#### PROBLEM STATEMENT:

E-retail factors for customer activation and retention:

A case study from Indian e-commerce customers

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.

### **UNDERSTANDING ANS STEPS TO BE FOLLOWED**

After reading the above problem statement completely and clearly, we can come to a decision that we have to take the dataset into evaluation regarding its dependant a nd independant variables and find the most customer satisfied Indian online shopping website to be recommended.

For that ,the following steps to be followed:

- 1) importing needed libraries
- 2) getting the dataset
- 3) EDA-Exploratory Data Analysis -- dtypes, isnull() ...etc
- 4) Data clensing -- transforming dtypes
- 5) Data Visualization- using matplotlib and seaborn

TILL THIS STEP WE CAN EASILY PREDICT THE MOST SATISFIED AND RECOMMENDED INDIAN ONLINE WEBSITE BY MOST CUSTOMERS .

But thre following steps needed to find the BEST FITTED MODEL for the given dataset.

- 6) More EDA -- describe, correlation
- 7) More data clensing by removing some unnecessary columns.
- 8) Removing OUTLIERS
- 9) Spliting the data as x and y
- 10) Balancing them
- 11) Training and Testing of them
- 12) Regression or Classification
- 13) Prediction of models
- $14)\,\mathrm{Hypertuning}$  of models ( This is not needed in this dataset as we get the accurate model before this step
  - 15) Saving the model

## **IMPORTING THE NEEDED LIBRARIES**

```
import pandas as pd
import numpy as np
import warnings
warnings.filterwarnings('ignore')
```

# **GETTING THE DATASET**

```
In [2]:
```

df=pd.read\_csv('customer\_retention\_dataset.csv')
df

Out[2]:

	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	10 What is the operating system (OS) of your device?	 Longer time to get logged in (promotion sales period
0	0	3	Delhi	110009	5	4	4	3	5	1	 Amazon.ir
1	1	2	Delhi	110030	5	5	2	1	2	3	 Amazon.in Flipkart.com
2	1	2	Greater Noida	201308	4	5	3	1	4	2	 Myntra.com
3	0	2	Karnal	132001	4	1	3	1	4	3	 Snapdeal.com
4	1	2	Bangalore	530068	3	2	2	1	2	3	 Flipkart.com Paytm.com
			•••			•••	•••	•••			
64	1	2	Solan	173212	2	1	3	1	4	2	 Amazon.ir
265	1	3	Ghaziabad	201008	2	4	3	1	5	2	 Flipkart.com
266	1	4	Bangalore	560010	3	1	3	2	5	1	 Amazon.ir
267	1	1	Solan	173229	3	1	2	1	4	2	 Amazon.ir
268	1	4	Ghaziabad	201009	3	4	3	1	4	2	 Amazon.ir
269 r	ows × 71 c	olumr	ıs								

# **EDA -- Exploratory Data Analysis**

```
In [3]:
```

df.columns

#### Out[3]:

```
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 sarean size of vour mobile device 2/t/t/t/t/t/t

```
A MITAL TO CITE OCTEGIT DITE OF MONTE MENTOG: /C/C/C/C/C/C
       '10 What is the operating system (OS) of your device?\t\t\t
       '11 What browser do you run on your device to access the website?\t\t\t
       '12 Which channel did you follow to arrive at your favorite online store for the f
irst time?
       '13 After first visit, how do you reach the online retail store?\t\t\t
       '14 How much time do you explore the e- retail store before making a purchase deci
sion?
       '15 What is your preferred payment Option?\t\t\t\t\t
       '16 How 4 do you abandon (selecting an items and leaving without making payment) y
our shopping cart?\t\t\t\t\t\t
       '17 Why did you abandon the "Bag", "Shopping Cart"?\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 produc
t comparison',
       '20 Complete information on listed seller and product being offered is important f
or 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 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, 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 decisi
on',
       '34 Gaining access to loyalty programs is a benefit of shopping online',
       '35 Displaying quality Information on the website improves satisfaction of custome
rs',
       '36 User derive satisfaction while shopping on a good quality website or applicati
on',
       '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 fr
om;
       '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)',
       "Tonger 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 [4]:

df.dtypes

#### Out[4]:

1Gender of respondent	int64
2 How old are you?	int64
3 Which city do you shop online from?	object
4 What is the Pin Code of where you shop online from?	int64
5 Since How Long You are Shopping Online ?	int64
Longer delivery period	object
Change in website/Application design	object
Frequent disruption when moving from one page to another	object
Website is as efficient as before	object
Which of the Indian online retailer would you recommend to a friend?	object
Length: 71, dtype: object	

#### In [5]:

```
df.isnull().sum()
```

#### Out[5]:

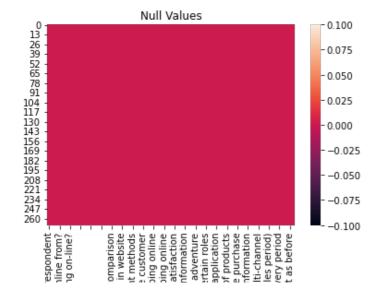
1Gender of respondent	0
2 How old are you?	0
3 Which city do you shop online from?	0
4 What is the Pin Code of where you shop online from?	0
5 Since How Long You are Shopping Online ?	0
Longer delivery period	0
Change in website/Application design	0
Frequent disruption when moving from one page to another	0
Website is as efficient as before	0
Which of the Indian online retailer would you recommend to a friend?	0
Length: 71, dtype: int64	

#### In [6]:

```
import seaborn as sns
import matplotlib.pyplot as plt
```

#### In [7]:

```
sns.heatmap(df.isnull())
plt.title('Null Values')
plt.show()
```



```
34 Gaining access to loyalty programs is a benefit of shop?
37 Net Benefit derived from shopping online can lead to users s
40 Provision of complete and relevant product in
43 Shopping on the website gives you the sense of
46 Shopping on the website helps you fulfill ce
                                                                                                                                                                                                                                                                                                                                                                                     Privacy of customers' in
                                                                                                                                                                                                                                                                                                                                             Complete, relevant description information of
                                                                                                                                                                                                                                                                                                                                                                                                         Presence of online assistance through mu
                                                                                                                                                                                                                                                                                                                                                                                                                              Late declaration of price (promotion, sa
                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Website is as efficien
```

## **DATA CLENSING**

```
In [8]:
```

```
#Considering the last column as the target column as customer satisfaction
df['Which of the Indian online retailer would you recommend to a friend?'].value_counts()
```

#### Out[8]:

```
79
Amazon.in
                                                       62
Amazon.in, Flipkart.com
                                                       39
Flipkart.com
                                                       30
Amazon.in, Myntra.com
                                                       20
Amazon.in, Paytm.com, Myntra.com
Amazon.in, Flipkart.com, Myntra.com
                                                       15
Amazon.in, Paytm.com
Flipkart.com, Paytm.com, Myntra.com, snapdeal.com
                                                       11
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64
```

#### In [9]:

```
import sklearn
from sklearn.preprocessing import OrdinalEncoder
ordin=OrdinalEncoder()
ordin.fit(df)
```

#### Out[9]:

#### ▼ OrdinalEncoder

```
OrdinalEncoder()
```

For better evaluations and prediction we have to transform the object data type into int or float.

```
In [10]:
```

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

In [11]:

df

Out[11]:

	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	10 What is the operating system (OS) of your device?	 Longer time to get logged in (promotion, sales period)	dis gı and (pror
0	0	3	2.0	110009	5	4	4	3	5	1	 0.0	
1	1	2	2.0	110030	5	5	2	1	2	3	 1.0	
2	1	2	4.0	201308	4	5	3	1	4	2	 7.0	
3	0	2	6.0	132001	4	1	3	1	4	3	 9.0	
4	1	2	0.0	530068	3	2	2	1	2	3	 5.0	
	•••										 •••	
264	1	2	10.0	173212	2	1	3	1	4	2	 0.0	
265	1	3	3.0	201008	2	4	3	1	5	2	 4.0	
266	1	4	0.0	560010	3	1	3	2	5	1	 0.0	
267	1	1	10.0	173229	3	1	2	1	4	2	 0.0	
268	1	4	3.0	201009	3	4	3	1	4	2	 0.0	

269 rows × 71 columns

**ALL VALUES ARE CHANGED INTO NUMBERS** 

# **DATA VISUALIZATION**

# Comparing different columns with the target variable

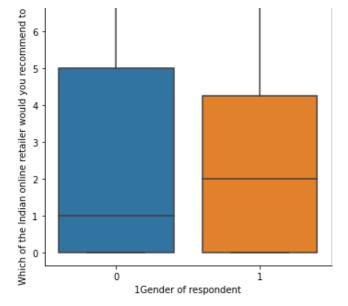
```
In [12]:
```

```
sns.catplot(data=df,x='1Gender of respondent',y='Which of the Indian online retailer woul
d you recommend to a friend?',kind='box')
```

#### Out[12]:

<seaborn.axisgrid.FacetGrid at 0x1b2d31f3bb0>

imena,

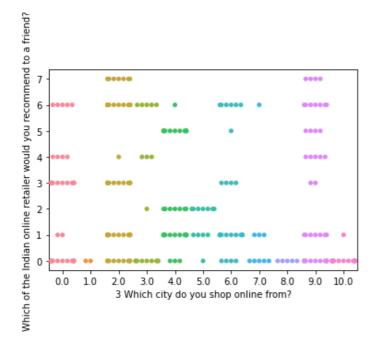


#### In [13]:

sns.swarmplot(data=df,x='3 Which city do you shop online from?',y='Which of the Indian on line retailer would you recommend to a friend?')

#### Out[13]:

<AxesSubplot:xlabel='3 Which city do you shop online from?', ylabel='Which of the Indian
online retailer would you recommend to a friend?'>



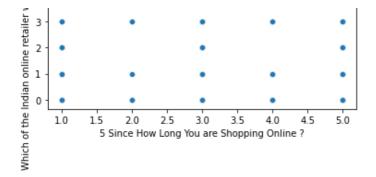
#### In [14]:

sns.scatterplot(data=df,x='5 Since How Long You are Shopping Online ?',y='Which of the In dian online retailer would you recommend to a friend?')

#### Out[14]:

<AxesSubplot:xlabel='5 Since How Long You are Shopping Online ?', ylabel='Which of the In
dian online retailer would you recommend to a friend?'>



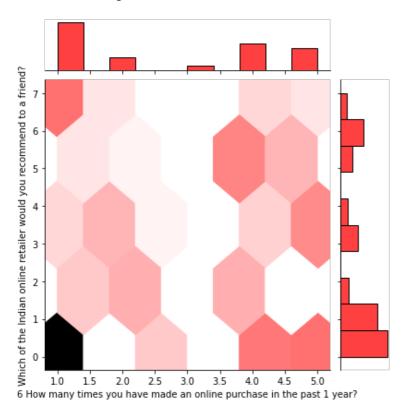


#### In [15]:

sns.jointplot(data=df,x='6 How many times you have made an online purchase in the past 1 year?',y='Which of the Indian online retailer would you recommend to a friend?',kind='hex',color='red')

#### Out[15]:

<seaborn.axisgrid.JointGrid at 0x1b2d323a9d0>

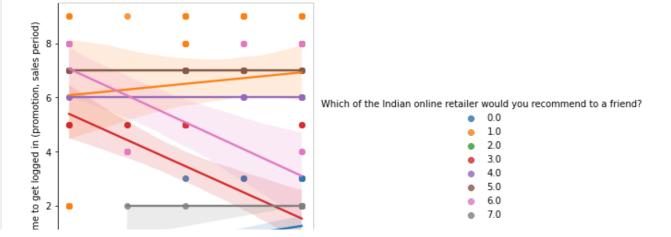


#### In [16]:

sns.lmplot(data=df,x='5 Since How Long You are Shopping Online ?',y='Longer time to get 1 ogged in (promotion, sales period)',hue='Which of the Indian online retailer would you re commend to a friend?')

#### Out[16]:

<seaborn.axisgrid.FacetGrid at 0x1b2d3484340>



```
1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5 Since How Long You are Shopping Online ?
```

#### In [17]:

df['Which of the Indian online retailer would you recommend to a friend?'].value\_counts()

#### Out[17]:

0.0 79 1.0 62

6.0 39

3.0 30

5.0 20

2.0 15

4.0 13

7.0 11

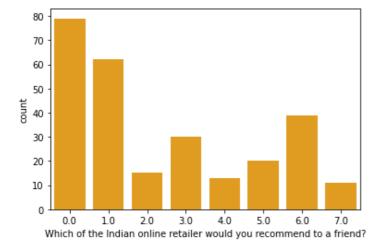
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64

#### In [18]:

sns.countplot(df['Which of the Indian online retailer would you recommend to a friend?'],
color='orange')

#### Out[18]:

<AxesSubplot:xlabel='Which of the Indian online retailer would you recommend to a friend?
', ylabel='count'>



# This gives the study that about:

```
79% percent customers are satisfied and recommend with AMAZON.IN
62% percent customers are satisfied and recommend with AMAZON.IN and FLIPKART.COM
39% percent customers are satisfied and recommend with FLIPKART.COM
30% percent customers are satisfied and recommend with AMAZON.IN and MYNTRA.COM
20% percent customers are satisfied and recommend with AMAZON.IN, PAYTM.COM and MYN
TRA.COM
15% percent customers are satisfied and recommend with AMAZON.IN, FLIPKART.COM and
MYNTRA.COM
13% percent customers are satisfied and recommend with AMAZON.IN and PAYTM.COM
11% percent customers are satisfied and recommend with FLIPKART.COM, PAYTM.COM, MYNT
RA.COM and SNAPDEAL.COM
```

From the above study, it reveals that amazon.in seperately and partnering with other sites gives nearly more than 95% percent of customer satisfaction and also to be much recommended by them

# **RESULT:**

MOST SATISFIED INDIAN ONLINE RETAILER IS : AMAZON.IN

# The following steps are needed to complete the project assumptions or predictions, analysis to find the best model of the dataset

# **More EDA**

In [19]:

df.describe()

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?	9 What is the screen size of your mobile device? \t\t\t\t\t\t	ope s; (
count	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.000000	269.0
mean	0.669145	2.959108	4.494424	220465.747212	3.524164	2.672862	3.260223	1.676580	4.282528	1.7
std	0.471398	1.066012	3.187687	140524.341051	1.436586	1.651788	1.135887	0.843904	0.923426	0.7
min	0.000000	1.000000	0.000000	110008.000000	1.000000	1.000000	2.000000	1.000000	2.000000	1.0
25%	0.000000	2.000000	2.000000	122018.000000	3.000000	1.000000	2.000000	1.000000	4.000000	1.0
50%	1.000000	3.000000	4.000000	201303.000000	4.000000	2.000000	3.000000	1.000000	4.000000	2.0
75%	1.000000	4.000000	7.000000	201310.000000	5.000000	4.000000	5.000000	2.000000	5.000000	2.0
max	1.000000	5.000000	10.000000	560037.000000	5.000000	5.000000	5.000000	4.000000	5.000000	3.0

#### 8 rows × 71 columns

4

In [20]:

df.corr()

Out[20]:

	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	10 Wha is the operating system (OS) o you device \t\t\t\
1Gender of respondent	1.000000	0.034449	0.091867	0.260696	-0.046005	0.076121	0.200974	-0.241847	0.058760	-0.03820
2 How old are you?	-0.034449	1.000000	- 0.077481	0.057393	0.014049	0.005089	0.024228	0.292176	0.227841	-0.13359
3 Which city do you shop online from?	-0.091867	- 0.077481	1.000000	- 0.416597	0.103714	- 0.127906	0.069673	-0.001366	0.181806	-0.12078

4 What is the Pin Code of where you shop online from? 5 Since How Long	0.260696 1Gender of	- 0.057393 2 How old are	- 034M366917 city do you	4 What 1.0090000 Pin Code of where	0.092980 5 Since How Long You	6 How many 0.02i1ae9 you have made an	7 How do 0.1348/90 you access the	-0.103424 8 Which device do you use to	9 What is 0.189 <b>816</b> screen size of	10 Wha 0.07790 is the operating systen
You are Shopping Online?	respondent	0.014869	0.10 <b>9791</b> online from?	0.092980 shop	1.000 <b>659</b> Shopping Online?	0.297409 purchase in the	0!050795 while shopping	0.399654 the online shopping?	0.11 <b>3/99/5</b> mobile device?	-0.(Q\$) @ you device
		•••		online from?		past.1 year?	on-line?		\t\t\t\t\t\t	\t\t\t\
L onger delivery period	-0.052701	0.077265	0.123369	0.078660	0.146307	0.006841	0.048490	0.279346	0.028235	-0.05646
Change in website/Application design	0.154007	0.076580	0.000427	0.058715	0.102906	0.041653	0.075205	0.159209	0.408534	-0.32512
Frequent disruption when moving from one page to another	0.260813	0.063690	0.019167	0.039936	-0.043482	- 0.009108	- 0.131151	-0.062060	0.086322	-0.07269
Website is as efficient as before	-0.047723	0.076628	0.007117	0.037662	-0.176908	- 0.162551	0.091342	0.105177	0.087796	0.21116
Which of the Indian online retailer would you recommend to a friend?	-0.002005	- 0.002406	- 0.142123	- 0.045388	0.029584	0.159652	0.037752	0.220059	0.047486	0.00765

#### 71 rows × 71 columns

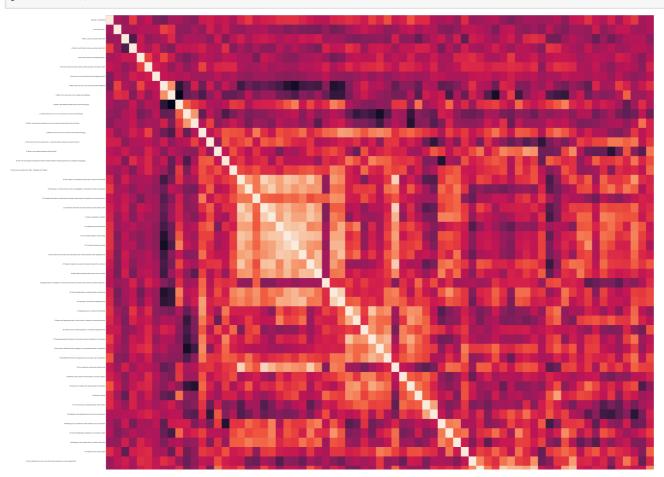
<u>|</u>|

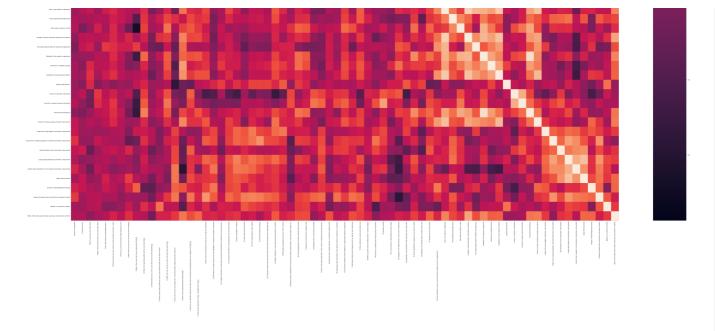
#### In [21]:

import seaborn as sns
import matplotlib.pyplot as plt

#### In [22]:

plt.figure(figsize=(100,100))
sns.heatmap(df.corr())
plt.show()





#### In [23]:

```
pd.set option('display.max rows',269)
```

#### In [24]:

```
corr_matrix=df.corr()
corr_matrix['Which of the Indian online retailer would you recommend to a friend?'].sort_
values(ascending=False)
```

```
Out[24]:
Which of the Indian online retailer would you recommend to a friend?
1.000000
Complete, relevant description information of products
0.680926
Reliability of the website or application
0.542711
Easy to use website or application
0.541713
Presence of online assistance through multi-channel
0.503836
15 What is your preferred payment Option?\t\t\t\t
0.487653
Perceived Trustworthiness
0.483457
Longer delivery period
0.428419
17 Why did you abandon the "Bag", "Shopping Cart"?\t\t\t\t
0.426250
Change in website/Application design
0.423877
Availability of several payment options
0.416729
47 Getting value for money spent
0.407681
Quickness to complete purchase
0.398754
27 Empathy (readiness to assist with queries) towards the customers
0.381823
```

Fast loading website speed of website and application 0.335192
37 Net Benefit derived from shopping online can lead to users satisfaction

16 How 4 do you abandon (selecting an items and leaving without making payment) your shop

0.334884
31 Enjoyment is derived from shopping online

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

0.331096

0.348667

0.335247

ping cart?\t\t\t\t\t\t

```
30 Online shopping gives monetary benefit and discounts
0.325032
Visual appealing web-page layout
0.316054
45 You feel gratification shopping on your favorite e-tailer
0.285367
Longer page loading time (promotion, sales period)
0.278281
38 User satisfaction cannot exist without trust
0.273217
Longer time to get logged in (promotion, sales period)
0.261774
14 How much time do you explore the e- retail store before making a purchase decision?
0.252640
Website is as efficient as before
0.252154
22 Ease of navigation in website
0.237481
Late declaration of price (promotion, sales period)
0.231029
8 Which device do you use to access the online shopping?
0.220059
Wild variety of product on offer
0.208213
21 All relevant information on listed products must be stated clearly
0.207874
29 Responsiveness, availability of several communication channels (email, online rep, twi
tter, phone etc.)
0.203022
19 Information on similar product to the one highlighted is important for product compar
ison
0.194834
From the following, tick any (or all) of the online retailers you have shopped from;
0.170697
18 The content on the website must be easy to read and understand
0.166009
6 How many times you have made an online purchase in the past 1 year?
0.159652
12 Which channel did you follow to arrive at your favorite online store for the first tim
0.155508
13 After first visit, how do you reach the online retail store?\t\t\t\t
0.155481
43 Shopping on the website gives you the sense of adventure
0.155160
39 Offering a wide variety of listed product in several category
0.152054
28 Being able to guarantee the privacy of the customer
26 Trust that the online retail store will fulfill its part of the transaction at the sti
pulated time
0.135180
24 User friendly Interface of the website
0.132886
20 Complete information on listed seller and product being offered is important for purch
ase decision.
0.130883
Frequent disruption when moving from one page to another
0.122953
46 Shopping on the website helps you fulfill certain roles
0.118893
44 Shopping on your preferred e-tailer enhances your social status
0.110229
36 User derive satisfaction while shopping on a good quality website or application
0.099100
23 Loading and processing speed
0.081131
9 What is the screen size of your mobile device?\t\t\t\t
0.047486
35 Displaying quality Information on the website improves satisfaction of customers
0.046758
7 How do you access the internet while shopping on-line?
```

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0.027647
10 What is the operating system (OS) of your device?\t\t\t
0.007651
1Gender of respondent
-0.002005
2 How old are you?
-0.002406
41 Monetary savings
-0.005116
Security of customer financial information
-0.014895
25 Convenient Payment methods
-0.030506
4 What is the Pin Code of where you shop online from?
-0.045388
Privacy of customers' information
-0.071876
Speedy order delivery
-0.089890
32 Shopping online is convenient and flexible
-0.114768
Longer time in displaying graphics and photos (promotion, sales period)
-0.140519
3 Which city do you shop online from?
-0.142123
40 Provision of complete and relevant product information
-0.144946
11 What browser do you run on your device to access the website?\t\t\t
-0.262845
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: float6
In [25]:
df
Out[25]:
                             4 What
                                                6 How
                              is the
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                                    Shopping
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33 Return and replacement policy of the e-tailer is important for purchase decision

Limited mode of payment on most products (promotion, sales period)

0.037752

0.029584

0.028901

5 Since How Long You are Shopping Online ?

42 The Convenience of patronizing the online retailer

10	0	3		24400e#	5	6 Hovg	3	2	5			3.0	
11	1	4	3 Whi&iÑ	is the 201 <b>30</b> 6	5 Sincē	many time <b>s</b>	7 How do yoû	8 Whick	9 What is the	10 What is th <b>é</b>		Longe	
12	1Gender of	Hovg	city 50 do	Code 122018	How Long You	you have	access	device do	screen size of	operating		time to get	dis
13	respondent	old ar <del>ê</del>	уру	2Where	are	made an online	thé internet	you use to access	size of	system (OS) of		logged in (promotion,	gı and
14	1	you?	shop online	you 13 <b>500</b> p	Shopping Online ?	purchase in the	while shopping	the online shopping?	mobile device?	your device2		sales period)	(pror
		2	from?	online		past 1	on-line?		\t\t\t\t\t\t	\t\t\t\t		• • • • • • • • • • • • • • • • • • • •	
15	1	2	0.0	5 <del>60037</del>	3	year?	3	1	4			9.0	
16	0	3		201308	2	3	3	2	5			5.0	
17	0	4	2.0	110011	1	1	2	2	5	1		6.0	
18	1	4	2.0	110018	2	1	2	2	5	1		2.0	
19	1	2	10.0	173229	2	2	2	1	4	3		9.0	
20	1	2	9.0	201308	2	5	2	1	2	3		5.0	
21	0	3	5.0	122018	4	4	2	4	4	2		1.0	
22	0	4	4.0	201310	5	4	3	4	4	2		0.0	
23	1	4	4.0	203207	5	5	5	3	5	1		8.0	
24	1	2	7.0	250001	4	5	5	1	4	1		3.0	
25	1	2	0.0	530068	3	1	5	2	5	1		8.0	
26	0	2	3.0	201005	1	2	5	2	5	1		7.0	
27	0	3	2.0	110044	5	5	5	2	5	1		2.0	
28	1	4	4.0	201306	5	4	5	2	5	1		7.0	
29	1	4	6.0	132001	3	1	5	2	5	3		9.0	
30	1	1		560010	5	1	5	1	2			5.0	
31	0	3		201305	3	1	5	3	5			0.0	
32	0	3		110042	5	3	5	1	2			1.0	
33	1	4		201308	5	1	5	1	4	2		7.0	
34	1	5		132036	4	1	5	1	4			9.0	
35	1	2		560018	3	2	5	1	2			5.0	
36	0	3		201305	1		5		4		•••	6.0	
37	0	4		110008	5		5	4	5			2.0	
38	1	4		201308	5			3	5		•••	1.0	
39	1	2		132036	3		5	1	4			0.0	
40	1	2		560002	5		5	2	5		•••	8.0	
41	0	3		201303	4	5	5	2	5			3.0	
42	0	2		110044	3		5	2	5			8.0	
43	1	2		201312	1	1	5	2	5	1		7.0	
44	1	3	7.0	250001	5	2	5	3	5	1		0.0	
45	1	4	0.0	560037	5	5	5	1	2	3		1.0	
46	0	4	9.0	201308	5	4	5	1	4	2		7.0	
47	0	1	2.0	110011	5	1	5	1	4	3		9.0	
48	1	3	4.0	203202	3	1	5	1	4	3		9.0	
49	1	3	6.0	132001	5	5	5	1	2	3		5.0	
50	1	4	0.0	560001	4	4	5	1	4	2		6.0	
51	0	5	9.0	201304	3	4	5	4	5	2		2.0	
52	0	4	2.0	110044	1	5	5	3	5	1		1.0	
53	1	4	4.0	201312	5	5	5	3	5	1		1.0	
54	1	2	7.0	250001	5	1	5	1	4			0.0	
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55	1	2		<b>5600bes</b>	4	6 Hovg	5	2				8.0	
56	0	2	3 Whi€ii	is the 201 <b>⊅i</b> n	5 Since	many time <b>§</b>	7 How do	8 Whick	9 What is the	10 What is th <b>é</b>		Longe	
57	0	2 Hov <u>e</u>	city 20 do	Code 110044	How	you have	access	device do	screen	operating		time to get	dis
	1Gender of respondent	old	प्र <u>क</u> ृ	2Where	Long You are	made an online	the internet	you use to access	size of	system (OS) of		logged'in	gı and
58		are you?	shop	you	Shopping	purchase	while	the online	mobile	your	•••	sales	(pror
59	1	4	online from?	13 <b>2/00</b> p online	Online 3	in the past 1	shopping on-line?	shopping3	device3	device? \t\t\t\t		peri <b>o</b> d)	
60	1	4	0.0	5 <b>60019</b>	4	year <del>\$</del>	5	1	2	3		1.0	
61	0	1	9.0	201308	3	1	5	1	4	2		7.0	
62	0	3	2.0	110014	1	1	5	1	4	3		9.0	
63	1	3	4.0	201310	5	5	5	1	4	3		9.0	
64	1	4	7.0	250001	3	4	5	3	5	1		1.0	
65	1	5	0.0	560037	5	4	5	3	5	1		1.0	
66	0	3	9.0	201304	4	1	5	3	5	1		0.0	
67	0	4	2.0	110044	3	1	5	1	2	3		1.0	
68	1	4	4.0	201312	1	5	5	1	4	2		7.0	
69	1	2		250001	5	4	5	1	4			9.0	
70	1	2		560003	5	4	5	3	5			1.0	
71	0	3		201310	4	1	5	2	5		•••	8.0	
72	0	2		110044	3	5	5	2	5		•••	8.0	
73	1	2	4.0	201306	1	4	5	2	5	1	•••	7.0	
74	1	3	6.0	132001	5	4	5	2	5	1	•••	2.0	
75	1	4	0.0	560010	3	1	5	2	5	1		0.0	
76	0	4	9.0	201308	5	1	5	2	5	1		3.0	
77	0	1	2.0	110042	4	5	5	1	2	3		1.0	
78	1	3	4.0	201308	3	4	5	1	4	2		7.0	
79	1	3	6.0	132036	1	4	5	1	2	3		5.0	
80	1	4	0.0	560018	4	2	5	1	4	2		6.0	
81	0	5	9.0	201305	3	5	5	1	4	2		0.0	
82	0	4	2.0	110008	3	4	5	1	4	2		0.0	
83	1	4	4.0	201308	1	1	5	1	4			2.0	
84	1	2		132036	5	1	5	1	4			0.0	
85	1	2		560002	5	1	5	1	5			4.0	
				201303	4								
86	0	3					5	1	4			0.0	
87	0	4		110044	3	1	5	1	4			9.0	
88	0	2		560013	1		5	1	4			1.0	
89	0	2		201308	5	2	5	4	5		•••	2.0	
90	1	3		110014	1		5		5		•••	8.0	
91	1	2	4.0	201310	5	4	5	2	5	1		8.0	
92	1	2	6.0	132001	5	4	5	2	5	1		8.0	
93	1	2	2.0	110008	5	5	2	2	5	1		8.0	
94	1	2	4.0	201308	4	5	3	1	4	2		7.0	
95	1	2	0.0	530068	3	2	2	1	2	3		5.0	
96	1	3	3.0	201005	5	5	2	1	4	2		6.0	
97	1	1	10.0	173229	3	1	2	1	4	2		0.0	
98	1	3		110044	1	1	2		5			8.0	
99	1	4		201308	5	1	2	2	5			8.0	
33	ı	4	9.0	201000	3	1	2	2	อ	1	•••	0.0	

100	1	5	5.0	<b>1220</b> pet	3	6 How	2	2	5			7.0	
101	1	3	3 Whi€i9	is the 201 <b>⊅</b> i∩	5 Sinc€	many time\$	7 How do	8 Whick	9 What is the	10 What is the		Longle	
102	40	Hovg	<b>city</b> 10.0 <b>do</b>	Code 173212	How	you have	access	device do	screen	operating		time to get	dis
103	1Gender of respondent	old ar <del>e</del>	¥6.4	173212	Long You are	made an online	the internet	you use to access	size of your	system (OS) of		logged'in	gı and
		you?	shop	you 12 <b>5009</b>	Shopping Online ?	purchase in the	while shopping	the online shopping?	mobile device?	your device3		sales peri <b>2</b> d)	(pror
104	1	_	online from?	online		past 1	on-line?	•	\t\t\t\t\t\t	\t\t\t\t	•••		
105	1	4	3.0	2 <b>91999</b>	3	year <del>?</del>	3	1	4			0.0	
106	1	3		201008	2	4	3	1	5		•••	4.0	
107	1	1	3.0	201001	1	1	2	1	4	1		0.0	
108	0	2	6.0	132001	4	1	3	1	4	3		9.0	
109	0	4	2.0	110011	5	4	2	4	5	2		2.0	
110	0	4	2.0	110018	4	1	3	3	5	1		1.0	
111	0	3	8.0	244001	5	3	3	2	5	1		3.0	
112	0	3	1.0	203001	2	1	3	1	4	2		1.0	
113	0	3	2.0	110009	5	4	4	3	5	1		0.0	
114	1	2	2.0	110030	5	5	2	1	2	3		1.0	
115	1	2	4.0	201308	4	5	3	1	4	2		7.0	
116	1	2	0.0	560037	3	2	2	1	2	3		5.0	
117	0	3	9.0	201308	5	5	2	1	4	2		6.0	
118	1	1		173229	3	1	2	1	4			0.0	
119	1	3		110039	1	1	2	2	5			8.0	
120	1	4		201308	5	1	2	2	5			8.0	
121	1	5		122018	3	1	2	2	5			7.0	
122	1	3		201310	5	2	2	2	5			2.0	
123	1	3		173212	4	1	3	2	5			0.0	
124	1	2		173212	2	1	3	1	4		•••	0.0	
125	1	5		122009	1	1	2	1	4	3		2.0	
126	1	4	3.0	201009	3	4	3	1	4	2	•••	0.0	
127	1	3	3.0	201008	2	4	3	1	5	2		4.0	
128	1	1	3.0	201001	1	1	2	1	4	1		0.0	
129	0	2	6.0	132001	4	1	3	1	4	3		9.0	
130	0	4	2.0	110011	5	4	2	4	5	2		2.0	
131	0	4	2.0	110018	4	1	3	3	5	1		1.0	
132	0	3	8.0	244001	5	3	3	2	5	1		3.0	
133	0	3	1.0	203001	2	1	3	1	4	2		1.0	
134	0	3	2.0	110009	5	4	4	3	5	1		0.0	
135	1	1	10.0	173229	3	1	2	1	4	2		0.0	
136	1	3	9.0	201308	5	5	2	1	4	2		6.0	
137	0	3		244001	5	3	3		5			3.0	
138	1	2		201308	4		3	1	4			7.0	
139	0	2		132001	4		3		4			9.0	
140	0	4		110011	5				5			2.0	
141	1	4		201308	5		2		5			8.0	
142	1	2		560037	3	2	2		2		•••	5.0	
143	0	4		110018	4	1	3	3	5			1.0	
144	1	3	2.0	110039	1	1	2	2	5	1	•••	8.0	

145	1	2		4 What	5	6 Hovg	2	1		3		1.0	
146	1	5	3 White	is the 122 <b>0</b> 16	5 Sinc€	many times	7 How do	8 Whick	9 What is the	10 What is the		Longe	
147	4041	Hovg	city 40 do	Code 201310	How	you have	access	device do	screen size of	operating		time to get	dis
148	1Gender of respondent	old ar <del>ê</del>	уду	2Where	Long You are	made afi online	thé internet	you use to access	size of	system (OS) of		logged in (promotion,	gr and
149	1	you?	shop online	you 56 <b>\$1000</b>	Shopping Online 2	purchase in the	while shopping	the online shopping?	mobile device2	your device3		sales period)	(pror
		•	from?	online	-	past 1	on-line?	•	\t\t\t\t\t\t	\t\t\t\t			
150	1	2	4.0	2 <b>0130</b> 6	1	year <del>?</del>	3	2	5			7.0	
151	1	3		132001	5	4	3	2	5			2.0	
152	1	5		122018	3	1	2	2	5		•••	7.0	
153	1	3		201310	5	2	2	2	5			2.0	
154	1	4		201308	1	1	3	1	4			2.0	
155	1	5	5.0	122009	1	1	2	1	4	3		2.0	
156	1	4	7.0	250001	3	4	3	3	5	1	•••	1.0	
157	1	5	0.0	560037	5	4	3	3	5	1		1.0	
158	1	2	0.0	560003	5	4	3	3	5	1		1.0	
159	1	3	6.0	132036	1	4	3	1	2	3		5.0	
160	1	3	2.0	110014	1	1	3	2	5	1		8.0	
161	1	2	6.0	132001	5	4	3	2	5	1		8.0	
162	1	2	0.0	530068	3	2	2	1	2	3		5.0	
163	1	3	2.0	110044	1	1	2	2	5	1		8.0	
164	1	3	4.0	201310	5	5	3	1	4	3		9.0	
165	1	4	4.0	201312	1	5	3	1	4	2		7.0	
166	1	2	7.0	250001	5	4	3	1	4	3		9.0	
167	1	3	4.0	201308	3	4	3	1	4	2		7.0	
168	1	2	4.0	201310	5	4	3	2	5	1		8.0	
169	1	2		110008	5	5	2	2	5			8.0	
170	1			201308	4	5	3	1	4			7.0	
171	1	4		201308	5	1	2		5			8.0	
172	1			132001	5	5	3	3	5			0.0	
173	1	2		560002	5	1	3	1	5			4.0	
174	1			201008	2	4	3	1	5			4.0	
175	1	1		201001	1	1	2	1	4			0.0	
176	1	4		560018	4	2	3	1	4			6.0	
177	1	3		201005	5	5	2	1	4			6.0	
178	1			560010	3	1						0.0	
							3		5				
179	1			132036	5	1	3	1	4			0.0	
180	1			173229	3		2		4			0.0	
181	1			173212	4	1	3	2	5		•••	0.0	
182	1			173212	2		3		4			0.0	
183	1	4		201009	3	4	3	1	4			0.0	
184	0	4		110044	3	1	3		2			1.0	
185	0	1	2.0	110042	4	5	3	1	2	3		1.0	
186	0	3	9.0	201310	4	1	3	2	5	1		8.0	
187	0	1	9.0	201308	3	1	3	1	4	2		7.0	
188	0	3	2.0	110014	1	1	3	1	4	3		9.0	
189	0	2	2.0	110044	3	5	3	2	5	1		8.0	

190	0	4	2.0	4 Whet	3	6 How	3	1	4	3		9.0	
191	0	2 2	3 Whi€ii	is the 201 <b>30</b> 6	5 Sincē	many time\$	7 How do	8 Whick	9 What is the	10 What is th€		Longle	
192		2 Hove	city	Code	How	you have	access	device do	screen	operating		time to get	dis
193	1Gender of respondent	old	88 98	132001 2 <b>W130</b> 4	Long You are	made an online	the internet	you use to access	size of your	system (OS) of		logged in (promotion)	gı and
	•	are you?	shop	you 201306	Shopping Online 3	purchase in the	while	the online shopping?	mobile device3	your device?	•••	sales peri <b>o</b> d)	(pror
194	0		online from?	online		past 1	shopping on-line?	•	\t\t\t\t\t\t	\t\t\t\t		• •	
195	0	3	9.0	201309	4	year?	3	1	4			0.0	
196	0	2		560013	1	1	3	1	4		•••	1.0	
197	0	5		201305	3	5	3	1	4			0.0	
198	0	4		110008	3	4	3	1	4		•••	0.0	
199	1	4		560010	3	1	3	2	5			0.0	
200	1	2		132036	5	1	3	1	4			0.0	
201	1	1	10.0	173229	3	1	2	1	4	2	•••	0.0	
202	1	3		173212	4	1	3	2	5		•••	0.0	
203	1	2	10.0	173212	2	1	3	1	4	2		0.0	
204	1	4	3.0	201009	3	4	3	1	4			0.0	
205	0	5	9.0	201305	3	5	3	1	4	2		0.0	
206	0	4	2.0	110008	3	4	3	1	4	2	•••	0.0	
207	0	2	0.0	560013	1	1	3	1	4	2		1.0	
208	1	4	0.0	560018	4	2	3	1	4	2		6.0	
209	1	3	3.0	201005	5	5	2	1	4	2		6.0	
210	1	4	6.0	132001	5	5	3	3	5	1		0.0	
211	1	2	0.0	560002	5	1	3	1	5	2		4.0	
212	1	3	3.0	201008	2	4	3	1	5	2		4.0	
213	1	1	3.0	201001	1	1	2	1	4	1		0.0	
214	0	3	9.0	201304	4	1	3	3	5	1		0.0	
215	0	4	9.0	201308	5	1	3	2	5	1		3.0	
216	0	3	9.0	201303	4	3	3	1	4	1		0.0	
217	1	3	4.0	201310	5	5	3	1	4	3		9.0	
218	1	4	4.0	201312	1	5	3	1	4	2		7.0	
219	1	2	7.0	250001	5	4	3	1	4	3		9.0	
220	1	3	4.0	201308	3	4	3	1	4	2		7.0	
221	1	2	4.0	201310	5	4	3	2	5	1		8.0	
222	1	2	2.0	110008	5	5	2	2	5	1		8.0	
223	1	2	4.0	201308	4	5	3	1	4	2		7.0	
224	1	4	9.0	201308	5	1	2	2	5	1		8.0	
225	0	1	9.0	201308	3	1	3	1	4	2		7.0	
226	0	3		110014	1	1		1	4			9.0	
227	0	2	2.0	110044	3	5	3	2	5			8.0	
228	0	4		110044	3	1		1	4			9.0	
229	0	2		201308	5	2		4	5			2.0	
230	0			132001	4			1	4			9.0	
231	1	4		250001	3			3	5			1.0	
232	1	5		560037	5	4		3	5			1.0	
233	1	2		560003	5	4	3	3	5			1.0	
234	1	3	0.0	132036	1	4	3	1	2	3		5.0	

235	1	3	2.0 3	4 What	1	6 How	3 7 How do	2	5 9 What is		 8.0	
236	1	2	Whi <b>êl</b> 9	is the 132 <b>00</b> 1	5 Sinc€	times	7 How do yoû	8 Whick	9 What is	10 What is th <b>é</b>	 Longe	
237	1Gender of	Hove	city 0,0 do	<b>Code</b> 530068	How Long You	you have made afi	access the	device do you use to	screen size of	operating system	 time to get logged in	dis gr
238	respondent	old ar <del>ê</del>	у <u>о</u> ц shop	1 <b>4004</b>	are Shopping	online purchase	internet while	access the online	youg mobile	(OS) of your	 (promotion sales	and (pror
239	0	you?	onli <b>ne</b>	you 20 <b>⊴13⊄p</b>	Online 2	in the	shopping	shopping 2	device3	device?	 peri <b>@d)</b>	(proi
240	1	4	from? 4.0	online 2013/19	1	past 1 year?	on-line? 3	1	\t\t\t\t\t\t 4	\ <b>t\t\t\</b> 3	 2.0	
241	1	5	5.0	122009	1	1	2	1	4	3	 2.0	
242	1	3	4.0	201306	5	2	3	2	5	1	 7.0	
243	1	4	0.0	560010	4	4	3	1	2	3	 1.0	
244	1	2	4.0	201306	1	4	3	2	5	1	 7.0	
245	1	3	6.0	132001	5	4	3	2	5	1	 2.0	
246	1	5	5.0	122018	3	1	2	2	5	1	 7.0	
247	1	3	4.0	201310	5	2	2	2	5	1	 2.0	
248	0	4	2.0	110044	3	1	3	1	2	3	 1.0	
249	0	1	2.0	110042	4	5	3	1	2	3	 1.0	
250	0	3	2.0	110009	5	4	4	3	5	1	 0.0	
251	1	1	10.0	173229	3	1	2	1	4	2	 0.0	
252	0	2	6.0	132001	4	1	3	1	4	3	 9.0	
253	0	4	2.0	110011	5	4	2	4	5	2	 2.0	
254	1	5	5.0	122018	3	1	2	2	5	1	 7.0	
255	0	3	8.0	244001	5	3	3	2	5	1	 3.0	
256	1	4	9.0	201308	5	1	2	2	5	1	 8.0	
257	1	3	2.0	110039	1	1	2	2	5	1	 8.0	
258	1	2	2.0	110030	5	5	2	1	2	3	 1.0	
259	1	3	4.0	201310	5	2	2	2	5	1	 2.0	
260	1	3	9.0	201308	5	5	2	1	4	2	 6.0	
261	1	2	4.0	201308	4	5	3	1	4	2	 7.0	
262	1	2	0.0	560037	3	2	2	1	2	3	 5.0	
263	0	4	2.0	110018	4	1	3	3	5	1	 1.0	
264	1	2	10.0	173212	2	1	3	1	4	2	 0.0	
265	1	3	3.0	201008	2	4	3	1	5	2	 4.0	
266	1	4	0.0	560010	3	1	3	2	5	1	 0.0	
267	1	1	10.0	173229	3	1	2	1	4	2	 0.0	
268	1	4	3.0	201009	3	4	3	1	4	2	 0.0	
000	rows × 71 o											

269 rows × 71 columns

**More DATA CLENSING** 

In [26]:

df.drop('4 What is the Pin Code of where you shop online from?',axis=1,inplace=True)

In [27]:

df

Out[27]:

	1Gender of respondent	2 How old are you?	3 Which city do 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	10 What is the operating system (OS) of your device?	11 What browser do you run on your device to access the website?	•••	Longer time to get logged in (promotion, sales period)	d an (pr
0	0	3	2.0	5	4	4	3	5	1	1		0.0	
1	1	2	2.0	5	5	2	1	2	3	1		1.0	
2	1	2	4.0	4	5	3	1	4	2	1		7.0	
3	0	2	6.0	4	1	3	1	4	3	2		9.0	
4	1	2	0.0	3	2	2	1	2	3	2		5.0	
5	1	3	9.0	5	5	2	1	4	2	1	•••	6.0	
6	0	4	2.0	5	4	2	4	5	2			2.0	
7	0	4	2.0	4	1	3	3	5	1		•••	1.0	
8	1	1	10.0	3	1	2	1	4	2		•••	0.0	
9	1	3	2.0	1	1	2	2	5	1		•••	8.0	
10	0	3	8.0	5	3	3	2	5	1		•••	3.0	
11 12	1	4 5	9.0 5.0	5	1	2	2	5	1			8.0 7.0	
13	1	3	4.0	3 5	2	2	2	5	1			2.0	
14	1	2	6.0	1	5	2	1	4	2			7.0	
15	1	2	0.0	3	5	3	1	4	3			9.0	
16	0	3	9.0	2	3	3	2	5	3			5.0	
17	0	4		1	1	2	2	5	1	1		6.0	
18	1	4		2	1	2	2					2.0	
19	1	2		2	2	2	1	4				9.0	
20	1	2		2		2	1						
21	0	3	5.0	4	4	2	4	4	2	1		1.0	
22	0	4	4.0	5	4	3	4	4	2	1		0.0	
23	1	4	4.0	5	5	5	3	5	1	1		8.0	
24	1	2	7.0	4	5	5	1	4	1	1		3.0	
25	1	2	0.0	3	1	5	2	5	1	1		8.0	
26	0	2	3.0	1	2	5	2	5	1	1		7.0	
27	0	3	2.0	5	5	5	2	5	1	1		2.0	
28	1	4	4.0	5	4	5	2	5	1	1		7.0	
29	1	4		3	1	5	2				•••	9.0	
30	1			5		5					•••		
31	0	3		3		5	3				•••	0.0	
32	0	3		5	3	5	1						
33	1			5		5	1				•••	7.0	
34	1	5		4	1	5	1						
35	1	2		3	2		1	2				5.0	
36	0	3		1	1	5	1					6.0	
37	n	4	20	5	2	5	4	5	2	1		21	

٧.	v	-		·	_	·	-	v	_				
38	1	4	4.0	5	6 Hove	5	3	5	1	11 What browser		1.0	
39	1	2	3 White	5 Sinc€	many time <del>s</del>	7 How do	8 Which	9 What is the	10 What is th <b>ê</b>	do you		Longle	
40	1	Hove	city 0.0	How	you have	access	device do	screen	operating	run on your		time to get	d
41	1Gender of respondent	old ar <del>ê</del>	λδ.Α .αα	Long You are	made an	the internet	you use to access	size of your	system (OS) of	device		logged in (promotion)	an
	- 0	vou?	shop	Shopping Online 3		while	the online shopping?	mobile	your	td access	•••	(promotion sales peri <b>od)</b>	(pr
42	0		onligae from?		in the past 1	on-line?		device3	device?	the website?	•••		
43	1	2	4.0	1	year?	5	2	5	1	\t\t\t	•••	7.0	
44	1	3	7.0	5	2	5	3	5	1		•••	0.0	
45	1	4	0.0	5	5	5	1	2	3	1	•••	1.0	
46	0	4	9.0	5	4	5	1	4	2	1	•••	7.0	
47	0	1	2.0	5	1	5	1	4	3	2	•••	9.0	
48	1	3	4.0	3	1	5	1	4	3	2	•••	9.0	
49	1	3	6.0	5	5	5	1	2	3	2		5.0	
50	1	4	0.0	4	4	5	1	4	2	1		6.0	
51	0	5	9.0	3	4	5	4	5	2	1		2.0	
52	0	4	2.0	1	5	5	3	5	1	1		1.0	
53	1	4	4.0	5	5	5	3	5	1	1		1.0	
54	1	2	7.0	5	1	5	1	4	2	1		0.0	
55	1	2	0.0	4	2	5	2	5	1			8.0	
56	0	2	9.0	3	5	5	2	5	1			3.0	
57	0	2	2.0	1	1	5	2	5	1			8.0	
58	1	3	4.0	5	2	5	2	5	1		•••	7.0	
59	1	4	6.0	5	5	5	3	5	1			0.0	
60	1	4	0.0	4	4	5	1	2	3		•••	1.0	
61	0	1	9.0	3	1	5	1	4	2	1		7.0	
62	0	3	2.0	1	1	5	1	4	3		•••	9.0	
63	1	3	4.0	5	5	5	1	4	3	2	•••	9.0	
64	1	4	7.0	3	4	5	3	5	1	1	•••	1.0	
65	1	5	0.0	5	4	5	3	5	1	1	•••	1.0	
66	0	3	9.0	4	1	5	3	5	1	1		0.0	
67	0	4	2.0	3	1	5	1	2	3	1		1.0	
68	1	4	4.0	1	5	5	1	4	2	1		7.0	
69	1	2	7.0	5	4	5	1	4	3	2		9.0	
70	1	2	0.0	5	4	5	3	5	1	1		1.0	
71	0	3	9.0	4	1	5	2	5	1	1		8.0	
72	0	2	2.0	3	5	5	2	5	1	1		8.0	
73	1	2	4.0	1	4	5	2	5	1			7.0	
74	1	3	6.0	5	4	5	2	5	1		•••	2.0	
75	1	4	0.0	3	1	5	2	5	1			0.0	
76	0	4	9.0	5	1	5	2	5	1			3.0	
77	0		2.0	4	5	5	1	2	3			1.0	
78	1	3	4.0	3	4	5	1	4	2			7.0	
79	1	3	6.0	1	4	5	1	2	3			5.0	
80	1	4	0.0	4	2	5	1	4	2		•••	6.0	
81	0	5	9.0	3	5	5	1	4	2		•••	0.0	
82	n	4	2 በ	3	4	5	1	4	2	4		0.0	

	<u></u>	v	-	2.0	·	-	J		-		-		0.0	
	83	1	4	4.0	1	6 How	5	1		3	11 What browser		2.0	
	84	1	2 2	3 White	5 Sinc <del></del>	many times	7 How do	8 Which	9 What is the	10 What is the	do you		Long	
	85	1	2 Hove	city	How	you have	access	device do	screen	operating	run on your		time to get	d
	86	1Gender of respondent	old	<b>76.6</b> €	Long You are	made an online	the internet	you use to access	size of your	system (OS) of	device		logged in (promotion,	an
		• 0	arê you?	shop	Shopping	purchase	while	the online	mobile	your	td access		sales	(pr
	87	0	-	onli <b>⊵</b> (e from?	Online 3	in the past 1	shopping on-line?	shopping?	device?\t\t\t\t\t\t	device3 \t\t\t\t	the		peri <b>o</b> d)	
	88	0	2	0.0	1	year?	5	1	4	2	website3		1.0	
_	89	0	2	9.0	5	2	5	4	5	2	1	•••	2.0	
	90	1	3	2.0	1	1	5	2	5	1	1		8.0	
	91	1	2	4.0	5	4	5	2	5	1	1		8.0	
	92	1	2	6.0	5	4	5	2	5	1	1		8.0	
	93	1	2	2.0	5	5	2	2	5	1	1		8.0	
	94	1	2	4.0	4	5	3	1	4	2	1		7.0	
	95	1	2	0.0	3	2	2	1	2	3	2		5.0	
	96	1	3	3.0	5	5	2	1	4	2	1		6.0	
	97	1	1	10.0	3	1	2	1	4	2	1		0.0	
	98	1		2.0	1	1	2	2	5	1	1		8.0	
	99	1		9.0	5	1	2	2	5	1			8.0	
	100	1		5.0	3	1	2	2	5	1			7.0	
	101	1		4.0	5	2	2	2	5	1			2.0	
	102	1		10.0	4	1	3	2		1		•••	0.0	
	103	1		10.0	2	1	3	1	4	2	4		0.0	
	104	1	5	5.0	1	1	2	1	4	3	1		2.0	
•	105	1	4	3.0	3	4	3	1	4	2	1		0.0	
•	106	1	3	3.0	2	4	3	1	5	2	1		4.0	
-	107	1	1	3.0	1	1	2	1	4	1	1		0.0	
-	108	0	2	6.0	4	1	3	1	4	3	2		9.0	
1	109	0	4	2.0	5	4	2	4	5	2	1		2.0	
-	110	0	4	2.0	4	1	3	3	5	1	1		1.0	
	111	0	3	8.0	5	3	3	2	5	1	1		3.0	
-	112	0	3	1.0	2	1	3	1	4	2	3		1.0	
	113	0	3	2.0	5	4	4	3	5	1	1		0.0	
-	114	1	2	2.0	5	5	2	1	2	3	1		1.0	
	115	1			4	5	3	1	4	2			7.0	
	116	1			3	2	2	1	2	3			5.0	
	117	0			5	5	2	1	4	2			6.0	
	118	1		10.0	3	1	2	1	4	2			0.0	
	119	1			1	1	2							
				2.0				2		1			8.0	
	120	1		9.0	5	1	2	2		1		•••	8.0	
	121	1		5.0	3	1	2	2		1			7.0	
	122	1		4.0	5	2	2	2		1			2.0	
	123	1	3	10.0	4	1	3	2	5	1	1		0.0	
-	124	1	2	10.0	2	1	3	1	4	2	4		0.0	
1	125	1	5	5.0	1	1	2	1	4	3	1		2.0	
-	126	1	4	3.0	3	4	3	1	4	2	1		0.0	
•	197	1	3	3.0	9	4	3	1	5	9	1		4 0	

		v	<b>U.U</b>	~	-	v		~	-			TIV	
128	1	1	3.0	1	6 How	2	1	4	1	11 What browser		0.0	
129	0	2	3 Whi <b>©</b> i9	5 Sinc <del>é</del>	many times	7 How do	8 Which	9 What is the	10 What is the	do you		Longe	
130		How,	city	How	you have	access	device do	screen	operating	run on your		time to get	d
	1Gender of respondent	old	72.4 72.4	Long You are	made afi online	the internet	you use to access	size of	system (OS) of	device		logged in (promotion,	an
131	- 0	ar <del>é</del> you?	shop	Shopping	purchase	while	the online	mobile	your	td access	•••	sales	(pr
132	0	3	online from?	Online 3	in the past 1	shopping on-line?	shopping?	device3	device? \t\t\t\t	the	•••	peri <b>o</b> d)	
133	0	3	1.0	2	year?	3	1	4	2	website3	•••	1.0	
134	0	3	2.0	5	4	4	3	5		1		0.0	
135	1	1	10.0	3	1	2	1	4	2	1		0.0	
136	1	3	9.0	5	5	2	1	4	2	1		6.0	
137	0	3	8.0	5	3	3	2	5	1	1		3.0	
138	1	2	4.0	4	5	3	1	4	2	1		7.0	
139	0	2	6.0	4	1	3	1	4	3	2		9.0	
140	0	4	2.0	5	4	2	4	5	2	1		2.0	
141	1	4	9.0	5	1	2	2	5	1	1		8.0	
142	1	2	0.0	3	2	2	1	2	3	_		5.0	
143	0	4	2.0	4	1	3	3	5	1	1	•••	1.0	
144	1	3	2.0	1	1	2	2	5	1		•••	8.0	
145	1	2	2.0	5	5	2	1	2	3	1	•••	1.0	
146	1	5	5.0	3	1	2	2	5	1	1	•••	7.0	
147	1	3	4.0	5	2	2	2	5	1	1	•••	2.0	
148	1	3	4.0	5	2	5	2	5	1	1		7.0	
149	1	4	0.0	4	4	3	1	2	3	1	•••	1.0	
150	1	2	4.0	1	4	3	2	5	1	1		7.0	
151	1	3	6.0	5	4	3	2	5	1	1		2.0	
152	1	5	5.0	3	1	2	2	5	1	1		7.0	
153	1	3	4.0	5	2	2	2	5	1	1		2.0	
154	1	4	4.0	1	1	3	1	4	3	1		2.0	
155	1	5	5.0	1	1	2	1	4	3	1		2.0	
156	1	4	7.0	3	4	3	3	5	1			1.0	
157	1	5	0.0	5	4	3	3	5	1			1.0	
158	1	2	0.0	5	4	3	3	5	1			1.0	
159	1	3				3		2	3				
			6.0	1	4		1					5.0	
160	1	3	2.0	1	1	3	2	5	1			8.0	
161	1	2	6.0	5	4	3	2	5	1		•••	8.0	
162	1	2	0.0	3	2	2	1	2	3		•••	5.0	
163	1	3	2.0	1	1	2	2	5	1			8.0	
164	1	3	4.0	5	5	3	1	4	3	2	•••	9.0	
165	1	4	4.0	1	5	3	1	4	2	1		7.0	
166	1	2	7.0	5	4	3	1	4	3	2		9.0	
167	1	3	4.0	3	4	3	1	4	2	1		7.0	
168	1	2	4.0	5	4	3	2	5	1	1		8.0	
169	1	2	2.0	5	5	2	2	5	1	1		8.0	
170	1	2	4.0	4	5	3	1	4	2	1		7.0	
171	1	4	9.0	5	1	2	2	5	1	1		8.0	
179	1	4	6.0	5	5	3	3		1	1		0.0	
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173	1	2	0.0	5	6 How	3	1	5	2	11 What browset		4.0	
174	1	3	3 Whiⅈ	5 Sinc€	many time <del>s</del>	7 How do	8 Which	9 What is the	10 What is th <b>€</b>	do you		Longle	
175	1	2 How	citv	How	you have	access	device do	screen	operating	run on your		time to get	d
176	1Gender of respondent	old	3.8 79.6	Long You are	made an online	the internet	you use to access	size of your	system (OS) of	device		logged in (promotion,	an
		ar <del>é</del> you?	shop	Shopping	purchase	while	the online	mobile	your	td access		sales	(pr
177	1	- 3	online from?	Online 3	in the past 1	shopping on-line?	shopping?	device2 \t\t\t\t\t\t	device2 \t\t\t\t	the website?		peri <b>©</b> d)	
178	1	4	0.0	3	year?	3	2	5	1	\t\t\t	•••	0.0	
179	1	2	6.0	5	1	3	1	4	2	1	***	0.0	
180	1	1	10.0	3	1	2	1	4	2	1		0.0	
181	1	3	10.0	4	1	3	2	5	1	1		0.0	
182	1	2	10.0	2	1	3	1	4	2	4		0.0	
183	1	4	3.0	3	4	3	1	4	2	1		0.0	
184	0	4	2.0	3	1	3	1	2	3	1		1.0	
185	0	1	2.0	4	5	3	1	2	3	1		1.0	
186	0	3	9.0	4	1	3	2	5	1	1		8.0	
187	0	1	9.0	3	1	3	1	4	2	1		7.0	
188	0	3	2.0	1	1	3	1	4	3	2		9.0	
189	0	2	2.0	3	5	3	2	5	1			8.0	
190	0	4	2.0	3	1	3	1	4	3			9.0	
191	0	2	9.0	5	2	3	4	5	2			2.0	
192	0	2	6.0	4	1	3	1	4	3			9.0	
193	0	3	9.0	4	1	3	3	5	1			0.0	
194	0	4	9.0	5	1	3	2	5	1			3.0	
195	0	3	9.0	4	3	3	1	4	1			0.0	
196	0	2	0.0	1	1	3	1	4	2	3		1.0	
197	0	5	9.0	3	5	3	1	4	2	1		0.0	
198	0	4	2.0	3	4	3	1	4	2	4		0.0	
199	1	4	0.0	3	1	3	2	5	1	1		0.0	
200	1	2	6.0	5	1	3	1	4	2	1		0.0	
201	1	1	10.0	3	1	2	1	4	2	1		0.0	
202	1	3	10.0	4	1	3	2	5	1	1		0.0	
203	1	2	10.0	2	1	3	1	4	2	4		0.0	
204	1	4	3.0	3	4	3	1	4	2	1		0.0	
205	0	5	9.0	3	5	3	1	4	2	1		0.0	
206	0	4	2.0	3	4	3	1	4	2	4		0.0	
207	0		0.0	1	1	3	1	4	2			1.0	
208	1	4	0.0	4	2	3	1	4	2			6.0	
209	1	3	3.0	5	5	2	1	4	2			6.0	
210	1	4	6.0	5	5	3	3		1			0.0	
211	1	2	0.0	5	1	3	1	5	2			4.0	
212	1	3	3.0	2	4	3	1	5	2			4.0	
213	1	1	3.0	1	1	2	1	4	1			0.0	
214	0	3	9.0	4	1	3	3	5	1			0.0	
215	0	4	9.0	5	1	3	2	5	1			3.0	
216	0	3	9.0	4	3	3	1	4	1	1		0.0	
917	1	3	<b>4</b> N	5	5	3	1	4	3	2		9 N	

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218	1	4	4.0	1	6 Hovg	3	1	4	2	11 What browser		7.0	
219	1	2	3 Which	5 Sinc€	many time <del>s</del>	7 How do	8 Which	9 What is the	10 What is the	do you		Longle	
220	1	Hovg	city 40 a8	How	you have	access	device do	screen	operating	run on your		time to get	d
221	1Gender of respondent	old are	у <u>ъ</u> . Н	Long You are	made an onling	the internet	you use to access	size of your	system (OS) of	device		logged in (promotion)	an
		you?	shop	Shopping	purchase	while	the online	mobile	your	td access	•••	(promotion sales peri <b>od)</b>	(pr
222	1		onligae from?	Online 3	in th <b>e</b> past 1	shopping on-line?	shopping?	device3	device? \t\t\t\t	the website?	•••		
223	1	2	4.0	4	year?	3	1	4	2	\t\t\t	•••	7.0	
<del>224</del>	1	4	9.0	5	1	2	2	5	ſ		•••	8.0	
225	0	1	9.0	3	1	3	1	4	2	1	•••	7.0	
226	0	3	2.0	1	1	3	1	4	3	2		9.0	
227	0	2	2.0	3	5	3	2	5	1	1		8.0	
228	0	4	2.0	3	1	3	1	4	3	2	•••	9.0	
229	0	2	9.0	5	2	3	4	5	2	1		2.0	
230	0	2	6.0	4	1	3	1	4	3	2		9.0	
231	1	4	7.0	3	4	3	3	5	1	1		1.0	
232	1	5	0.0	5	4	3	3	5	1	1		1.0	
233	1	2	0.0	5	4	3	3	5	1	1		1.0	
234	1	3	6.0	1	4	3	1	2	3			5.0	
235	1	3	2.0	1	1	3	2	5	1			8.0	
236	1	2	6.0	5	4	3	2	5	1			8.0	
237	1	2	0.0	3	2	2	1	2	3			5.0	
238	1	3	2.0	1	1	2	2	5	1		•••	8.0	
239	0	3	9.0	4	1	3	2	5	1	1	•••	8.0	
240	1	4	4.0	1	1	3	1	4	3	1	•••	2.0	
241	1	5	5.0	1	1	2	1	4	3	1	•••	2.0	
242	1	3	4.0	5	2	3	2	5	1	1	•••	7.0	
243	1	4	0.0	4	4	3	1	2	3	1	•••	1.0	
244	1	2	4.0	1	4	3	2	5	1	1		7.0	
245	1	3	6.0	5	4	3	2	5	1	1		2.0	
246	1	5	5.0	3	1	2	2	5	1	1		7.0	
247	1	3	4.0	5	2	2	2	5	1	1		2.0	
248	0	4	2.0	3	1	3	1	2	3	1		1.0	
249	0	1	2.0	4	5	3	1	2	3	1		1.0	
250	0	3	2.0	5	4	4	3	5	1			0.0	
251	1	1	10.0	3	1	2	1	4	2			0.0	
252	0		6.0	4	1	3	1	4	3		•••	9.0	
253	0		2.0	5	4	2	4	5	2			2.0	
254	1	5	5.0	3	1	2	2		1			7.0	
						3							
255	0		8.0	5	3		2		1			3.0	
256	1		9.0	5	1	2	2		1		•••	8.0	
257	1	3	2.0	1	1	2	2		1		•••	8.0	
258	1	2	2.0	5	5	2	1	2	3		•••	1.0	
259	1	3	4.0	5	2	2	2	5	1		•••	2.0	
260	1	3	9.0	5	5	2	1	4	2	1	•••	6.0	
261	1	2	4.0	4	5	3	1	4	2	1		7.0	
262	1	2	0.0	3	2	2	1	2	3	2		5.0	

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263	0	4	2.0	4	6 How many	3 7 How do	3	5 9 What is	1 10 What	11 What browser	 1.0	
264	1	2	WHISHW 64.511W	5 Sinc€	times	yoû	8 Which	thé	is th <b>ê</b>	do you run on	 Longe	
265	1Gender of	Hovg	city 30 <b>d</b> 8	How Long You	you have made an	access the	device do you use to	screen size of	operating system	your device	 time to get logged in	
266	respondent	are	you shop	are Shopping	online purchase	interneţ while	access the online	youg mobile	(OS) of your	tđ	 (promotion sales	an (pr
267	1	you?	onli <b>ne</b>	Online 3	in the	shopping	shopping?	device2	device2	access the	 peri <b>o</b> d)	(P-
268	1	4	from? 3.0	3	past 1 year?	on-line? 3	1	\t\t\t\t\t\t 4	\t\t\t\t 2	website?	 0.0	
										161616		

269 rows × 70 columns

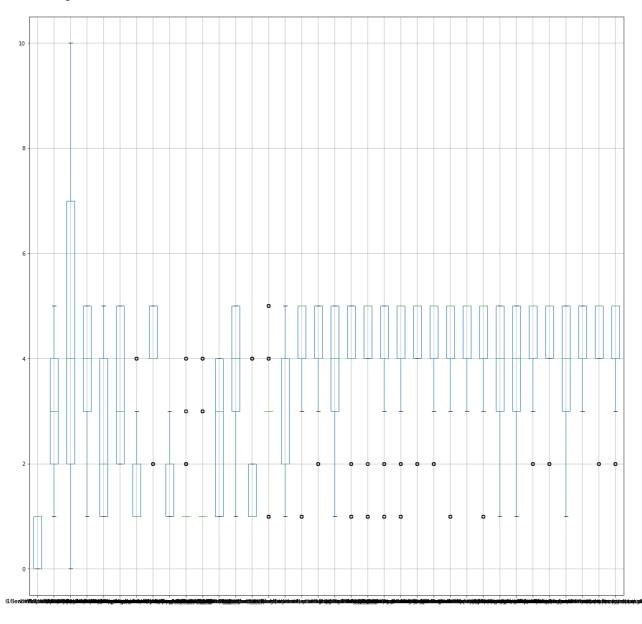
1

In [28]:

df.iloc[:,:36].boxplot(figsize=(20,20))

Out[28]:

<AxesSubplot:>



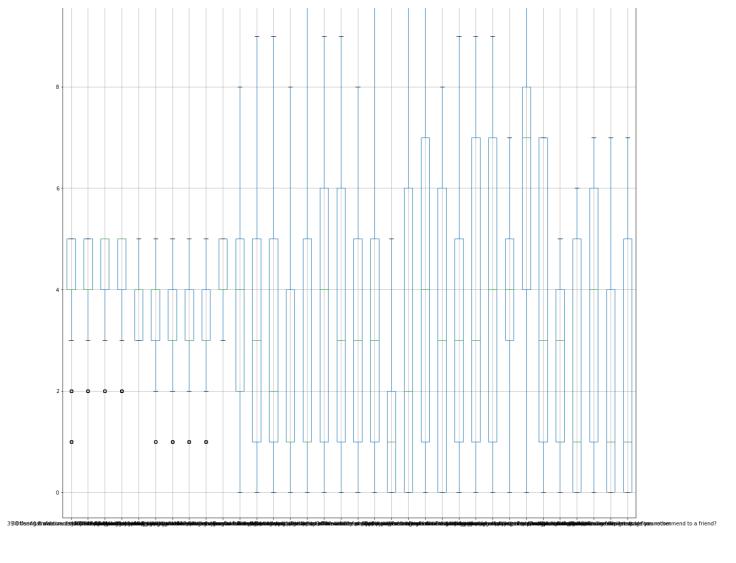
In [29]:

df.iloc[:,36:].boxplot(figsize=(20,20))

Out[29]:

<AxesSubplot:>

10



# **Removing OUTLIERS**

```
In [30]:
```

```
# many outliers found so to clear them
from scipy.stats import zscore
```

#### In [31]:

```
zscore=np.abs(zscore(df))
```

#### In [32]:

```
dfnew=df[(zscore<3).all(axis=1)]</pre>
```

#### In [33]:

dfnew

#### Out[33]:

	1Gender of respondent	2 How old are you?	you	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	10 What is the operating system (OS) of your device?	11 What browser do you run on your device to access the website?	 Longer time to get logged in (promotion, sales period)	
1	1	2	2.0	5	5	2	1	2	3	1	 1.0	
2	1	2	4 0	1	5	2	1	1	9	1	7 0	

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;	3 (	) 2		4	6 How	3	1	4	3	11 What browse?		9.0	
	J 1	3	3 Whi@di	5 Since	many time	7 How do yo2	8 Which	9 What is th€	10 What is the	do you		Longie	
		Ночи	city	How	you have	access	device do	screen	operating	run oñ your		time to get	d
	reenonden	old	%8 .y2.y	Long You	made afi onling	th <del>2</del> internet	you use to access	size of your	system (OS) of	device		logged in (promotion,	an
	, - (	vou?	shop	Shopping	purchase	while	the online	mobile	your	tó access	•••	salēš	(pr
1	3 1	1	from?	Online 3	in the past 1	shopping on-line?	shopping?	device2	device2 \t\t\t\t	the	•••	peri <b>o</b> ợi)	
,	) 1	3	2.0	1	year?	2	2	5	1	website?		8.0	
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1	1 1	4	9.0	5	1	2	2	5	1	1		8.0	
1:	2 1	5	5.0	3	1	2	2	5	1	1		7.0	
1	<b>.</b> 1	2	6.0	1	5	2	1	4	2	1		7.0	
1	5 1	2	0.0	3	5	3	1	4	3	2		9.0	
10	<b>5</b> (			2	3	3	2	5	3	2		5.0	
1				1	1	2	2	5	1			6.0	
18				2	1	2	2	5	1	1		2.0	
19				2	2	2	1	4	3		•••	9.0	
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2	1	2	7.0	4	5	5	1	4	1	1		3.0	
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2	3 1	4	4.0	5	4	5	2	5	1	1		7.0	
2	) 1	4	6.0	3	1	5	2	5	3	2		9.0	
3	) 1	1	0.0	5	1	5	1	2	3	2		5.0	
3				5	3	5	1	2	3			1.0	
3				5	1	5	1	4	2			7.0	
3				4	1	5	1		3			9.0	
3				3	2	5	1		3		•••	5.0	
3				1	1	5	1	4	2		•••	6.0	
3	7 (	) 4	2.0	5	2	5	4	5	2	1		2.0	
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4	) 1	2	0.0	5	4	5	2	5	1	1		8.0	
4		3	9.0	4	5	5	2	5	1	1		3.0	
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4				5	1	5	1		3			9.0	
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4				5	5	5	1	2	3			5.0	
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57	0	2	2.0	1	6 How	5	2	5	1 1	11 What browsef		8.0	
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60	1Gender of	How	city 048	How Long You	you have made afi	access th <del></del>	device do you use to	screen size of	operating system	run on your		time to get logged <sup>1</sup> in	d
61	respondent	old ar <b>é</b>	уgų	are	online	internet	access	your	(OS) of	device td		(promotion,	an
62	0	you?	shop onli <u>ne</u>	Shopping Online ?	purchase in the	while shopping	the online shopping?	mobile device2	your device3	access		salėš peri <b>o</b> d)	(pr
63	1	3	from? 4.0	5	past 1	on-line?	1	\t\t\t\t\t\t 4	\t\t\t\ 3	the website 3		9.0	
					year?			_	_	\t\t\t			
67	0	4	2.0	3	'	5	1	2	3			1.0	
68	1	4	4.0	1	5	5	1	4	2		•••	7.0	
69	1	2	7.0	5	4	5	1	4	3		•••	9.0	
71	0	3	9.0	4	1	5	2	5	1		•••	8.0	
72	0	2	2.0	3	5	5	2	5	1	1		8.0	
73	1	2	4.0	1	4	5	2	5	1			7.0	
75	1	4	0.0	3	1	5	2	5	1	1		0.0	
76	0	4	9.0	5	1	5	2	5	1	1		3.0	
77	0	1	2.0	4	5	5	1	2	3	1		1.0	
78	1	3	4.0	3	4	5	1	4	2	1		7.0	
79	1	3	6.0	1	4	5	1	2	3	2		5.0	
80	1	4	0.0	4	2	5	1	4	2	1		6.0	
81	0	5	9.0	3	5	5	1	4	2	1		0.0	
83	1	4	4.0	1	1	5	1	4	3	1		2.0	
84	1	2	6.0	5	1	5	1	4	2	1		0.0	
85	1	2	0.0	5	1	5	1	5	2	1		4.0	
86	0	3	9.0	4	3	5	1	4	1	1		0.0	
87	0	4	2.0	3	1	5	1	4	3	2		9.0	
89	0	2	9.0	5	2	5	4	5	2	1		2.0	
90	1	3	2.0	1	1	5	2	5	1	1		8.0	
91	1	2	4.0	5	4	5	2	5	1	1		8.0	
92	1	2	6.0	5	4	5	2	5	1	1		8.0	
93	1	2	2.0	5	5	2	2	5	1	1		8.0	
94	1	2	4.0	4	5	3	1	4	2			7.0	
95	1	2	0.0	3	2	2	1	2	3			5.0	
96	1	3	3.0	5	5	2	1	4	2			6.0	
97	1	1	10.0	3	1	2	1	4	2			0.0	
98	1	3	2.0	1	1	2	2	5	1			8.0	
99	1	4	9.0	5	1	2	2		1			8.0	
100	1	5	5.0	3	1	2	2	5	1			7.0	
102	1	3	10.0	4	1	3	2	5	1			0.0	
104		5		1	1	2						2.0	
	1		5.0				1	4	3				
105	1	4	3.0	3	4	3	1	4	2			0.0	
106	1	3	3.0	2	4	3	1	5	2		•••	4.0	
107	1	1	3.0	1	1	2	1	4	1		•••	0.0	
108	0	2	6.0	4	1	3	1	4	3			9.0	
109	0	4	2.0	5	4	2	4	5	2			2.0	
111	0	3	8.0	5	3	3	2	5	1	1		3.0	
111	1	9	2 0	5	5	9	1	9	3	1		1 0	

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117		Hove	city	How	you have	access	device do	screen	operating	run ofi your		time to get	d
	1Gender of respondent	old	₹6.9 ¥6.9	Long You	made afi online	th <del>e</del> internet	you use to access	size of your	system (OS) of	device		logged if	an
118	· .	aré you?	shop	Shopping	purchase	while	the online	mobile	your	tó access	•••	(promotion sales	(pr
119	1	3	onli <u>me</u> from?	Online ?	in the past 1	shopping on-line?	shopping2	device§	device? \t\t\t\t	the	•••	peri <b>od)</b>	
120	1	4	9.0	5	year?	2	2	5	1	website?		8.0	
121	1	5	5.0	3	1	2	2	5	1	1		7.0	
123	1	3	10.0	4	1	3	2	5	1	1		0.0	
125	1	5	5.0	1	1	2	1	4	3	1		2.0	
126	1	4	3.0	3	4	3	1	4	2	1		0.0	
127	1	3	3.0	2	4	3	1	5	2	1		4.0	
128	1	1	3.0	1	1	2	1	4	1	1		0.0	
129	0	2	6.0	4	1	3	1	4	3	2		9.0	
130	0	4	2.0	5	4	2	4	5	2	1		2.0	
132	0	3	8.0	5	3	3	2	5	1		•••	3.0	
135	1	1	10.0	3	1	2	1	4	2	1		0.0	
136	1	3	9.0	5	5	2	1	4	2	1	•••	6.0	
137	0	3	8.0	5	3	3	2	5	1	1		3.0	
138	1	2	4.0	4	5	3	1	4	2	1		7.0	
139	0	2	6.0	4	1	3	1	4	3	2		9.0	
140	0	4	2.0	5	4	2	4	5	2	1		2.0	
141	1	4	9.0	5	1	2	2	5	1	1		8.0	
142	1	2	0.0	3	2	2	1	2	3	2		5.0	
144	1	3	2.0	1	1	2	2	5	1	1		8.0	
145	1	2	2.0	5	5	2	1	2	3			1.0	
146	1	5	5.0	3	1	2	2	5	1			7.0	
148	1	3	4.0	5	2	5			1				
							2	5				7.0	
149	1	4	0.0	4	4	3	1	2	3			1.0	
150	1	2	4.0	1	4	3	2	5	1		•••	7.0	
152	1	5	5.0	3	1	2	2	5	1	1		7.0	
154	1	4	4.0	1	1	3	1	4	3	1		2.0	
155	1	5	5.0	1	1	2	1	4	3	1		2.0	
159	1	3	6.0	1	4	3	1	2	3	2		5.0	
160	1	3	2.0	1	1	3	2	5	1	1		8.0	
161	1	2	6.0	5	4	3	2	5	1	1		8.0	
162	1	2	0.0	3	2	2	1	2	3	2		5.0	
163	1	3	2.0	1	1	2	2	5	1	1		8.0	
164	1	3	4.0	5	5	3	1	4	3			9.0	
165	1	4	4.0	1	5	3	1	4	2			7.0	
166	1	2	7.0	5	4	3	1	4	3			9.0	
167	1	3	4.0	3	4	3	1	4	2			7.0	
168	1	2	4.0	5	4	3	2	5	1		•••	8.0	
169	1	2	2.0	5	5	2	2	5	1		•••	8.0	
170	1	2	4.0	4	5	3	1	4	2	1		7.0	
171	1	1	۹۸	F	1	2	2	5	1	1		a u	

.,.		-	9.0	J		_	_	J				0.0	
173	1	2	0.0	5	6 How	3	1	5	2	11 What browset		4.0	
174	1	3	3 Wh <b>i&amp;10</b>	5 Since	many times	7 How do	8 Which	9 What is the	10 What is the	do you		Longle	
175		2 How	city	How	you have	access	device do	screen	operating	run on your		time to get	d
	1Gender of respondent	old	38 98.9	Long You are	made an online	the internet	you use to access	size of your	system (OS) of	device		logged in	an
176		ar <del>d</del> you? 3	shop	Shopping	purchase	while	the online	mobile	your	tó access		(promotion sales	(pr
177	1	3	onligge from?	Online §	in the past 1	shopping on-line?	shopping?	device2	device <u>?</u> \t\t\t\t	the	•••	peri <b>c</b> ct)	
178	1	4	0.0	3	year?	3	2	5	1	website?		0.0	
179	1	2	6.0	5	1	3	1	4	2	1		0.0	_
180	1	1	10.0	3	1	2	1	4	2	1		0.0	
181	1	3	10.0	4	1	3	2	5	1	1		0.0	
183	1	4	3.0	3	4	3	1	4	2	1		0.0	
184	0	4	2.0	3	1	3	1	2	3	1		1.0	
185	0	1	2.0	4	5	3	1	2	3			1.0	
186	0	3	9.0	4	1	3	2	5	1	1		8.0	
187	0	1	9.0	3	1	3	1	4	2		•••	7.0	
188	0	3	2.0	1	1	3	1	4	3			9.0	
189	0	2	2.0	3	5	3	2	5	1			8.0	
190	0	4	2.0	3	1	3	1	4	3	2		9.0	
191	0	2	9.0	5	2	3	4	5	2	1		2.0	
192	0	2	6.0	4	1	3	1	4	3	2		9.0	
194	0	4	9.0	5	1	3	2	5	1	1		3.0	
195	0	3	9.0	4	3	3	1	4	1	1		0.0	
197	0	5	9.0	3	5	3	1	4	2	1		0.0	
199	1	4	0.0	3	1	3	2	5	1	1		0.0	
200	1	2	6.0	5	1	3	1	4	2			0.0	
201	1	1	10.0	3	1	2	1	4	2			0.0	
202	1		10.0	4	1	3	2		1			0.0	
								5					
204	1	4	3.0	3	4	3	1	4	2			0.0	
205	0		9.0	3	5	3	1	4	2			0.0	
208	1	4	0.0	4	2	3	1	4	2	1		6.0	
209	1	3	3.0	5	5	2	1	4	2	1		6.0	
211	1	2	0.0	5	1	3	1	5	2	1		4.0	
212	1	3	3.0	2	4	3	1	5	2	1		4.0	
213	1	1	3.0	1	1	2	1	4	1	1		0.0	
215	0	4	9.0	5	1	3	2	5	1	1		3.0	
216	0	3	9.0	4	3	3	1	4	1	1		0.0	
217	1	3	4.0	5	5	3	1	4	3	2		9.0	
218	1		4.0	1	5	3	1	4	2			7.0	
219	1	2	7.0	5	4	3	1	4	3			9.0	
220	1	3	4.0	3	4	3	1	4					
									2			7.0	
221	1	2	4.0	5	4	3	2	5	1		•••	8.0	
222	1	2	2.0	5	5	2	2	5	1			8.0	
223	1	2	4.0	4	5	3	1	4	2	1		7.0	
224	1	4	9.0	5	1	2	2	5	1	1		8.0	
225	0	1	9.0	3	1	3	1	4	2	1		7.0	
226	n	3	20	1	1	3	1	А	2	9		۵۸	

220	v	J	۷.0	•	•	J		7	U	11 What		9.0	
227	0	2	2.0 3	3	6 Hovy many	3 <b>7 How do</b>	2	5 9 What is	1 10 What	browset		8.0	
228	0	4	Whi2.10	5 Since	times	yoG	8 Which	th <b>é</b>	is th <b>e</b>	do you run on		Longe	
229	1Gender of	Hove	city 948	How Long You	you have made af	access the	device do you use to	screen size of	operating system	your		time to get logged in	d
230	respondent	old ar <b>€</b>	урн	are	online	internet	access	your	(OS) of	device t@		(promotion)	an
234	1	you?	shop online	Shopping Online ?	purchase in the	while shopping	the online shopping?	mobile device?	your device3	access		saleš periop()	(pr
235	1	3	from? 2.0	1	past 1 year?	on-line?	2	\t\t\t\t\t\t 5	\t\t\t\t 1	thé website?		8.0	
					_					\t\t\t			
236	1	2	6.0	5	4	3	2	5	1		•••	8.0	
237	1	2	0.0	3	2	2	1	2	3			5.0	
238	1	3	2.0	1	1	2	2		1		•••	8.0	
239	0	3	9.0	4	1	3	2	5	1	1		8.0	
240	1	4	4.0	1	1	3	1	4	3	1		2.0	
241	1	5	5.0	1	1	2	1	4	3	1		2.0	
242	1	3	4.0	5	2	3	2	5	1	1		7.0	
243	1	4	0.0	4	4	3	1	2	3	1		1.0	
244	1	2	4.0	1	4	3	2	5	1	1		7.0	
246	1	5	5.0	3	1	2	2	5	1	1		7.0	
248	0	4	2.0	3	1	3	1	2	3	1		1.0	
249	0	1	2.0	4	5	3	1	2	3	1		1.0	
251	1	1	10.0	3	1	2	1	4	2	1		0.0	
252	0	2	6.0	4	1	3	1	4	3	2		9.0	
253	0	4	2.0	5	4	2	4	5	2	1		2.0	
254	1	5	5.0	3	1	2	2	5	1			7.0	
255	0	3	8.0	5	3	3	2		1			3.0	
256	1	4	9.0	5	1	2	2	5	1	1		8.0	
257	-	3	2.0	1	-	2	2	_				8.0	
	1				1				1				
258	1	2		5	5	2						1.0	
260	1	3		5	5	2	1					6.0	
261	1	2		4	5	3	1					7.0	
262	1	2		3	2							5.0	
265	1	3	3.0	2	4	3	1	5	2	1		4.0	
266	1	4	0.0	3	1	3	2	5	1	1		0.0	
267	1	1	10.0	3	1	2	1	4	2	1		0.0	
268	1	4	3.0	3	4	3	1	4	2	1		0.0	

215 rows × 70 columns

4

In [34]:

df.shape

Out[34]:

(269, 70)

In [35]:

dfnew.shape

Out[35]:

(215, 70)

#### In [36]:

data\_loss=(269-215)/269 data\_loss\*100

Out[36]:

20.074349442379184

# Splitting the data as X and Y

In [37]:

```
x=dfnew.iloc[:,:-1]
x
```

Out[37]:

	1Gender of respondent	2 How old are you?	3 Which city do you shop online from?	5 Since How Long You are Shopping Online ?	times you have made an online purchase	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	10 What is the operating system (OS) of your device?	11 What browser do you run on your device to access the website?		Presence of online assistance through multi- channel	tim k (pro
1	1	2	2.0	5	5	2	1	2	3	1		2.0	
2	1	2	4.0	4	5	3	1	4	2	1		8.0	
3	0	2	6.0	4	1	3	1	4	3	2		3.0	
4	1	2	0.0	3	2	2	1	2	3	2		5.0	
5	1	3	9.0	5	5	2	1	4	2	1		4.0	
6	0	4	2.0	5	4	2	4	5	2	1		3.0	
8	1	1	10.0	3	1	2	1	4	2	1		3.0	
9	1	3	2.0	1	1	2	2	5	1	1		1.0	
10	0	3	8.0	5	3	3	2	5	1	1	•••	0.0	
11	1	4	9.0	5	1	2	2	5	1	1		6.0	
12	1	5	5.0	3	1	2	2	5	1	1		1.0	
14	1	2	6.0	1	5	2	1	4	2	1		8.0	
15	1	2	0.0	3	5	3	1	4	3	2	•••	3.0	
16	0	3	9.0	2	3	3	2	5	3	2		5.0	
17	0	4	2.0	1	1	2	2	5	1		•••	4.0	
18	1	4	2.0	2	1	2	2	5	1		•••	3.0	
19	1	2	10.0	2	2	2	1	4	3		•••	3.0	
20	1	2	9.0	2	5	2	1	2	3			5.0	
22	0	4	4.0	5		3	4		2				
23	1	4	4.0	5	5	5	3		1			1.0	
24	1	2	7.0	4					1		•••		
25	1	2		3		5	2		1			6.0	
26	0	2	3.0	1					1				
28	1	4	4.0	5	4	5	2		1				
29	1	4	6.0	3	1	5	2	5	3	2		3.0	

30	1	1	0.0	5	1	5	1	2	3	11 What		5.0	
32	0	3	2.8	5	6 How man <del>ŷ</del>	7 How d <del>ð</del>	1	9 What is	10 What	browser		2.0	
33	1	2	Which	5 Since	timeş	you	8 Which	the	is the	do you run on		Presence	
	1Gender of	How	city 6!9	How Long You	you have made an	access the	device do	screen size of	operating system	your		of online assistance	tim Ic
34	respondent	olā are	you	are	online	internet	access	your	(OS) of	device		through	
35	1	you?	sh@p online	Shopping Online?	purchas@ in the	while shopping	the online shopping?	mobile device?	youir device?	to access		mufti) channel	
36	0	3	from?	1	past 1	on-line?	Shopping: 1	\t\t\t\t\t\t\t	\t\t\t\ <del>\</del>	the website?		4.0	
37	0	4	2.0	5	year2	5	4	5	2	\t\t\ <del>1</del>		3.0	
39	1	2	6.0	3	4	5	1	4	2	1		3.0	
40	1	2	0.0	5	4	5	2	5	1	1		1.0	
41	0	3	9.0	4	5	5	2	5	1	1		0.0	
42	0	2	2.0	3	5	5	2	5	1	1		6.0	
43	1	2	4.0	1	1	5	2	5	1	1		1.0	
45	1	4	0.0	5	5	5	1	2	3			2.0	
						5							
46	0	4	9.0	5	4		1	4	2		•••	8.0	
47	0	1	2.0	5	1	5	1	4	3			3.0	
48	1	3	4.0	3	1	5	1	4	3			3.0	
49	1	3	6.0	5	5	5	1	2	3	2		5.0	
50	1	4	0.0	4	4	5	1	4	2	1		4.0	
51	0	5	9.0	3	4	5	4	5	2	1		3.0	
54	1	2	7.0	5	1	5	1	4	2	1		3.0	
55	1	2	0.0	4	2	5	2	5	1	1		1.0	
56	0	2	9.0	3	5	5	2	5	1	1		0.0	
57	0	2	2.0	1	1	5	2	5	1	1		6.0	
58	1	3	4.0	5	2	5	2	5	1	1		1.0	
60	1	4	0.0	4	4	5	1	2	3	1		2.0	
61	0	1	9.0	3	1	5	1	4				8.0	
62	0		2.0	1	1	5	1					3.0	
63	1	3	4.0	5	5	5	1	4				3.0	
67		4	2.0			5	1	2	3				
	0			3	1							2.0	
68	1	4	4.0	1	5	5	1	4				8.0	
69	1	2	7.0	5	4	5	1	4	3			3.0	
71	0	3	9.0	4	1	5	2		1		•••	1.0	
72	0	2	2.0	3	5	5	2		1	1		6.0	
73	1	2	4.0	1	4	5	2	5	1	1		1.0	
75	1	4	0.0	3	1	5	2	5	1	1		0.0	
76	0	4	9.0	5	1	5	2	5	1	1		0.0	
77	0	1	2.0	4	5	5	1	2	3	1		2.0	
78	1	3	4.0	3	4	5	1	4	2	1		8.0	
79	1	3	6.0	1	4	5	1	2	3	2		5.0	
80	1	4	0.0	4	2	5	1	4	2	1		4.0	
81	0	5	9.0	3	5	5	1	4				3.0	
83	1	4	4.0	1	1	5	1	4	3			6.0	
84	1	2	6.0	5	1	5	1	4	2			0.0	
85	1	2	0.0	5	1	5	1	5	2		•••	7.0	
86	0	3	9.0	4	3	5	1	4	1	1		0.0	

87	0	4	2.0	3	1	5	1	4	3	11 What		3.0	
89	0	2	9. <b>g</b>	5	6 How man <del>y</del>	7 How dð	4	9 What i§	10 Wha <del>l</del>	browser		3.0	
90	1	2	Which	5 Since	times	уоџ	8 Which	the	is the	do you run ori		Presence of online	
91	1Gender of	How	city 49	How Long You	you have made an	access the	device do you use to	screen size of	operating system	your		of online assistance	tim lc
	respondent	ol <del>d</del> are	you	are	online	internet	access	your	(OS) of	device to	===	through	
92	1	you?	sh <b>6</b> ,6 online	Shopping Online?	purchase in the	while shopping	the online shopping?	mobil <del>e</del> device?	your device?	access		mu <b>iti</b> 9 channel	
93	1	2	from?	Online ?	past 1	on-line?	2	\t\t\t\t\t\ <u>*</u>	\t\t\t\ <del>1</del>	the website?		6.0	
94	1	2	4.0	4	year <sub>3</sub>	3	1	4	2	\t\t\ <del>1</del>		8.0	
95	1	2	0.0	3	2	2	1	2	3	2		5.0	
96	1	3	3.0	5	5	2	1	4	2	1		4.0	
97	1	1	10.0	3	1	2	1	4	2	1		3.0	
98	1	3	2.0	1	1	2	2	5	1	1		1.0	
99	1	4	9.0	5	1	2	2	5	1	1		6.0	
100	1	5	5.0	3	1	2	2	5	1	1		1.0	
102	1	3	10.0	4	1	3	2	5	1	1		0.0	
104	1	5	5.0	1	1	2	1	4	3	1		6.0	
105	1	4	3.0	3	4	3	1	4	2	1		0.0	
106	1	3	3.0	2	4	3	1	5	2	1		7.0	
107	1	1	3.0	1	1	2	1	4	1	1		0.0	
108	0	2	6.0	4	1	3	1	4	3	2		3.0	
109	0	4	2.0	5	4	2	4	5	2	1		3.0	
111	0	3	8.0	5	3	3	2	5	1	1		0.0	
114	1	2	2.0	5	5	2	1	2	3	1		2.0	
115	1	2	4.0	4	5	3	1	4	2	1		8.0	
116	1	2	0.0	3	2	2	1	2	3	2		5.0	
117	0	3	9.0	5	5	2	1	4	2	1		4.0	
118	1	1	10.0	3	1	2	1	4	2			3.0	
119	1		2.0	1	1	2	2	5	1			1.0	
120	1	4	9.0	5	1	2	2		1			6.0	
121	1		5.0	3	1	2	2	5	1			1.0	
123	1	3	10.0	4	1	3	2	5	1			0.0	
125	1		5.0	1	1	2		4	3			6.0	
126 127	1	3	3.0	3	4	3	1	4	2			0.0	
	1			2	4			5	2			7.0	
128	1	1	3.0	1	1	2	1	4	1			0.0	
129	0			4	1	3	1	4	3		•••	3.0	
130	0	4	2.0	5	4	2	4	5	2			3.0	
132	0		8.0	5	3	3	2		1			0.0	
135	1		10.0	3	1	2		4	2			3.0	
136	1	3	9.0	5	5	2	1	4	2			4.0	
137	0		8.0	5	3	3	2		1			0.0	
138	1	2	4.0	4	5	3	1	4	2		•••	8.0	
139	0	2	6.0	4	1	3	1	4	3	2		3.0	
140	0	4	2.0	5	4	2	4	5	2	1		3.0	
141	1	4	9.0	5	1	2	2	5	1	1		6.0	
142	1	2	0.0	3	2	2	1	2	3	2		5.0	

145	1	3	2.0				2						
		2	2.8	5	6 How man∳	7 How de	1	5 <b>9 What i</b>	1 10 Wha <del>f</del>	11 What browser		2.0	
146	1	2	Which	5 Sincę	timeş	you	8 Which	the screen	is the	do you run on		Presence of online	
	1Gender of	How	city 49	How Long You	you have made an	access the	device do	screeň size of	operating system	your		of online assistance	tim Ic
0	respondent	old arg	you	are	online	internet	access	your	(OS) of	device to		through	
149	1	you?	sh@p online	Shopping Online?	purchase in the	while shopping	the online shopping?	mobile device?	you? device?	access	•••	mu <b>lti</b> i) channel	
150	1	2	from?	1	past 1	on-line?	2	\t\t\t\t\t\ <u>*</u>	\t\t\t\ <del>1</del>	the website?	•••	1.0	
152	1	5	5.0	3	year?	2	2	5	1	\t\t\ <del>1</del>		1.0	
154	1	4	4.0	1	1	3	1	4	3	1		6.0	
155	1	5	5.0	1	1	2	1	4	3	1		6.0	
159	1	3	6.0	1	4	3	1	2	3	2		5.0	
160	1	3	2.0	1	1	3	2	5	1	1		1.0	
161	1	2	6.0	5	4	3	2	5	1	1		1.0	
162	1	2	0.0	3	2	2	1	2	3	2		5.0	
163	1	3	2.0	1	1	2	2	5	1	1		1.0	
164	1	3	4.0	5	5	3	1	4	3	2		3.0	
165	1	4	4.0	1	5	3	1	4	2			8.0	
166	1	2	7.0	5	4	3	1	4	3			3.0	
167	1	3	4.0	3	4	3	1	4	2			8.0	
168	1	2	4.0	5	4	3	2	5	1			6.0	
169	1	2	2.0	5	5	2	2	5	1			6.0	
170	1	2	4.0	4	5	3	1	4	2			8.0	
		4							1				
171	1		9.0	5	1	2	2	5			•••	6.0	
173	1	2	0.0	5	1	3	1	5	2			7.0	
174	1	3	3.0	2	4	3	1	5	2			7.0	
175	1	1	3.0	1	1	2	1	4	1			0.0	
176	1	4	0.0	4	2	3	1	4	2		•••	4.0	
177	1	3	3.0	5	5	2	1	4	2	1		4.0	
178	1	4	0.0	3	1	3	2	5	1	1		0.0	
179	1	2	6.0	5	1	3	1	4	2	1		0.0	
180	1	1	10.0	3	1	2	1	4	2	1		3.0	
181	1	3	10.0	4	1	3	2	5	1	1		0.0	
183	1	4	3.0	3	4	3	1	4	2	1		0.0	
184	0	4	2.0	3	1	3	1	2	3	1		2.0	
185	0	1	2.0	4	5	3	1	2	3	1		2.0	
186	0	3	9.0	4	1	3	2	5	1	1		1.0	
187	0	1	9.0	3	1	3	1	4	2	1		8.0	
188	0	3	2.0	1	1	3	1	4	3	2		3.0	
189	0	2	2.0	3	5	3	2	5	1	1		6.0	
190	0	4	2.0	3	1	3	1	4	3	2		3.0	
191	0	2	9.0	5	2	3	4	5	2	1		3.0	
192	0	2	6.0	4	1	3	1	4	3			3.0	
194	0	4	9.0	5	1	3	2	5	1			0.0	
195	0	3	9.0	4	3	3	1	4	1			0.0	
197	0	5	9.0	3	5	3	1	4	2			3.0	
199	1	4	0.0	3	1	3	2	5	1			0.0	
155	'	7	5.0	3	'	3	2	3	•	•		0.0	

200	1	2	6.0	5	1	3	1	4	2	11 What		0.0	
201	1	1	10. <b>9</b>	3	6 How man∳	7 How de	1	9 What is	10 Wha <del>l</del>	browser		3.0	
202	1	2	Which 10,0 city	5 Since	times	you	8 Which	the	is the	do you run on		Presence of online	
204	1Gender of	How old	3!9	How Long Yog	you have made an	access the	device do you use te	screeň size of	operating system	your device	:::	assistance	tim Ic
205	respondent 0	are	you shô(p)	are Shopping	online purchas <b>5</b>	internet while	access the online	your mobil <del>é</del>	(OS) of you?	to		through mu <b>lti</b> 9	(pro
208	1	you?	online	Online ?	in the	shopping	shopping?	device?	device?	access the		channel 4.0	
209	1	3	from?	5	past 7 year?	on-line?	1	\t\t\t\t\t\ <del>1</del>	\t\t\t\ <del>t</del> 2	website?		4.0	
211	1	2	0.0	5	1	3	1	5	2	\t\t\ <del>1</del>		7.0	
212	1	3	3.0	2	4	3	1	5	2			7.0	
213	1	1	3.0	1	1		1		1				
						2		4				0.0	
215	0	4	9.0	5	1	3	2	5	1			0.0	
216	0	3	9.0	4	3	3	1	4	1			0.0	
217	1	3	4.0	5	5	3	1	4	3		•••	3.0	
218	1	4	4.0	1	5	3	1	4	2			8.0	
219	1	2	7.0	5	4	3	1	4	3			3.0	
220	1	3	4.0	3	4	3	1	4	2			8.0	
221	1	2	4.0	5	4	3	2	5	1		•••	6.0	
222	1	2	2.0	5	5	2	2	5	1			6.0	
223	1	2	4.0	4	5	3	1	4	2			8.0	
224	1	4	9.0	5	1	2	2	5	1			6.0	
225	0	1	9.0	3	1	3	1	4	2			8.0	
226	0	3	2.0	1	1	3	1	4	3	2		3.0	
227	0	2	2.0	3	5	3	2	5	1	1		6.0	
228	0	4	2.0	3	1	3	1	4	3	2		3.0	
229	0	2	9.0	5	2	3	4	5	2	1		3.0	
230	0	2	6.0	4	1	3	1	4	3	2		3.0	
234	1	3	6.0	1	4	3	1	2	3	2		5.0	
235	1	3	2.0	1	1	3	2	5	1	1		1.0	
236	1	2	6.0	5	4	3	2	5	1	1		1.0	
237	1	2	0.0	3	2	2	1	2	3	2		5.0	
238	1	3	2.0	1	1	2	2	5	1	1		1.0	
239	0	3	9.0	4	1	3	2	5	1	1		1.0	
240	1	4	4.0	1	1	3	1	4	3	1		6.0	
241	1	5	5.0	1	1	2	1	4	3	1		6.0	
242	1	3	4.0	5	2	3	2	5	1	1		1.0	
243	1	4	0.0	4	4	3	1	2	3	1		2.0	
244	1	2	4.0	1	4	3	2	5	1	1		1.0	
246	1	5	5.0	3	1	2	2	5	1	1		1.0	
248	0	4	2.0	3	1	3	1	2	3	1		2.0	
249	0	1	2.0	4	5	3	1	2	3	1		2.0	
251	1	1	10.0	3	1	2	1	4	2	1		3.0	
252	0	2	6.0	4	1	3	1	4	3	2		3.0	
253	0	4	2.0	5	4	2	4	5	2	1		3.0	
254	1	5	5.0	3	1	2	2	5	1	1		1.0	
255	0	3	8.0	5	3	3	2	5	1	1		0.0	

256	1	4	9.0	5	1 <b>6 How</b>	2	2	5	1	11 What	•••	6.0	
257	1	3	2.9	1		7 How de	2	9 What i€	10 What	browser do you	•••	1.0	
258	1	2	Which city	5 Since How	times you have	you access	8 Which device do	the screen	is the operating	run ofi		Presence of online	tim
260	1Gender of	How		Long You	made an	the	-	size of	system	your device	:::	assistançe	lc /===
261	respondent 1	are you?	you sh <b>é</b> p	are Shoppin <del>g</del>	online purchas <b>ē</b>	internet while	access the online	your mobil <del>é</del>	(OS) of you?	to access		through mu <b>lti</b> 9	(pro
		you.		O-1: O	: 4b		-hi2	device?	4	access		ahannal	
262	1	2	online from?	Online ?	in the past 1	shopping on-line?	shopping?	\t\t\t\t\t\ <del>\</del>	device? \t\t\t\	the		<b>channel</b> 5.0	
262 265	1	2			2	n	snopping?		2	the website?			
	1 1		from?	3	past 2	on-line?	1 1 2	\t\t\t\t\ <del>{</del>	\t\t\t\ <sup>3</sup>	website?		5.0	
265	1 1 1 1	3	from? 3.0	2	past 2	on-line?	1	\t\t\t\t\t\ <del>1</del>	\t\t\t\ <sup>3</sup>	website?		7.0	

### 215 rows × 69 columns

### In [38]:

y=dfnew['Which of the Indian online retailer would you recommend to a friend?'] У

## Out[38]:

- 1 3.0
- 2 5.0
- 3 1.0
- 4 3.0
- 5 4.0 6 7.0
- 8 0.0
- 9
- 6.0 10 0.0
- 11 1.0
- 12 2.0
- 14 5.0
- 1.0 15
- 16 3.0
- 17 4.0 7.0 18
- 1.0 19
- 3.0 20
- 22 0.0
- 23 6.0
- 24 0.0
- 25 1.0
- 26 2.0
- 28 5.0
- 29 1.0
- 30 3.0
- 32 3.0
- 33 5.0
- 34 1.0 35 3.0
- 36 4.0
- 37 7.0
- 39 0.0
- 40 6.0
- 41 0.0 42 1.0
- 43 2.0
- 45 3.0
- 46 5.0
- 47 1.0
- 48 1.0
- 49 3.0 50 4.0
- 51 7.0
- 54 0.0
- 55 6.0

 F <i>C</i>	0.0
57	0.0 1.0 2.0
58	2.0
61	3.0 5.0
62	1.0
63 67	3.0
68	5.0
69 71	6.0
72	1.0
73	0.0
76	0.0
78	3.0 5.0
79	3.0
80 81	4.0
83	1.0
84 85	0.0
86	0.0
87 89	1.0
90	6.0
91 92	1.0
93	1.0
56 57 58 60 61 62 63 67 68 69 71 77 77 78 79 80 81 84 85 87 89 99 99 99 99 99 99 99 99 99 99 99 99	5.0
96	4.0
97	0.0
99	0.0 1.0 2.0 3.0 5.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 1.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6
97 98 99 100 102	2.0
104	1.0
105 106	0.0 6.0
107	0.0
108 109	1.0 7.0 0.0
111	7.0 0.0
114	3.0 5.0 3.0 4.0 0.0 6.0 1.0 2.0
116	3.0
117	4.0
119	6.0
120	1.0 2.0
115 116 117 118 119 120 121 123	0.0
125 126	1.0
127	6.0
128 129	0.0 1.0
130	7.0
132 135 136 137 138	0.0
136	0.0 4.0 0.0
137 138	0.0 5.0
139	1.0
140 141	5.0 1.0 7.0 1.0 3.0 6.0 3.0 2.0
142	3.0
144 145	6.0 3.0
146	2.0

187       5.0         188       1.0         189       1.0         190       1.0         191       7.0         192       1.0         194       0.0         195       0.0         197       0.0         200       0.0         201       0.0         202       0.0         204       0.0         205       0.0         208       4.0         209       4.0	
199 0.0 200 0.0 201 0.0	
204 0.0 205 0.0 208 4.0	
208       4.0         209       4.0         211       6.0         212       6.0         213       0.0         215       0.0         216       0.0         217       1.0         218       5.0         219       1.0         220       5.0	
216 0.0 217 1.0 218 5.0 219 1.0 220 5.0	
221 1.0 222 1.0 223 5.0 224 1.0	
218 5.0 219 1.0 220 5.0 221 1.0 222 1.0 223 5.0 224 1.0 225 5.0 226 1.0 227 1.0 228 1.0 229 7.0 230 1.0 234 3.0 235 6.0 236 6.0	
230 1.0 234 3.0 235 6.0 236 6.0 237 3.0	

```
238
       6.0
239
       6.0
240
       1.0
241
       1.0
242
       2.0
243
       3.0
244
       2.0
246
       2.0
248
       3.0
249
       3.0
251
       0.0
252
       1.0
253
       7.0
254
       2.0
255
       0.0
256
       1.0
257
       6.0
258
       3.0
260
       4.0
261
       5.0
262
       3.0
265
       6.0
266
       0.0
267
       0.0
268
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: float6
Balancing the input variable (X) and output variable(Y)
In [39]:
import sklearn
from sklearn.preprocessing import power transform
In [40]:
newx=power transform(x)
newx
Out[40]:
array([[ 0.65828059, -0.78560281, -0.74563427, ..., -1.21706606,
        -0.05022704, -0.54575967],
        [0.65828059, -0.78560281, -0.04466865, ..., 1.12852121,
          0.85996331, -1.35237104],
       [-1.51910905, -0.78560281, 0.53787135, ..., -0.38025713,
        -1.37756067, 0.002352781,
       [0.65828059, 0.99910369, -1.7232669, ..., 1.35985516,
          1.32023624, -1.35237104],
        [0.65828059, -1.83586706, 1.51220275, ..., -1.21706606,
       0.4029684 , 1.09299192],
[ 0.65828059, 0.99910369, -0.37533805, ..., -1.21706606,
        -1.8019676 , -1.35237104]])
In [41]:
dfx=pd.DataFrame(newx)
dfx
Out[41]:
          0
                         2
                                                                7
                                                                                9 ...
                  1
                                 3
                                                 5
                                                                                          59
  0 0.658281
                           1.150072 1.253735
                                           1.241087 0.815960 1.805672 1.267007 0.478091 ... 0.362307 1.1746
            0.785603 0.745634
  1 0.658281
                           0.334155 1.253735 0.058069 0.815960 0.480481 0.239694 0.478091 ... 1.568496 0.6740
            0.785603 0.044669
```

2	0 1.519109	1 <del>0.785603</del>	0.53787 <mark>2</mark>	0.33415 <mark>3</mark>	4 1.046141	0.058069	6 <del>0.815960</del>	7- 0.480481	1.267007	2.091650	:::	0.0601 <b>72</b>	1.2282
3	0.658281	0.785603	- 1.723267	0.400260	- 0.119286	- 1.241087	- 0.815960	- 1.805672	1.267007	2.091650		0.749910	0.0969
4	0.658281	0.146323	1.286008	1.150072	1.253735	- 1.241087	- 0.815960	- 0.480481	0.239694	0.478091		0.425113	0.3888
5	1.519109	0.999104	0.745634	1.150072	0.916428	- 1.241087	1.775434	1.027327	0.239694	- 0.478091		0.060172	0.8344
6	0.658281	1.835867	1.512203	0.400260	- 1.046141	- 1.241087	0.815960	0.480481	0.239694	- 0.478091		0.060172	1.5445
7	0.658281	0.146323	0.745634	1.583147	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		- 0.876981	0.9536
8	- 1.519109	0.146323	1.049455	1.150072	0.481020	0.058069	1.110874	1.027327	- 1.165520	0.478091		- 1.576273	0.5122
9	0.658281	0.999104	1.286008	1.150072	- 1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		1.044727	0.9536
10	0.658281	1.793692	0.257505	0.400260	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091		- 0.876981	0.6740
11	0.658281	0.785603	0.537871	- 1.583147	1.253735	- 1.241087	0.815960	0.480481	0.239694	0.478091		1.568496	0.6740
12	0.658281	0.785603	1.723267	0.400260	1.253735	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
13	1.519109	0.146323	1.286008	1.043909	0.481020	0.058069	1.110874	1.027327	1.267007	2.091650		0.749910	0.0969
14	1.519109	0.999104	0.745634	1.583147	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		0.425113	0.3888
15	0.658281	0.999104	0.745634	1.043909	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		0.060172	0.8344
16	0.658281	0.785603	1.512203	1.043909	0.119286	1.241087	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
17	0.658281	0.785603	1.286008	1.043909	1.253735	1.241087	0.815960	1.805672	1.267007	2.091650		0.749910	0.0969
18	1.519109	0.999104	0.044669	1.150072	0.916428	0.058069	1.775434	0.480481	0.239694	0.478091		0.060172	1.5445
	0.658281												
20	0.658281	0.785603	0.800828	0.334155	1.253735	1.388906	0.815960	0.480481	1.165520	0.478091		1.576273	0.5122
	0.658281												
	1.519109												
	0.658281												
	0.658281												
	0.658281												
	1.519109												
	0.658281												
	0.658281												
29	0.658281	0.785603	1.723267	0.400260	0.119286	1.388906	0.815960	1.805672	1.267007	2.091650		0.749910	0.0969
		0.440000	1 200000	-		1 000000	-	-	2 222224	-		0.405440	2 2222

30	1.51910	U.146323 <b>1</b>	1.286UU8 <b>2</b>	1.583143	1.046144	1.388906 5	0.81596	0.48048 <del>7</del>	0.239694 <b>8</b>	0.47809 <b>ģ</b>	 0.425113 <b>59</b>	0.3888
31	1.519109	0.999104	0.745634	1.150072	0.119286	1.388906	1.775434	1.027327	0.239694	0.478091	 0.060172	0.8344
32	0.658281	0.785603	0.537871	0.400260	0.916428	1.388906	0.815960	0.480481	0.239694	0.478091	 0.060172	1.5445
33	0.658281	0.785603	1.723267	1.150072	0.916428	1.388906	1.110874	1.027327	1.165520	0.478091	 0.876981	0.9536
34	1.519109	0.146323	1.286008	0.334155	1.253735	1.388906	1.110874	1.027327	1.165520	0.478091	 1.576273	0.5122
35	1.519109	0.785603	0.745634	0.400260	1.253735	1.388906	1.110874	1.027327	1.165520	0.478091	 1.044727	0.9536
36	0.658281	0.785603	0.044669	- 1.583147	- 1.046141	1.388906	1.110874	1.027327	- 1.165520	0.478091	 0.876981	0.6740
37	0.658281	0.999104	1.723267	1.150072	1.253735	1.388906	0.815960	1.805672	1.267007	0.478091	 0.362307	1.1746
38	1.519109	0.999104	1.286008	1.150072	0.916428	1.388906	0.815960	0.480481	0.239694	0.478091	 1.568496	0.6740
39	1.519109	1.835867	0.745634	1.150072	- 1.046141	1.388906	0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
40	0.658281	0.146323	0.044669	0.400260	- 1.046141	1.388906	0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
41	0.658281	0.146323	0.537871	1.150072	1.253735	1.388906	0.815960	1.805672	1.267007	2.091650	 0.749910	0.0969
42	0.658281	0.999104	1.723267	0.334155	0.916428	1.388906	0.815960	0.480481	0.239694	0.478091	 0.425113	0.3888
43	1.519109	1.793692	1.286008	0.400260	0.916428	1.388906	1.775434	1.027327	0.239694	0.478091	 0.060172	0.8344
44	0.658281	0.785603	0.800828	1.150072	- 1.046141	1.388906	0.815960	- 0.480481	0.239694	0.478091	 0.060172	1.5445
45	0.658281	0.785603	1.723267	0.334155	0.119286	1.388906	1.110874	1.027327	1.165520	0.478091	 0.876981	0.9536
46	1.519109	0.785603	1.286008	0.400260	1.253735	1.388906	1.110874	1.027327	1.165520	0.478091	 1.576273	0.5122
47	1.519109	0.785603	0.745634	1.583147	1.046141	1.388906	1.110874	1.027327	1.165520	0.478091	 1.044727	0.9536
48	0.658281	0.146323	0.044669	1.150072	0.119286	1.388906	1.110874	1.027327	1.165520	0.478091	 0.876981	0.6740
49	0.658281	0.999104	1.723267	0.334155	0.916428	1.388906	0.815960	1.805672	1.267007	0.478091	 0.362307	1.1746
50	- 1.519109	1.835867	1.286008	0.400260	- 1.046141	1.388906	- 0.815960	0.480481	0.239694	0.478091	 1.568496	0.6740
51	1.519109	0.146323	0.745634	1.583147	1.046141	1.388906	0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
52	0.658281	0.146323	0.044669	1.150072	1.253735	1.388906	- 0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
53	1.519109	0.999104	0.745634	0.400260	- 1.046141	1.388906	0.815960	1.805672	1.267007	0.478091	 0.362307	1.1746
54	0.658281	0.999104	0.044669	- 1.583147	1.253735	1.388906	- 0.815960	- 0.480481	0.239694	0.478091	 1.568496	0.6740
55	0.658281	0.785603	0.800828	1.150072	0.916428	1.388906	- 0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
56	- 1.519109	0.146323	1.286008	0.334155	- 1.046141	1.388906	1.110874	1.027327	- 1.165520	0.478091	 - 0.876981	0.9536
57	- 1.519109	0.785603	0.745634	0.400260	1.253735	1.388906	1.110874	1.027327	- 1.165520	0.478091	 1.044727	0.9536
58	0.658281	0.785603	0.044669	- 1.583147	0.916428	1.388906	1.110874	1.027327	- 1.165520	- 0.478091	 0.876981	0.6740

50	0 659991	1	2	3	4	5	6 1.110874	7	8	9	 59	(
-00	<del>0.000201</del>	0.000104	1.723267	0.400260	1.046141	1.000000	1.110074	1.021021	1.165520	0.478091	 1.576273	1.5445
60	1.519109	0.999104	1.286008	1.150072	1.046141	1.388906	1.110874	1.027327	1.165520	0.478091	 1.576273	0.5122
61	1.519109	1.835867	0.745634	0.334155	1.253735	1.388906	0.815960	1.805672	1.267007	0.478091	 0.362307	1.1746
62	0.658281	0.146323	0.044669	0.400260	0.916428	1.388906	- 0.815960	- 0.480481	0.239694	0.478091	 1.568496	0.6740
63	0.658281	0.146323	0.537871	- 1.583147	0.916428	1.388906	- 0.815960	- 1.805672	1.267007	2.091650	 0.749910	0.0969
64	0.658281	0.999104	- 1.723267	0.334155	- 0.119286	1.388906	- 0.815960	- 0.480481	0.239694	0.478091	 0.425113	0.3888
65	- 1.519109	1.793692	1.286008	0.400260	1.253735	1.388906	0.815960	- 0.480481	0.239694	0.478091	 0.060172	1.5445
66	0.658281	0.999104	0.044669	- 1.583147	- 1.046141	1.388906	0.815960	- 0.480481	1.267007	0.478091	 1.044727	0.8344
67	0.658281	0.785603	0.537871	1.150072	- 1.046141	1.388906	- 0.815960	- 0.480481	0.239694	0.478091	 - 1.576273	1.5445
68	0.658281	- 0.785603	- 1.723267	1.150072	- 1.046141	1.388906	- 0.815960	1.027327	0.239694	- 0.478091	 1.316093	0.2027
69	- 1.519109	0.146323	1.286008	0.334155	0.481020	1.388906	- 0.815960	- 0.480481	- 1.165520	- 0.478091	 - 1.576273	1.5445
70	- 1.519109	0.999104	- 0.745634	0.400260	- 1.046141	1.388906	- 0.815960	- 0.480481	1.267007	2.091650	 0.060172	1.2282
71	- 1.519109	- 0.785603	1.286008	1.150072	- 0.119286	1.388906	1.775434	1.027327	0.239694	- 0.478091	 0.060172	0.8344
72	0.658281	0.146323	- 0.745634	- 1.583147	- 1.046141	1.388906	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.9536
73	0.658281	- 0.785603	0.044669	1.150072	0.916428	1.388906	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
74	0.658281	0.785603	0.537871	1.150072	0.916428	1.388906	1.110874	1.027327	- 1.165520	0.478091	 - 0.876981	0.9536
75	0.658281	0.785603	0.745634	1.150072	1.253735	- 1.241087	1.110874	1.027327	- 1.165520	0.478091	 1.044727	0.9536
76	0.658281	0.785603	0.044669	0.334155	1.253735	0.058069	0.815960	- 0.480481	0.239694	0.478091	 1.568496	0.6740
77	0.658281	0.785603	1.723267	0.400260	- 0.119286	- 1.241087	0.815960	1.805672	1.267007	2.091650	 0.749910	0.0969
78	0.658281	0.146323	0.375338	1.150072	1.253735	- 1.241087	- 0.815960	- 0.480481	0.239694	0.478091	 0.425113	0.3888
79	0.658281	- 1.835867	1.512203	0.400260	- 1.046141	- 1.241087	- 0.815960	- 0.480481	0.239694	- 0.478091	 0.060172	1.5445
80	0.658281	0.146323	- 0.745634	- 1.583147	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091	 - 0.876981	0.9536
81	0.658281	0.999104	1.286008	1.150072	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
82	0.658281	1.793692	0.257505	0.400260	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091	 - 0.876981	0.6740
83	0.658281	0.146323	1.512203	0.334155	- 1.046141	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 - 1.576273	1.5445
84	0.658281	1.793692	0.257505	- 1.583147	- 1.046141	- 1.241087	- 0.815960	- 0.480481	1.267007	0.478091	 1.044727	0.8344
85	0.658281	0.999104	0.375338	0.400260	0.916428	0.058069	- 0.815960	- 0.480481	0.239694	- 0.478091	 - 1.576273	1.5445
86	0.658281	0.146323	0.375338	1.043909	0.916428	0.058069	- 0.815960	1.027327	0.239694	0.478091	 1.316093	0.2027

87	0.65828	1.83586 <b>7</b>	0.37533 <b>8</b>	- 1.58314 <b>7</b>	- 1.04614 <b><del>1</del></b>	- 1.24108 <b>5</b>	- 0.81596 <b>9</b>	0.48048 <b>7</b>	- 1.16552 <b>8</b>	0.47809 <b>9</b>	:::	- 1.5762 <b>79</b>	1.5445
88	- 1.519109	0.785603	0.537871	0.334155	- 1.046141	0.058069	- 0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
89	- 1.519109	0.999104	0.745634	1.150072	0.916428	- 1.241087	1.775434	1.027327	0.239694	0.478091		0.060172	0.8344
90	1.519109	0.146323	1.049455	1.150072	0.481020	0.058069	1.110874	1.027327	- 1.165520	0.478091		- 1.576273	0.5122
91	0.658281	0.785603	0.745634	1.150072	1.253735	1.241087	0.815960	1.805672	1.267007	0.478091		0.362307	1.1746
92	0.658281	0.785603	0.044669	0.334155	1.253735	0.058069	0.815960	- 0.480481	0.239694	0.478091		1.568496	0.6740
93	0.658281	0.785603	1.723267	0.400260	0.119286	1.241087	0.815960	1.805672	1.267007	2.091650		0.749910	0.0969
94	1.519109	0.146323	1.286008	1.150072	1.253735	- 1.241087	- 0.815960	0.480481	0.239694	0.478091		0.425113	0.3888
95	0.658281	1.835867	1.512203	0.400260	1.046141	1.241087	0.815960	0.480481	0.239694	0.478091		0.060172	1.5445
96	0.658281	0.146323	0.745634	- 1.583147	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091		0.876981	0.9536
97	0.658281	0.999104	1.286008	1.150072	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		1.044727	0.9536
98	0.658281	1.793692	0.257505	0.400260	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		0.876981	0.6740
99	0.658281	0.146323	1.512203	0.334155	1.046141	0.058069	1.110874	1.027327	1.165520	0.478091		1.576273	1.5445
100	0.658281	1.793692	0.257505	1.583147	1.046141	1.241087	0.815960	0.480481	1.267007	0.478091		1.044727	0.8344
101	0.658281	0.999104	0.375338	0.400260	0.916428	0.058069	0.815960	0.480481	0.239694	0.478091		1.576273	1.5445
	0.658281												
103	0.658281	1.835867	0.375338	1.583147	1.046141	1.241087	0.815960	0.480481	1.165520	0.478091		1.576273	1.5445
104	1.519109	0.785603	0.537871	0.334155	1.046141	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
	1.519109												
106	1.519109	0.146323	1.049455	1.150072	0.481020	0.058069	1.110874	1.027327	1.165520	0.478091		1.576273	0.5122
	0.658281												
	0.658281												
109	1.519109	0.146323	1.049455	1.150072	0.481020	0.058069	1.110874	1.027327	1.165520	0.478091		1.576273	0.5122
110	0.658281	0.785603	0.044669	0.334155	1.253735	0.058069	0.815960	0.480481	0.239694	0.478091		1.568496	0.6740
	1.519109												
	1.519109												
113	0.658281	0.999104	1.286008	1.150072	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		1.044727	0.9536
	0.658281												
115	0.658281	0.146323	- በ 745634	- 1 503147	- 1 በ46141	- 1 2/11087	1.110874	1.027327	- 1 165520	- በ <i>4</i> 72001		- ೧	0.9536

	0	1	0.7 <del>1</del> 000 <del>1</del>	1.505 1 <del>7</del> 7 3	1.0 <del>1</del> 0171	1.27100 <i>1</i> 5	6	7	1.100020	0. <del>1</del> 70031		0.07030 i 59	
116	0.658281	0.785603	0.745634	1.150072	1.253735	1.241087				0.478091		0.362307	1.1746
117	0.658281	1.793692	0.257505	0.400260	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091		- 0.876981	0.6740
118	0.658281	0.146323	0.044669	1.150072	- 0.119286	1.388906	1.110874	1.027327	- 1.165520	0.478091	•••	- 0.876981	0.6740
119	0.658281	0.999104	- 1.723267	0.334155	0.916428	0.058069	- 0.815960	1.805672	1.267007	- 0.478091	•••	0.362307	1.1746
120	0.658281	0.785603	0.044669	- 1.583147	0.916428	0.058069	1.110874	1.027327	- 1.165520	0.478091		0.876981	0.6740
121	0.658281	1.793692	0.257505	0.400260	- 1.046141	- 1.241087	1.110874	1.027327	1.165520	0.478091		0.876981	0.6740
			0.044669										
123	0.658281	1.793692	0.257505	1.583147	1.046141	1.241087	0.815960	0.480481	1.267007	0.478091	•••	1.044727	0.8344
124	0.658281	0.146323	0.537871	1.583147	0.916428	0.058069	0.815960	1.805672	1.267007	2.091650		0.749910	0.09699
125	0.658281	0.146323	0.745634	1.583147	1.046141	0.058069	1.110874	1.027327	1.165520	0.478091		0.876981	0.9536
126	0.658281	0.785603	0.537871	1.150072	0.916428	0.058069	1.110874	1.027327	- 1.165520	0.478091		0.876981	0.9536
127	0.658281	0.785603	1.723267	0.400260	0.119286	1.241087	0.815960	1.805672	1.267007	2.091650	•••	0.749910	0.0969
128	0.658281	0.146323	0.745634	1.583147	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		0.876981	0.9536
129	0.658281	0.146323	0.044669	1.150072	1.253735	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
130	0.658281	0.999104	0.044669	- 1.583147	1.253735	0.058069	- 0.815960	0.480481	0.239694	0.478091		1.568496	0.6740
131	0.658281	0.785603	0.800828	1.150072	0.916428	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
			0.044669										
133	0.658281	0.785603	0.044669	1.150072	0.916428	0.058069	1.110874	1.027327	1.165520	0.478091		1.044727	0.9536
			0.745634										
135	0.658281	0.785603	0.044669	0.334155	1.253735	0.058069	0.815960	0.480481	0.239694	0.478091		1.568496	0.6740
136	0.658281	0.999104	1.286008	1.150072	1.046141	1.241087	1.110874	1.027327	1.165520	0.478091		1.044727	0.9536
137	0.658281	0.785603	1.723267	1.150072	1.046141	0.058069	0.815960	1.027327	0.239694	0.478091		1.316093	0.2027
138	0.658281	0.146323	0.375338	1.043909	0.916428	0.058069	0.815960	1.027327	0.239694	0.478091		1.316093	0.2027
139	0.658281	1.835867	0.375338	1.583147	1.046141	1.241087	0.815960	0.480481	1.165520	0.478091		1.576273	1.5445
140	0.658281	0.999104	- 1.723267	0.334155	- 0.119286	0.058069	0.815960	0.480481	0.239694	0.478091		0.425113	0.3888
141	0.658281	0.146323	0.375338	1.150072	1.253735	1.241087	0.815960	0.480481	0.239694	0.478091		0.425113	0.3888
			1.723267										
143	0.658281	0.785603	0.537871	1.150072	1.046141	0.058069	0.815960	0.480481	0.239694	0.478091		1.576273	1.5445

144	0.65828	<b>f</b> 1.835867	1.51220 <b>3</b>	0.400260	<b>4</b> 1.046141	5 1.241087	6 0.815960	7 0.480481	0.239694	9 0.478091	111	0.0601 <b>59</b>	1.5445
145	0.658281	0.146323	1.512203	0.334155	- 1.046141	0.058069	1.110874	1.027327	- 1.165520	- 0.478091		- 1.576273	1.5445
146	0.658281	0.999104	0.375338	0.400260	0.916428	0.058069	- 0.815960	- 0.480481	0.239694	- 0.478091		- 1.576273	1.5445
147	- 1.519109	0.999104	0.745634	0.400260	- 1.046141	0.058069	- 0.815960	- 1.805672	1.267007	- 0.478091		0.362307	1.1746
148	1.519109	- 1.835867	0.745634	0.334155	1.253735	0.058069	0.815960	1.805672	1.267007	- 0.478091		0.362307	1.1746
149	1.519109	0.146323	1.286008	0.334155	- 1.046141	0.058069	1.110874	1.027327	- 1.165520	- 0.478091		- 0.876981	0.9536
150	- 1.519109	- 1.835867	1.286008	0.400260	- 1.046141	0.058069	0.815960	0.480481	0.239694	0.478091		1.568496	0.6740
151	1.519109	0.146323	0.745634	- 1.583147	1.046141	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
152	- 1.519109	0.785603	- 0.745634	0.400260	1.253735	0.058069	1.110874	1.027327	- 1.165520	0.478091		1.044727	0.9536
153	1.519109	0.999104	0.745634	0.400260	1.046141	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
154	- 1.519109	0.785603	1.286008	1.150072	0.119286	0.058069	1.775434	1.027327	0.239694	0.478091		0.060172	0.8344
155	1.519109	0.785603	0.537871	0.334155	1.046141	0.058069	0.815960	0.480481	1.267007	2.091650		0.060172	1.2282
156	1.519109	0.999104	1.286008	1.150072	1.046141	0.058069	1.110874	1.027327	1.165520	0.478091		1.576273	0.5122
157	1.519109	0.146323	1.286008	0.334155	0.481020	0.058069	0.815960	0.480481	1.165520	0.478091		1.576273	1.5445
158	1.519109	1.793692	1.286008	0.400260	1.253735	0.058069	0.815960	0.480481	0.239694	0.478091		0.060172	1.5445
	0.658281												
	0.658281												
161	0.658281	1.835867	1.512203	0.400260	1.046141	1.241087	0.815960	0.480481	0.239694	0.478091		0.060172	1.5445
	0.658281												
	0.658281												
	1.519109												
	0.658281												
166	0.658281	0.146323	0.375338	1.150072	1.253735	1.241087	0.815960	0.480481	0.239694	0.478091		0.425113	0.3888
	0.658281												
	0.658281												
	0.658281												
	1.519109												
	1.519109												
179	0 658281	N 146323	-	1 150072	1 253735	N 058069	-	-	1 267007	2 091650		N N6N172	1 2282

	0	1	0.044669	3	4	5	0.815960	0.480481	8	9	 59	
173	0.658281	0.999104	0.044669	1.583147	1.253735	0.058069	0.815960	0.480481	0.239694	0.478091	 1.568496	0.6740
174	0.658281	0.785603	0.800828	1.150072	0.916428	0.058069	0.815960	0.480481	1.267007	2.091650	 0.060172	1.2282
175	0.658281	0.146323	- 0.044669	0.400260	0.916428	0.058069	- 0.815960	- 0.480481	0.239694	- 0.478091	 1.568496	0.6740
176	0.658281	0.785603	0.044669	1.150072	0.916428	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
177	0.658281	0.785603	0.745634	1.150072	1.253735	- 1.241087	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
178	0.658281	0.785603	0.044669	0.334155	1.253735	0.058069	- 0.815960	- 0.480481	0.239694	- 0.478091	 1.568496	0.6740
179	0.658281	0.999104	1.286008	1.150072	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
180	- 1.519109	- 1.835867	1.286008	0.400260	- 1.046141	0.058069	- 0.815960	- 0.480481	0.239694	- 0.478091	 1.568496	0.6740
181	- 1.519109	0.146323	- 0.745634	- 1.583147	- 1.046141	0.058069	- 0.815960	- 0.480481	1.267007	2.091650	 0.060172	1.2282
182	- 1.519109	- 0.785603	- 0.745634	0.400260	1.253735	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 1.044727	0.9536
183	- 1.519109	0.999104	- 0.745634	- 0.400260	- 1.046141	0.058069	- 0.815960	- 0.480481	1.267007	2.091650	 0.060172	1.2282
184	- 1.519109	- 0.785603	1.286008	1.150072	- 0.119286	0.058069	1.775434	1.027327	0.239694	- 0.478091	 0.060172	0.8344
185	- 1.519109	- 0.785603	0.537871	0.334155	- 1.046141	0.058069	- 0.815960	- 0.480481	1.267007	2.091650	 0.060172	1.2282
186	0.658281	0.146323	0.537871	- 1.583147	0.916428	0.058069	- 0.815960	- 1.805672	1.267007	2.091650	 0.749910	0.0969
187	0.658281	0.146323	- 0.745634	- 1.583147	- 1.046141	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.9536
188	0.658281	0.785603	0.537871	1.150072	0.916428	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.9536
189	0.658281	0.785603	- 1.723267	0.400260	- 0.119286	- 1.241087	- 0.815960	- 1.805672	1.267007	2.091650	 0.749910	0.0969
190	0.658281	0.146323	- 0.745634	- 1.583147	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.9536
191	- 1.519109	0.146323	1.286008	0.334155	- 1.046141	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.9536
192	0.658281	0.999104	0.044669	- 1.583147	- 1.046141	0.058069	- 0.815960	- 0.480481	1.267007	- 0.478091	 1.044727	0.8344
193	0.658281	1.793692	0.257505	- 1.583147	- 1.046141	- 1.241087	- 0.815960	- 0.480481	1.267007	- 0.478091	 1.044727	0.8344
194	0.658281	0.146323	0.044669	1.150072	- 0.119286	0.058069	1.110874	1.027327	- 1.165520	- 0.478091	 - 0.876981	0.6740
195	0.658281	0.999104	- 1.723267	0.334155	0.916428	0.058069	- 0.815960	- 1.805672	1.267007	- 0.478091	 0.362307	1.1746
196	0.658281	0.785603	0.044669	- 1.583147	0.916428	0.058069	1.110874	1.027327	- 1.165520	0.478091	 0.876981	0.6740
197	0.658281	1.793692	0.257505	0.400260	- 1.046141	- 1.241087	1.110874	1.027327	- 1.165520	0.478091	 - 0.876981	0.6740
198	- 1.519109	0.999104	0.745634	0.400260	- 1.046141	0.058069	0.815960	1.805672	1.267007	0.478091	 0.362307	1.1746
199	- 1.519109	- 1.835867	0.745634	0.334155	1.253735	0.058069	0.815960	1.805672	1.267007	- 0.478091	 0.362307	1.1746
200	0.658281	1.835867	1.512203	0.400260	- 1.046141	- 1.241087	0.815960	0.480481	0.239694	0.478091	 0.060172	1.5445

```
1 0.537871 0.334155 4 0.058069 6 7 1.267007 2.091650 ... 0.060172 1.2282
202 1.519109 0.999104 0.745634 1.150072 0.916428 1.241087 1.775434 1.027327 0.239694 0.478091 ... 0.060172 0.8344
203 0.658281 1.793692 0.257505 0.400260 1.046141 1.241087 1.110874 1.027327 1.165520 0.478091 ... 0.876981 0.6740
204 1.519109 0.146323 1.049455 1.150072 0.481020 0.058069 1.110874 1.027327 1.165520 0.478091 ... 1.576273 0.51223
205 0.658281 0.999104 1.286008 1.150072 1.046141 1.241087 1.110874 1.027327 1.165520 0.478091 ... 1.044727 0.95363
206 0.658281 0.146323 0.745634 1.583147 1.046141 1.241087 1.110874 1.027327 1.165520 0.478091 ... 0.876981 0.95367
207 0.658281 0.785603 0.745634 1.150072 1.253735 1.241087 0.815960 1.805672 1.267007 0.478091 ... 0.362307 1.17468
208 0.658281 0.146323 1.286008 1.150072 1.253735 1.241087 0.815960 0.480481 0.239694 0.478091 ... 0.425113 0.3888
209 0.658281 0.785603 0.044669 0.334155 1.253735 0.058069 0.815960 0.480481 0.239694 0.478091 ... 1.568496 0.6740
210 0.658281 0.785603 1.723267 0.400260 0.119286 1.241087 0.815960 1.805672 1.267007 2.091650 ... 0.749910 0.09698
211 0.658281 0.146323 0.375338 1.043909 0.916428 0.058069 0.815960 1.027327 0.239694 0.478091 ... 1.316093 0.2027;
212 0.658281 0.999104 1.723267 0.400260 1.046141 0.058069 1.110874 1.027327 1.165520 0.478091 ... 1.576273 1.54456
213 0.658281 1.835867 1.512203 0.400260 1.046141 1.241087 0.815960 0.480481 0.239694 0.478091 ... 0.060172 1.54456
214 0.658281 0.999104 0.375338 0.400260 0.916428 0.058069 0.815960 0.480481 0.239694 0.478091 ... 1.576273 1.54456
215 rows × 69 columns
In [42]:
y.value counts()
Out[42]:
1.0
        51
0.0
        48
        30
3.0
6.0
        27
        20
5.0
2.0
        15
4.0
        13
7.0
        11
Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64
In [43]:
```

from imblearn.over sampling import SMOTE

x train1, y train1=smt.fit resample(dfx,y)

smt=SMOTE()

y train1.value counts()

In [44]:

Out[44]:

3.0 5.0

1.0

4.0

7.0

51

51

51

51

51

```
0.0 51
6.0 51
2.0 51
```

Name: Which of the Indian online retailer would you recommend to a friend?, dtype: int64

#### In [45]:

```
sns.countplot(y_train1)
```

#### Out[45]:

<AxesSubplot:xlabel='Which of the Indian online retailer would you recommend to a friend?
', ylabel='count'>



# TRAINING AND TESTING THE DATA

```
In [46]:
```

```
from sklearn.model_selection import train_test_split
```

## **MODEL SELECTION**

#### In [47]:

```
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score, mean_squared_error, mean_absolute_error
lr=LinearRegression()
```

#### In [48]:

```
maxR2S=0
maxR=0
for i in range(0,1000):
    x_train,x_test,y_train,y_test=train_test_split(x_train1,y_train1,test_size=0.20,rand
om_state=i)
    lr.fit(x_train,y_train)
    predlr=lr.predict(x_test)
    score=r2_score(y_test,predlr)
    print('R2_score' ,score, 'at random_state' ,i)
    if score > maxR2S:
        maxR2S=score
        maxR=i
        print('Max r2_score' ,maxR2S, 'at random_state' ,i)
```

```
R2_score 1.0 at random_state 0
Max r2_score 1.0 at random_state 0
R2_score 1.0 at random_state 1
R2_score 1.0 at random_state 2
R2_score 1.0 at random_state 3
R2_score 1.0 at random_state 4
R2_score 1.0 at random_state 5
R2_score 1.0 at random_state 6
```

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R2 score 1.0 at random state
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R2 score 1.0 at random state
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R2 score 1.0 at random state
R2 score 1.0 at random state 373
R2 score 1.0 at random state 374
R2 score 1.0 at random state
R2 score 1.0 at random state
R2 score 1.0 at random state
                             377
R2 score 1.0 at random_state
                             378
R2 score 1.0 at random state
                             379
R2 score 1.0 at random state
                             380
R2 score 1.0 at random state
                             381
R2 score 1.0 at random state
R2_score 1.0 at random_state 383
R2 score 1.0 at random state 384
R2 score 1.0 at random state 385
R2_score 1.0 at random_state 386
R2_score 1.0 at random state 387
R2 score 1.0 at random state 388
R2 score 1.0 at random state 389
R2 score 1.0 at random state 390
R2 score 1.0 at random state 391
R2 score 1.0 at random state 392
R2 score 1.0 at random state 393
R2 score 1.0 at random state 394
R2 score 1.0 at random state 395
R2 score 1.0 at random state 396
R2 score 1.0 at random state 397
R2_score 1.0 at random_state 398
R2 score 1.0 at random state
                            399
R2 score 1.0 at random state
R2_score 1.0 at random_state 401
R2_score 1.0 at random_state 402
R2 score 1.0 at random state 403
R2 score 1.0 at random state 404
R2_score 1.0 at random_state 405
R2 score 1.0 at random state 406
R2 score 1.0 at random state 407
R2 score 1.0 at random state 408
R2 score 1.0 at random state 409
R2 score 1.0 at random state 410
R2 score 1.0 at random state 411
R2 score 1.0 at random state 412
R2 score 1.0 at random state 413
R2 score 1.0 at random state 414
R2 score 1.0 at random_state
                             415
R2 score 1.0 at random state
                             416
R2 score 1.0 at random state
                             417
R2_score 1.0 at random_state
R2 score 1.0 at random state
R2_score 1.0 at random_state 420
R2_score 1.0 at random_state 421
R2 score 1.0 at random state 422
R2_score 1.0 at random_state 423
R2 score 1.0 at random state 424
R2 score 1.0 at random state 425
R2 score 1.0 at random state 426
R2 score 1.0 at random state 427
R2 score 1.0 at random state 428
R2 score 1.0 at random state 429
R2 score 1.0 at random state 430
R2 score 1.0 at random state 431
R2 score 1.0 at random state 432
R2 score 1.0 at random_state 433
R2 score 1.0 at random state
                             434
R2 score 1.0 at random_state
                             435
R2 score 1.0 at random state
                             436
R2 score 1.0 at random state
R2 score 1.0 at random state
                             438
```

```
R2 score 1.0 at random state
R2 score 1.0 at random_state
R2 score 1.0 at random state 441
R2 score 1.0 at random state 442
R2 score 1.0 at random state 443
R2 score 1.0 at random state 444
R2 score 1.0 at random state 445
R2 score 1.0 at random state 446
R2 score 1.0 at random state 447
R2 score 1.0 at random state
R2 score 1.0 at random state 449
R2 score 1.0 at random_state 450
R2 score 1.0 at random state
R2 score 1.0 at random state
R2_score 1.0 at random_state
R2 score 1.0 at random state 454
R2_score 1.0 at random_state 455
R2 score 1.0 at random state 456
R2_score 1.0 at random_state 457
R2_score 1.0 at random_state 458
R2 score 1.0 at random state 459
R2 score 1.0 at random state 460
R2 score 1.0 at random state 461
R2 score 1.0 at random state 462
R2 score 1.0 at random state 463
R2 score 1.0 at random state 464
R2 score 1.0 at random state 465
R2 score 1.0 at random state 466
R2 score 1.0 at random state 467
R2 score 1.0 at random_state 468
R2 score 1.0 at random_state
                             469
R2_score 1.0 at random_state
                            470
R2 score 1.0 at random state
                             471
R2 score 1.0 at random state
R2_score 1.0 at random_state 473
R2_score 1.0 at random_state 474
R2 score 1.0 at random state 475
R2 score 1.0 at random state 476
R2_score 1.0 at random_state 477
R2 score 1.0 at random state 478
R2 score 1.0 at random state 479
R2 score 1.0 at random state 480
R2 score 1.0 at random state 481
R2 score 1.0 at random state 482
R2 score 1.0 at random state 483
R2 score 1.0 at random state 484
R2 score 1.0 at random state 485
R2 score 1.0 at random state 486
R2 score 1.0 at random_state 487
R2 score 1.0 at random state
                             488
R2 score 1.0 at random state
                             489
R2_score 1.0 at random_state
R2 score 1.0 at random state 491
R2_score 1.0 at random_state 492
R2 score 1.0 at random state 493
R2_score 1.0 at random_state 494
R2_score 1.0 at random_state 495
R2 score 1.0 at random state 496
R2 score 1.0 at random state 497
R2 score 1.0 at random state 498
R2 score 1.0 at random state 499
R2 score 1.0 at random state 500
R2 score 1.0 at random state 501
R2 score 1.0 at random state 502
R2 score 1.0 at random state 503
R2 score 1.0 at random state 504
R2 score 1.0 at random state 505
R2 score 1.0 at random state 506
R2_score 1.0 at random_state 507
R2 score 1.0 at random state 508
R2 score 1.0 at random_state
                             509
R2 score 1.0 at random state
                             510
```

```
R2 score 1.0 at random state
R2 score 1.0 at random_state
R2_score 1.0 at random state 513
R2 score 1.0 at random state 514
R2 score 1.0 at random state 515
R2 score 1.0 at random state 516
R2 score 1.0 at random state 517
R2 score 1.0 at random state 518
R2 score 1.0 at random state 519
R2 score 1.0 at random state 520
R2 score 1.0 at random state 521
R2 score 1.0 at random state
R2 score 1.0 at random state 523
R2 score 1.0 at random state
R2_score 1.0 at random_state
R2 score 1.0 at random state
R2_score 1.0 at random_state 527
R2 score 1.0 at random state 528
R2 score 1.0 at random state 529
R2_score 1.0 at random_state 530
R2 score 1.0 at random state 531
R2 score 1.0 at random state 532
R2 score 1.0 at random state 533
R2 score 1.0 at random state 534
R2 score 1.0 at random state 535
R2 score 1.0 at random state 536
R2 score 1.0 at random state 537
R2 score 1.0 at random state 538
R2 score 1.0 at random state 539
R2 score 1.0 at random state 540
R2 score 1.0 at random state 541
R2_score 1.0 at random_state 542
R2 score 1.0 at random state 543
R2 score 1.0 at random state 544
R2_score 1.0 at random_state 545
R2_score 1.0 at random_state 546
R2 score 1.0 at random state 547
R2 score 1.0 at random state 548
R2_score 1.0 at random_state 549
R2 score 1.0 at random state 550
R2 score 1.0 at random state 551
R2 score 1.0 at random state 552
R2 score 1.0 at random state 553
R2 score 1.0 at random state 554
R2 score 1.0 at random state 555
R2 score 1.0 at random state 556
R2 score 1.0 at random state 557
R2 score 1.0 at random state 558
R2 score 1.0 at random state 559
R2 score 1.0 at random state 560
R2 score 1.0 at random state
R2_score 1.0 at random_state
R2 score 1.0 at random state
                             563
R2_score 1.0 at random_state
                             564
R2_score 1.0 at random_state 565
R2 score 1.0 at random state 566
R2_score 1.0 at random_state 567
R2 score 1.0 at random state 568
R2 score 1.0 at random state 569
R2 score 1.0 at random state 570
R2 score 1.0 at random state 571
R2 score 1.0 at random state 572
R2 score 1.0 at random state 573
R2 score 1.0 at random state 574
R2 score 1.0 at random state 575
R2 score 1.0 at random state 576
R2 score 1.0 at random state 577
R2 score 1.0 at random state
                             578
R2_score 1.0 at random_state 579
R2 score 1.0 at random state 580
R2 score 1.0 at random_state
                             581
R2 score 1.0 at random state
                             582
```

```
R2 score 1.0 at random state
R2_score 1.0 at random_state 584
R2_score 1.0 at random state 585
R2 score 1.0 at random state 586
R2 score 1.0 at random state 587
R2 score 1.0 at random state 588
R2 score 1.0 at random state 589
R2 score 1.0 at random state 590
R2 score 1.0 at random state 591
R2 score 1.0 at random state 592
R2 score 1.0 at random state 593
R2 score 1.0 at random_state
                             594
R2 score 1.0 at random state
                             595
R2 score 1.0 at random state
                             596
R2_score 1.0 at random_state
R2 score 1.0 at random state
R2_score 1.0 at random_state 599
R2 score 1.0 at random state 600
R2 score 1.0 at random state 601
R2_score 1.0 at random_state 602
R2_score 1.0 at random state 603
R2 score 1.0 at random state 604
R2 score 1.0 at random state 605
R2 score 1.0 at random state 606
R2 score 1.0 at random state 607
R2 score 1.0 at random state 608
R2 score 1.0 at random state 609
R2 score 1.0 at random state 610
R2 score 1.0 at random state 611
R2 score 1.0 at random state 612
R2 score 1.0 at random_state 613
R2_score 1.0 at random_state 614
R2 score 1.0 at random state 615
R2 score 1.0 at random state 616
R2_score 1.0 at random_state 617
R2_score 1.0 at random_state 618
R2 score 1.0 at random state 619
R2 score 1.0 at random state 620
R2_score 1.0 at random_state 621
R2 score 1.0 at random state 622
R2 score 1.0 at random state 623
R2 score 1.0 at random state 624
R2 score 1.0 at random state 625
R2 score 1.0 at random state 626
R2 score 1.0 at random state 627
R2 score 1.0 at random state 628
R2 score 1.0 at random state 629
R2 score 1.0 at random state 630
R2 score 1.0 at random_state 631
R2 score 1.0 at random state
R2 score 1.0 at random state
R2_score 1.0 at random_state
R2 score 1.0 at random state 635
R2_score 1.0 at random_state 636
R2_score 1.0 at random_state 637
R2 score 1.0 at random state 638
R2_score 1.0 at random_state 639
R2 score 1.0 at random state 640
R2 score 1.0 at random state 641
R2 score 1.0 at random state 642
R2 score 1.0 at random state 643
R2 score 1.0 at random state 644
R2 score 1.0 at random state 645
R2 score 1.0 at random state 646
R2 score 1.0 at random state 647
R2 score 1.0 at random state 648
R2_score 1.0 at random_state 649
R2 score 1.0 at random state
                             650
R2 score 1.0 at random_state
                             651
R2 score 1.0 at random state 652
R2 score 1.0 at random state
R2 score 1.0 at random state
                             654
```

```
R2 score 1.0 at random state
                              655
R2 score 1.0 at random_state
R2 score 1.0 at random state 657
R2 score 1.0 at random state 658
R2 score 1.0 at random state 659
R2 score 1.0 at random state 660
R2 score 1.0 at random state 661
R2 score 1.0 at random state 662
R2 score 1.0 at random state 663
R2 score 1.0 at random state
R2 score 1.0 at random state
R2 score 1.0 at random_state
                              666
R2 score 1.0 at random state
                              667
R2 score 1.0 at random_state
                              668
R2_score 1.0 at random_state
                              670
R2 score 1.0 at random state
R2_score 1.0 at random_state 671
                              672
R2 score 1.0 at random state
R2_score 1.0 at random_state 673
R2_score 1.0 at random_state 674
R2 score 1.0 at random state 675
R2 score 1.0 at random state 676
R2 score 1.0 at random state 677
R2 score 1.0 at random state 678
R2 score 1.0 at random state 679
R2 score 1.0 at random state 680
R2 score 1.0 at random state 681
R2 score 1.0 at random state 682
R2 score 1.0 at random state 683
R2 score 1.0 at random_state 684
R2 score 1.0 at random_state
                             685
R2 score 1.0 at random_state
                             686
R2 score 1.0 at random state
R2 score 1.0 at random state
R2_score 1.0 at random_state 689
R2_score 1.0 at random_state 690
R2 score 1.0 at random state 691
R2 score 1.0 at random state 692
R2_score 1.0 at random_state 693
R2 score 1.0 at random state 694
R2 score 1.0 at random state 695
R2 score 1.0 at random state 696
R2 score 1.0 at random state 697
R2 score 1.0 at random state 698
R2 score 1.0 at random state
R2 score 1.0 at random state
                              700
R2 score 1.0 at random state
                              701
R2 score 1.0 at random state
                              702
R2 score 1.0 at random state
                              703
R2 score 1.0 at random state
                              704
R2 score 1.0 at random state
                              705
R2_score 1.0 at random_state
                              706
                              707
R2 score 1.0 at random state
R2_score 1.0 at random_state
                              708
                              709
R2 score 1.0 at random state
R2_score 1.0 at random_state 710
R2_score 1.0 at random_state 711
R2 score 1.0 at random state 712
R2 score 1.0 at random state 713
R2 score 1.0 at random state
                             714
R2 score 1.0 at random state
                             715
R2 score 1.0 at random state
R2 score 1.0 at random state
                             717
R2 score 1.0 at random state
                             718
R2 score 1.0 at random state
                             719
R2 score 1.0 at random state
                             720
                             721
R2 score 1.0 at random state
R2 score 1.0 at random state
                              722
R2 score 1.0 at random_state
                              723
R2 score 1.0 at random state
                             724
R2 score 1.0 at random state
                             725
R2 score 1.0 at random state
                             726
```

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R2 score 1.0 at random state
                              727
R2 score 1.0 at random_state
                              728
                              729
R2 score 1.0 at random state
R2 score 1.0 at random state
                              730
R2 score 1.0 at random state
                              731
R2 score 1.0 at random state
                              735
R2 score 1.0 at random state
                              736
R2 score 1.0 at random state
                              737
R2 score 1.0 at random_state
                              738
R2 score 1.0 at random state
                              739
R2 score 1.0 at random state
                              740
R2_score 1.0 at random_state
                              741
R2 score 1.0 at random state
R2_score 1.0 at random_state
                              743
R2 score 1.0 at random state
                              744
                             745
R2 score 1.0 at random state
R2_score 1.0 at random_state 746
                             747
R2 score 1.0 at random state
R2 score 1.0 at random state 748
R2 score 1.0 at random state
                             749
R2 score 1.0 at random state
                             750
                             751
R2 score 1.0 at random state
R2 score 1.0 at random state
                             752
R2 score 1.0 at random state
                             753
R2 score 1.0 at random state
                             754
R2 score 1.0 at random state
                             755
R2 score 1.0 at random_state
                              756
R2 score 1.0 at random_state
                              757
R2_score 1.0 at random_state
                              758
R2 score 1.0 at random state
                              759
                              760
R2 score 1.0 at random state
R2_score 1.0 at random_state
                              761
R2_score 1.0 at random_state
                              762
R2 score 1.0 at random state
                              763
R2 score 1.0 at random state
                             764
                             765
R2_score 1.0 at random_state
R2 score 1.0 at random_state
                             766
R2 score 1.0 at random state
                             767
R2 score 1.0 at random state
                              772
R2 score 1.0 at random state
                              773
                              774
R2 score 1.0 at random state
R2 score 1.0 at random state
                              775
R2 score 1.0 at random state
                              776
                              777
R2 score 1.0 at random state
R2_score 1.0 at random_state
                              778
                              779
R2 score 1.0 at random state
R2_score 1.0 at random_state
                              780
                              781
R2 score 1.0 at random state
                              782
R2 score 1.0 at random state
R2_score 1.0 at random_state 783
R2 score 1.0 at random state 784
R2 score 1.0 at random state
                             785
R2 score 1.0 at random state
                             786
R2 score 1.0 at random state
                             787
R2 score 1.0 at random state
R2 score 1.0 at random state
                              789
R2 score 1.0 at random state
                              790
R2 score 1.0 at random state
                              791
R2 score 1.0 at random state
                              792
R2 score 1.0 at random state
                              793
R2 score 1.0 at random state
                              794
R2 score 1.0 at random_state
                              795
R2 score 1.0 at random state
                              796
                              797
R2 score 1.0 at random state
R2 score 1.0 at random state
                              798
```

```
R2 score 1.0 at random state
                             799
R2_score 1.0 at random_state 800
R2 score 1.0 at random state 801
R2 score 1.0 at random state 802
R2 score 1.0 at random state 803
R2 score 1.0 at random state 804
R2 score 1.0 at random state 805
R2 score 1.0 at random state 806
R2 score 1.0 at random state 807
R2 score 1.0 at random state 808
R2 score 1.0 at random state 809
R2 score 1.0 at random_state
                             810
R2 score 1.0 at random state
                             811
R2 score 1.0 at random state
                             812
R2_score 1.0 at random_state 813
R2 score 1.0 at random state 814
R2_score 1.0 at random_state 815
R2 score 1.0 at random state 816
R2 score 1.0 at random state 817
R2_score 1.0 at random_state 818
R2 score 1.0 at random state 819
R2 score 1.0 at random state 820
R2 score 1.0 at random state 821
R2 score 1.0 at random state 822
R2 score 1.0 at random state 823
R2 score 1.0 at random state 824
R2 score 1.0 at random state 825
R2 score 1.0 at random state 826
R2 score 1.0 at random state 827
R2 score 1.0 at random state 828
R2 score 1.0 at random state 829
R2_score 1.0 at random_state 830
R2_score 1.0 at random_state 831
R2_score 1.0 at random_state 832
R2_score 1.0 at random_state 833
R2_score 1.0 at random_state 834
R2 score 1.0 at random state 835
R2 score 1.0 at random state 836
R2_score 1.0 at random_state 837
R2 score 1.0 at random state 838
R2 score 1.0 at random state 839
R2 score 1.0 at random state 840
R2 score 1.0 at random state 841
R2 score 1.0 at random state 842
R2 score 1.0 at random state 843
R2 score 1.0 at random state 844
R2 score 1.0 at random state 845
R2 score 1.0 at random state 846
R2 score 1.0 at random state 847
R2 score 1.0 at random state 848
R2 score 1.0 at random state 849
R2_score 1.0 at random_state 850
R2 score 1.0 at random state 851
R2_score 1.0 at random_state 852
R2 score 1.0 at random state 853
R2 score 1.0 at random state 854
R2_score 1.0 at random_state 855
R2 score 1.0 at random state 856
R2 score 1.0 at random state 857
R2 score 1.0 at random state 858
R2 score 1.0 at random state 859
R2 score 1.0 at random state 860
R2 score 1.0 at random state 861
R2 score 1.0 at random state 862
R2 score 1.0 at random state 863
R2 score 1.0 at random state 864
R2 score 1.0 at random state 865
R2 score 1.0 at random state 866
R2_score 1.0 at random_state 867
R2 score 1.0 at random state 868
R2 score 1.0 at random_state 869
R2 score 1.0 at random state 870
```

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R2 score 1.0 at random state
R2 score 1.0 at random_state
R2 score 1.0 at random state 873
R2 score 1.0 at random state 874
R2 score 1.0 at random state
                             875
R2 score 1.0 at random state
R2 score 1.0 at random_state
R2 score 1.0 at random state
                             883
R2 score 1.0 at random state
                             884
R2 score 1.0 at random state
R2 score 1.0 at random state
R2_score 1.0 at random_state 887
R2 score 1.0 at random state 888
R2 score 1.0 at random state 889
R2_score 1.0 at random_state 890
R2 score 1.0 at random state 891
R2 score 1.0 at random state 892
R2 score 1.0 at random state 893
R2 score 1.0 at random state 894
R2 score 1.0 at random state 895
R2 score 1.0 at random state 896
R2 score 1.0 at random state 897
R2 score 1.0 at random state 898
R2 score 1.0 at random state 899
R2 score 1.0 at random state 900
R2 score 1.0 at random state 901
R2_score 1.0 at random_state 902
R2 score 1.0 at random state 903
R2 score 1.0 at random state 904
R2_score 1.0 at random_state 905
R2_score 1.0 at random_state 906
R2 score 1.0 at random state 907
R2 score 1.0 at random state 908
R2_score 1.0 at random_state 909
R2 score 1.0 at random state 910
R2 score 1.0 at random state 911
R2 score 1.0 at random state 912
R2 score 1.0 at random state 913
R2 score 1.0 at random state 914
R2 score 1.0 at random state 915
R2 score 1.0 at random state 916
R2 score 1.0 at random state 917
R2 score 1.0 at random state 918
R2 score 1.0 at random state 919
R2 score 1.0 at random state 920
R2 score 1.0 at random state
R2_score 1.0 at random_state
R2 score 1.0 at random state 923
R2_score 1.0 at random_state 924
R2 score 1.0 at random state 925
R2 score 1.0 at random state 926
R2_score 1.0 at random_state 927
R2 score 1.0 at random state 928
R2 score 1.0 at random state 929
R2 score 1.0 at random state 930
R2 score 1.0 at random state 931
R2 score 1.0 at random state 932
R2 score 1.0 at random state 933
R2 score 1.0 at random state 934
R2 score 1.0 at random state 935
R2 score 1.0 at random state 936
R2_score 1.0 at random_state 937
                            938
R2 score 1.0 at random state
R2_score 1.0 at random_state 939
R2 score 1.0 at random state 940
R2 score 1.0 at random state
R2 score 1.0 at random state
                             942
```

```
R2 score 1.0 at random state
                             943
R2_score 1.0 at random_state 944
R2 score 1.0 at random state 945
R2 score 1.0 at random state 946
R2 score 1.0 at random state 947
R2 score 1.0 at random state 948
R2 score 1.0 at random state 949
R2 score 1.0 at random state 950
R2 score 1.0 at random state 951
R2 score 1.0 at random state 952
R2 score 1.0 at random state 953
R2 score 1.0 at random state 954
R2_score 1.0 at random state 955
R2_score 1.0 at random state 956
R2_score 1.0 at random_state 957
R2 score 1.0 at random state 958
R2_score 1.0 at random_state 959
R2_score 1.0 at random_state 960
R2_score 1.0 at random_state 961
R2_score 1.0 at random_state 962
R2_score 1.0 at random state 963
R2_score 1.0 at random state 964
R2 score 1.0 at random state 965
R2 score 1.0 at random state 966
R2 score 1.0 at random state 967
R2 score 1.0 at random state 968
R2 score 1.0 at random state 969
R2 score 1.0 at random state 970
R2 score 1.0 at random state 971
R2 score 1.0 at random state 972
R2 score 1.0 at random state 973
R2_score 1.0 at random_state 974
R2 score 1.0 at random state 975
R2_score 1.0 at random_state 976
R2_score 1.0 at random_state 977
R2_score 1.0 at random_state 978
R2_score 1.0 at random_state 979
R2_score 1.0 at random_state 980
R2_score 1.0 at random_state 981
R2 score 1.0 at random state 982
R2 score 1.0 at random state 983
R2 score 1.0 at random state 984
R2 score 1.0 at random state 985
R2 score 1.0 at random state 986
R2 score 1.0 at random state 987
R2 score 1.0 at random state 988
R2 score 1.0 at random state 989
R2 score 1.0 at random state 990
R2_score 1.0 at random_state 991
R2 score 1.0 at random state 992
R2_score 1.0 at random state 993
R2_score 1.0 at random_state 994
R2_score 1.0 at random_state 995
R2_score 1.0 at random_state 996
R2_score 1.0 at random_state 997
R2_score 1.0 at random_state 998
R2_score 1.0 at random_state 999
```

## In [49]:

x\_train,x\_test,y\_train,y\_test=train\_test\_split(x\_train1,y\_train1,test\_size=0.20) #at defa
ult random\_size as all values is the same at all random\_state
lr.fit(x\_train,y\_train)

#### Out[49]:

▼ LinearRegression

LinearRegression()

## **PKEDICTION**

```
In [50]:
```

```
predlr=lr.predict(x_test)
score=r2_score(y_test,predlr)
print('Best r2_score', score*100,'of model',lr)
```

Best r2\_score 100.0 of model LinearRegression()

# **SAVING THE BEST MODEL**

```
In [51]:
```

```
import pickle
filename='customer_retention_dataset.pkl'
pickle.dump(lr,open(filename,'wb'))
```

# **DISPLAYING THE BEST MODEL**

```
In [52]:
```

```
best_model=pickle.load(open(filename, 'rb'))
best_model
```

#### Out[52]:

```
▼ LinearRegression
LinearRegression()
```

### In [ ]: