

Homework4_Fall21

October 6, 2021

1 Homework 4

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Instructions: In this homework you will process and analyze a large data set that contains crimes reported in the city of Chicago from 2018 to February 2021.

To load the data set and get the *crimes* dataframe correctly configured, execute the cells with the code provided in this notebook by the instructor. This could take a few minutes after you start the execution of the code cells.

Once the *crimes* dataframe has been setup you could should proceed to obtain 3 meaningful data analysis results from processing the *crimes* dataframe. Four cells have been provided for you to describe the results of each of your data analysis procedures. You can add as many code cells as you want to complete each of your analysis and I also recommend that you add some explanatory cells (use Markdown cells) to provide some additional text with explanations of what you are doing.

```
[1]: #EXECUTE THIS CELL to setup the modules you need
%matplotlib inline

import pandas as pd
import numpy as np
import requests
from io import StringIO
```

```
[2]: #EXECUTE THIS CELL to load the dataset into your environment - a security␣
    ↳warning will appear. You can ignore it.
url="https://gitlab.gitlab.svc.cent-su.org/ccaicedo/652public/-/raw/master/␣
    ↳crimes_2018.csv"
csvdata=requests.get(url,verify=False).text #this will generate a warning but␣
    ↳you can proceed
```

```
/opt/conda/lib/python3.9/site-packages/urllib3/connectionpool.py:1013:
InsecureRequestWarning: Unverified HTTPS request is being made to host
'gitlab.gitlab.svc.cent-su.org'. Adding certificate verification is strongly
advised. See: https://urllib3.readthedocs.io/en/1.26.x/advanced-usage.html#ssl-
warnings
warnings.warn(
```

```
[3]: #EXECUTE THIS CELL to setup the crimes dataframe with the data from dataset_
      ↪ correctly formatted
      crimes=pd.read_csv(StringIO(csvdata),parse_dates=[0], index_col=[0])
```

2 Exploratory Analysis

```
[4]: crimes.head()
```

```
[4]:
```

	ID Case Number	Block	IUCR \
Date			
2018-09-01 00:01:00	11646166 JC213529	082XX S INGLESIDE AVE	0810
2020-03-17 21:30:00	12014684 JD189901	039XX N LECLAIRE AVE	0820
2018-01-01 08:00:00	11645648 JC212959	024XX N MONITOR AVE	1153
2019-09-24 08:00:00	11864018 JC476123	022XX S MICHIGAN AVE	1154
2019-10-13 20:30:00	11859805 JC471592	024XX W CHICAGO AVE	0860

	Primary Type \
Date	
2018-09-01 00:01:00	THEFT
2020-03-17 21:30:00	THEFT
2018-01-01 08:00:00	DECEPTIVE PRACTICE
2019-09-24 08:00:00	DECEPTIVE PRACTICE
2019-10-13 20:30:00	THEFT

	Description \
Date	
2018-09-01 00:01:00	OVER \$500
2020-03-17 21:30:00	\$500 AND UNDER
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER
2019-10-13 20:30:00	RETAIL THEFT

	Location Description	Arrest	Domestic	Beat \
Date				
2018-09-01 00:01:00	RESIDENCE	False	True	631
2020-03-17 21:30:00	STREET	False	False	1634
2018-01-01 08:00:00	RESIDENCE	False	False	2515
2019-09-24 08:00:00	COMMERCIAL / BUSINESS OFFICE	False	False	132
2019-10-13 20:30:00	GROCERY FOOD STORE	False	False	1221

	...	Ward	Community Area	FBI Code	X Coordinate \
Date	...				
2018-09-01 00:01:00	...	8.0	44.0	06	NaN
2020-03-17 21:30:00	...	45.0	15.0	06	1141659.0
2018-01-01 08:00:00	...	30.0	19.0	11	NaN
2019-09-24 08:00:00	...	3.0	33.0	11	1177560.0

```
2019-10-13 20:30:00 ... 26.0          24.0          06    1160005.0
```

	Y Coordinate	Year	Updated On	Latitude \
Date				
2018-09-01 00:01:00	NaN	2018	04/06/2019 04:04:43 PM	NaN
2020-03-17 21:30:00	1925649.0	2020	03/25/2020 03:45:43 PM	41.952052
2018-01-01 08:00:00	NaN	2018	04/06/2019 04:04:43 PM	NaN
2019-09-24 08:00:00	1889548.0	2019	10/20/2019 03:56:02 PM	41.852248
2019-10-13 20:30:00	1905256.0	2019	10/20/2019 04:03:03 PM	41.895732

	Longitude	Location
Date		
2018-09-01 00:01:00	NaN	NaN
2020-03-17 21:30:00	-87.754660	(41.952051946, -87.754660372)
2018-01-01 08:00:00	NaN	NaN
2019-09-24 08:00:00	-87.623786	(41.852248185, -87.623786256)
2019-10-13 20:30:00	-87.687784	(41.895732399, -87.687784384)

```
[5 rows x 21 columns]
```

```
[5]: crimes.info()
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 766163 entries, 2018-09-01 00:01:00 to 2021-02-27 09:55:00
Data columns (total 21 columns):
#   Column                Non-Null Count  Dtype
---  -
0   ID                    766163 non-null  int64
1   Case Number          766163 non-null  object
2   Block                766163 non-null  object
3   IUCR                 766163 non-null  object
4   Primary Type         766163 non-null  object
5   Description           766163 non-null  object
6   Location Description  762688 non-null  object
7   Arrest               766163 non-null  bool
8   Domestic             766163 non-null  bool
9   Beat                 766163 non-null  int64
10  District              766163 non-null  float64
11  Ward                  766133 non-null  float64
12  Community Area        766162 non-null  float64
13  FBI Code              766163 non-null  object
14  X Coordinate          758002 non-null  float64
15  Y Coordinate          758002 non-null  float64
16  Year                  766163 non-null  int64
17  Updated On           766163 non-null  object
18  Latitude              758002 non-null  float64
19  Longitude             758002 non-null  float64
```

```

20 Location 758002 non-null object
dtypes: bool(2), float64(7), int64(3), object(9)
memory usage: 118.4+ MB

```

3 Code for data analysis 1

You can place the code for your first data analysis result in this section. Add as many code cells as you need.

```

[6]: crimes_description = crimes.set_index(['Description'], append=True)
crimes_description #add index

```

```

[6]:
ID \
Date      Description
2018-09-01 00:01:00 OVER $500 11646166
2020-03-17 21:30:00 $500 AND UNDER 12014684
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER $ 300 11645648
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT $300 AND UNDER 11864018
2019-10-13 20:30:00 RETAIL THEFT 11859805
...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE 12304455
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE 12303401
2021-02-22 18:55:00 $500 AND UNDER 12307254
2021-02-27 13:00:00 AGGRAVATED OF A CHILD 12303054
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE 12302712

Case Number \
Date      Description
2018-09-01 00:01:00 OVER $500 JC213529
2020-03-17 21:30:00 $500 AND UNDER JD189901
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER $ 300 JC212959
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT $300 AND UNDER JC476123
2019-10-13 20:30:00 RETAIL THEFT JC471592
...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE JE156019
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE JE153690
2021-02-22 18:55:00 $500 AND UNDER JE158654
2021-02-27 13:00:00 AGGRAVATED OF A CHILD JE154104
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE JE153854

```

```

Block \
Date      Description
2018-09-01 00:01:00 OVER $500 082XX
S INGLESIDE AVE
2020-03-17 21:30:00 $500 AND UNDER
039XX N LECLAIRE AVE
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER $ 300

```

024XX N MONITOR AVE
 2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER
 022XX S MICHIGAN AVE
 2019-10-13 20:30:00 RETAIL THEFT
 024XX W CHICAGO AVE
 ...
 ...
 2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE
 046XX N PAULINA ST
 2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE 134XX
 S BALTIMORE AVE
 2021-02-22 18:55:00 \$500 AND UNDER
 023XX N KEDZIE BLVD
 2021-02-27 13:00:00 AGGRAVATED OF A CHILD 063XX S DR MARTIN
 LUTHER KING JR DR
 2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE
 063XX N TROY ST

Date	Description	IUCR \
2018-09-01 00:01:00	OVER \$500	0810
2020-03-17 21:30:00	\$500 AND UNDER	0820
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	1153
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	1154
2019-10-13 20:30:00	RETAIL THEFT	0860
...
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	0486
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	0486
2021-02-22 18:55:00	\$500 AND UNDER	0820
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	0485
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	0486

Date	Description	Primary Type
2018-09-01 00:01:00	OVER \$500	THEFT
2020-03-17 21:30:00	\$500 AND UNDER	THEFT
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	DECEPTIVE PRACTICE
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	DECEPTIVE PRACTICE
2019-10-13 20:30:00	RETAIL THEFT	THEFT
...
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	BATTERY
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	BATTERY
2021-02-22 18:55:00	\$500 AND UNDER	THEFT
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	BATTERY
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	BATTERY

Description \		Location
Date	Description	
2018-09-01 00:01:00	OVER \$500	
	RESIDENCE	
2020-03-17 21:30:00	\$500 AND UNDER	
	STREET	
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	
	RESIDENCE	
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	COMMERCIAL /
	BUSINESS OFFICE	
2019-10-13 20:30:00	RETAIL THEFT	GROCERY
	FOOD STORE	
...		
...		
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	
	APARTMENT	
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	
	STREET	
2021-02-22 18:55:00	\$500 AND UNDER	RESIDENCE - PORCH
	/ HALLWAY	
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	
	APARTMENT	
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	
	STREET	

Date	Description	Arrest	Domestic \
2018-09-01 00:01:00	OVER \$500	False	True
2020-03-17 21:30:00	\$500 AND UNDER	False	False
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	False	False
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	False	False
2019-10-13 20:30:00	RETAIL THEFT	False	False
...	
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	False	True
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	False	True
2021-02-22 18:55:00	\$500 AND UNDER	False	False
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	False	False
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	False	True

Date	Description	Beat	District \
2018-09-01 00:01:00	OVER \$500	631	6.0
2020-03-17 21:30:00	\$500 AND UNDER	1634	16.0
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	2515	25.0
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	132	1.0
2019-10-13 20:30:00	RETAIL THEFT	1221	12.0

...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE	1912	19.0
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE	433	4.0
2021-02-22 18:55:00 \$500 AND UNDER	1413	14.0
2021-02-27 13:00:00 AGGRAVATED OF A CHILD	312	3.0
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE	2413	24.0

Date	Description	Ward \
2018-09-01 00:01:00 OVER \$500		8.0
2020-03-17 21:30:00 \$500 AND UNDER		45.0
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300		30.0
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER		3.0
2019-10-13 20:30:00 RETAIL THEFT		26.0

...	...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE	47.0
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE	10.0
2021-02-22 18:55:00 \$500 AND UNDER	32.0
2021-02-27 13:00:00 AGGRAVATED OF A CHILD	20.0
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE	50.0

Date	Description	Community Area \
2018-09-01 00:01:00 OVER \$500		44.0
2020-03-17 21:30:00 \$500 AND UNDER		15.0
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300		19.0
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER		33.0
2019-10-13 20:30:00 RETAIL THEFT		24.0

...	...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE	3.0
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE	55.0
2021-02-22 18:55:00 \$500 AND UNDER	22.0
2021-02-27 13:00:00 AGGRAVATED OF A CHILD	69.0
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE	2.0

Date	Description	FBI Code \
2018-09-01 00:01:00 OVER \$500		06
2020-03-17 21:30:00 \$500 AND UNDER		06
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300		11
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER		11
2019-10-13 20:30:00 RETAIL THEFT		06
...	...	
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE	08B	
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE	08B	
2021-02-22 18:55:00 \$500 AND UNDER	06	
2021-02-27 13:00:00 AGGRAVATED OF A CHILD	04B	

2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE

08B

X Coordinate \

Date	Description	
2018-09-01 00:01:00	OVER \$500	NaN
2020-03-17 21:30:00	\$500 AND UNDER	1141659.0
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	NaN
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	1177560.0
2019-10-13 20:30:00	RETAIL THEFT	1160005.0
...		...
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	1164394.0
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	1199105.0
2021-02-22 18:55:00	\$500 AND UNDER	1154647.0
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	1180014.0
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	1154210.0

Y Coordinate \

Date	Description	
2018-09-01 00:01:00	OVER \$500	NaN
2020-03-17 21:30:00	\$500 AND UNDER	1925649.0
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	NaN
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	1889548.0
2019-10-13 20:30:00	RETAIL THEFT	1905256.0
...		...
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	1930823.0
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	1816488.0
2021-02-22 18:55:00	\$500 AND UNDER	1915433.0
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	1862897.0
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	1941830.0

Year \

Date	Description	
2018-09-01 00:01:00	OVER \$500	2018
2020-03-17 21:30:00	\$500 AND UNDER	2020
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	2018
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	2019
2019-10-13 20:30:00	RETAIL THEFT	2019
...		...
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	2021
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	2021
2021-02-22 18:55:00	\$500 AND UNDER	2021
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	2021
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	2021

Updated

On \

Date Description

2018-09-01 00:01:00 OVER \$500 PM	04/06/2019 04:04:43
2020-03-17 21:30:00 \$500 AND UNDER PM	03/25/2020 03:45:43
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300 PM	04/06/2019 04:04:43
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER PM	10/20/2019 03:56:02
2019-10-13 20:30:00 RETAIL THEFT PM	10/20/2019 04:03:03
...	
...	
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE PM	03/06/2021 03:50:24
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE PM	03/06/2021 03:50:24
2021-02-22 18:55:00 \$500 AND UNDER PM	03/06/2021 03:48:05
2021-02-27 13:00:00 AGGRAVATED OF A CHILD PM	03/06/2021 03:50:24
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE PM	03/06/2021 03:50:24

Date	Description	Latitude \
2018-09-01 00:01:00 OVER \$500		NaN
2020-03-17 21:30:00 \$500 AND UNDER		41.952052
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300		NaN
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER		41.852248
2019-10-13 20:30:00 RETAIL THEFT		41.895732
...		...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE		41.965798
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE		41.651251
2021-02-22 18:55:00 \$500 AND UNDER		41.923768
2021-02-27 13:00:00 AGGRAVATED OF A CHILD		41.779060
2021-02-27 09:55:00 DOMESTIC BATTERY SIMPLE		41.996212

Date	Description	Longitude \
2018-09-01 00:01:00 OVER \$500		NaN
2020-03-17 21:30:00 \$500 AND UNDER		-87.754660
2018-01-01 08:00:00 FINANCIAL IDENTITY THEFT OVER \$ 300		NaN
2019-09-24 08:00:00 FINANCIAL IDENTITY THEFT \$300 AND UNDER		-87.623786
2019-10-13 20:30:00 RETAIL THEFT		-87.687784
...		...
2021-02-27 09:00:00 DOMESTIC BATTERY SIMPLE		-87.670939
2021-02-27 04:00:00 DOMESTIC BATTERY SIMPLE		-87.547162

2021-02-22 18:55:00	\$500 AND UNDER	-87.707190
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	-87.615597
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	-87.708088

Date	Description	Location
2018-09-01 00:01:00	OVER \$500	NaN
2020-03-17 21:30:00	\$500 AND UNDER	(41.952051946, -87.754660372)
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	NaN
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	(41.852248185, -87.623786256)
2019-10-13 20:30:00	RETAIL THEFT	(41.895732399, -87.687784384)
...		
...		
2021-02-27 09:00:00	DOMESTIC BATTERY SIMPLE	(41.96579798, -87.670939132)
2021-02-27 04:00:00	DOMESTIC BATTERY SIMPLE	(41.651250849, -87.547162057)
2021-02-22 18:55:00	\$500 AND UNDER	(41.923767917, -87.707190335)
2021-02-27 13:00:00	AGGRAVATED OF A CHILD	(41.779059693, -87.615596501)
2021-02-27 09:55:00	DOMESTIC BATTERY SIMPLE	(41.996211719, -87.708088331)

[766163 rows x 20 columns]

```
[7]: crimes_description['times'] = np.ones(len(crimes_description), dtype=int)
      ↪ #trickiness to be able to combine since there are
crimes_combined = crimes_description.times.groupby(level=[0,1]).sum()
      ↪ #duplicates for the same hours and days
```

```
[8]: crimes_combined[crimes_combined>1].count() #check that it works
```

```
[8]: 61146
```

```
[9]: crimes_by_desc = crimes_combined.unstack(level=1).fillna(0).resample('h').sum().
      ↪ fillna(0).astype(int) #summarise the stat as a sum
```

```
[10]: crimes_by_desc #view
```

```
[10]: Description      $500 AND UNDER  ABUSE / NEGLECT - CARE FACILITY  \
Date
```

2018-01-01 00:00:00	4	0
2018-01-01 01:00:00	1	0
2018-01-01 02:00:00	0	0
2018-01-01 03:00:00	0	0
2018-01-01 04:00:00	0	0
...
2021-02-27 19:00:00	1	0
2021-02-27 20:00:00	3	0
2021-02-27 21:00:00	1	0
2021-02-27 22:00:00	4	0
2021-02-27 23:00:00	0	0

Description ABUSE/NEGLECT: CARE FACILITY \

Date

2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description AGG CRIM SEX ABUSE FAM MEMBER AGG CRIMINAL SEXUAL ABUSE \

Date

2018-01-01 00:00:00	36	10
2018-01-01 01:00:00	0	0
2018-01-01 02:00:00	0	0
2018-01-01 03:00:00	0	0
2018-01-01 04:00:00	0	0
...
2021-02-27 19:00:00	0	0
2021-02-27 20:00:00	0	0
2021-02-27 21:00:00	0	0
2021-02-27 22:00:00	0	0
2021-02-27 23:00:00	0	0

Description AGG PO HANDS ETC SERIOUS INJ AGG PO HANDS NO/MIN INJURY \

Date

2018-01-01 00:00:00	0	0
2018-01-01 01:00:00	0	0
2018-01-01 02:00:00	0	0
2018-01-01 03:00:00	0	0
2018-01-01 04:00:00	0	0

...
2021-02-27 19:00:00	0	0
2021-02-27 20:00:00	0	0
2021-02-27 21:00:00	0	0
2021-02-27 22:00:00	0	0
2021-02-27 23:00:00	0	0

Description	AGG PRO EMP HANDS SERIOUS INJ	AGG PRO.EMP: HANDGUN \
Date		

2018-01-01 00:00:00	0	0
2018-01-01 01:00:00	0	0
2018-01-01 02:00:00	0	0
2018-01-01 03:00:00	0	0
2018-01-01 04:00:00	0	0

...
2021-02-27 19:00:00	0	0
2021-02-27 20:00:00	0	0
2021-02-27 21:00:00	0	0
2021-02-27 22:00:00	0	0
2021-02-27 23:00:00	0	0

Description	AGG PRO.EMP: OTHER DANG WEAPON ... \
Date	...

2018-01-01 00:00:00	0 ...
2018-01-01 01:00:00	1 ...
2018-01-01 02:00:00	0 ...
2018-01-01 03:00:00	0 ...
2018-01-01 04:00:00	0 ...

...
2021-02-27 19:00:00	0 ...	
2021-02-27 20:00:00	0 ...	
2021-02-27 21:00:00	0 ...	
2021-02-27 22:00:00	0 ...	
2021-02-27 23:00:00	0 ...	

Description	VIOLETION OF CIVIL NO CONTACT ORDER \
Date	

2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0

...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0

2021-02-27 23:00:00 0

Description VIOLATION OF SMOKING BAN \

Date

2018-01-01 00:00:00 0

2018-01-01 01:00:00 0

2018-01-01 02:00:00 0

2018-01-01 03:00:00 0

2018-01-01 04:00:00 0

...

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2021-02-27 19:00:00 0

2021-02-27 20:00:00 0

2021-02-27 21:00:00 0

2021-02-27 22:00:00 0

2021-02-27 23:00:00 0

Description VIOLATION OF STALKING NO CONTACT ORDER \

Date

2018-01-01 00:00:00 0

2018-01-01 01:00:00 0

2018-01-01 02:00:00 0

2018-01-01 03:00:00 0

2018-01-01 04:00:00 0

...

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2021-02-27 19:00:00 0

2021-02-27 20:00:00 0

2021-02-27 21:00:00 0

2021-02-27 22:00:00 0

2021-02-27 23:00:00 0

Description VIOLATION OF SUMMARY CLOSURE \

Date

2018-01-01 00:00:00 0

2018-01-01 01:00:00 0

2018-01-01 02:00:00 0

2018-01-01 03:00:00 0

2018-01-01 04:00:00 0

...

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2021-02-27 19:00:00 0

2021-02-27 20:00:00 0

2021-02-27 21:00:00 0

2021-02-27 22:00:00 0

2021-02-27 23:00:00 0

Description VIOLENT OFFENDER - ANNUAL REGISTRATION \

Date

2018-01-01 00:00:00 0

2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description	VIOLENT OFFENDER - DUTY TO REGISTER \
Date	
2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description	VIOLENT OFFENDER - FAIL TO REGISTER NEW ADDRESS \
Date	
2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description	VIOLENT OFFENDER: ANNUAL REGISTRATION \
Date	
2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...

2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description	VIOLENT OFFENDER: DUTY TO REGISTER \
Date	
2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

Description	VIOLENT OFFENDER: FAIL TO REGISTER NEW ADDRESS
Date	
2018-01-01 00:00:00	0
2018-01-01 01:00:00	0
2018-01-01 02:00:00	0
2018-01-01 03:00:00	0
2018-01-01 04:00:00	0
...	...
2021-02-27 19:00:00	0
2021-02-27 20:00:00	0
2021-02-27 21:00:00	0
2021-02-27 22:00:00	0
2021-02-27 23:00:00	0

[27696 rows x 473 columns]

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```

HANDGUN', 'AGGRAVATED - HANDS, FISTS, FEET, NO / MINOR INJURY', 'AGGRAVATED - HANDS, FISTS, FEET, SERIOUS INJURY', 'AGGRAVATED - KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED - OTHER', 'AGGRAVATED - OTHER DANGEROUS WEAPON', 'AGGRAVATED - OTHER FIREARM', 'AGGRAVATED COMPUTER TAMPERING', 'AGGRAVATED CRIMINAL SEXUAL ABUSE', 'AGGRAVATED CRIMINAL SEXUAL ABUSE BY FAMILY MEMBER', 'AGGRAVATED DOMESTIC BATTERY - HANDGUN', 'AGGRAVATED DOMESTIC BATTERY - KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED DOMESTIC BATTERY - OTHER DANGEROUS WEAPON', 'AGGRAVATED DOMESTIC BATTERY - OTHER FIREARM', 'AGGRAVATED DOMESTIC BATTERY: HANDGUN', 'AGGRAVATED DOMESTIC BATTERY: HANDS/FIST/FEET SERIOUS INJURY', 'AGGRAVATED DOMESTIC BATTERY: KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED DOMESTIC BATTERY: KNIFE/CUTTING INST', 'AGGRAVATED DOMESTIC BATTERY: OTHER DANG WEAPON', 'AGGRAVATED DOMESTIC BATTERY: OTHER DANGEROUS WEAPON', 'AGGRAVATED FINANCIAL IDENTITY THEFT', 'AGGRAVATED OF A CHILD', 'AGGRAVATED OF A SENIOR CITIZEN', 'AGGRAVATED OF A UNBORN CHILD', 'AGGRAVATED OF AN UNBORN CHILD', 'AGGRAVATED P.O. - HANDS, FISTS, FEET, NO / MINOR INJURY', 'AGGRAVATED P.O. - HANDS, FISTS, FEET, SERIOUS INJURY', 'AGGRAVATED PO: HANDGUN', 'AGGRAVATED PO: KNIFE/CUT INSTR', 'AGGRAVATED PO: OTHER DANG WEAP', 'AGGRAVATED PO: OTHER DANGEROUS WEAPON', 'AGGRAVATED PO: OTHER FIREARM', 'AGGRAVATED PO:KNIFE/CUT INSTR', 'AGGRAVATED POLICE OFFICER - HANDGUN', 'AGGRAVATED POLICE OFFICER - HANDS, FISTS, FEET, NO INJURY', 'AGGRAVATED POLICE OFFICER - KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED POLICE OFFICER - OTHER DANGEROUS WEAPON', 'AGGRAVATED POLICE OFFICER - OTHER FIREARM', 'AGGRAVATED PROTECTED EMPLOYEE - HANDGUN', 'AGGRAVATED PROTECTED EMPLOYEE - KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED PROTECTED EMPLOYEE - OTHER DANGEROUS WEAPON', 'AGGRAVATED PROTECTED EMPLOYEE - OTHER FIREARM', 'AGGRAVATED SEXUAL ASSAULT OF CHILD BY FAMILY MEMBER', 'AGGRAVATED VEHICULAR HIJACKING', 'AGGRAVATED: HANDGUN', 'AGGRAVATED: HANDS / FIST / FEET NO / MINOR INJURY', 'AGGRAVATED: HANDS / FIST / FEET SERIOUS INJURY', 'AGGRAVATED: KNIFE / CUTTING INSTRUMENT', 'AGGRAVATED: KNIFE/CUT INSTR', 'AGGRAVATED: OTHER', 'AGGRAVATED: OTHER DANG WEAPON', 'AGGRAVATED: OTHER DANGEROUS WEAPON', 'AGGRAVATED: OTHER FIREARM', 'AGGRAVATED:KNIFE/CUTTING INSTR', 'AIDING ARRESTEE ESCAPE', 'ALTER / FORGE PRESCRIPTION', 'ALTER COINS', 'ALTER/FORGE PRESCRIPTION', 'ANIMAL ABUSE / NEGLECT', 'ANIMAL ABUSE/NEGLECT', 'ANIMAL FIGHTING', 'ARMED - HANDGUN', 'ARMED - KNIFE / CUTTING INSTRUMENT', 'ARMED - OTHER DANGEROUS WEAPON', 'ARMED - OTHER FIREARM', 'ARMED WHILE UNDER THE INFLUENCE', 'ARMED: HANDGUN', 'ARMED: OTHER DANGEROUS WEAPON', 'ARMED: OTHER FIREARM', 'ARMED:KNIFE/CUTTING INSTRUMENT', 'ARSON THREAT', 'ARSONIST - ANNUAL REGISTRATION', 'ARSONIST - FAIL TO REGISTER NEW ADDRESS', 'ARSONIST: ANNUAL REGISTRATION', 'ARSONIST: DUTY TO REGISTER', 'ARSONIST: FAIL TO REGISTER NEW ADDRESS', 'ATT AGG CRIMINAL SEXUAL ABUSE', 'ATT CRIM SEXUAL ABUSE', 'ATT: AUTOMOBILE', 'ATT: TRUCK, BUS, MOTOR HOME', 'ATTEMPT - AUTOMOBILE', 'ATTEMPT - CYCLE, SCOOTER, BIKE WITH VIN', 'ATTEMPT - FINANCIAL IDENTITY THEFT', 'ATTEMPT - TRUCK, BUS, MOTOR HOME', 'ATTEMPT AGG: HANDGUN', 'ATTEMPT AGG: KNIFE/CUT INSTR', 'ATTEMPT AGG: OTHER', 'ATTEMPT AGG: OTHER DANG WEAPON', 'ATTEMPT AGGRAVATED', 'ATTEMPT AGGRAVATED - HANDGUN', 'ATTEMPT AGGRAVATED - KNIFE / CUTTING INSTRUMENT', 'ATTEMPT AGGRAVATED - OTHER', 'ATTEMPT AGGRAVATED - OTHER DANGEROUS WEAPON', 'ATTEMPT AGGRAVATED CRIMINAL SEXUAL ABUSE', 'ATTEMPT ARMED - HANDGUN', 'ATTEMPT ARMED - KNIFE / CUTTING INSTRUMENT', 'ATTEMPT ARMED - OTHER DANGEROUS WEAPON', 'ATTEMPT ARMED - OTHER FIREARM', 'ATTEMPT ARMED: HANDGUN', 'ATTEMPT ARSON', 'ATTEMPT CRIMINAL SEXUAL ABUSE',

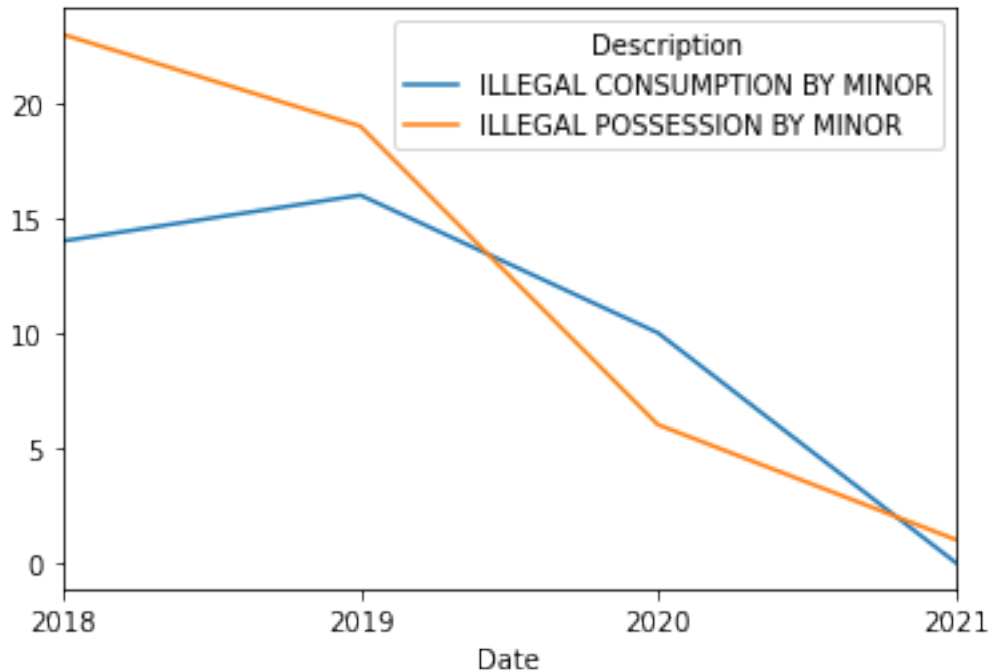
'ATTEMPT FORCIBLE ENTRY', 'ATTEMPT NON-AGGRAVATED', 'ATTEMPT POSSESSION
 CANNABIS', 'ATTEMPT POSSESSION NARCOTICS', 'ATTEMPT STRONG ARM - NO WEAPON',
 'ATTEMPT STRONG ARM: NO WEAPON', 'ATTEMPT THEFT', 'ATTEMPT: AGGRAVATED',
 'ATTEMPT: ARMED-HANDGUN', 'ATTEMPT: ARMED-KNIFE/CUT INSTR', 'ATTEMPT: ARMED-
 OTHER DANG WEAP', 'ATTEMPT: ARMED-OTHER FIREARM', 'ATTEMPT: CYCLE, SCOOTER, BIKE
 NO VIN', 'ATTEMPT: CYCLE, SCOOTER, BIKE W-VIN', 'ATTEMPT: STRONGARM-NO WEAPON',
 'AUTOMOBILE', 'BIGAMY', 'BOARD PLANE WITH WEAPON', 'BOGUS CHECK', 'BOMB THREAT',
 'BRIBERY', 'BY EXPLOSIVE', 'BY FIRE', 'CALL OPERATION', 'CANNABIS PLANT', 'CHILD
 ABANDONMENT', 'CHILD ABDUCTION', 'CHILD ABDUCTION / STRANGER', 'CHILD
 ABDUCTION/STRANGER', 'CHILD ABUSE', 'CHILD PORNOGRAPHY', 'COMMERCIAL SEX ACTS',
 'COMPELLING CONFESSION', 'COMPUTER FRAUD', 'CONCEALED CARRY LICENSE REVOCATION',
 'CONT SUBS:FAIL TO MAINT RECORD', 'CONTRIBUTE CRIM DELINQUENCY JUVENILE',
 'CONTRIBUTE DELINQUENCY OF A CHILD', 'CONTRIBUTE TO THE CRIMINAL DELINQUENCY OF
 CHILD', 'CONTRIBUTE TO THE DELINQUENCY OF CHILD', 'COUNTERFEIT CHECK',
 'COUNTERFEITING DOCUMENT', 'CREDIT CARD FRAUD', 'CRIM SEX ABUSE BY FAM MEMBER',
 'CRIMINAL DEFACEMENT', 'CRIMINAL DRUG CONSPIRACY', 'CRIMINAL SEXUAL ABUSE',
 'CRIMINAL SEXUAL ABUSE BY FAMILY MEMBER', 'CRIMINAL TRANSMISSION OF HIV',
 'CYBERSTALKING', 'CYCLE, SCOOTER, BIKE NO VIN', 'CYCLE, SCOOTER, BIKE W-VIN',
 'CYCLE, SCOOTER, BIKE WITH VIN', 'DECEPTIVE COLLECTION PRACTICES', 'DEFACE IDENT
 MARKS OF FIREARM', 'DEFACE IDENTIFICATION MARKS OF FIREARM', 'DEL CONT SUBS TO
 PERSON <18', 'DELIVER CANNABIS TO PERSON <18', 'DELIVERY CONTAINER THEFT',
 'DOMESTIC BATTERY SIMPLE', 'EAVESDROPPING', 'EDUCATIONAL INTIMIDAITON',
 'EMBEZZLEMENT', 'EMPLOY MINOR', 'ENDANGERING LIFE / HEALTH OF CHILD',
 'ENDANGERING LIFE/HEALTH CHILD', 'ESCAPE', 'EXTORTION', 'FALSE / STOLEN /
 ALTERED TRP', 'FALSE FIRE ALARM', 'FALSE POLICE REPORT', 'FALSE/STOLEN/ALTERED
 TRP', 'FINAN EXPLOIT-ELDERLY/DISABLED', 'FINANCIAL EXPLOITATION OF AN ELDERLY OR
 DISABLED PERSON', 'FINANCIAL IDENTITY THEFT \$300 AND UNDER', 'FINANCIAL IDENTITY
 THEFT OVER \$ 300', 'FIRST DEGREE MURDER', 'FOID - REVOCATION', 'FORCIBLE
 DETENTION', 'FORCIBLE ENTRY', 'FORFEIT PROPERTY', 'FORGERY', 'FOUND SUSPECT
 NARCOTICS', 'FRAUD OR CONFIDENCE GAME', 'FROM BUILDING', 'FROM COIN-OP
 MACHINE/DEVICE', 'FROM COIN-OPERATED MACHINE OR DEVICE', 'GAME / AMUSEMENT
 DEVICE', 'GAME/AMUSEMENT DEVICE', 'GAME/CARDS', 'GAME/DICE', 'GUN OFFENDER -
 ANNUAL REGISTRATION', 'GUN OFFENDER - DUTY TO REGISTER', 'GUN OFFENDER - DUTY TO
 REPORT CHANGE OF INFORMATION', 'GUN OFFENDER: ANNUAL REGISTRATION', 'GUN
 OFFENDER: DUTY TO REGISTER', 'GUN OFFENDER: DUTY TO REPORT CHANGE OF
 INFORMATION', 'HARASSMENT BY ELECTRONIC MEANS', 'HARASSMENT BY TELEPHONE',
 'HARBOR RUNAWAY', 'HAZARDOUS MATERIALS VIOLATION', 'HOME INVASION', 'ILLEGAL
 CONSUMPTION BY MINOR', 'ILLEGAL POSSESSION BY MINOR', 'ILLEGAL POSSESSION CASH
 CARD', 'ILLEGAL USE CASH CARD', 'IMPERSONATION', 'IN TAVERN', 'INDECENT
 SOLICITATION OF A CHILD', 'INDECENT SOLICITATION OF AN ADULT', 'INDECENT
 SOLICITATION/ADULT', 'INDECENT SOLICITATION/CHILD', 'INSTITUTIONAL VANDALISM',
 'INSURANCE FRAUD', 'INTERFERE W/ EMERGENCY EQUIP', 'INTERFERE W/ HIGHER
 EDUCATION', 'INTERFERE WITH EMERGENCY EQUIPMENT', 'INTERFERENCE JUDICIAL
 PROCESS', 'INTIMIDATION', 'INTIMIDATION OF LAW ENFORCEMENT OFFICIAL',
 'INTOXICATING COMPOUNDS', 'INVOLUNTARY MANSLAUGHTER', 'INVOLUNTARY SERVITUDE',
 'JUVENILE PIMPING', 'KIDNAPPING', 'LIBRARY VANDALISM', 'LICENSE VIOLATION',
 'LICENSED PREMISE', 'LIQUOR LICENSE VIOLATION', 'LOOTING', 'LOST PASSPORT',
 'MANU/DEL:CANNABIS 10GM OR LESS', 'MANU/DEL:CANNABIS OVER 10 GMS',

'MANU/DELIVER: HALLUCINOGEN', 'MANU/DELIVER: HEROIN (WHITE)', 'MANU/DELIVER: HEROIN(BRN/TAN)', 'MANU/DELIVER: METHAMPHETAMINES', 'MANU/DELIVER: AMPHETAMINES', 'MANU/DELIVER: BARBITURATES', 'MANU/DELIVER: COCAINE', 'MANU/DELIVER: CRACK', 'MANU/DELIVER: HEROIN (BLACK TAR)', 'MANU/DELIVER: LOOK-ALIKE DRUG', 'MANU/DELIVER: PCP', 'MANU/DELIVER: SYNTHETIC DRUGS', 'MANU/POSS. W/INTENT TO DELIVER: SYNTHETIC MARIJUANA', 'MANUFACTURE / DELIVER - HEROIN (WHITE)', 'MANUFACTURE / DELIVER - AMPHETAMINES', 'MANUFACTURE / DELIVER - BARBITURATES', 'MANUFACTURE / DELIVER - CANNABIS 10 GRAMS OR LESS', 'MANUFACTURE / DELIVER - CANNABIS OVER 10 GRAMS', 'MANUFACTURE / DELIVER - COCAINE', 'MANUFACTURE / DELIVER - CRACK', 'MANUFACTURE / DELIVER - HALLUCINOGEN', 'MANUFACTURE / DELIVER - HEROIN (BLACK TAR)', 'MANUFACTURE / DELIVER - HEROIN (TAN / BROWN TAR)', 'MANUFACTURE / DELIVER - METHAMPHETAMINE', 'MANUFACTURE / DELIVER - PCP', 'MANUFACTURE / DELIVER - SYNTHETIC DRUGS', 'MANUFACTURE / DELIVER - SYNTHETIC MARIJUANA', 'MOB ACTION', 'MONEY LAUNDERING', 'NON-AGGRAVATED', 'NON-CONSENSUAL DISSEMINATION OF PRIVATE SEXUAL IMAGES', 'NON-CONSENSUAL DISSEMINATION PRIVATE SEXUAL IMAGES', 'NOTIFICATION OF CIVIL NO CONTACT ORDER', 'NOTIFICATION OF STALKING - NO CONTACT ORDER', 'OBSCENE MATTER', 'OBSCENE TELEPHONE CALLS', 'OBSCENITY', 'OBSTRUCTING IDENTIFICATION', 'OBSTRUCTING JUSTICE', 'OBSTRUCTING SERVICE', 'OF AN UNBORN CHILD', 'OF UNBORN CHILD', 'OFFICIAL MISCONDUCT', 'OTHER', 'OTHER ARSON / EXPLOSIVE INCIDENT', 'OTHER ARSON/EXPLOSIVE INCIDENT', 'OTHER CRIME AGAINST PERSON', 'OTHER CRIME INVOLVING PROPERTY', 'OTHER OFFENSE', 'OTHER PROSTITUTION OFFENSE', 'OTHER VEHICLE OFFENSE', 'OTHER VIOLATION', 'OTHER WEAPONS VIOLATION', 'OVER \$500', 'PANDERING', 'PAROLE VIOLATION', 'PATRONIZE JUVENILE PROSTITUTE', 'PATRONIZING A PROSTITUTE', 'PAY TV SERVICE OFFENSES', 'PEEPING TOM', 'PIMPING', 'POCKET-PICKING', 'POS: EXPLOSIVE/INCENDIARY DEV', 'POS: HYPODERMIC NEEDLE', 'POS: PORNOGRAPHIC PRINT', 'POSS FIREARM/AMMO:NO FOID CARD', 'POSS: AMPHETAMINES', 'POSS: BARBITURATES', 'POSS: CANNABIS 30GMS OR LESS', 'POSS: CANNABIS MORE THAN 30GMS', 'POSS: COCAINE', 'POSS: CRACK', 'POSS: HALLUCINOGENS', 'POSS: HEROIN (BLACK TAR)', 'POSS: HEROIN (BRN/TAN)', 'POSS: HEROIN (WHITE)', 'POSS: LOOK-ALIKE DRUGS', 'POSS: METHAMPHETAMINES', 'POSS: PCP', 'POSS: SYNTHETIC DRUGS', 'POSSESS - AMPHETAMINES', 'POSSESS - BARBITURATES', 'POSSESS - CANNABIS 30 GRAMS OR LESS', 'POSSESS - CANNABIS MORE THAN 30 GRAMS', 'POSSESS - COCAINE', 'POSSESS - CRACK', 'POSSESS - HALLUCINOGENS', 'POSSESS - HEROIN (BLACK TAR)', 'POSSESS - HEROIN (TAN / BROWN TAR)', 'POSSESS - HEROIN (WHITE)', 'POSSESS - METHAMPHETAMINE', 'POSSESS - PCP', 'POSSESS - SYNTHETIC DRUGS', 'POSSESS FIREARM / AMMUNITION - NO FOID CARD', 'POSSESSION - EXPLOSIVE / INCENDIARY DEVICE', 'POSSESSION OF BURGLARY TOOLS', 'POSSESSION OF DRUG EQUIPMENT', 'POSSESSION OF PORNOGRAPHIC PRINT', 'POSSESSION: SYNTHETIC MARIJUANA', 'PREDATORY', 'PRO EMP HANDS NO/MIN INJURY', 'PROBATION VIOLATION', 'PROHIBITED PLACES', 'PROTECTED EMPLOYEE - HANDS, FISTS, FEET, NO / MINOR INJURY', 'PROTECTED EMPLOYEE: HANDS NO / MIN INJURY', 'PUBLIC DEMONSTRATION', 'PUBLIC INDECENCY', 'PURSE-SNATCHING', 'RECKLESS CONDUCT', 'RECKLESS FIREARM DISCHARGE', 'RECKLESS HOMICIDE', 'REFUSING TO AID AN OFFICER', 'RESIST / OBSTRUCT / DISARM OFFICER', 'RESIST/OBSTRUCT/DISARM OFFICER', 'RETAIL THEFT', 'SALE / DELIVER - DRUG PARAPHERNALIA', 'SALE / DISTRIBUTE OBSCENE MATERIAL TO MINOR', 'SALE OF TOBACCO PRODUCTS TO MINOR', 'SALE TOBACCO PRODUCTS TO MINOR', 'SALE/DEL DRUG PARAPHERNALIA', 'SALE/DIST OBSCENE MAT TO MINOR', 'SELL / GIVE / DELIVER LIQUOR TO MINOR', 'SELL/GIVE/DEL LIQUOR TO MINOR', 'SEX ASSLT OF CHILD

BY FAM MBR', 'SEX OFFENDER - FAIL TO REGISTER', 'SEX OFFENDER - FAIL TO REGISTER
 NEW ADDRESS', 'SEX OFFENDER: FAIL REG NEW ADD', 'SEX OFFENDER: FAIL TO
 REGISTER', 'SEX OFFENDER: PROHIBITED ZONE', 'SEXUAL ASSAULT OF CHILD BY FAMILY
 MEMBER', 'SEXUAL EXPLOITATION OF A CHILD', 'SEXUAL RELATIONS IN FAMILY',
 'SIMPLE', 'SOLICIT FOR BUSINESS', 'SOLICIT FOR PROSTITUTE', 'SOLICIT NARCOTICS
 ON PUBLIC WAY', 'SOLICIT NARCOTICS ON PUBLICWAY', 'SOLICIT OFF PUBLIC WAY',
 'SOLICIT ON PUBLIC WAY', 'SOLICITING FOR A PROSTITUTE', 'SOLICITING FOR
 BUSINESS', 'STOLEN PROP: BUY/RECEIVE/POS.', 'STOLEN PROPERTY BUY / RECEIVE /
 POSSESS', 'STRONG ARM - NO WEAPON', 'STRONGARM - NO WEAPON', 'STRONGARM: NO
 WEAPON', 'TAMPER WITH MOTOR VEHICLE', 'TELEPHONE THREAT', 'THEFT / RECOVERY -
 AUTOMOBILE', 'THEFT / RECOVERY - CYCLE, SCOOTER, BIKE WITH VIN', 'THEFT /
 RECOVERY - TRUCK, BUS, MOBILE HOME', 'THEFT BY LESSEE, MOTOR VEHICLE', 'THEFT BY
 LESSEE, NON-MOTOR VEHICLE', 'THEFT BY LESSEE,MOTOR VEH', 'THEFT BY LESSEE,NON-
 VEH', 'THEFT OF LABOR / SERVICES', 'THEFT OF LABOR/SERVICES', 'THEFT OF LOST /
 MISLAID PROPERTY', 'THEFT OF LOST/MISLAID PROP', 'THEFT/RECOVERY: AUTOMOBILE',
 'THEFT/RECOVERY: CYCLE, SCOOTER, BIKE NO VIN', 'THEFT/RECOVERY: CYCLE, SCOOTER,
 BIKE W-VIN', 'THEFT/RECOVERY: TRUCK,BUS,MHOME', 'TO AIRPORT', 'TO CITY OF
 CHICAGO PROPERTY', 'TO FIRE FIGHT.APP.EQUIP', 'TO LAND', 'TO PROPERTY', 'TO
 RESIDENCE', 'TO STATE SUP LAND', 'TO STATE SUP PROP', 'TO STATE SUPPORTED
 PROPERTY', 'TO VEHICLE', 'TRUCK, BUS, MOTOR HOME', 'UNAUTHORIZED VIDEOTAPING',
 'UNIDENTIFIABLE RECORDING SOUND', 'UNLAWFUL ENTRY', 'UNLAWFUL
 INTERFERE/VISITATION', 'UNLAWFUL POSS AMMUNITION', 'UNLAWFUL POSS OF HANDGUN',
 'UNLAWFUL POSS OTHER FIREARM', 'UNLAWFUL POSSESSION - AMMUNITION', 'UNLAWFUL
 POSSESSION - HANDGUN', 'UNLAWFUL POSSESSION - OTHER FIREARM', 'UNLAWFUL
 RESTRAINT', 'UNLAWFUL SALE - DELIVERY OF FIREARM AT SCHOOL', 'UNLAWFUL SALE -
 HANDGUN', 'UNLAWFUL SALE - OTHER FIREARM', 'UNLAWFUL SALE HANDGUN', 'UNLAWFUL
 SALE OTHER FIREARM', 'UNLAWFUL SALE/DELIVERY OF FIREARM AT SCHOOL', 'UNLAWFUL
 USE - HANDGUN', 'UNLAWFUL USE - OTHER DANGEROUS WEAPON', 'UNLAWFUL USE - OTHER
 FIREARM', 'UNLAWFUL USE / SALE OF AIR RIFLE', 'UNLAWFUL USE HANDGUN', 'UNLAWFUL
 USE OF A COMPUTER', 'UNLAWFUL USE OF BODY ARMOR', 'UNLAWFUL USE OF RECORDED
 SOUND', 'UNLAWFUL USE OTHER DANG WEAPON', 'UNLAWFUL USE OTHER FIREARM',
 'UNLAWFUL USE/SALE AIR RIFLE', 'UNLAWFUL VISITATION INTERFERENCE', 'VEHICLE
 TITLE / REGISTRATION OFFENSE', 'VEHICLE TITLE/REG OFFENSE', 'VEHICULAR
 HIJACKING', 'VIO BAIL BOND: DOM VIOLENCE', 'VIOLATE ORDER OF PROTECTION',
 'VIOLATION GPS MONITORING DEVICE', 'VIOLATION OF BAIL BOND - DOMESTIC VIOLENCE',
 'VIOLATION OF CIVIL NO CONTACT ORDER', 'VIOLATION OF SMOKING BAN', 'VIOLATION OF
 STALKING NO CONTACT ORDER', 'VIOLATION OF SUMMARY CLOSURE', 'VIOLENT OFFENDER -
 ANNUAL REGISTRATION', 'VIOLENT OFFENDER - DUTY TO REGISTER', 'VIOLENT OFFENDER -
 FAIL TO REGISTER NEW ADDRESS', 'VIOLENT OFFENDER: ANNUAL REGISTRATION', 'VIOLENT
 OFFENDER: DUTY TO REGISTER', 'VIOLENT OFFENDER: FAIL TO REGISTER NEW ADDRESS']

```
[12]: crimes_by_desc.loc[:,["ILLEGAL CONSUMPTION BY MINOR", "ILLEGAL POSSESSION BY_
    ↳MINOR"]].resample('Y').sum().plot()
#subset and plot desired columns over time
```

```
[12]: <AxesSubplot:xlabel='Date'>
```



3.1 Description of data analysis result 1

Use the next cell to describe your data analysis result 1

Over the course of 4 years, the total number of Illegal Consumption and Illegal Possession charges for minors has decreased. There was not a huge number to begin with, but there has been a definite decline over time. For example, Illegal Possession cases decreased from over 20 in 2018 to just a few in 2021 (to date).

4 Code for data analysis 2

You can place the code for your second data analysis result in this section. Add as many code cells as you need.

```
[13]: crimes.head() #check data again
```

```
[13]:
```

Date	ID	Case Number	Block	IUCR	\
2018-09-01 00:01:00	11646166	JC213529	082XX S INGLESIDE AVE	0810	
2020-03-17 21:30:00	12014684	JD189901	039XX N LECLAIRE AVE	0820	
2018-01-01 08:00:00	11645648	JC212959	024XX N MONITOR AVE	1153	
2019-09-24 08:00:00	11864018	JC476123	022XX S MICHIGAN AVE	1154	
2019-10-13 20:30:00	11859805	JC471592	024XX W CHICAGO AVE	0860	

```
Primary Type \
```

Date	
2018-09-01 00:01:00	THEFT
2020-03-17 21:30:00	THEFT
2018-01-01 08:00:00	DECEPTIVE PRACTICE
2019-09-24 08:00:00	DECEPTIVE PRACTICE
2019-10-13 20:30:00	THEFT

Date	Description \
2018-09-01 00:01:00	OVER \$500
2020-03-17 21:30:00	\$500 AND UNDER
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER
2019-10-13 20:30:00	RETAIL THEFT

Date	Location	Description	Arrest	Domestic	Beat \
2018-09-01 00:01:00		RESIDENCE	False	True	631
2020-03-17 21:30:00		STREET	False	False	1634
2018-01-01 08:00:00		RESIDENCE	False	False	2515
2019-09-24 08:00:00	COMMERCIAL /	BUSINESS OFFICE	False	False	132
2019-10-13 20:30:00		GROCERY FOOD STORE	False	False	1221

Date	...	Ward	Community Area	FBI Code	X Coordinate \
2018-09-01 00:01:00	...	8.0	44.0	06	NaN
2020-03-17 21:30:00	...	45.0	15.0	06	1141659.0
2018-01-01 08:00:00	...	30.0	19.0	11	NaN
2019-09-24 08:00:00	...	3.0	33.0	11	1177560.0
2019-10-13 20:30:00	...	26.0	24.0	06	1160005.0

Date	Y Coordinate	Year	Updated On	Latitude \
2018-09-01 00:01:00	NaN	2018	04/06/2019 04:04:43 PM	NaN
2020-03-17 21:30:00	1925649.0	2020	03/25/2020 03:45:43 PM	41.952052
2018-01-01 08:00:00	NaN	2018	04/06/2019 04:04:43 PM	NaN
2019-09-24 08:00:00	1889548.0	2019	10/20/2019 03:56:02 PM	41.852248
2019-10-13 20:30:00	1905256.0	2019	10/20/2019 04:03:03 PM	41.895732

Date	Longitude	Location
2018-09-01 00:01:00	NaN	NaN
2020-03-17 21:30:00	-87.754660	(41.952051946, -87.754660372)
2018-01-01 08:00:00	NaN	NaN
2019-09-24 08:00:00	-87.623786	(41.852248185, -87.623786256)
2019-10-13 20:30:00	-87.687784	(41.895732399, -87.687784384)

[5 rows x 21 columns]

```
[14]: crimes.info() #checking data
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 766163 entries, 2018-09-01 00:01:00 to 2021-02-27 09:55:00
Data columns (total 21 columns):
 #   Column                Non-Null Count  Dtype
---  -
 0   ID                    766163 non-null  int64
 1   Case Number           766163 non-null  object
 2   Block                 766163 non-null  object
 3   IUCR                  766163 non-null  object
 4   Primary Type          766163 non-null  object
 5   Description            766163 non-null  object
 6   Location Description   762688 non-null  object
 7   Arrest                766163 non-null  bool
 8   Domestic              766163 non-null  bool
 9   Beat                  766163 non-null  int64
10   District              766163 non-null  float64
11   Ward                  766133 non-null  float64
12   Community Area        766162 non-null  float64
13   FBI Code              766163 non-null  object
14   X Coordinate          758002 non-null  float64
15   Y Coordinate          758002 non-null  float64
16   Year                  766163 non-null  int64
17   Updated On            766163 non-null  object
18   Latitude              758002 non-null  float64
19   Longitude             758002 non-null  float64
20   Location              758002 non-null  object
dtypes: bool(2), float64(7), int64(3), object(9)
memory usage: 118.4+ MB
```

```
[15]: crime_loc = crimes.groupby(["Location Description"]) #group data
```

```
[21]: crime_loc_count = crime_loc.count() #summarise with a count
```

```
[35]: crime_loc_count.sort_values(by = "ID", ascending = False).head(10)["ID"] #check values
```

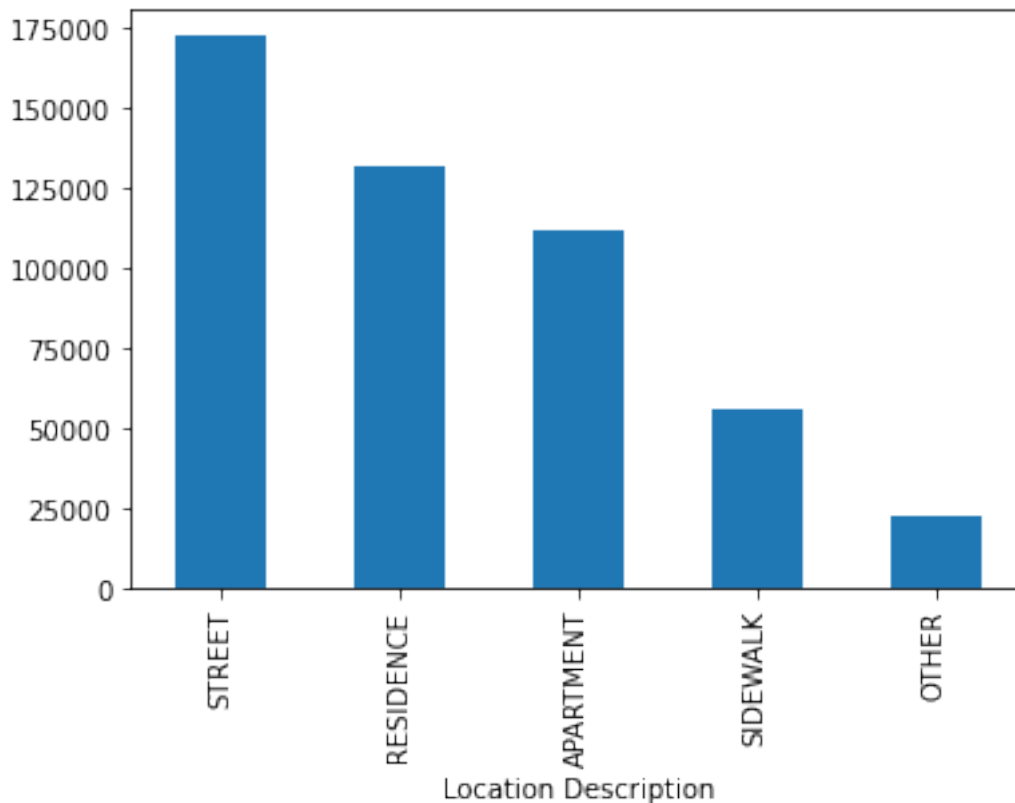
```
[35]: Location Description
STREET                172560
RESIDENCE              131990
APARTMENT              111584
SIDEWALK               55978
OTHER                  22762
SMALL RETAIL STORE     20171
```

RESTAURANT	18191
PARKING LOT/GARAGE(NON.RESID.)	16039
ALLEY	15346
VEHICLE NON-COMMERCIAL	13424

Name: ID, dtype: int64

```
[28]: crime_loc_count.sort_values(by = "ID", ascending = False).head()["ID"].plot.  
      ↪ bar() #sort, plot
```

```
[28]: <AxesSubplot:xlabel='Location Description'>
```



4.1 Description of data analysis result 2

Use the next cell to describe your data analysis result 2

The vast majority of crimes occurred on the street, at a residence, or at an apartment. In fact, these locales were the only ones to see over 100,000 cases occur at them. The **other** tag is misleading, as that was literally the label for a category of crime location – it is not the sum of the remaining cases.

5 Code for data analysis 3

You can place the code for your third data analysis result in this section. Add as many code cells as you need.

```
[36]: crimes.head() #check data out
```

```
[36]:
```

	ID	Case Number	Block	IUCR	\
Date					
2018-09-01 00:01:00	11646166	JC213529	082XX S INGLESIDE AVE	0810	
2020-03-17 21:30:00	12014684	JD189901	039XX N LECLAIRE AVE	0820	
2018-01-01 08:00:00	11645648	JC212959	024XX N MONITOR AVE	1153	
2019-09-24 08:00:00	11864018	JC476123	022XX S MICHIGAN AVE	1154	
2019-10-13 20:30:00	11859805	JC471592	024XX W CHICAGO AVE	0860	

	Primary Type	\
Date		
2018-09-01 00:01:00	THEFT	
2020-03-17 21:30:00	THEFT	
2018-01-01 08:00:00	DECEPTIVE PRACTICE	
2019-09-24 08:00:00	DECEPTIVE PRACTICE	
2019-10-13 20:30:00	THEFT	

	Description	\
Date		
2018-09-01 00:01:00	OVER \$500	
2020-03-17 21:30:00	\$500 AND UNDER	
2018-01-01 08:00:00	FINANCIAL IDENTITY THEFT OVER \$ 300	
2019-09-24 08:00:00	FINANCIAL IDENTITY THEFT \$300 AND UNDER	
2019-10-13 20:30:00	RETAIL THEFT	

	Location Description	Arrest	Domestic	Beat	\
Date					
2018-09-01 00:01:00	RESIDENCE	False	True	631	
2020-03-17 21:30:00	STREET	False	False	1634	
2018-01-01 08:00:00	RESIDENCE	False	False	2515	
2019-09-24 08:00:00	COMMERCIAL / BUSINESS OFFICE	False	False	132	
2019-10-13 20:30:00	GROCERY FOOD STORE	False	False	1221	

	...	Ward	Community Area	FBI Code	X Coordinate	\
Date	...					
2018-09-01 00:01:00	...	8.0	44.0	06	NaN	
2020-03-17 21:30:00	...	45.0	15.0	06	1141659.0	
2018-01-01 08:00:00	...	30.0	19.0	11	NaN	
2019-09-24 08:00:00	...	3.0	33.0	11	1177560.0	
2019-10-13 20:30:00	...	26.0	24.0	06	1160005.0	

Y Coordinate	Year	Updated On	Latitude	\
--------------	------	------------	----------	---

Date						
2018-09-01 00:01:00		NaN	2018	04/06/2019	04:04:43 PM	NaN
2020-03-17 21:30:00	1925649.0		2020	03/25/2020	03:45:43 PM	41.952052
2018-01-01 08:00:00		NaN	2018	04/06/2019	04:04:43 PM	NaN
2019-09-24 08:00:00	1889548.0		2019	10/20/2019	03:56:02 PM	41.852248
2019-10-13 20:30:00	1905256.0		2019	10/20/2019	04:03:03 PM	41.895732

	Longitude	Location
Date		
2018-09-01 00:01:00	NaN	NaN
2020-03-17 21:30:00	-87.754660	(41.952051946, -87.754660372)
2018-01-01 08:00:00	NaN	NaN
2019-09-24 08:00:00	-87.623786	(41.852248185, -87.623786256)
2019-10-13 20:30:00	-87.687784	(41.895732399, -87.687784384)

[5 rows x 21 columns]

```
[37]: crimes.info() #check data out
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 766163 entries, 2018-09-01 00:01:00 to 2021-02-27 09:55:00
Data columns (total 21 columns):
#   Column                Non-Null Count  Dtype
---  -
0   ID                    766163 non-null  int64
1   Case Number          766163 non-null  object
2   Block                766163 non-null  object
3   IUCR                 766163 non-null  object
4   Primary Type         766163 non-null  object
5   Description           766163 non-null  object
6   Location Description  762688 non-null  object
7   Arrest               766163 non-null  bool
8   Domestic             766163 non-null  bool
9   Beat                 766163 non-null  int64
10  District              766163 non-null  float64
11  Ward                  766133 non-null  float64
12  Community Area        766162 non-null  float64
13  FBI Code              766163 non-null  object
14  X Coordinate          758002 non-null  float64
15  Y Coordinate          758002 non-null  float64
16  Year                  766163 non-null  int64
17  Updated On           766163 non-null  object
18  Latitude              758002 non-null  float64
19  Longitude             758002 non-null  float64
20  Location              758002 non-null  object
dtypes: bool(2), float64(7), int64(3), object(9)
memory usage: 118.4+ MB
```

```
[38]: crimes_arrest_bool = crimes.set_index(['Arrest'], append=True)
      crimes_arrest_bool #add index
```

```
[38]:
```

Date	Arrest	ID	Case Number \
2018-09-01 00:01:00	False	11646166	JC213529
2020-03-17 21:30:00	False	12014684	JD189901
2018-01-01 08:00:00	False	11645648	JC212959
2019-09-24 08:00:00	False	11864018	JC476123
2019-10-13 20:30:00	False	11859805	JC471592
...	
2021-02-27 09:00:00	False	12304455	JE156019
2021-02-27 04:00:00	False	12303401	JE153690
2021-02-22 18:55:00	False	12307254	JE158654
2021-02-27 13:00:00	False	12303054	JE154104
2021-02-27 09:55:00	False	12302712	JE153854

Date	Arrest	Block	IUCR \
2018-09-01 00:01:00	False	082XX S INGLESIDE AVE	0810
2020-03-17 21:30:00	False	039XX N LECLAIRE AVE	0820
2018-01-01 08:00:00	False	024XX N MONITOR AVE	1153
2019-09-24 08:00:00	False	022XX S MICHIGAN AVE	1154
2019-10-13 20:30:00	False	024XX W CHICAGO AVE	0860
...	
2021-02-27 09:00:00	False	046XX N PAULINA ST	0486
2021-02-27 04:00:00	False	134XX S BALTIMORE AVE	0486
2021-02-22 18:55:00	False	023XX N KEDZIE BLVD	0820
2021-02-27 13:00:00	False	063XX S DR MARTIN LUTHER KING JR DR	0485
2021-02-27 09:55:00	False	063XX N TROY ST	0486

Date	Arrest	Primary Type \
2018-09-01 00:01:00	False	THEFT
2020-03-17 21:30:00	False	THEFT
2018-01-01 08:00:00	False	DECEPTIVE PRACTICE
2019-09-24 08:00:00	False	DECEPTIVE PRACTICE
2019-10-13 20:30:00	False	THEFT
...		...
2021-02-27 09:00:00	False	BATTERY
2021-02-27 04:00:00	False	BATTERY
2021-02-22 18:55:00	False	THEFT
2021-02-27 13:00:00	False	BATTERY
2021-02-27 09:55:00	False	BATTERY

Date	Arrest	Description \
------	--------	---------------

2018-09-01 00:01:00	False	OVER \$500
2020-03-17 21:30:00	False	\$500 AND UNDER
2018-01-01 08:00:00	False	FINANCIAL IDENTITY THEFT OVER \$ 300
2019-09-24 08:00:00	False	FINANCIAL IDENTITY THEFT \$300 AND UNDER
2019-10-13 20:30:00	False	RETAIL THEFT
...		...
2021-02-27 09:00:00	False	DOMESTIC BATTERY SIMPLE
2021-02-27 04:00:00	False	DOMESTIC BATTERY SIMPLE
2021-02-22 18:55:00	False	\$500 AND UNDER
2021-02-27 13:00:00	False	AGGRAVATED OF A CHILD
2021-02-27 09:55:00	False	DOMESTIC BATTERY SIMPLE

Date	Arrest	Location Description	Domestic	Beat \
2018-09-01 00:01:00	False	RESIDENCE	True	631
2020-03-17 21:30:00	False	STREET	False	1634
2018-01-01 08:00:00	False	RESIDENCE	False	2515
2019-09-24 08:00:00	False	COMMERCIAL / BUSINESS OFFICE	False	132
2019-10-13 20:30:00	False	GROCERY FOOD STORE	False	1221
...	
2021-02-27 09:00:00	False	APARTMENT	True	1912
2021-02-27 04:00:00	False	STREET	True	433
2021-02-22 18:55:00	False	RESIDENCE - PORCH / HALLWAY	False	1413
2021-02-27 13:00:00	False	APARTMENT	False	312
2021-02-27 09:55:00	False	STREET	True	2413

Date	Arrest	District	Ward	Community Area	FBI Code \
2018-09-01 00:01:00	False	6.0	8.0	44.0	06
2020-03-17 21:30:00	False	16.0	45.0	15.0	06
2018-01-01 08:00:00	False	25.0	30.0	19.0	11
2019-09-24 08:00:00	False	1.0	3.0	33.0	11
2019-10-13 20:30:00	False	12.0	26.0	24.0	06
...	
2021-02-27 09:00:00	False	19.0	47.0	3.0	08B
2021-02-27 04:00:00	False	4.0	10.0	55.0	08B
2021-02-22 18:55:00	False	14.0	32.0	22.0	06
2021-02-27 13:00:00	False	3.0	20.0	69.0	04B
2021-02-27 09:55:00	False	24.0	50.0	2.0	08B

Date	Arrest	X Coordinate	Y Coordinate	Year \
2018-09-01 00:01:00	False	NaN	NaN	2018
2020-03-17 21:30:00	False	1141659.0	1925649.0	2020
2018-01-01 08:00:00	False	NaN	NaN	2018
2019-09-24 08:00:00	False	1177560.0	1889548.0	2019
2019-10-13 20:30:00	False	1160005.0	1905256.0	2019

```

...
2021-02-27 09:00:00 False      1164394.0      1930823.0  2021
2021-02-27 04:00:00 False      1199105.0      1816488.0  2021
2021-02-22 18:55:00 False      1154647.0      1915433.0  2021
2021-02-27 13:00:00 False      1180014.0      1862897.0  2021
2021-02-27 09:55:00 False      1154210.0      1941830.0  2021

                                Updated On  Latitude  Longitude  \
Date          Arrest
2018-09-01 00:01:00 False  04/06/2019 04:04:43 PM      NaN      NaN
2020-03-17 21:30:00 False  03/25/2020 03:45:43 PM  41.952052 -87.754660
2018-01-01 08:00:00 False  04/06/2019 04:04:43 PM      NaN      NaN
2019-09-24 08:00:00 False  10/20/2019 03:56:02 PM  41.852248 -87.623786
2019-10-13 20:30:00 False  10/20/2019 04:03:03 PM  41.895732 -87.687784
...
2021-02-27 09:00:00 False  03/06/2021 03:50:24 PM  41.965798 -87.670939
2021-02-27 04:00:00 False  03/06/2021 03:50:24 PM  41.651251 -87.547162
2021-02-22 18:55:00 False  03/06/2021 03:48:05 PM  41.923768 -87.707190
2021-02-27 13:00:00 False  03/06/2021 03:50:24 PM  41.779060 -87.615597
2021-02-27 09:55:00 False  03/06/2021 03:50:24 PM  41.996212 -87.708088

                                Location
Date          Arrest
2018-09-01 00:01:00 False      NaN
2020-03-17 21:30:00 False  (41.952051946, -87.754660372)
2018-01-01 08:00:00 False      NaN
2019-09-24 08:00:00 False  (41.852248185, -87.623786256)
2019-10-13 20:30:00 False  (41.895732399, -87.687784384)
...
2021-02-27 09:00:00 False  (41.96579798, -87.670939132)
2021-02-27 04:00:00 False  (41.651250849, -87.547162057)
2021-02-22 18:55:00 False  (41.923767917, -87.707190335)
2021-02-27 13:00:00 False  (41.779059693, -87.615596501)
2021-02-27 09:55:00 False  (41.996211719, -87.708088331)

```

[766163 rows x 20 columns]

```

[39]: crimes_arrest_bool['counts'] = np.ones(len(crimes_arrest_bool), dtype=int)
      ↪ #trickiness to be able to combine since there are
crimes_bool_combo = crimes_arrest_bool.counts.groupby(level=[0,1]).sum()
      ↪ #duplicates for the same hours and days

```

```

[40]: crimes_bool_combo[crimes_bool_combo>1].count() #check that it works

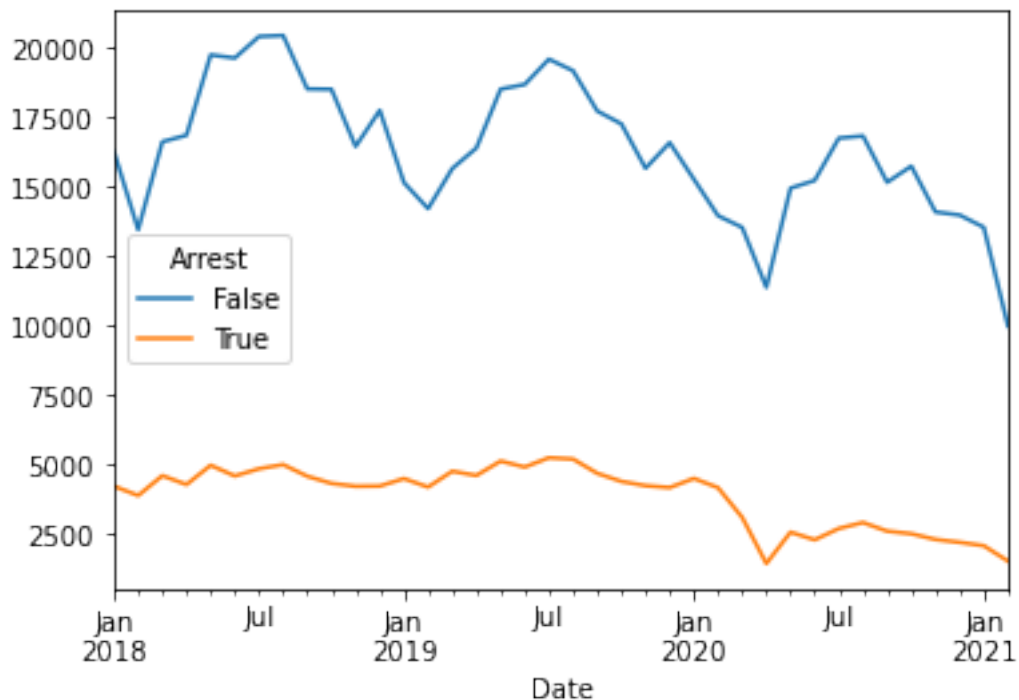
```

[40]: 102220

```
[41]: crimes_bool_desc = crimes_bool_combo.unstack(level=1).fillna(0).resample('h').  
      ↪sum().fillna(0).astype(int) #summarise the stat as a sum
```

```
[48]: crimes_bool_desc.resample('M').sum().plot()  
      #subset and plot desired columns over time
```

```
[48]: <AxesSubplot:xlabel='Date'>
```



5.1 Description of data analysis result 3

Use the next cell to describe your data analysis result 3

Over the four years, the rate of arrests remained fairly constant, with the only exception being recently due to the covid lockdown and subsequent quarantining. However, the rate of crimes fluctuates wildly, with more being committed generally in the summer months. This is easily discernable by the changes in the **False** line, which means the individuals did not get arrested, but they were still charged with a crime.

```
[ ]:
```