

```
In [118...     import pandas as pd

In [119...     data = pd.read_csv("D:/ECE143/Project/Crime_Data_from_2010_to_2019.csv")

In [120...     data.shape

Out[120...    (2060948, 28)
```

```
In [121...     data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2060948 entries, 0 to 2060947
Data columns (total 28 columns):
 #   Column          Dtype  
--- 
 0   DR_NO           int64  
 1   Date Rptd       object 
 2   DATE OCC        object 
 3   TIME OCC        int64  
 4   AREA            int64  
 5   AREA NAME       object 
 6   Rpt Dist No    int64  
 7   Part 1-2        int64  
 8   Crm Cd          int64  
 9   Crm Cd Desc    object 
 10  Mocodes         object 
 11  Vict Age        int64  
 12  Vict Sex        object 
 13  Vict Descent   object 
 14  Premis Cd      float64
 15  Premis Desc    object 
 16  Weapon Used Cd float64
 17  Weapon Desc    object 
 18  Status          object 
 19  Status Desc    object 
 20  Crm Cd 1       float64
 21  Crm Cd 2       float64
 22  Crm Cd 3       float64
 23  Crm Cd 4       float64
 24  LOCATION         object 
 25  Cross Street   object 
 26  LAT              float64
 27  LON              float64
dtypes: float64(8), int64(7), object(13)
memory usage: 440.3+ MB
```

### Changes of different types of crime

```
In [122...     data_1 = pd.read_csv("D:/ECE143/Project/Crime_Data_from_2010_to_2019.csv", usecols=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27])

In [123...     data_1.shape

Out[123...    (2060948, 15)

In [124...     data_1 = data_1.dropna()
```

```
In [125...]  
rec_num=list(data_1['DR_NO'])  
data_1['DateTimeValues'] = pd.to_datetime(data_1['DATE OCC'])  
data_1['year'] = data_1['DateTimeValues'].dt.year  
data_1['month'] = data_1['DateTimeValues'].dt.month  
data_1['day'] = data_1['DateTimeValues'].dt.day  
year = list(data_1['year'])  
month = list(data_1['month'])  
day = list(data_1['day'])  
time_occ=list(data_1['TIME OCC'])  
area_name=list(data_1['AREA NAME'])  
crm_cd=list(data_1['Crm Cd'])  
crm_dec=list(data_1['Crm Cd Desc'])  
vict_age=list(data_1['Vict Age'])  
vict_sex=list(data_1['Vict Sex'])  
vict_descent=list(data_1['Vict Descent'])  
pre_cd=list(data_1['Premis Cd'])  
pre_dec=list(data_1['Premis Desc'])  
sta_desc=list(data_1['Status Desc'])  
crm_cd=list(data_1['Crm Cd 1'])  
loc=list(data_1['LOCATION'])
```

```
In [126...]  
from collections import defaultdict
```

```
In [127...]  
Crm_Dec_Dict = defaultdict(set)
```

```
In [128...]  
Crm_Dec_List = []
```

```
In [129...]  
for i in range(len(crm_dec)):  
    crm_dec_1 = []  
    str1 = '-'  
    if str1 in crm_dec_1:  
        crm_dec_1.replace(str1, " ")  
    crm_dec_1 = crm_dec[i].split(",")  
    Crm_Dec_Dict[rec_num[i]].add(crm_dec_1[0])  
    Crm_Dec_List.append(crm_dec_1[0])
```

```
In [130...]  
Crm_Dec_Dict[rec_num[0]]
```

```
Out[130...]  
{'VIOLATION OF COURT ORDER'}
```

```
In [131...]  
from wordcloud import WordCloud  
import matplotlib.pyplot as plt
```

```
In [132...]  
Crm_Dec_wordcloud = ",".join(Crm_Dec_List)
```

```
In [133...]  
word_cloud = WordCloud(font_path="simsun.ttc",  
                      background_color="white")  
word_cloud.generate(Crm_Dec_wordcloud)  
  
plt.subplots(figsize=(12, 8))
```

```
plt.imshow(word_cloud)  
plt.axis("off")
```

```
Out[133... (-0.5, 399.5, 199.5, -0.5)
```



```
In [137...]: years = [2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021]
```

```
In [138]: crm_dec_years = defaultdict(list)
for j in range(len(years)):
    for i in range(len(year)):
        if year[i] == years[j]:
            crm_dec_years[years[j]].append(year[i])
```

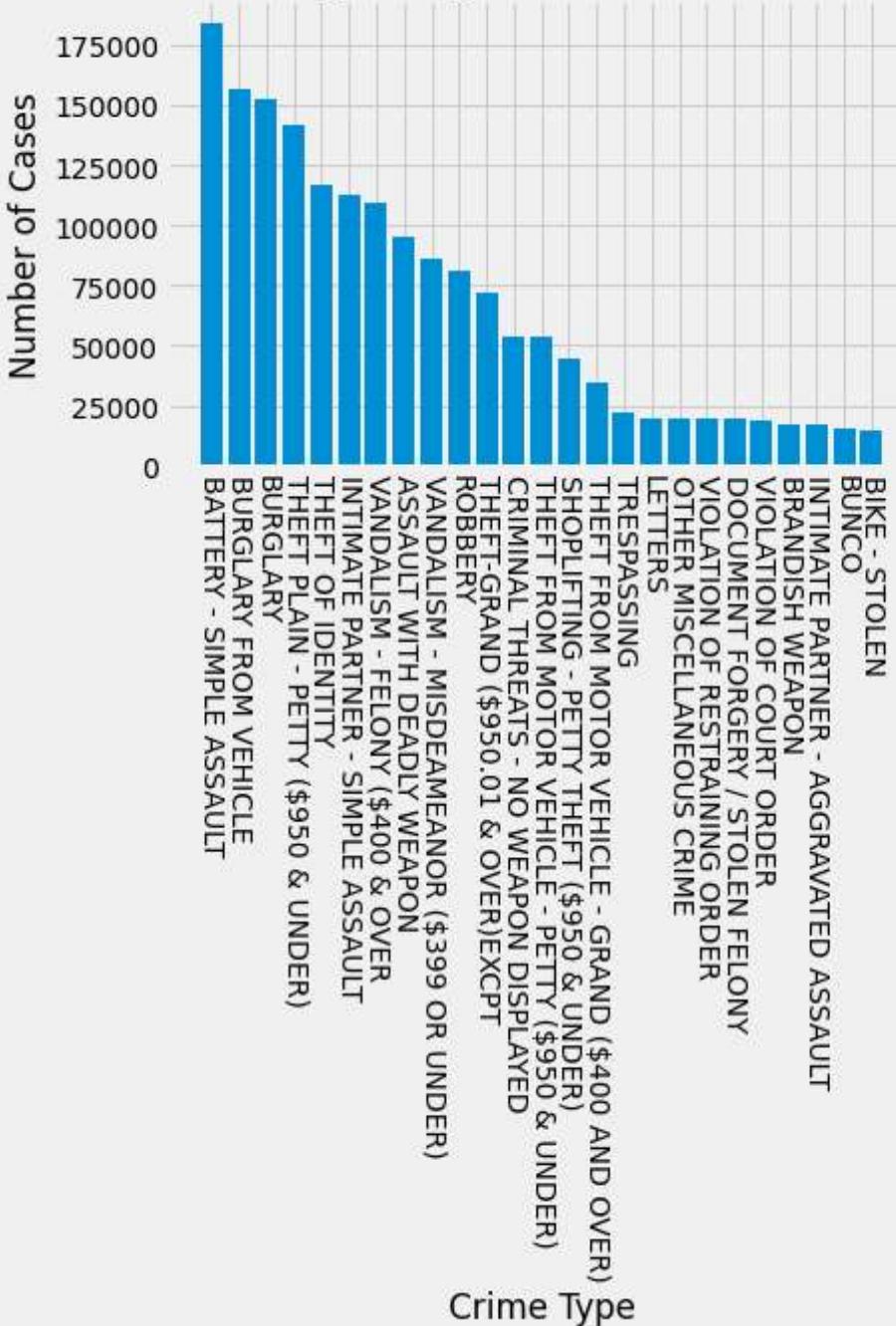
```
In [140...]: import numpy as np
```

```
In [141...]: from collections import Counter
```

```
In [142...]: plt.style.use('fivethirtyeight')
title_year = "25 Most Happening Crime from 2010 to 2021"
plt.title(title_year)
plt.xlabel('Crime Type')
plt.ylabel('Number of Cases')
crm_dec_dict = Counter(Crm_Dec_List)
crm_dec_dict_1 = crm_dec_dict.most_common(25)
a1, b1 = zip(*crm_dec_dict_1)
crm_dec_x = list(a1)
crm_dec_y = list(b1)
plt.xticks(rotation = 270)
plt.bar(crm_dec_x, crm_dec_y)

plt.show()
```

## 25 Most Happening Crime from 2010 to 2021



In [143...]

crm\_dec\_x

Out[143...]

```
[ 'BATTERY - SIMPLE ASSAULT',
  'BURGLARY FROM VEHICLE',
  'BURGLARY',
  'THEFT PLAIN - PETTY ($950 & UNDER)',
  'THEFT OF IDENTITY',
  'INTIMATE PARTNER - SIMPLE ASSAULT',
  'VANDALISM - FELONY ($400 & OVER',
  'ASSAULT WITH DEADLY WEAPON',
  'VANDALISM - MISDEAMEANOR ($399 OR UNDER',
  'ROBBERY',
  'THEFT-GRAND ($950.01 & OVER) EXCPT',
  'CRIMINAL THREATS - NO WEAPON DISPLAYED',
  'THEFT FROM MOTOR VEHICLE - PETTY ($950 & UNDER',
  'SHOPLIFTING - PETTY THEFT ($950 & UNDER',
  'THEFT FROM MOTOR VEHICLE - GRAND ($400 AND OVER',
  'TRESPASSING',
  'LETTERS',
```

```
' OTHER MISCELLANEOUS CRIME',
' VIOLATION OF RESTRAINING ORDER',
' DOCUMENT FORGERY / STOLEN FELONY',
' VIOLATION OF COURT ORDER',
' BRANDISH WEAPON',
' INTIMATE PARTNER - AGGRAVATED ASSAULT',
' BUNCO',
' BIKE - STOLEN']
```

```
In [144...]: crm_dec_top_25 = defaultdict(list)
```

```
In [145...]: for j in range(len(crm_dec_x)):
    for i in range(len(year)):
        if Crm_Dec_List[i] == crm_dec_x[j]:
            crm_dec_top_25[crm_dec_x[j]].append(year[i])
```

```
In [147...]: crm_dec_top_25_dict_x = defaultdict(list)
crm_dec_top_25_dict_y = defaultdict(list)

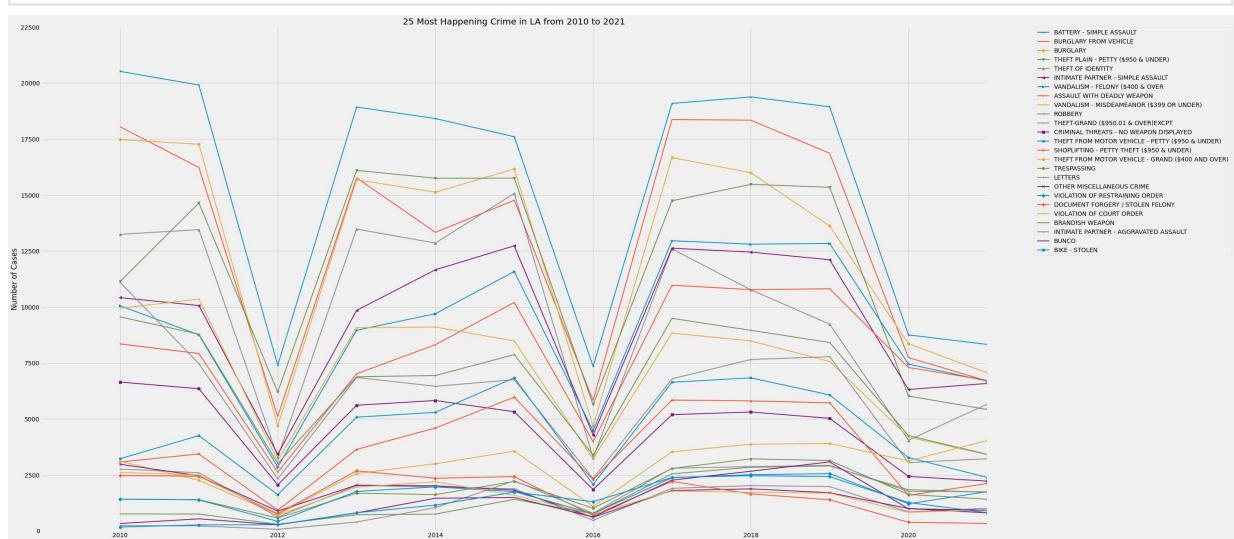
for i in range(len(crm_dec_x)):
    x, y = zip(*sorted(Counter(crm_dec_top_25[crm_dec_x[i]]).items()))
    crm_dec_top_25_dict_x[crm_dec_x[i]] = list(x)
    crm_dec_top_25_dict_y[crm_dec_x[i]] = list(y)
```

```
In [148...]: plt.figure(figsize=(35, 20))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

plt.xlim(2009, 2021)
plt.ylim(0, 22500)
maker = ['.', ',', '—', 'o', 'v', '^', '<', '>', '1', '2', '3', '4', 's', 'p', '*', 'h', 'h']

for i in range(len(crm_dec_x)):
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],
    plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad=0.)
    plt.xlabel('Year')
    plt.ylabel("Number of Cases")
    plt.title("25 Most Happening Crime in LA from 2010 to 2021")

plt.savefig('plot1.png', bbox_inches='tight', transparent=True)
```



```
In [149...]
```

```

plt.figure(figsize=(20, 10))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

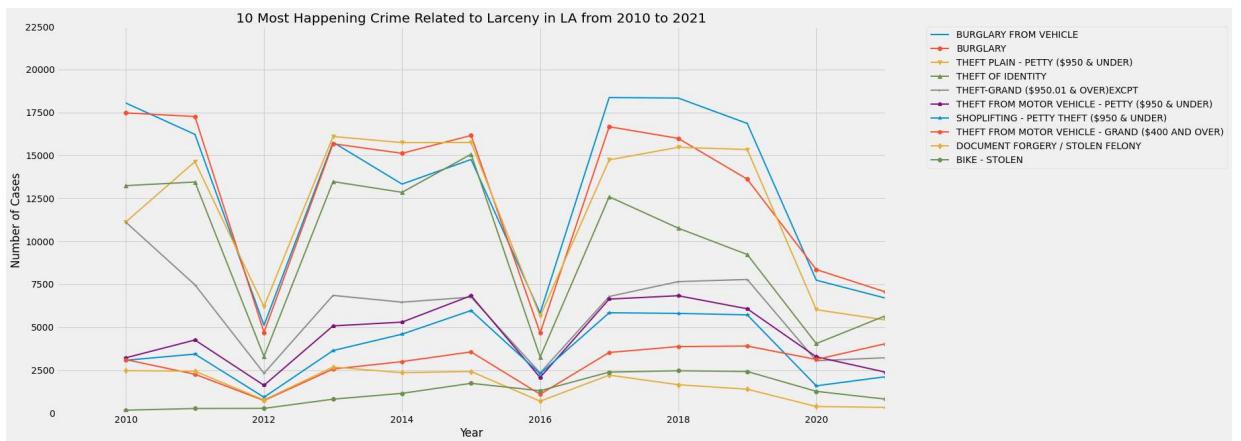
plt.xlim(2009, 2021)
plt.ylim(0, 22500)

for i in [1, 2, 3, 4, 10, 12, 13, 14, 19, 24]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("10 Most Happening Crime Related to Larceny in LA from 2010 to 2021")

plt.savefig('plot2.png', bbox_inches='tight', transparent = True)

```



In [151...]

```

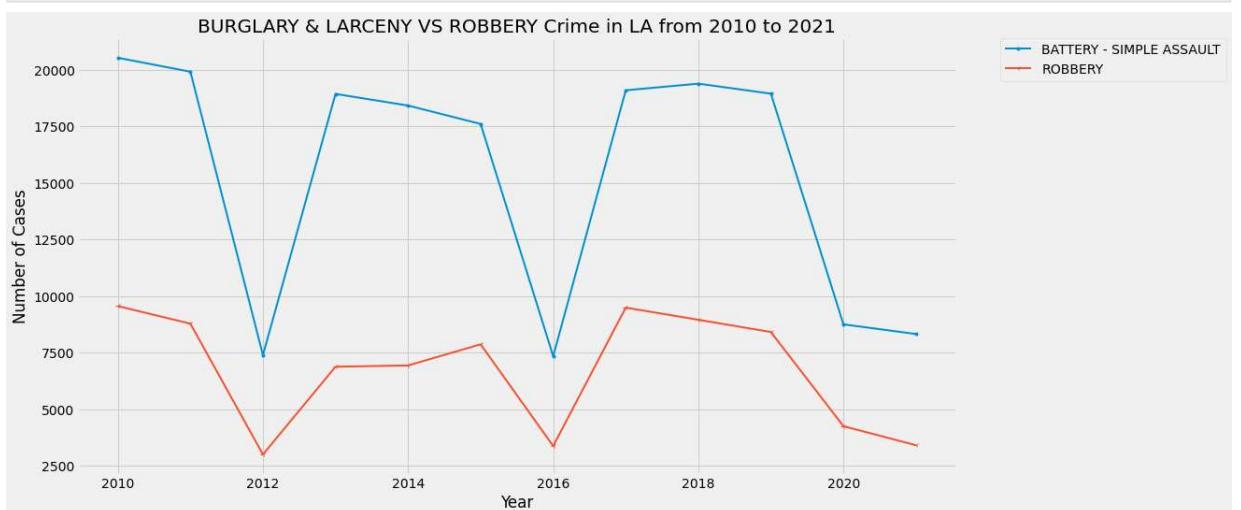
plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [0, 9]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("BURGLARY & LARCENY VS ROBBERY Crime in LA from 2010 to 2021")

plt.savefig('plot3.png', bbox_inches='tight', transparent = True)

```



In [152...]

```

plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

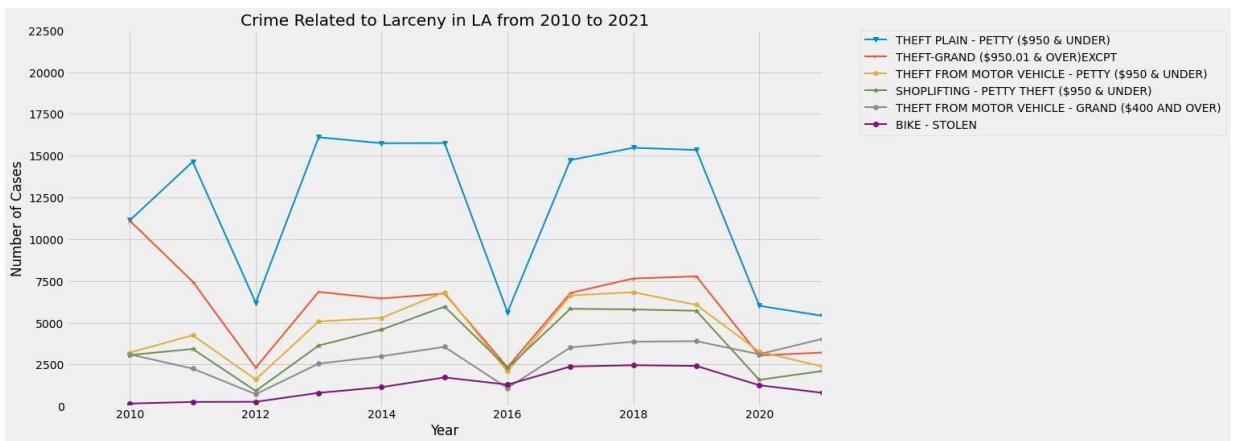
plt.xlim(2009, 2021)
plt.ylim(0, 22500)

for i in [3, 10, 12, 13, 14, 24]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("Crime Related to Larceny in LA from 2010 to 2021")

plt.savefig('plot4.png', bbox_inches='tight', transparent = True)

```



In [153...]

```

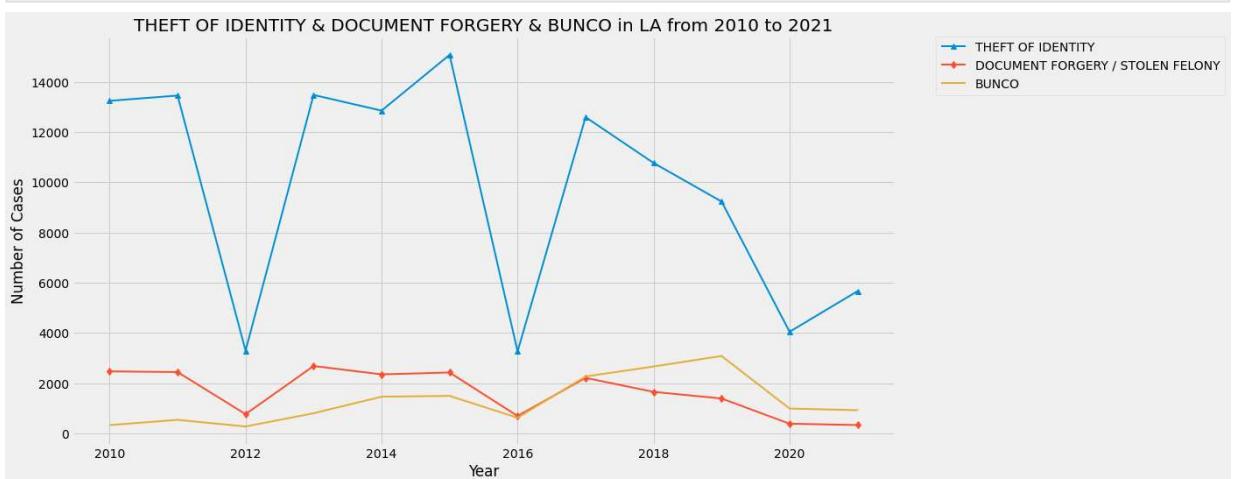
plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [4, 19, 23]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("THEFT OF IDENTITY & DOCUMENT FORGERY & BUNCO in LA from 2010 to 2021")

plt.savefig('plot5.png', bbox_inches='tight', transparent = True)

```



In [154...]

```
plt.figure(figsize=(20, 10))
```

```

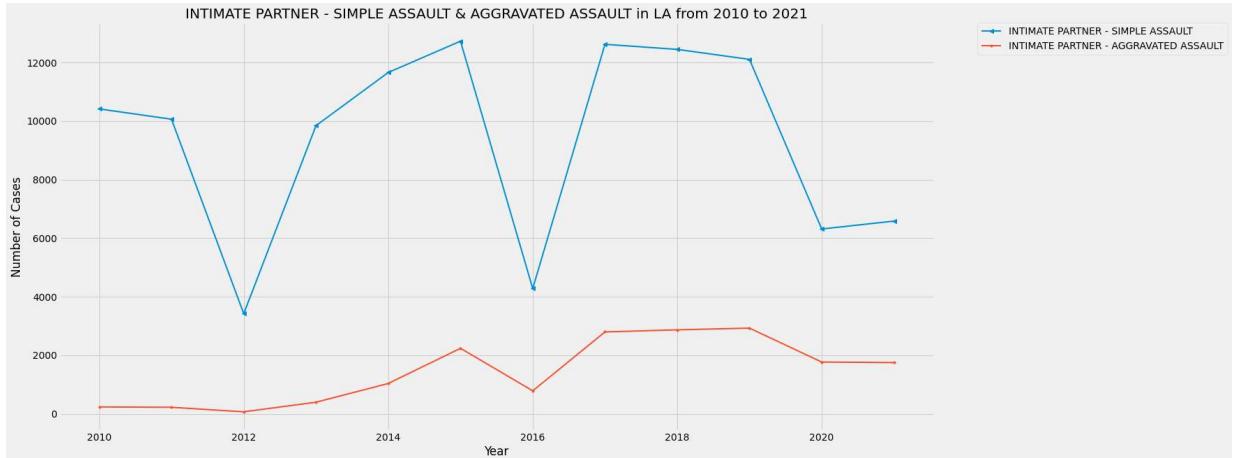
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [5, 22]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("INTIMATE PARTNER - SIMPLE ASSAULT & AGGRAVATED ASSAULT in LA from 2010 to 2021")

plt.savefig('plot6.png', bbox_inches='tight', transparent = True)

```



In [155]:

```

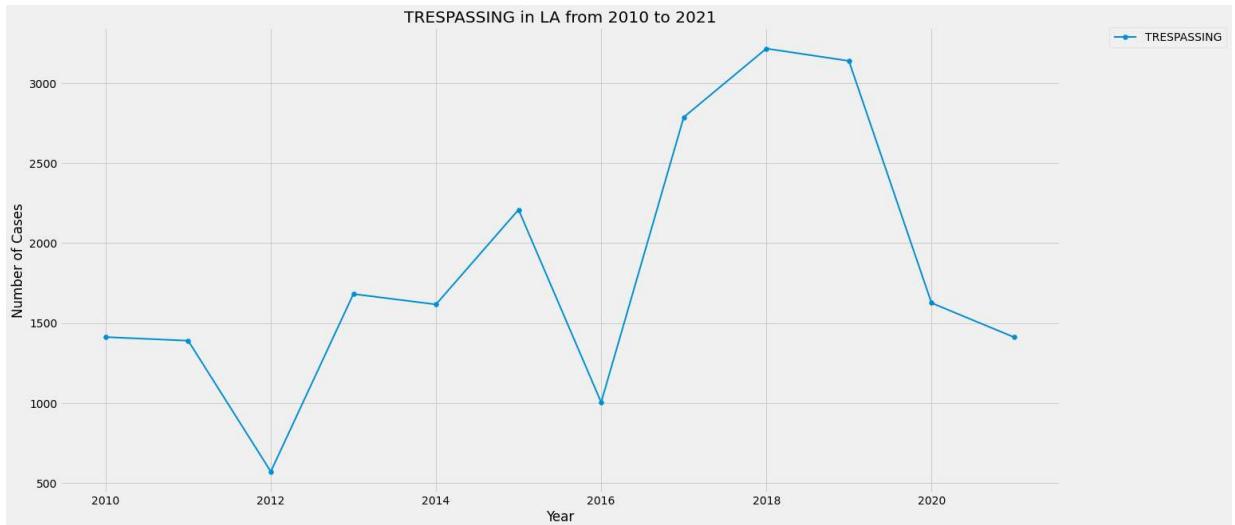
plt.figure(figsize=(20, 10))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

plt.plot(crm_dec_top_25_dict_x[crm_dec_x[15]], crm_dec_top_25_dict_y[crm_dec_x[15]], ma

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("TRESPASSING in LA from 2010 to 2021")

plt.savefig('plot17.png', bbox_inches='tight', transparent = True)

```



In [156]:

```

plt.figure(figsize=(20, 10))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

```

```

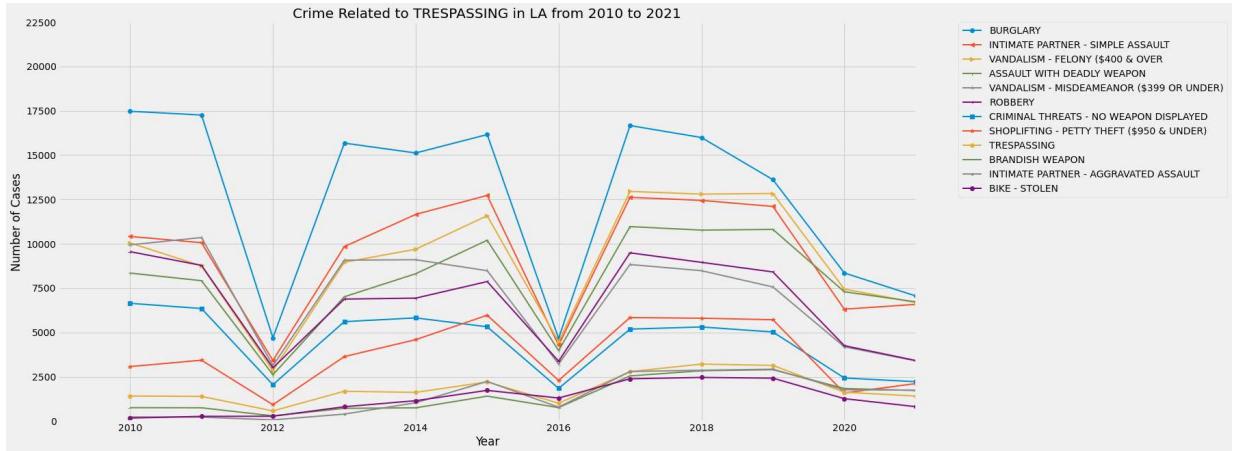
plt.xlim(2009, 2021)
plt.ylim(0, 22500)

for i in [2, 5, 6, 7, 8, 9, 11, 13, 15, 21, 22, 24]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("Crime Related to TRESPASSING in LA from 2010 to 2021")

plt.savefig('plot8.png', bbox_inches='tight', transparent = True)

```



In [157]...

```

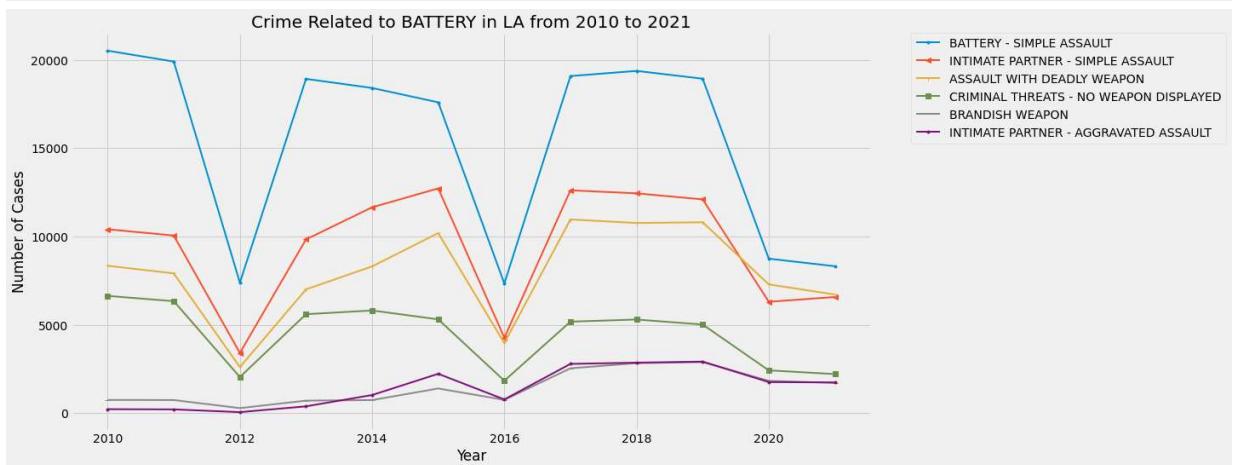
plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [0, 5, 7, 11, 21, 22]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("Crime Related to BATTERY in LA from 2010 to 2021")

plt.savefig('plot9.png', bbox_inches='tight', transparent = True)

```



In [158]...

```

plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

plt.plot(crm_dec_top_25_dict_x[crm_dec_x[7]], crm_dec_top_25_dict_y[crm_dec_x[7]], make

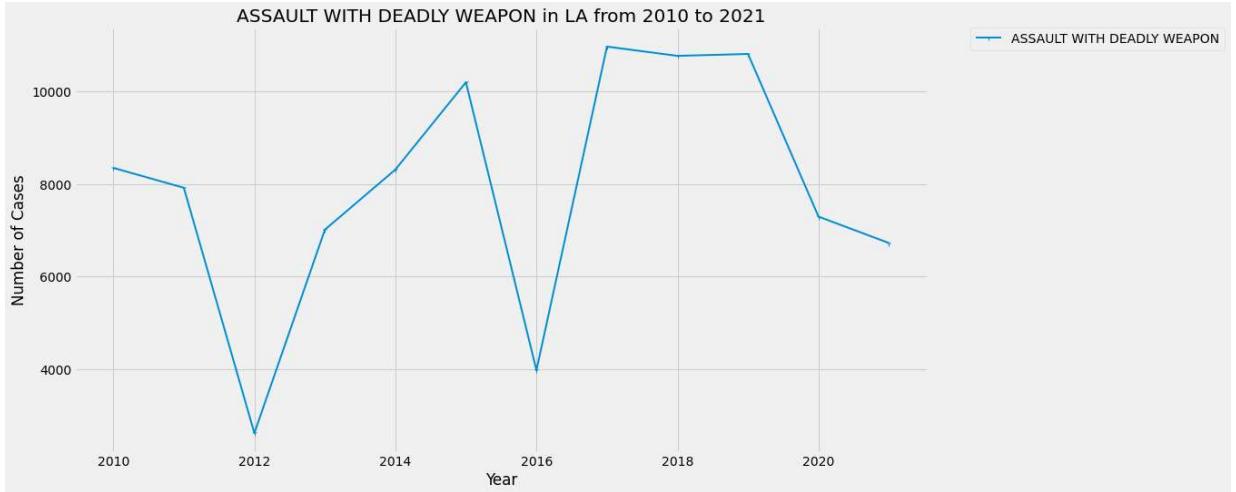
```

```

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("ASSAULT WITH DEADLY WEAPON in LA from 2010 to 2021")

plt.savefig('plot10.png', bbox_inches='tight', transparent = True)

```



In [159]...

```

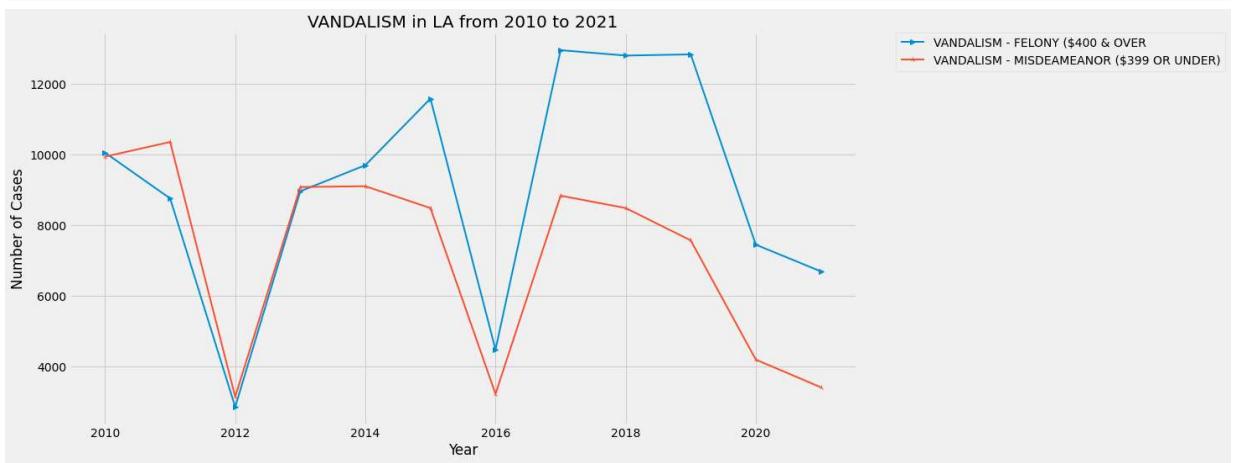
# N/A
plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [6,8]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("VANDALISM in LA from 2010 to 2021")

plt.savefig('plot11.png', bbox_inches='tight', transparent = True)

```



In [160]...

```

#Only RESTRAINING ORDER
plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [16, 17, 18, 19, 20]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

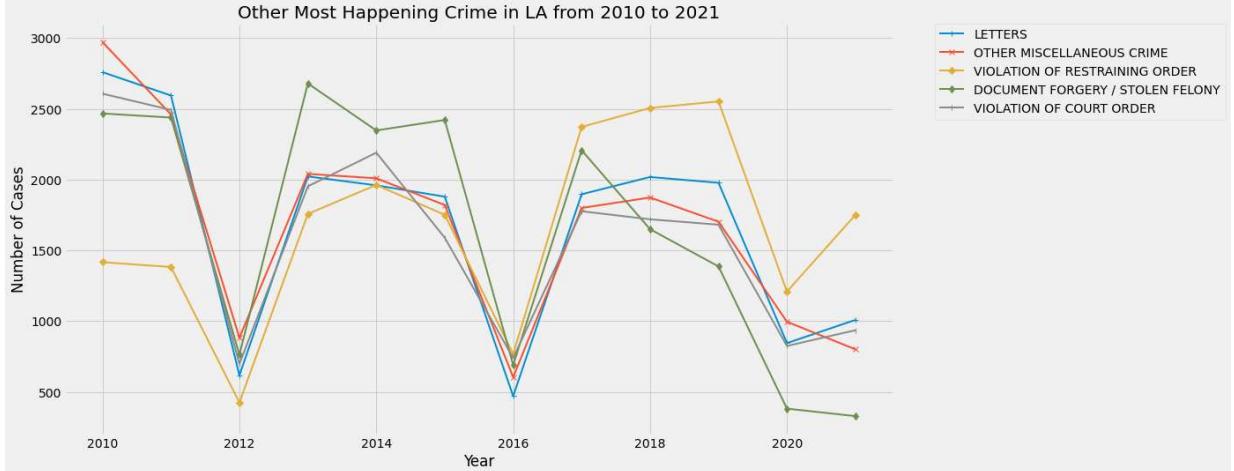

```

```

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("Other Most Happening Crime in LA from 2010 to 2021")

plt.savefig('plot12.png', bbox_inches='tight', transparent = True)

```



In [161]:

```

plt.figure(figsize=(15, 8))
plt.style.use('fivethirtyeight')
palette = plt.get_cmap('Set1')

for i in [18, 20, 5, 22]:
    plt.plot(crm_dec_top_25_dict_x[crm_dec_x[i]], crm_dec_top_25_dict_y[crm_dec_x[i]],

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.xlabel('Year')
plt.ylabel("Number of Cases")
plt.title("Crime Related to RESTRAINING ORDER in LA from 2010 to 2021")

plt.savefig('plot13.png', bbox_inches='tight', transparent = True)

```



Vict Age

In [162]:

```

rec_num=list(data_1['DR_NO'])
data_1['DateTimeValues'] = pd.to_datetime(data_1['DATE OCC'])
data_1['year'] = data_1['DateTimeValues'].dt.year
data_1['month'] = data_1['DateTimeValues'].dt.month
data_1['day'] = data_1['DateTimeValues'].dt.day
year = list(data_1['year'])
month = list(data_1['month'])
day = list(data_1['day'])

```

```
time_occ=list(data_1['TIME OCC'])
area_name=list(data_1['AREA NAME'])
crm_cd=list(data_1['Crm Cd'])
crm_desc=list(data_1['Crm Cd Desc'])
vict_age=list(data_1['Vict Age'])
vict_sex=list(data_1['Vict Sex'])
vict_descent=list(data_1['Vict Descent'])
pre_cd=list(data_1['Premis Cd'])
pre_desc=list(data_1['Premis Desc'])
sta_desc=list(data_1['Status Desc'])
crm_cd=list(data_1['Crm Cd 1'])
loc=list(data_1['LOCATION'])
```

In [165...]

```
vict_sex_nonzero = []
vict_age_nonzero = []
year_nonzero = []
month_nonzero = []

for i in range(len(vict_age)):
    if vict_age != 0:
        vict_sex_nonzero.append(vict_sex[i])
        vict_age_nonzero.append(vict_age[i])
        year_nonzero.append(year[i])
        month_nonzero.append(month[i])
```

In [166...]

```
vict_sex_m = []
vict_sex_fm = []
for i in range(len(year)):
    if vict_sex_nonzero[i] == 'M':
        vict_sex_m.append(year[i])
    elif vict_sex_nonzero[i] == 'F':
        vict_sex_fm.append(year[i])
```

In [167...]

```
vict_sex_m_dict = Counter(vict_sex_m)
vict_sex_m_dict_1 = sorted(vict_sex_m_dict.items())
x, y = zip(*vict_sex_m_dict_1)
vict_sex_m_dict_x = list(x)
vict_sex_m_dict_y = list(y)

vict_sex_fm_dict = Counter(vict_sex_fm)
vict_sex_fm_dict_1 = sorted(vict_sex_fm_dict.items())
#crm_desc_top_1_dict_1 = crm_desc_top_1_dict.most_common()
x, y = zip(*vict_sex_fm_dict_1)
vict_sex_fm_dict_x = list(x)
vict_sex_fm_dict_y = list(y)
```

In [168...]

```
import matplotlib.pyplot as plt
import matplotlib as mpl
import numpy as np

mpl.rcParams['font.family'] = 'SimHei', weight='bold'
plt.rcParams['axes.unicode_minus'] = False

plt.figure(figsize=(15, 8))
vict_sex_fm_dict_x.reverse()
x = np.arange(12)
y = vict_sex_m_dict_y
y1 = vict_sex_fm_dict_y
bar_width = 0.35
```

```

    tick_label = list(reversed(vict_sex_fm_dict_x))

    plt.barh(x, y, bar_width, align="center", color="c", label="Male", alpha=0.5)
    plt.barh(x+bar_width, y1, bar_width, align="center", color="b", label="Female", alpha=0.5)

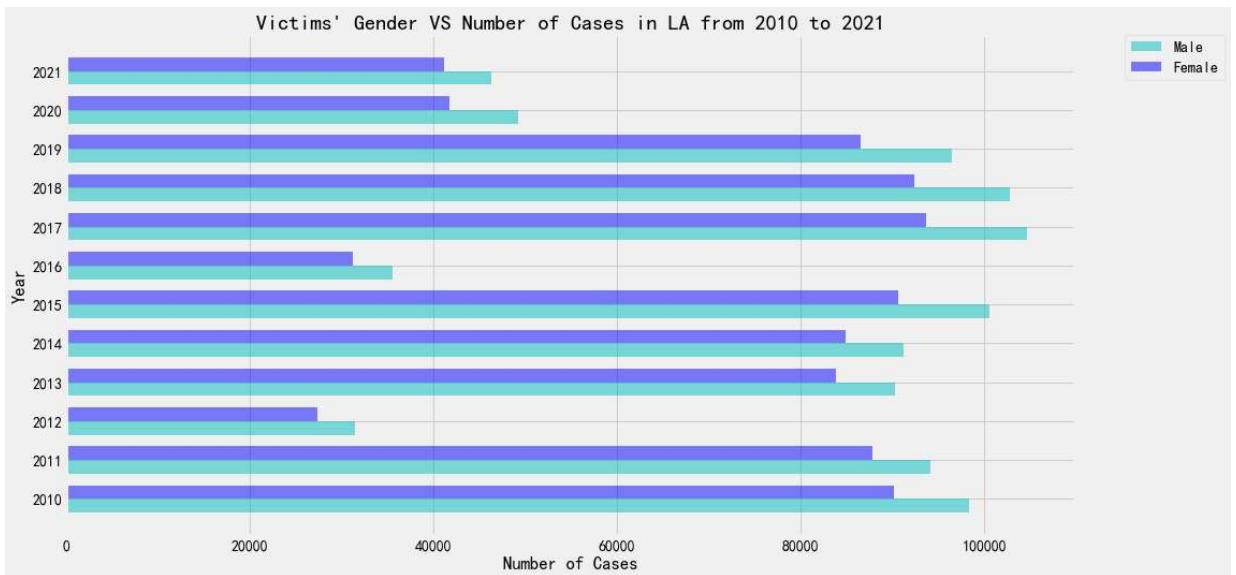
    plt.xlabel("Number of Cases")
    plt.ylabel("Year")

    plt.yticks(x+bar_width/2, tick_label)

    plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
    plt.title("Victims' Gender VS Number of Cases in LA from 2010 to 2021")

    plt.show()

```



In [169...]

```

vict_age_1 = [] #children
vict_age_2 = [] #young adults
vict_age_3 = [] #middle age adults
vict_age_4 = [] #elderly age adults
vict_age_5 = [] #senile age adults
vict_age_6 = [] #long-livers
for i in range(len(year)):
    if vict_age_nonzero[i] >= 0 and vict_age_nonzero[i]<=17:
        vict_age_1.append(year[i])
    elif vict_age_nonzero[i] >= 18 and vict_age_nonzero[i]<=44:
        vict_age_2.append(year[i])
    elif vict_age_nonzero[i] >= 45 and vict_age_nonzero[i]<=59:
        vict_age_3.append(year[i])
    elif vict_age_nonzero[i] >= 60 and vict_age_nonzero[i]<=74:
        vict_age_4.append(year[i])
    elif vict_age_nonzero[i] >= 75 and vict_age_nonzero[i]<=89:
        vict_age_5.append(year[i])
    elif vict_age_nonzero[i] >= 90:
        vict_age_6.append(year[i])

```

In [170...]

```

x,y = zip(*sorted(Counter(vict_age_1).items()))
vict_age_1_dict_x = list(x)
vict_age_1_dict_y = list(y)

x,y = zip(*sorted(Counter(vict_age_2).items()))
vict_age_2_dict_x = list(x)
vict_age_2_dict_y = list(y)

```

```

x, y = zip(*sorted(Counter(vict_age_3).items()))
vict_age_3_dict_x = list(x)
vict_age_3_dict_y = list(y)

x, y = zip(*sorted(Counter(vict_age_4).items()))
vict_age_4_dict_x = list(x)
vict_age_4_dict_y = list(y)

x, y = zip(*sorted(Counter(vict_age_5).items()))
vict_age_5_dict_x = list(x)
vict_age_5_dict_y = list(y)

x, y = zip(*sorted(Counter(vict_age_6).items()))
vict_age_6_dict_x = list(x)
vict_age_6_dict_y = list(y)

```

In [171...]

```

import pandas as pd
import numpy as np
from pandas import Series, DataFrame
from numpy.random import randn, rand
import matplotlib.pyplot as plt

```

In [172...]

```
pic2 = plt.figure(figsize=(8, 8), dpi=80)
```

<Figure size 640x640 with 0 Axes>

In [173...]

```

all_vict_age = []
for i in range(len(vict_age_1_dict_x)):
    all_vict_age.append(str(vict_age_1_dict_y[i]))
    all_vict_age.append(str(vict_age_2_dict_y[i]))
    all_vict_age.append(str(vict_age_3_dict_y[i]))
    all_vict_age.append(str(vict_age_4_dict_y[i]))
    all_vict_age.append(str(vict_age_5_dict_y[i]))
    all_vict_age.append(str(vict_age_6_dict_y[i]))

```

In [174...]

```

import matplotlib.pyplot as plt
import matplotlib as mpl

plt.figure(figsize=(15, 15))
labels=['Children', 'Young Age', 'Middle Age', 'Elderly Age', 'Senile Age', 'Long-liver']
age_2010=all_vict_age[0:6]
age_2011=all_vict_age[6:12]
age_2012=all_vict_age[12:18]
age_2013=all_vict_age[18:24]
age_2014=all_vict_age[24:30]
age_2015=all_vict_age[30:36]
age_2016=all_vict_age[36:42]
age_2017=all_vict_age[42:48]
age_2018=all_vict_age[48:54]
age_2019=all_vict_age[54:60]
age_2020=all_vict_age[60:66]
age_2021=all_vict_age[66:72]
bottom3 = []
bottom4 = []
bottom5 = []
bottom6 = []

plt.bar(vict_age_1_dict_x, vict_age_1_dict_y, align="center", color="#66c2a5", tick_label=labels)
plt.bar(vict_age_2_dict_x, vict_age_2_dict_y, align="center", color="#8da0cb", bottom=bottom3)
plt.bar(vict_age_3_dict_x, vict_age_3_dict_y, align="center", color="#e69138", bottom=bottom4)
plt.bar(vict_age_4_dict_x, vict_age_4_dict_y, align="center", color="#f08080", bottom=bottom5)
plt.bar(vict_age_5_dict_x, vict_age_5_dict_y, align="center", color="#ffccbc", bottom=bottom6)

```

```

plt.bar(vict_age_1_dict_x, vict_age_1_dict_y, align="center", color="#66c2a5", tick_label=labels)
plt.bar(vict_age_2_dict_x, vict_age_2_dict_y, align="center", color="#8da0cb", bottom=bottom3)
plt.bar(vict_age_3_dict_x, vict_age_3_dict_y, align="center", color="#e69138", bottom=bottom4)
plt.bar(vict_age_4_dict_x, vict_age_4_dict_y, align="center", color="#f08080", bottom=bottom5)
plt.bar(vict_age_5_dict_x, vict_age_5_dict_y, align="center", color="#ffccbc", bottom=bottom6)

```

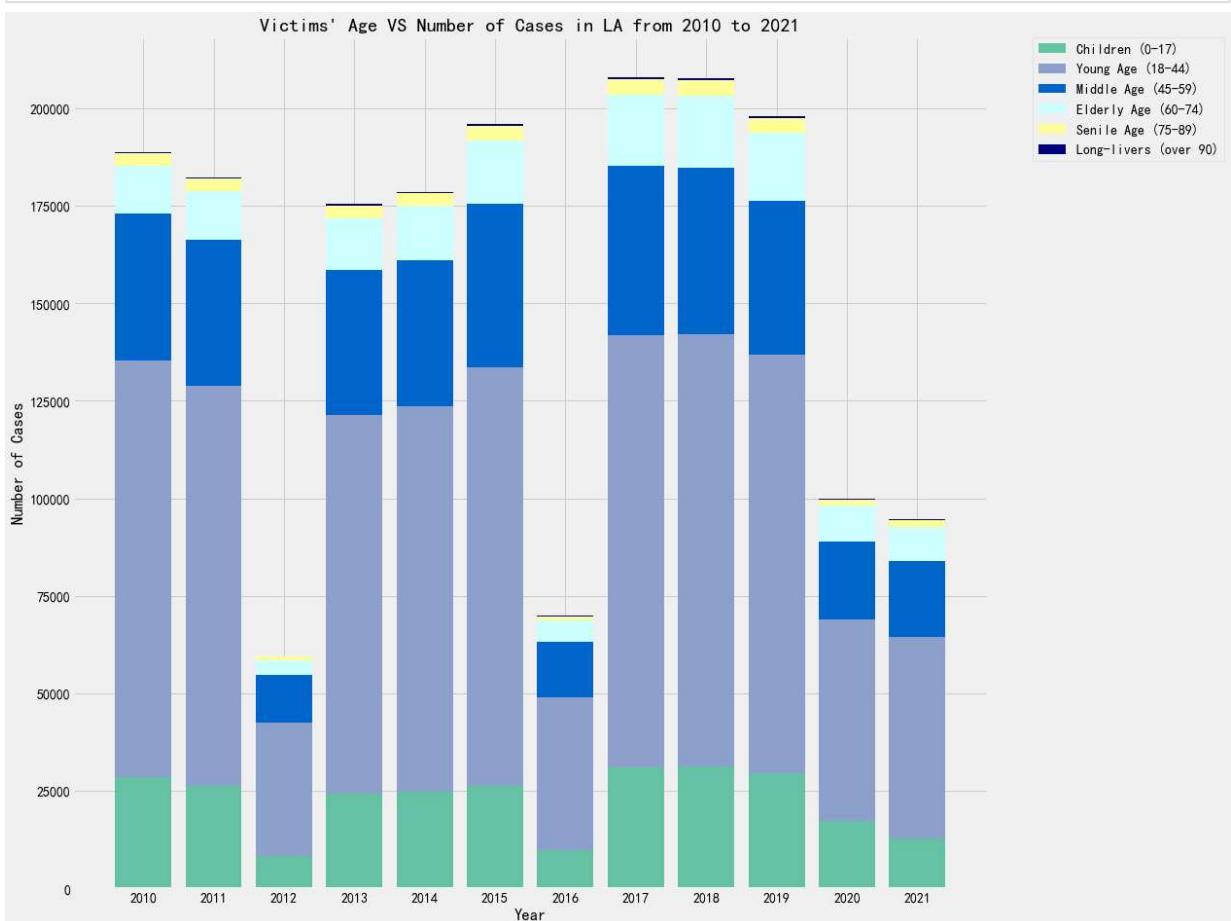
```

for i in range(0, len(vict_age_2_dict_y)):
    a = vict_age_1_dict_y[i] + vict_age_2_dict_y[i]
    bottom3.append(a)
plt.bar(vict_age_3_dict_x, vict_age_3_dict_y, align="center", color="#0066cc", bottom=bottom3)
for i in range(0, len(vict_age_2_dict_y)):
    a = vict_age_1_dict_y[i] + vict_age_2_dict_y[i] +vict_age_3_dict_y[i]
    bottom4.append(a)
plt.bar(vict_age_4_dict_x, vict_age_4_dict_y, align="center", color="#ccffff", bottom=bottom4)
for i in range(0, len(vict_age_2_dict_y)):
    a = vict_age_1_dict_y[i] + vict_age_2_dict_y[i] +vict_age_3_dict_y[i]+vict_age_4_
    bottom5.append(a)
plt.bar(vict_age_5_dict_x, vict_age_5_dict_y, align="center", color="#ffff99", bottom=bottom5)
for i in range(0, len(vict_age_2_dict_y)):
    a = vict_age_1_dict_y[i] + vict_age_2_dict_y[i] +vict_age_3_dict_y[i]+vict_age_4_
    bottom6.append(a)
plt.bar(vict_age_6_dict_x, vict_age_6_dict_y, align="center", color="#000080", bottom=bottom6)

plt.xlabel("Year")
plt.ylabel("Number of Cases")
plt.title("Victims' Age VS Number of Cases in LA from 2010 to 2021")

plt.legend(loc=2, bbox_to_anchor=(1.05, 1.0), borderaxespad = 0.)
plt.show()

```



In [175]:

```

plt.style.use('fivethirtyeight')
plt.figure(figsize=(50, 17))

```

```

crm_dec_top15_years_dict_x = defaultdict(list)
crm_dec_top15_years_dict_y = defaultdict(list)

for i in range(len(years)):
    plt.subplot(2, 6, i+1)
    ax = plt.gca()

```

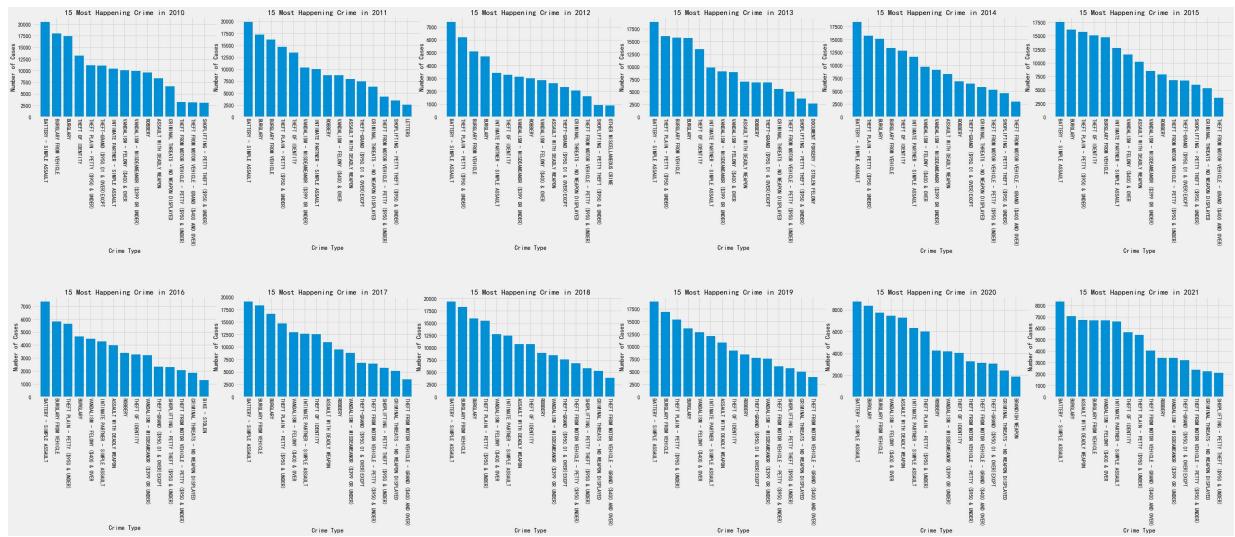
```

a, b = zip(*Counter(crm_dec_years[years[i]]).most_common(15))
crm_dec_top15_years_dict_x[years[i]] = list(a)
crm_dec_top15_years_dict_y[years[i]] = list(b)
plt.xticks(rotation = 270)
plt.bar(crm_dec_top15_years_dict_x[years[i]], crm_dec_top15_years_dict_y[years[i]])
ax.set_xlabel('Crime Type')
ax.set_ylabel('Number of Cases')
title = "15 Most Happening Crime in "+str(years[i])
ax.set_title(title)

plt.subplots_adjust(left=None, bottom=None, right=None, top=None,
                    wspace=0.1, hspace=1.8)

plt.savefig('plot14.png', bbox_inches='tight', transparent = True)

```



In [ ]: