

The Influence of Weather Variables on Denver Crime

January 2015 - January 2020

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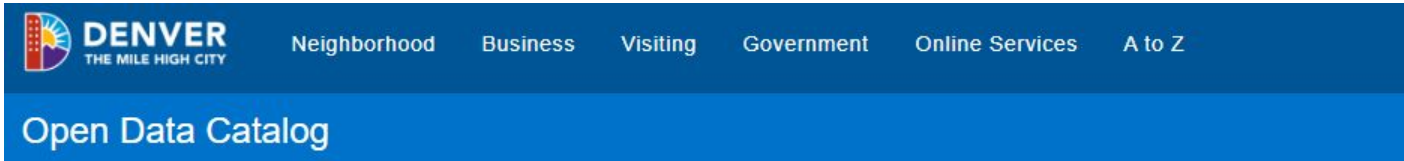
QUESTION WE ARE ANALYZING

Does weather influence volume of crime reports in Denver?

- Looking into temperature, cloudiness, and windiness
- Breaking it down by type of crime, type of weather, and season
- Viewing certain trends such as by neighborhood
- Exploring with heat maps and regression models

STARTING WITH TWO DATA SETS

Denver Crime Data: denvergov.org



- Csv of 19 columns x 426,641 rows consisting of crime/traffic reports from 2015-2020

Weather Data: openweather.org

- JSON file
- 1/1/2013-1/1/2020 hourly weather data

CLEANING

- Dropped columns we don't need and renamed the columns we do need
- Removed incorrect latitudes and longitudes - keeping them in the range of Denver's
- Made a dataframe for crimes and one for traffic violations
- Renamed categories of crimes to group similar ones together
- Dropped NaN values so value counts matched each other

MERGING

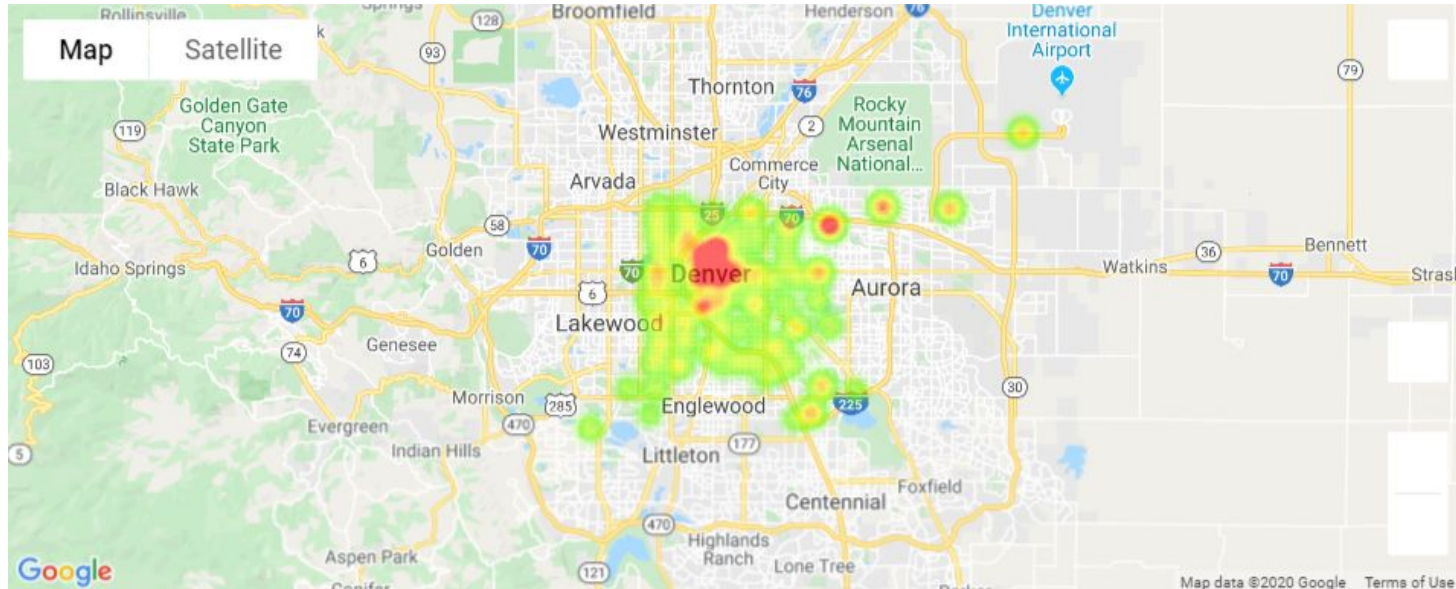
- Datetime conversion and rounding
- Left join on date

```
1 crime['Date'] = pd.to_datetime(crime['FIRST_OCCURRENCE_DATE'])
2 crime.drop(columns=['FIRST_OCCURRENCE_DATE'], inplace=True)
3 crime['Date'] = crime['Date'].dt.round('60min')
4
```

```
1 #merge crime and weather data
2 crime_weather = pd.merge(crime, weather, on='Date', how='left')
3
```

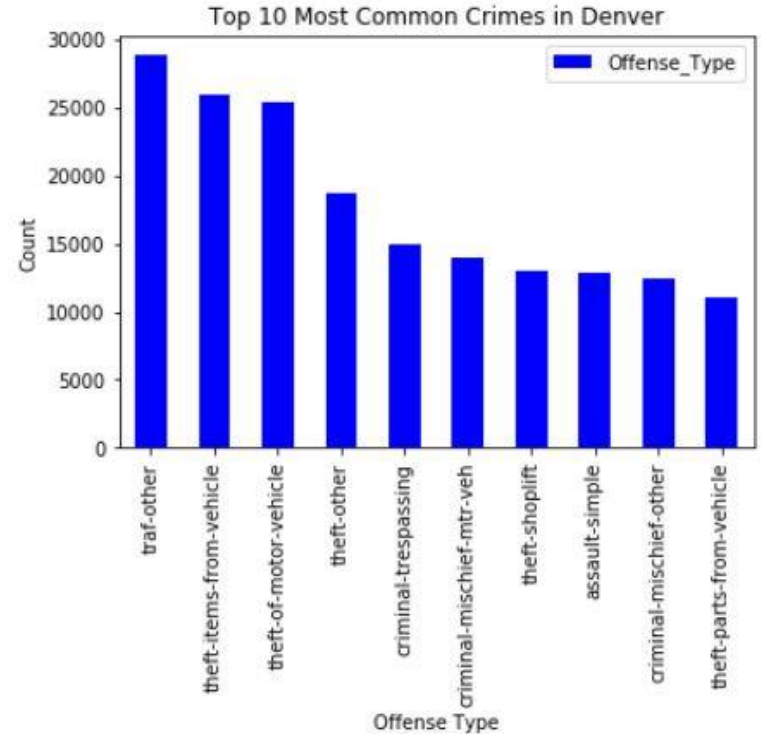
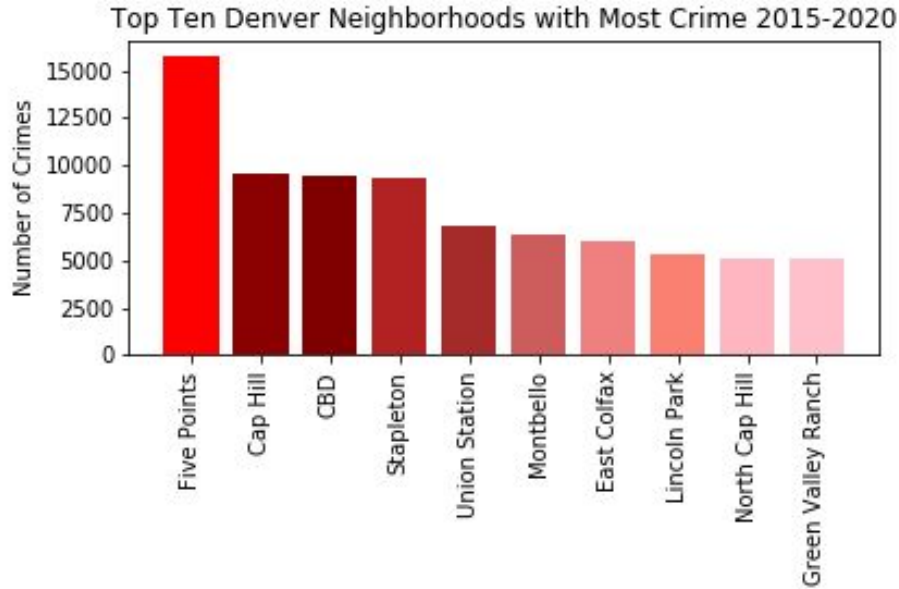
DENVER CRIME MAP

- Gmap of each neighborhood lat/lon with weight placed on crime occurrence



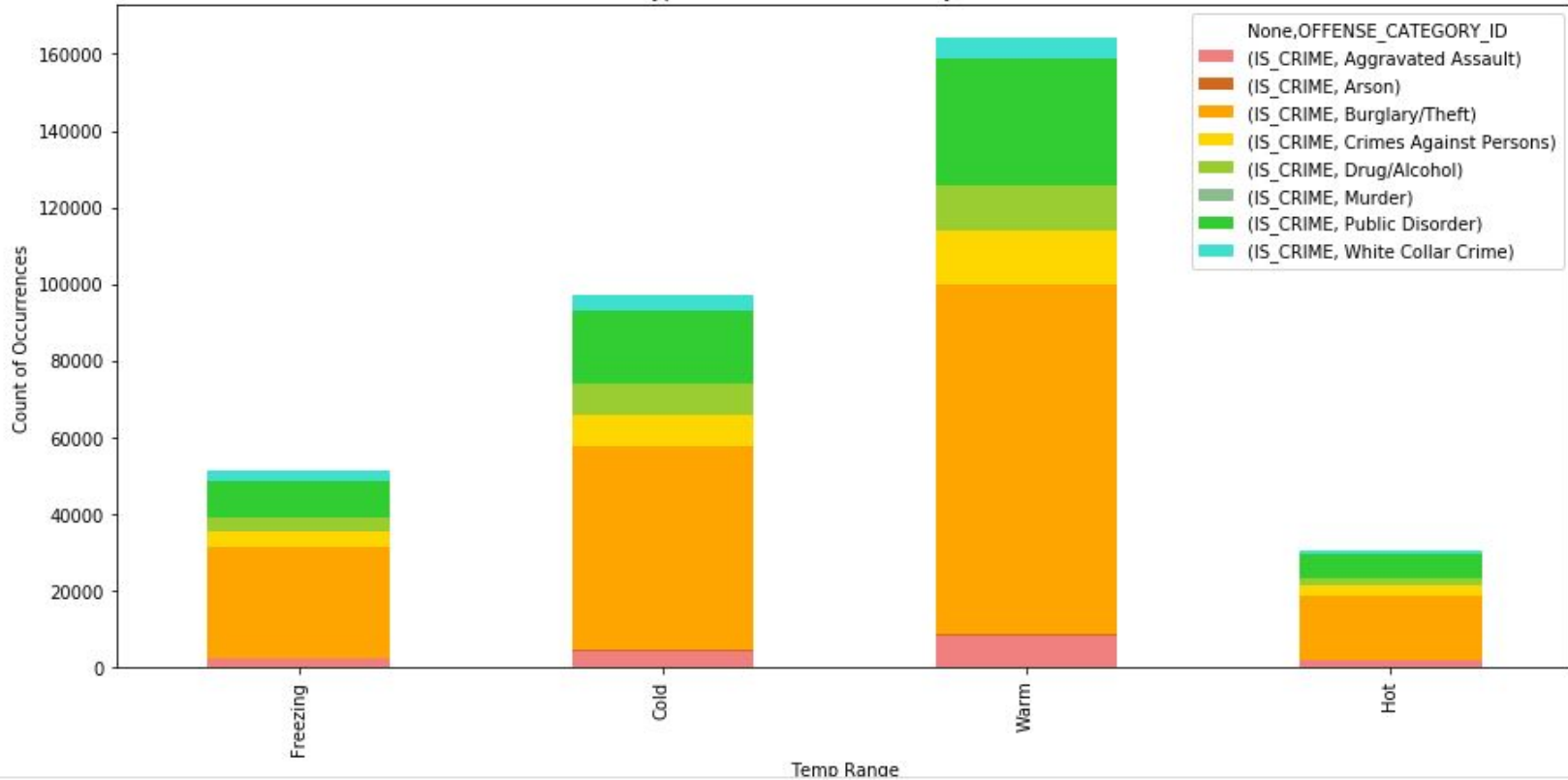
TRENDS

- By neighborhood
- By crime type

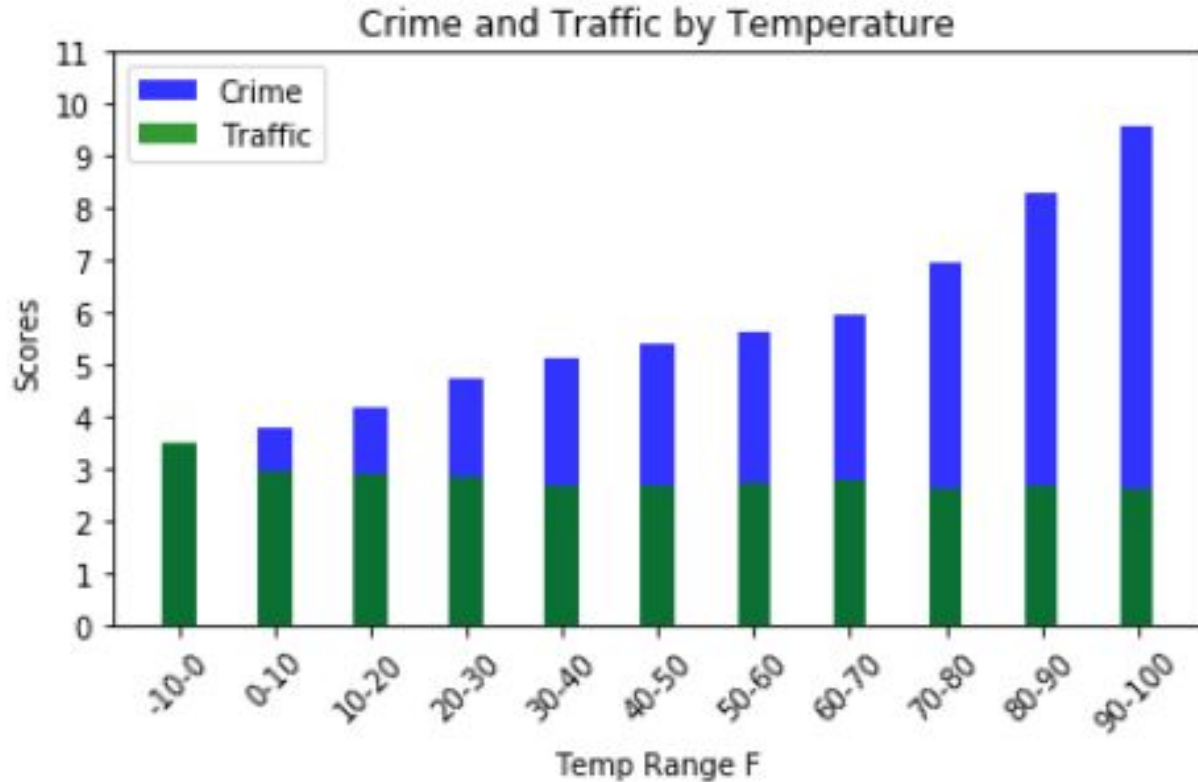


TEMPERATURE'S EFFECT ON DENVER CRIME

Type of Crime Occurrences by Weather

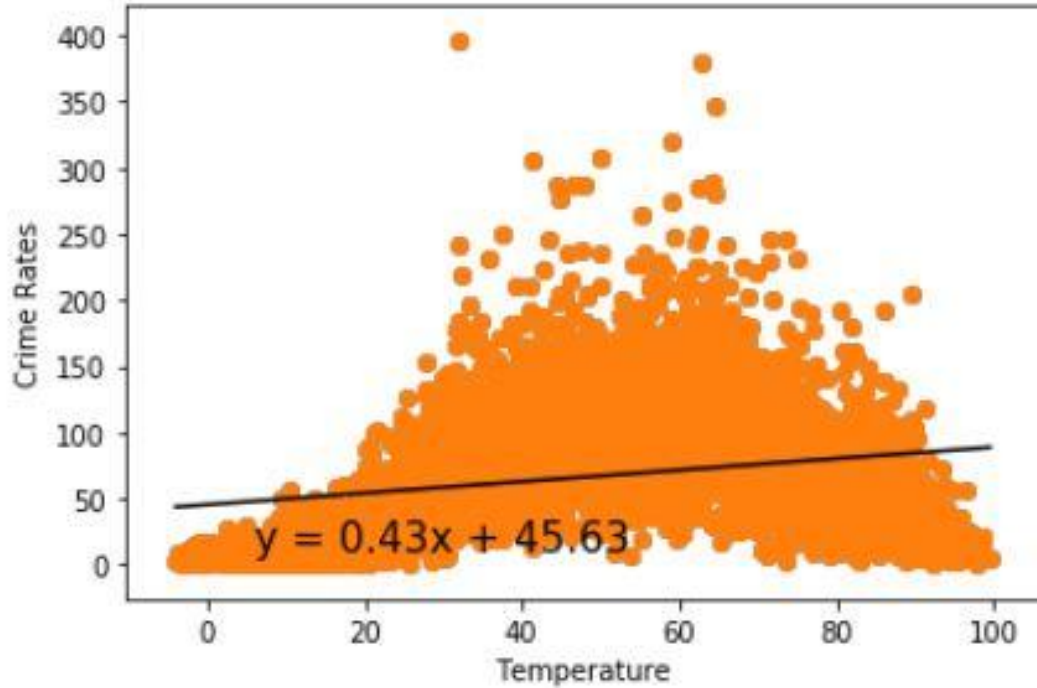


TEMPERATURE'S EFFECT ON DENVER CRIME

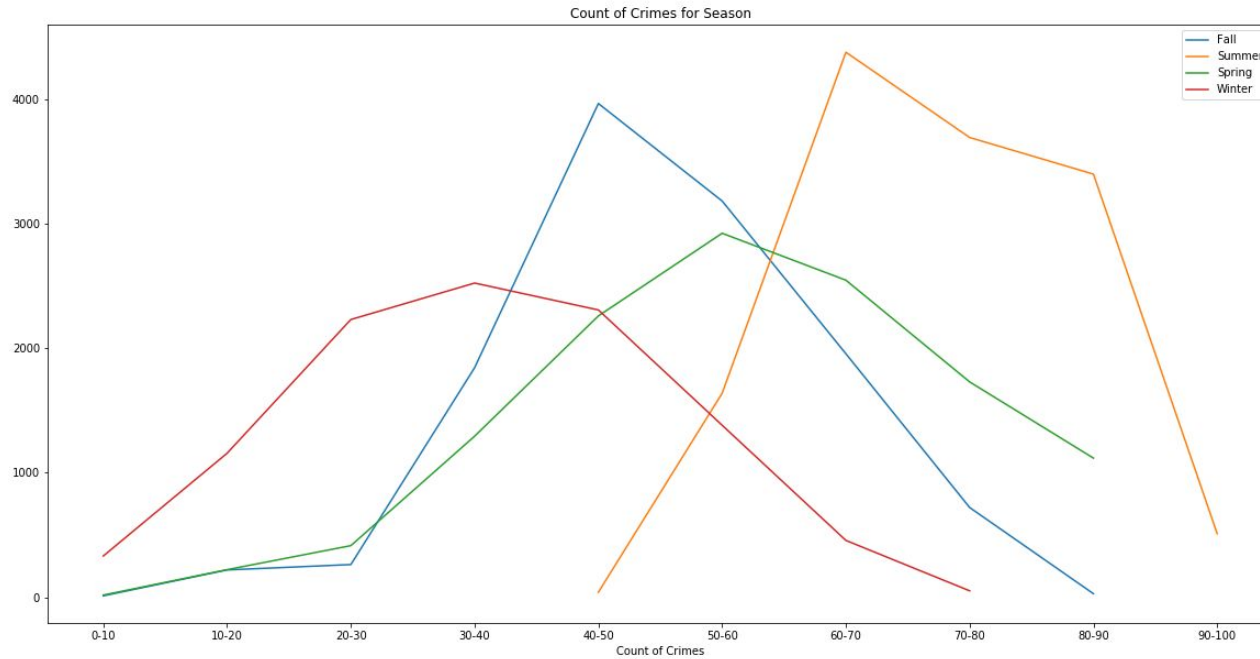


TEMPERATURE'S EFFECT ON DENVER CRIME

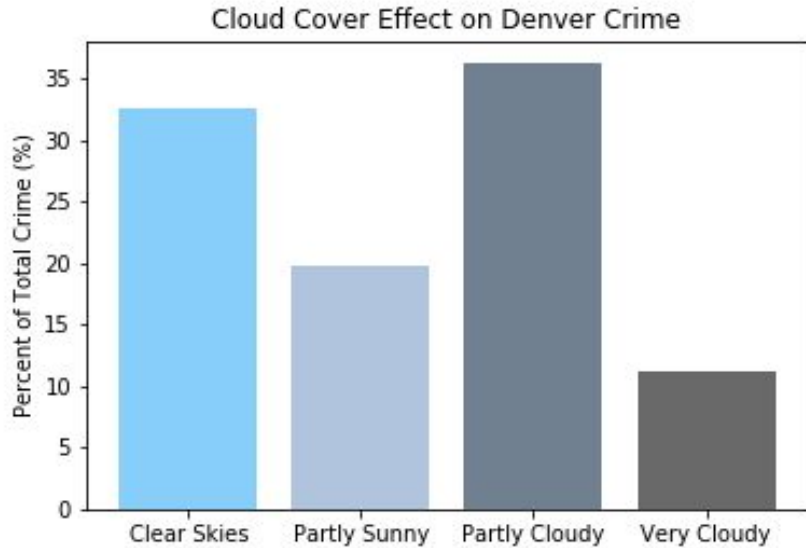
The r-squared is: 0.23336192679012055



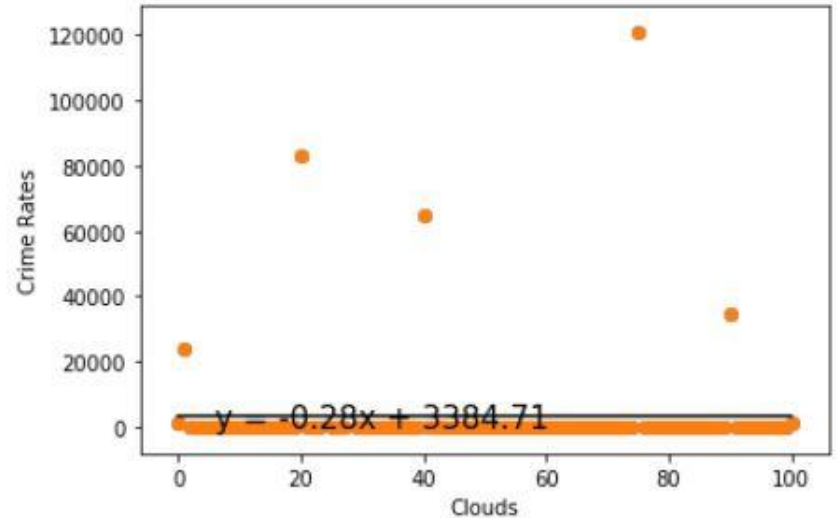
CRIMES BY SEASON



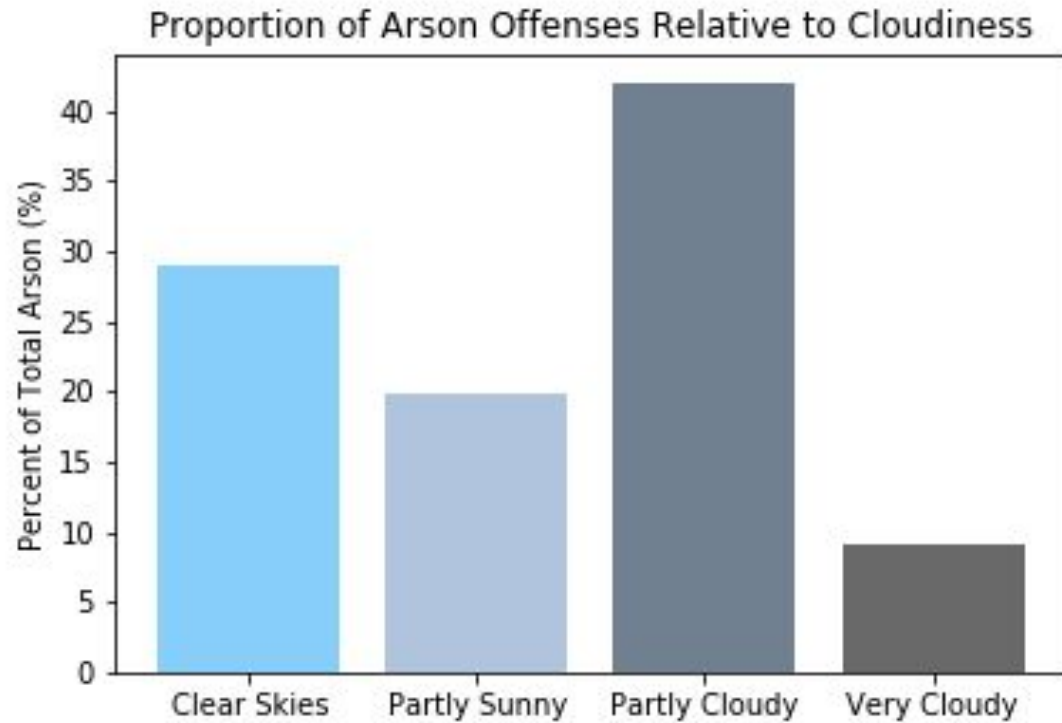
CLOUD COVER EFFECT ON DENVER CRIME



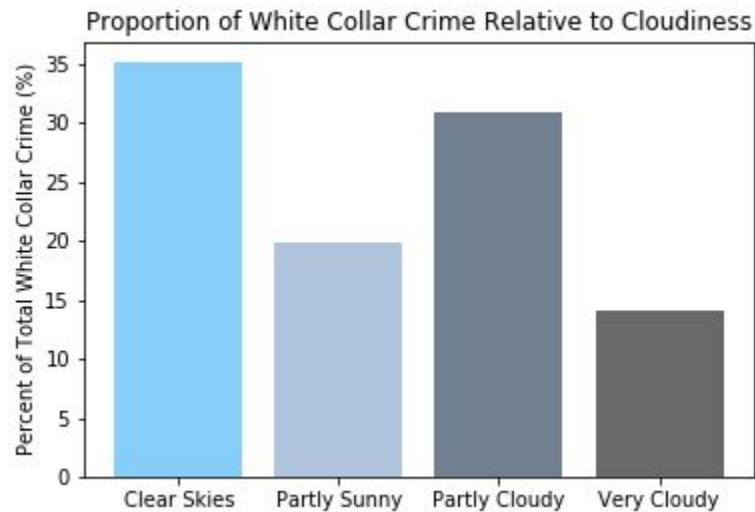
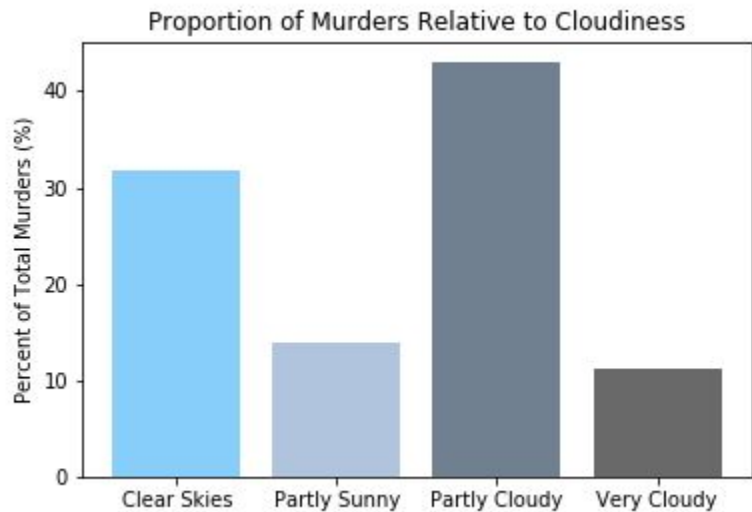
The r-squared is: -0.0005022142475868433



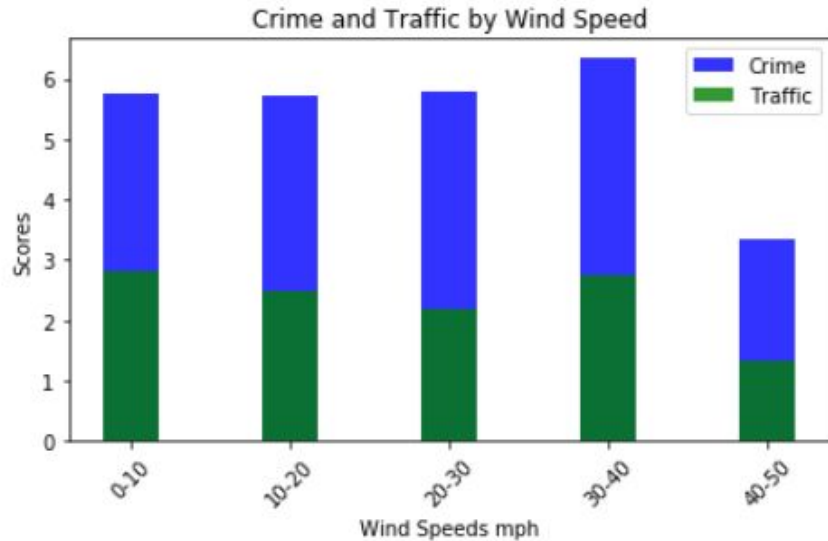
CLOUDY ARSON



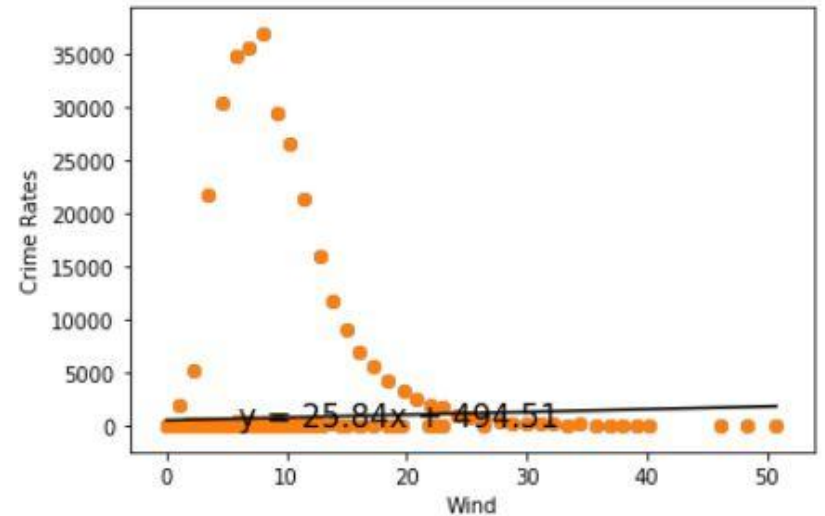
CLOUDY MURDER AND CLOUDY WHITE COLLAR CRIME



WIND'S EFFECT ON DENVER CRIME



The r-squared is: 0.045893399135512845



CONCLUSION