

customer_retention_dataset

```
In [70]: #import the Libraries
import pandas as pd
import warnings
warnings.filterwarnings('ignore')
```

Load DataSet

```
In [71]: df=pd.read_excel('customer_retention_dataset.xlsx')
```

```
In [72]: df.head()
```

Out[72]:

	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?
0	Male	31-40 years	Delhi	110009	Above 4 years	31-40 times	Dial-up	Desktop	Others Wi
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

```
In [73]: pd.set_option('display.max_columns',None)  
pd.set_option('display.max_rows',None)
```

```
In [74]: df.isnull().sum().sum()
```

```
Out[74]: 0
```

```
In [75]: df.columns
```

```
Out[75]: Index(['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?\t\t\t\t\t\t\t\t\t',  
   '10 What is the operating system (OS) of your device?\t\t\t\t\t',  
   '11 What browser do you run on your device to access the website?\t\t\t\t',  
   '12 Which channel did you follow to arrive at your favorite online store for t  
he first time?',  
   '13 After first visit, how do you reach the online retail store?\t\t\t\t\t',  
   '14 How much time do you explore the e- retail store before making a purchase  
decision?',  
   '15 What is your preferred payment Option?\t\t\t\t\t\t\t\t\t\t',  
   '16 How frequently do you abandon (selecting an items and leaving without maki  
ng payment) your shopping cart?\t\t\t\t\t\t\t\t\t\t\t\t\t',  
   '17 Why did you abandon the “Bag”, “Shopping Cart”? \t\t\t\t\t\t\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 pr  
oduct comparison',  
   '20 Complete information on listed seller and product being offered is importa  
nt 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 transactio  
n at 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, onl  
ine 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 de  
cision',  
   '34 Gaining access to loyalty programs is a benefit of shopping online',  
   '35 Displaying quality Information on the website improves satisfaction of cus  
tomers',  
   '36 User derive satisfaction while shopping on a good quality website or appli  
cation',  
   '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 from;',
'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')
```

In [76]: df2=df[['7 How do you access the internet while shopping on-line?']]

In [77]: *#Here the data change categorical to numerical*
`from sklearn.preprocessing import LabelEncoder
le=LabelEncoder()`

In [78]: le.fit_transform(df2["7 How do you access the internet while shopping on-line?"])

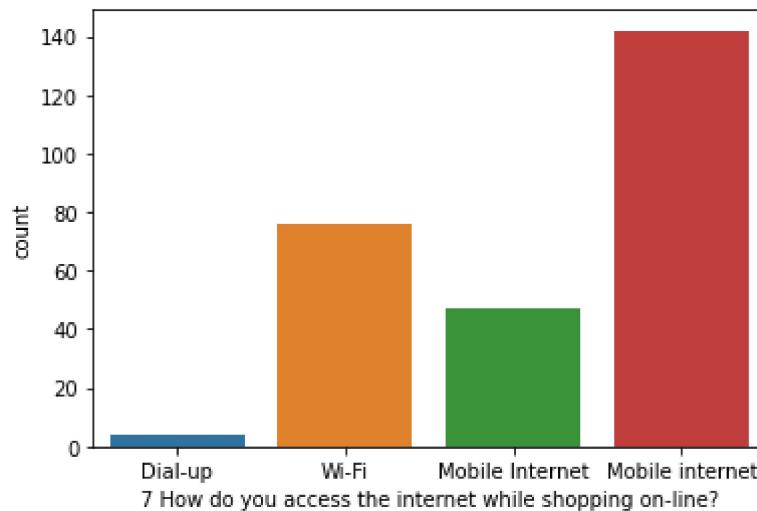
Out[78]: array([0, 3, 1, 1, 3, 3, 1, 3, 3, 1, 3, 3, 3, 3, 1, 1, 3, 3, 3, 3, 3,
2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
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1, 1, 1, 0, 3, 1, 3, 3, 3, 3, 3, 3, 1, 1, 3, 1, 1, 3, 1, 1, 3, 1, 3, 1, 1,
1, 1, 0, 3, 3, 1, 1, 1, 3, 3, 3, 1, 3, 3, 3, 2, 2, 2, 2, 2, 3, 3, 2, 1, 3,
2, 3, 2, 2, 2, 2, 2, 3, 3, 2, 2, 2, 2, 2, 3, 1, 3, 2, 2, 1, 3, 2, 2, 2, 2,
2, 3, 2, 2, 3, 1, 1, 1, 2, 2, 2, 2, 3, 2, 2, 2, 2, 2, 1, 2, 2, 2, 2, 2, 2,
2, 2, 2, 3, 1, 1, 2, 2, 2, 2, 1, 2, 2, 2, 2, 2, 2, 3, 3, 2, 2, 2, 3,
2, 2, 2, 2, 3, 3, 2, 2, 0, 3, 1, 3, 3, 1, 3, 3, 3, 1, 3, 1, 3, 1, 1, 3, 1,
1, 1, 2, 3, 1])

In [79]: `import seaborn as sns`

In [80]: ax=sns.countplot(x="7 How do you access the internet while shopping on-line?", data=df2)
print(df2["7 How do you access the internet while shopping on-line?"].value_counts())

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

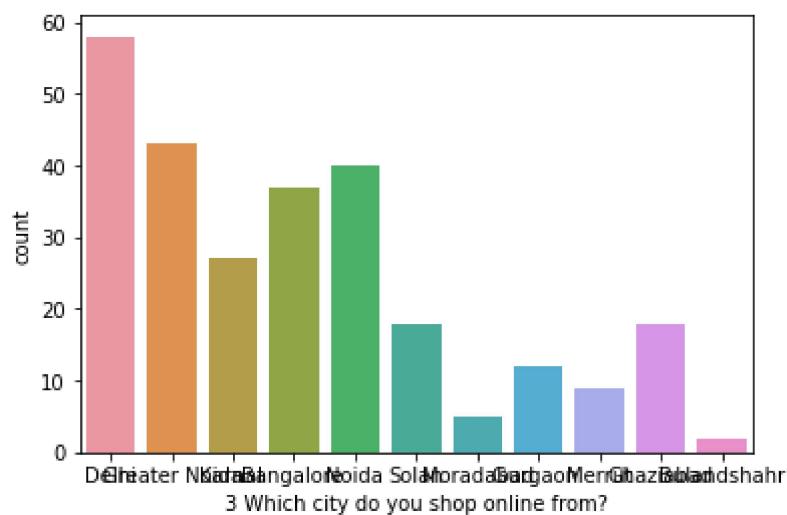
Name: 7 How do you access the internet while shopping on-line?, dtype: int64



```
In [81]: ax=sns.countplot(x="3 Which city do you shop online from?",data=df)
print(df['3 Which city do you shop online from?'].value_counts())
```

City	Count
Delhi	58
Greater Noida	43
Noida	40
Bangalore	37
Karnal	27
Solan	18
Ghaziabad	18
Gurgaon	12
Merrut	9
Moradabad	5
Bulandshahr	2

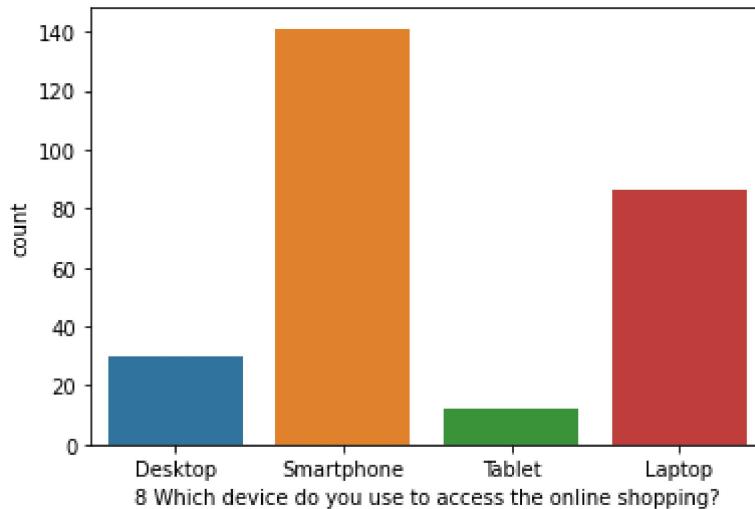
Name: 3 Which city do you shop online from?, dtype: int64



```
In [82]: ax=sns.countplot(x="8 Which device do you use to access the online shopping?",data=df)
print(df['8 Which device do you use to access the online shopping?'].value_counts())
```

Device	Count
Smartphone	141
Laptop	86
Desktop	30
Tablet	12

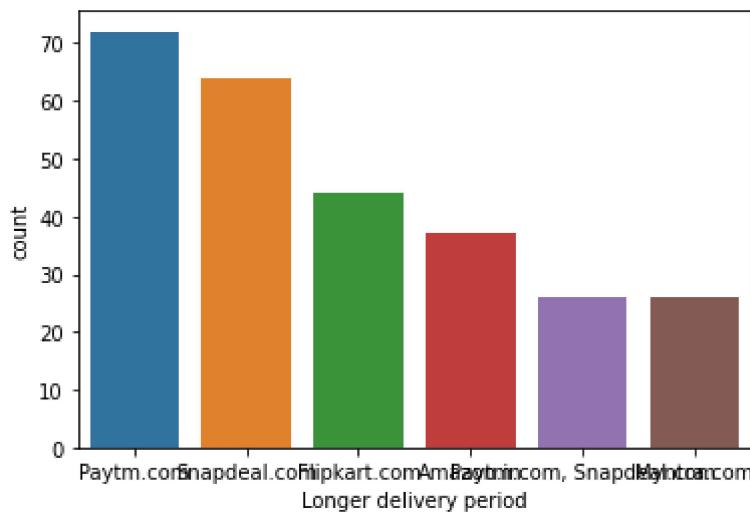
Name: 8 Which device do you use to access the online shopping?, dtype: int64



```
In [83]: ax=sns.countplot(x="Longer delivery period",data=df)
print(df['Longer delivery period'].value_counts())
```

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

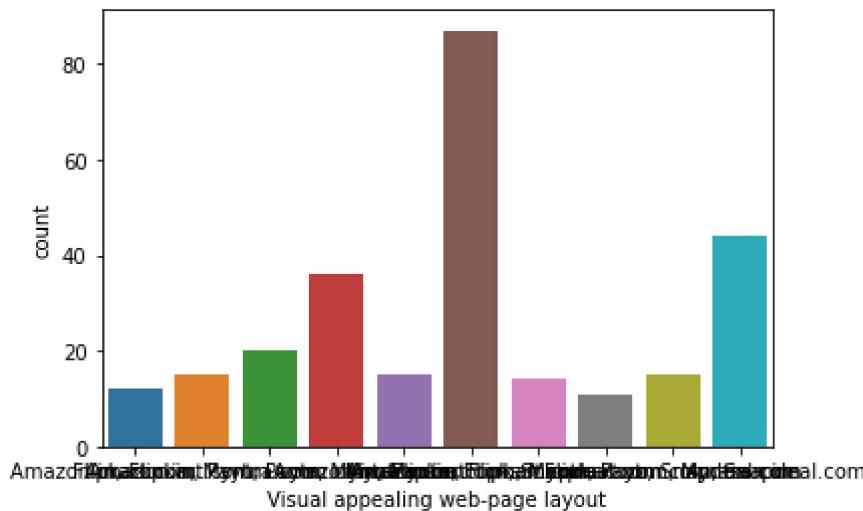
Name: Longer delivery period, dtype: int64



```
In [86]: ax=sns.countplot(x="Visual appealing web-page layout",data=df)
print(df['Visual appealing web-page layout'].value_counts())
```

Category	Count
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

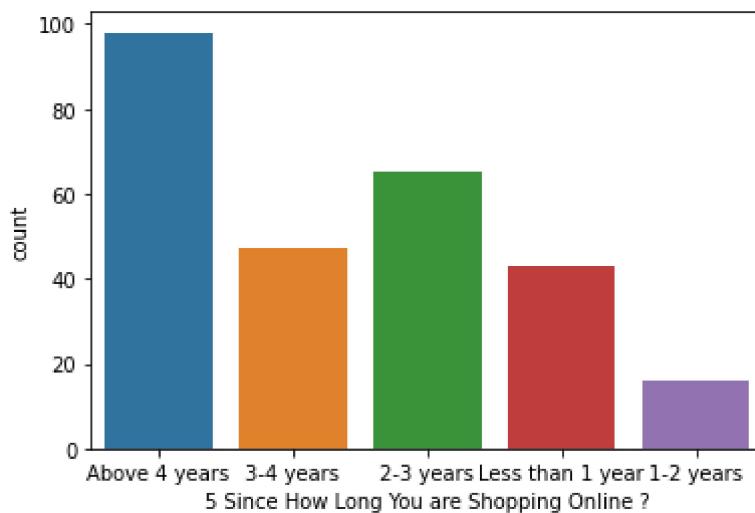
Name: Visual appealing web-page layout, dtype: int64



```
In [87]: ax=sns.countplot(x="5 Since How Long You are Shopping Online ?",data=df)
print(df['5 Since How Long You are Shopping Online ?'].value_counts())
```

5 Since How Long You are Shopping Online ?	Count
Above 4 years	98
2-3 years	65
3-4 years	47
Less than 1 year	43
1-2 years	16

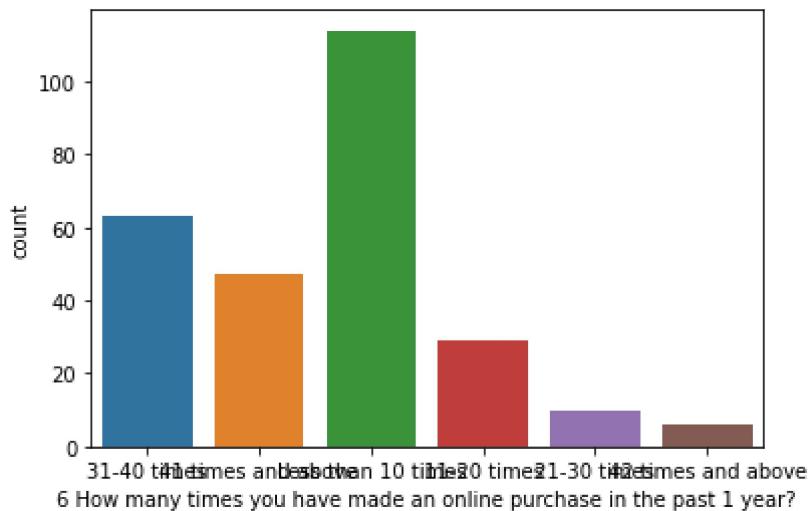
Name: 5 Since How Long You are Shopping Online ?, dtype: int64



```
In [88]: ax=sns.countplot(x="6 How many times you have made an online purchase in the past 1 year?",data=df)
print(df['6 How many times you have made an online purchase in the past 1 year?'].value_counts())
```

6 How many times you have made an online purchase in the past 1 year?	Count
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: 6 How many times you have made an online purchase in the past 1 year?, dtype: int64



```
In [84]: from sklearn.preprocessing import OrdinalEncoder  
enc=OrdinalEncoder()
```

```
In [15]: for i in df.columns:  
    if df[i].dtypes=='object':  
        df[i]=enc.fit_transform(df[i].values.reshape(-1,1))
```

```
In [16]: df
```

Out[16]:

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
0	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	
1	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
2	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
3	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
4	0.0	0.0	0.0	530068	1.0	0.0	3.0	2.0	0.0	
5	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
6	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
7	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
8	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
9	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
10	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
11	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
12	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
13	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
14	0.0	0.0	6.0	132001	4.0	3.0	3.0	2.0	2.0	
15	0.0	0.0	0.0	560037	1.0	3.0	1.0	2.0	2.0	
16	1.0	1.0	9.0	201308	0.0	1.0	1.0	1.0	3.0	
17	1.0	2.0	2.0	110011	4.0	5.0	3.0	1.0	3.0	
18	0.0	2.0	2.0	110018	0.0	5.0	3.0	1.0	3.0	
19	0.0	0.0	10.0	173229	0.0	0.0	3.0	2.0	2.0	
20	0.0	0.0	9.0	201308	0.0	3.0	3.0	2.0	0.0	
21	1.0	1.0	5.0	122018	2.0	2.0	3.0	3.0	1.0	
22	1.0	2.0	4.0	201310	3.0	2.0	2.0	3.0	2.0	
23	0.0	2.0	4.0	203207	3.0	3.0	2.0	0.0	3.0	
24	0.0	0.0	7.0	250001	2.0	3.0	2.0	2.0	1.0	
25	0.0	0.0	0.0	530068	1.0	5.0	2.0	1.0	3.0	

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
26	1.0	0.0	3.0	201005	4.0	0.0	2.0	1.0	3.0	
27	1.0	1.0	2.0	110044	3.0	3.0	2.0	1.0	3.0	
28	0.0	2.0	4.0	201306	3.0	2.0	2.0	1.0	3.0	
29	0.0	2.0	6.0	132001	1.0	5.0	2.0	1.0	3.0	
30	0.0	4.0	0.0	560010	3.0	5.0	2.0	2.0	0.0	
31	1.0	1.0	9.0	201305	1.0	5.0	2.0	0.0	3.0	
32	1.0	1.0	2.0	110042	3.0	1.0	2.0	2.0	0.0	
33	0.0	2.0	4.0	201308	3.0	5.0	2.0	2.0	2.0	
34	0.0	3.0	6.0	132036	2.0	5.0	2.0	2.0	2.0	
35	0.0	0.0	0.0	560018	1.0	0.0	2.0	2.0	0.0	
36	1.0	1.0	9.0	201305	4.0	5.0	2.0	2.0	2.0	
37	1.0	2.0	2.0	110008	3.0	0.0	2.0	3.0	3.0	
38	0.0	2.0	4.0	201308	3.0	3.0	2.0	0.0	3.0	
39	0.0	0.0	6.0	132036	1.0	2.0	2.0	2.0	2.0	
40	0.0	0.0	0.0	560002	3.0	2.0	2.0	1.0	3.0	
41	1.0	1.0	9.0	201303	2.0	3.0	2.0	1.0	3.0	
42	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
43	0.0	0.0	4.0	201312	4.0	5.0	2.0	1.0	3.0	
44	0.0	1.0	7.0	250001	3.0	0.0	2.0	0.0	3.0	
45	0.0	2.0	0.0	560037	3.0	3.0	2.0	2.0	0.0	
46	1.0	2.0	9.0	201308	3.0	2.0	2.0	2.0	2.0	
47	1.0	4.0	2.0	110011	3.0	5.0	2.0	2.0	2.0	
48	0.0	1.0	4.0	203202	1.0	5.0	2.0	2.0	2.0	
49	0.0	1.0	6.0	132001	3.0	3.0	2.0	2.0	0.0	
50	0.0	2.0	0.0	560001	2.0	2.0	2.0	2.0	2.0	
51	1.0	3.0	9.0	201304	1.0	2.0	2.0	3.0	3.0	

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper sys (C de \t
52	1.0	2.0	2.0	110044	4.0	3.0	2.0	0.0	3.0
53	0.0	2.0	4.0	201312	3.0	3.0	2.0	0.0	3.0
54	0.0	0.0	7.0	250001	3.0	5.0	2.0	2.0	2.0
55	0.0	0.0	0.0	560003	2.0	0.0	2.0	1.0	3.0
56	1.0	0.0	9.0	201310	1.0	3.0	2.0	1.0	3.0
57	1.0	0.0	2.0	110044	4.0	5.0	2.0	1.0	3.0
58	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0
59	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0
60	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0
61	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0
62	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0
63	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0
64	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0
65	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0
66	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0
67	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0
68	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0
69	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0
70	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0
71	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0
72	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0
73	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0
74	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0
75	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0
76	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0
77	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
78	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0	
79	0.0	1.0	6.0	132036	4.0	2.0	2.0	2.0	0.0	
80	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0	
81	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0	
82	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0	
83	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0	
84	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0	
85	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0	
86	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0	
87	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0	
88	1.0	0.0	0.0	560013	4.0	5.0	2.0	2.0	1.0	
89	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0	
90	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0	
91	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0	
92	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
93	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0	
94	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
95	0.0	0.0	0.0	530068	1.0	0.0	3.0	2.0	0.0	
96	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0	
97	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
98	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0	
99	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
100	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
101	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
102	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0	
103	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper sys (C de \t
104	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0
105	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0
106	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0
107	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0
108	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0
109	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0
110	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0
111	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0
112	1.0	1.0	1.0	203001	0.0	5.0	1.0	2.0	1.0
113	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0
114	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0
115	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0
116	0.0	0.0	0.0	560037	1.0	0.0	3.0	2.0	0.0
117	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0
118	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0
119	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0
120	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0
121	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0
122	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0
123	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0
124	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0
125	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0
126	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0
127	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0
128	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0
129	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0

	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 oper s) (C de \t
130	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
131	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
132	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
133	1.0	1.0	1.0	203001	0.0	5.0	1.0	2.0	1.0	
134	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	
135	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
136	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
137	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
138	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
139	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
140	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
141	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
142	0.0	0.0	0.0	560037	1.0	0.0	3.0	2.0	0.0	
143	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
144	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
145	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
146	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
147	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
148	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0	
149	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0	
150	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0	
151	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
152	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
153	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
154	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0	
155	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0	

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
156	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0
157	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0
158	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0
159	0.0	1.0	6.0	132036	4.0	2.0	2.0	2.0	0.0
160	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0
161	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0
162	0.0	0.0	0.0	530068	1.0	0.0	3.0	2.0	0.0
163	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0
164	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0
165	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0
166	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0
167	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0
168	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0
169	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0
170	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0
171	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0
172	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0
173	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0
174	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0
175	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0
176	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0
177	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0
178	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0
179	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0
180	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0
181	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0

	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 oper s) (C de \t
182	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
183	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	
184	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0	
185	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0	
186	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0	
187	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0	
188	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0	
189	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
190	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0	
191	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0	
192	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
193	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0	
194	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0	
195	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0	
196	1.0	0.0	0.0	560013	4.0	5.0	2.0	2.0	1.0	
197	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0	
198	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0	
199	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0	
200	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0	
201	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
202	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0	
203	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
204	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	
205	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0	
206	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0	
207	1.0	0.0	0.0	560013	4.0	5.0	2.0	2.0	1.0	

	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 oper s) (C de \t
208	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0	
209	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0	
210	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0	
211	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0	
212	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0	
213	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0	
214	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0	
215	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0	
216	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0	
217	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0	
218	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0	
219	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0	
220	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0	
221	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0	
222	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0	
223	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
224	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
225	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0	
226	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0	
227	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
228	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0	
229	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0	
230	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
231	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0	
232	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0	
233	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0	

	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 oper s) (C de \t
234	0.0	1.0	6.0	132036	4.0	2.0	2.0	2.0	0.0	
235	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0	
236	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
237	0.0	0.0	0.0	530068	1.0	0.0	3.0	2.0	0.0	
238	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0	
239	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0	
240	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0	
241	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0	
242	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0	
243	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0	
244	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0	
245	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
246	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
247	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
248	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0	
249	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0	
250	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	
251	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
252	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
253	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
254	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
255	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
256	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
257	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
258	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
259	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	

	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 oper s) (C de \t
260	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
261	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
262	0.0	0.0	0.0	560037	1.0	0.0	3.0	2.0	0.0	
263	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
264	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
265	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0	
266	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0	
267	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
268	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	

◀ ▶

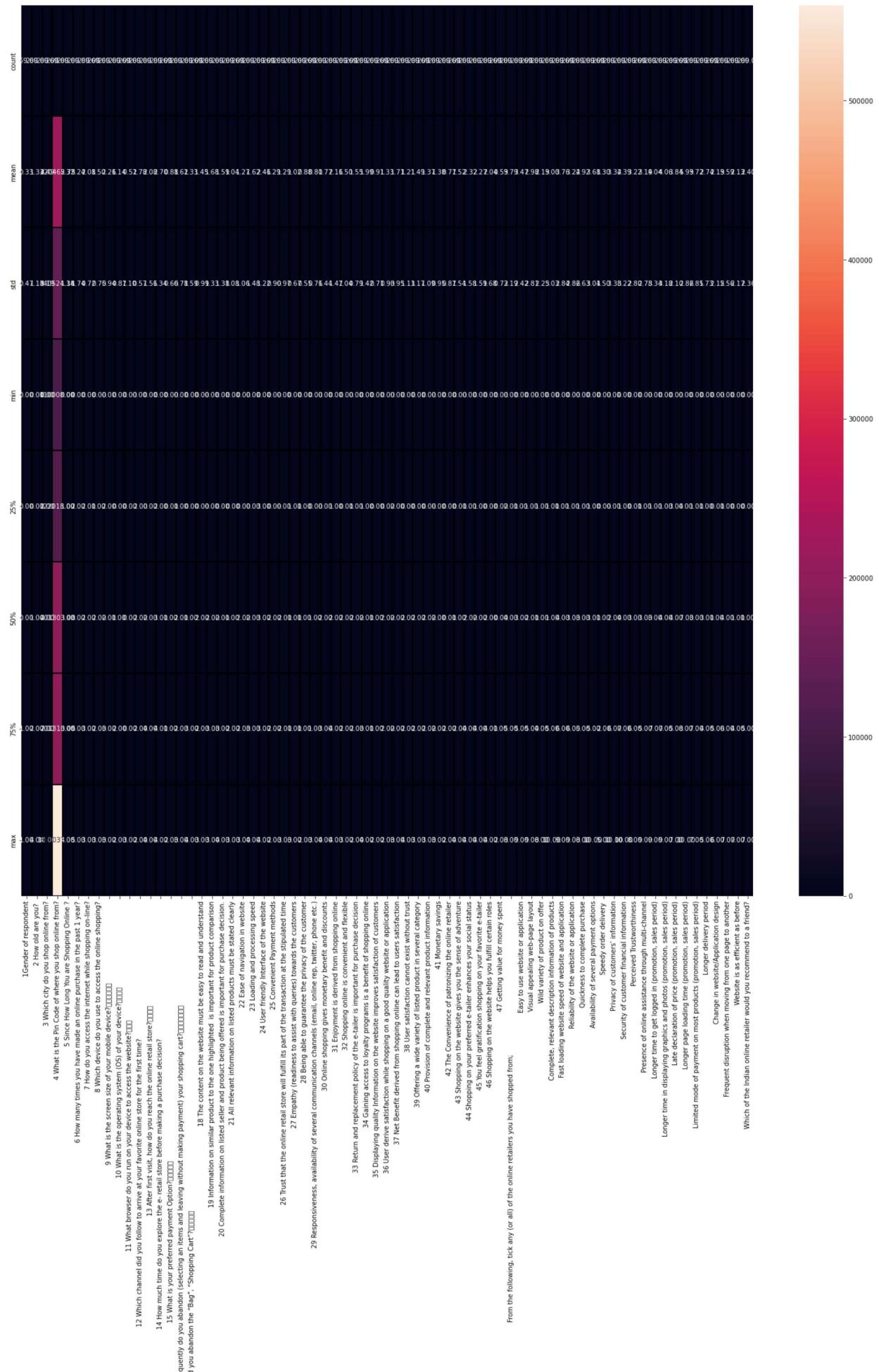
In [17]: `df.describe()`

Out[17]:

	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 V devi you u acce a shop
count	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000
mean	0.327138	1.330855	4.494424	220465.747212	2.323420	3.237918	2.078067	1.50
std	0.470042	1.183774	3.187687	140524.341051	1.176357	1.739331	0.715919	0.75
min	0.000000	0.000000	0.000000	110008.000000	0.000000	0.000000	0.000000	0.00
25%	0.000000	0.000000	2.000000	122018.000000	1.000000	2.000000	2.000000	1.00
50%	0.000000	1.000000	4.000000	201303.000000	3.000000	3.000000	2.000000	2.00
75%	1.000000	2.000000	7.000000	201310.000000	3.000000	5.000000	3.000000	2.00
max	1.000000	4.000000	10.000000	560037.000000	4.000000	5.000000	3.000000	3.00

In [18]: `import matplotlib.pyplot as plt
plt.figure(figsize=(25,25))
sns.heatmap(df.describe(), annot=True, linewidths=0.1, linecolor="black", fmt=".2f")`

Out[18]: <AxesSubplot:>



Correlation

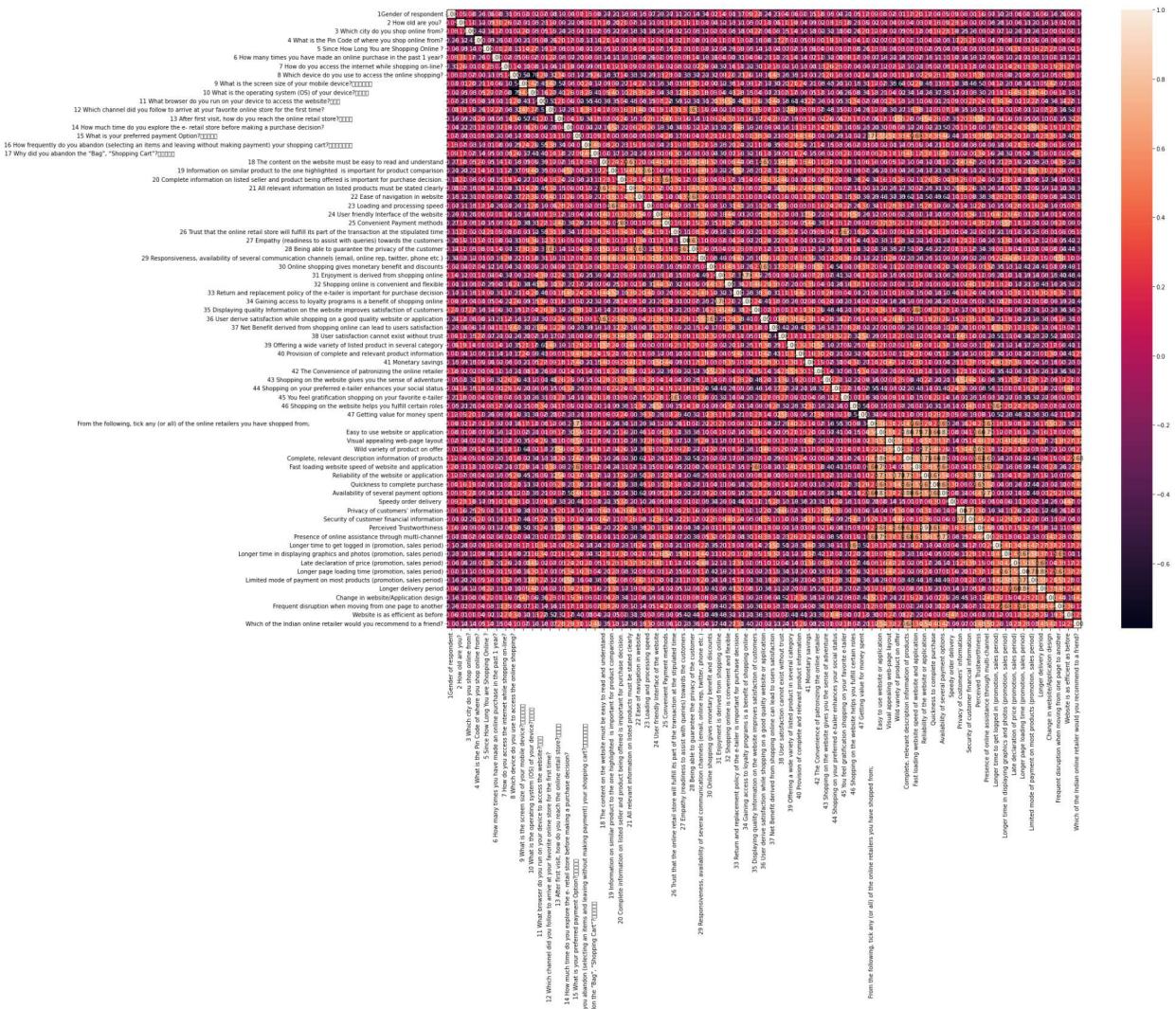
In [19]: `df.corr().head()`

Out[19]:

	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?
1Gender of respondent	1.000000	0.046169	0.080912	-0.260365	-0.057096	0.077876	-0.309029	0.061673
2 How old are you?	0.046169	1.000000	0.113712	-0.120704	-0.087847	0.309575	0.255594	0.022383
3 Which city do you shop online from?	0.080912	0.113712	1.000000	-0.416597	-0.138329	0.173871	-0.010436	0.020650
4 What is the Pin Code of where you shop online from?	-0.260365	-0.120704	-0.416597	1.000000	-0.090049	-0.263685	0.005511	-0.004980
5 Since How Long You are Shopping Online ?	-0.057096	-0.087847	-0.138329	-0.090049	1.000000	0.013315	0.226883	-0.125240

In [20]: `plt.figure(figsize=(25,20))
sns.heatmap(df.corr(), annot=True, linewidths=0.1, linecolor="black", fmt="0.2f")`

Out[20]: <AxesSubplot:>



Skewness:

```
In [21]: df.skew()
```


28 Being able to guarantee the privacy of the customer
-0.067247

29 Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
1.119422

30 Online shopping gives monetary benefit and discounts
0.151518

31 Enjoyment is derived from shopping online
-0.165331

32 Shopping online is convenient and flexible
-0.447632

33 Return and replacement policy of the e-tailer is important for purchase decision
-1.305697

34 Gaining access to loyalty programs is a benefit of shopping online
0.026436

35 Displaying quality Information on the website improves satisfaction of customers
0.128003

36 User derive satisfaction while shopping on a good quality website or application
-0.704827

37 Net Benefit derived from shopping online can lead to users satisfaction
-0.785908

38 User satisfaction cannot exist without trust
0.171700

39 Offering a wide variety of listed product in several category
-0.226594

40 Provision of complete and relevant product information
-0.236621

41 Monetary savings
-0.442062

42 The Convenience of patronizing the online retailer
0.456611

43 Shopping on the website gives you the sense of adventure
0.579282

44 Shopping on your preferred e-tailer enhances your social status
-0.303870

45 You feel gratification shopping on your favorite e-tailer
-0.232866

46 Shopping on the website helps you fulfill certain roles
-0.064795

47 Getting value for money spent
0.812878

From the following, tick any (or all) of the online retailers you have shopped from;
0.145462

Easy to use website or application
0.508414

Visual appealing web-page layout
0.813015

Wild variety of product on offer
1.186071

Complete, relevant description information of products
0.964100

Fast loading website speed of website and application
0.106301

Reliability of the website or application
0.464836

Quickness to complete purchase
0.606858

Availability of several payment options
0.781633

Speedy order delivery

```
1.061243  
Privacy of customers' information  
0.716860  
Security of customer financial information  
0.073523  
Perceived Trustworthiness  
0.199441  
Presence of online assistance through multi-channel  
0.577166  
Longer time to get logged in (promotion, sales period)  
0.131096  
Longer time in displaying graphics and photos (promotion, sales period)  
0.167550  
Late declaration of price (promotion, sales period)  
-0.378929  
Longer page loading time (promotion, sales period)  
-0.708594  
Limited mode of payment on most products (promotion, sales period)  
-0.086712  
Longer delivery period  
-0.147702  
Change in website/Application design  
0.354163  
Frequent disruption when moving from one page to another  
-0.100608  
Website is as efficient as before  
0.662084  
Which of the Indian online retailer would you recommend to a friend?  
0.583614  
dtype: float64
```

Outliers Check:

```
In [22]: df.dtypes
```


28 Being able to guarantee the privacy of the customer
float64

29 Responsiveness, availability of several communication channels (email, online rep, twitter, phone etc.)
float64

30 Online shopping gives monetary benefit and discounts
float64

31 Enjoyment is derived from shopping online
float64

32 Shopping online is convenient and flexible
float64

33 Return and replacement policy of the e-tailer is important for purchase decision
float64

34 Gaining access to loyalty programs is a benefit of shopping online
float64

35 Displaying quality Information on the website improves satisfaction of customers
float64

36 User derive satisfaction while shopping on a good quality website or application
float64

37 Net Benefit derived from shopping online can lead to users satisfaction
float64

38 User satisfaction cannot exist without trust
float64

39 Offering a wide variety of listed product in several category
float64

40 Provision of complete and relevant product information
float64

41 Monetary savings
float64

42 The Convenience of patronizing the online retailer
float64

43 Shopping on the website gives you the sense of adventure
float64

44 Shopping on your preferred e-tailer enhances your social status
float64

45 You feel gratification shopping on your favorite e-tailer
float64

46 Shopping on the website helps you fulfill certain roles
float64

47 Getting value for money spent
float64

From the following, tick any (or all) of the online retailers you have shopped from;
float64

Easy to use website or application
float64

Visual appealing web-page layout
float64

Wide variety of product on offer
float64

Complete, relevant description information of products
float64

Fast loading website speed of website and application
float64

Reliability of the website or application
float64

Quickness to complete purchase
float64

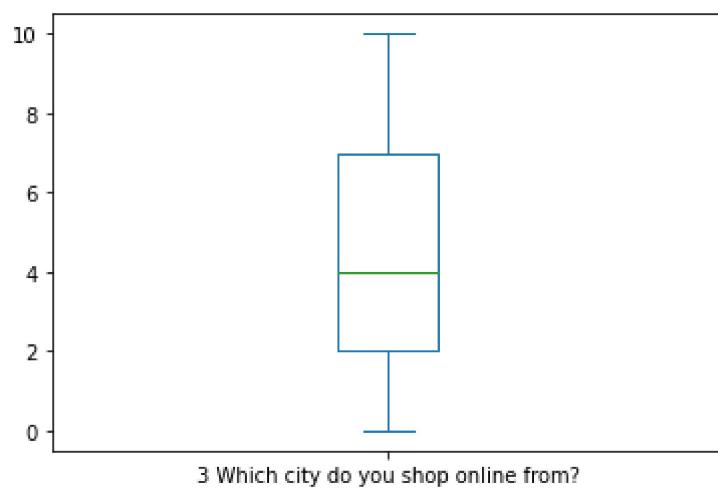
Availability of several payment options
float64

Speedy order delivery

```
float64
Privacy of customers' information
float64
Security of customer financial information
float64
Perceived Trustworthiness
float64
Presence of online assistance through multi-channel
float64
Longer time to get logged in (promotion, sales period)
float64
Longer time in displaying graphics and photos (promotion, sales period)
float64
Late declaration of price (promotion, sales period)
float64
Longer page loading time (promotion, sales period)
float64
Limited mode of payment on most products (promotion, sales period)
float64
Longer delivery period
float64
Change in website/Application design
float64
Frequent disruption when moving from one page to another
float64
Website is as efficient as before
float64
Which of the Indian online retailer would you recommend to a friend?
float64
dtype: object
```

In [23]: `df['3 Which city do you shop online from?'].plot.box()`

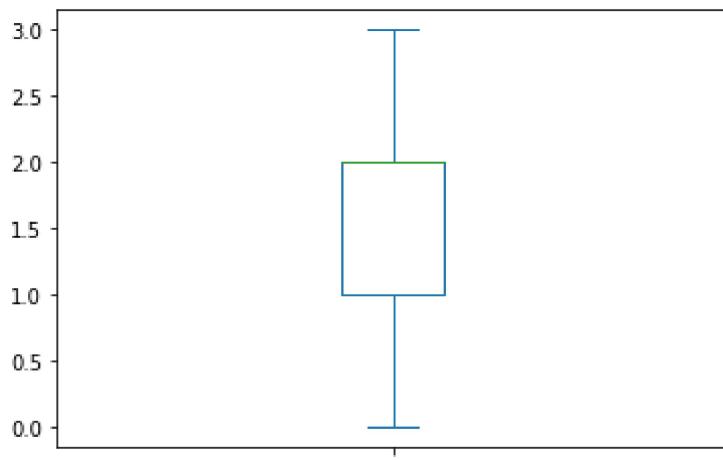
Out[23]: <AxesSubplot:>



Here no outliers present in the above

In [24]: `df['8 Which device do you use to access the online shopping?'].plot.box()`

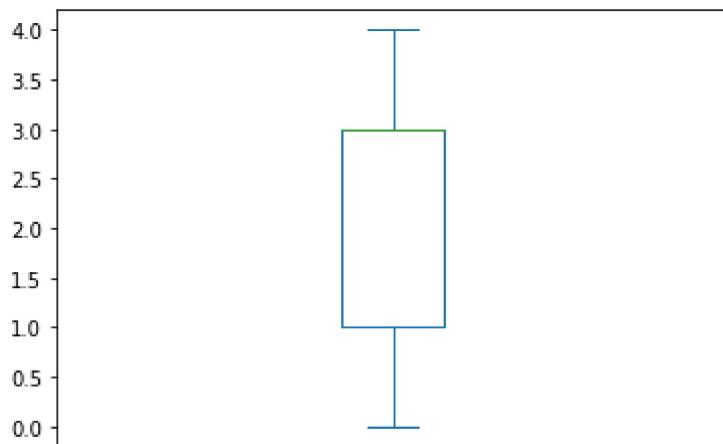
Out[24]: <AxesSubplot:>



8 Which device do you use to access the online shopping?

```
In [25]: df['5 Since How Long You are Shopping Online ?'].plot.box()
```

```
Out[25]: <AxesSubplot:>
```



5 Since How Long You are Shopping Online ?

```
In [26]: #df.plot(kind='box', subplots=True, layout=(20,71))
```

outlier removal

```
In [27]: df.shape
```

```
Out[27]: (269, 71)
```

```
In [28]: from scipy.stats import zscore
import numpy as np
z=np.abs(zscore(df))
threshold=3
np.where(z>3)
```

```
Out[28]: (array([ 4, 16, 20, 30, 35, 49, 79, 88, 95, 112, 116, 133, 142,
       159, 162, 196, 207, 234, 237, 262], dtype=int64),
 array([11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11], dtype=int64))
```

```
In [29]: df_new_z=df[(z<3).all(axis=1)]
df_new_z
```

Out[29]:

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
0	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	
1	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
2	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
3	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
5	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
6	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
7	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
8	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
9	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
10	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
11	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
12	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
13	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
14	0.0	0.0	6.0	132001	4.0	3.0	3.0	2.0	2.0	
15	0.0	0.0	0.0	560037	1.0	3.0	1.0	2.0	2.0	
17	1.0	2.0	2.0	110011	4.0	5.0	3.0	1.0	3.0	
18	0.0	2.0	2.0	110018	0.0	5.0	3.0	1.0	3.0	
19	0.0	0.0	10.0	173229	0.0	0.0	3.0	2.0	2.0	
21	1.0	1.0	5.0	122018	2.0	2.0	3.0	3.0	1.0	
22	1.0	2.0	4.0	201310	3.0	2.0	2.0	3.0	2.0	
23	0.0	2.0	4.0	203207	3.0	3.0	2.0	0.0	3.0	
24	0.0	0.0	7.0	250001	2.0	3.0	2.0	2.0	1.0	
25	0.0	0.0	0.0	530068	1.0	5.0	2.0	1.0	3.0	
26	1.0	0.0	3.0	201005	4.0	0.0	2.0	1.0	3.0	
27	1.0	1.0	2.0	110044	3.0	3.0	2.0	1.0	3.0	
28	0.0	2.0	4.0	201306	3.0	2.0	2.0	1.0	3.0	

	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 oper s) (C de \t
29	0.0	2.0	6.0	132001	1.0	5.0	2.0	1.0	3.0	
31	1.0	1.0	9.0	201305	1.0	5.0	2.0	0.0	3.0	
32	1.0	1.0	2.0	110042	3.0	1.0	2.0	2.0	0.0	
33	0.0	2.0	4.0	201308	3.0	5.0	2.0	2.0	2.0	
34	0.0	3.0	6.0	132036	2.0	5.0	2.0	2.0	2.0	
36	1.0	1.0	9.0	201305	4.0	5.0	2.0	2.0	2.0	
37	1.0	2.0	2.0	110008	3.0	0.0	2.0	3.0	3.0	
38	0.0	2.0	4.0	201308	3.0	3.0	2.0	0.0	3.0	
39	0.0	0.0	6.0	132036	1.0	2.0	2.0	2.0	2.0	
40	0.0	0.0	0.0	560002	3.0	2.0	2.0	1.0	3.0	
41	1.0	1.0	9.0	201303	2.0	3.0	2.0	1.0	3.0	
42	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
43	0.0	0.0	4.0	201312	4.0	5.0	2.0	1.0	3.0	
44	0.0	1.0	7.0	250001	3.0	0.0	2.0	0.0	3.0	
45	0.0	2.0	0.0	560037	3.0	3.0	2.0	2.0	0.0	
46	1.0	2.0	9.0	201308	3.0	2.0	2.0	2.0	2.0	
47	1.0	4.0	2.0	110011	3.0	5.0	2.0	2.0	2.0	
48	0.0	1.0	4.0	203202	1.0	5.0	2.0	2.0	2.0	
50	0.0	2.0	0.0	560001	2.0	2.0	2.0	2.0	2.0	
51	1.0	3.0	9.0	201304	1.0	2.0	2.0	3.0	3.0	
52	1.0	2.0	2.0	110044	4.0	3.0	2.0	0.0	3.0	
53	0.0	2.0	4.0	201312	3.0	3.0	2.0	0.0	3.0	
54	0.0	0.0	7.0	250001	3.0	5.0	2.0	2.0	2.0	
55	0.0	0.0	0.0	560003	2.0	0.0	2.0	1.0	3.0	
56	1.0	0.0	9.0	201310	1.0	3.0	2.0	1.0	3.0	
57	1.0	0.0	2.0	110044	4.0	5.0	2.0	1.0	3.0	

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
58	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0	
59	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0	
60	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0	
61	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0	
62	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0	
63	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0	
64	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0	
65	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0	
66	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0	
67	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0	
68	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0	
69	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0	
70	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0	
71	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0	
72	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
73	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0	
74	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
75	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0	
76	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0	
77	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0	
78	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0	
80	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0	
81	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0	
82	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0	
83	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0	
84	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0	

	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 oper s) (C de \t
85	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0	
86	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0	
87	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0	
89	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0	
90	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0	
91	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0	
92	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
93	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0	
94	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
96	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0	
97	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
98	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0	
99	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
100	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
101	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
102	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0	
103	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
104	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0	
105	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	
106	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0	
107	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0	
108	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
109	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
110	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
111	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
113	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	

	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 oper s) (C de \t
114	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
115	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
117	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
118	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
119	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
120	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
121	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
122	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
123	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0	
124	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
125	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0	
126	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	
127	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0	
128	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0	
129	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
130	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
131	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
132	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
134	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0	
135	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
136	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0	
137	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0	
138	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	
139	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
140	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0	
141	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	

	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 oper s) (C de \t
143	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0	
144	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0	
145	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0	
146	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
147	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
148	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0	
149	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0	
150	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0	
151	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
152	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0	
153	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0	
154	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0	
155	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0	
156	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0	
157	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0	
158	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0	
160	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0	
161	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0	
163	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0	
164	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0	
165	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0	
166	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0	
167	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0	
168	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0	
169	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0	
170	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0	

	1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
171	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0	
172	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0	
173	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0	
174	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0	
175	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0	
176	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0	
177	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0	
178	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0	
179	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0	
180	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0	
181	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0	
182	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0	
183	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0	
184	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0	
185	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0	
186	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0	
187	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0	
188	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0	
189	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0	
190	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0	
191	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0	
192	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0	
193	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0	
194	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0	
195	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0	
197	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0	

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper s) (C de \t
198	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0
199	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0
200	0.0	0.0	6.0	132036	3.0	5.0	2.0	2.0	2.0
201	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0
202	0.0	1.0	10.0	173212	2.0	5.0	1.0	1.0	3.0
203	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0
204	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0
205	1.0	3.0	9.0	201305	1.0	3.0	2.0	2.0	2.0
206	1.0	2.0	2.0	110008	1.0	2.0	2.0	2.0	2.0
208	0.0	2.0	0.0	560018	2.0	0.0	2.0	2.0	2.0
209	0.0	1.0	3.0	201005	3.0	3.0	3.0	2.0	2.0
210	0.0	2.0	6.0	132001	3.0	3.0	2.0	0.0	3.0
211	0.0	0.0	0.0	560002	3.0	5.0	2.0	2.0	3.0
212	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0
213	0.0	4.0	3.0	201001	4.0	5.0	3.0	2.0	2.0
214	1.0	1.0	9.0	201304	2.0	5.0	2.0	0.0	3.0
215	1.0	2.0	9.0	201308	3.0	5.0	2.0	1.0	3.0
216	1.0	1.0	9.0	201303	2.0	1.0	2.0	2.0	2.0
217	0.0	1.0	4.0	201310	3.0	3.0	2.0	2.0	2.0
218	0.0	2.0	4.0	201312	4.0	4.0	2.0	2.0	2.0
219	0.0	0.0	7.0	250001	3.0	2.0	2.0	2.0	2.0
220	0.0	1.0	4.0	201308	1.0	2.0	2.0	2.0	2.0
221	0.0	0.0	4.0	201310	3.0	2.0	2.0	1.0	3.0
222	0.0	0.0	2.0	110008	3.0	3.0	3.0	1.0	3.0
223	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0
224	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper sys (C de \t
225	1.0	4.0	9.0	201308	1.0	5.0	2.0	2.0	2.0
226	1.0	1.0	2.0	110014	4.0	5.0	2.0	2.0	2.0
227	1.0	0.0	2.0	110044	1.0	3.0	2.0	1.0	3.0
228	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	2.0
229	1.0	0.0	9.0	201308	3.0	0.0	2.0	3.0	3.0
230	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0
231	0.0	2.0	7.0	250001	1.0	2.0	2.0	0.0	3.0
232	0.0	3.0	0.0	560037	3.0	2.0	2.0	0.0	3.0
233	0.0	0.0	0.0	560003	3.0	2.0	2.0	0.0	3.0
235	0.0	1.0	2.0	110014	4.0	5.0	2.0	1.0	3.0
236	0.0	0.0	6.0	132001	3.0	2.0	2.0	1.0	3.0
238	0.0	1.0	2.0	110044	4.0	5.0	3.0	1.0	3.0
239	1.0	1.0	9.0	201310	2.0	5.0	2.0	1.0	3.0
240	0.0	2.0	4.0	201308	4.0	5.0	2.0	2.0	2.0
241	0.0	3.0	5.0	122009	4.0	5.0	3.0	2.0	2.0
242	0.0	1.0	4.0	201306	3.0	0.0	2.0	1.0	3.0
243	0.0	2.0	0.0	560010	2.0	2.0	2.0	2.0	0.0
244	0.0	0.0	4.0	201306	4.0	2.0	2.0	1.0	3.0
245	0.0	1.0	6.0	132001	3.0	2.0	2.0	1.0	3.0
246	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0
247	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0
248	1.0	2.0	2.0	110044	1.0	5.0	2.0	2.0	0.0
249	1.0	4.0	2.0	110042	2.0	4.0	2.0	2.0	0.0
250	1.0	1.0	2.0	110009	3.0	2.0	0.0	0.0	3.0
251	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0
252	1.0	0.0	6.0	132001	2.0	5.0	1.0	2.0	2.0

1Gender of respondent	2How old are you?	3Which city do you shop online from?	4What is the Pin Code of where you shop online from?	5Since How Long You are Shopping Online ?	6How many times you have made an online purchase in the past 1 year?	7How do you access the internet while shopping on-line?	8Which device do you use to access the online shopping?	9What is the screen size of your mobile device?	10oper sys (C de \t
253	1.0	2.0	2.0	110011	3.0	2.0	3.0	3.0	3.0
254	0.0	3.0	5.0	122018	1.0	5.0	3.0	1.0	3.0
255	1.0	1.0	8.0	244001	3.0	1.0	1.0	1.0	3.0
256	0.0	2.0	9.0	201308	3.0	5.0	3.0	1.0	3.0
257	0.0	1.0	2.0	110039	4.0	5.0	3.0	1.0	3.0
258	0.0	0.0	2.0	110030	3.0	3.0	3.0	2.0	0.0
259	0.0	1.0	4.0	201310	3.0	0.0	3.0	1.0	3.0
260	0.0	1.0	9.0	201308	3.0	3.0	3.0	2.0	2.0
261	0.0	0.0	4.0	201308	2.0	3.0	1.0	2.0	2.0
263	1.0	2.0	2.0	110018	2.0	5.0	1.0	0.0	3.0
264	0.0	0.0	10.0	173212	0.0	5.0	1.0	2.0	2.0
265	0.0	1.0	3.0	201008	0.0	2.0	1.0	2.0	3.0
266	0.0	2.0	0.0	560010	1.0	5.0	2.0	1.0	3.0
267	0.0	4.0	10.0	173229	1.0	5.0	3.0	2.0	2.0
268	0.0	2.0	3.0	201009	1.0	2.0	1.0	2.0	2.0

In [30]: df_new_z.shape

Out[30]: (249, 71)

In [31]: # Percentage Loss of data:

```
data_loss=((269-249)/269)*100
data_loss
```

Out[31]: 7.434944237918216

Splitting the dataframe:

```
In [32]: x=df.drop('8 Which device do you use to access the online shopping?',axis=1)
y=df['8 Which device do you use to access the online shopping?']

print('shape of x =', x.shape)
print('shape of y =', y.shape)

shape of x = (269, 70)
shape of y = (269,)
```

```
In [33]: from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2,random_state=51)

print('shape of x_train =', x_train.shape)
print('shape of y_train =', y_train.shape)
print('shape of x_test =', x_test.shape)
print('shape of y_test =', y_test.shape)

shape of x_train = (215, 70)
shape of y_train = (215,)
shape of x_test = (54, 70)
shape of y_test = (54,)
```

Feature Scaling

```
In [34]: from sklearn.preprocessing import StandardScaler
sc=StandardScaler()
sc.fit(x_train)
x_train=sc.transform(x_train)
x_test=sc.transform(x_test)
```

Linear Regression-ML Model Training

```
In [35]: from sklearn.linear_model import LinearRegression
lr=LinearRegression()

lr.fit(x_train,y_train)
```

```
Out[35]: ▾ LinearRegression
          LinearRegression()
```

```
In [36]: lr.coef_
```

```
Out[36]: array([ 5.01108128e-02, -2.27874272e-03, -1.03257789e-04, -8.10749848e-03,
 2.68636763e-02, -2.99631499e-02,  1.94429532e-02, -4.19347838e-01,
-5.39545871e-01, -4.24140683e-02,  4.41819809e-02, -3.55222023e-02,
 1.66650231e-03, -3.11634564e-02, -3.51756508e-02, -3.66741737e-02,
-1.39397310e-02, -1.95564008e-02,  3.20668716e-02,  4.92661335e-02,
-3.28120181e-02, -3.65474515e-03, -9.79160819e-02, -6.81285179e-02,
 1.42830716e-02, -9.42281390e-04, -7.09124603e-03,  2.54723139e-02,
-4.32402572e-02, -4.17239368e-02, -8.41830857e-02,  8.51956357e-02,
 5.16976755e-02, -3.07849811e-02, -5.05480378e-03,  4.60354728e-02,
-5.99074732e-02, -2.98293575e-02, -4.00461955e-03, -1.45320094e-02,
-4.65343585e-02,  1.19218398e-02, -6.35030361e-02, -1.04474537e-01,
-2.47025240e-02, -6.64138201e-02,  9.56350910e-03,  1.90926493e-02,
-5.14183343e-02, -4.54123494e-02, -1.05006066e-03,  2.09692853e-02,
-1.13641202e-02,  1.68390590e-02, -2.02671567e-02,  1.28398179e-01,
-3.25410054e-02,  6.63076836e-03,  1.16296417e-02, -3.01213276e-02,
 5.15626246e-02,  3.39521091e-02,  8.27288567e-03,  7.29623721e-03,
-1.81801187e-03, -1.52369086e-02,  3.96219567e-02,  4.54028971e-03,
 2.82109642e-02, -1.25740717e-02])
```

```
In [37]: lr.intercept_
```

```
Out[37]: 1.5255813953488373
```

```
In [38]: x_test[0,:]
```

```
Out[38]: array([-0.71699687,  0.64640556, -1.43203662,  2.5439838 , -1.14509528,
 1.00720358, -0.09141544,  0.7878913 ,  0.99479344, -0.48634529,
 0.39166316, -0.05719261,  0.96950323,  0.19870653,  0.48784024,
-0.81921789,  0.59151592,  0.99686807, -1.11023828, -0.98439188,
 0.65966336, -1.08548113, -1.93703052,  0.82364127, -1.32878554,
 2.85756665,  2.05690732, -1.03458705, -1.20856625,  1.23010727,
-1.42563058,  0.56174678,  1.38257111, -1.30144919, -1.38077956,
-1.78982869, -1.024444343,  1.35185347,  0.56601817, -1.42503691,
-0.90113646, -0.33729161,  1.06064879, -1.39706283, -1.23656922,
-0.78348717,  1.0514476 , -1.41292718, -1.03668985, -0.93822041,
-0.96255982, -1.33167713, -1.11778304, -1.09806758, -0.83300342,
-0.90012799, -0.98080624, -1.39186714, -1.14366984, -1.11351334,
-1.2270762 ,  1.57757406, -1.84277802,  1.39883113,  1.17260836,
 1.29709272,  1.76602693,  1.39163252, -0.9727736 , -0.99837065])
```

```
In [39]: lr.predict([x_test[0,:]])
```

```
Out[39]: array([0.98634176])
```

```
In [40]: lr.predict(x_test)
```

```
Out[40]: array([ 9.86341755e-01, -4.36667774e-02,  1.03769097e+00,  1.98547408e+00,
 9.42645935e-01,  1.94198051e+00,  9.73520108e-01,  1.05058408e+00,
 2.08632062e+00,  2.06034540e+00,  2.05086484e+00,  2.83969365e-02,
 1.00342193e+00,  2.07572807e+00,  1.97424040e+00,  1.96616052e+00,
 2.04426418e+00,  9.86341755e-01,  4.74261913e-03,  2.05086484e+00,
 2.07271023e+00,  2.07271023e+00,  2.02823535e+00,  1.01933432e+00,
 1.98499087e+00,  1.98547408e+00,  9.80317376e-01,  1.97654969e+00,
 9.73520108e-01,  1.04601958e+00,  1.03769097e+00,  1.03032190e+00,
 2.00013452e+00,  2.03595399e+00,  1.05058408e+00,  3.03491693e-02,
 2.05086484e+00,  2.07572807e+00,  6.25896411e-02, -4.36667774e-02,
 1.98881429e+00,  2.01500913e+00,  2.01517557e+00,  2.04247000e+00,
 1.05120155e+00,  2.05086484e+00,  1.99395432e+00,  2.83969365e-02,
 2.05741375e+00,  2.95807805e+00,  2.01757205e+00,  2.14113730e-03,
 1.04601958e+00,  2.01500913e+00])
```

```
In [41]: lr.score(x_test,y_test) #model give good accuracy when used the Linear regression
```

```
Out[41]: 0.9680838545106764
```

```
In [42]: x_test[0]
```

```
Out[42]: array([-0.71699687,  0.64640556, -1.43203662,  2.5439838 , -1.14509528,
 1.00720358, -0.09141544,  0.7878913 ,  0.99479344, -0.48634529,
 0.39166316, -0.05719261,  0.96950323,  0.19870653,  0.48784024,
 -0.81921789,  0.59151592,  0.99686807, -1.11023828, -0.98439188,
 0.65966336, -1.08548113, -1.93703052,  0.82364127, -1.32878554,
 2.85756665,  2.05690732, -1.03458705, -1.20856625,  1.23010727,
 -1.42563058,  0.56174678,  1.38257111, -1.30144919, -1.38077956,
 -1.78982869, -1.024444343,  1.35185347,  0.56601817, -1.42503691,
 -0.90113646, -0.33729161,  1.06064879, -1.39706283, -1.23656922,
 -0.78348717,  1.0514476 , -1.41292718, -1.03668985, -0.93822041,
 -0.96255982, -1.33167713, -1.11778304, -1.09806758, -0.83300342,
 -0.90012799, -0.98080624, -1.39186714, -1.14366984, -1.11351334,
 -1.2270762 ,  1.57757406, -1.84277802,  1.39883113,  1.17260836,
 1.29709272,  1.76602693,  1.39163252, -0.9727736 , -0.99837065])
```

```
In [59]: pred=lr.predict([x_test[0]]) #model give good predict value
pred
```

```
Out[59]: array([0.98634176])
```

Support Vector Regression -ML Model Training

```
In [60]: from sklearn.svm import SVR
svr_rbf=SVR(kernel='rbf')
svr_rbf.fit(x_train,y_train)
svr_rbf.score(x_test,y_test)
```

```
Out[60]: 0.9489025722825645
```

```
In [61]: svr_poly=SVR(kernel='poly',degree=2)
svr_poly.fit(x_train,y_train)
svr_poly.score(x_test,y_test)
```

```
Out[61]: 0.9467381397931449
```

```
In [62]: svr_linear=SVR(kernel='linear')
```

```
svr_linear.fit(x_train,y_train)
svr_linear.score(x_test,y_test)
```

Out[62]: 0.9592151253484148

Root Mean Square Error

```
In [63]: from sklearn.metrics import mean_squared_error
import numpy as np

mse=mean_squared_error(y_test,y_pred)
rmse=np.sqrt(mse)

print('MSE',mse)
print('RMSE',rmse)
```

MSE 0.019526201492782377

RMSE 0.1397361853378801

Model Saving

```
In [64]: import pickle
filename='customer_retention.pkl'
pickle.dump(lr, open(filename,'wb'))
```

Conclusion

```
In [68]: import numpy as np
a=np.array(y_test)
predicted=np.array(lr.predict(x_test))
df_com=pd.DataFrame({"original":a,"predicted":predicted},index=range(len(a)))
df_com
```

Out[68]:

	original	predicted
0	1.0	0.986342
1	0.0	-0.043667
2	1.0	1.037691
3	2.0	1.985474
4	1.0	0.942646
5	2.0	1.941981
6	1.0	0.973520
7	1.0	1.050584
8	2.0	2.086321
9	2.0	2.060345
10	2.0	2.050865
11	0.0	0.028397
12	1.0	1.003422
13	2.0	2.075728
14	2.0	1.974240
15	2.0	1.966161
16	2.0	2.044264
17	1.0	0.986342
18	0.0	0.004743
19	2.0	2.050865
20	2.0	2.072710
21	2.0	2.072710
22	2.0	2.028235
23	1.0	1.019334
24	2.0	1.984991
25	2.0	1.985474
26	0.0	0.980317
27	2.0	1.976550
28	1.0	0.973520
29	1.0	1.046020
30	1.0	1.037691
31	1.0	1.030322
32	2.0	2.000135

	original	predicted
33	2.0	2.035954
34	1.0	1.050584
35	0.0	0.030349
36	2.0	2.050865
37	2.0	2.075728
38	0.0	0.062590
39	0.0	-0.043667
40	2.0	1.988814
41	2.0	2.015009
42	2.0	2.015176
43	2.0	2.042470
44	1.0	1.051202
45	2.0	2.050865
46	2.0	1.993954
47	0.0	0.028397
48	2.0	2.057414
49	3.0	2.958078
50	2.0	2.017572
51	0.0	0.002141
52	1.0	1.046020
53	2.0	2.015009

we can visualize there is some error in the outcome using the above model.

In []: