

# CRIME DATA FROM MONTGOMERY COUNTY



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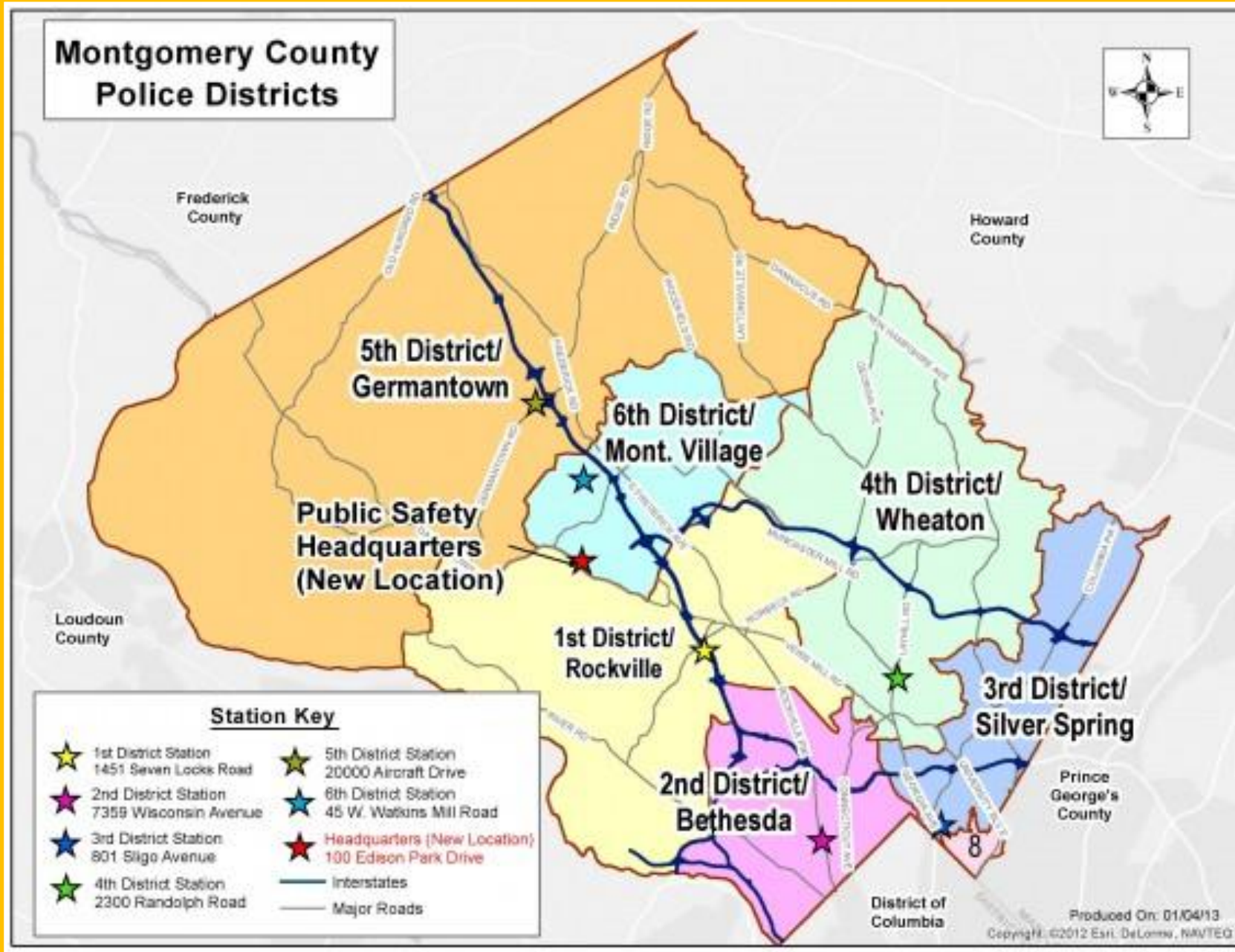
# OVERVIEW

- INTRODUCTION
- THE DATA
- ANALYZING THE TIMES OF CRIMES
- ANALYZING LOCATIONS OF CRIMES
- ANALYZING TYPES OF CRIME
- COMBINE ANALYSIS
- QUESTIONS



# INTRODUCTION



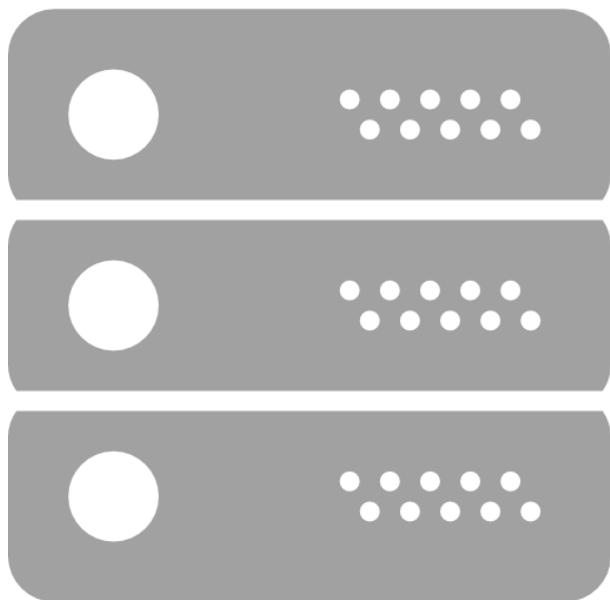




# THE DATA



# THE DATA



```
crimes.columns # Displaying the columns name
```

```
Output:Index(['Incident ID', 'CR Number', 'Dispatch Date / Time', 'Class',  
             'Class Description', 'Police District Name', 'Block Address', 'City',  
             'State', 'Zip Code', 'Agency', 'Place', 'Sector', 'Beat', 'PRA',  
             'Start Date / Time', 'End Date / Time', 'Latitude', 'Longitude',  
             'Police District Number', 'Location', 'Address Number'],  
            dtype='object')
```



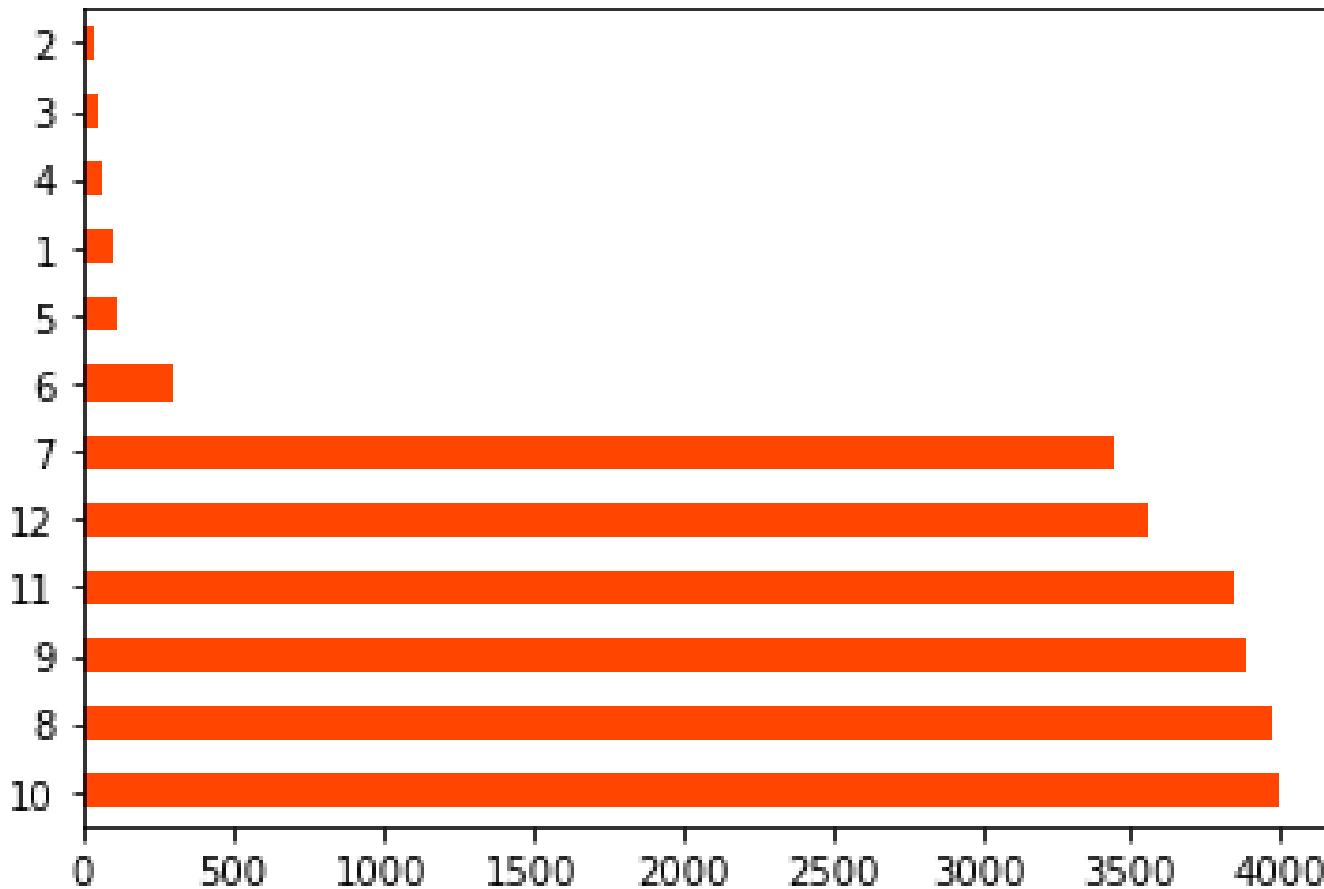
# ANALYZING THE TIMES



# ANALYZING THE TIMES



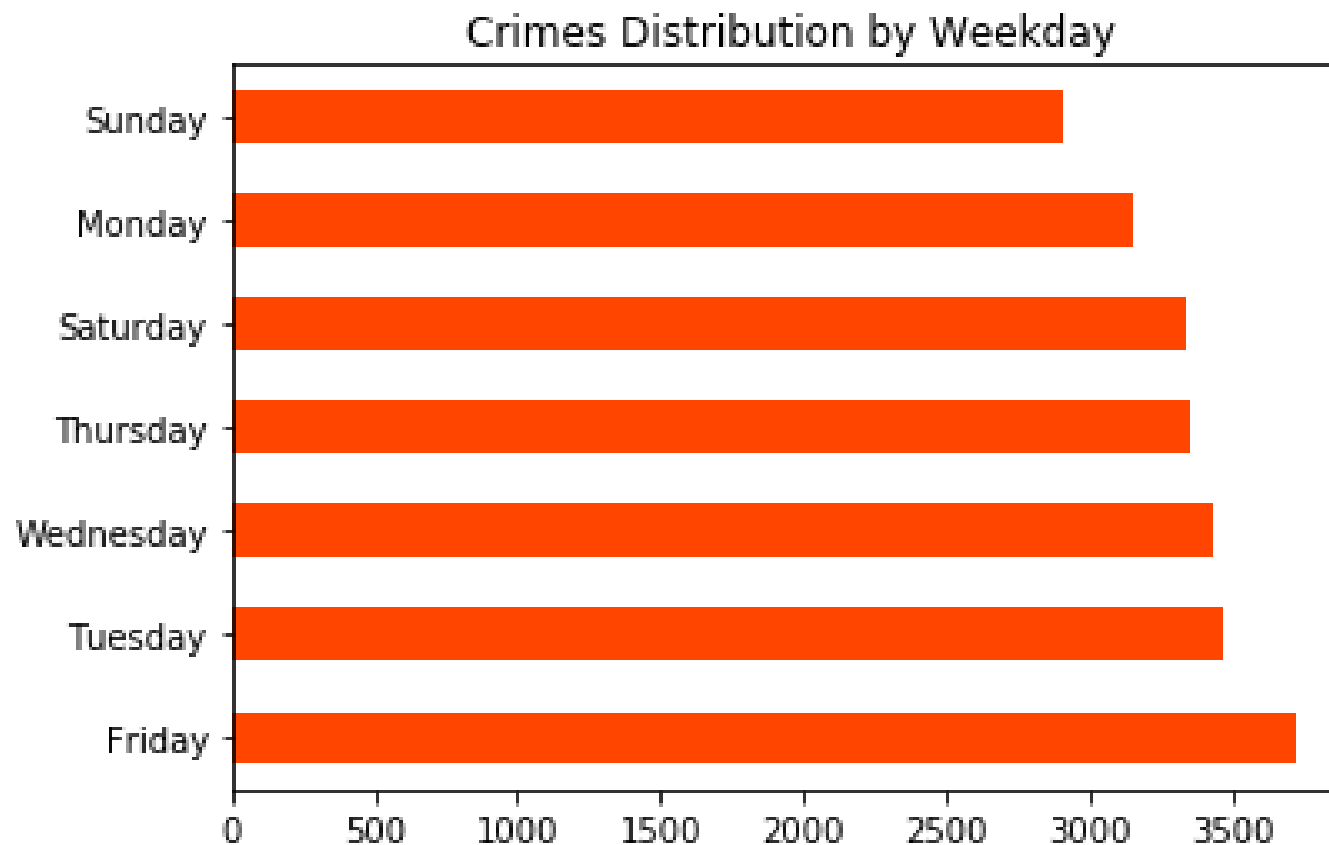
Crimes Distribution by Month





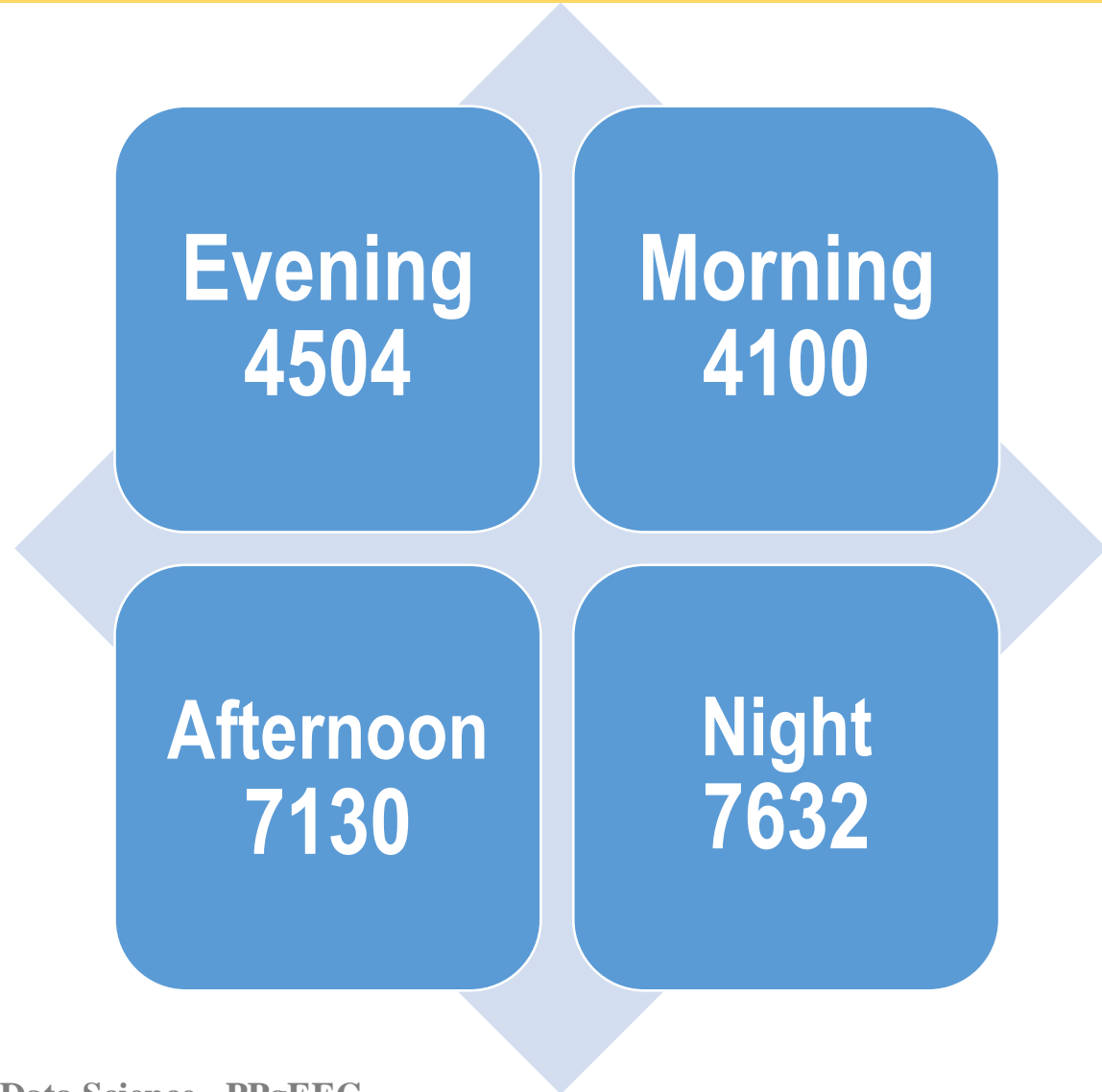


# ANALYZING THE TIMES





# ANALYZING THE TIMES





# ANALYZING LOCATION



# ANALYZING LOCATION







# GRANULARITY

```
crimes_granularity = ['Police District Name', 'Block Address', 'Zip Code', 'Sector',  
                      'Beat', 'Latitude', 'Longitude', 'Police District Number', 'Location', 'Address Number']  
for i in crimes_granularity :  
    g = crimes[i].value_counts().count()  
    print (i, g)
```

Output:

Police District Name 8

Block Address 8143

Zip Code 49

Sector 15

Beat 42

Latitude 8065

Longitude 8065

Police District Number 8

Location 8065

Address Number 286



# COMPREHENSIBILITY

- **Readily comprehended or understood; intelligible**
- **Columns that provide simple interpretation:**
  - **Police District Name**
  - **Police District Number**



# MISSING VALUES

```
crimes.apply(lambda x: sum(x.isnull()),axis=0)
```

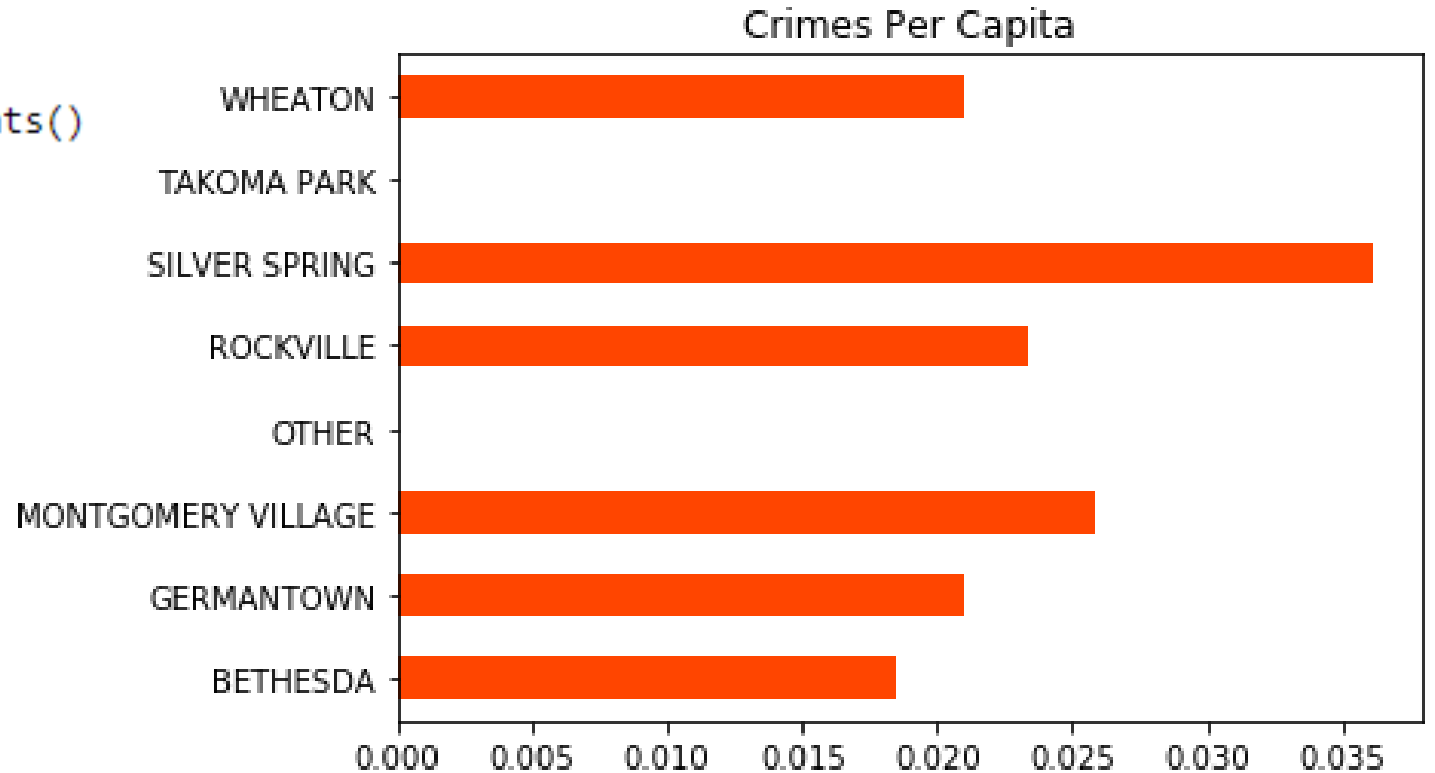
Incident ID	0
CR Number	0
Dispatch Date / Time	0
Class	0
Class Description	0
Police District Name	0
Block Address	0
City	0
State	0
Zip Code	30
Agency	0
Place	0
Sector	46
Beat	8
PRA	6
Start Date / Time	0
End Date / Time	10178
Latitude	161
Longitude	161
Police District Number	0
Location	161
Address Number	132



# CRIMES PER CAPITA

```
p = pd.Series(population)
c = crimes['Police District Name'].value_counts()
crimes_per_capita = c.div(p)
crimes_per_capita
```

BETHESDA	0.018498
GERMANTOWN	0.020968
MONTGOMERY VILLAGE	0.025847
OTHER	NaN
ROCKVILLE	0.023337
SILVER SPRING	0.036166
TAKOMA PARK	NaN
WHEATON	0.021005





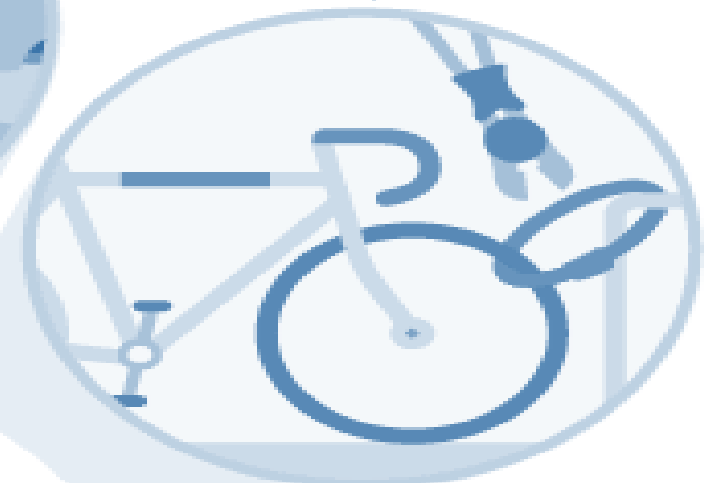
Burglary



Car theft



Bike theft



# ANALYZING TYPES

15/09/2017

Vandalism

Data Science - PPgEEC

Violence 17



# ANALYZING TYPES

- The following code shows the first five crimes most common

```
crimes.groupby(['Class Description', 'Class']).size().sort_values(ascending=False).to_frame('qtd').iloc[0:5]
```

Class Description	Class	qtd
DRIVING UNDER THE INFLUENCE	2812	1710
CDS-POSS MARIJUANA/HASHISH	1834	1334
POL INFORMATION	2938	1191
LARCENY FROM AUTO OVER 200	614	914
LARCENY FROM BUILDING OVER 200	617	895



# ANALYZING TYPES

- The least common are:

```
crimes.groupby(['Class Description', 'Class']).size().sort_values(ascending=True).to_frame('qtd').iloc[0:5]
```

Class Description	Class	qtd
ABANDONED AUTO	2811	1
ROB KNIFE/CUT - CONV. STORE	324	1
ANIMAL OFFENSE - HOT CAR	3213	1
PARKING OFFENSES	2814	1
LARCENY COIN MACH 50-199	628	1



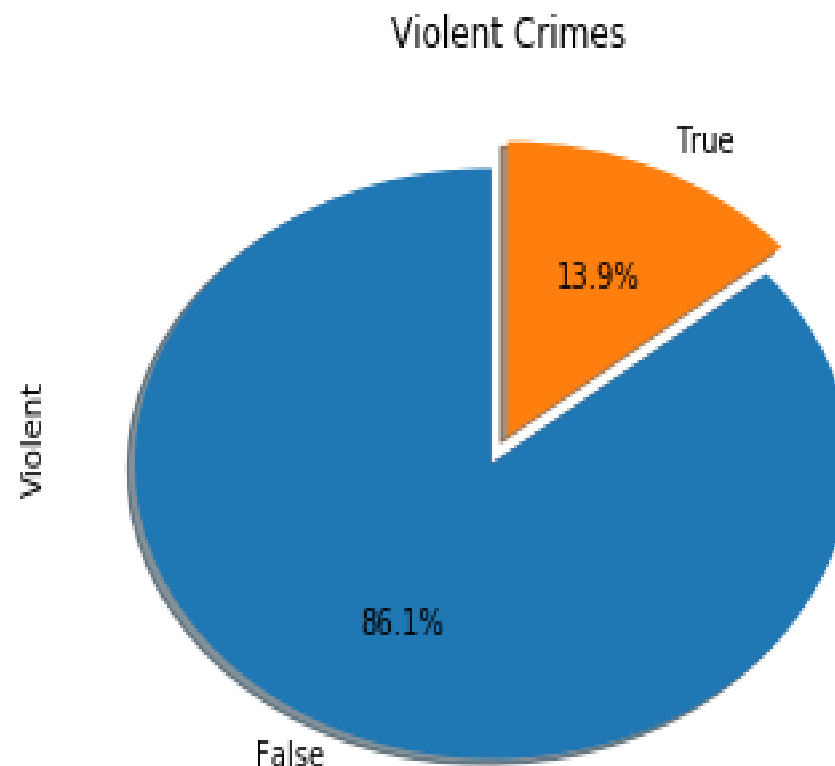
# ANALYZING TYPES

```
Violent_True = ['AGG ASSLT', 'ABUSE', 'ASSAULT', 'BURG FORCE', 'BOMB', 'EXPLOSIVE', 'HOMICIDE', 'FIRE OTHER',  
                'KIDNAPPING', 'RAPE', 'ROB ', 'SEX OFFENDER', 'WEAPON']
```





# ANALYZING TYPES



Class	Class Description	Violent	qtd
2812	DRIVING UNDER THE INFLUENCE	False	1710

Class	Class Description	Violent	qtd
811	ASSAULT & BATTERY - CITIZEN	True	382

Analysis



COMBINE ANALYZING



# COMBINE ANALYSIS

```
crimes.groupby(['Zip Code', 'City', 'Violent']).size().sort_values(ascending=False).iloc[0:30]
```

Zip Code	City	Violent	
20910.0	SILVER SPRING	False	1748
20904.0	SILVER SPRING	False	1481

Zip Code	City	Violent	
20904.0	SILVER SPRING	True	298
20910.0	SILVER SPRING	True	263



# COMBINE ANALYSIS

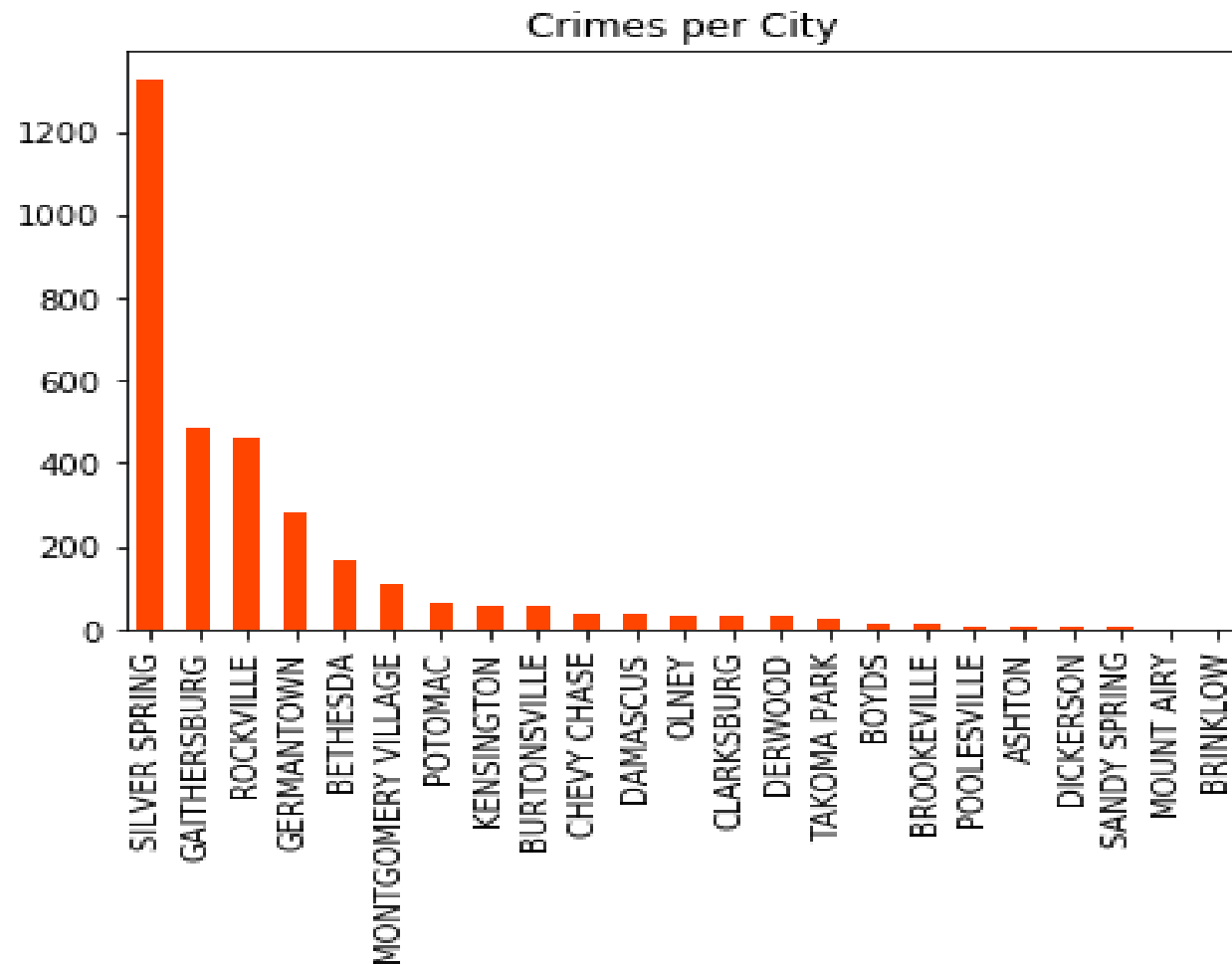
```
crimes.groupby(['Zip Code', 'City', 'Class Description',  
'Violent']).size().sort_values(ascending=False).iloc[0:30]
```

Zip Code	City	Class Description	Violent	
20814.0	BETHESDA	DRIVING UNDER THE INFLUENCE	False	141
20878.0	GAITHERSBURG	POL INFORMATION	False	132
20877.0	GAITHERSBURG	DRIVING UNDER THE INFLUENCE	False	130
20904.0	SILVER SPRING	CDS-POSS MARIJUANA/HASHISH	False	127
20910.0	SILVER SPRING	CDS-POSS MARIJUANA/HASHISH	False	126





# COMBINE ANALYSIS





# COMBINE ANALYSIS

```
crimes["Start Date"] = pd.to_datetime(crimes["Start Date / Time"]).dt.weekday_name  
crimes_weekday = crimes.groupby(["Start Date", "Violent"]).size().sort_values(ascending=False)  
crimes_weekday
```

Friday	False	3234
Tuesday	False	2966
Wednesday	False	2958
Thursday	False	2892
Saturday	False	2876
Monday	False	2711
Sunday	False	2481

Tuesday	True	497
Friday	True	485
Wednesday	True	472
Saturday	True	467
Thursday	True	457
Monday	True	446
Sunday	True	427

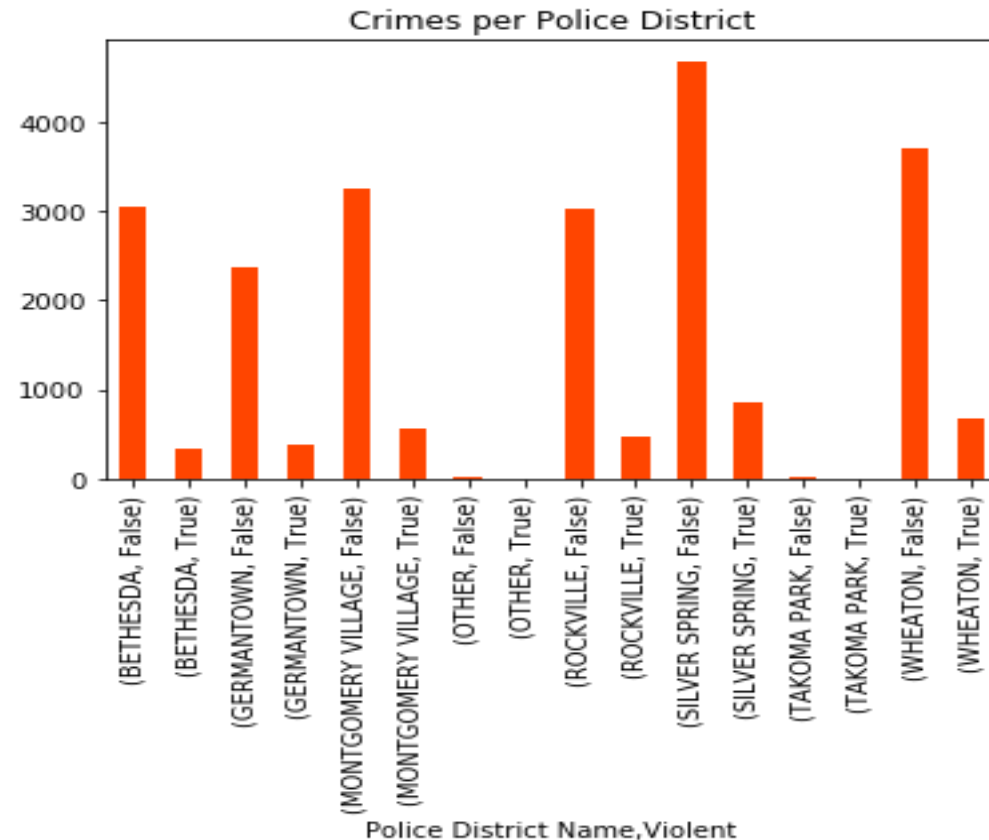


# QUESTIONS



# QUESTION 1

```
aux = crimes.groupby(['Police District Name', 'Violent']).size().groupby(level=[0,1]).sum()
```





# QUESTION 2

```
crimes_place = crimes.groupby(["Place", "Violent"]).size().groupby(level=[0,1]).sum().sort_values(ascending=False).iloc[0:15]
```

Place	Violent	Count
Street - In vehicle	False	2483

Place	Violent	Count
Residence - Single Family	True	763



# QUESTION 3

```
crimes['Minute'] = pd.to_datetime(crimes['Dispatch Date / Time']) - pd.to_datetime(crimes['Start Date / Time'])
c = crimes.pivot_table(index=['Police District Name', 'Minute'], values="Incident ID", aggfunc='count')
c.reset_index().sort_values(['Police District Name', 'Incident ID'], ascending=[True, False]).groupby(['Police District Name']).head(3).set_index(['Police District Name', 'Minute'])
```

Nome do Distrito da Polícia	Minuto	ID de incidente
BETHESDA	00:00:04	30
	00:00:22	29
	00:00:09	28

Nome do Distrito da Polícia	Minuto	ID de incidente
ROCKVILLE	00:00:05	34
	00:00:56	31
	00:00:02	30

# QUESTIONS?

THANK YOU!



# CRIME DATA FROM MONTGOMERY COUNTY



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