagree (2)         31  
indifferent (3)      15  
Name: Monetary_Savings, dtype: int64  
  
-----  
-----
```

```
Agree (4)             138  
indifferent (3)      77  
Strongly agree (5)   54  
Name: Patronizing_Convenience, dtype: int64  
  
-----  
-----
```

```
Agree (4)             101  
indifferent (3)      59  
Strongly agree (5)   54  
Dis-agree (2)       50  
Strongly disagree (1) 5  
Name: Adventure_Sense, dtype: int64  
  
-----  
-----
```

```
indifferent (3)      100  
Agree (4)            59  
Strongly agree (5)   48  
Strongly disagree (1) 33  
Dis-agree (2)       29  
Name: Enhances_Social_Status, dtype: int64  
  
-----  
-----
```

```
indifferent (3)      101  
Strongly agree (5)   65  
Agree (4)            63  
Disagree (2)        22  
Strongly disagree (1) 18  
Name: Shopping_Gratification, dtype: int64  
  
-----  
-----
```

```

Agree (4)                88
indifferent (3)          88
Strongly agree (5)       38
Strongly disagree (1)    33
Dis-agree (2)            22
Name: Role_Fulfilment, dtype: int64

```

```

Agree (4)                149
Strongly agree (5)       82
indifferent (3)          38
Name: Worth_of_Money, dtype: int64

```

```

Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    82
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com              44
Amazon.in, Flipkart.com                                         32
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com              29
Amazon.in, Flipkart.com, Snapdeal.com                         27
Amazon.in, Paytm.com, Myntra.com                               20
Amazon.in                                                        16
Amazon.in, Paytm.com                                           12
Amazon.in, Flipkart.com, Paytm.com                             7
Name: Shopped_From_Retailer, dtype: int64

```

```

Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    64
Amazon.in, Flipkart.com                                         44
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com              44
Amazon.in                                                        29
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com              22
Amazon.in, Paytm.com, Myntra.com                               20
Amazon.in, Flipkart.com, Myntra.com                           19
Paytm.com                                                        12
Flipkart.com                                                    8
Amazon.in, Paytm.com                                           7
Name: Ease_Website_Application, dtype: int64

```

```

Amazon.in, Flipkart.com                                         87
Amazon.in                                                        44
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com    36
Amazon.in, Paytm.com, Myntra.com                               20
Amazon.in, Myntra.com                                           15
Myntra.com                                                       15
Flipkart.com, Myntra.com                                         15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com              14
Flipkart.com                                                    12
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com              11
Name: Visually_Appealing_layout, dtype: int64

```

Amazon.in, Flipkart.com	130
Amazon.in	43
Amazon.in, Myntra.com	20
Myntra.com	15
Flipkart.com, Myntra.com	15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Amazon.in, Flipkart.com, Paytm.com	13
Flipkart.com	12
Paytm.com	7

Name: Product_Variety, dtype: int64

Amazon.in, Flipkart.com	100
Amazon.in	43
Amazon.in, Flipkart.com, Paytm.com	24
Amazon.in, Paytm.com, Myntra.com	20
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com	15
Amazon.in, Flipkart.com, Myntra.com	15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Snapdeal.com	12
Flipkart.com, Snapdeal.com	11
Flipkart.com	8
Amazon.in, Flipkart.com, Snapdeal.com	7

Name: Complete_Product_Information, dtype: int64

Amazon.in	51
Amazon.in, Paytm.com	44
Amazon.in, Flipkart.com	30
Amazon.in, Flipkart.com, Myntra.com	30
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com	30
Amazon.in, Flipkart.com, Paytm.com	25
Amazon.in, Flipkart.com, Snapdeal.com	25
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Snapdeal.com	12
Flipkart.com	8

Name: Fast>Loading_Speed_Web_App, dtype: int64

Amazon.in	61
Amazon.in, Flipkart.com	50
Amazon.in, Flipkart.com, Paytm.com	36
Amazon.in, Paytm.com, Myntra.com	35
Amazon.in, Flipkart.com, Snapdeal.com	18
Myntra.com	15
Flipkart.com	15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Amazon.in, Flipkart.com, Paytm.com, Snapdeal.com	13
Paytm.com	12

Name: Reliable_Website_Application, dtype: int64

Amazon.com	66
Amazon.com, Flipkart.com, Paytm.com	47
Amazon.com, Flipkart.com	37
Amazon.com, Flipkart.com, Myntra.com	30
Paytm.com	25
Amazon.com, Paytm.com, Myntra.com	20
Amazon.com, Flipkart.com, Paytm.com, Myntra.com, Snapdeal	15
Flipkart.com	15
Flipkart.com, Myntra.com, Snapdeal	14
Name: Quick_Purchase, dtype: int64	

Amazon.in, Flipkart.com	65
Amazon.in, Flipkart.com, Myntra.com	40
Amazon.in, Flipkart.com, Patym.com, Myntra.com, Snapdeal.com	39
Amazon.in	23
Patym.com, Myntra.com	20
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	19
Amazon.in, Flipkart.com, Snapdeal.com	18
Flipkart.com, Myntra.com, Snapdeal.com	14
Patym.com	12
Amazon.in, Patym.com	11
Flipkart.com	8
Name: Payment_Options, dtype: int64	

Amazon.in	107
Amazon.in, Flipkart.com	82
Amazon.in, Flipkart.com, Snapdeal.com	36
Amazon.in, Flipkart.com, Myntra.com	15
Flipkart.com	15
Flipkart.com, Myntra.com, Snapdeal.com	14
Name: Fast_Delivery, dtype: int64	

Amazon.in	71
Amazon.in, Flipkart.com	54
Amazon.in, Flipkart.com, Myntra.com	25
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com	24
Paytm.com	18
Myntra.com	15
Flipkart.com	15
Amazon.in, Paytm.com	15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Amazon.in, Flipkart.com, Paytm.com	11
Amazon.in, Flipkart.com, Snapdeal.com	7
Name: Customer_Info_Privacy, dtype: int64	

Amazon.in	51
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com	42
Flipkart.com	33

Amazon.in, Flipkart.com, Snapdeal.com	25
Amazon.in, Flipkart.com	24
Amazon.in, Paytm.com, Myntra.com	20
Amazon.in, Snapdeal.com	19
Myntra.com	15
Paytm.com	15
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	14
Amazon.in, Flipkart.com, Paytm.com	11

Name: Customer_Financial_Info_Security, dtype: int64

Amazon.in	76
Amazon.in, Flipkart.com, Snapdeal.com	36
Amazon.in, Myntra.com	35
Amazon.in, Flipkart.com	31
Flipkart.com	27
Amazon.in, Flipkart.com, Myntra.com, Snapdeal.com	25
Myntra.com	15
Amazon.in, Flipkart.com, Paytm.com, Myntra.com, Snapdeal.com	13
Amazon.in, Flipkart.com, Paytm.com	11

Name: Perceived_Trustworthiness, dtype: int64

Amazon.in, Flipkart.com, Myntra.com, Snapdeal	61
Amazon.in	60
Amazon.in, Flipkart.com	39
Amazon.in, Snapdeal	26
Myntra.com	20
Amazon.in, Myntra.com	15
Amazon.in, Flipkart.com, Myntra.com	15
Amazon.in, Flipkart.com, Paytm.com	13
Paytm.com	12
Flipkart.com	8

Name: Multi_Channel_Assistance, dtype: int64

Amazon.in	57
Amazon.in, Flipkart.com	38
Paytm.com	38
Myntra.com	35
Amazon.in, Flipkart.com, Snapdeal.com	29
Snapdeal.com	25
Flipkart.com, Paytm.com	15
Flipkart.com, Paytm.com, Snapdeal.com	13
Amazon.in, Paytm.com	11
Flipkart.com	8

Name: Loading_Logging_Time, dtype: int64

Amazon.in, Flipkart.com	60
Amazon.in	39
Myntra.com	35
Snapdeal.com	34

Myntra.com, Snapdeal.com	25
Flipkart.com, Snapdeal.com	19
Flipkart.com	15
Paytm.com	15
Amazon.in, Myntra.com, Snapdeal.com	14
Amazon.in, Paytm.com	13

Name: Loading_Graphics_Photo_Display_Time, dtype: int64

Myntra.com	75
Paytm.com	52
snapdeal.com	41
Amazon.in	38
Flipkart.com	38
Amazon.in, Paytm.com	13
Paytm.com, snapdeal.com	7
Amazon.in, Flipkart.com	5

Name: Late_Price_Declare, dtype: int64

Myntra.com	61
Paytm.com	59
Flipkart.com	32
Snapdeal.com	23
Amazon.in, Flipkart.com	18
Amazon.in	16
Paytm.com, Snapdeal.com	15
Amazon.in, Snapdeal.com	14
Amazon.in, Paytm.com	13
Flipkart.com, Snapdeal.com	11
Amazon.in, Paytm.com, Myntra.com	7

Name: Page_Loading_Time, dtype: int64

Snapdeal.com	87
Amazon.in	62
Flipkart.com	31
Amazon.in, Flipkart.com	29
Paytm.com	25
Paytm.com, Snapdeal.com	15
Amazon.in, Paytm.com	13
Myntra.com, Snapdeal.com	7

Name: Limited_Payment_Mode, dtype: int64

Paytm.com	72
Snapdeal.com	64
Flipkart.com	44
Amazon.in	37
Paytm.com, Snapdeal.com	26
Myntra.com	26

Name: Late_Delivery, dtype: int64

```

-----
-----
Amazon.in                96
Paytm.com                63
Amazon.in, Flipkart.com  45
Myntra.com               30
Flipkart.com             20
Snapdeal.com             8
Flipkart.com, Myntra.com  7
Name: Design_Change_of_Web_App, dtype: int64
-----
-----

```

```

-----
-----
Amazon.in                53
Myntra.com               52
Snapdeal.com            49
Paytm.com                39
Flipkart.com             26
Amazon.in, Flipkart.com  25
Myntra.com, Snapdeal.com 14
Flipkart.com, Snapdeal.com 11
Name: Page_Disruption, dtype: int64
-----
-----

```

```

-----
-----
Amazon.in                94
Flipkart.com             47
Amazon.in, Flipkart.com  45
Amazon.in, Flipkart.com, Paytm.com 25
Amazon.in, Paytm.com     18
Paytm.com                15
Myntra.com, Snapdeal.com 14
Snapdeal.com             11
Name: Website_Efficiency, dtype: int64
-----
-----

```

```

-----
-----
Amazon.in                79
Amazon.in, Flipkart.com  62
Flipkart.com             39
Amazon.in, Myntra.com     30
Amazon.in, Paytm.com, Myntra.com 20
Amazon.in, Flipkart.com, Myntra.com 15
Amazon.in, Paytm.com     13
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com 11
Name: Recommend_to_Friend, dtype: int64
-----
-----

```

```

In [45]: #Column name "Purchase_Frequency" have value "41 times and above" and "42 times and above"
df1['Purchase_Frequency'].replace("42 times and above", "41 times and above", inplace=True)
df1['Purchase_Frequency'].value_counts()

```

```
Out[45]: Less than 10 times    114
        31-40 times         63
        41 times and above   53
        11-20 times          29
        21-30 times          10
        Name: Purchase_Frequency, dtype: int64
```

```
In [46]: #Column name "Internet_Access_Mode" have "Mobile internet" value 2 times("I" of "Intern
df1["Internet_Access_Mode"].replace("Mobile internet","Mobile Internet",inplace=True)
df1['Internet_Access_Mode'].value_counts()
```

```
Out[46]: Mobile Internet    189
        Wi-Fi              76
        Dial-up            4
        Name: Internet_Access_Mode, dtype: int64
```

```
In [48]: object_datatype = []
        for x in df1.dtypes.index:
            if df1.dtypes[x] == 'O':
                object_datatype.append(x)
        object_datatype
```

```
Out[48]: ['Gender',
        'Age',
        'City_Of_Shopping',
        'Online_Shopping_Since',
        'Purchase_Frequency',
        'Internet_Access_Mode',
        'Device_Used',
        'Mobile_Screen_Size',
        'Device_Operating_System',
        'Browser_Used',
        'Channel_Followed',
        'Login_Mode',
        'Exploring_Time_Spent',
        'Payment_Mode',
        'Shopping_Cart_Abandon_Frequency',
        'Bag_Abandon_Reason',
        'Content_Readability',
        'Similar_Product_Info',
        'Seller_Product_Info',
        'Product_Info_Clarity',
        'Website_Navigation_Ease',
        'Loading_Processing_Speed',
        'User_Friendly_Interface',
        'Conveninet_Payment_Mode',
        'Timely_Fulfilment_Trust',
        'Customer_Empathy',
        'Customer_Privacy_Guarantee',
        'Several_Channels_Responses',
        'Discount_Benefit',
        'Online_Shopping_Enjoyment',
        'Online_Shopping_Convenience_Flexibility',
        'Return_Replace_Policy',
        'Loyalty_Program_Access',
        'Quality_Information_Satisfaction',
        'Quality_Satisfaction',
        'Net_Benefit_Satisfaction',
        'Users_Trust',
        'Product_Categories',
        'Relevant_Product_Information',
        'Monetary_Savings',
        'Patronizing_Convenience',
        'Adventure_Sense',
```

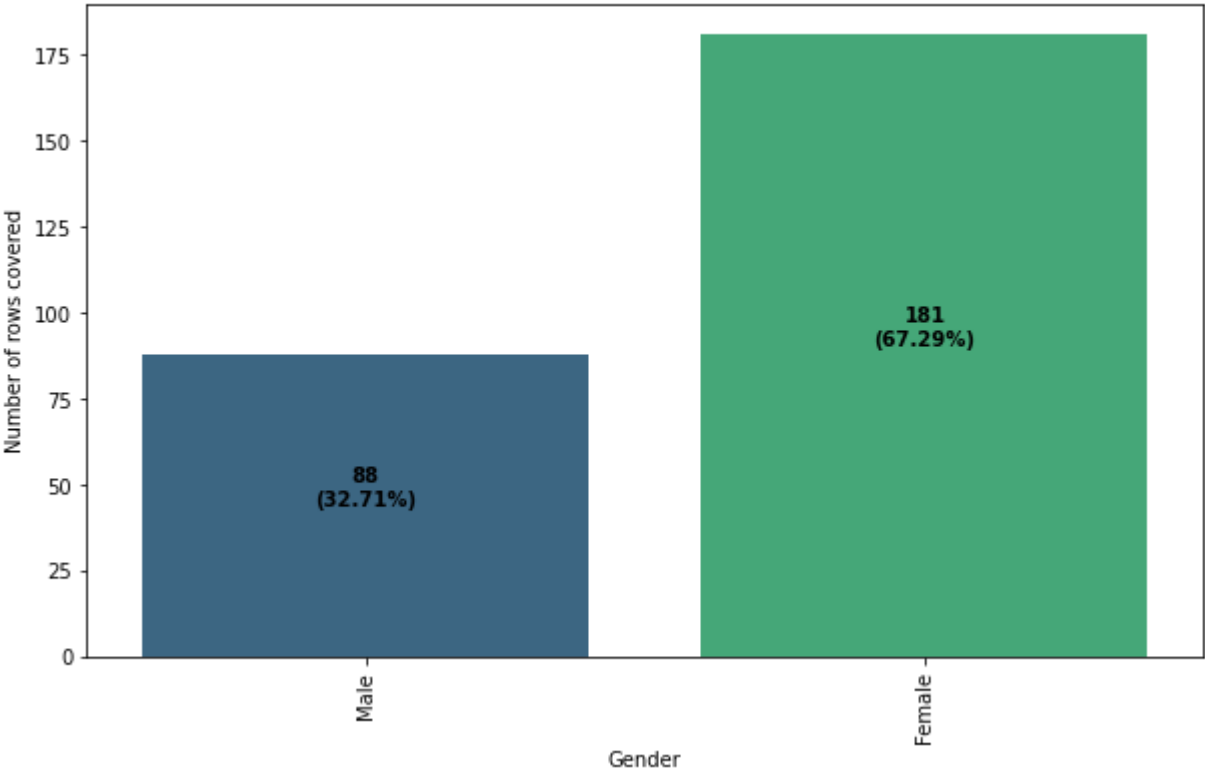
```
'Enhances_Social_Status',
'Shopping_Gratification',
'Role_Fulfilment',
'Worth_of_Money',
'Shopped_From_Retailer',
'Ease_Website_Application',
'Visually_Appealing_layout',
'Product_Variety',
'Complete_Product_Information',
'Fast>Loading_Speed_Web_App',
'Reliable_Website_Application',
'Quick_Purchase',
'Payment_Options',
'Fast_Delivery',
'Customer_Info_Privacy',
'Customer_Financial_Info_Security',
'Perceived_Trustworthiness',
'Multi_Channel_Assistance',
>Loading_Logging_Time',
>Loading_Graphics_Photo_Display_Time',
'Late_Price_Declare',
'Page>Loading_Time',
'Limited_Payment_Mode',
'Late_Delivery',
'Design_Change_of_Web_App',
'Page_Disruption',
'Website_Efficiency',
'Recommend_to_Friend']
```

```
In [49]: for col in df1[object_datatype]:
    plt.figure(figsize=(10,6))
    col_name = col
    values = df1[col_name].value_counts()
    index = 0
    ax = sns.countplot(df1[col_name], palette="viridis")

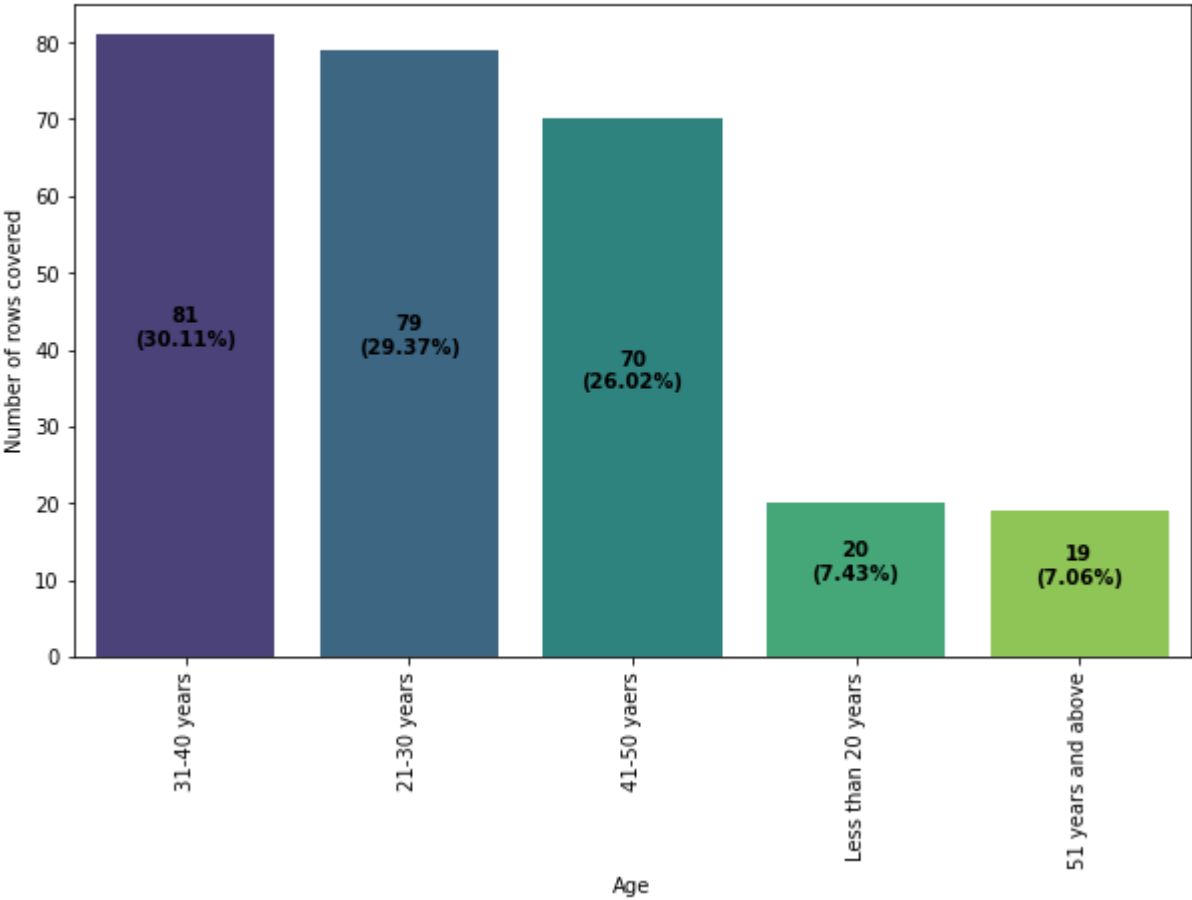
    for i in ax.patches:
        h = i.get_height() # getting the count of each value
        t = len(df1[col_name]) # getting the total number of records using length
        s = f"{h}\n({round(h*100/t,2)}%)" # making the string for displaying in count bar
        plt.text(index, h/2, s, ha="center", fontweight="bold")
        index += 1

    plt.title(f"Count Plot for {col_name}\n")
    plt.xlabel(col_name)
    plt.ylabel(f"Number of rows covered")
    plt.xticks(rotation=90)
    plt.show()
```

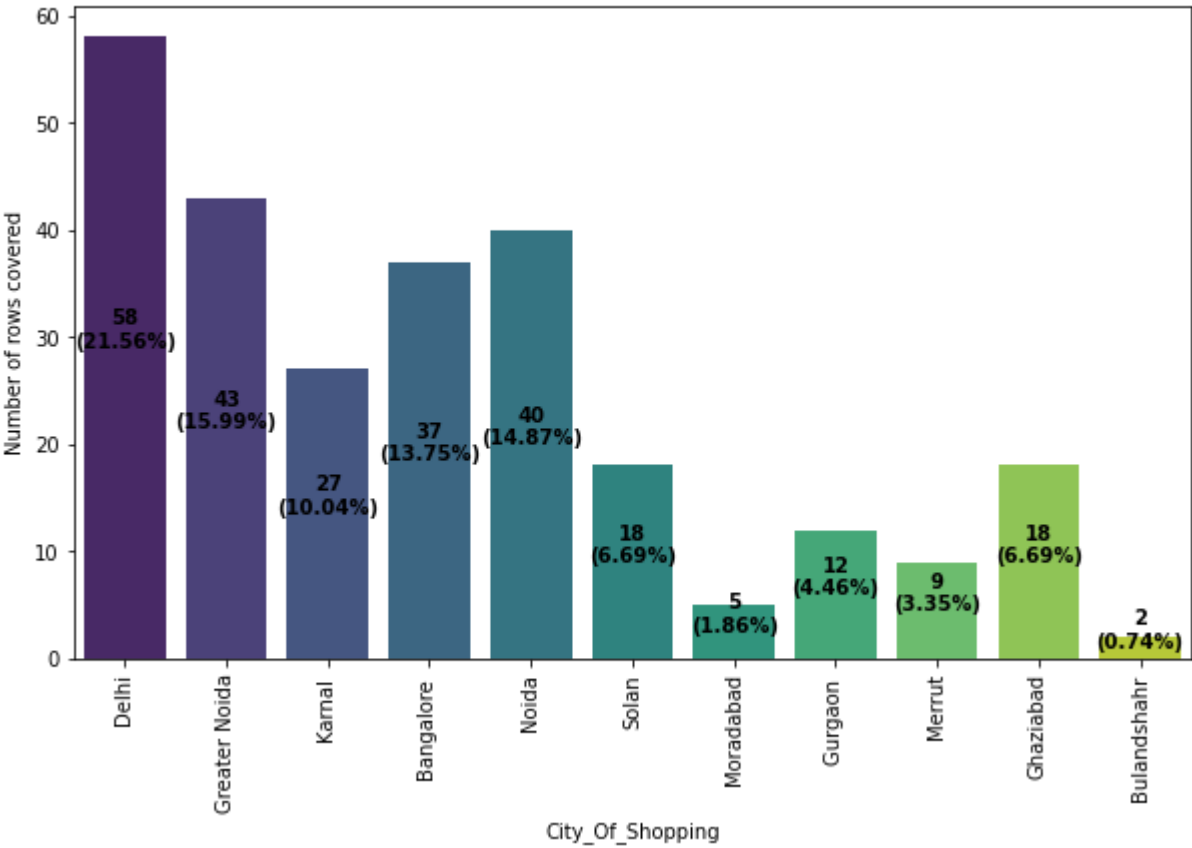
Count Plot for Gender



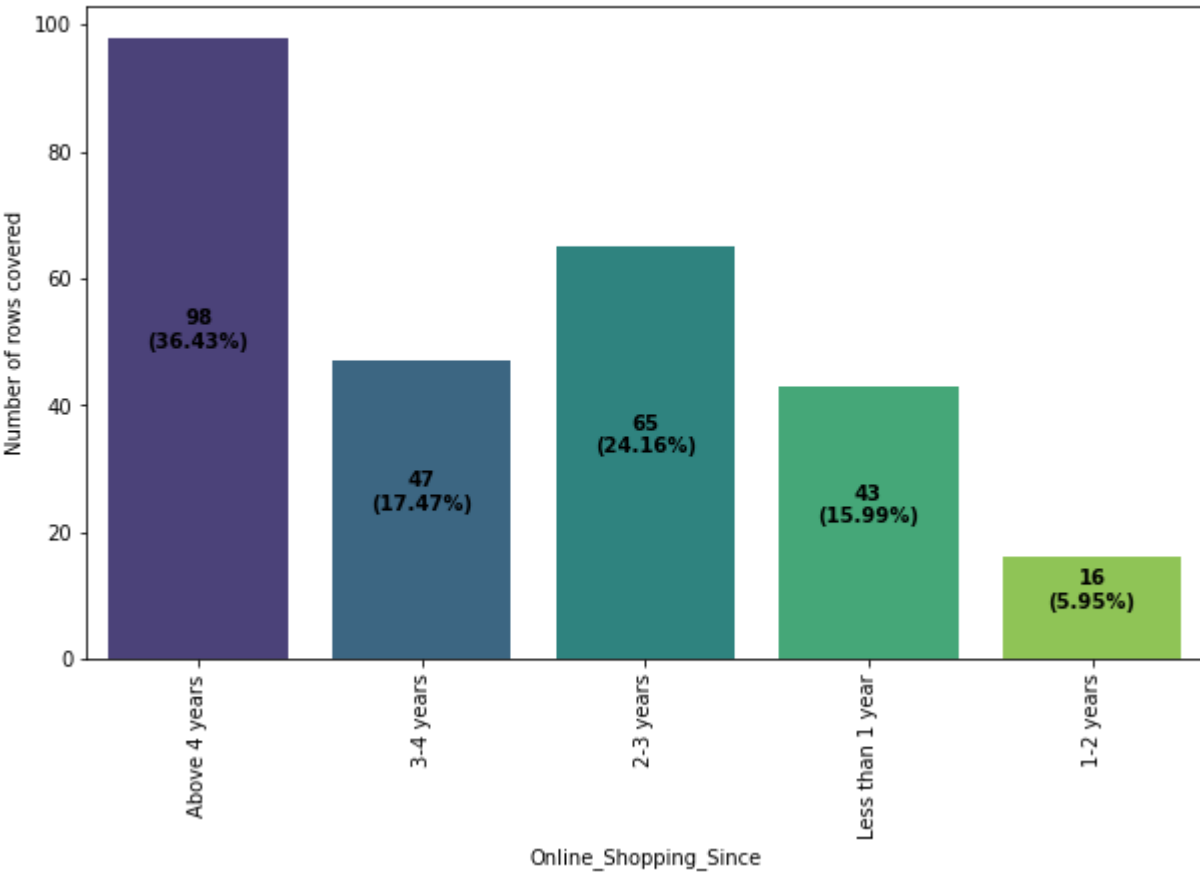
Count Plot for Age



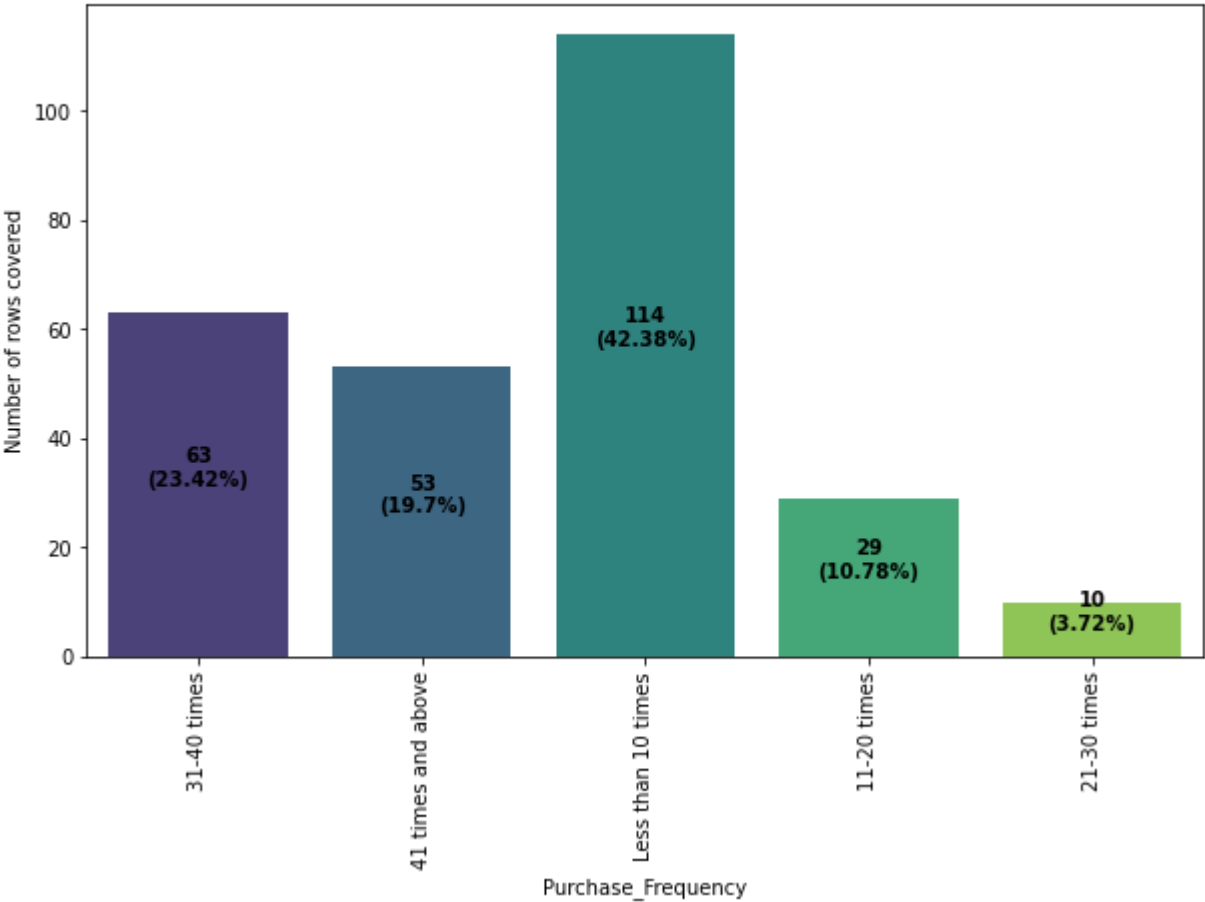
Count Plot for City_Of_Shopping



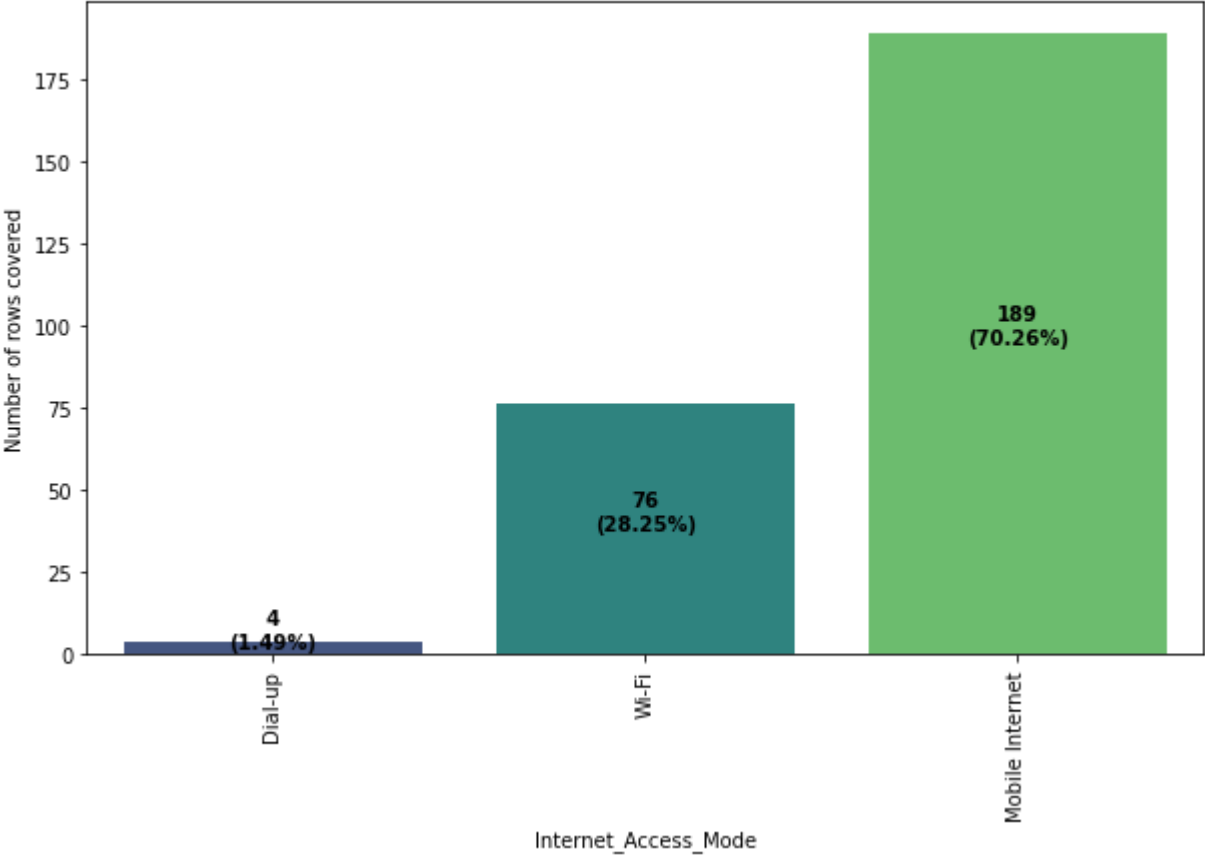
Count Plot for Online_Shopping_Since



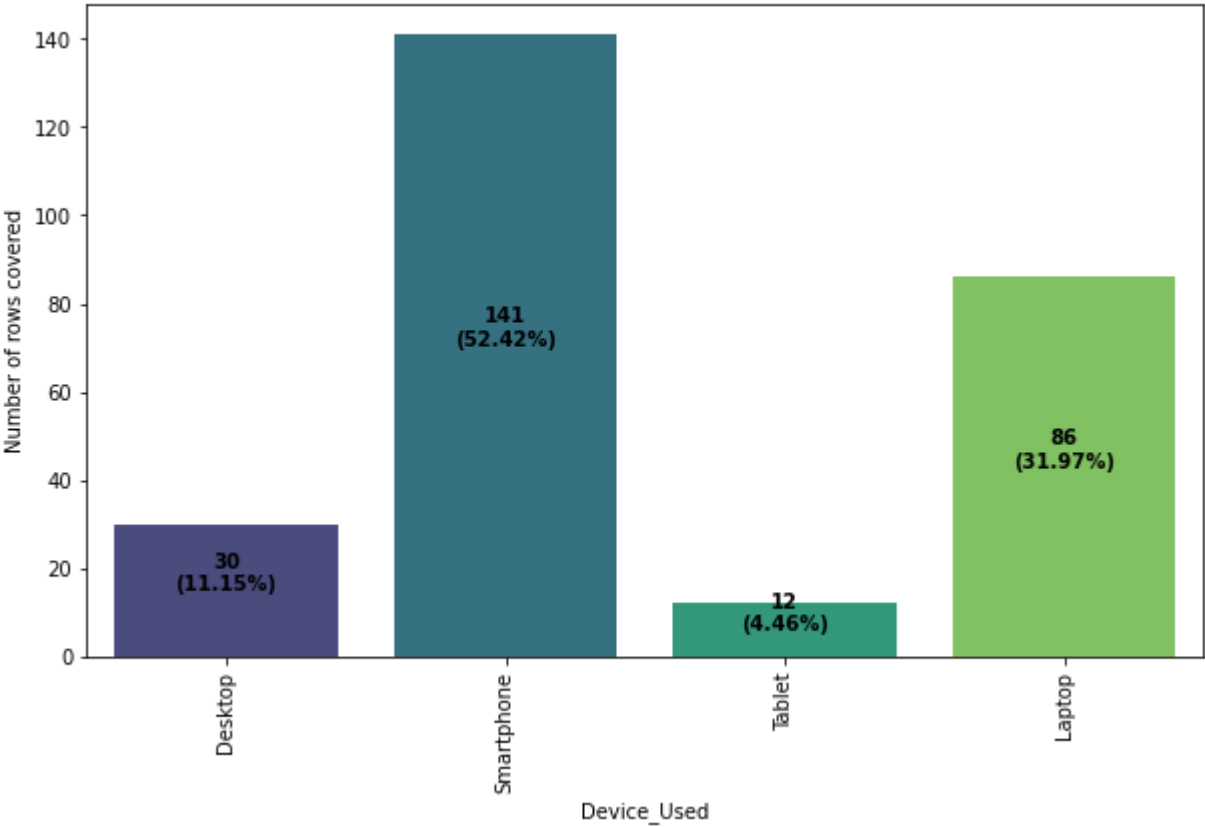
Count Plot for Purchase_Frequency



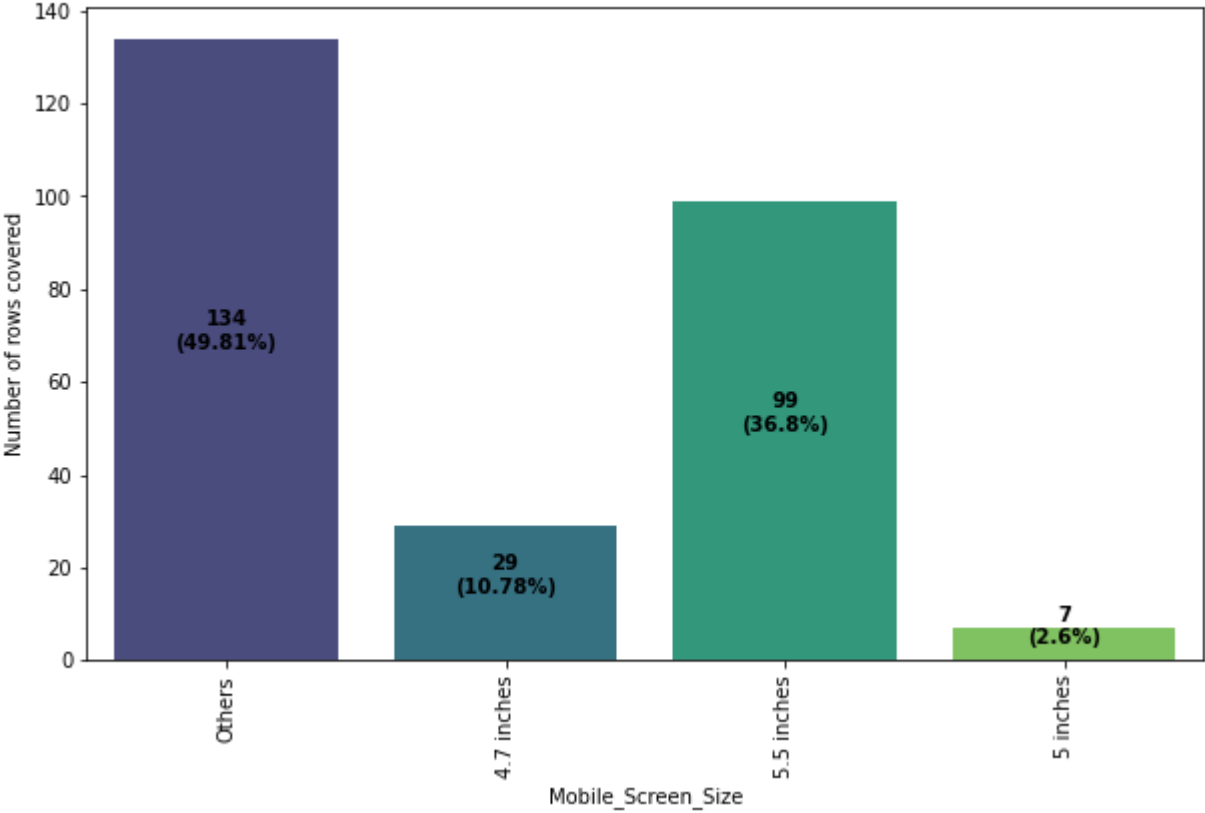
Count Plot for Internet_Access_Mode

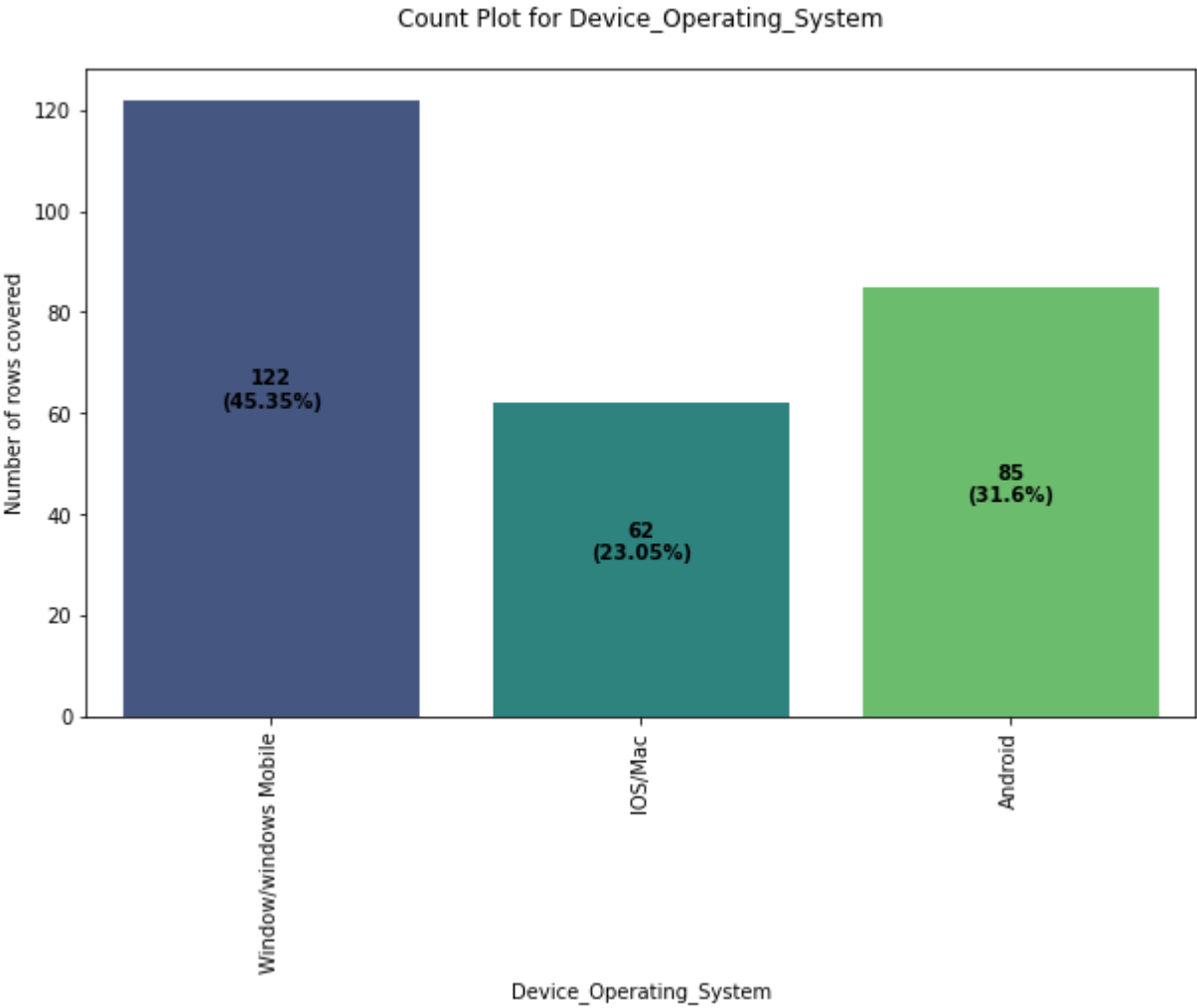


Count Plot for Device_Used

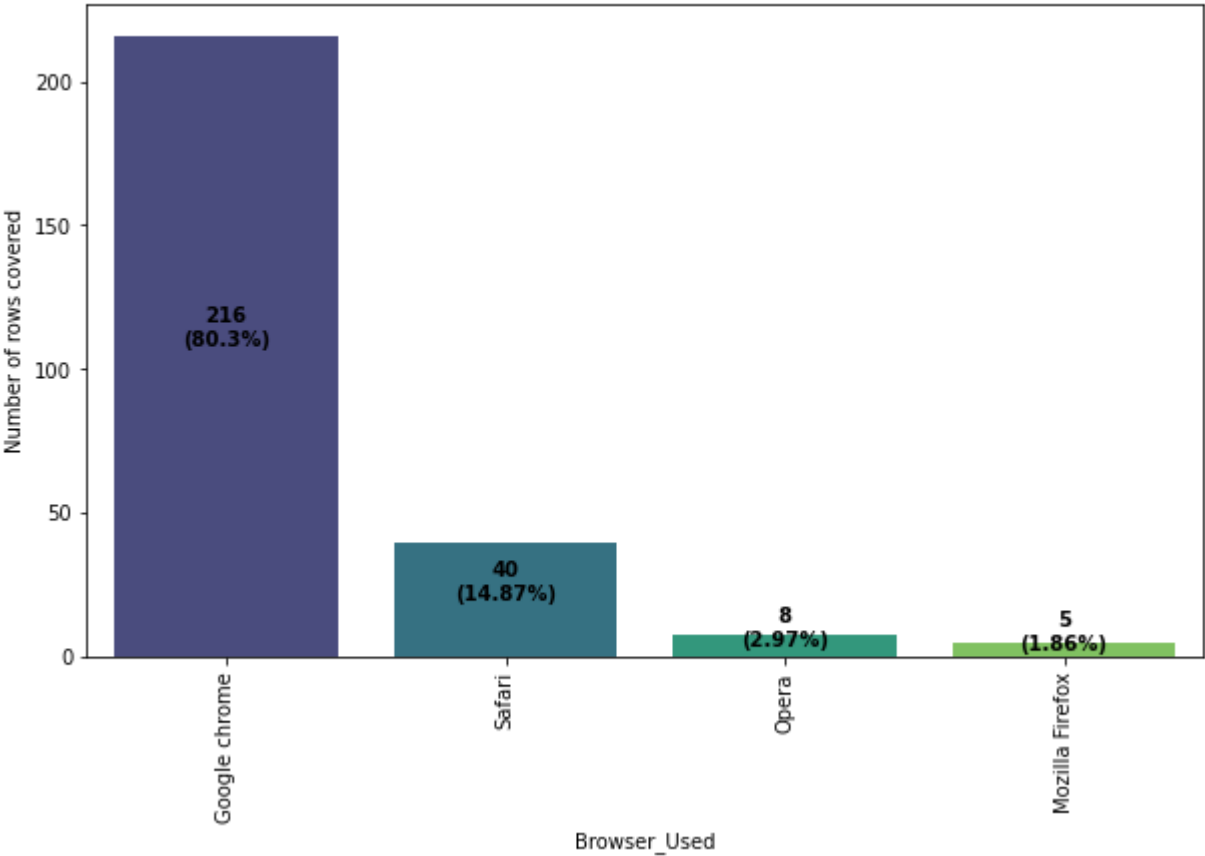


Count Plot for Mobile_Screen_Size

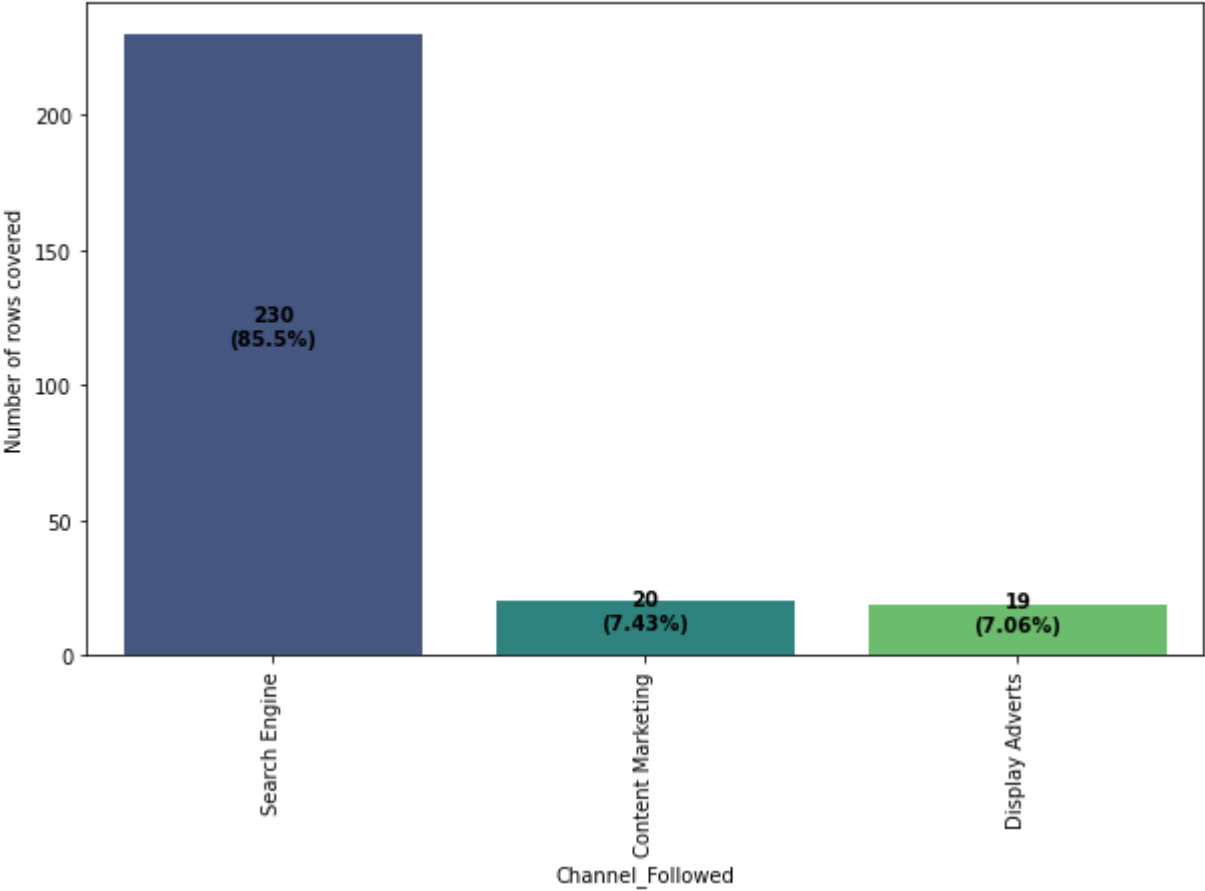


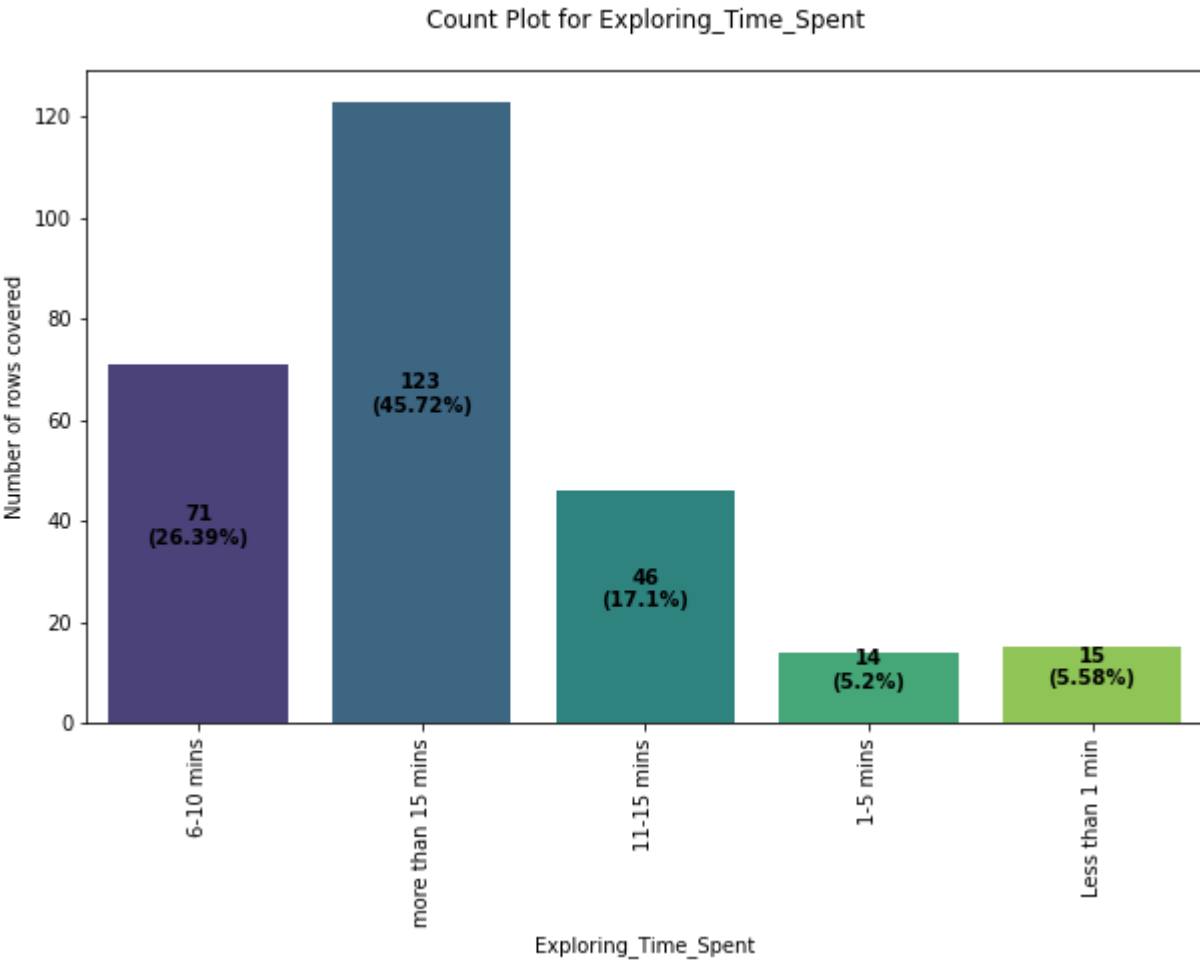
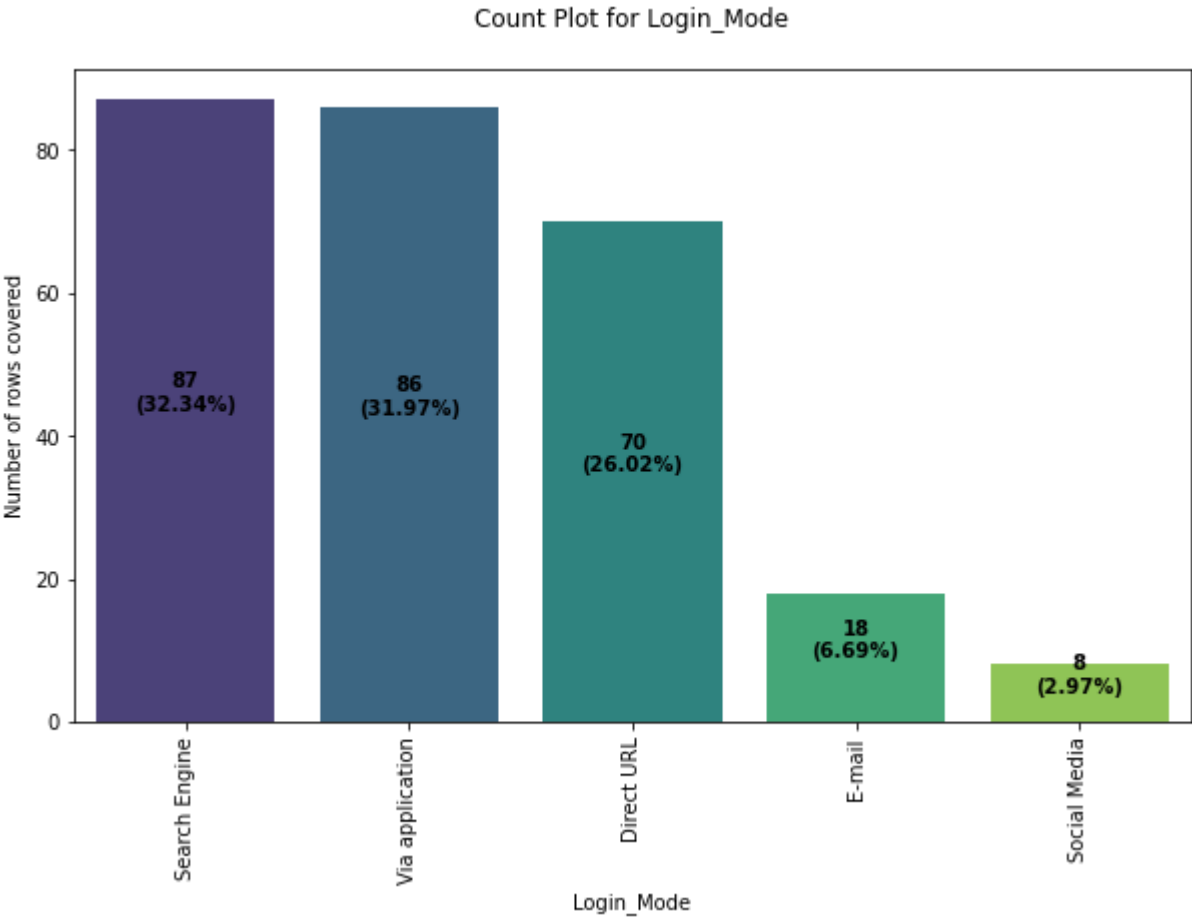


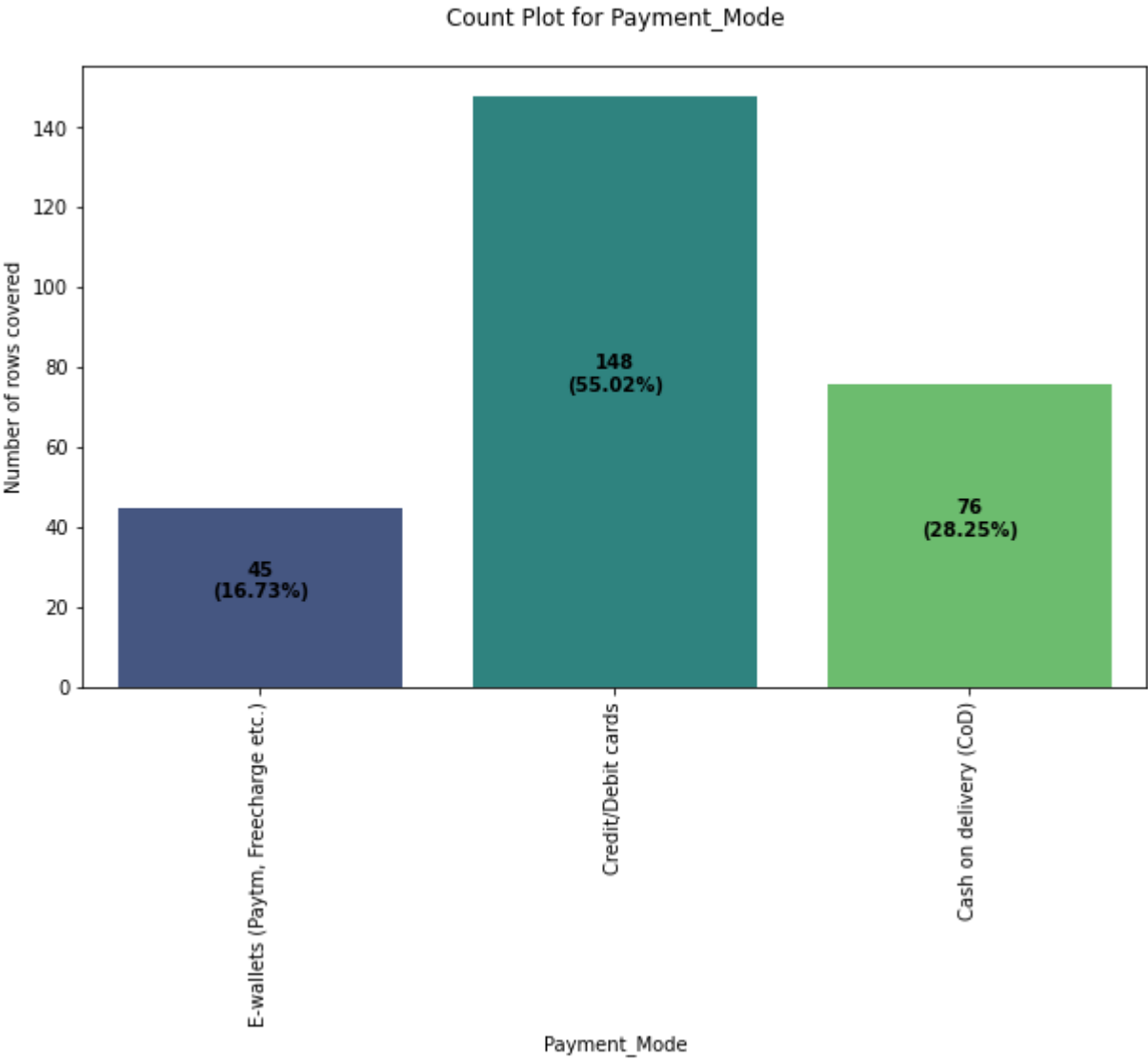
Count Plot for Browser_Used

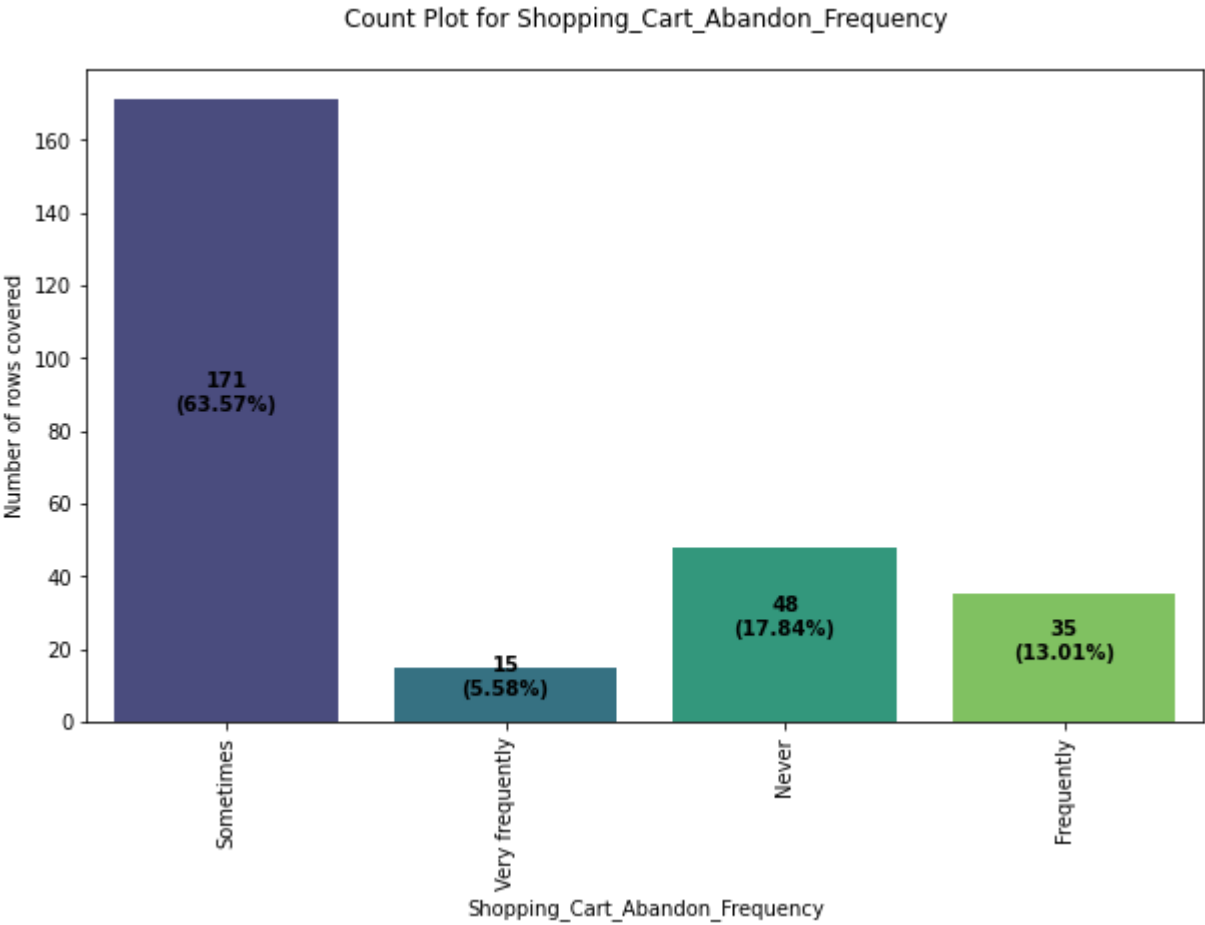


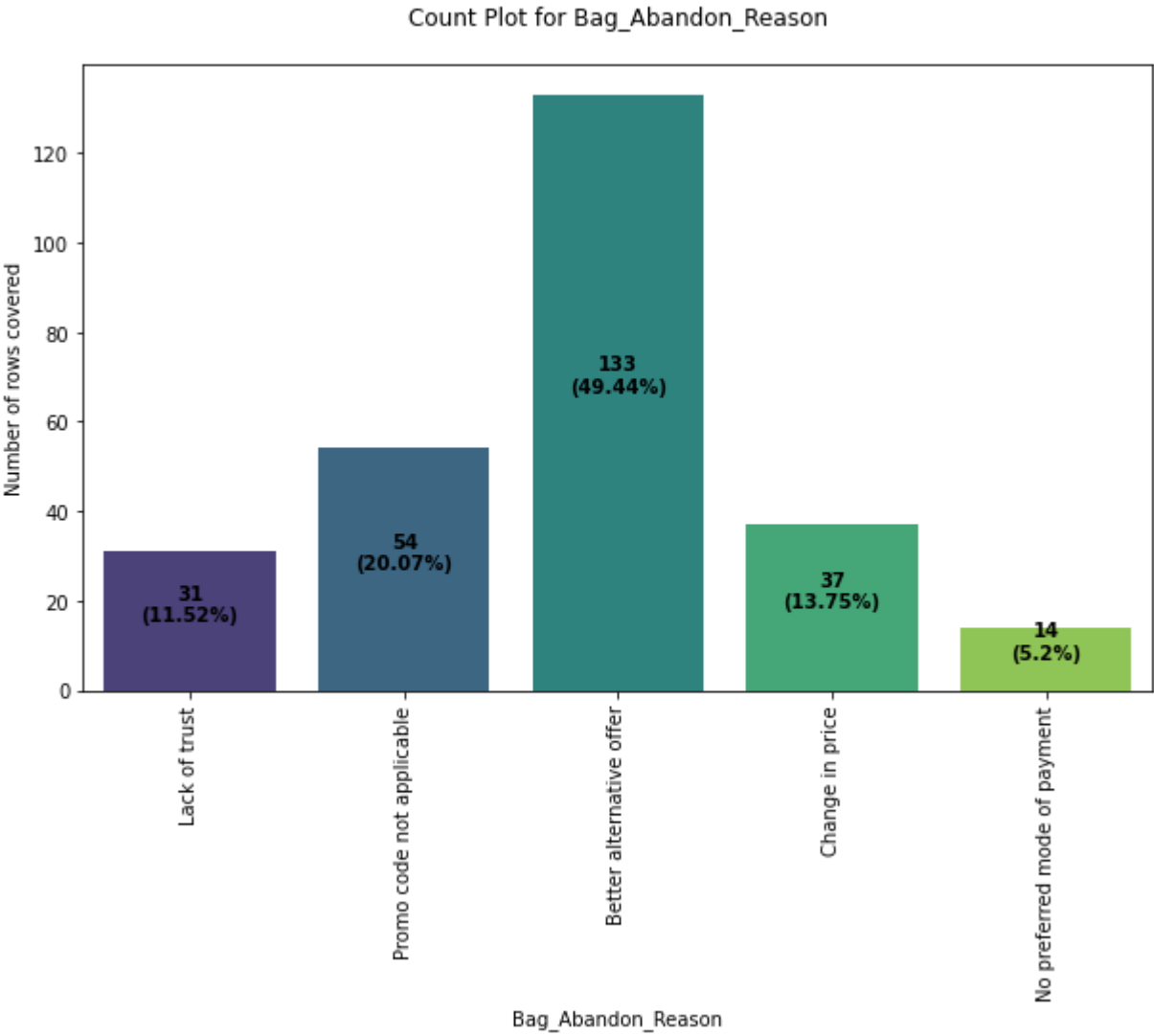
Count Plot for Channel_Followed

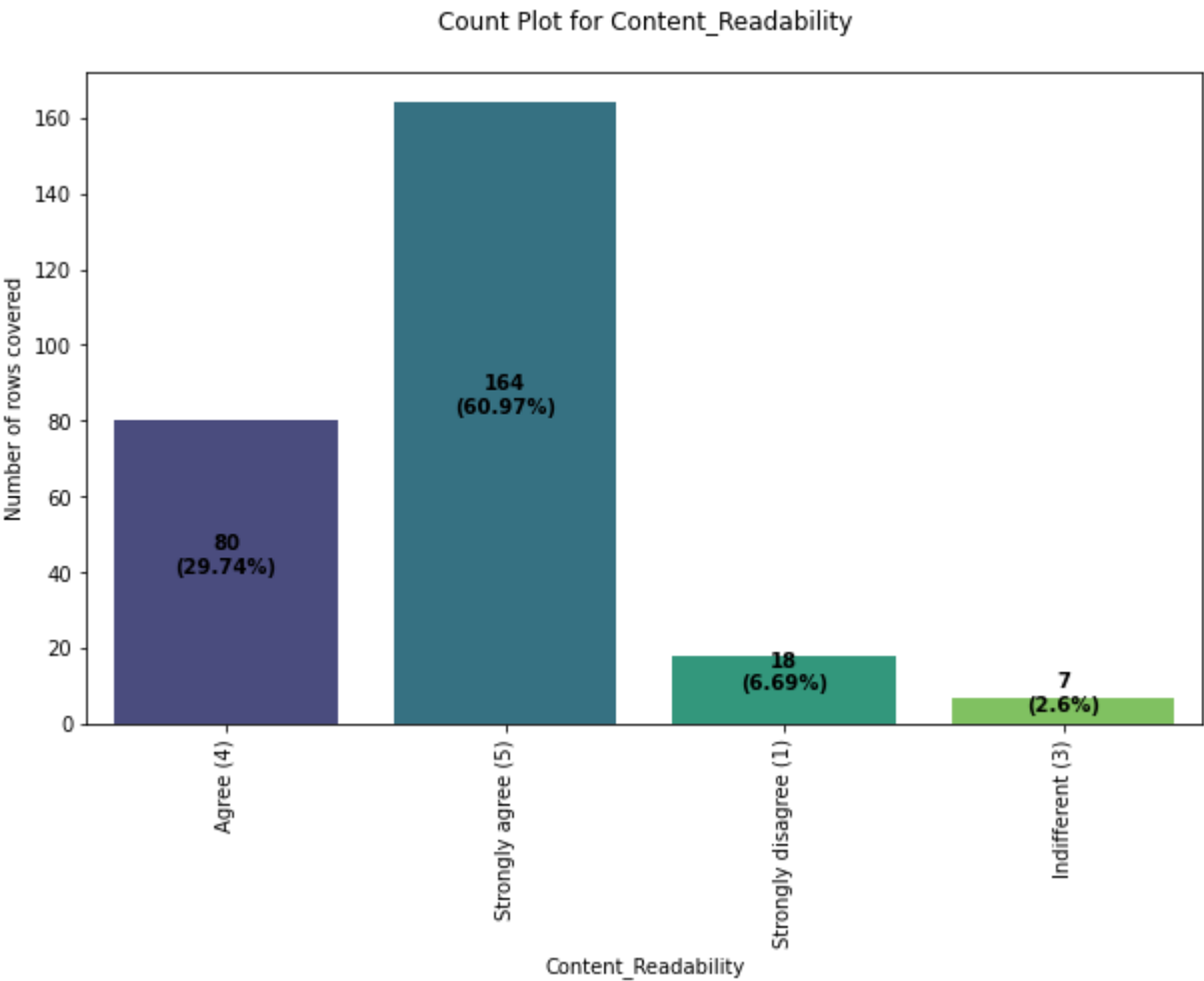


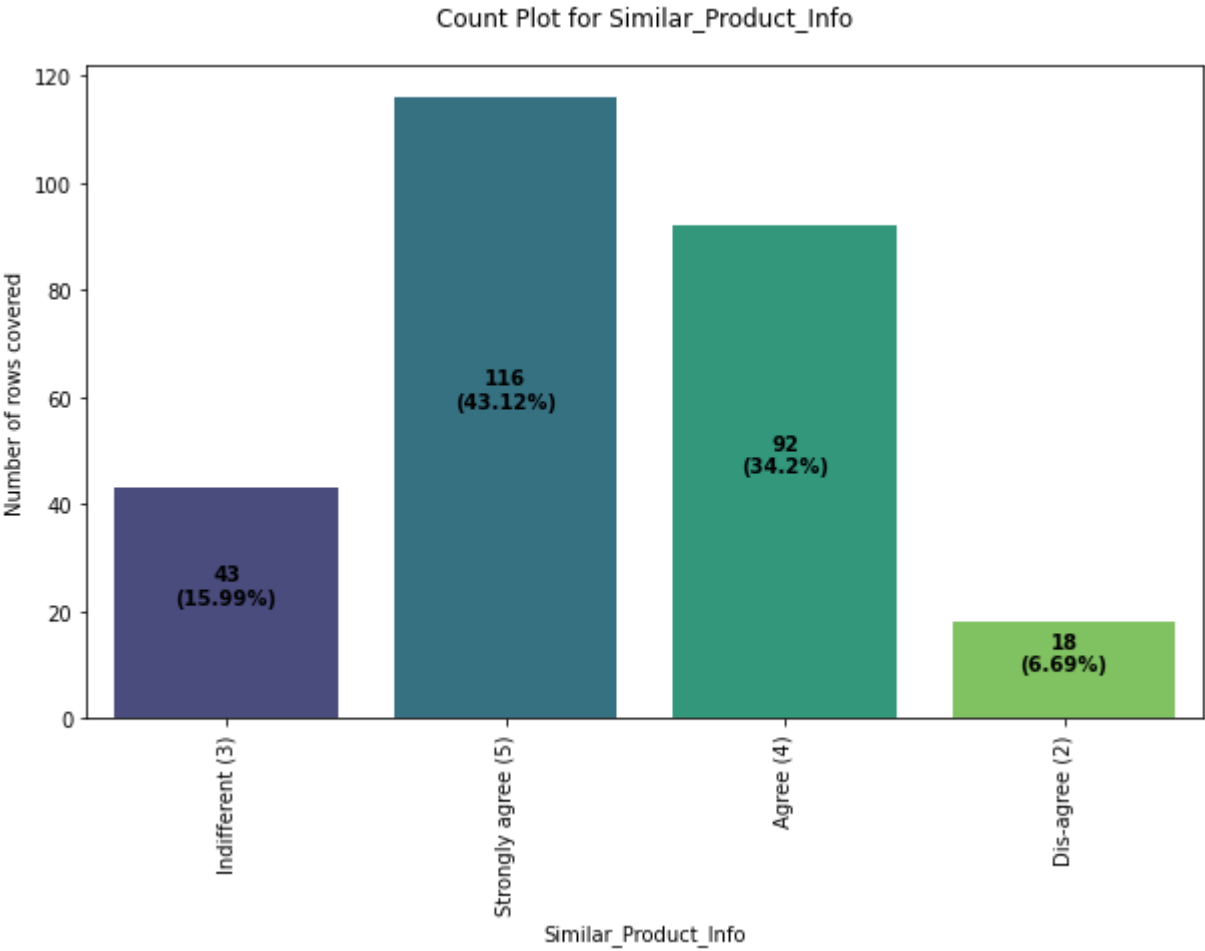


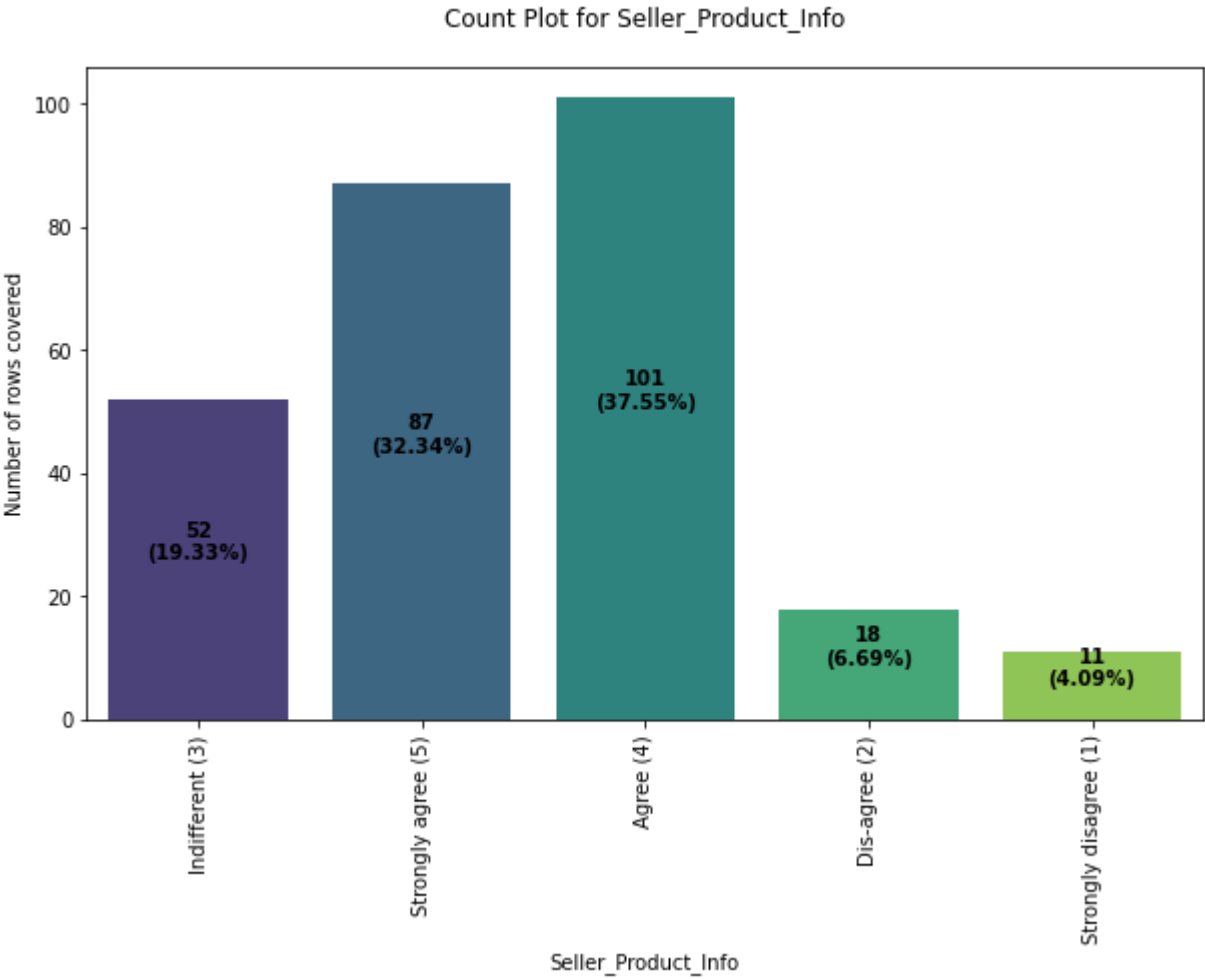


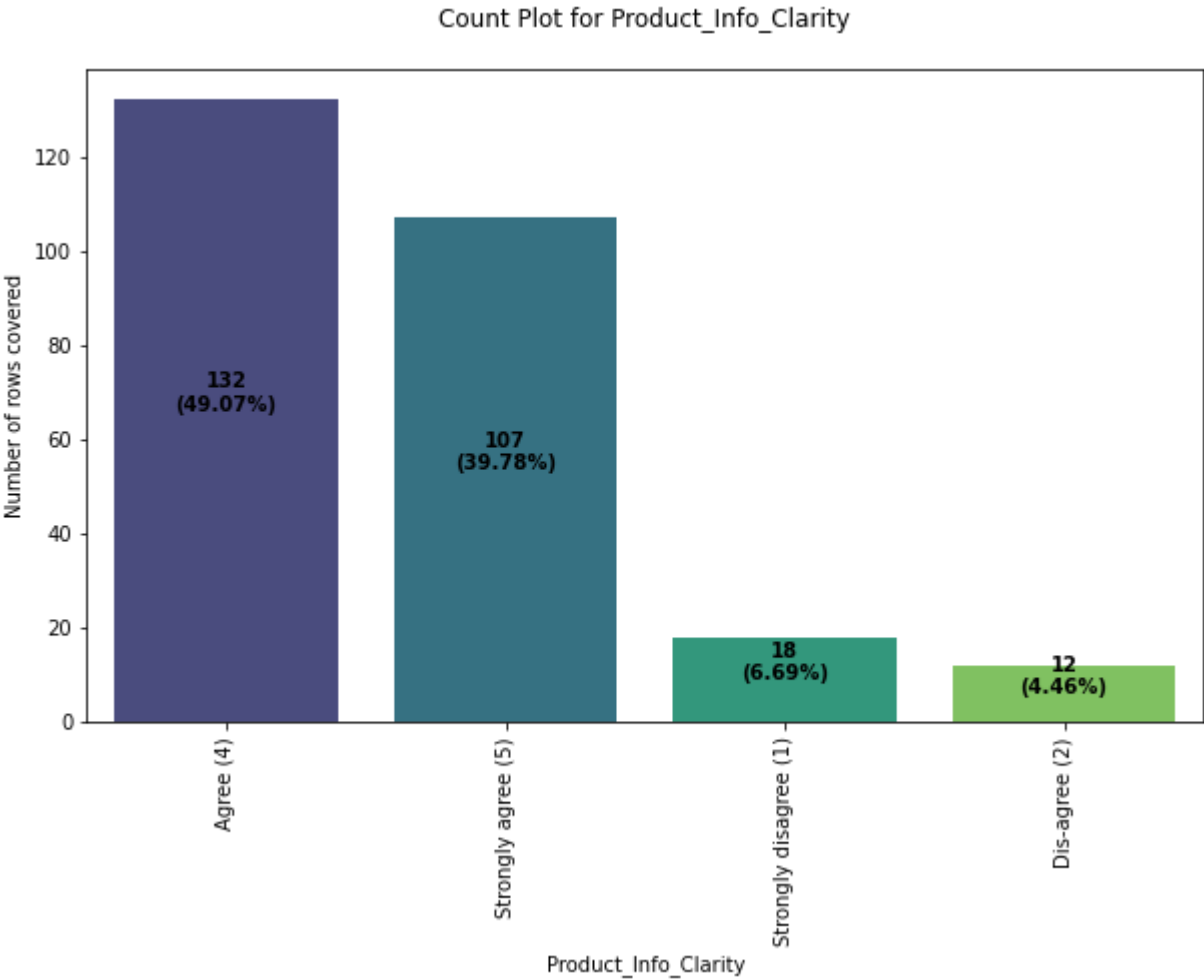


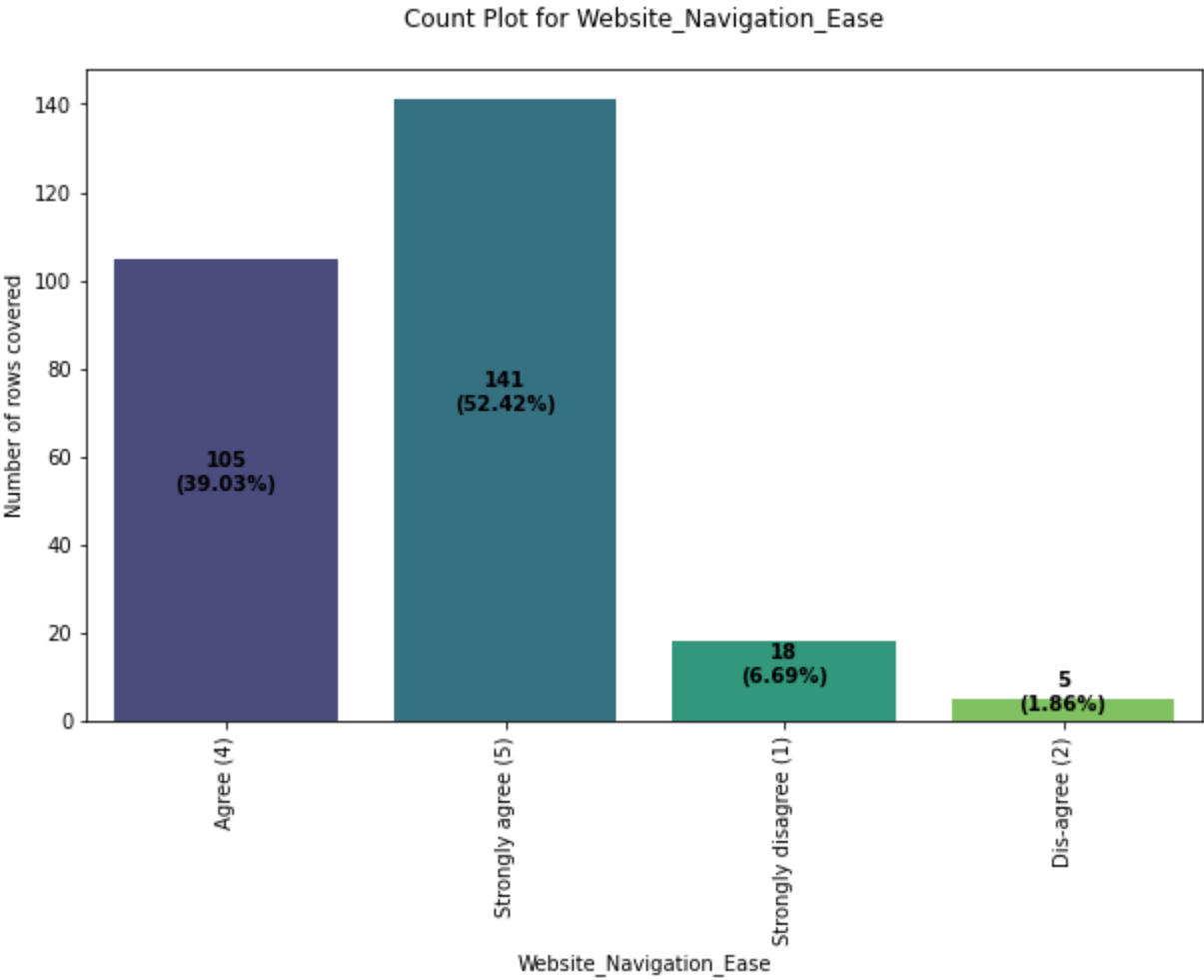


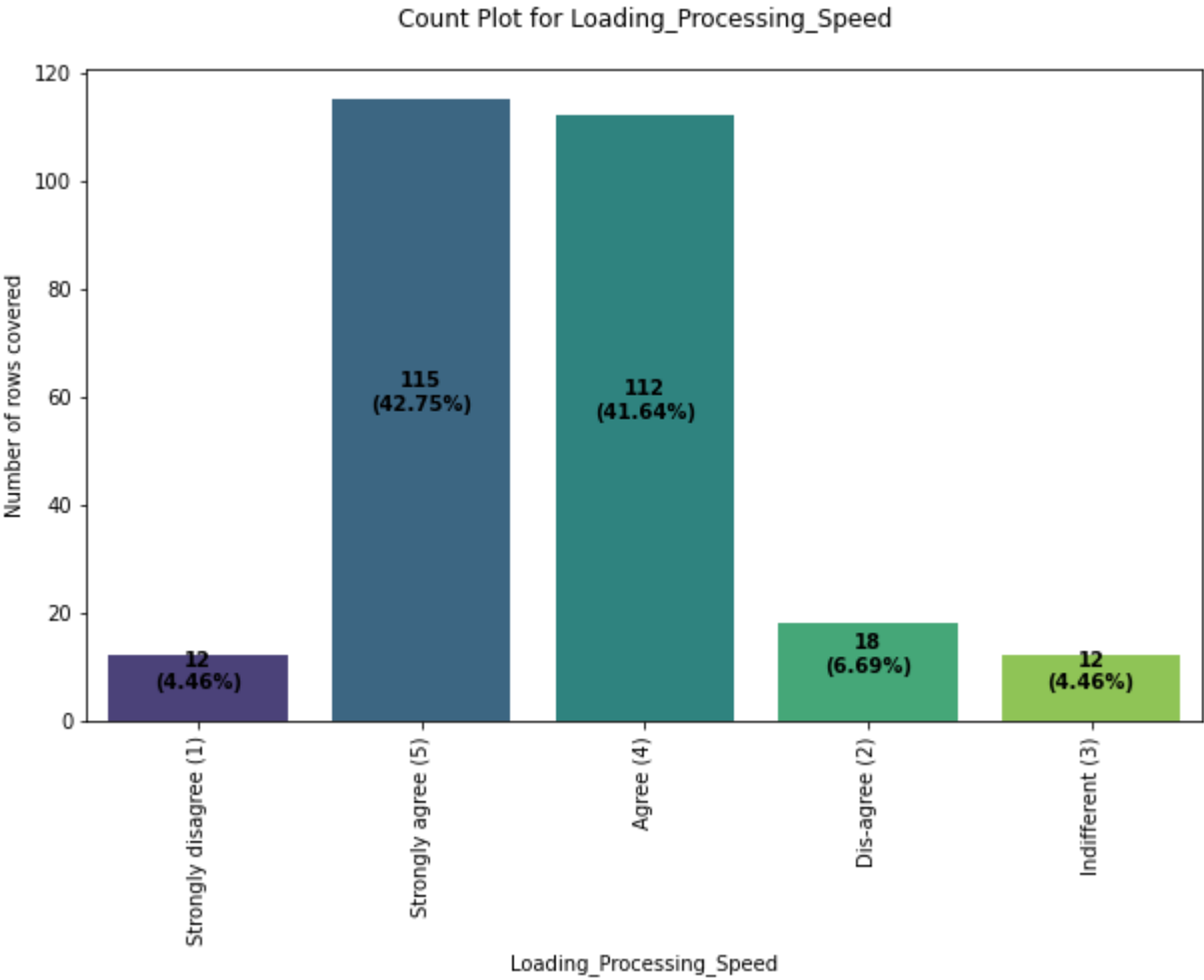


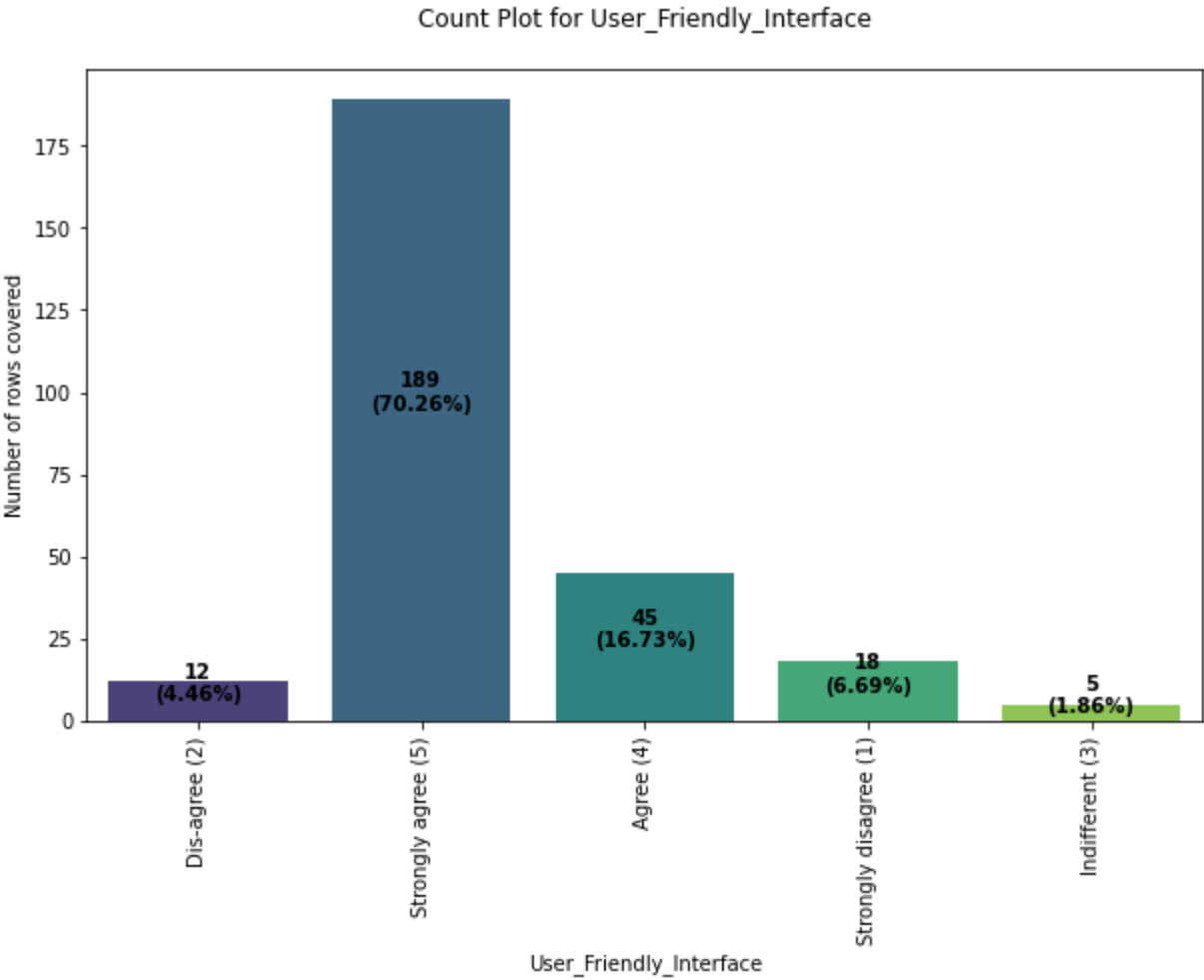


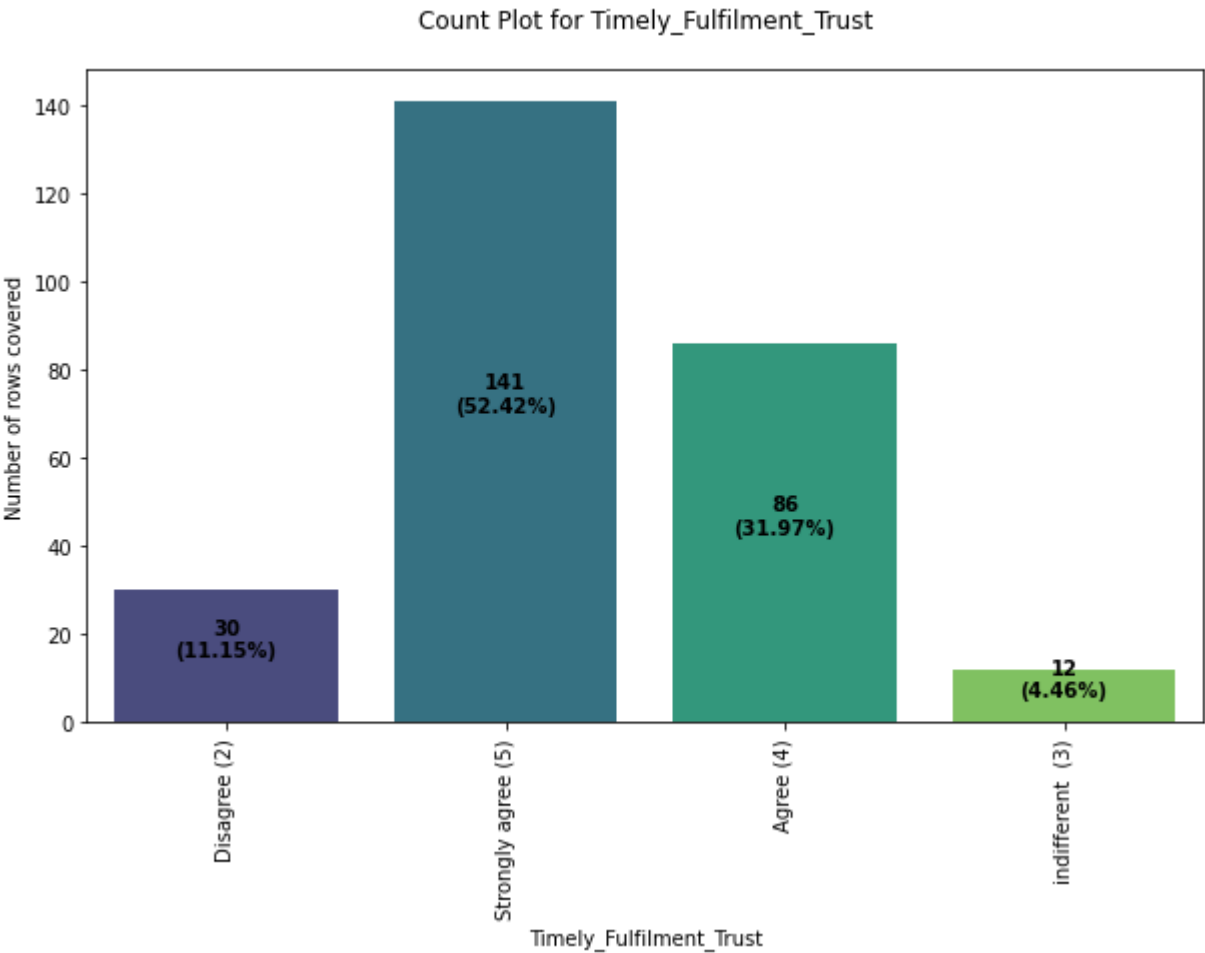
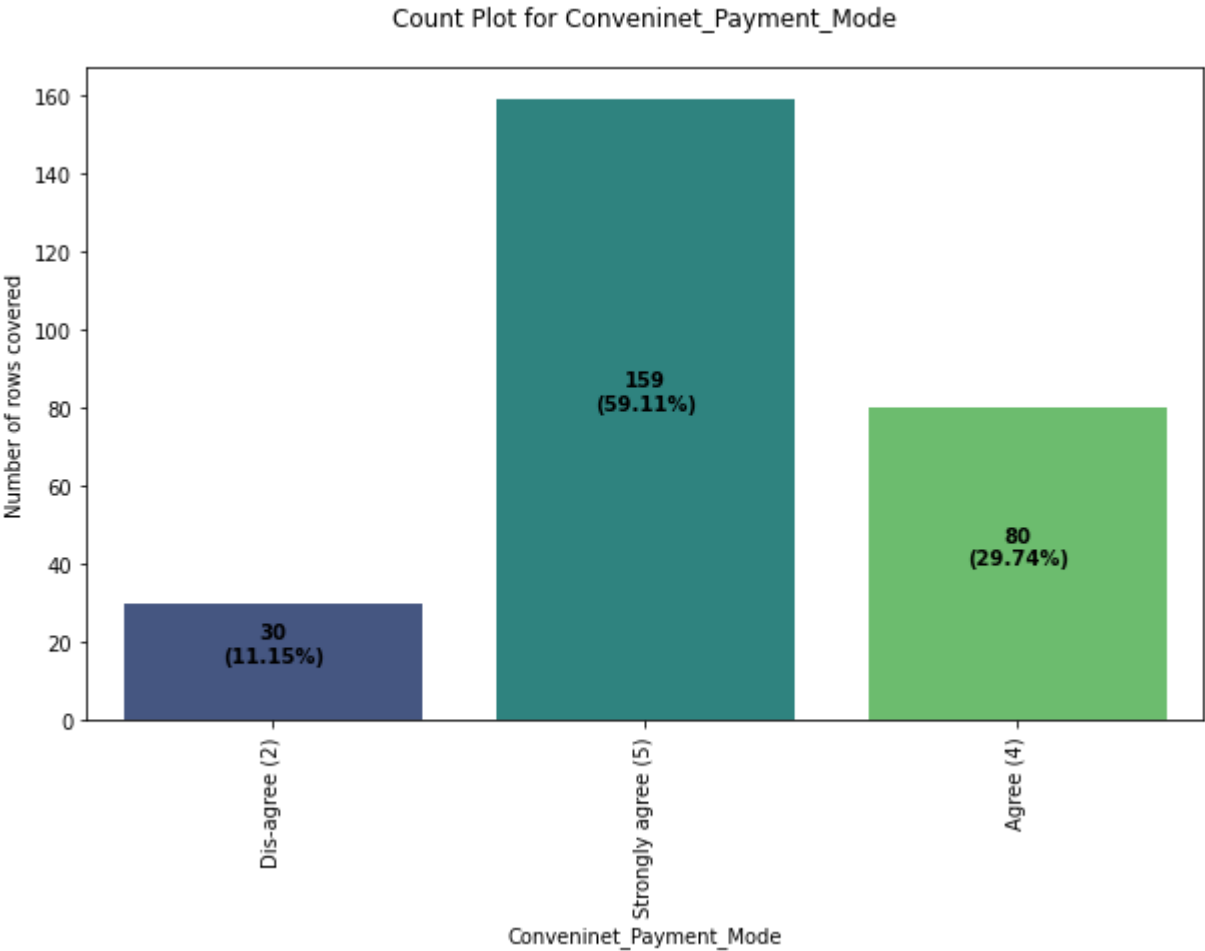


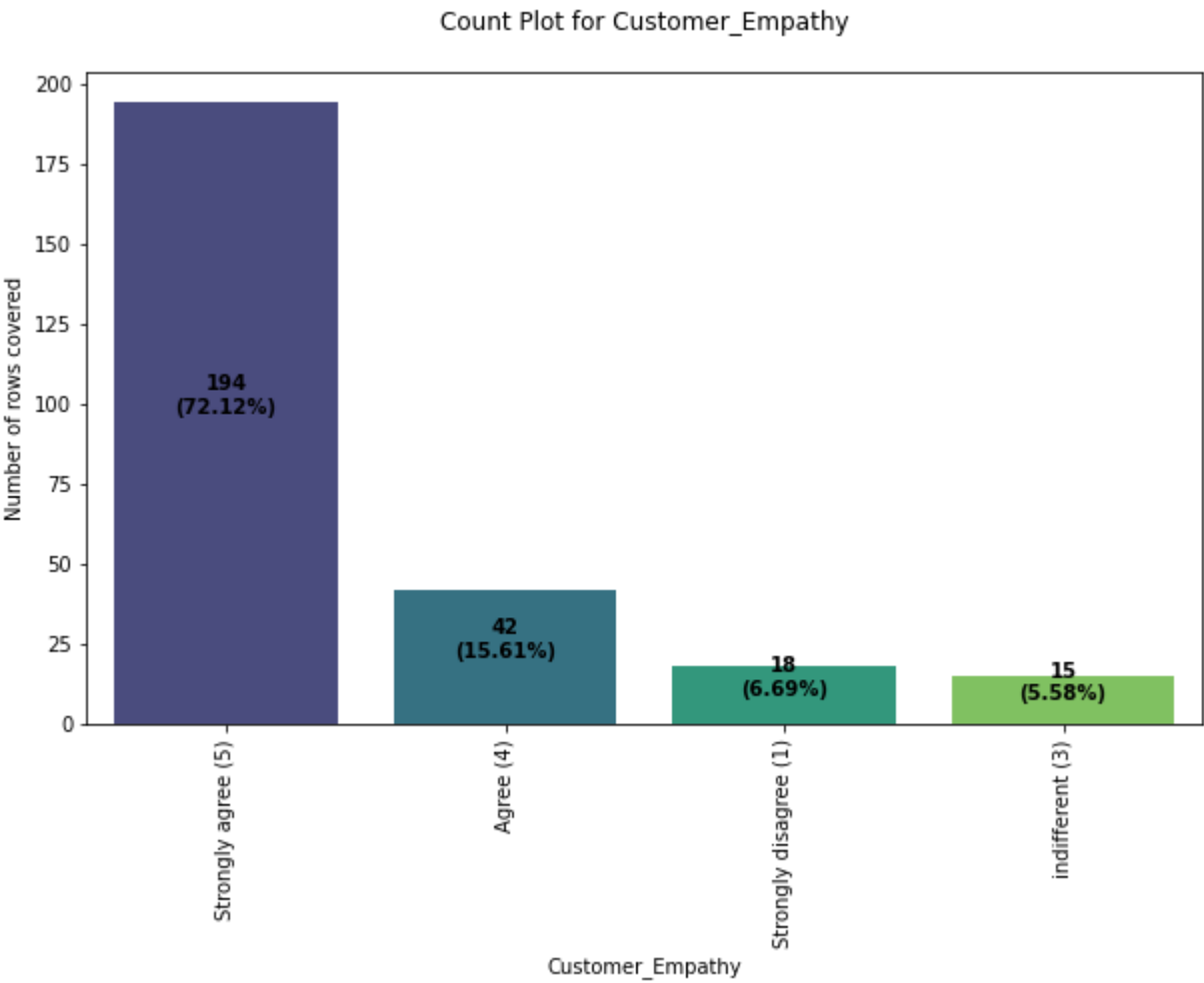


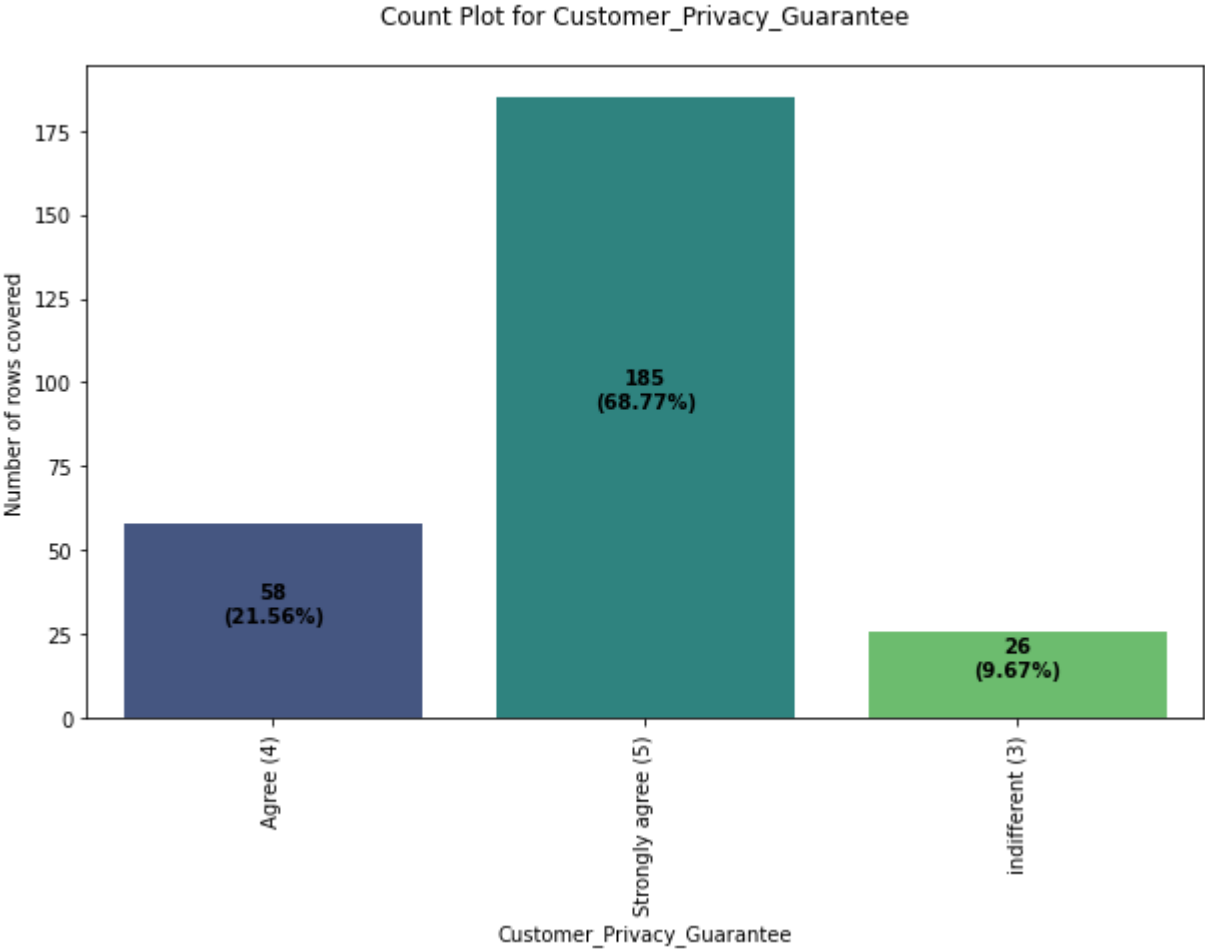


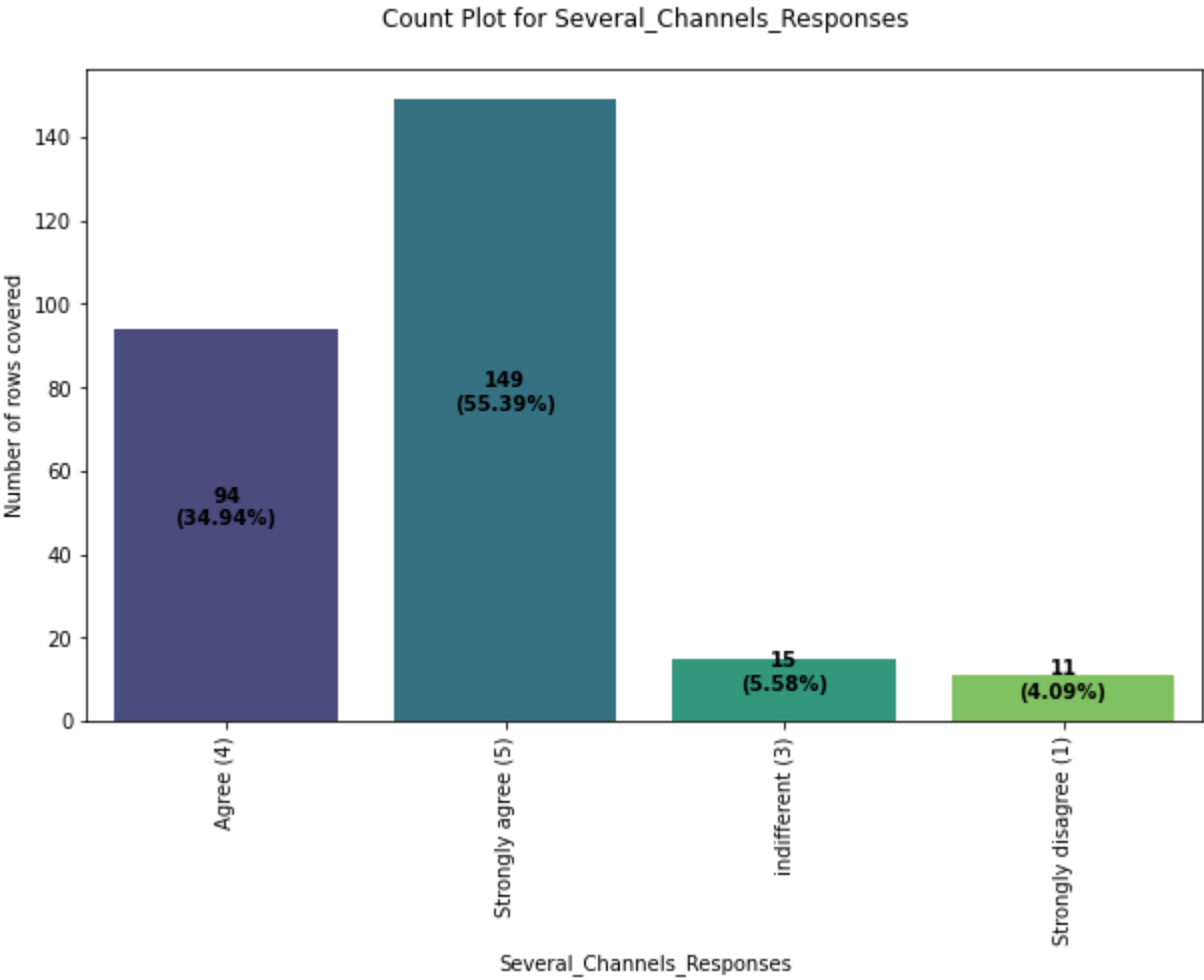


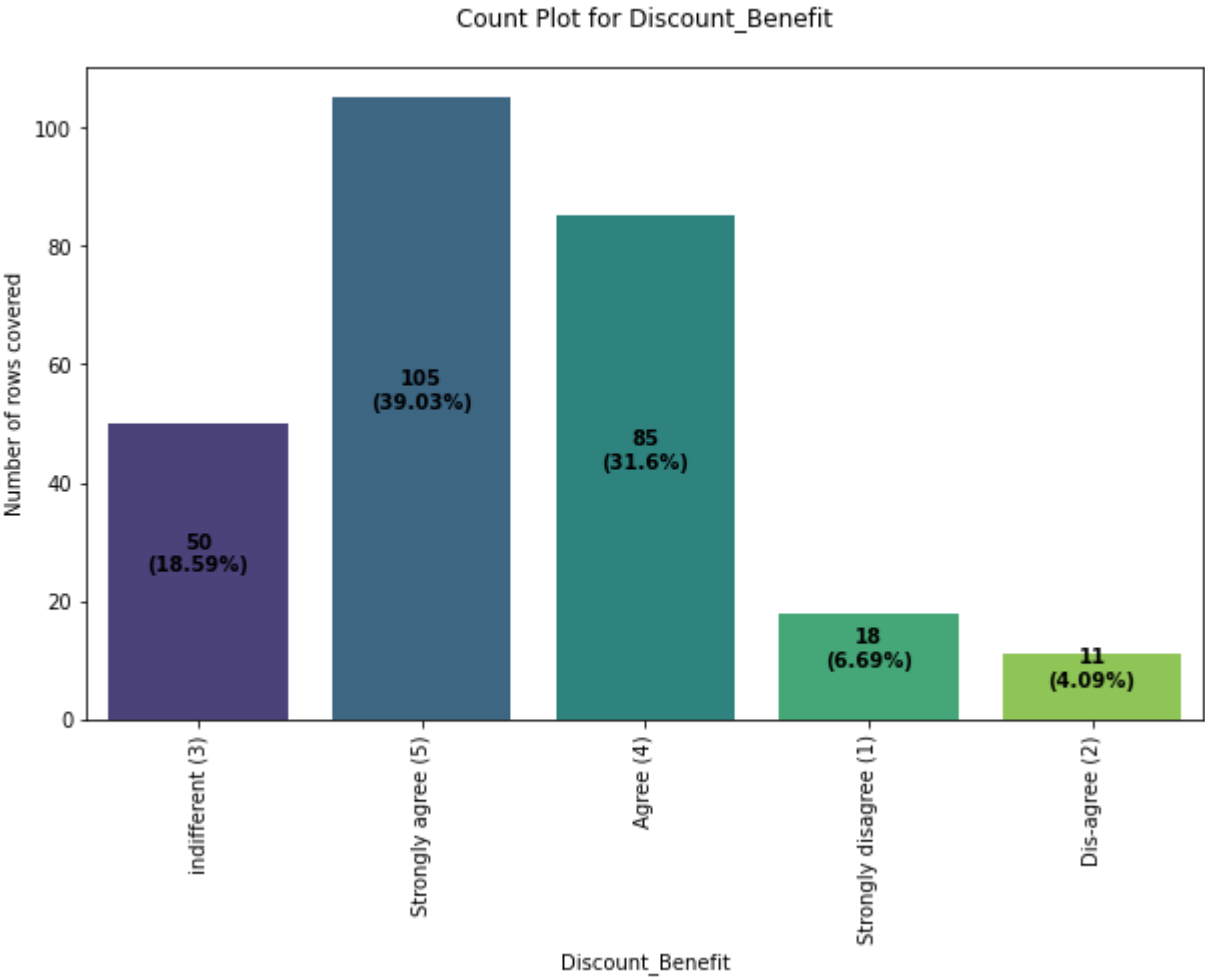


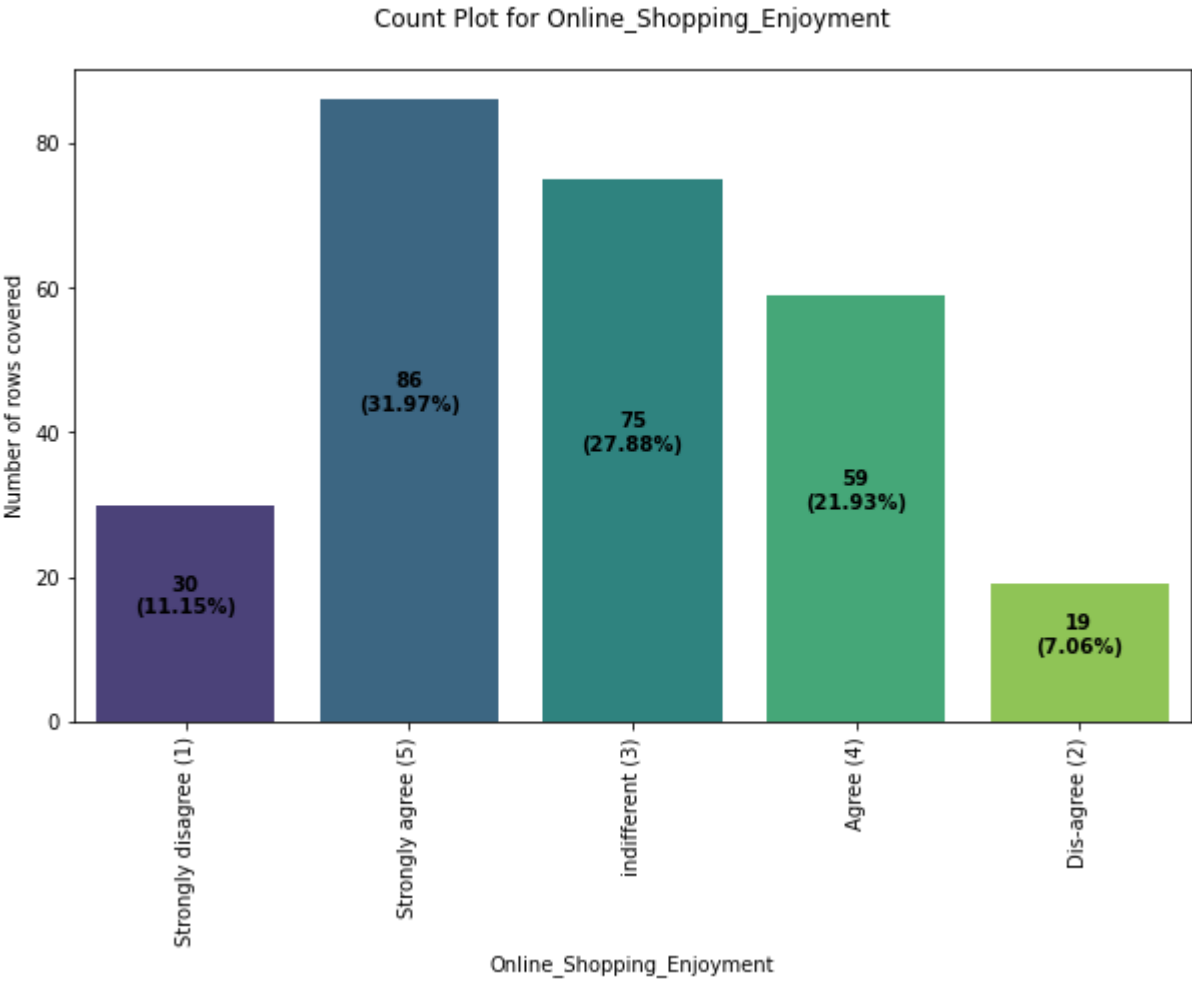


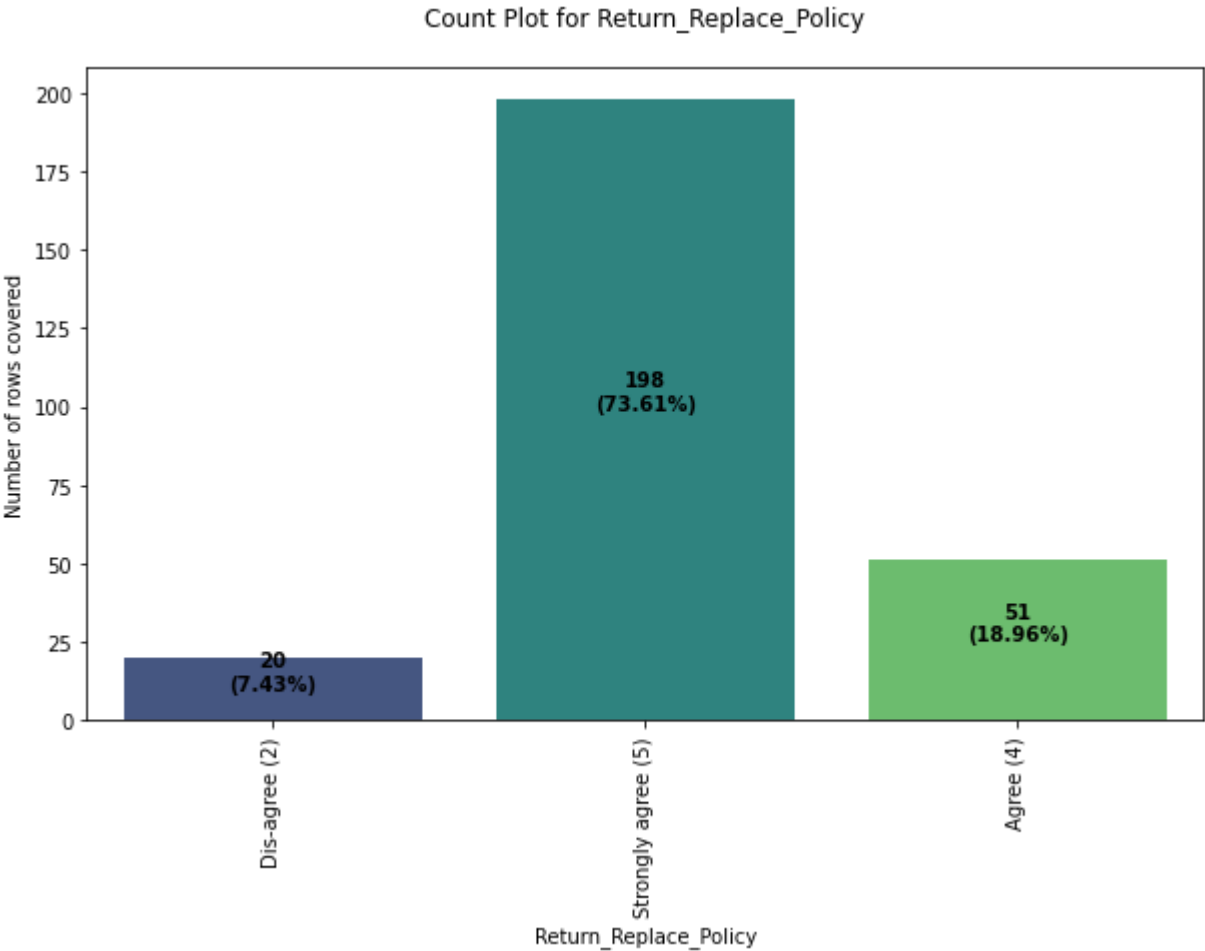
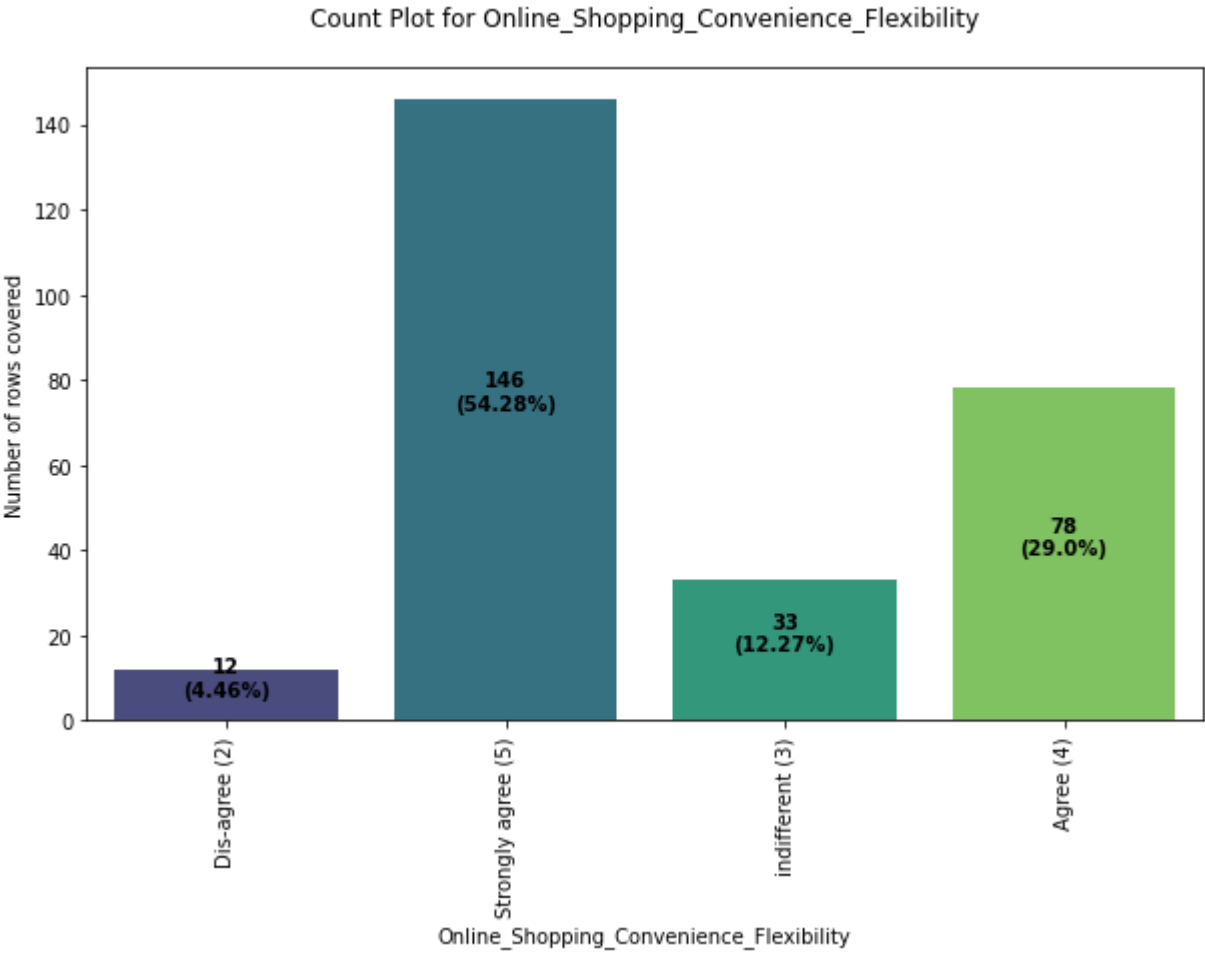


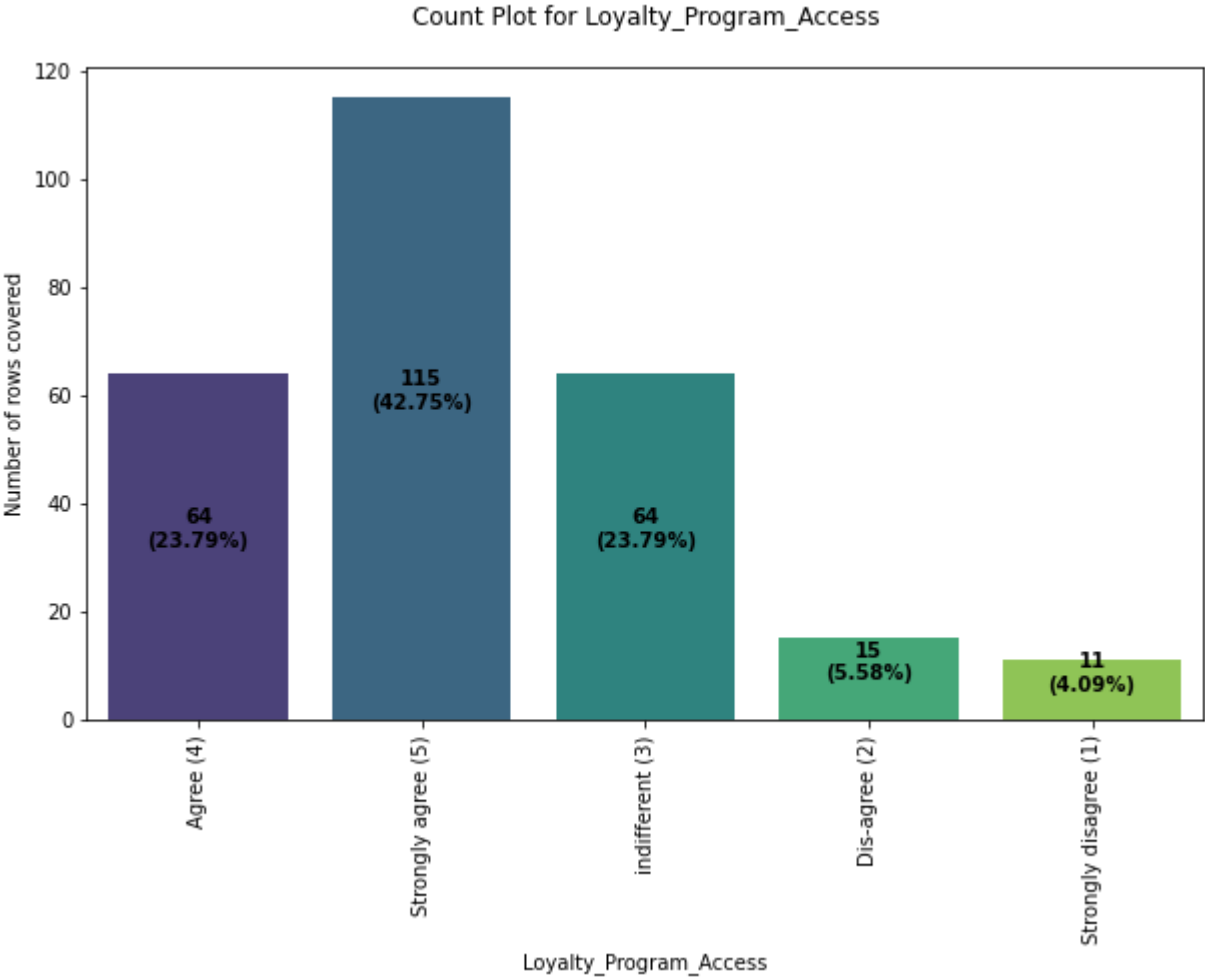


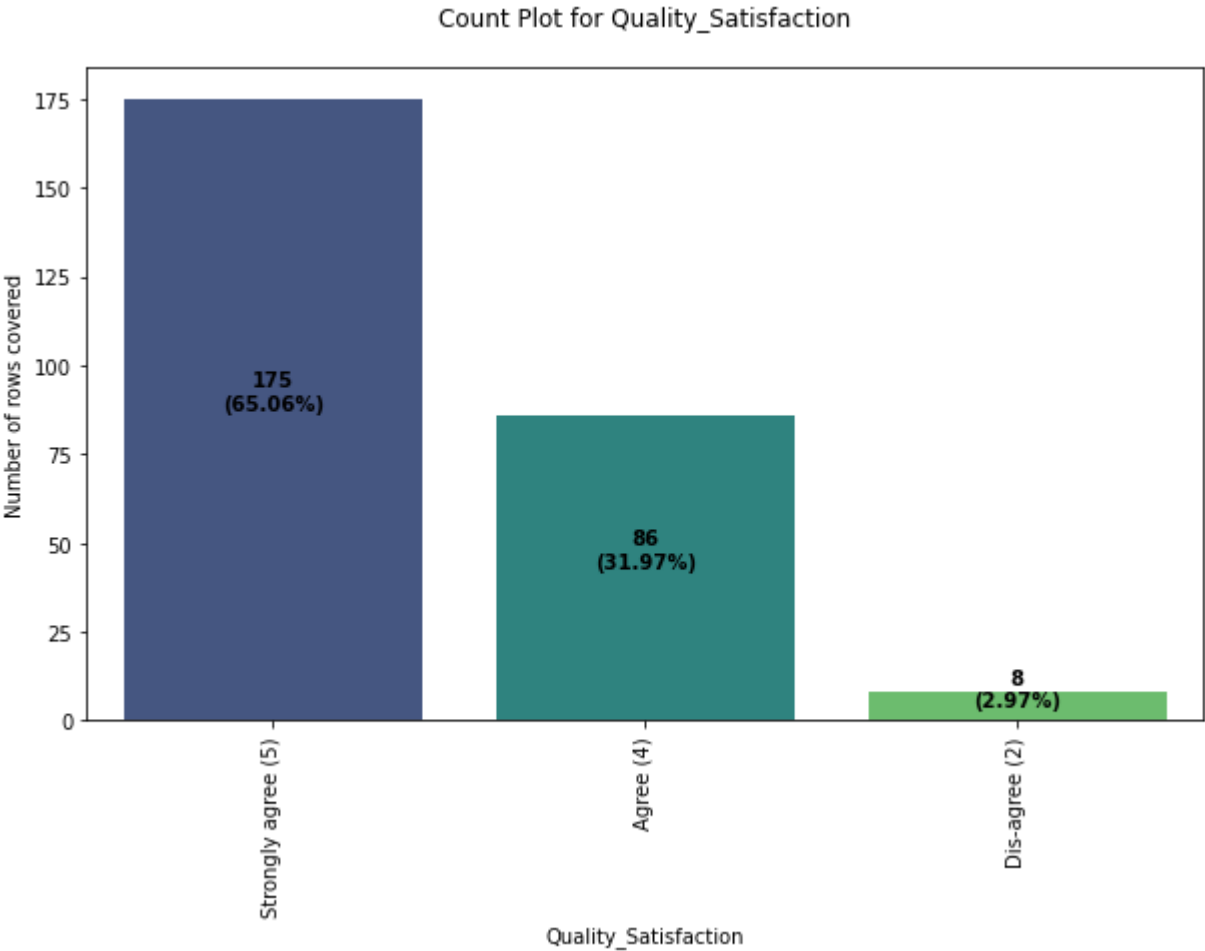
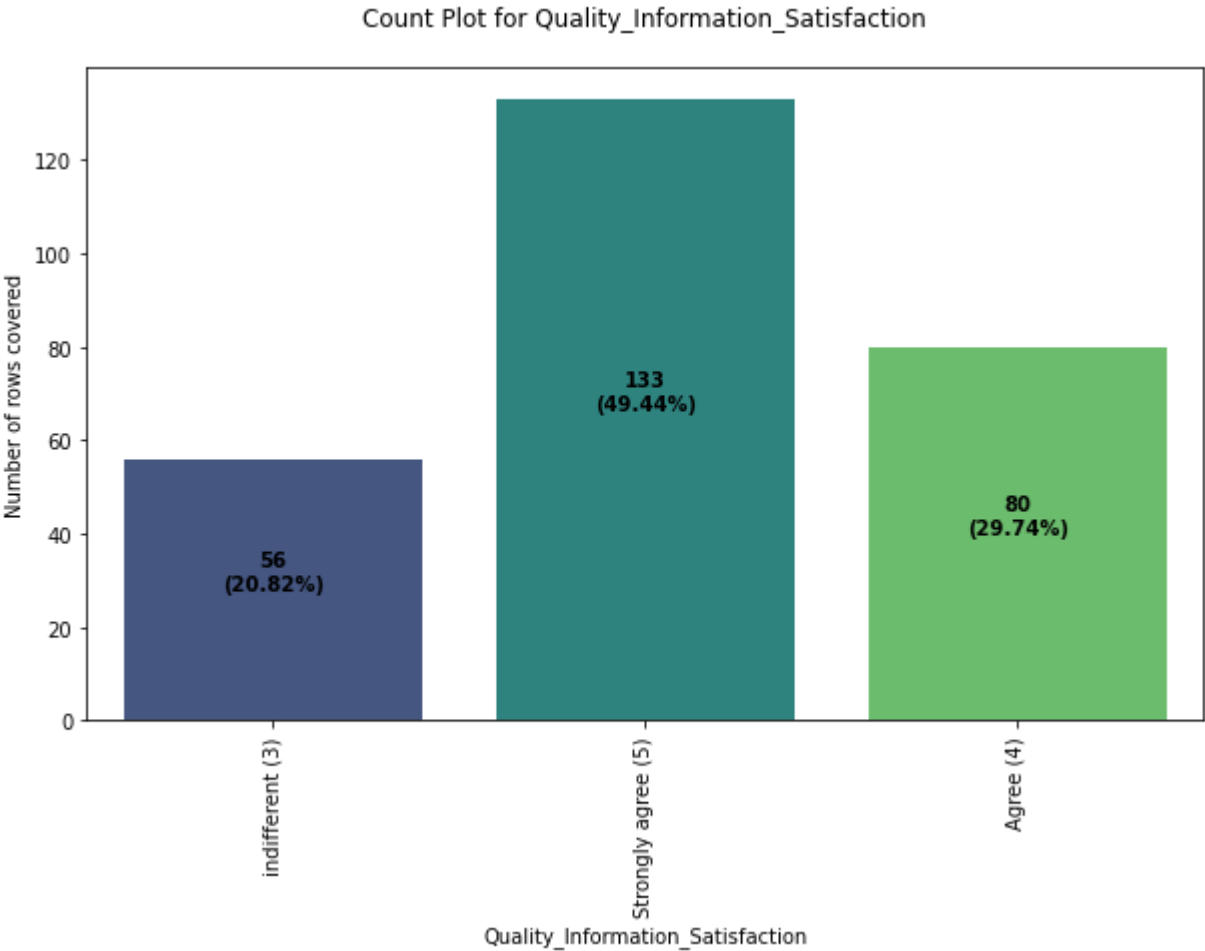


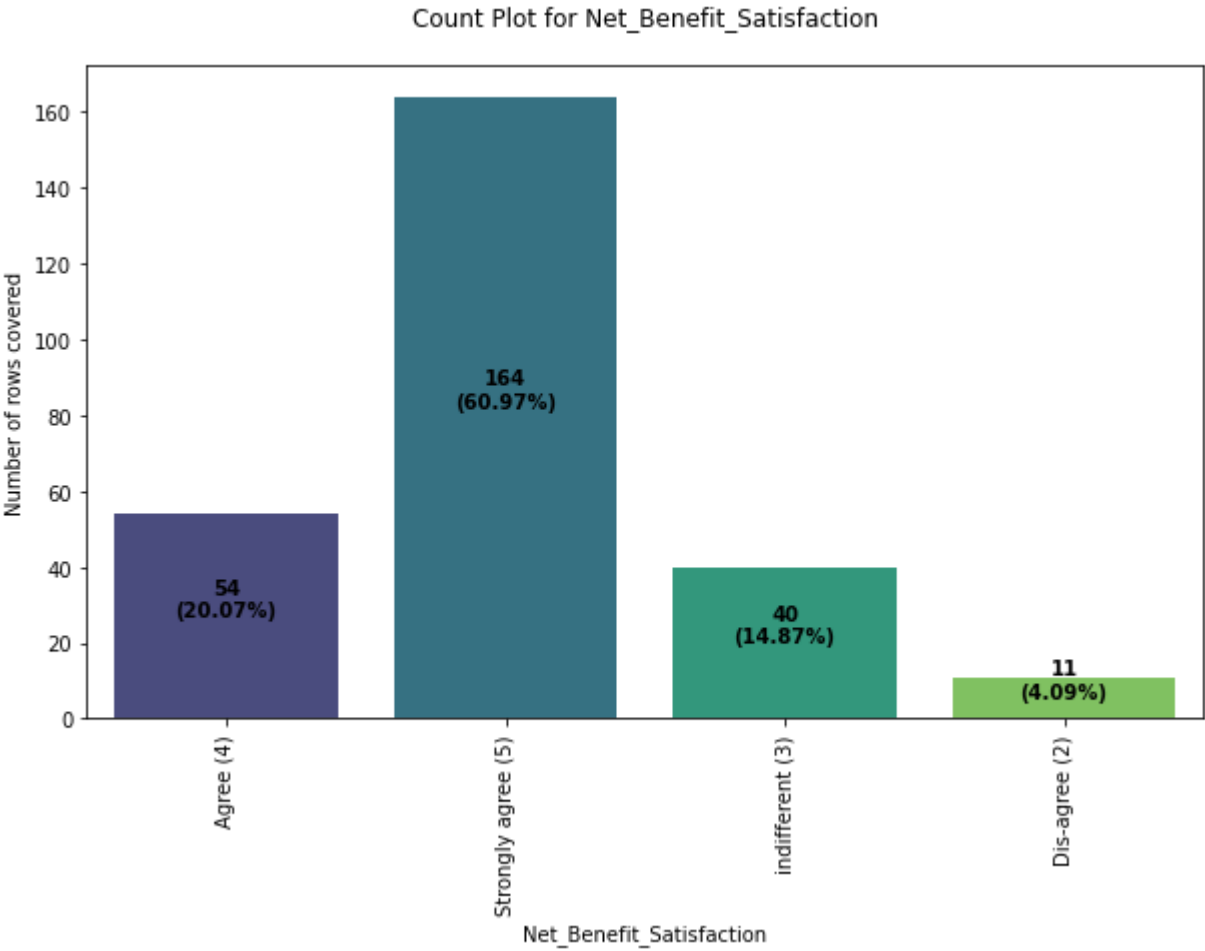


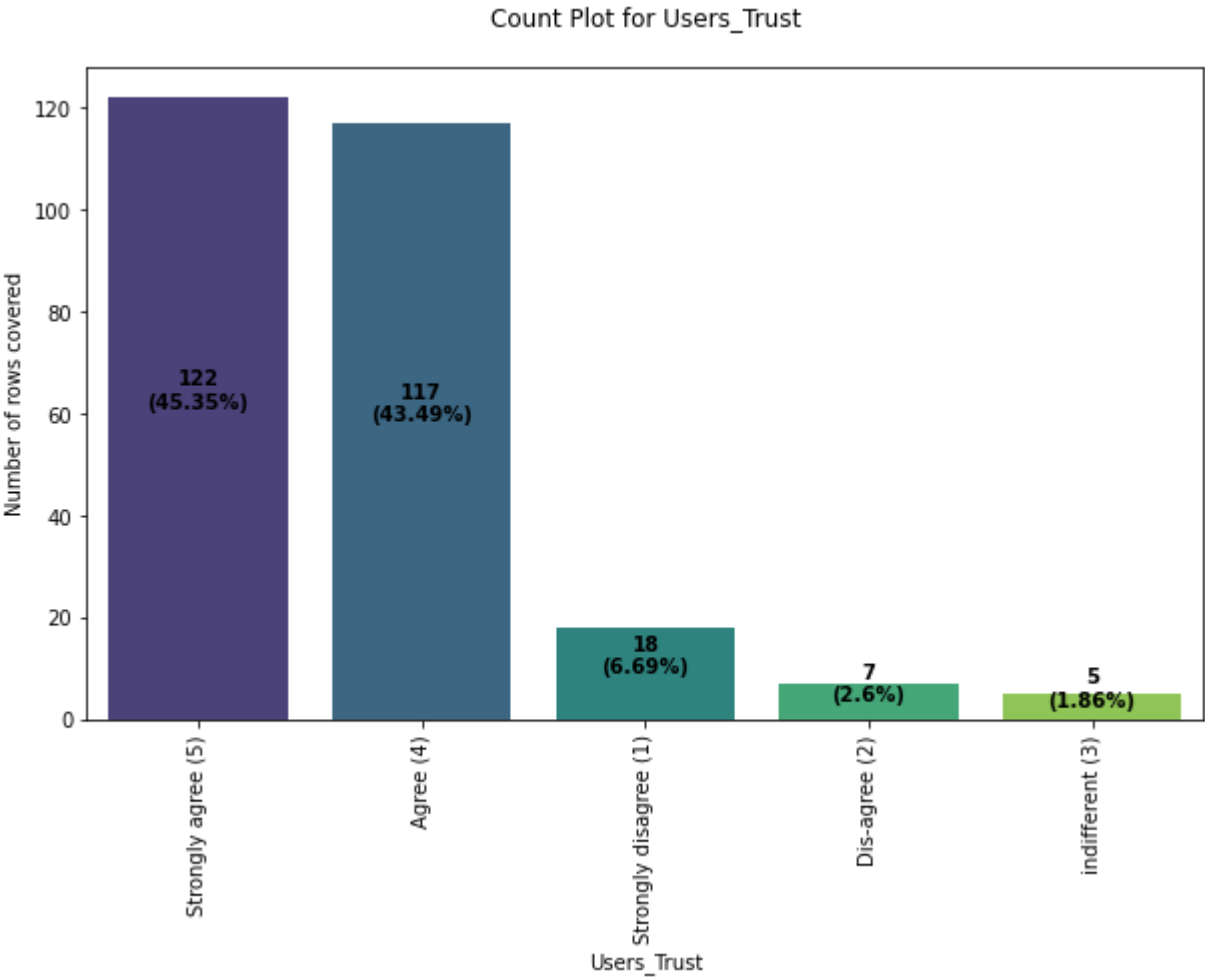




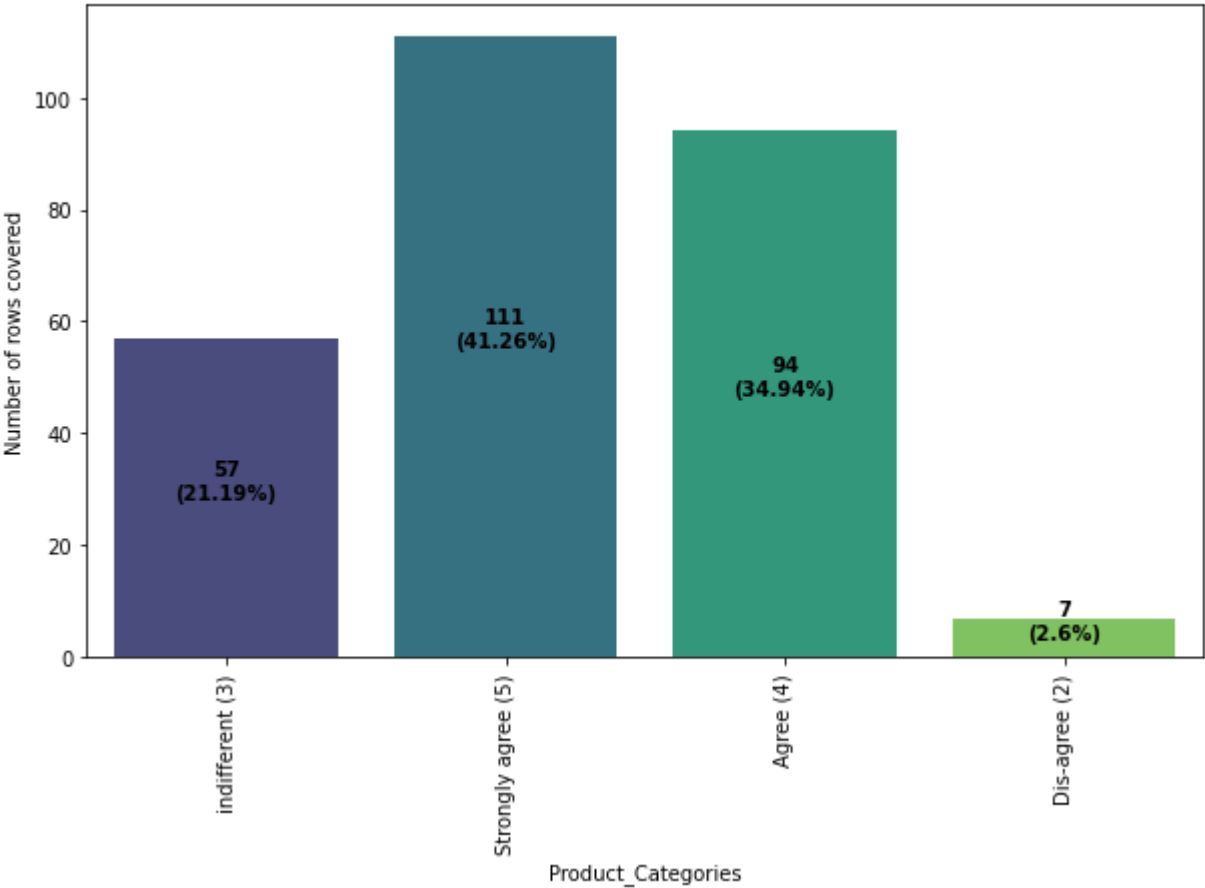




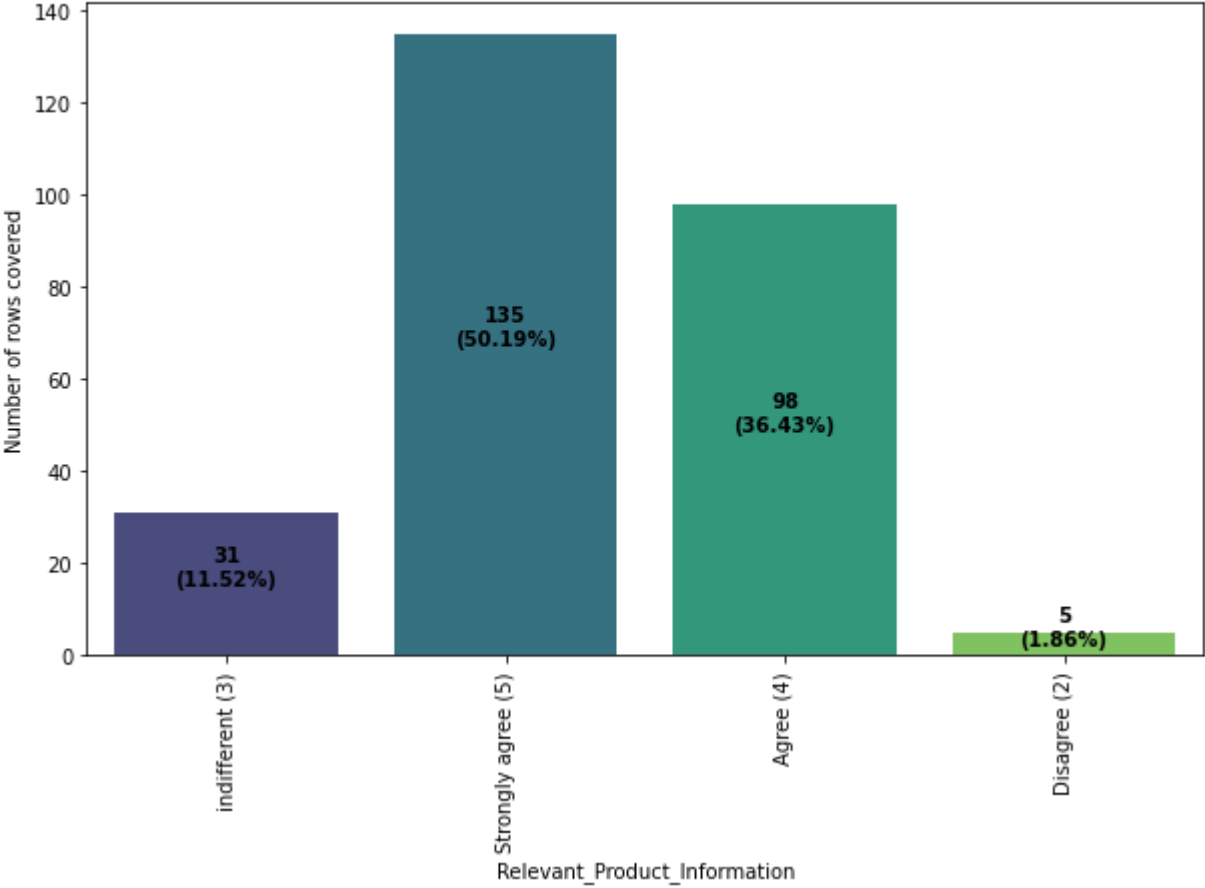




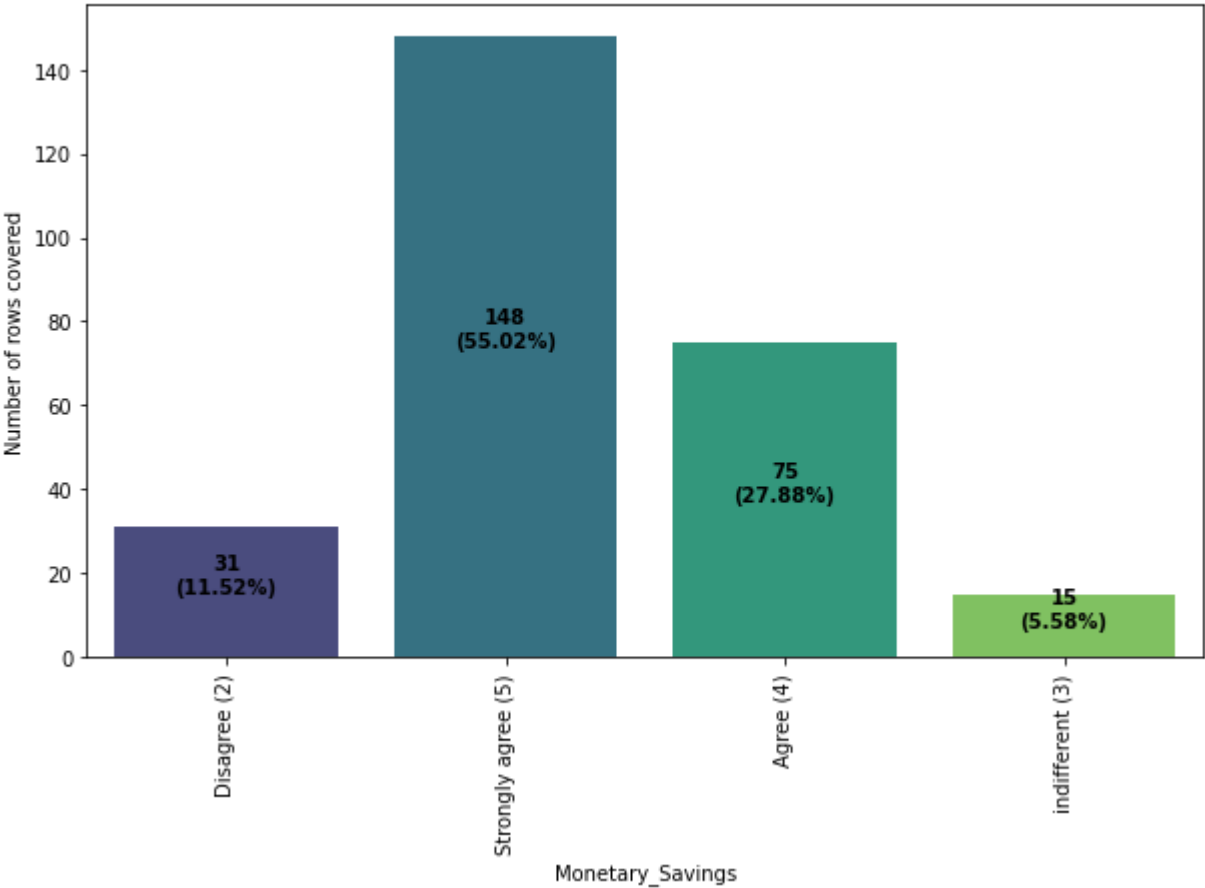
Count Plot for Product_Categories



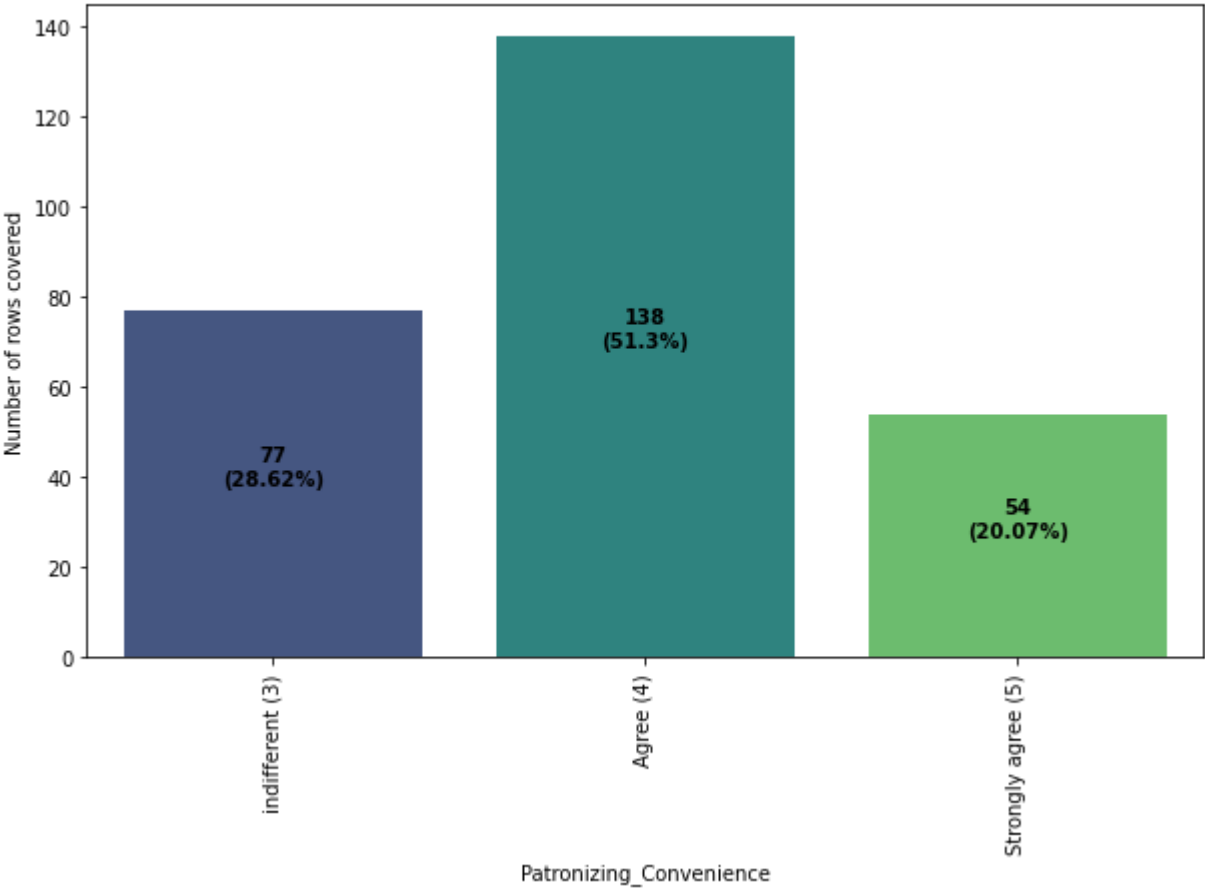
Count Plot for Relevant_Product_Information

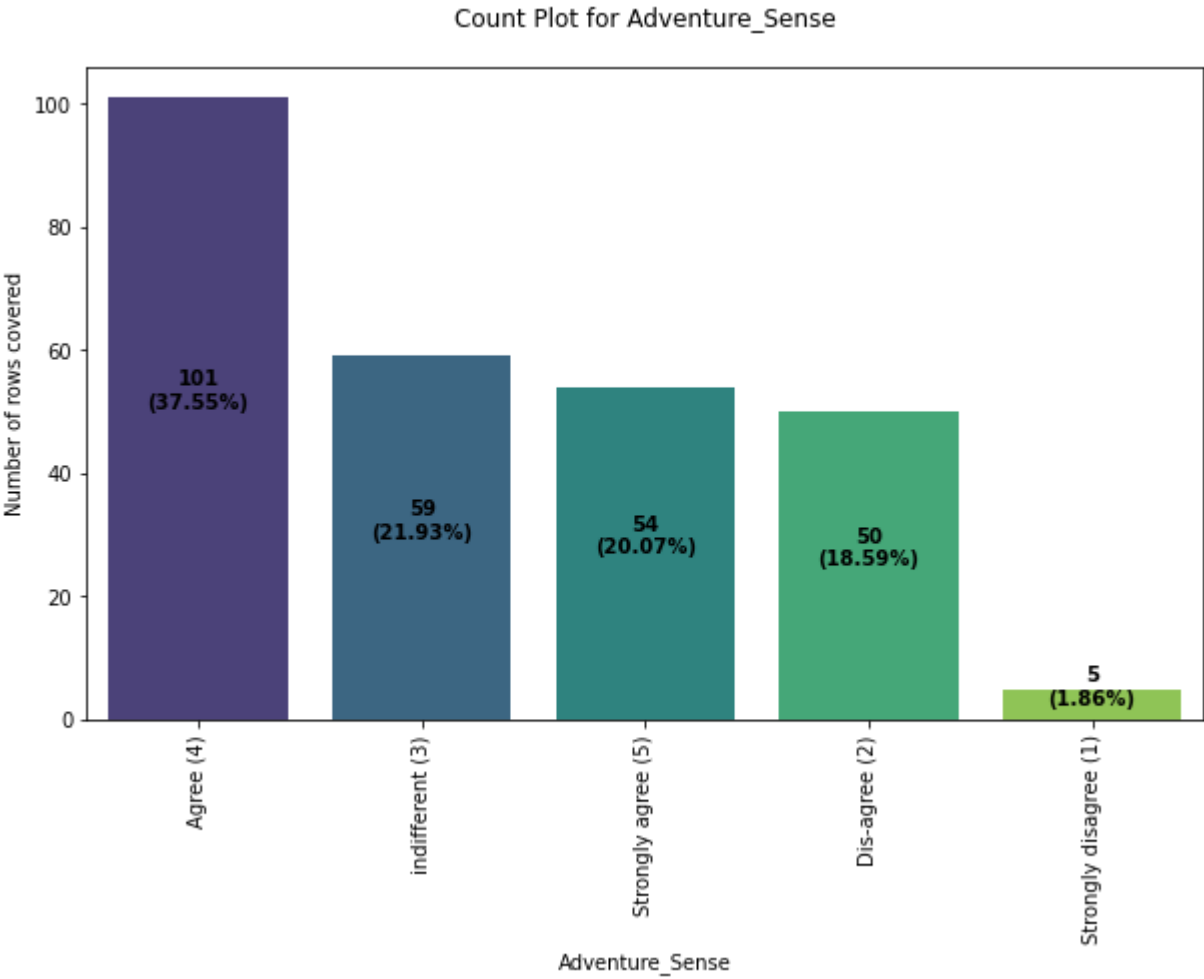


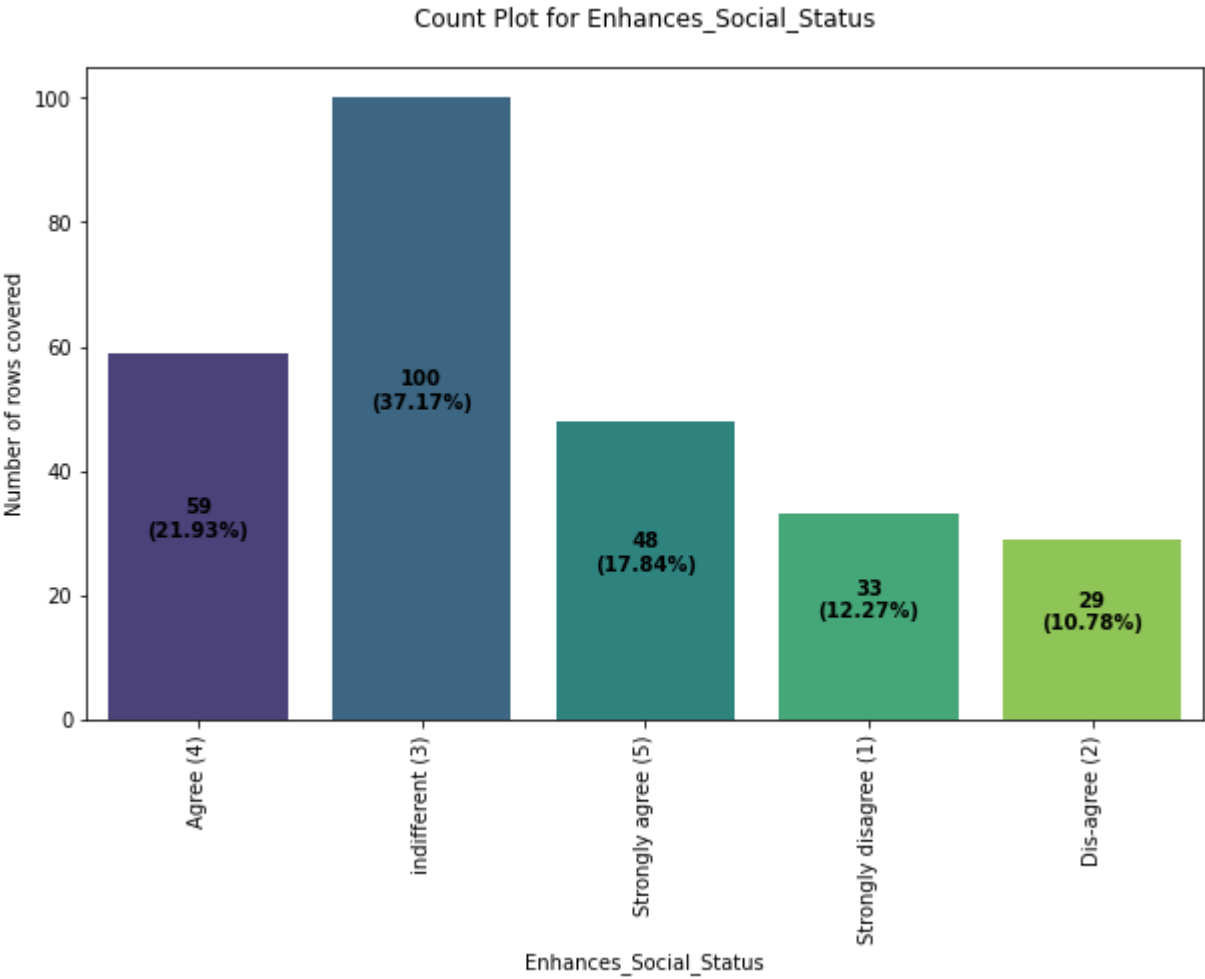
Count Plot for Monetary_Savings

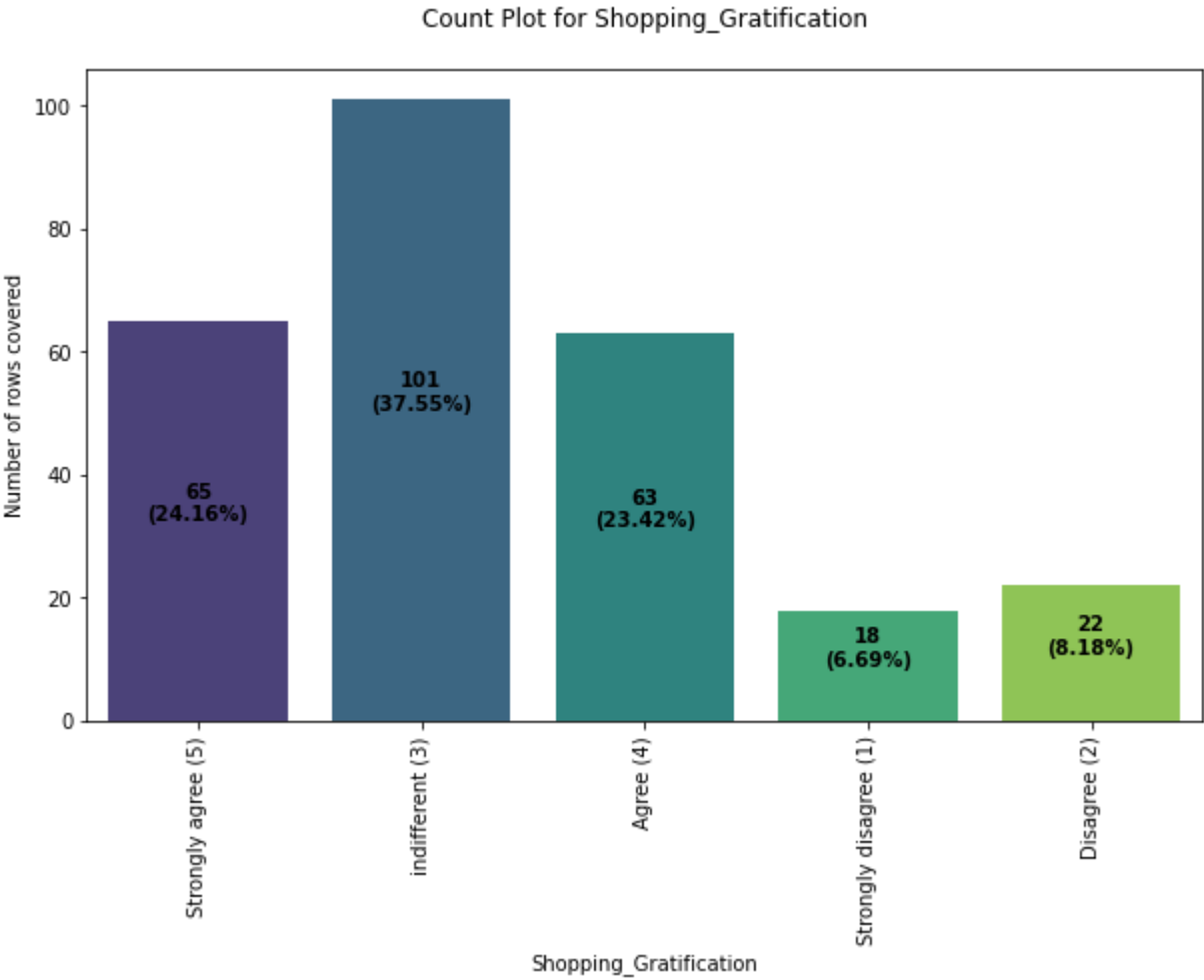


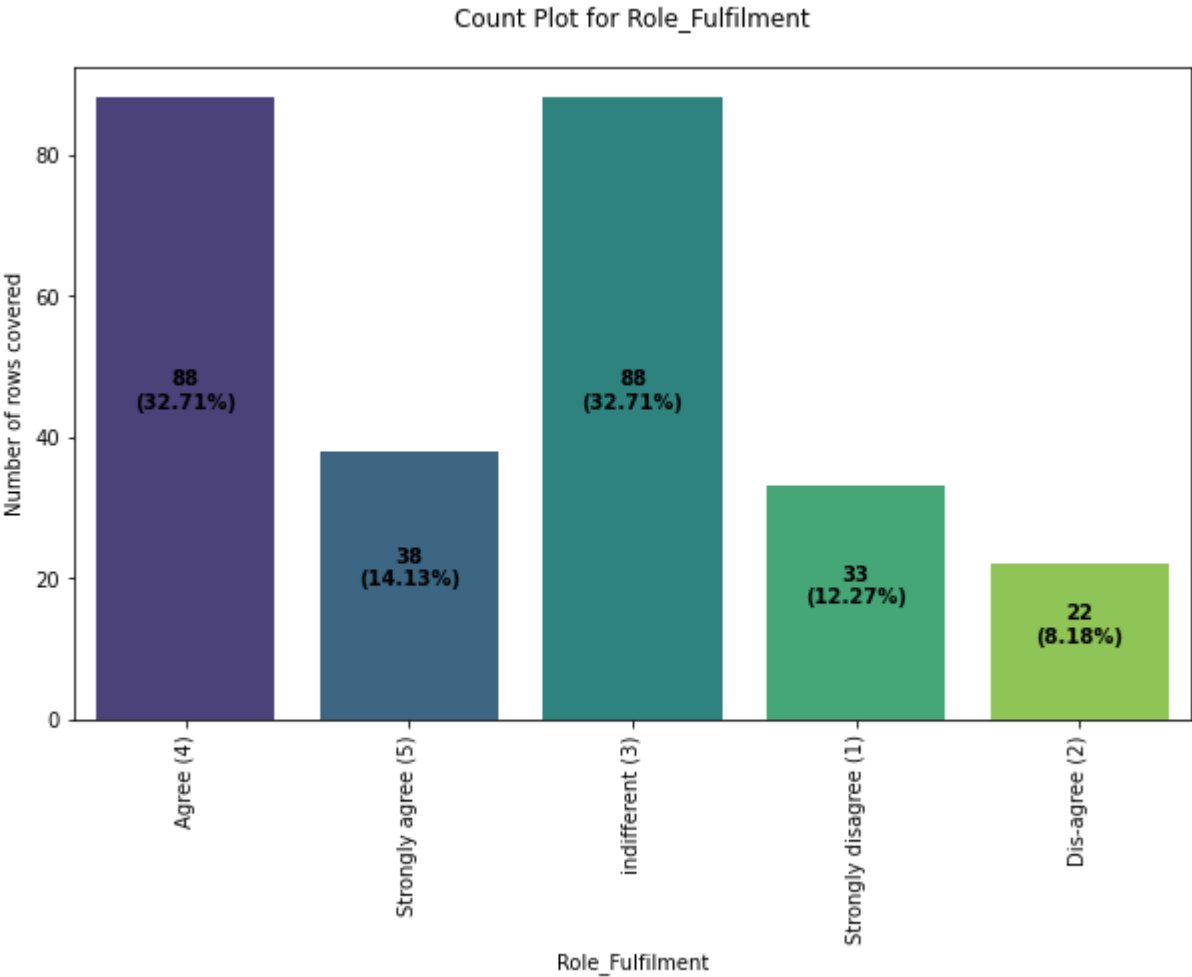
Count Plot for Patronizing_Convenience

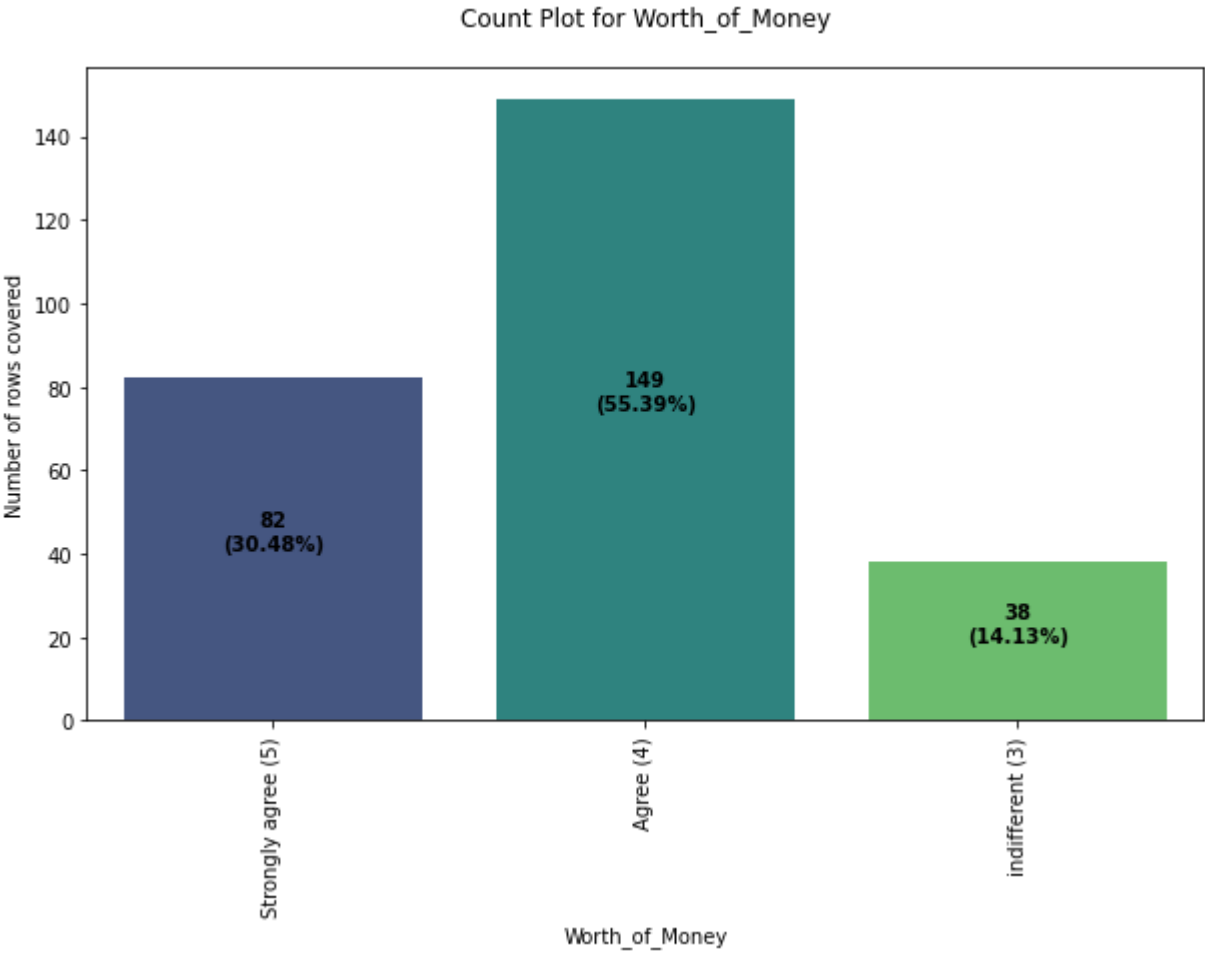


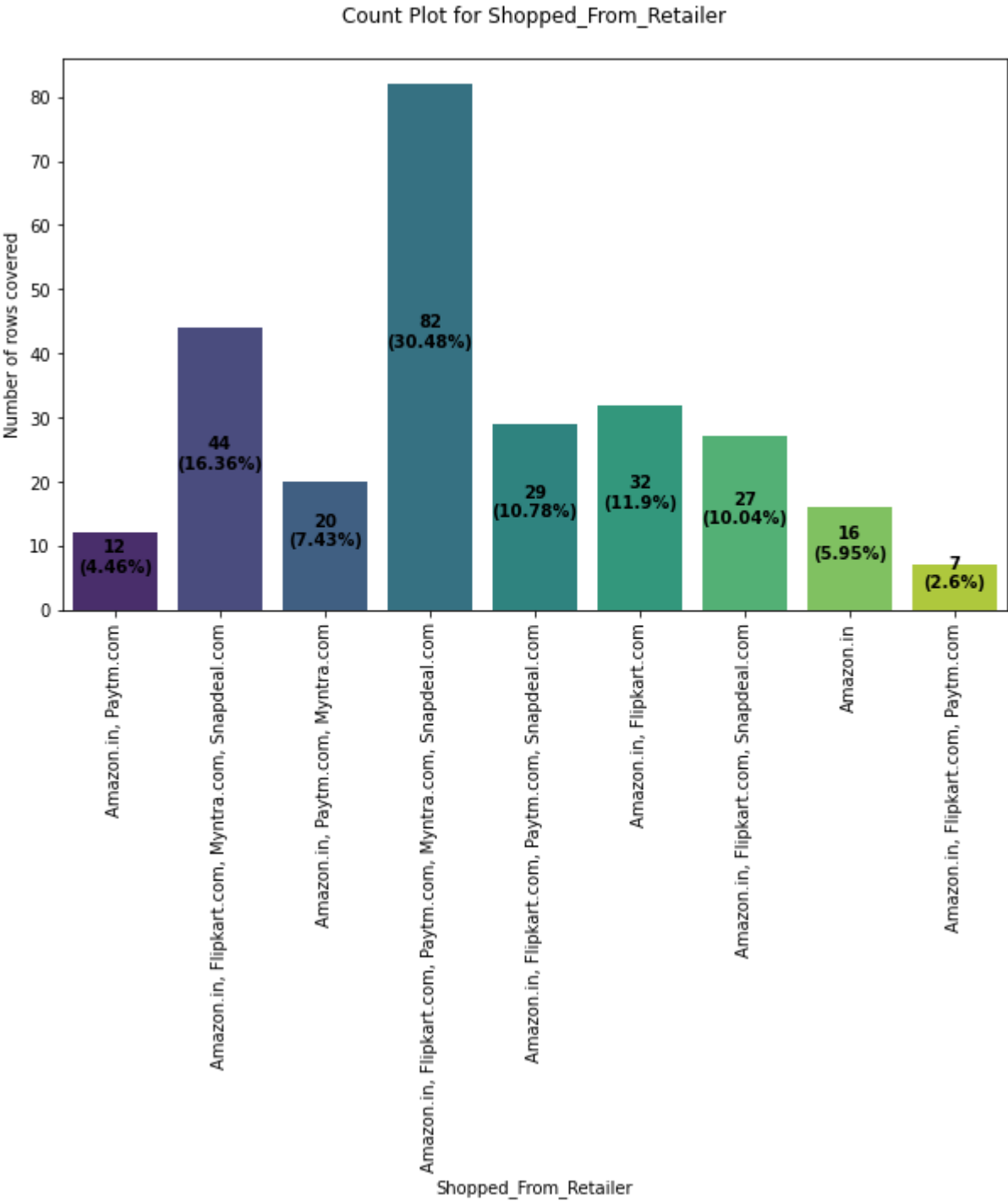


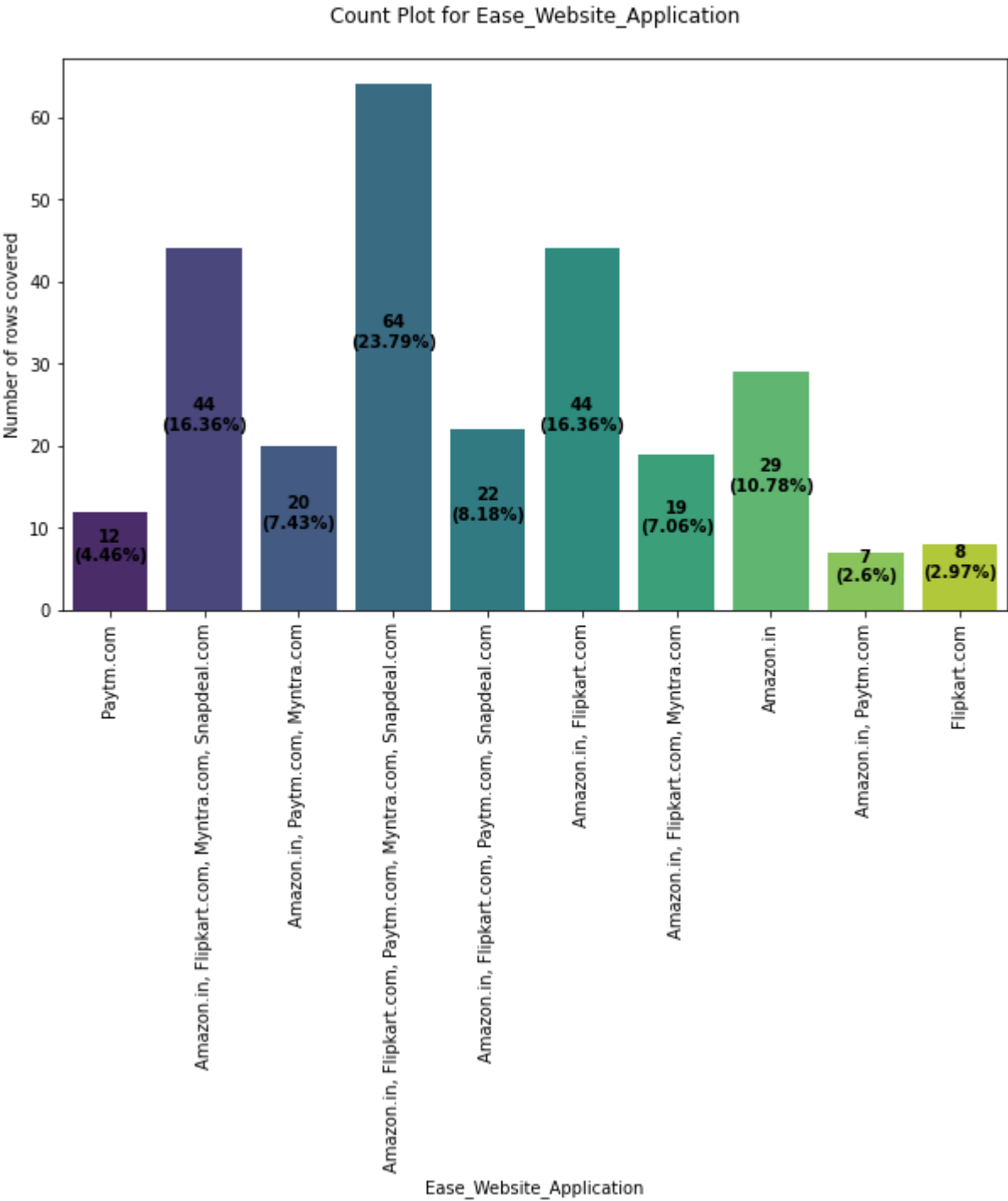


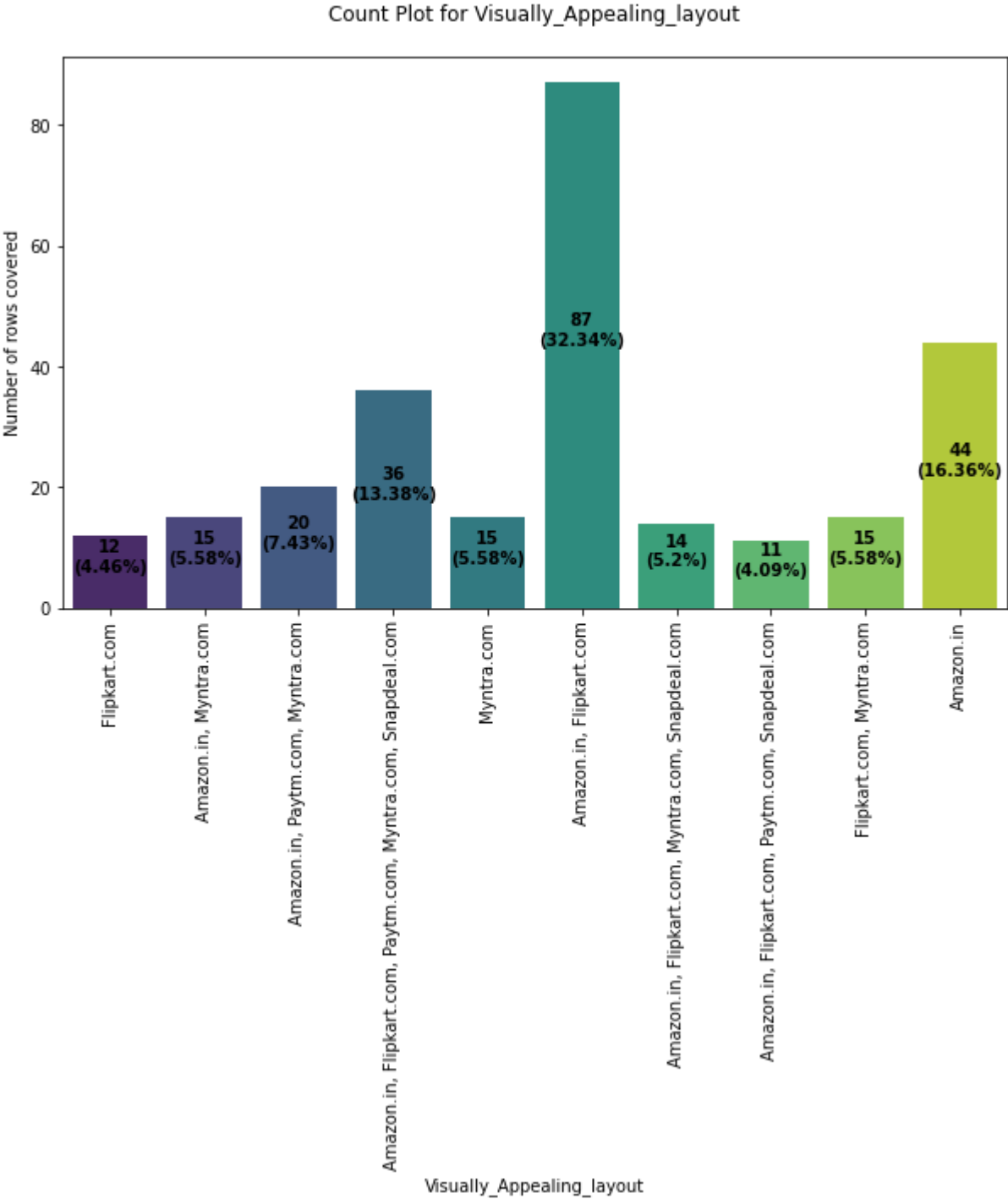


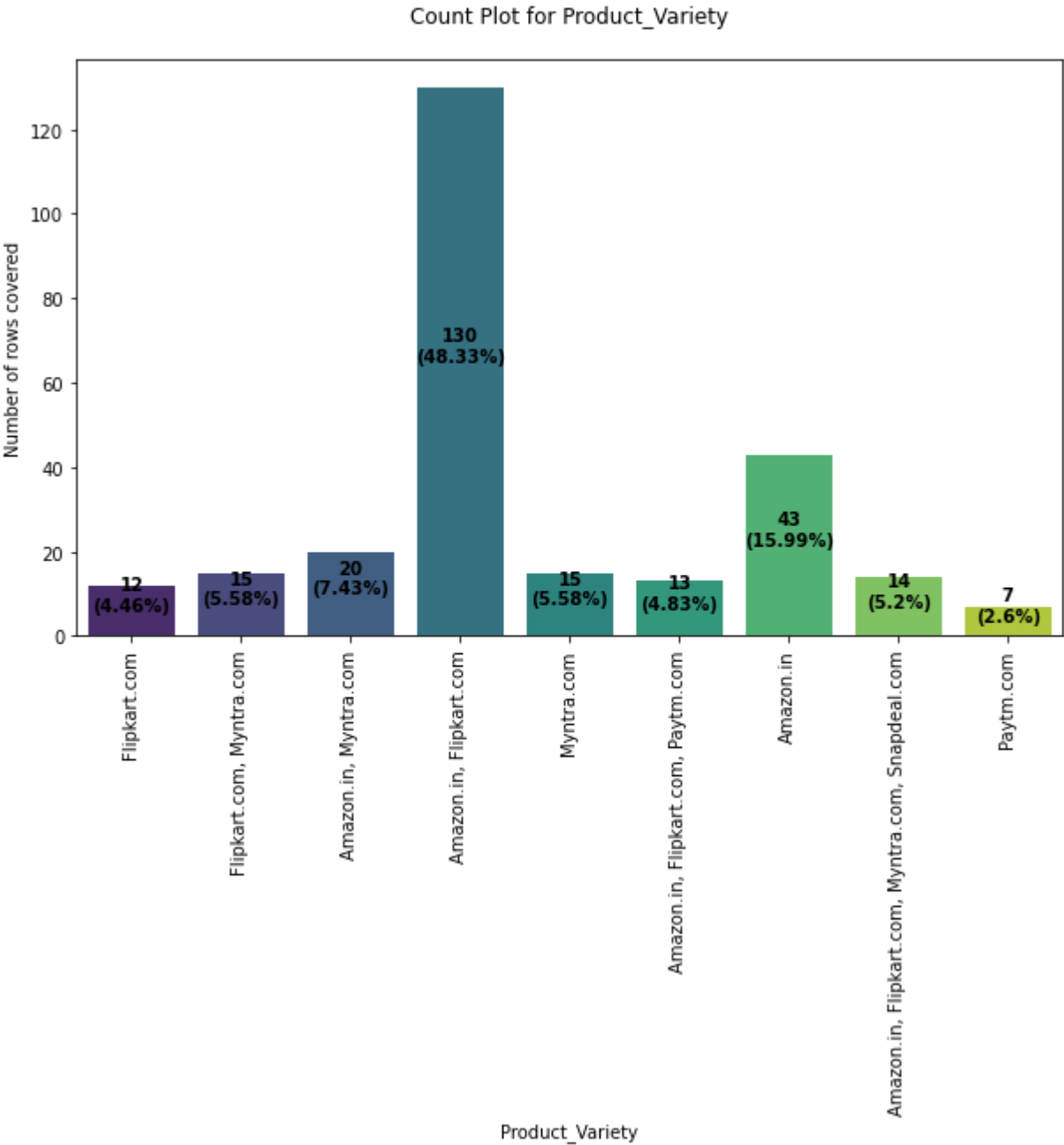


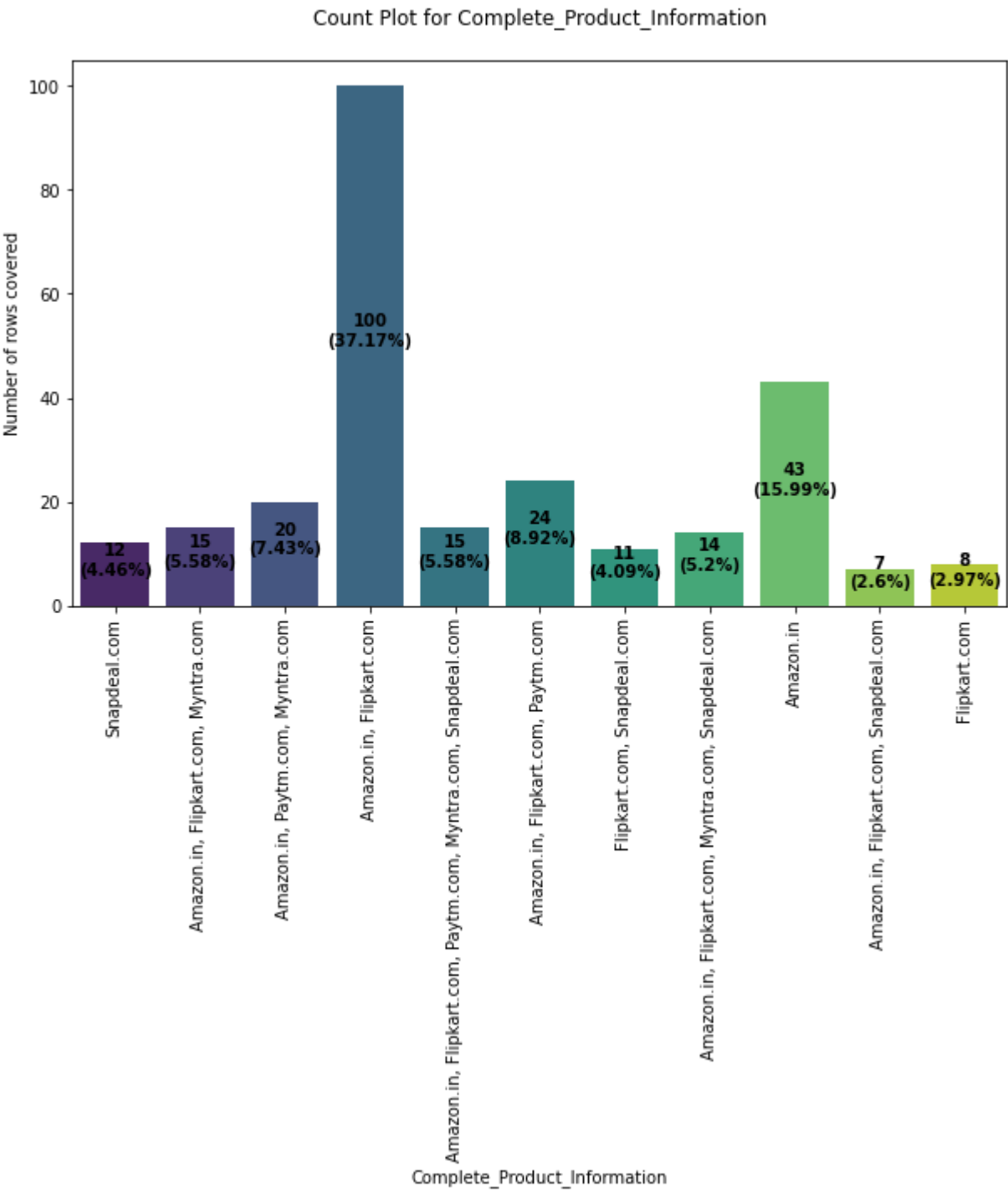


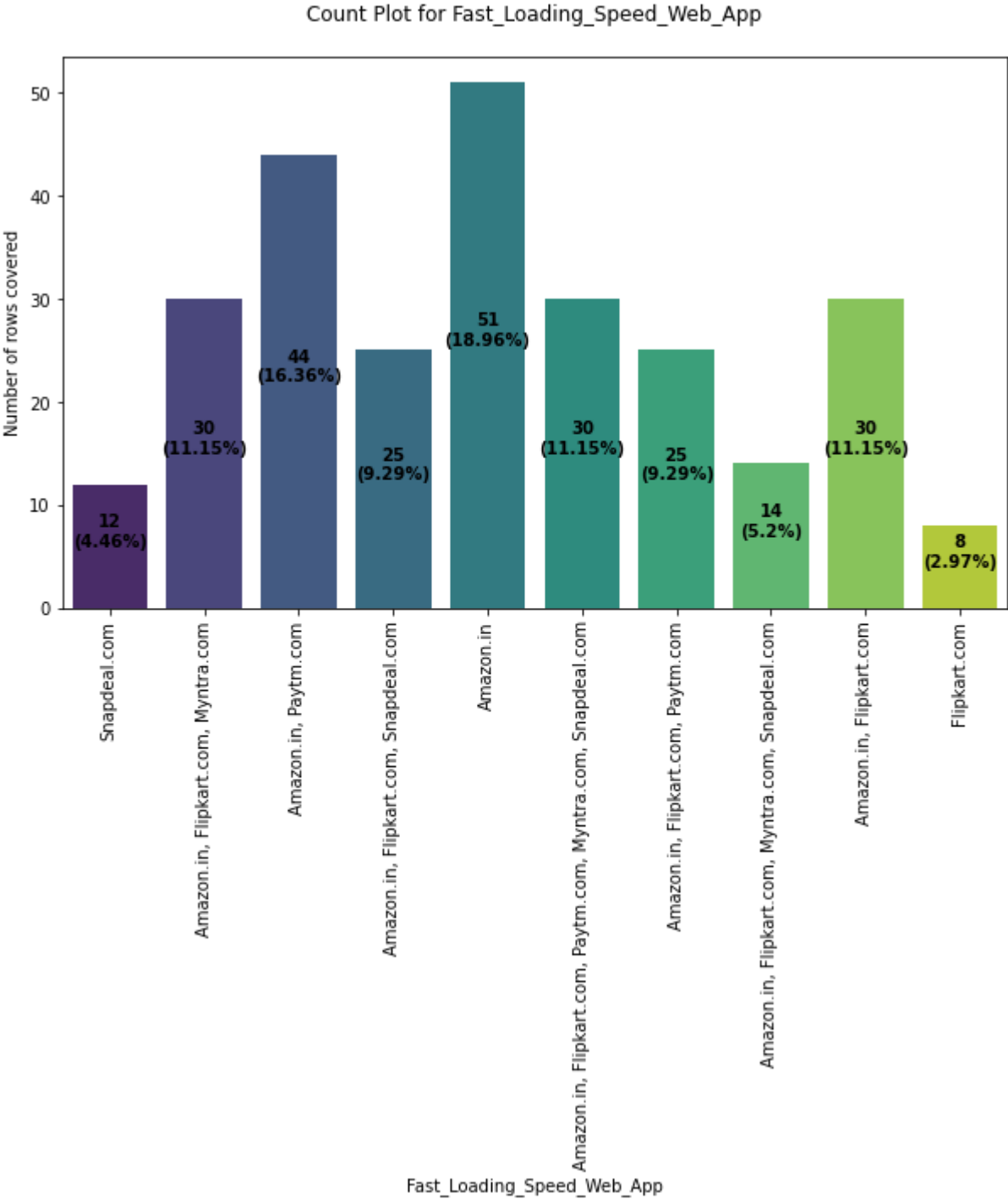


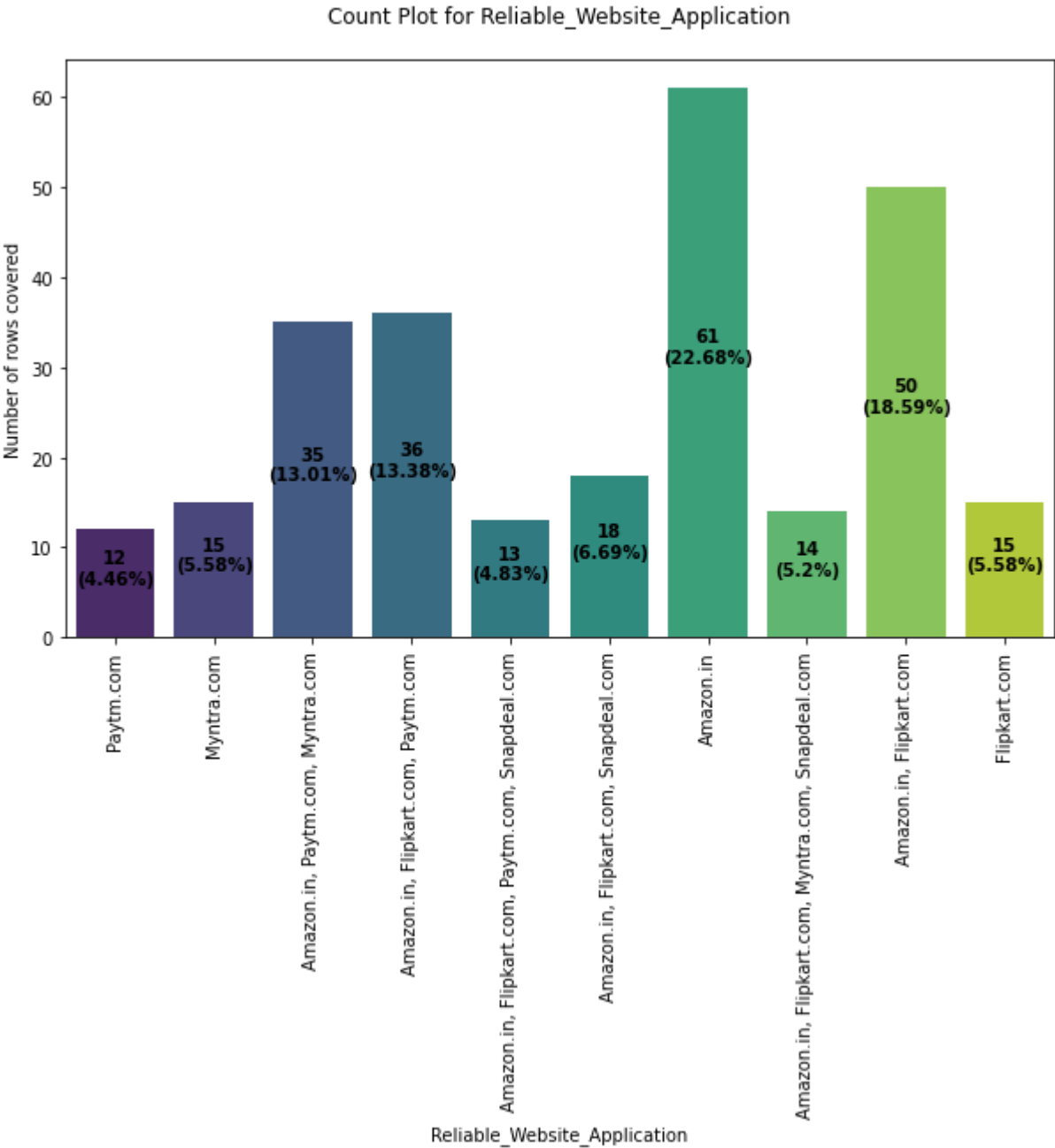


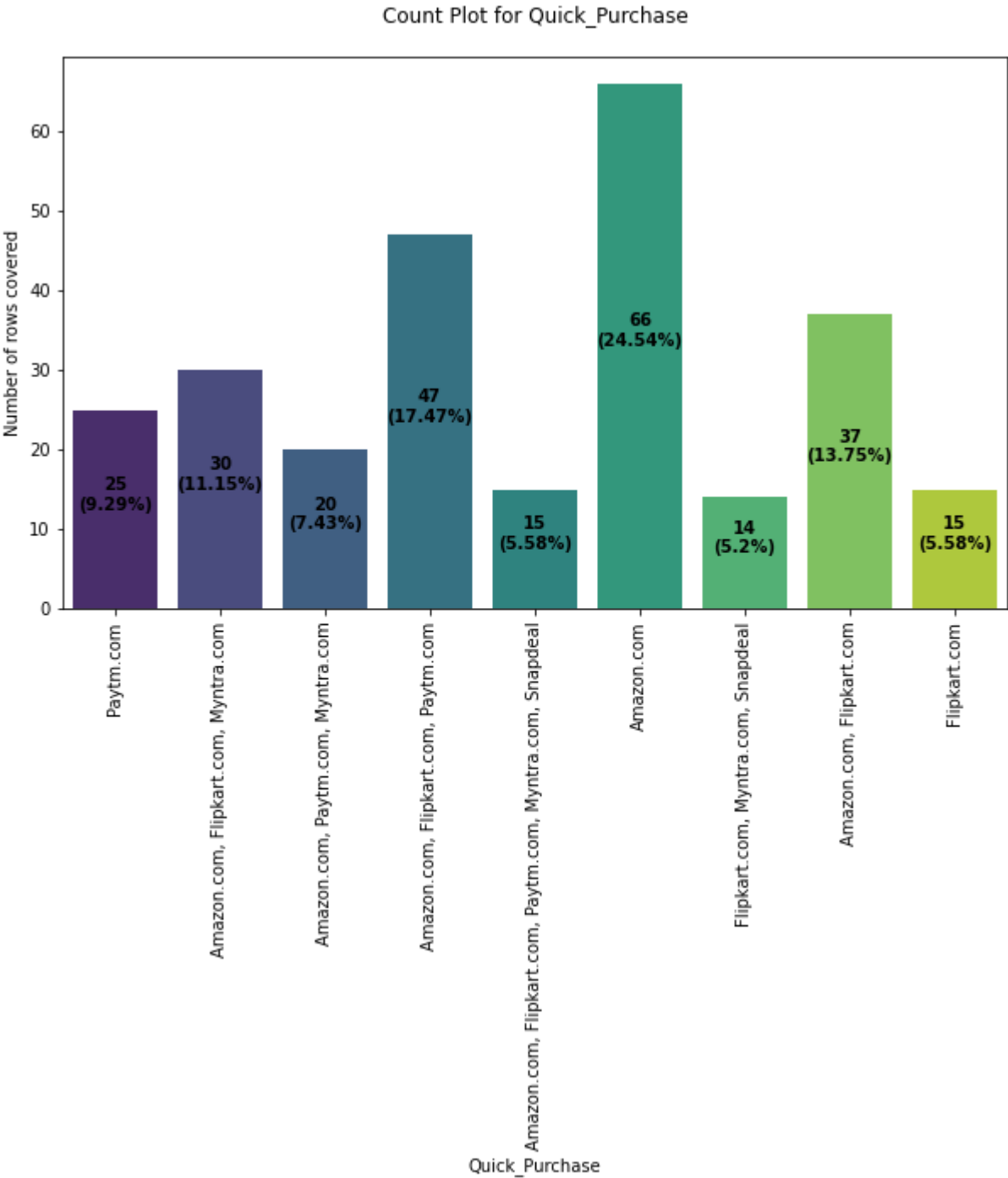


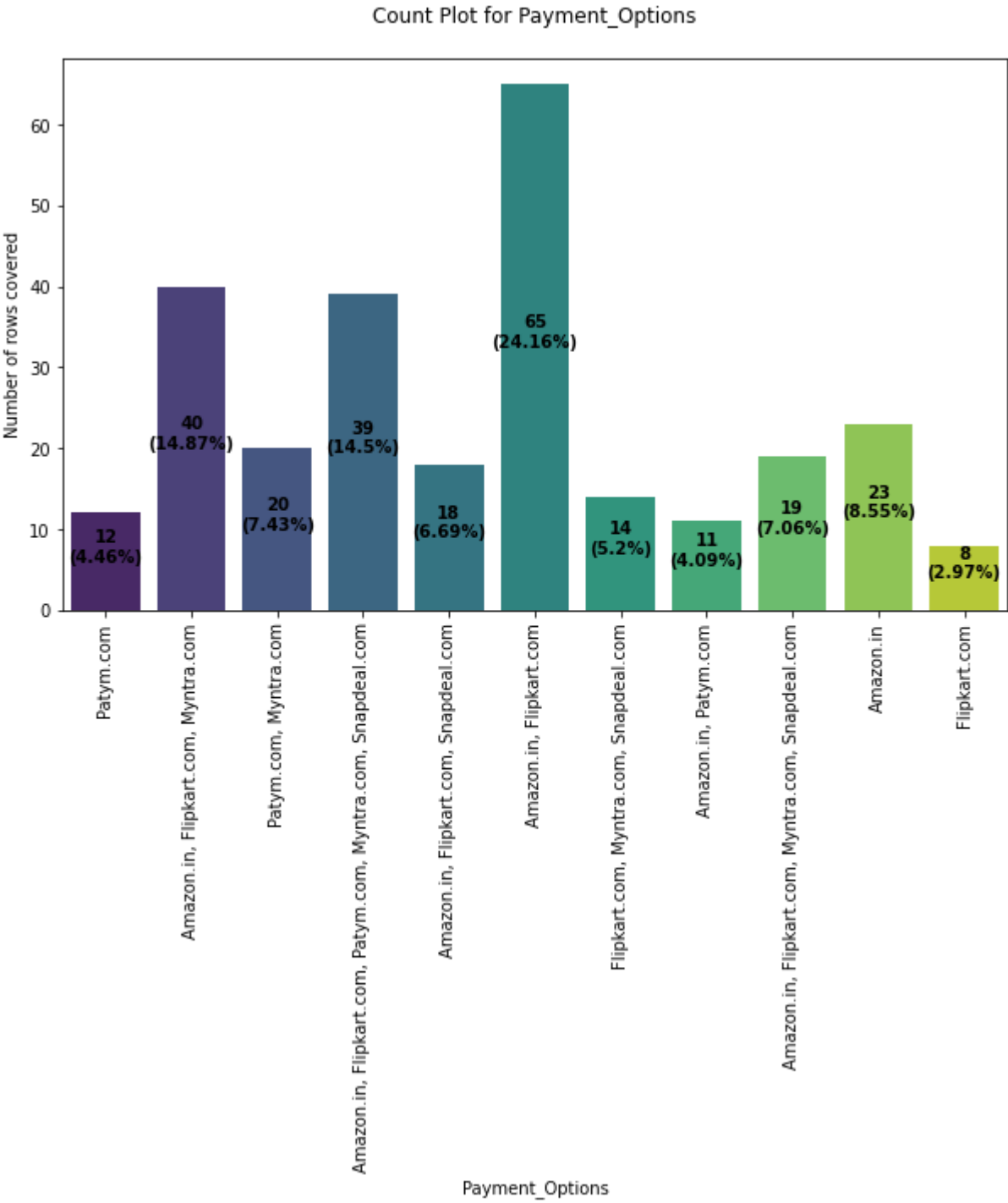


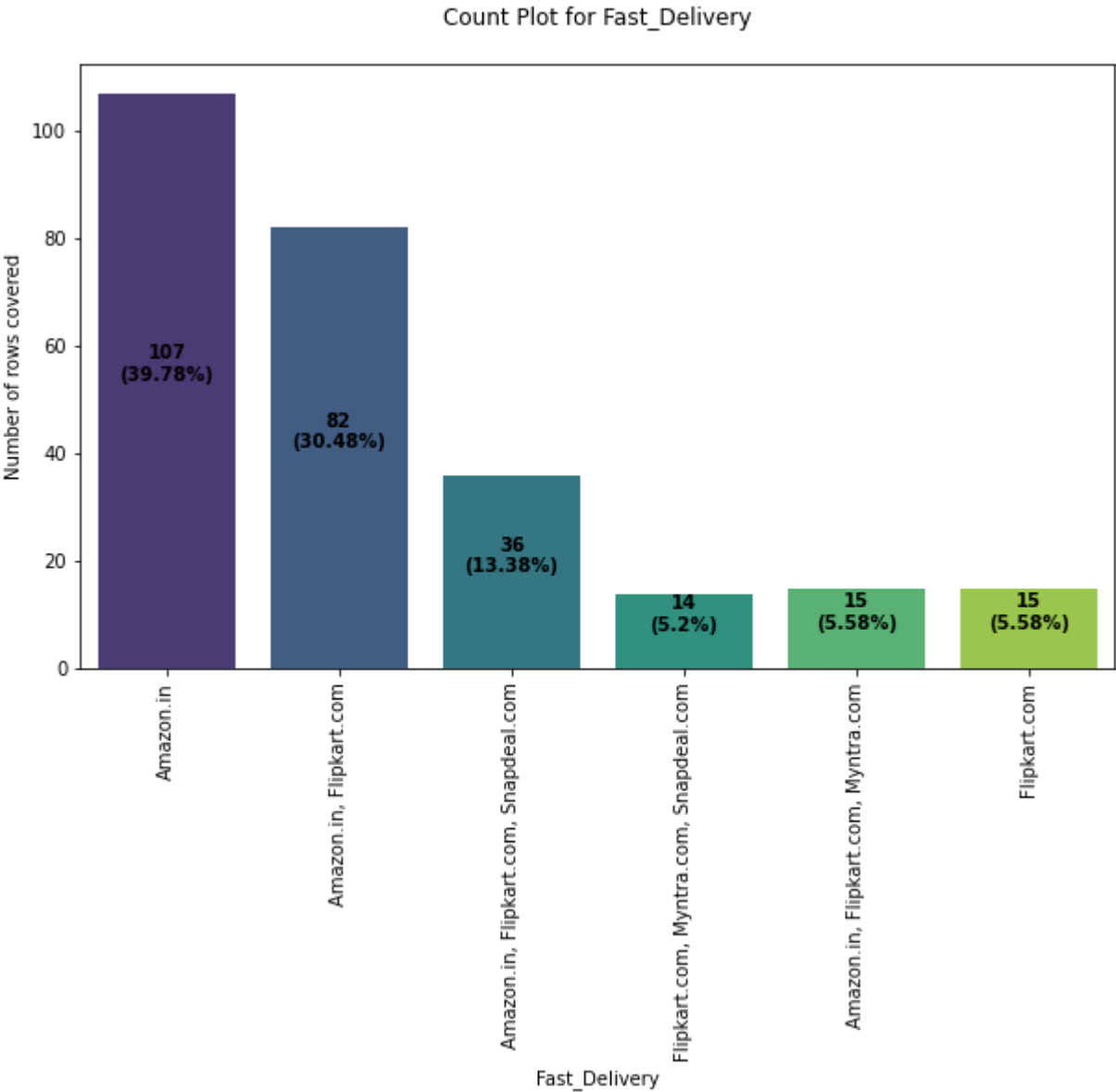




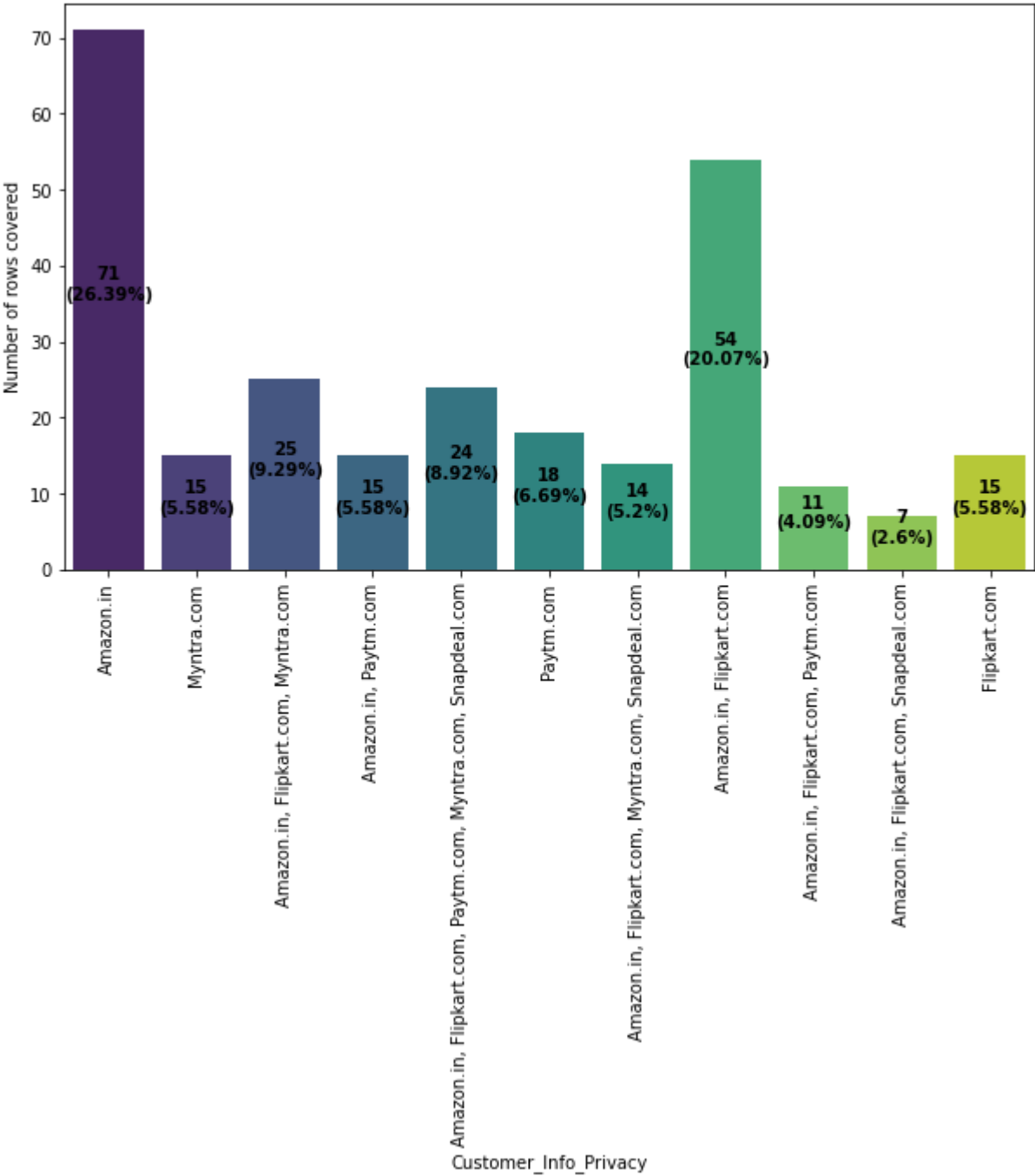


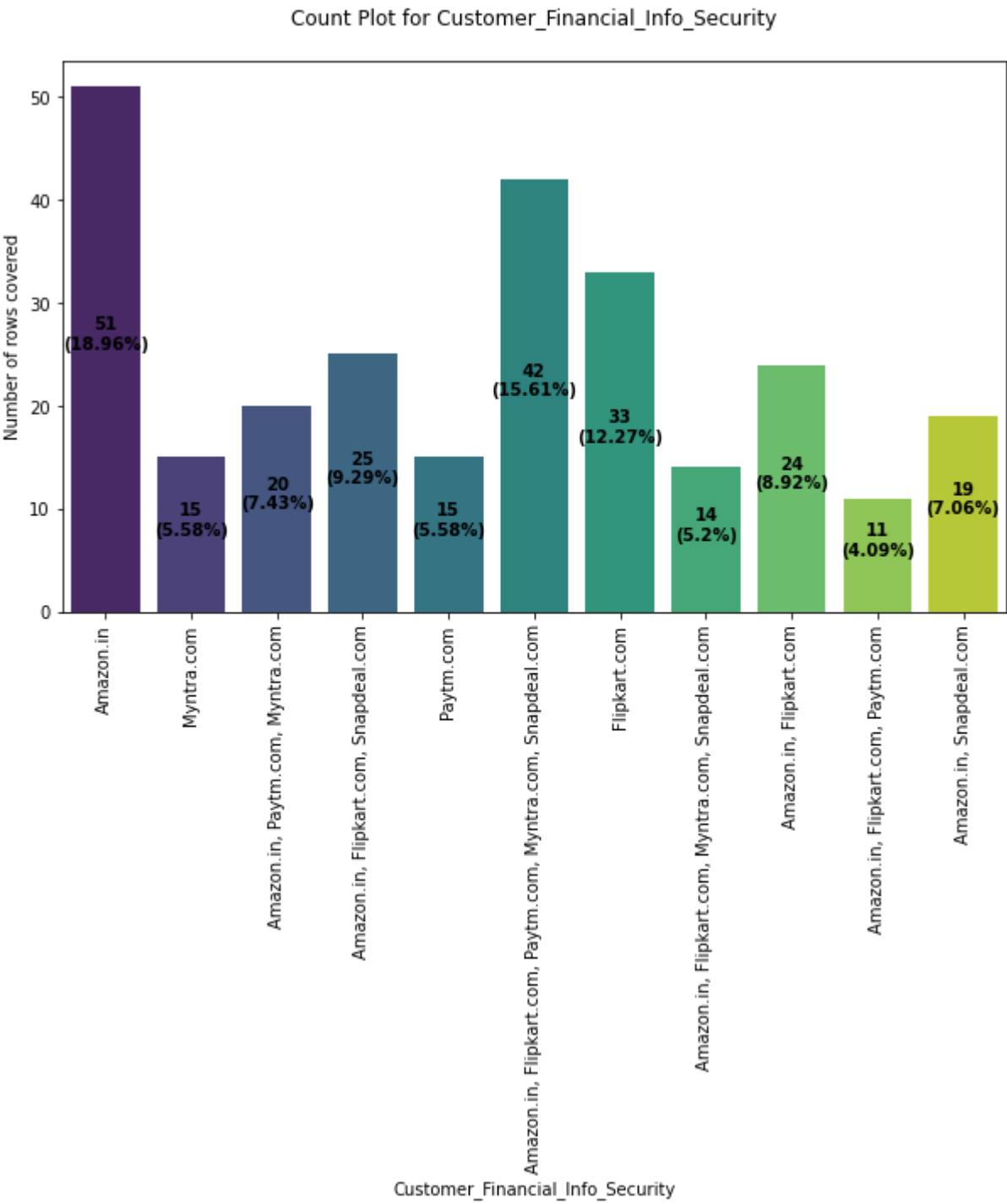


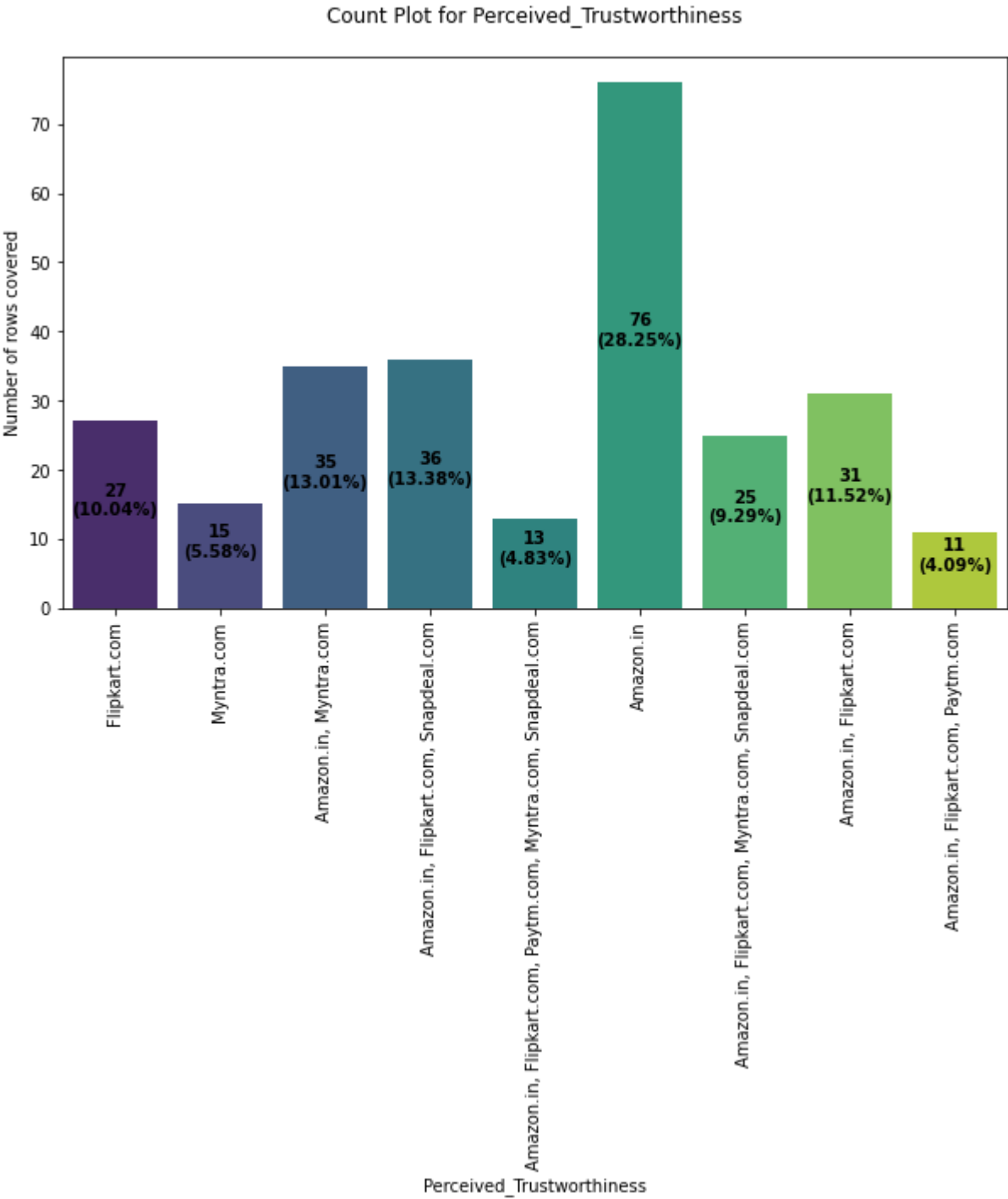


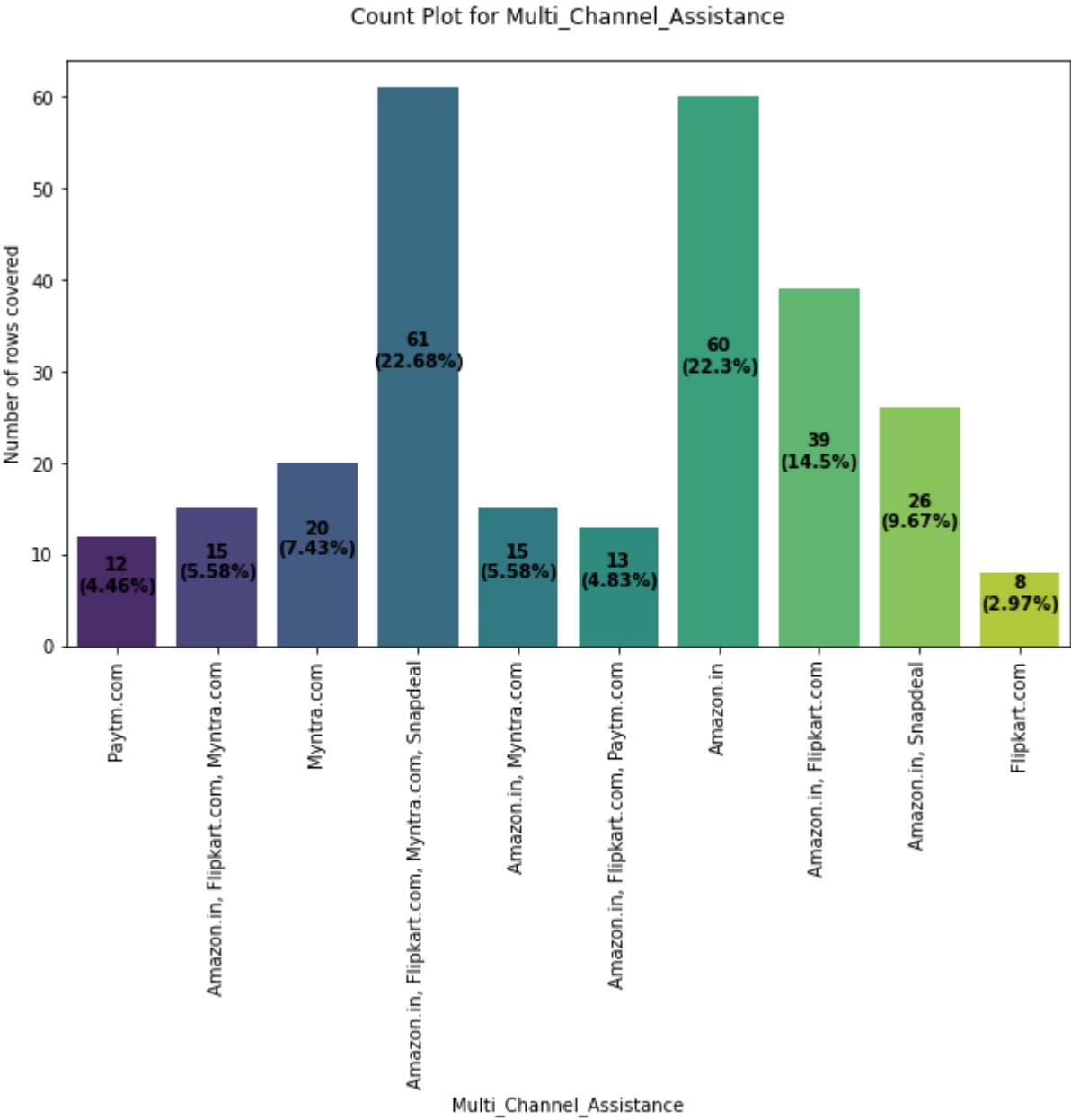


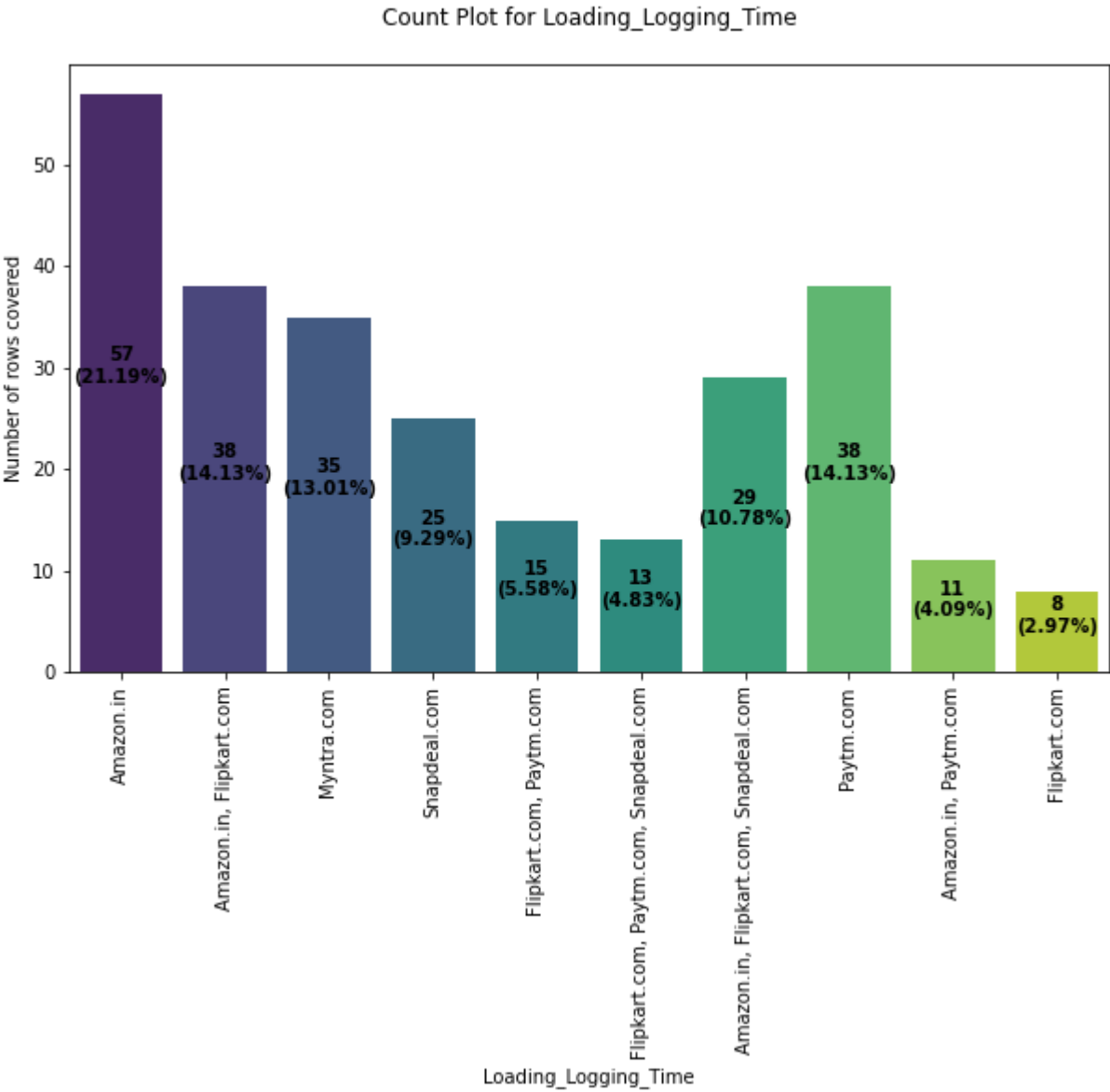
Count Plot for Customer_Info_Privacy

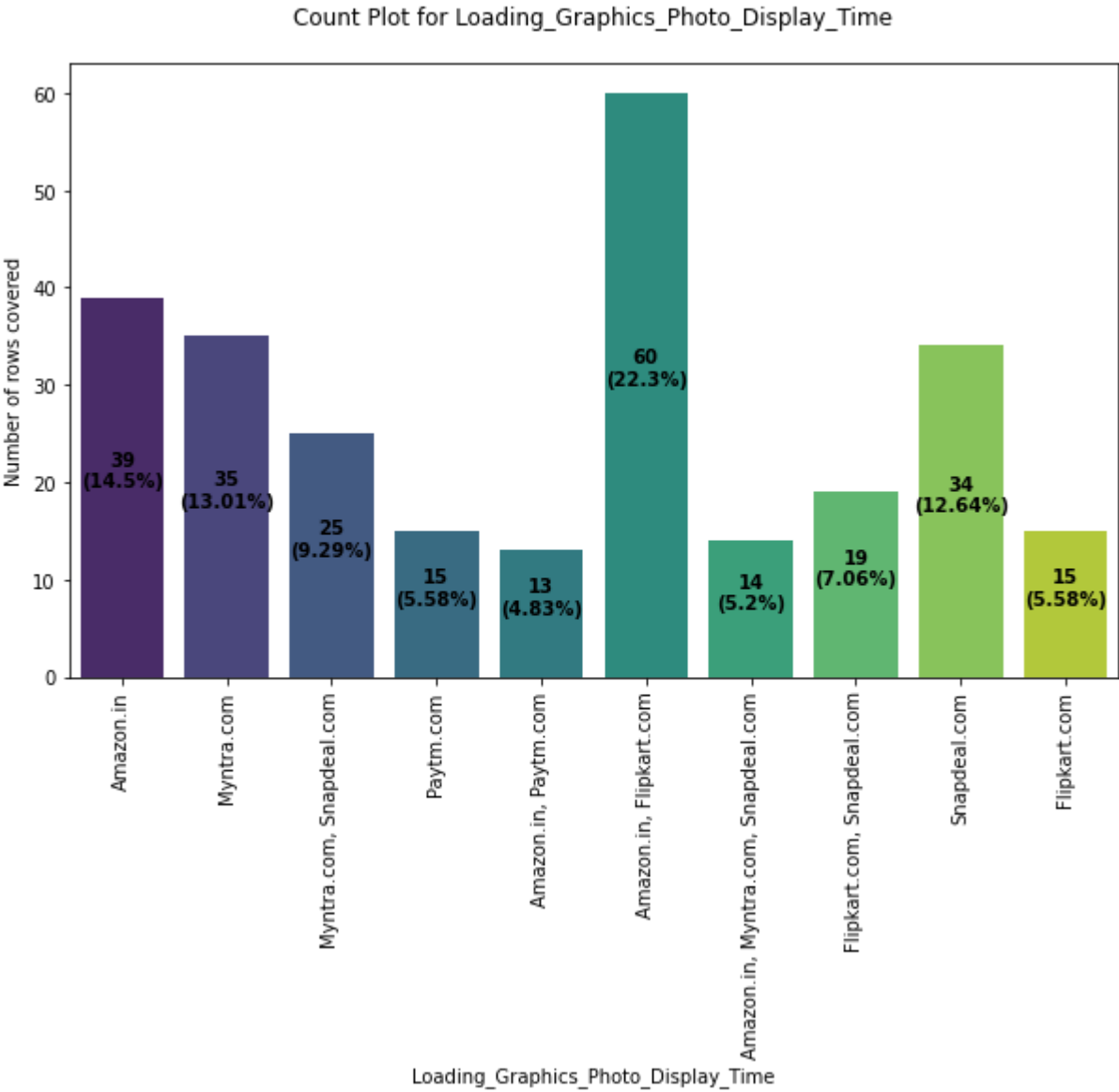


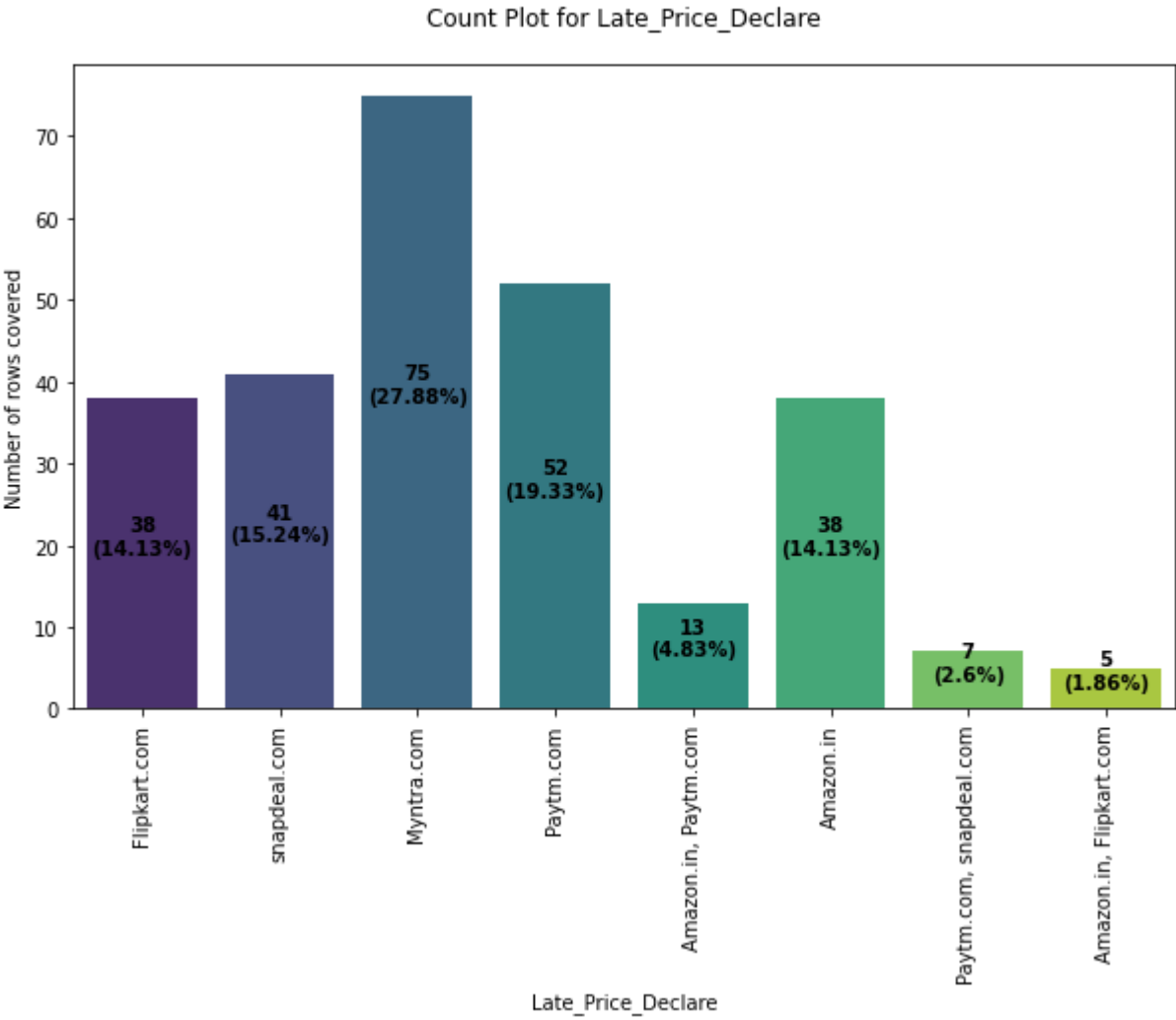


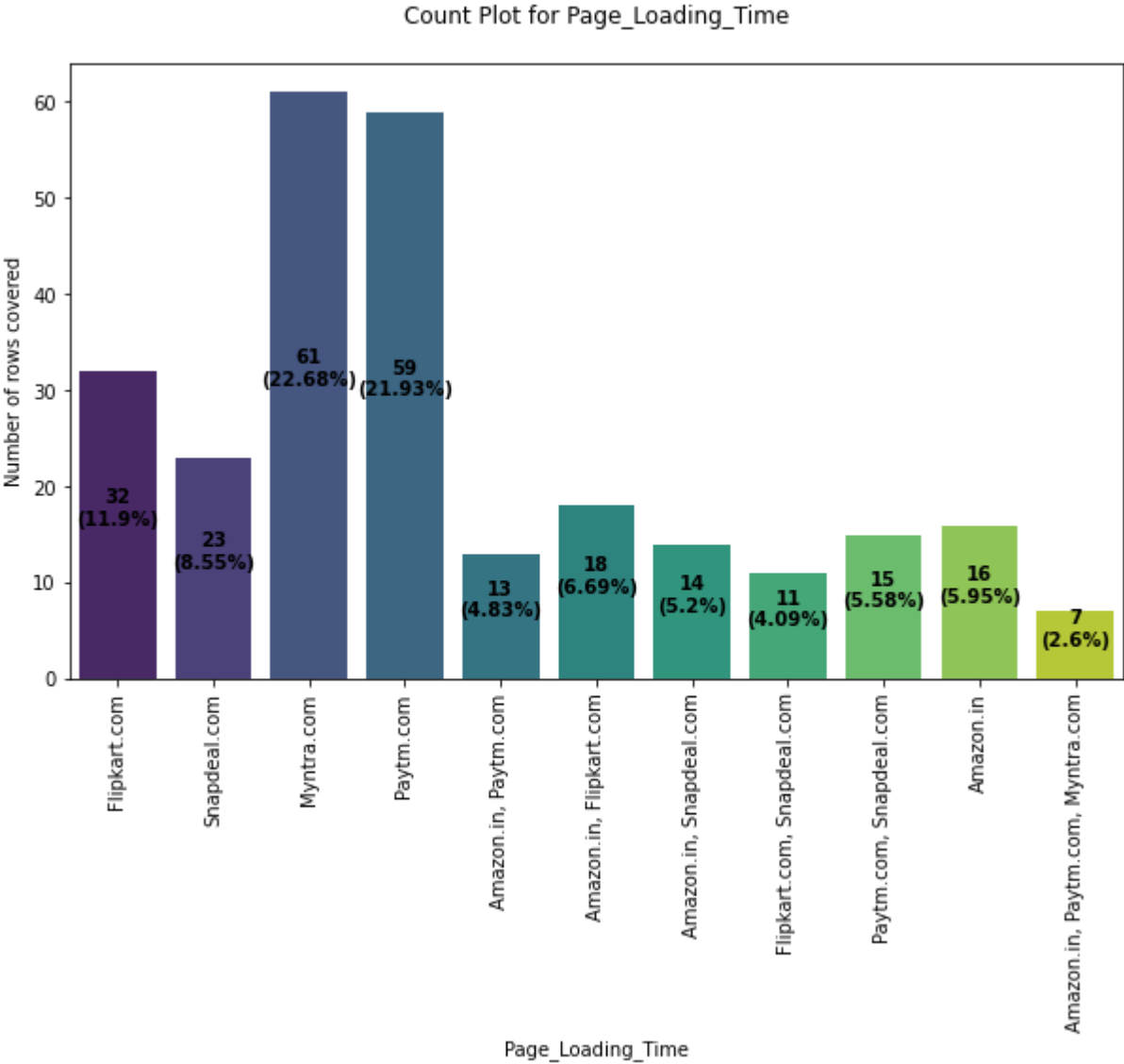


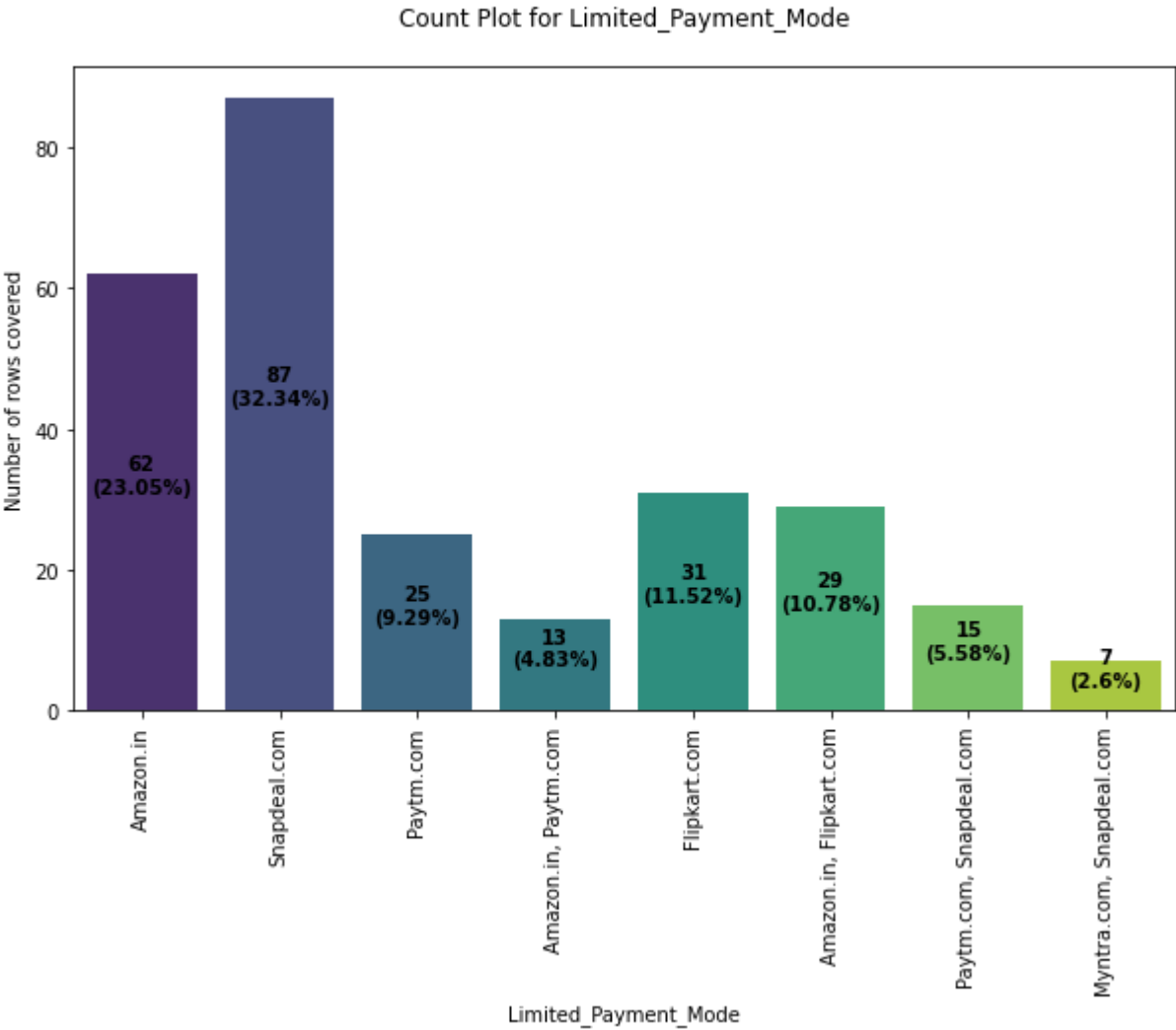


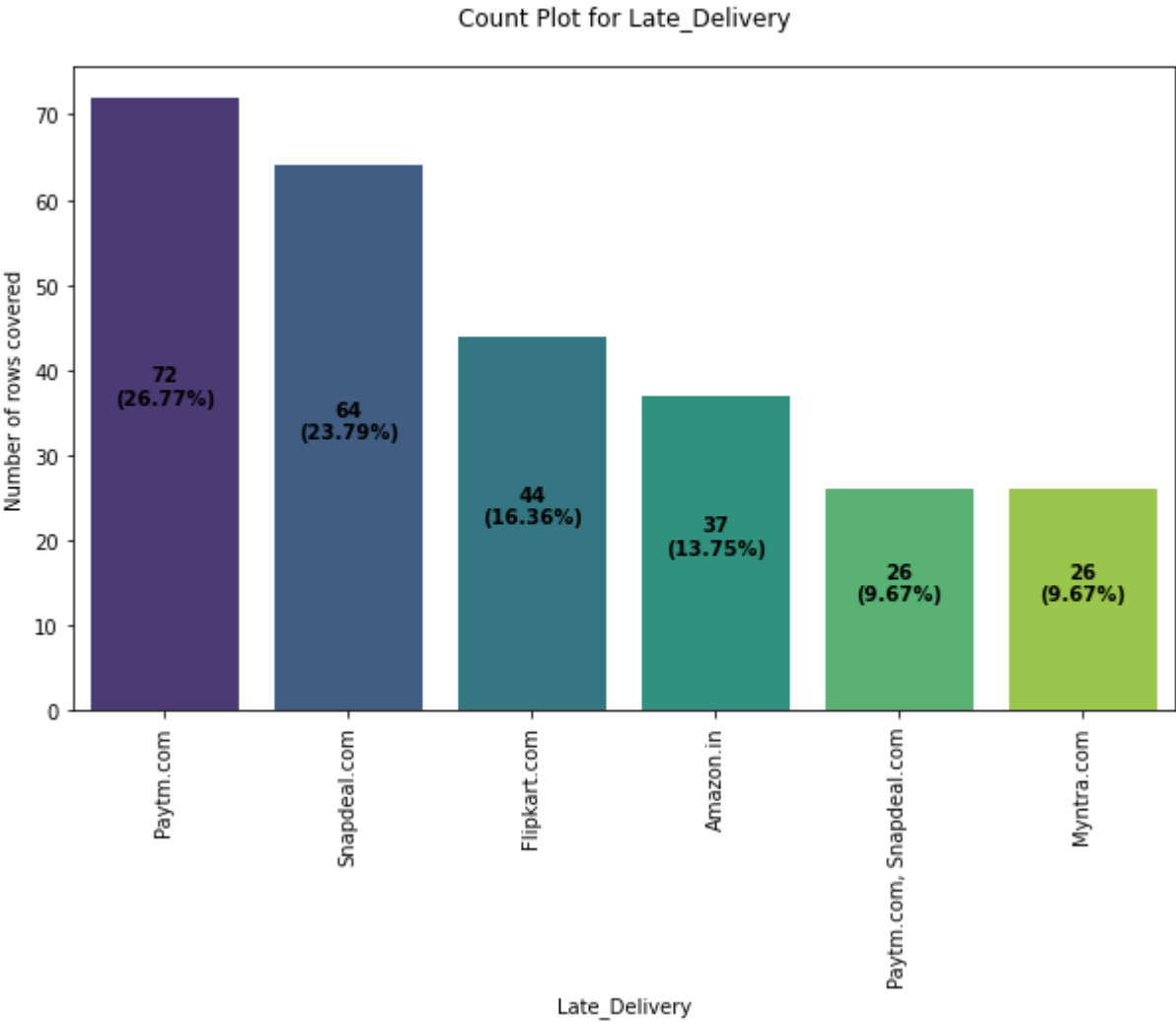


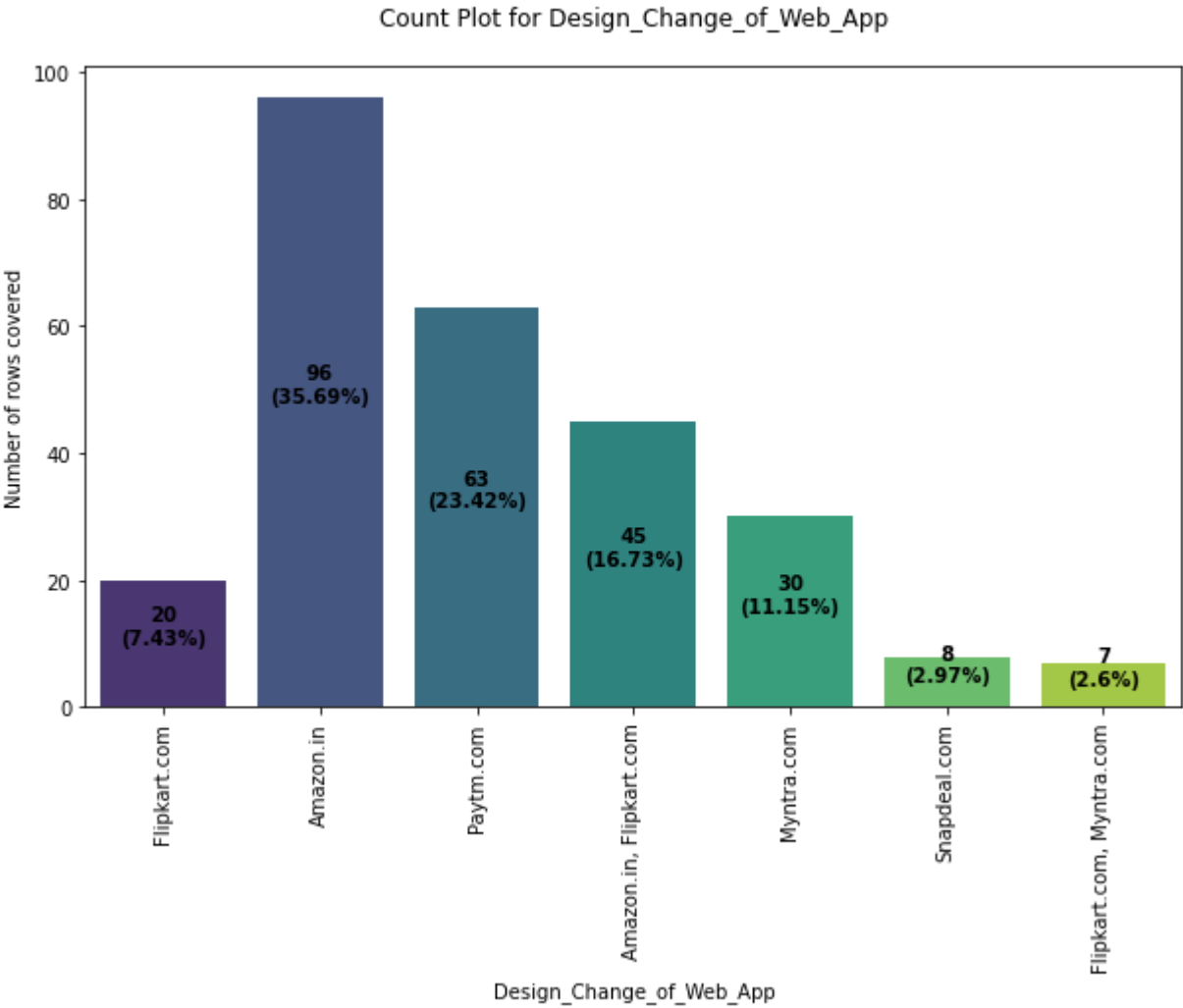


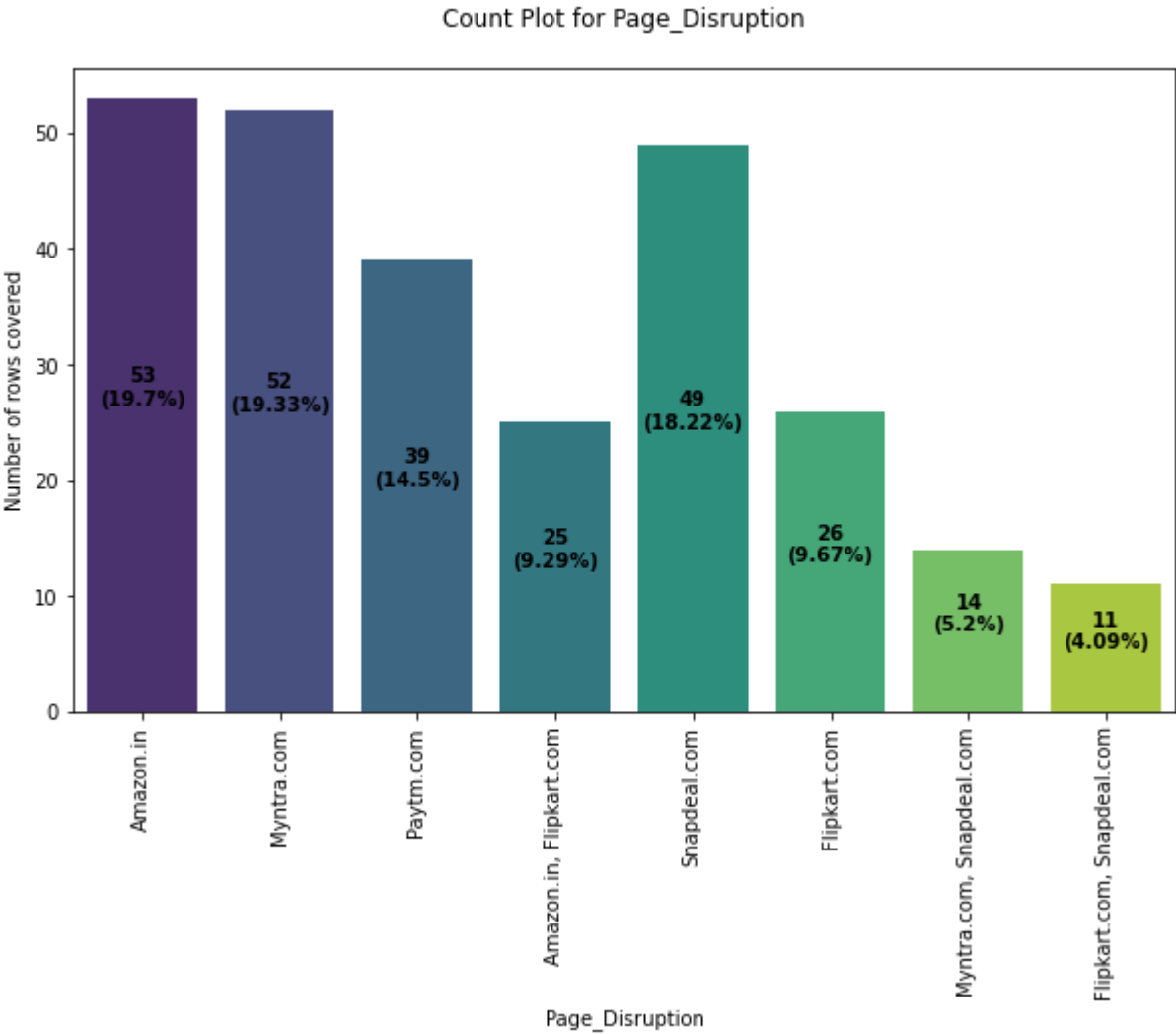


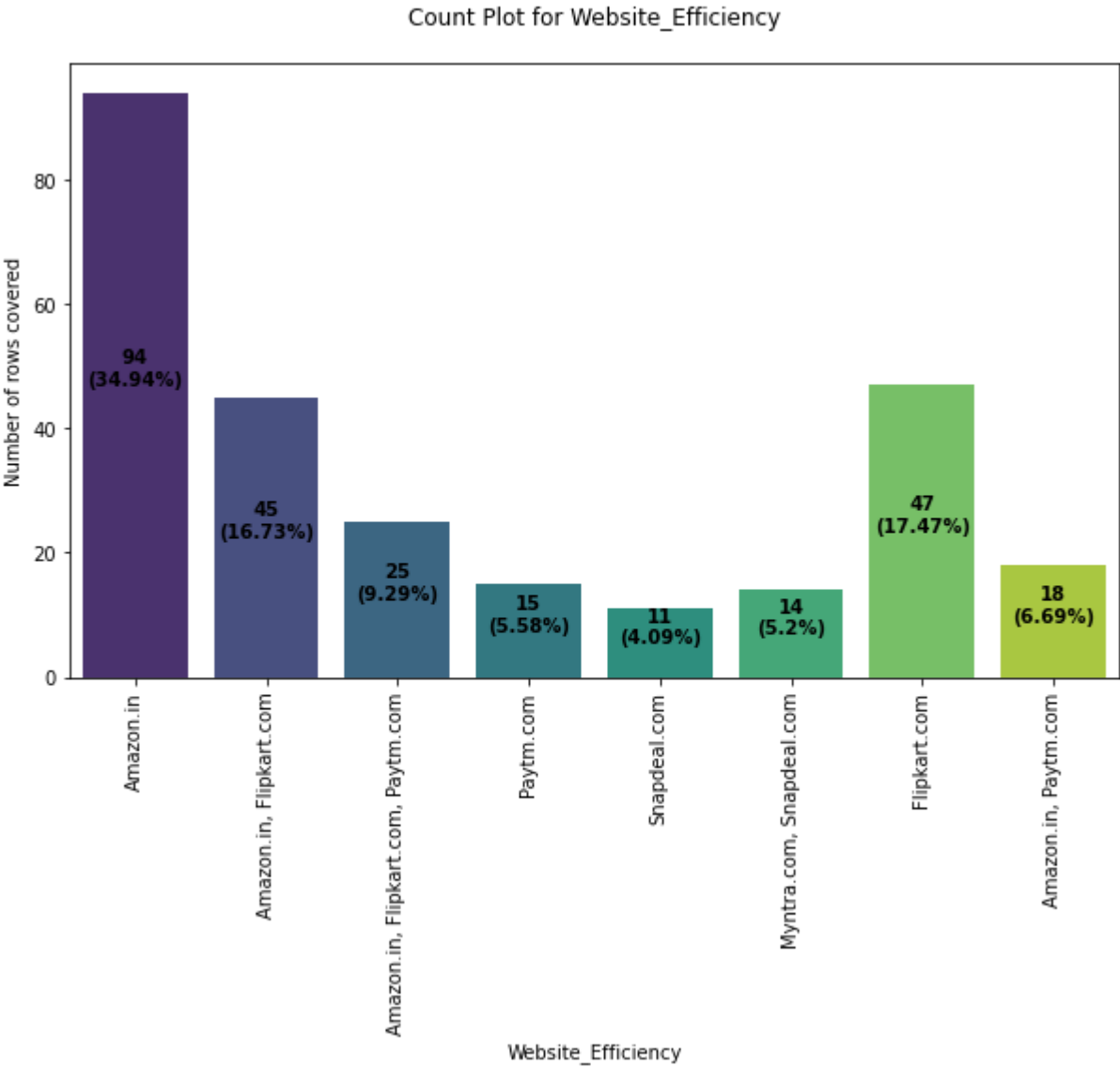


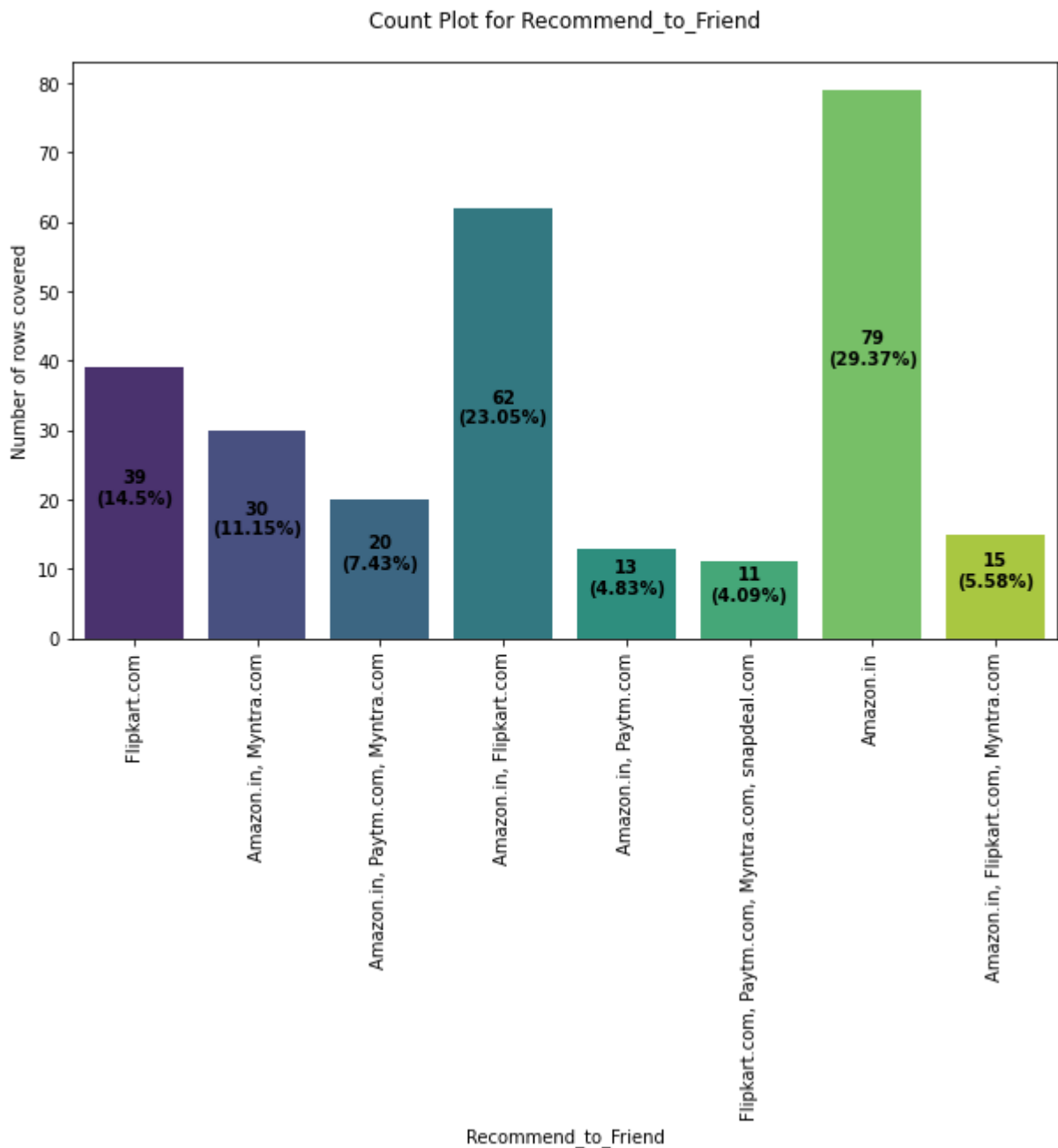












We can observe above all graph where we can see that count and their comparison with all other values.

Observations:

- Pin code: 201308 (Uttar Pradesh) has the maximum number of counts for online shopping.
- Female buyer has more number of count than male in the Dataset.
- Buyer Age between 31 to 40 years is more followed by 21-30 years for online shopping.
- Delhi city has a maximum number of buyers followed by greater Noida & Noida. Bulandshahr city has a minimum number of buyers for online shopping.
- Tenure wise maximum buyers are preferred online shopping since 4+ years.
- Maximum number of online buyers purchased less than 10 products in past one year.
- Using mobile phone internet is more for online shopping.
- Smart Phone has been used more for online shopping followed by laptop.

- Smartphones having screen sizes other than 4.7, 5.5 & 5 inches had been used more times for online shopping.
- Devices having a windows operating system has been used often more for online shopping followed by android.
- Google Chrome browser is used maximum times to access the website as compared to other browsers.
- Search engine is more useful for the potential online buyers, also after the 1st visit to the store, the search engine has been used more to locate the website.
- Usually buyers explore the particular website more than 15 times before making a purchase decision.
- Credit/Debit has been used more than other options for online purchases.
- Maximum buyer chooses to add the product to the cart & leave without making payment because of a better alternative offer.
- Content & all relevant information on the website is easy to read & understand, also easy to navigate for a maximum number of the online buyer.
- Maximum number of people strongly agree that information on a similar product to the one highlighted is important for product comparison.
- Maximum number of people strongly agree that complete information on the listed sellers and the product being offered is important for purchase decisions.
- Most buyers strongly agree that the loading & processing speed of the website should be fast which makes the website user- friendly.
- For online purchases, the payment method is a key factor to retain the customer, also buyers trust that online retail stores would fulfill their part of the transaction at the stipulated time.
- More number of buyer strongly agree that customer service & customer privacy is very much important to retain the customer.
- Online shopping provides monetary benefits and discounts on the product that customers would buy for & visit the website again to shop more as it is value for money spent.
- Maximum number of people enjoys online shopping, which is more convenient & easy to use.
- Most buyers strongly agree that the return & replacement policy is important for purchase decisions.
- People strongly agreed that gaining access to loyalty programs is a benefit of online shopping.
- Maximum number of buyers strongly agree that provided quality information on the website improves satisfaction & trust of the customer.
- Offering a wide variety of products in several categories with correct information helps to retain the customer.
- Frequent online shopping gives a sense of adventure.
- Shopping on your preferred e-tailer enhances your social status is indifferent to the maximum number of buyers.
- Maximum buyer feels that it is ok to shop from a favorite e-tailer.
- Most people prefer to shop online from Amazon.in, Flipkart.com, Paytm.com, Myntra.com & Snapdeal.com as these are more user friendly.
- According to the survey, the best visually appealing web page layout is Amazon.in & flipkart.com.

- Wide variety of products & its offer are mostly available on Amazon.in & flipkart.com.
- Complete, relevant description information of products are available in Amazon.in & flipkart.com.
- Amazon is best in terms of Trustworthiness/reliability, quickness to complete purchase & fast loading speed on website & application.
- Amazon & Flipkart.com has several payment options whereas Snapdeal has a limited mode of payment method.
- Amazon comes in number 1 position in terms of delivery of products & security of customer information followed by flipkart.com whereas Paytm took longer time to deliver the products.
- Amazon.in provides the best customer support followed by Flipkart.com, Myntra.com, & Snapdeal.
- Flipkart.com takes less time to get logged in(promotion, sales period), however, Amazon.in takes a long time to logged in.
- When it comes to displaying graphics & photos(promotion, sales period), Amazon.in & flipkart.com take a longer time to load.
- Myntra delays to declare its sale price & offers, also took a long time to load the page followed by paytm.com.
- With time Amazon update/changes its website/Application design as Amazon disrupts frequently when moving one page to another & still works efficiently as before.
- Most recommended Indian online retailer by a friend is Amazon followed by Flipkart.

In [55]: `pip install pandas-profiling`

```
Collecting pandas-profiling
  Downloading pandas_profiling-3.4.0-py2.py3-none-any.whl (315 kB)
Collecting statsmodels<0.14,>=0.13.2
  Downloading statsmodels-0.13.5-cp38-cp38-win_amd64.whl (9.2 MB)
Requirement already satisfied: numpy<1.24,>=1.16.0 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (1.19.2)
Requirement already satisfied: PyYAML<6.1,>=5.0.0 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (5.3.1)
Collecting pydantic<1.11,>=1.8.1
  Downloading pydantic-1.10.2-cp38-cp38-win_amd64.whl (2.2 MB)
Collecting htmlmin==0.1.12
  Downloading htmlmin-0.1.12.tar.gz (19 kB)
Requirement already satisfied: Jinja2<3.2,>=2.11.1 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (2.11.2)
Requirement already satisfied: requests<2.29,>=2.24.0 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (2.24.0)
Collecting phik<0.13,>=0.11.1
  Downloading phik-0.12.2-cp38-cp38-win_amd64.whl (677 kB)
Requirement already satisfied: matplotlib<3.6,>=3.2 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (3.3.2)
Collecting missingno<0.6,>=0.4.2
  Downloading missingno-0.5.1-py3-none-any.whl (8.7 kB)
Requirement already satisfied: pandas!=1.4.0,<1.6,>1.1 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (1.1.3)
Collecting visions[type_image_path]==0.7.5
  Downloading visions-0.7.5-py3-none-any.whl (102 kB)
Collecting multimethod<1.10,>=1.4
  Downloading multimethod-1.9-py3-none-any.whl (10 kB)
Requirement already satisfied: scipy<1.10,>=1.4.1 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (1.5.2)
Requirement already satisfied: seaborn<0.13,>=0.10.1 in c:\users\hp\anaconda3\lib\site-packages (from pandas-profiling) (0.11.0)
```

```

Requirement already satisfied: tqdm<4.65,>=4.48.2 in c:\users\hp\anaconda3\lib\site-pack
ages (from pandas-profiling) (4.50.2)
Collecting patsy>=0.5.2
  Downloading patsy-0.5.3-py2.py3-none-any.whl (233 kB)
Collecting packaging>=21.3
  Downloading packaging-21.3-py3-none-any.whl (40 kB)
Collecting typing-extensions>=4.1.0
  Downloading typing_extensions-4.4.0-py3-none-any.whl (26 kB)
Requirement already satisfied: MarkupSafe>=0.23 in c:\users\hp\anaconda3\lib\site-packag
es (from jinja2<3.2,>=2.11.1->pandas-profiling) (1.1.1)
Collecting urllib3!=1.25.0,!1.25.1,<1.26,>=1.21.1
  Downloading urllib3-1.25.11-py2.py3-none-any.whl (127 kB)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\hp\anaconda3\lib\site-pack
ages (from requests<2.29,>=2.24.0->pandas-profiling) (2022.9.24)
Requirement already satisfied: idna<3,>=2.5 in c:\users\hp\anaconda3\lib\site-packages
(from requests<2.29,>=2.24.0->pandas-profiling) (2.10)
Requirement already satisfied: chardet<4,>=3.0.2 in c:\users\hp\anaconda3\lib\site-packa
ges (from requests<2.29,>=2.24.0->pandas-profiling) (3.0.4)
Requirement already satisfied: joblib>=0.14.1 in c:\users\hp\anaconda3\lib\site-packages
(from phik<0.13,>=0.11.1->pandas-profiling) (1.2.0)
Requirement already satisfied: pyparsing!=2.0.4,!2.1.2,!2.1.6,>=2.0.3 in c:\users\hp\ana
conda3\lib\site-packages (from matplotlib<3.6,>=3.2->pandas-profiling) (2.4.7)
Requirement already satisfied: cyclur>=0.10 in c:\users\hp\anaconda3\lib\site-packages
(from matplotlib<3.6,>=3.2->pandas-profiling) (0.10.0)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\hp\anaconda3\lib\site-packa
ges (from matplotlib<3.6,>=3.2->pandas-profiling) (1.3.0)
Requirement already satisfied: pillow>=6.2.0 in c:\users\hp\anaconda3\lib\site-packages
(from matplotlib<3.6,>=3.2->pandas-profiling) (8.0.1)
Requirement already satisfied: python-dateutil>=2.1 in c:\users\hp\anaconda3\lib\site-pa
ckages (from matplotlib<3.6,>=3.2->pandas-profiling) (2.8.1)
Requirement already satisfied: pytz>=2017.2 in c:\users\hp\anaconda3\lib\site-packages
(from pandas!=1.4.0,<1.6,>1.1->pandas-profiling) (2020.1)
Requirement already satisfied: networkx>=2.4 in c:\users\hp\anaconda3\lib\site-packages
(from visions[type_image_path]==0.7.5->pandas-profiling) (2.5)
Requirement already satisfied: attrs>=19.3.0 in c:\users\hp\anaconda3\lib\site-packages
(from visions[type_image_path]==0.7.5->pandas-profiling) (20.3.0)
Collecting tangled-up-in-unicode>=0.0.4
  Downloading tangled_up_in_unicode-0.2.0-py3-none-any.whl (4.7 MB)
Collecting imagehash; extra == "type_image_path"
  Downloading ImageHash-4.3.1-py2.py3-none-any.whl (296 kB)
Requirement already satisfied: six in c:\users\hp\anaconda3\lib\site-packages (from pats
y>=0.5.2->statsmodels<0.14,>=0.13.2->pandas-profiling) (1.15.0)
Requirement already satisfied: decorator>=4.3.0 in c:\users\hp\anaconda3\lib\site-packag
es (from networkx>=2.4->visions[type_image_path]==0.7.5->pandas-profiling) (4.4.2)
Requirement already satisfied: PyWavelets in c:\users\hp\anaconda3\lib\site-packages (fr
om imagehash; extra == "type_image_path"->visions[type_image_path]==0.7.5->pandas-profil
ing) (1.1.1)
Building wheels for collected packages: htmlmin
  Building wheel for htmlmin (setup.py): started
  Building wheel for htmlmin (setup.py): finished with status 'done'
  Created wheel for htmlmin: filename=htmlmin-0.1.12-py3-none-any.whl size=27091 sha256=
82dcafd0c4f92baba0aedac4bd1f132f9e18e41fcbdb0cba1f5e187cfc8cb9a37
  Stored in directory: c:\users\hp\appdata\local\pip\cache\wheels\23\14\6e\4be5bfeeb027f
4939a01764b48edd5996acf574b0913fe5243
Successfully built htmlmin
Installing collected packages: patsy, packaging, statsmodels, typing-extensions, pydanti
c, htmlmin, phik, missingno, multimethod, tangled-up-in-unicode, imagehash, visions, pan
das-profiling, urllib3
  Attempting uninstall: patsy
    Found existing installation: patsy 0.5.1
    Uninstalling patsy-0.5.1:
      Successfully uninstalled patsy-0.5.1
  Attempting uninstall: packaging
    Found existing installation: packaging 20.4
    Uninstalling packaging-20.4:

```

```
Successfully uninstalled packaging-20.4
Attempting uninstall: statsmodels
Found existing installation: statsmodels 0.12.0
Uninstalling statsmodels-0.12.0:
  Successfully uninstalled statsmodels-0.12.0
Attempting uninstall: typing-extensions
Found existing installation: typing-extensions 3.7.4.3
Uninstalling typing-extensions-3.7.4.3:
  Successfully uninstalled typing-extensions-3.7.4.3
Attempting uninstall: urllib3
Found existing installation: urllib3 1.26.12
Uninstalling urllib3-1.26.12:
  Successfully uninstalled urllib3-1.26.12
Successfully installed htmlmin-0.1.12 imagehash-4.3.1 missingno-0.5.1 multimethod-1.9 pa
ckaging-21.3 pandas-profiling-3.4.0 patsy-0.5.3 phik-0.12.2 pydantic-1.10.2 statsmodels-
0.13.5 tangled-up-in-unicode-0.2.0 typing-extensions-4.4.0 urllib3-1.25.11 visions-0.7.5
Note: you may need to restart the kernel to use updated packages.
ERROR: After October 2020 you may experience errors when installing or updating package
s. This is because pip will change the way that it resolves dependency conflicts.

We recommend you use --use-feature=2020-resolver to test your packages with the new reso
lver before it becomes the default.

selenium 4.5.0 requires urllib3[socks]>=1.26, but you'll have urllib3 1.25.11 which is i
ncompatible.
```

```
In [59]: import pandas as pd
import pandas_profiling
```

```
In [60]: pandas_profiling.ProfileReport(df1)
```

Overview

Dataset statistics

Number of variables	71
Number of observations	269
Missing cells	0
Missing cells (%)	0.0%
Duplicate rows	60
Duplicate rows (%)	22.3%
Total size in memory	149.3 KiB
Average record size in memory	568.5 B

Variable types

Categorical	70
Numeric	1

Alerts

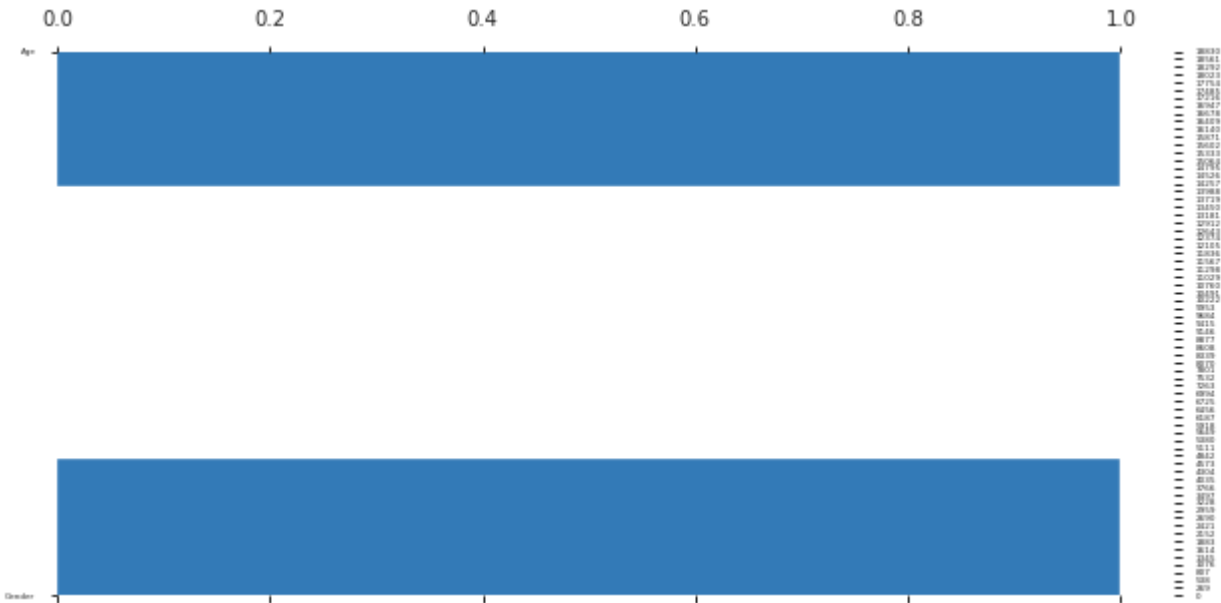
Dataset has 60 (22.3%) duplicate rows

Duplicates

Pin_Code is highly correlated with Age and 29 other fields (Age, City Of Shopping, Online Shopping Since, Purchase Frequency, Login Mode, Exploring Time Spent, Bag Abandon Reason, Loading Processing Speed, Discount Benefit

High correlation

Out[60]:



In []: