

Boston Crime Analysis

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Boston Crime Analysis

- Dataset Overview
- Objective
- Severity
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- Hypothesis: Temperature v.s. Crime
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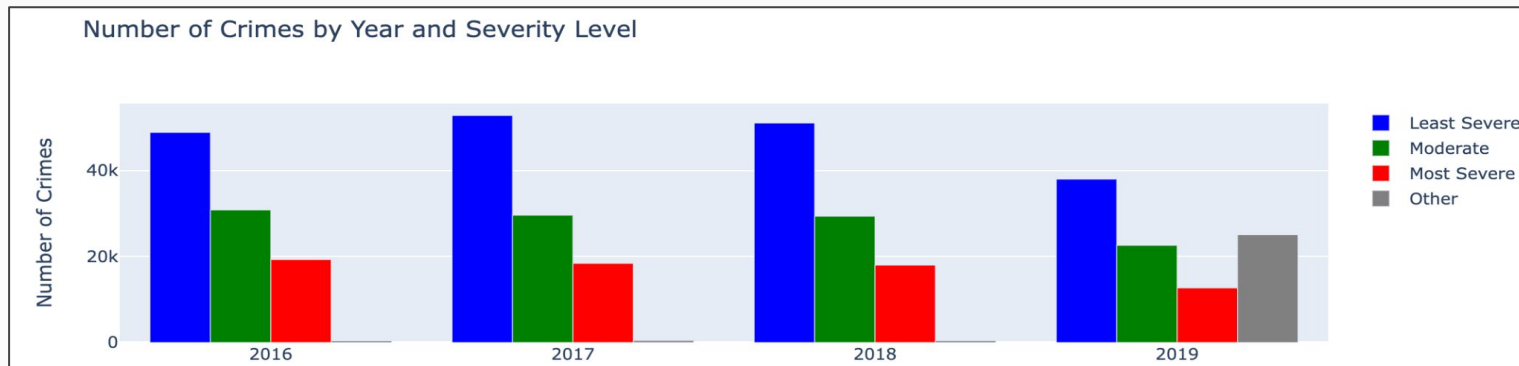
Boston Crime Data Overview

- Include 476,000 rows, 17 columns
- Key variables:
 - Type of Crime
 - Location of the crime
 - Date and time of the time (June, 2015 - April, 2020)
 - UCR (Uniform Crime Reporting)
 - Coordinates of the location

Objective

Understand the **severity** of crime occurred in Boston and identify if there are **geographic**, **temporal**, and other factors that contribute to a higher/lower **crime** rate.

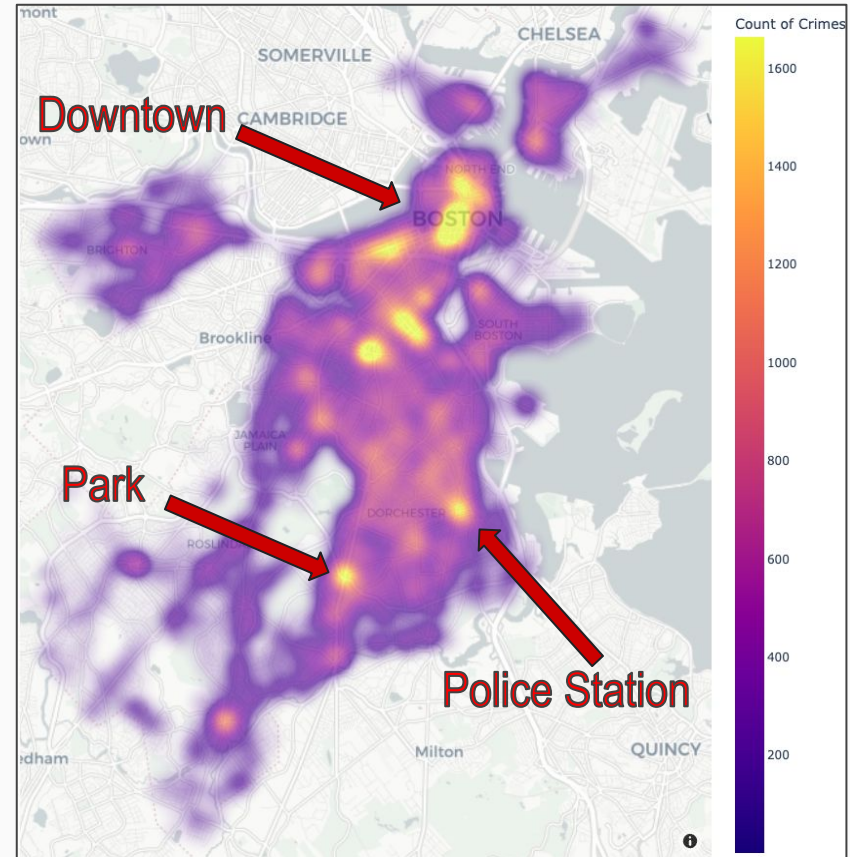
Severity



- Ratio of Least Severe : Moderate : Most Severe $\approx 2.5 : 1.5 : 1$
- Annual number of reported is roughly 8000 cases.
- Total of 1969 cases of shooting.

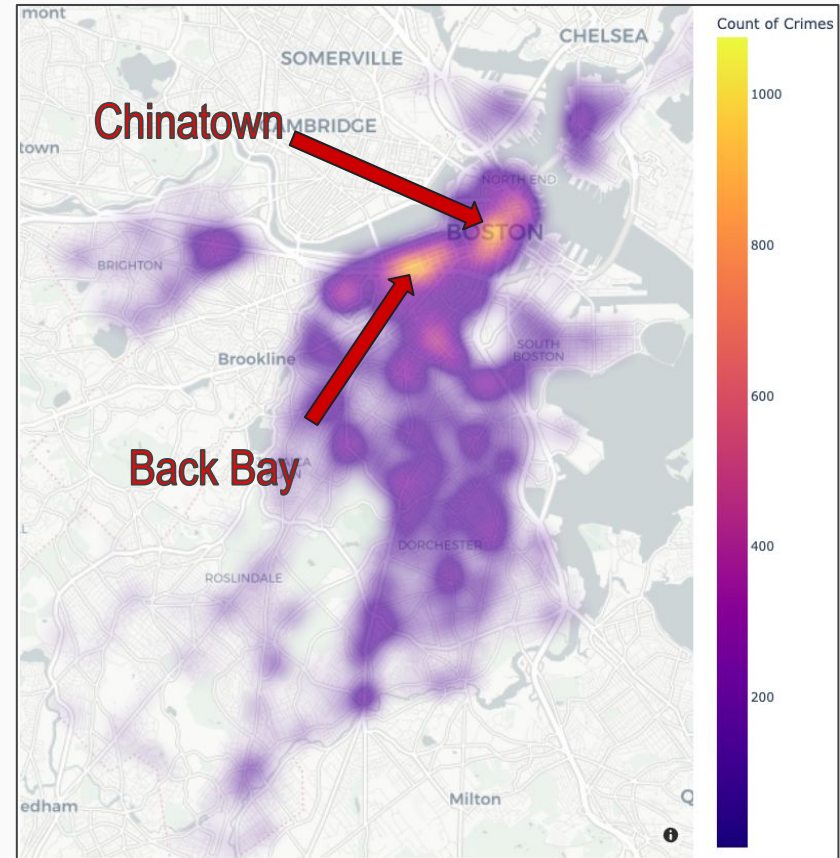
Geographical

- **High correlation** between crime and population density.
- Geographical location **is a strong indicator of criminality**.

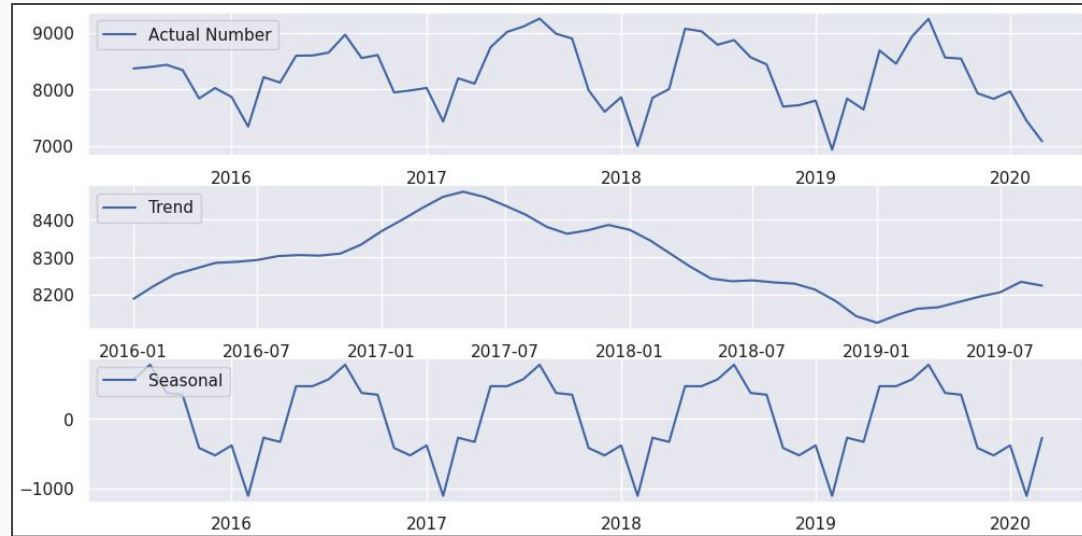


Most Severe Case

- Vast **majority** of severest case occurred in the **northern** Boston.
- Police are advised to focus on the downtown area.

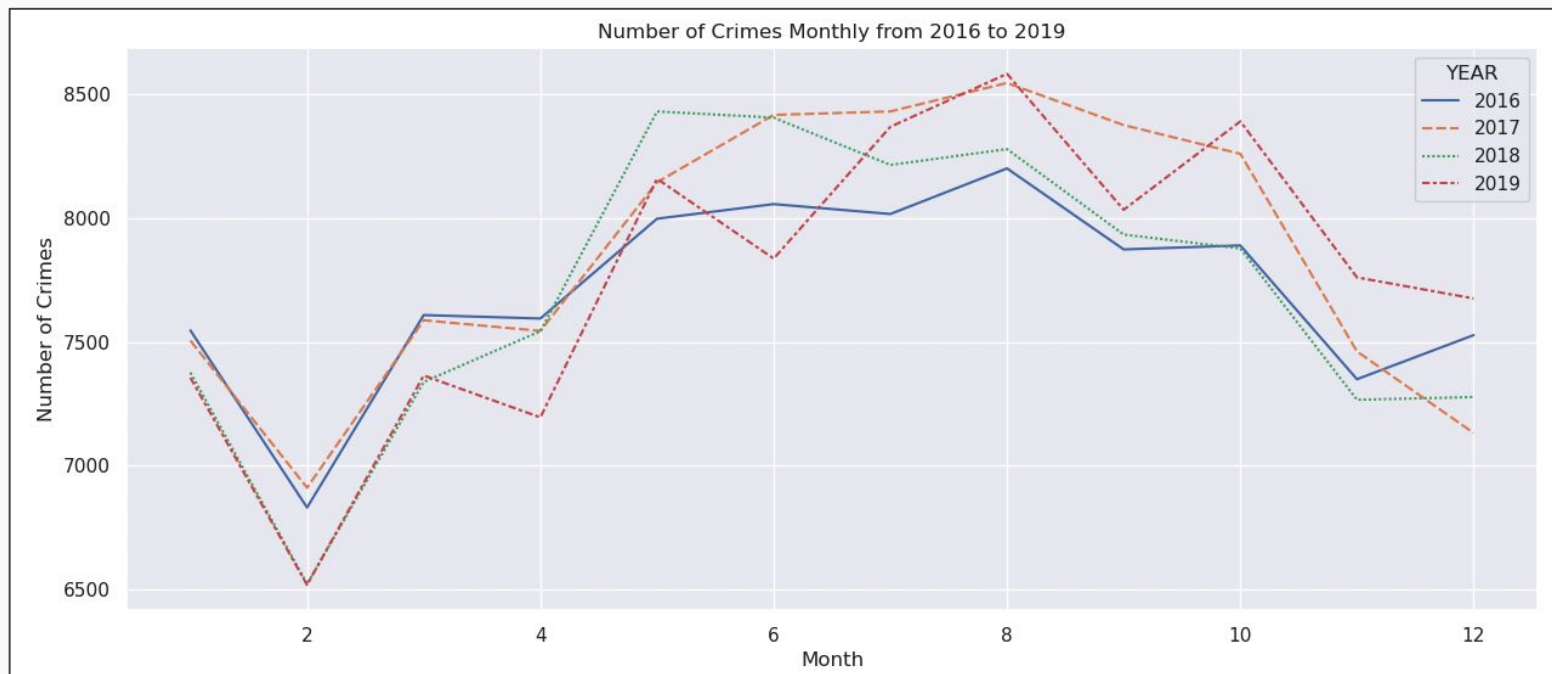


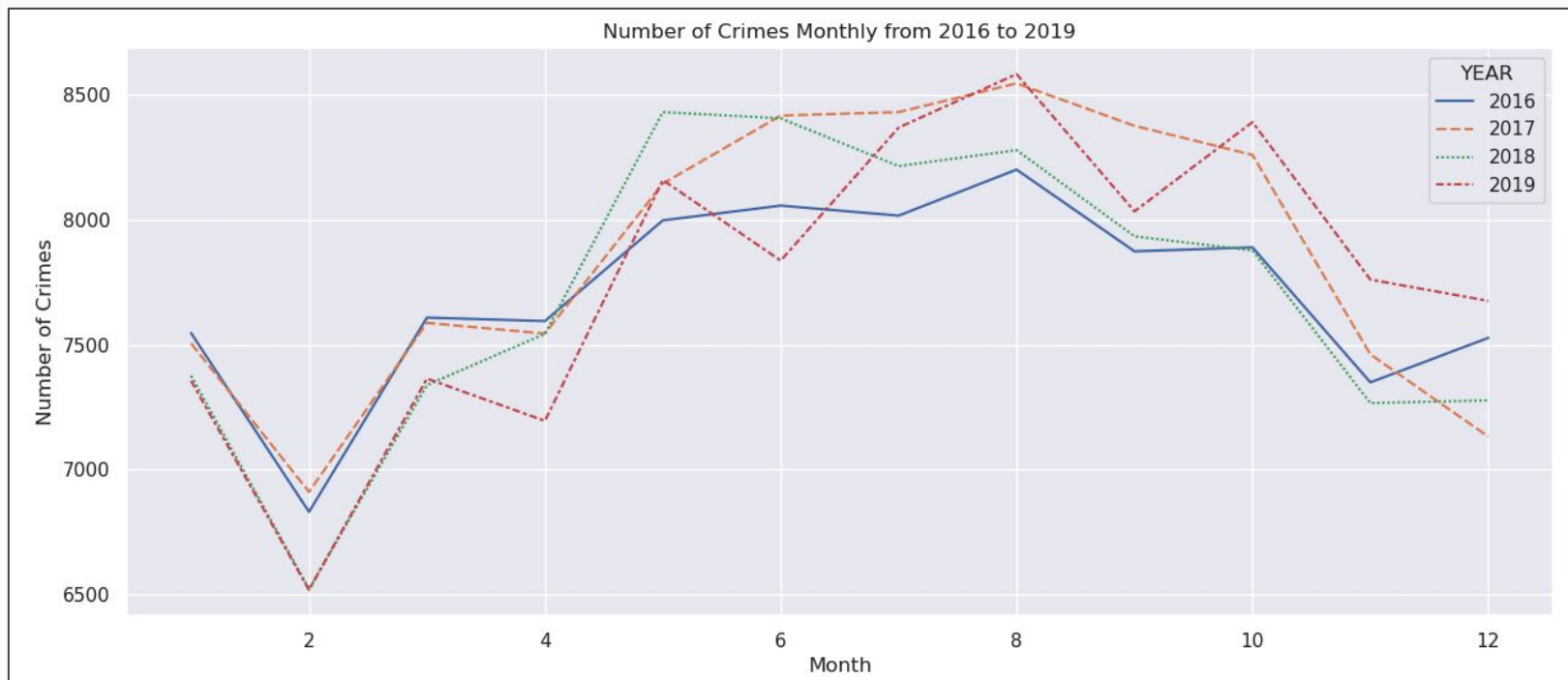
Temporality



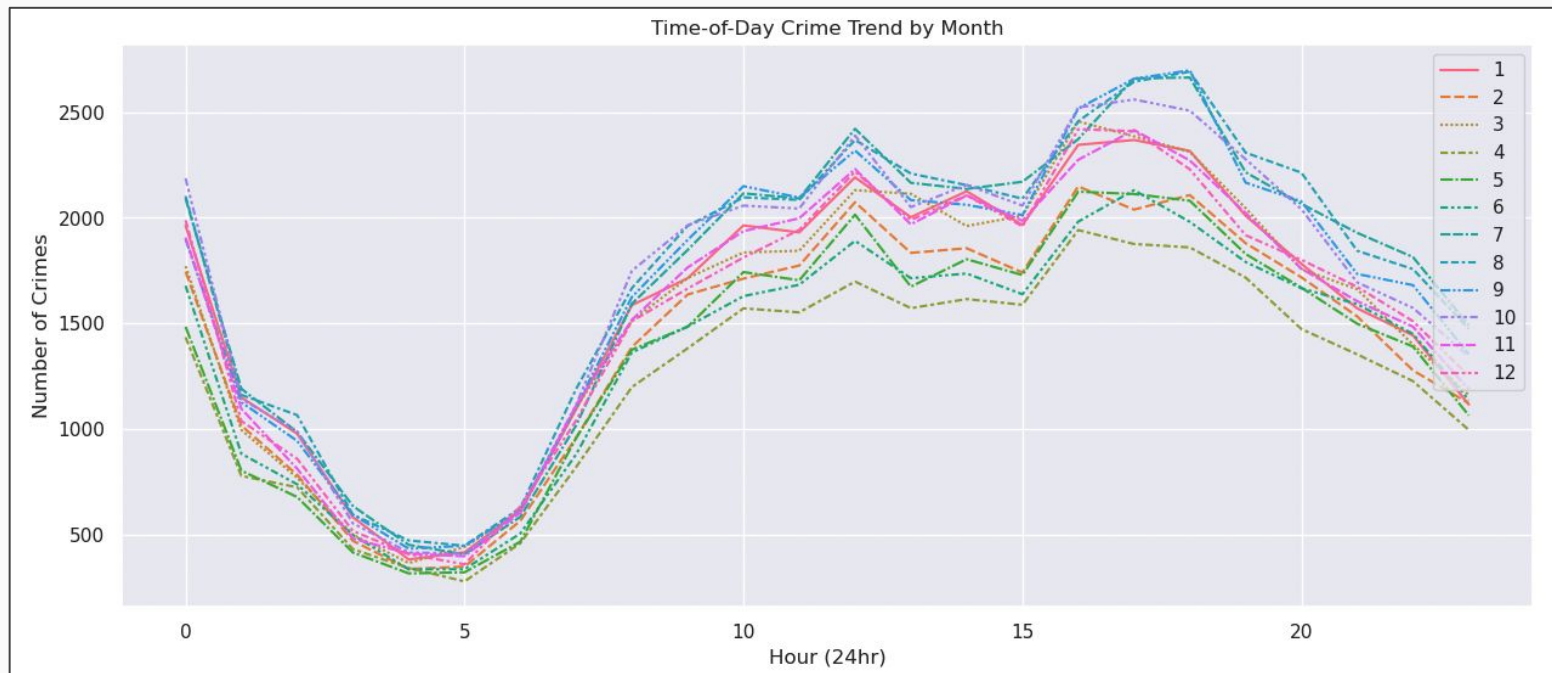
- Trend : Overall pattern of the time series (2015/04 - 2020/06)
- Seasonal : Periodic patterns that occur within each season

Temporality (Month)

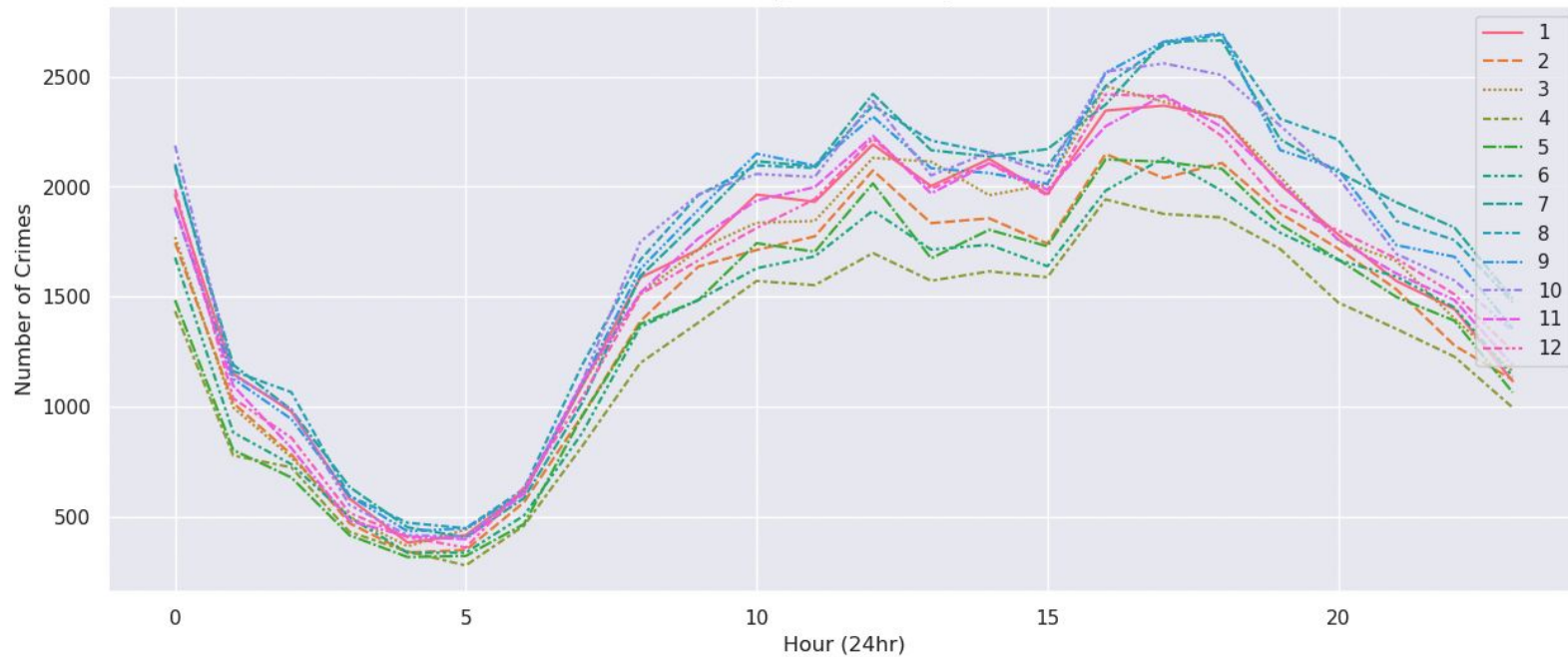




Temporality (Hour)



Time-of-Day Crime Trend by Month



Hypothesis: Temperature vs Crime

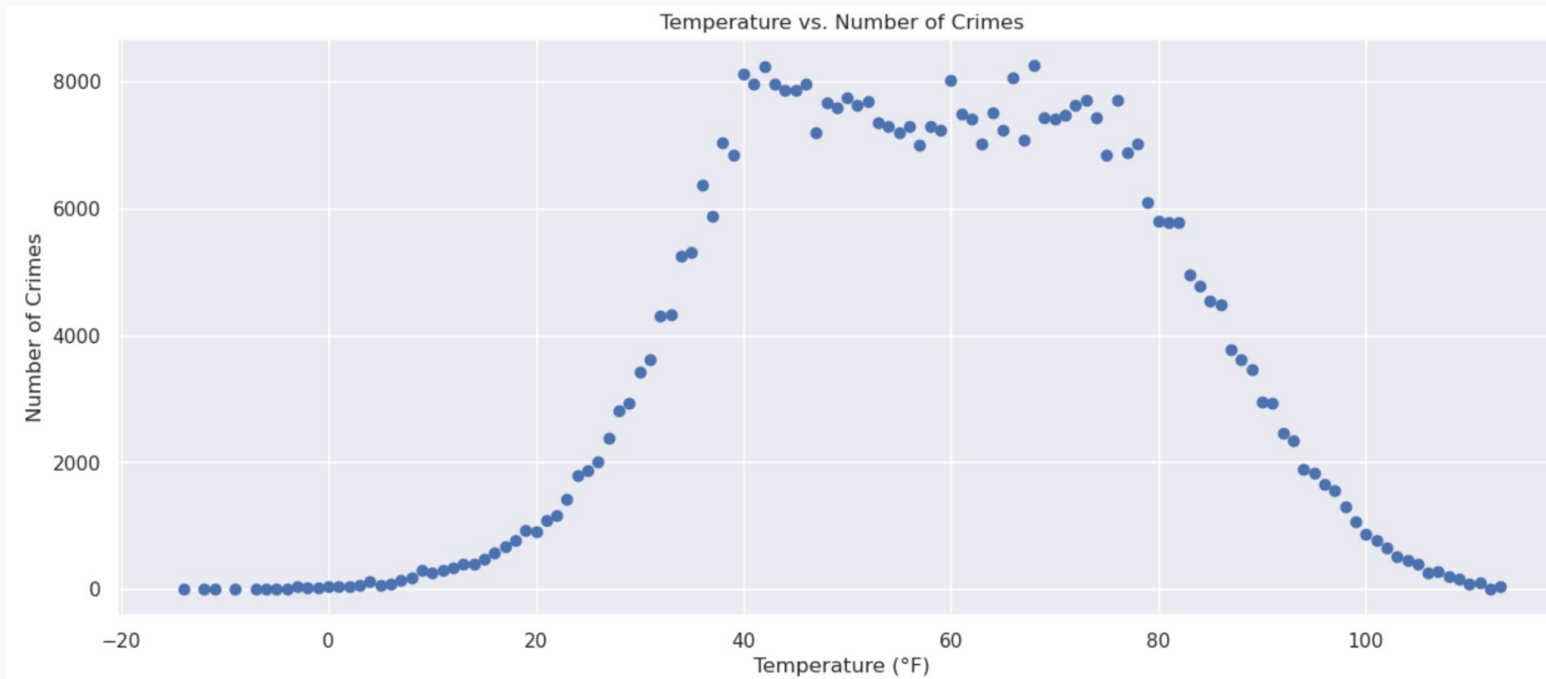
The overall crime rate will increase during hotter days, regardless of other confounding factors.

Additional Data: Temperature

- Include 1,769 rows, 3 columns
- Key variables:
 - Date
 - Temperature
 - Humidity
 - Snow
 - Windspeed

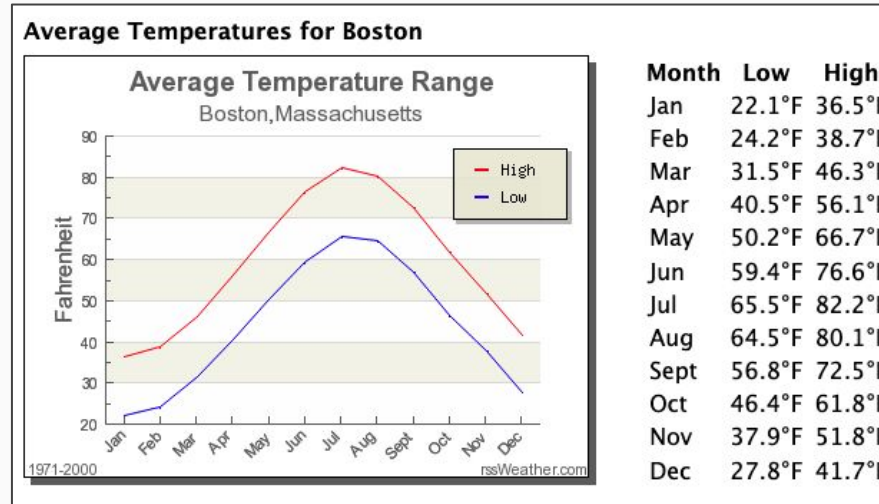
name	datetime	tempmax	tempmin	temp	feelslikemax	feelslikemin	feelslike	dew	humidity
Boston	2015-06-15	63	54	57.1	63	54	57.1	53	87.2
Boston	2015-06-16	69.9	56	61.4	69.9	56	61.4	59.1	92.2
Boston	2015-06-17	69	61.9	65.1	69	61.9	65.1	50.2	60.4
Boston	2015-06-18	74	56.7	65	74	56.7	65	49.3	57.8
Boston	2015-06-19	83	63	69.5	82.5	63	69.4	57.5	66.9
Boston	2015-06-20	74	58.6	64.5	74	58.6	64.5	50.6	61.2
Boston	2015-06-21	74.9	60.3	66.2	74.9	60.3	66.2	64.5	94.5
Boston	2015-06-22	75.2	61.2	66.3	75.2	61.2	66.3	62.2	87.5
Boston	2015-06-23	87.1	60.2	74.1	92.2	60.2	75.7	66.1	77.8
Boston	2015-06-24	83.9	66.7	75.6	82.2	66.7	75.4	54.6	50.1
Boston	2015-06-25	80.1	64.6	72.5	80.1	64.6	72.5	54.7	54.5
Boston	2015-06-26	72.9	59.6	66	72.9	59.6	66	53.3	64.1
Boston	2015-06-27	67.1	56.6	62.7	67.1	56.6	62.7	54.2	74.1
Boston	2015-06-28	59.1	52.9	57.3	59.1	52.9	57.3	55.7	94.5
Boston	2015-06-29	72	53.1	62	72	53.1	62	55.9	81.2
Boston	2015-06-30	74.2	60	67.8	74.2	60	67.8	59.9	76.4

More
Crime



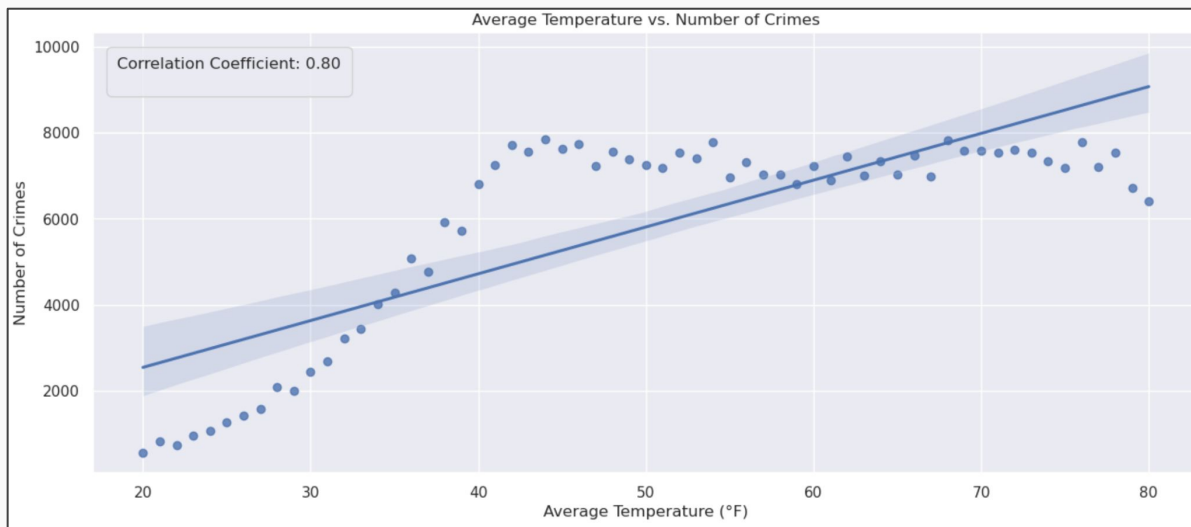
Higher
Temperature (°F)

Additional Data: Outliers



- **Highest** temperature in Boston is roughly **80° F**
- **Lowest** temperature in Boston is roughly **20° F**

Hypothesis: Temperature vs Crime



- **Correlation coefficient of 0.80** indicates a **strong positive** correlation between average temperature and crime rate.
- Every 1° F increases, the count of crimes increases by **108.82 cases** (slope).

Conclusion

Through Boston crime and weather data, we have found a strong correlation between temperature and crime rate.

By understanding these trends, we can better understand the factors that contribute to crime and develop effective strategies for reducing crime rates in the future.

Reference

- Corporation, V. C. (n.d.). *Historical Weather Data for Boston*. Historical weather data for boston | Visual Crossing. Retrieved April 3, 2023, from <https://www.visualcrossing.com/weather-history/boston>
- *Climate for Boston, Massachusetts*. Climate in Boston, Massachusetts. (n.d.). Retrieved April 3, 2023, from <https://www.rssweather.com/climate/Massachusetts/Boston/>