

Python 3.8.5 (default, Sep 3 2020, 21:29:08) [MSC v.1916 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 7.22.0 -- An enhanced Interactive Python.

```
In [1]: 'C:/Users/hwang/Desktop/Spring2021/CIS9650/FinalGroup5.py'
       = 'C:/Users/hwang/Desktop/Spring2021/CIS9650'
#####
##### STEP 0 - DATA LOADING #####
#####
<ipython-input-1-7970e417a65a>:1: DtypeWarning: Columns (18,38) have mixed
types.Specify dtype option on import or set low_memory=False.
  runfile('C:/Users/hwang/Desktop/Spring2021/CIS9650/FinalGroup5.py', wdir='C:/
Users/hwang/Desktop/Spring2021/CIS9650')
10803028 records were read from file.
```

```
#####
##### STEP 1 - DATA CLEANING #####
#####
Summons Number Plate ID ... Hydrant Violation Double Parking Violation
0      5092469481  GZH7067 ...           NaN           NaN
1      5092451658  GZH7067 ...           NaN           NaN
2      4006265037  FZX9232 ...           NaN           NaN
3      8478629828  66623ME ...           NaN           NaN
4      7868300310  37033JV ...           NaN           NaN
```

```
[5 rows x 43 columns]
10725125 records left after cleaning.
10597597 records left after dropping null values from certain columns.
C:\Users\hwang\Desktop\Spring2021\CIS9650\FinalGroup5.py:42:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy
  new['I_Date']=pd.to_datetime(df['Issue Date'])
C:\Users\hwang\Desktop\Spring2021\CIS9650\FinalGroup5.py:46:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy
  new['I_Month']=pd.DatetimeIndex(new['Issue Date']).month
C:\Users\hwang\Desktop\Spring2021\CIS9650\FinalGroup5.py:47:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
new['I_Year']=pd.DatetimeIndex(new['Issue Date']).year
```

C:\Users\hwang\Desktop\Spring2021\CIS9650\FinalGroup5.py:48:

SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame.

Try using `.loc[row_indexer,col_indexer] = value` instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy

```
new['I_Day']=pd.DatetimeIndex(new['Issue Date']).dayofweek.map(dayOfWeek)
```

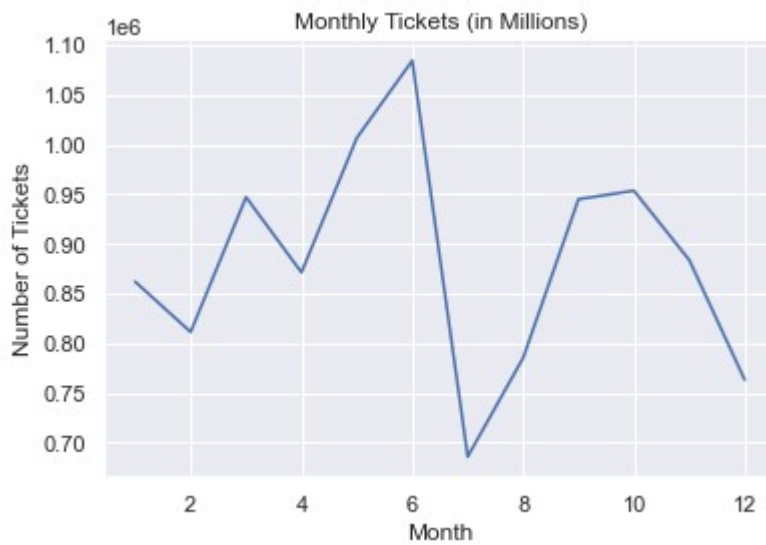
```
#####  
##### STEP 2 - DATA ANALYSIS #####  
#####
```

There were issued 10597597 tickets during 2017 fiscal year in NYC.

Here's monthly analysis on NYC parking tickets data:

	Month	Number of Tickets
0	1	861753
1	2	811250
2	3	946861
3	4	871142
4	5	1006591
5	6	1084138
6	7	685915
7	8	785077
8	9	944792
9	10	953353
10	11	883564
11	12	763161

This is a line chart showing Distribution of Monthly Tickets in NYC

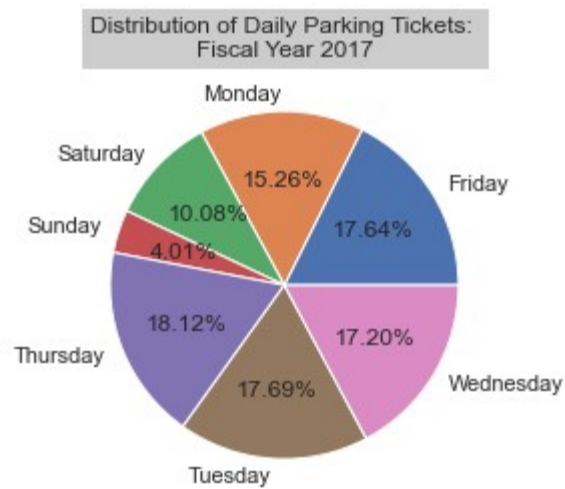


It shows NYC Parking tickets peaked in June

Top 3 months that parking tickets were issued the most:

```
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```

	index	I_Month	Plate ID
0	5	6	1084138
1	4	5	1006591
2	9	10	953353



Ranking of ticket distribution by Counties:

```
=====
```

	index	Violation County	count
0	2	Manhattan	3472281
1	1	Brooklyn	3047525
2	3	Queens	2485771
3	0	Bronx	1335003
4	4	Staten Island	257017

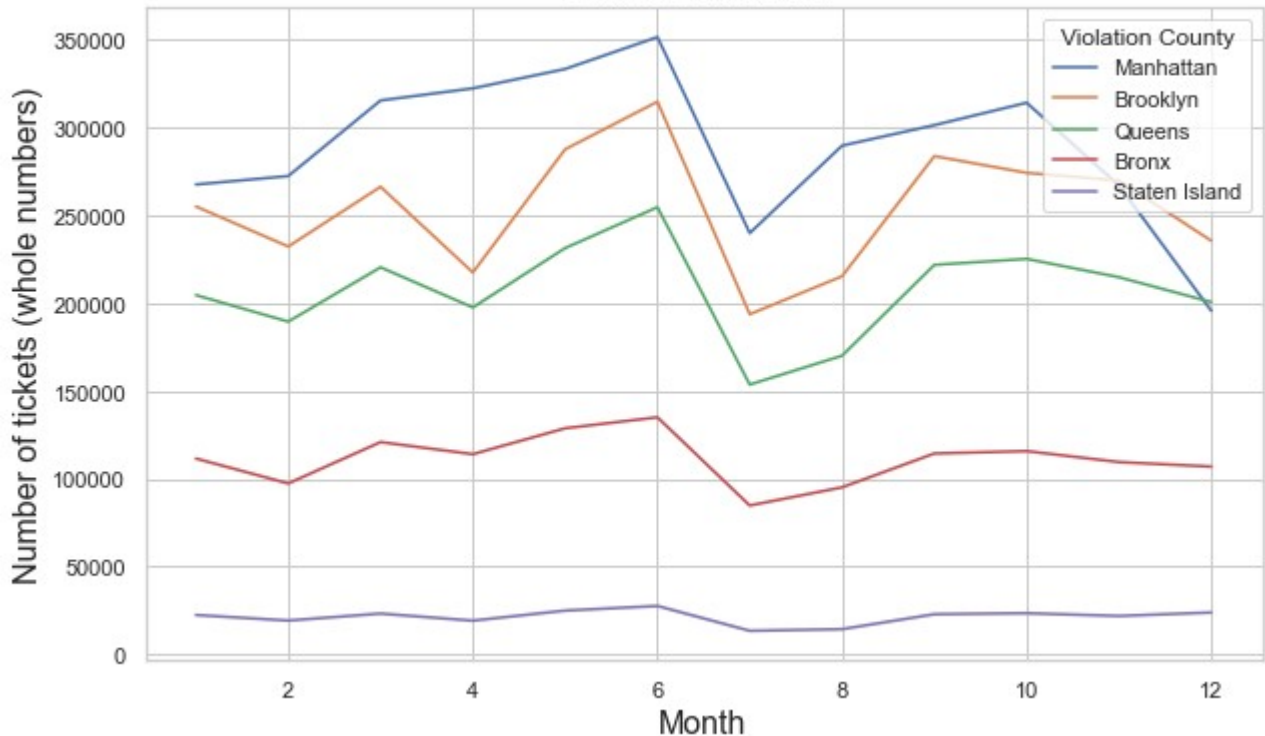
Manhattan has issued the most tickets in the 2017 fiscal year.

This line graph is displaying monthly tickets distribution by county in NYC

	Violation County	I_Month	count
29	Manhattan	6	351710
28	Manhattan	5	333526
27	Manhattan	4	322501
26	Manhattan	3	315601
17	Brooklyn	6	314907
33	Manhattan	10	314309
32	Manhattan	9	301544
31	Manhattan	8	289861
16	Brooklyn	5	287750
20	Brooklyn	9	283900
21	Brooklyn	10	274358
25	Manhattan	2	272524
22	Brooklyn	11	270010
24	Manhattan	1	267730
34	Manhattan	11	267129
14	Brooklyn	3	266442
12	Brooklyn	1	255218
41	Queens	6	254799
30	Manhattan	7	240046
23	Brooklyn	12	235685
13	Brooklyn	2	232394
40	Queens	5	231501
45	Queens	10	225362
44	Queens	9	221939
38	Queens	3	220552
15	Brooklyn	4	217618
19	Brooklyn	8	215439
46	Queens	11	214910
36	Queens	1	204722
47	Queens	12	200755
39	Queens	4	197689
35	Manhattan	12	195800
18	Brooklyn	7	193804
37	Queens	2	189616
43	Queens	8	170187
42	Queens	7	153739
5	Bronx	6	135109
4	Bronx	5	128831
2	Bronx	3	120985
9	Bronx	10	115834
8	Bronx	9	114487
3	Bronx	4	114086
0	Bronx	1	111611
10	Bronx	11	109593
11	Bronx	12	107019
1	Bronx	2	97406

7	Bronx	8	95192
6	Bronx	7	84850
53	Staten Island	6	27613
52	Staten Island	5	24983
59	Staten Island	12	23902
57	Staten Island	10	23490
50	Staten Island	3	23281
56	Staten Island	9	22922
48	Staten Island	1	22472
58	Staten Island	11	21922
49	Staten Island	2	19310
51	Staten Island	4	19248
55	Staten Island	8	14398
54	Staten Island	7	13476

Distribution of Monthly Parking Tickets by County:
Fiscal Year 2017



Summary of Code Violations by year

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Top five parking violation codes of the tickets that were given the most during a year.

Violation Code

21	1494376
36	1398672
38	1054683
14	877456
20	607824

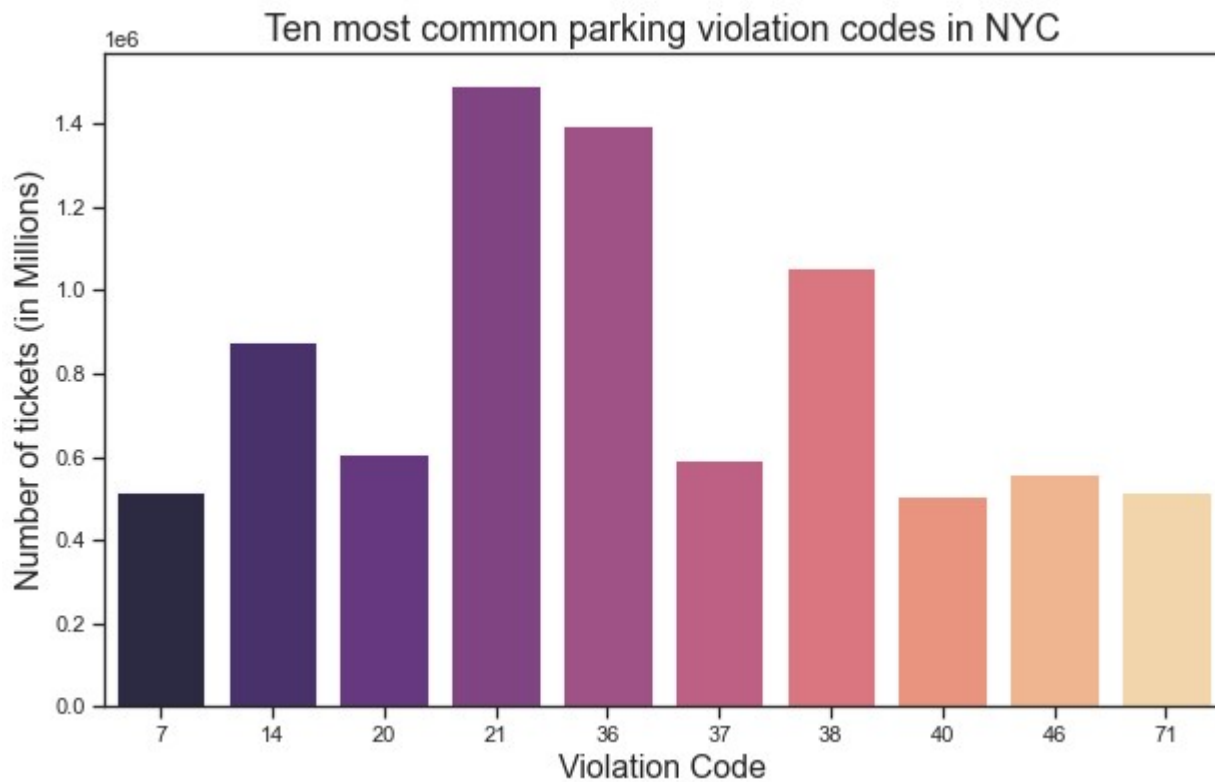
Name: I_Year, dtype: int64

Top five violation codes of the tickets that were given the least during a year.
Violation Code

57	5
28	7
44	7
86	10
54	11

Name: I_Year, dtype: int64

This bar chart is displaying ten most common parking violation codes in NYC



This bar chart is displaying ten least common parking violation codes in NYC



Top Three Vehicle Make & Year That Received Tickets This Fiscal Year

```
=====
Vehicle Make  Vehicle Year
TOYOT        2015          153685
HONDA        2016          119236
NISSA        2015          112229
```

dtype: int64

Are In State cars or Out of State cars more likely to violate the rules?

```
=====
In State cars are more likely to violate rules.
```

	Registration State	count
44	NY	8381949
39	NJ	910766
49	PA	279950
12	FL	142185
8	CT	127770
20	IN	79130
24	MA	76110
60	VA	71432
26	MD	61043
35	NC	54798

Consistency in violating the parking rules by the same cars

```
=====
Plate ID  Violation Code  count
819216    85848MD        46      880
```

271683	30954JX	46	792
924507	96087MA	46	790
53367	14828MJ	46	747
924546	96089MA	46	747
...
2438598	FRV7591	40	1
2438597	FRV7591	21	1
2438596	FRV7591	20	1
2438595	FRV7591	19	1
6409128	t65GYV	21	1

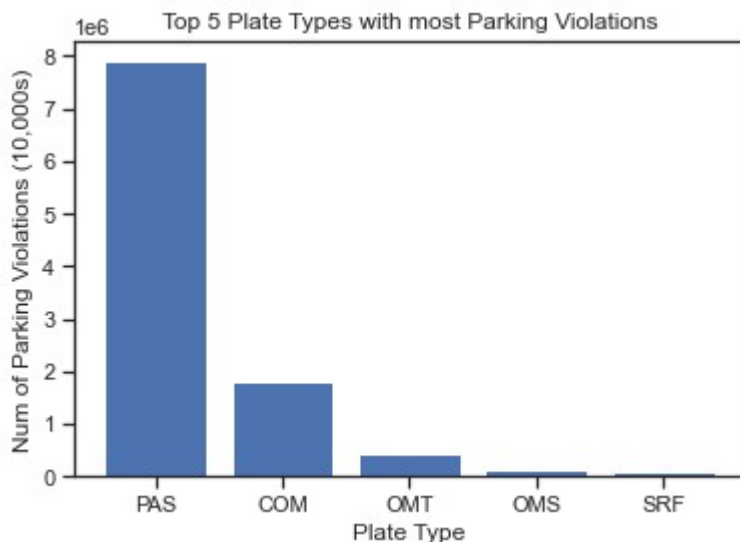
[6409129 rows x 3 columns]

The code 46 which is the most violated by the same people is the one we know as double parking

The top 5 plate types that received tickets in NYC

```
=====
Plate Type    count
58            PAS  7898104
17            COM  1798455
53            OMT   446595
52            OMS   108288
69            SRF   88457
```

As we can see in our graph, PAS plates are the most common to receive tickets with a big difference compared to the other plate's types



```
#####
##### STEP 3 - INTERACTIVE ANALYSIS #####
#####
```

Summary of Automobile Violations by Season

=====

Would you like to see the Automobile Violations Summary by Season (y/n): y

Enter name of the season (Spring, Summer, Fall, or Winter): Winter

The total number of given tickets by Season

Winter 2436164

Name: I_Month, dtype: int64

The maximum number of tickets was given on I_Day

Tuesday 446405

Name: Season, dtype: int64

The minimum number of tickets was given on I_Day

Sunday 92356

Name: Season, dtype: int64

None

Summary of Automobile Violations by Month

=====

When do you plan to visit NYC? Provide month (1 ~ 12):

Enter month number: 9

I_Month Plate ID

8 9 944792 tickets were issued in the month in 2017 fiscal year

Summary of Automobile Violations by Borough

=====

NYC Boroughs: Brooklyn, Bronx, Staten Island, Queens, Manhattan

Insert Borough Name: Queens

Month with the Most Amount of Tickets in Queens:

Violation County I_Month

Queens 6 254799

dtype: int64

Month with the Least Amount of Tickets in Queens:

Violation County I_Month

Queens 7 153739

dtype: int64

Average Number of Tickets Per Month in Queens:

207147.58333333334

Would you like to look at another borough? (y/n): n

Number of Tickets for any Registration State

=====

Please enter state abbreviation: NY

In the state of NY 8381949 tickets were distributed.

Would you like to look at another state? (y/n):n

In [2]: