Minneapolis Crime & Weather Analysis

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Approach/Challenges

Finding an API

➤ Finding valid API sources for our desired topic was a challenge.

Documentation

➤ Even with well known organizations/data sources, finding proper API documentation and data tables was a challenge.

Processing Time

➤ Some API data download times were ~5 hours.

Data Sources

Crime Data

➤Open Data Minneapolis

http://opendata.minneapolismn.gov/

➤Bulk downloadable data by year

➤Summarized by day, month, and type of a crime

Weather Data

➤Open Weather

➤Bulk download of historical Minneapolis data to CSV

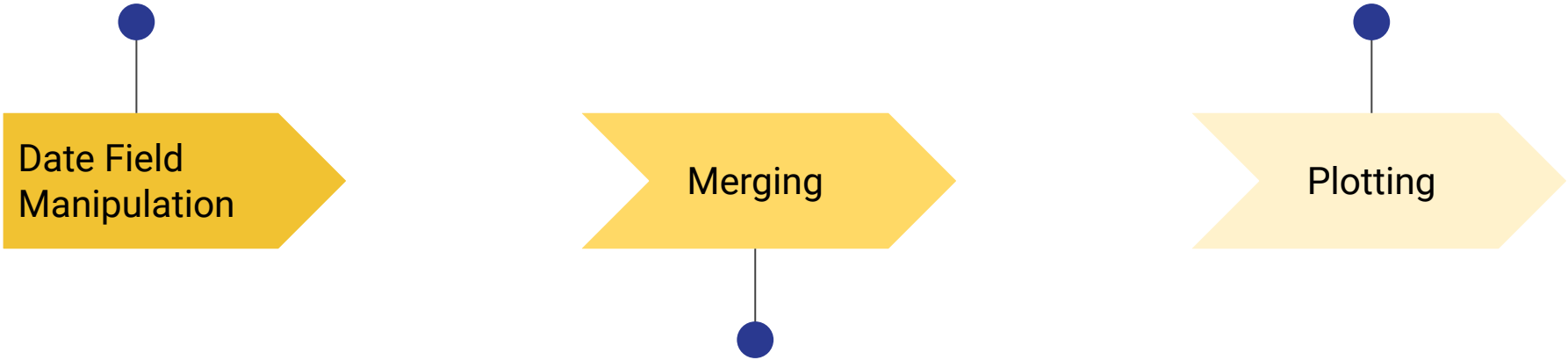
➤Temperature, description, humidity, cloudiness, etc.

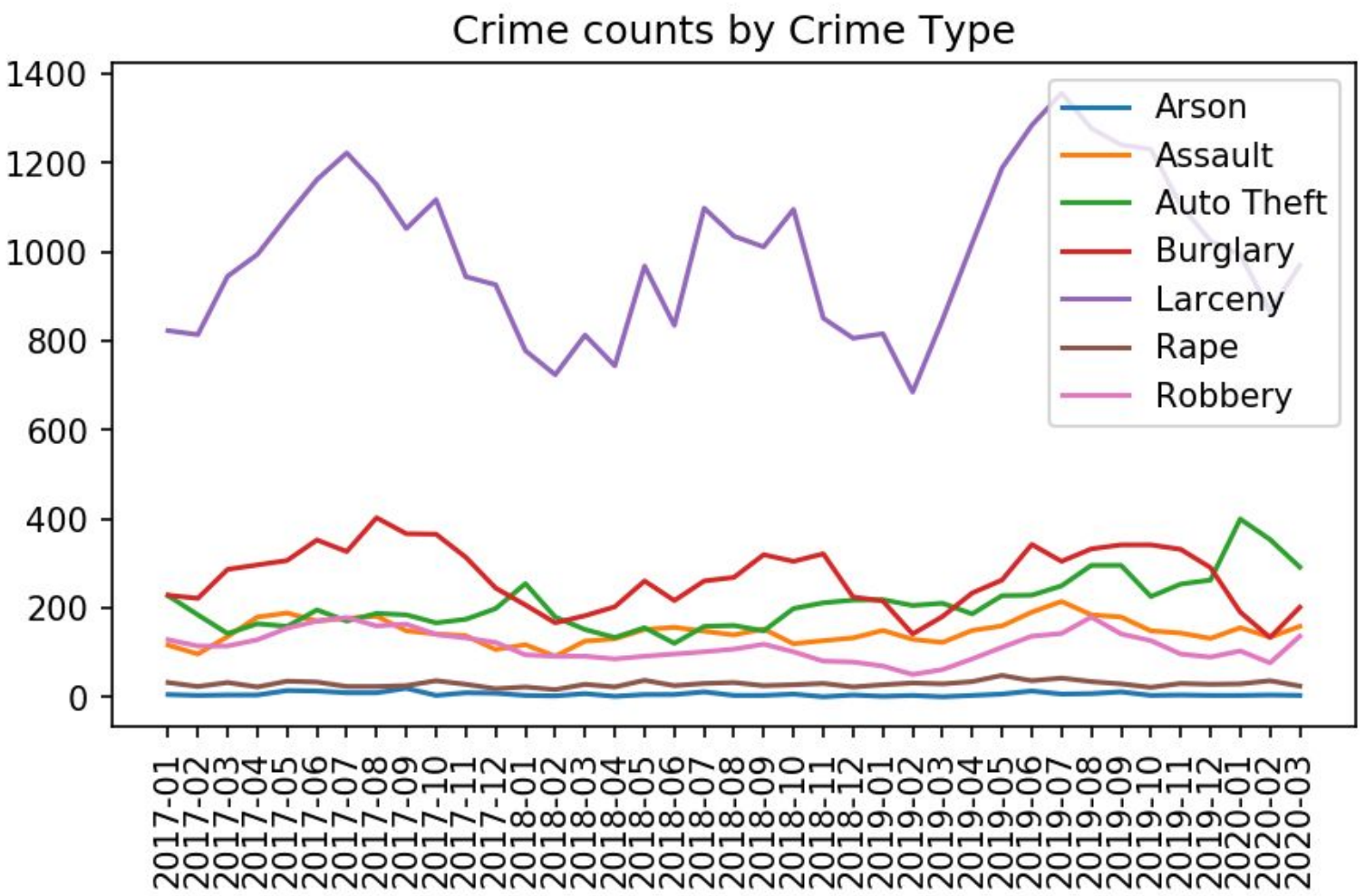
➤Summarized by hour by day

Analysis

Our burning questions

1. What are typical crime patterns in Minneapolis?
2. What are typical weather patterns in Minneapolis?
3. Does crime increase as the temperature increases in Minneapolis?


Date Field
Manipulation
Merging
Plotting


Crime counts by Crime Type
1400
1200
1000
800
600
400
200
0
Arson
Assault
Auto Theft
Burglary
Larceny
Rape
Robbery
2017-01
2017-02
2017-03
2017-04
2017-05
2017-06
2017-07
2017-08
2017-09
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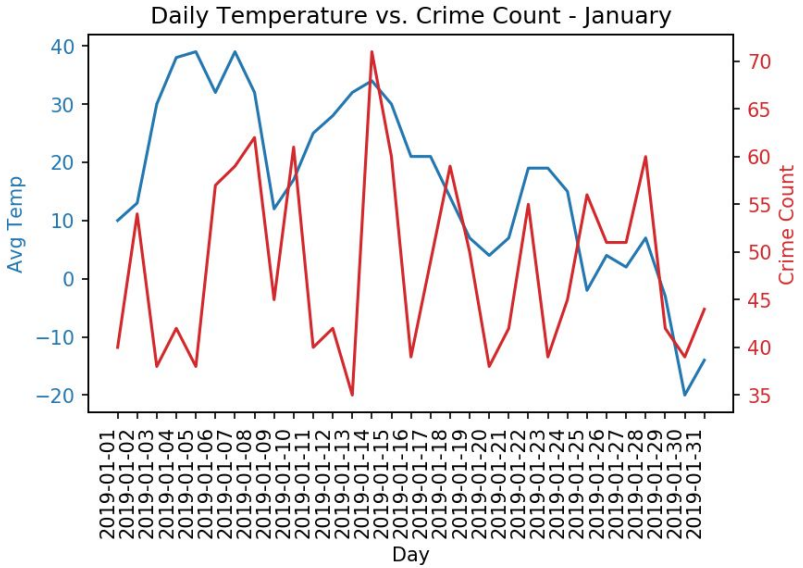
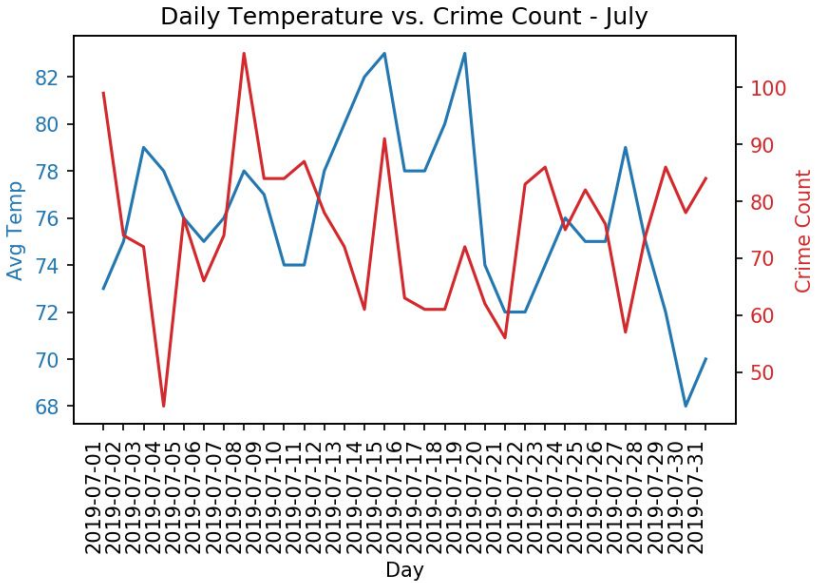
2020-03

Daily vs. Monthly Analysis



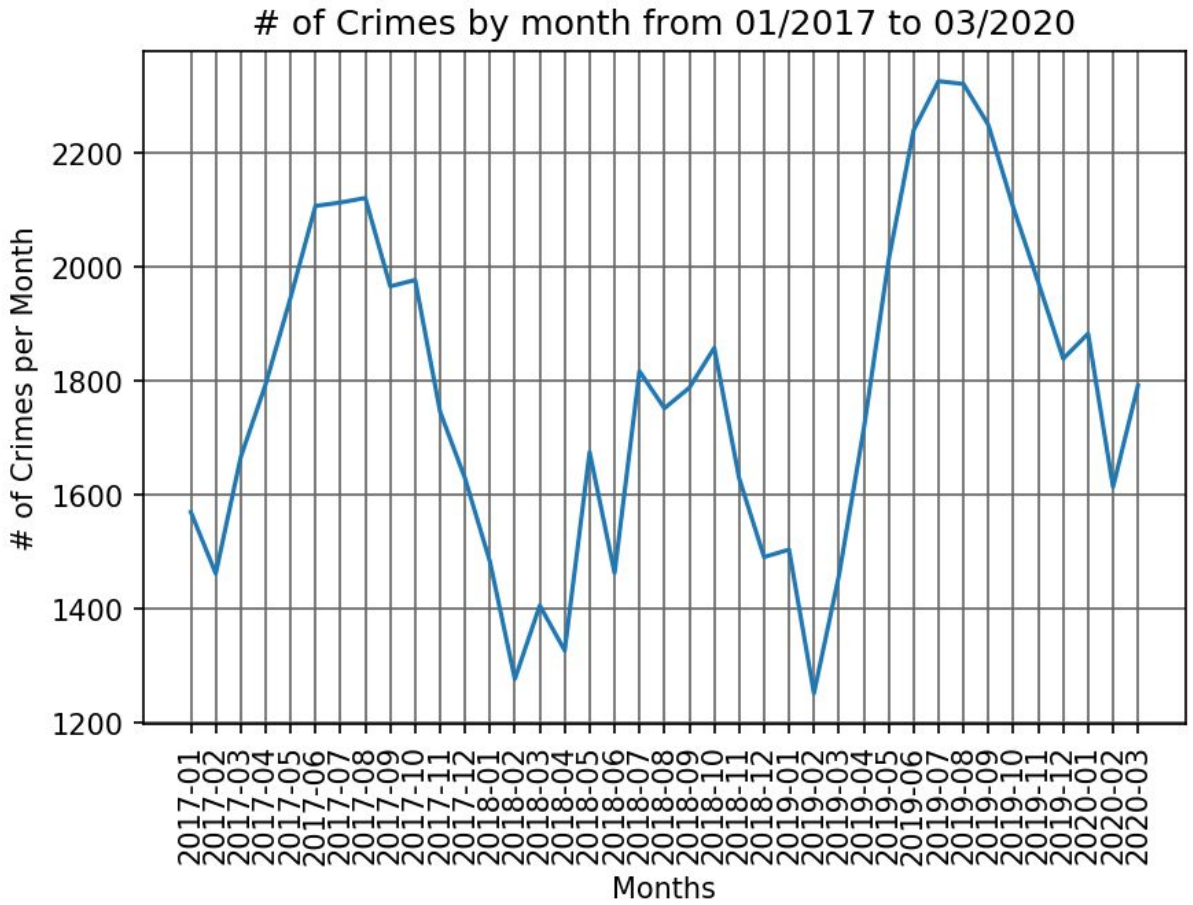


Findings

Crime

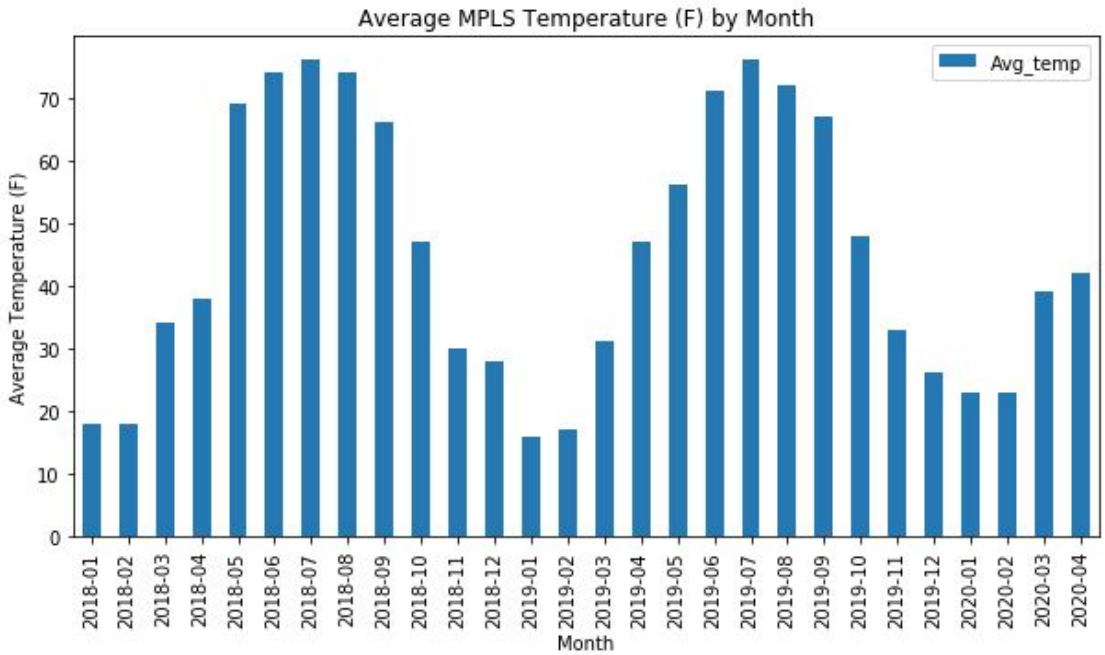
➢Overall 2018 seems to portray a dip in crime levels.

➢2019 shows a higher than normal peak in crime activity.



Weather

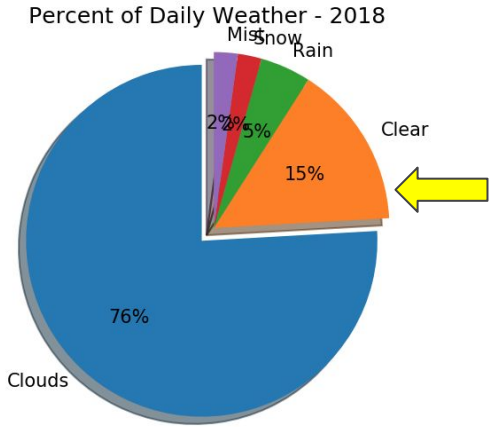
➤ Overall temperature trends for 2018 and 2019 were no surprise (but 2020 is).

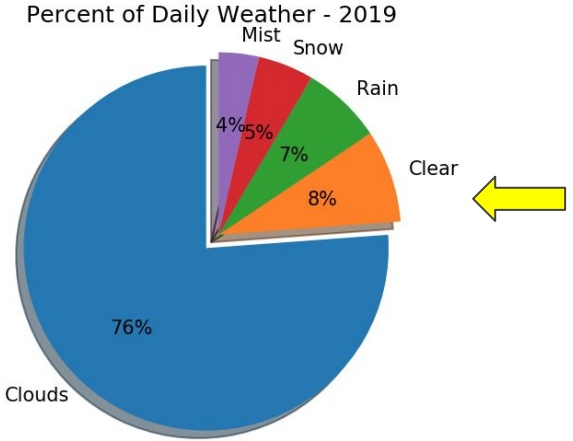


Weather

➢ Overall temperature trends for 2018 and 2019 were no surprise (but 2020 is).

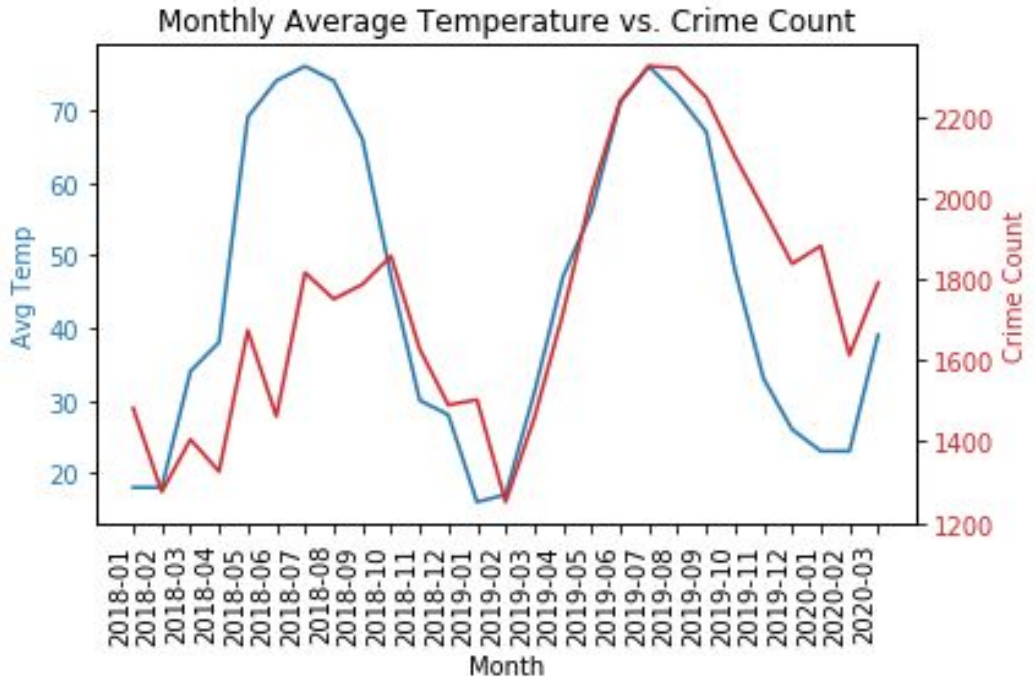
➢ There were more clear days in 2018.





Weather & Crime

➢ Monthly weather and crime trends *visually* followed similar trends.



Weather & Crime

➢ Monthly weather and crime trends *visually* followed similar trends.

➢ T-test resulted in the rejection of our null hypothesis.

The null hypothesis: There lies no difference in average crime levels during the cold vs. the warm months of the year.

Where cold months are <=45 ◦(F) & warm months are > 45◦(F)

Avg Monthly Crime **Cold Months**

Avg Monthly Crime **Warm Months**

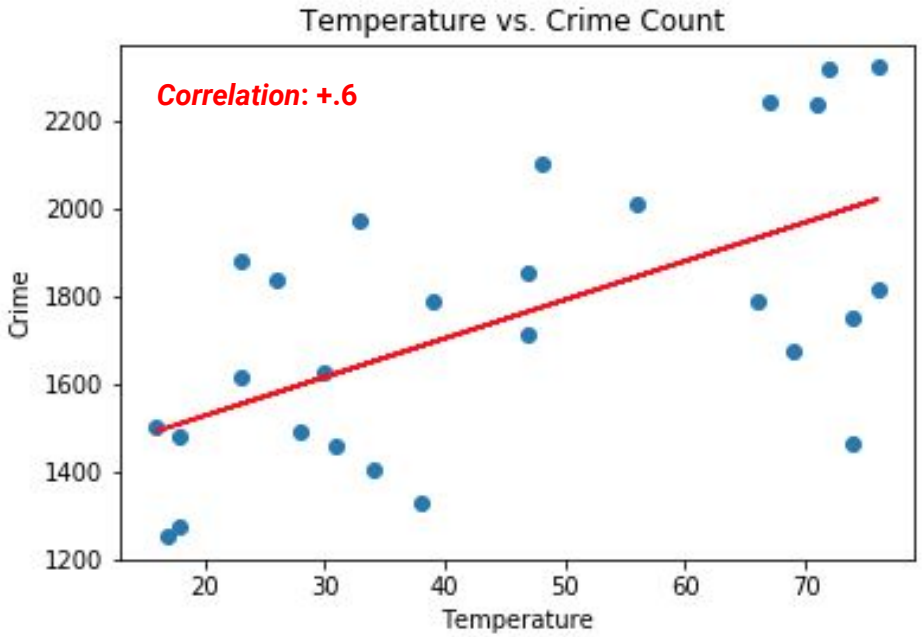
$$H_0 : \mu_A = \mu_B$$

Weather & Crime

➤ Monthly weather and crime trends *visually* followed similar trends.

➤ T-test resulted in the rejection of our null hypothesis.

➤ There appears to be a linear relationship.



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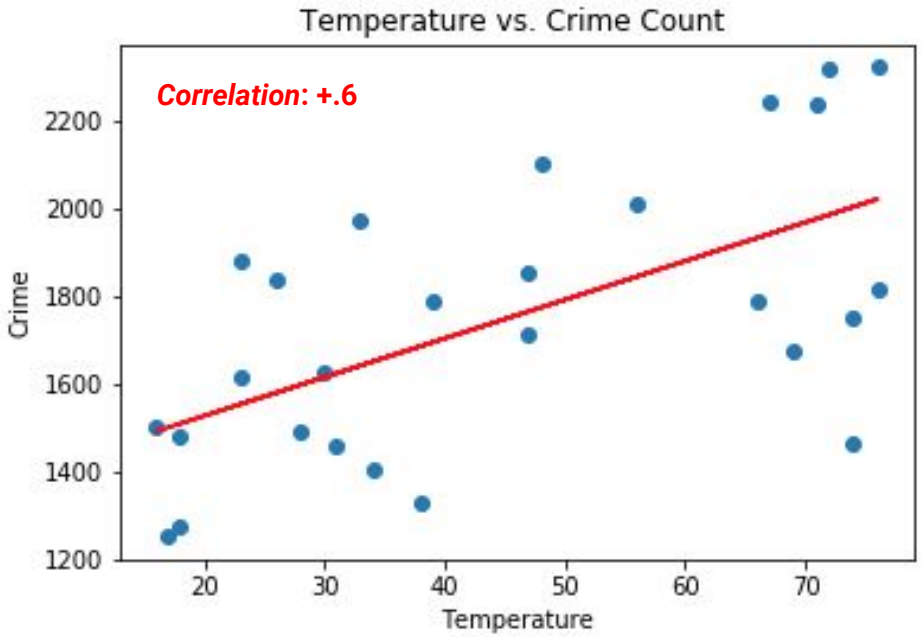

Y = 8.87x + 1349.35

*Where Y is Crime Count & x is temperature

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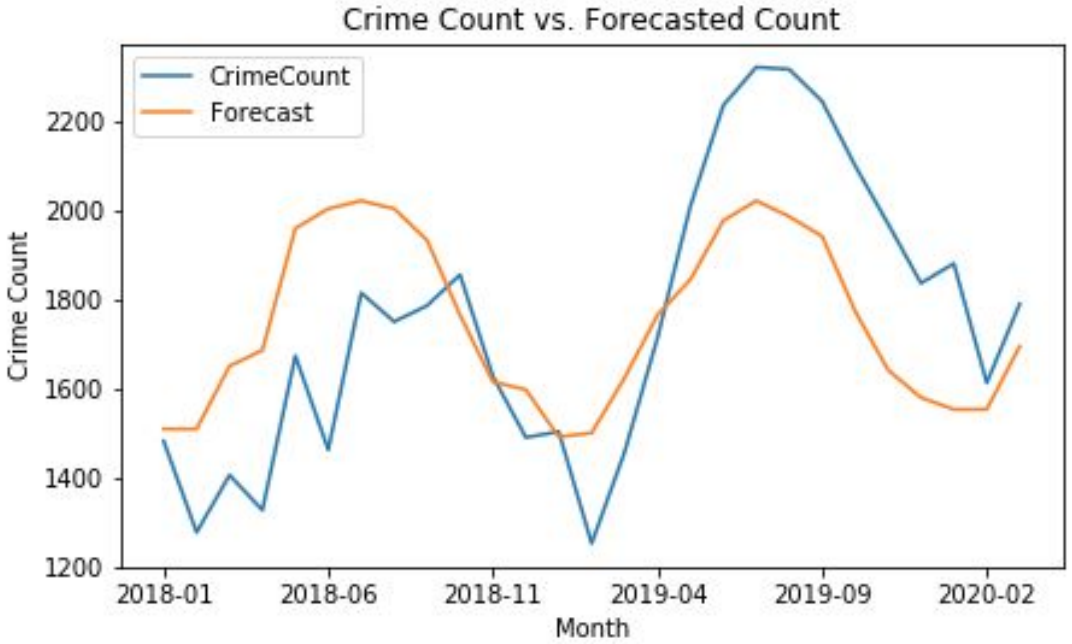

Summary

➢ Average crime levels are higher during the warmer months of the year vs. the colder months. Though there is a strong positive correlation between crime count and temperature, we also know that it is not the whole picture in what influences or causes crime count increases.

➢ Larceny is the highest reported crime in Minneapolis (2018-2019), it also drove a spike in total reported Minneapolis crime in 2019.

➢ Minneapolis weather is highly seasonal and consistent year-over-year.

➢ Data shows a warmer start of 2020, could be one indicator of higher crime levels to come.