Q1.

```
0                          franca
1          sao bernardo do campo
2                       sao paulo
3                 mogi das cruzes
4                        campinas
...                           ...
4114                       siriji
4115          natividade da serra
4116                 monte bonito
4117                   sao rafael
4118             eugenio de castro

[4119 rows x 1 columns]
```

Q2.

```
total orders placed in 2017 are 45101
```

Q3.

```
                    Category       Sales
0                   PERFUMERY    506738.66
1        FURNITURE DECORATION   1430176.39
2                   TELEPHONY    486882.05
3              BED TABLE BATH   1712553.67
4                  AUTOMOTIVE    852294.33
..                       ...          ...
69              CDS MUSIC DVDS     1199.43
70                  LA CUISINE     2913.53
71   FASHION CHILDREN'S CLOTHING    785.67
72                    PC GAMER     2174.43
73        INSURANCE AND SERVICES    324.51

[74 rows x 2 columns]
```
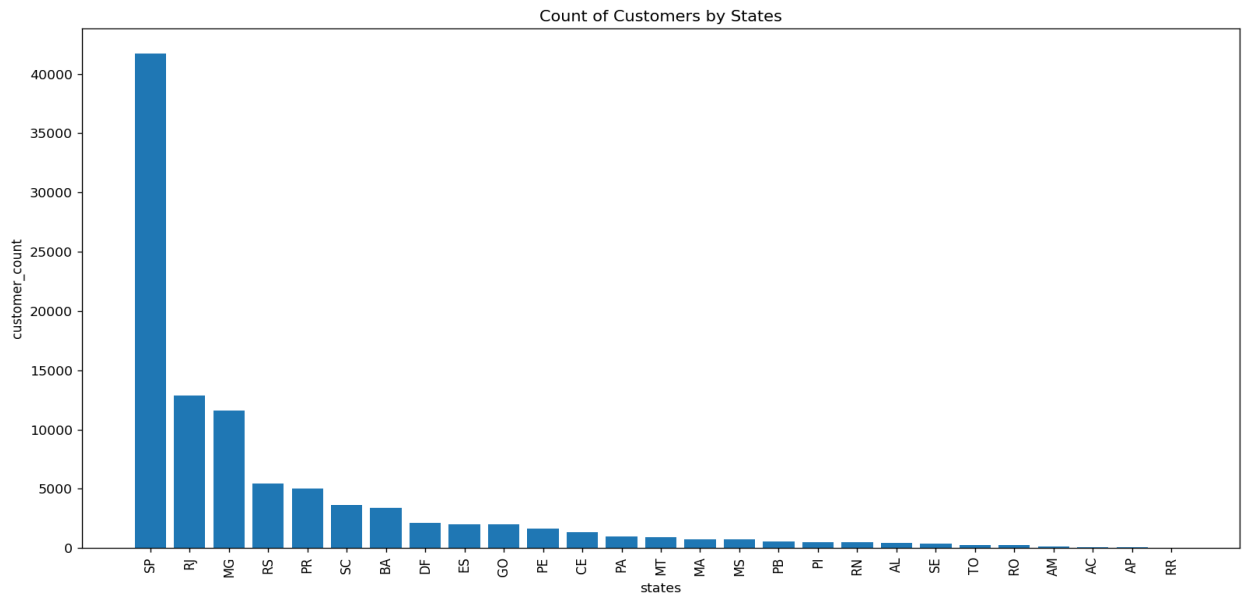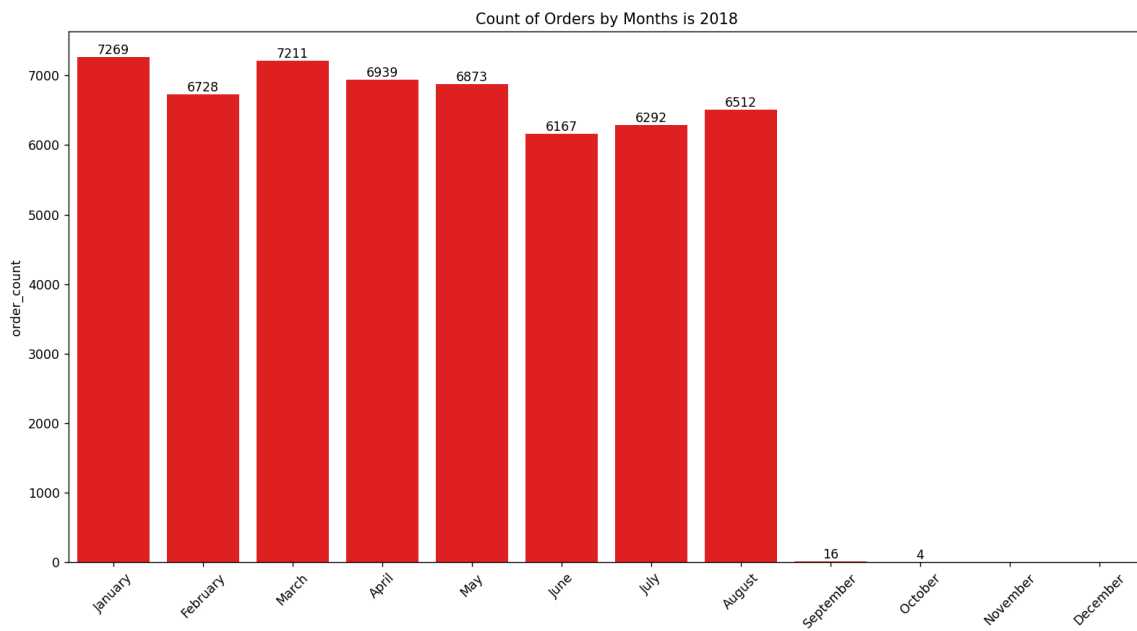
Q4.

the percentage of orders that were paid in installments is 49.4176

Q5.

Count of Customers by States

Q6.

Count of Orders by Months is 2018

Q7.

```
          customer city  average products/order
0          padre carvalho                    7.00
1             celso ramos                    6.50
2                   datas                    6.00
3           candido godoi                    6.00
4          matias olimpio                    5.00
...                   ...                     ...
4105        lagoa da canoa                    1.00
4106           japaratuba                    1.00
4107        sebastiao leal                    1.00
4108  morro agudo de goias                    1.00
4109         padre paraiso                    1.00

[4110 rows x 2 columns]
```

Q8.

```
                  Category  percentage distribution
0             BED TABLE BATH                     10.70
1              HEALTH BEAUTY                     10.35
2        COMPUTER ACCESSORIES                      9.90
3        FURNITURE DECORATION                      8.93
4             WATCHES PRESENT                      8.93
..                      ...                       ...
69            HOUSE COMFORT 2                      0.01
70              CDS MUSIC DVDS                      0.01
71                   PC GAMER                      0.01
72  FASHION CHILDREN'S CLOTHING                    0.00
73        INSURANCE AND SERVICES                   0.00

[74 rows x 2 columns]
```
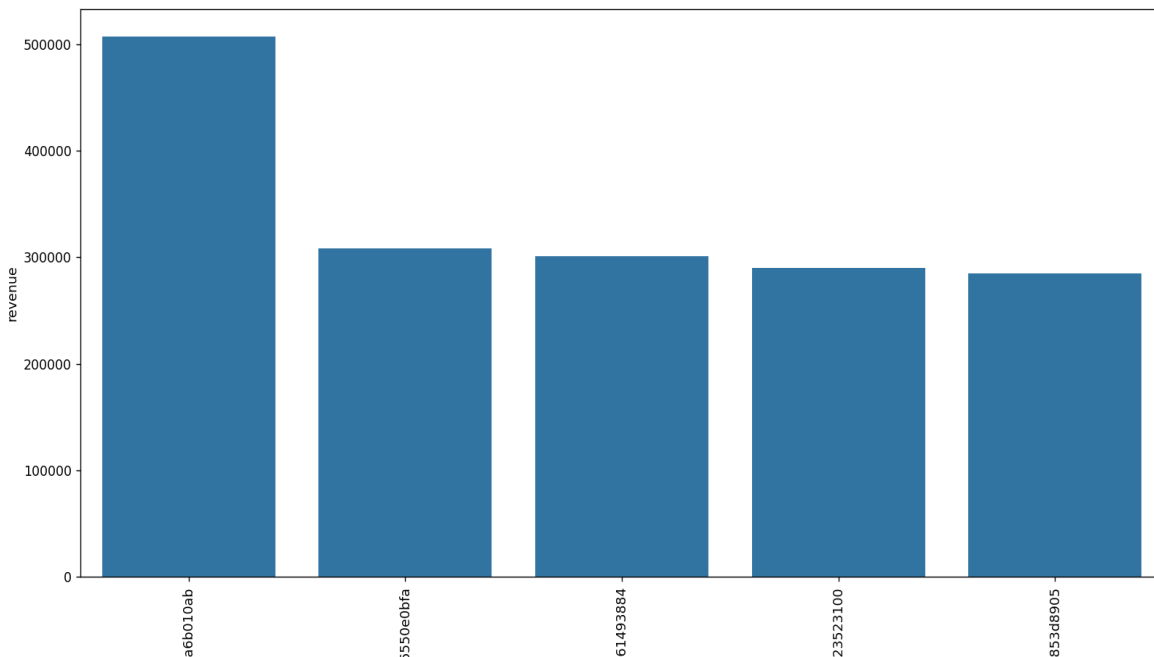
Q9.

```
the correlation is -0.10631514167157562
```

Q10.

Q11.

0	00012a2ce6f8dcda20d059ce98491703	2017-11-14 16:08:26	114.74	114.739998
1	000161a058600d5901f007fab4c27140	2017-07-16 09:40:32	67.41	67.410004
2	0001fd6190edaaf884bcaf3d49edf079	2017-02-28 11:06:43	195.42	195.419998
3	0002414f95344307404f0ace7a26f1d5	2017-08-16 13:09:20	179.35	179.350006
4	000379cdec625522490c315e70c7a9fb	2018-04-02 13:42:17	107.01	107.010002
...	...	...	...	...
103881	fffecc9f79fd8c764f843e9951b11341	2018-03-29 16:59:26	71.23	27.120001
103882	fffeda5b6d849fbd39689bb92087f431	2018-05-22 13:36:02	63.13	63.130001
103883	ffff42319e9b2d713724ae527742af25	2018-06-13 16:57:05	214.13	214.130005
103884	ffffa3172527f765de70084a7e53aae8	2017-09-02 11:53:32	45.50	45.500000
103885	ffffe8b65bbe3087b653a978c870db99	2017-09-29 14:07:03	18.37	18.370001

103886 rows × 4 columns

Q12.

```
0    2016    9        252.24         252.24
1    2016   10      59090.48       59342.72
2    2016   12         19.62       59362.34
3    2017    1     138488.04      197850.38
4    2017    2     291908.01      489758.39
5    2017    3     449863.60      939621.99
6    2017    4     417788.03     1357410.02
7    2017    5     592918.82     1950328.84
8    2017    6     511276.38     2461605.22
9    2017    7     592382.92     3053988.14
10   2017    8     674396.32     3728384.46
11   2017    9     727762.45     4456146.91
12   2017   10     779677.88     5235824.79
13   2017   11    1194882.80     6430707.59
14   2017   12     878401.48     7309109.07
15   2018    1    1115004.18     8424113.25
16   2018    2     992463.34     9416576.59
17   2018    3    1159652.12    10576228.71
18   2018    4    1160785.48    11737014.19
19   2018    5    1153982.15    12890996.34
20   2018    6    1023880.50    13914876.84
21   2018    7    1066540.75    14981417.59
22   2018    8    1022425.32    16003842.91
23   2018    9       4439.54    16008282.45
24   2018   10        589.67    16008872.12
```

Q13.

```
   years  yoy % growth
0   2016            NaN
1   2017   12112.703761
2   2018      20.000924
```

Q14.

```
[(None,)]
```

Q15.