Weather's Effect on Crime in Los Angeles

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Questions:

- Is Crime impacted by weather in Los Angeles?
  - Does crime happen most in high precipitation or low precipitation?
  - Does crime happen most in high temperatures or low temperatures?
  - What type of weather is ideal for crime?

Hypotheses/Core Message

- Null Hypothesis:
  - High temperature has no effect on crime count.
- Alternative Hypothesis
  - High temperature has a positive effect on crime count.

NOAA Weather Data

- **Available at:**
  - Climate Data Online (CDO) - The National Climatic Data Center's (NCDC) Climate Data Online (CDO) provides free access to NCDC's archive of historical weather and climate data in addition to station history information. | National Climatic Data Center (NCDC) (noaa.gov)
- **Available by:**
  - Daily Summaries
  - Global Marine Data
  - Global Summary of Month, Year
  - Local Climatological Data
  - Normal(s) are available for Annual/Seasonal, Daily, Hourly, Monthly
  - Precipitation 15 minute
  - Precipitation Hourly
  - Weather Radar II/III
  - More...
- **Highlights:**
  - Available by PDF/CSV/Text file
  - 4 Character codes in the files fairly well documented documented
  - Metrics are available for number of days with max, min temperatures, days with a snowfall, days with a minimal snow depth.
  - No costs
  - Files are sent via email links with a respectable turnaround time.
- **Cleansing tasks:**
  - Rename columns to documented names
  - Setting Null values to 0
- **Discoveries:**
  - Ordering the same CSV report does not mean report files will be identical for all cities. JFK file had more column information due to the seasonal weather types.
- **Selection Criteria:**
  - Chose International airports with the assumption that weather for the airports would be fairly consistent (uniform) with the surrounding city area.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 11 ft. Lat: 40.6392° N Lon: -73.7640° W
Station: **JFK INTERNATIONAL AIRPORT, NY US USW00094789**

Global Summary of the Year
2012 - 2021

Generated on 04/29/2021

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Date	Liquid Precipitation (Inches)			Frozen Precipitation (Inches)					Number of Days				
Elem->	PRCP	EMXP		SNOW	EMSN		EMSD		DP01	DP10	DP1X	DYHF	DYTS
Year	Total Liquid Content	Extreme Max Precip	Date of Occurrence	Snowfall	Extreme Max Snowfall	Date of Occurrence	Extreme Max Snow Depth	Date of Occurrence	Precip >= 0.01"	Precip >= 0.10"	Precip >= 1.00"	FG+	TS
2012	39.86	2.14	Apr-22	7.0	4.0	Nov-07	4	Nov-08	124	78	8	22	30
2013	35.54	4.01	Jun-07	19.9	3.5	Feb-09	6	Feb-09	114	62	6	5	2
2014	50.78	4.68	Apr-30	39.3	6.8	Jan-21	10+	Feb-18	122	75	16	4	6
2015	38.33	2.48	Aug-21	43.9	5.8	Mar-05	10	Jan-28	110	63	12	31	18
2016	36.04	2.90	Jan-23	44.7	30.3	Jan-23	28	Jan-24	111	65	7	20	23
2017	43.16	2.84	Oct-29	34.3	8.3	Feb-09	8+	Feb-10	122	72	11	24	26
2018	57.43	2.16	Mar-02	33.7	8.4	Mar-21	9	Mar-22	156	96	18	40	29
2019	52.03	2.07	Jul-23	11.8	3.2	Mar-02	3	Mar-02	140	89	15	24	34
2020	40.91	2.33	Jul-10	9.1	3.8	Dec-16	7+	Dec-19	133	80	12	28	36
2021												14	

Notes

(Blank) Data element not reported or missing.

X Monthly means or totals based on incomplete time series.

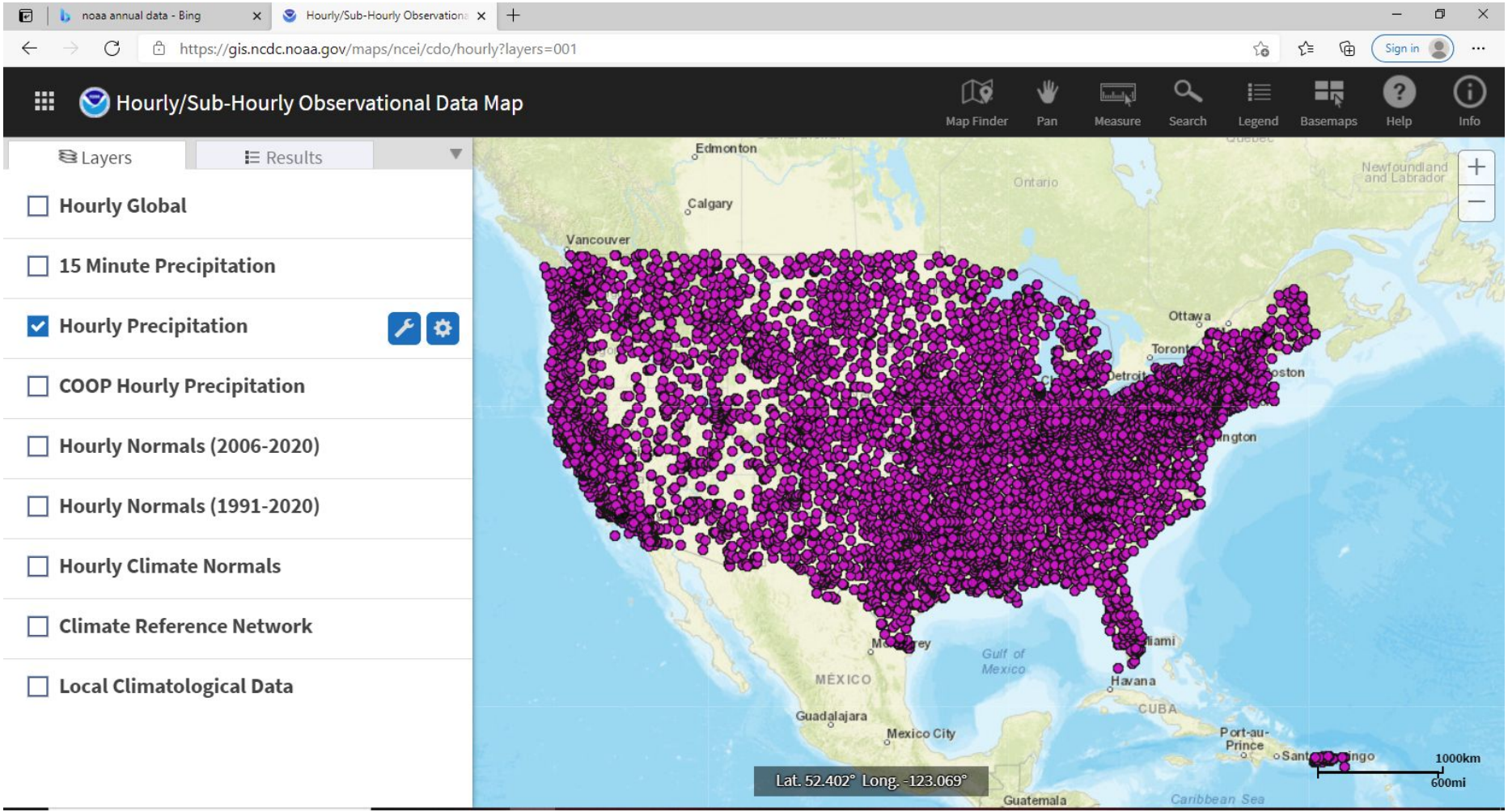
\+ Occurred on one or more previous dates during the month. The date in the Date field is the last day of occurrence.

A Accumulated amount.

T Trace Amount.

FG+ Heavy Fog

TS Thunderstorms


noaa annual data - Bing
Hourly/Sub-Hourly Observation
https://gis.ncdc.noaa.gov/maps/ncei/cdo/hourly?layers=001
Sign in
Hourly/Sub-Hourly Observational Data Map
Map Finder
Pan
Measure
Search
Legend
Basemaps
Help
Info
Layers
Results
Hourly Global
15 Minute Precipitation
Hourly Precipitation
COOP Hourly Precipitation
Hourly Normals (2006-2020)
Hourly Normals (1991-2020)
Hourly Climate Normals
Climate Reference Network
Local Climatological Data
Edmonton
Calgary
Vancouver
Ontario
Newfoundland and Labrador
Ottawa
Toronto
Detroit
Boston
Miami
Gulf of Mexico
MÉXICO
Havana
CUBA
Guadalajara
Mexico City
Port-au-Prince
Guatemala
Caribbean Sea
1000km
600mi
Lat. 52.402° Long. -123.069°

Crime Data info for LA

- Available at:
  - https://data.lacity.org/Public-Safety/Arrest-Data-from-2010-to-2019/yru6-6re4
- Available by:
  - Report ID
  - Arrest Date
  - Time
  - Age
  - Sex Code
  - Charge Group Code
  - Charge Group Description
  - Arrest Type
  - Charge
  - Charge Description
  - Disposition Description
  - LAT
  - LON
- Cleansing tasks:
  - Drop most columns, leave Report ID, Arrest Date, Age, Sex Code, Charge Description, LAT, LON
  - Convert Arrest Date to datetime and separate by month, day, and year
  - Drop 'Arrest Date','day','month','LAT','LON'
  - Drop NaN from Charge Description
- Selection Criteria:
  - Date and crime type
  - Crime description count

Arrest Data from 2010 to 2019

This dataset reflects arrest incidents in the City of Los Angeles from 2010 to 2019. This data is transcribed from original arrest reports that

More Views

Report ID	Report T...	Arrest Date	Time	Area ID	Area Name	Reporting District	Age	Sex Code	Descent Code	Charge Group Code
121920046	RFC	09/28/2012	0930	19	Mission	1998	60	M	H	
0000000	BOOKING	02/18/2019	1115	01	Central	0132	32	M	H	
090712341	RFC	03/10/2011	0940	07	Wilshire	0776	45	M	B	
121909585	RFC	04/01/2012	1715	19	Mission	1993	37	M	H	
100109543	RFC	04/14/2010	1510	01	Central	0158	38	F	W	
100208368	RFC	03/18/2010	2110	02	Rampart	0275	40	F	W	
100218913	RFC	10/07/2010	1835	02	Rampart	0217	32	F	O	
100321755	RFC	09/11/2010	1840	03	Southwest	0359	43	M	B	
100321757	RFC	09/11/2010	1730	03	Southwest	0359	36	M	B	
100321798	RFC	09/11/2010	1750	03	Southwest	0359	24	M	O	
100321800	RFC	09/11/2010	1750	03	Southwest	0359	19	F	H	
100325586	RFC	11/06/2010	1920	03	Southwest	0377	51	M	H	
100404077	RFC	01/03/2010	0015	04	Hollenbeck	0456	43	F	H	
100406558	RFC	02/26/2010	2040	04	Hollenbeck	0463	22	M	H	
100409711	RFC	05/08/2010	2135	04	Hollenbeck	0412	20	M	H	
100409797	RFC	05/07/2010	2125	04	Hollenbeck	0453	27	M	H	
100409813	RFC	05/08/2010	0130	04	Hollenbeck	0499	15	M	H	
100409814	RFC	05/08/2010	0100	04	Hollenbeck	0499	14	M	H	
121920272	RFC	09/15/2012	0040	19	Mission	1913	34	M	H	
100409815	RFC	05/08/2010	0145	04	Hollenbeck	0499	16	F	W	
100409816	RFC	05/08/2010	0100	04	Hollenbeck	0499	14	M	H	

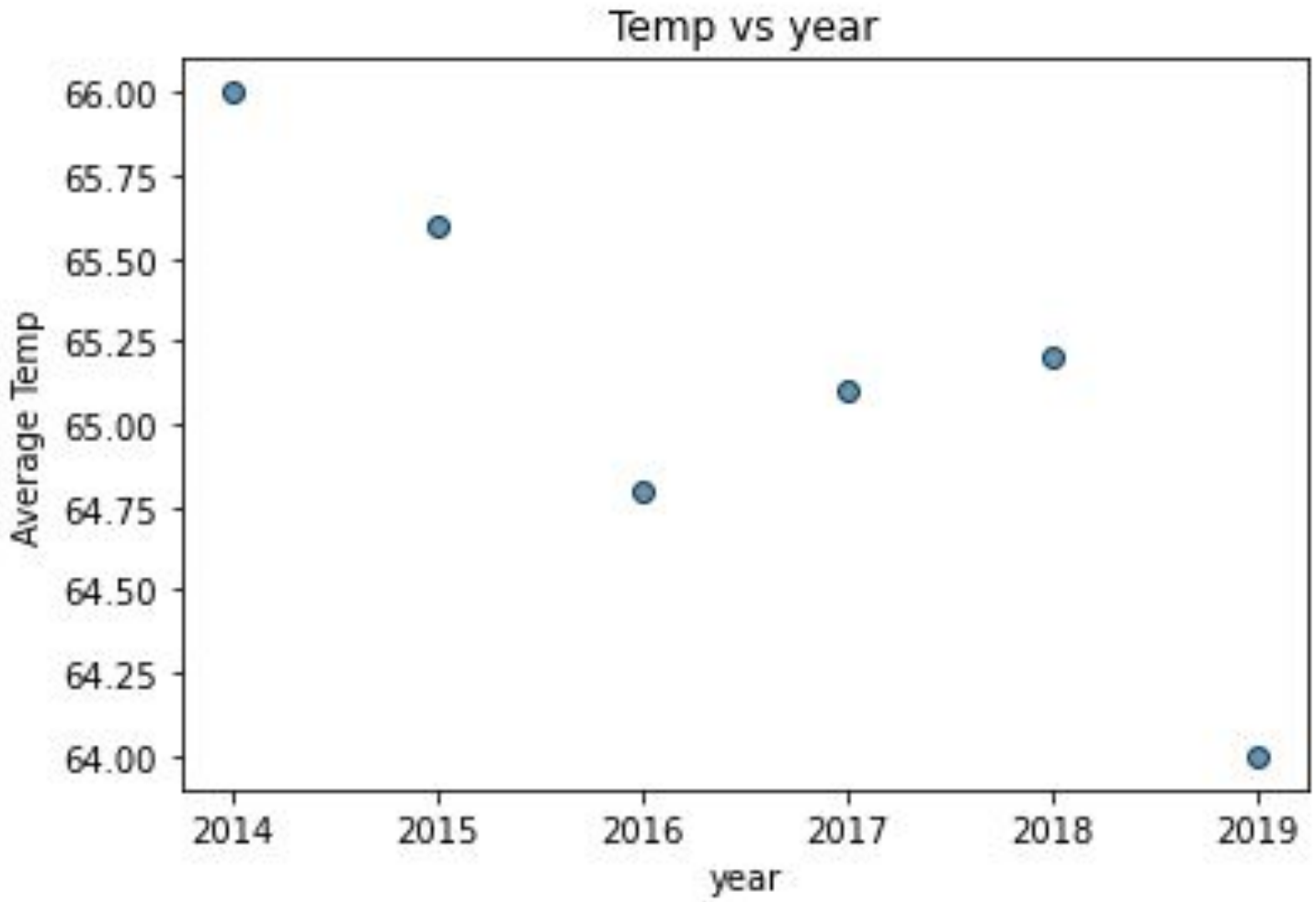
< Previous Next >

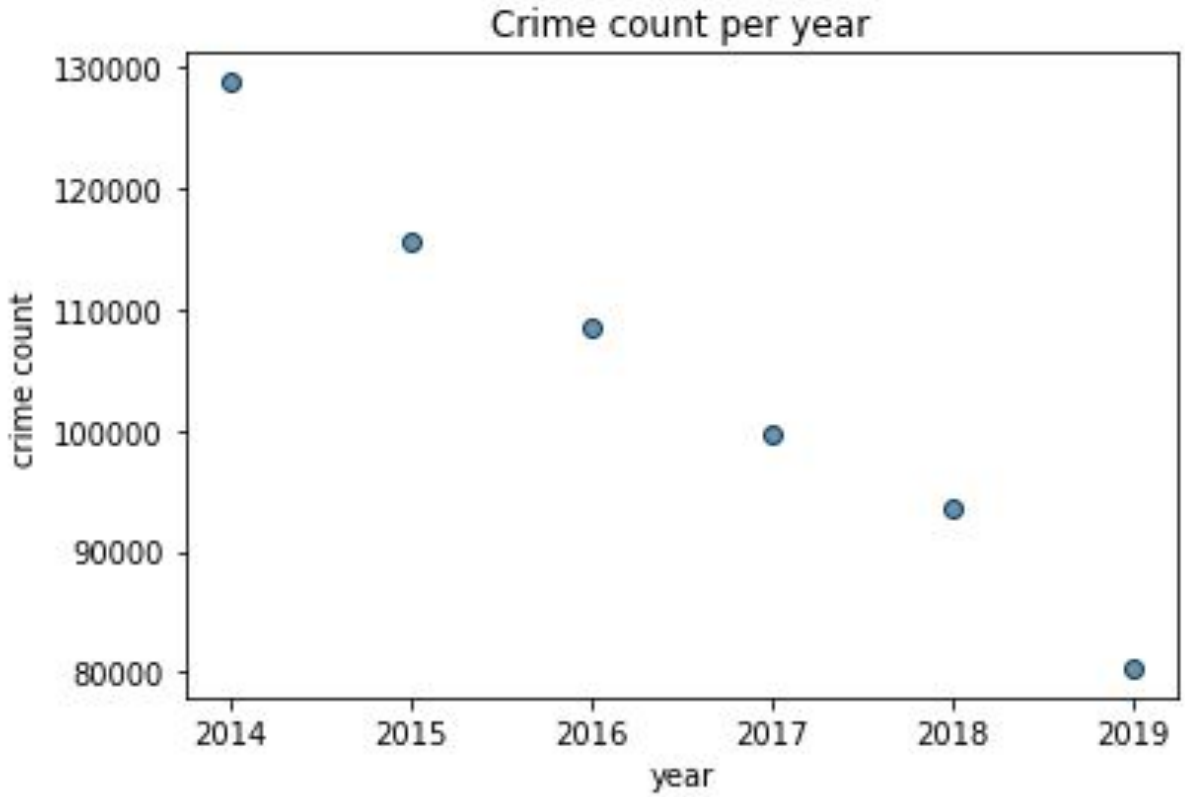
Showing Each row represents an arrests 1 to 100 out of 1,316,499

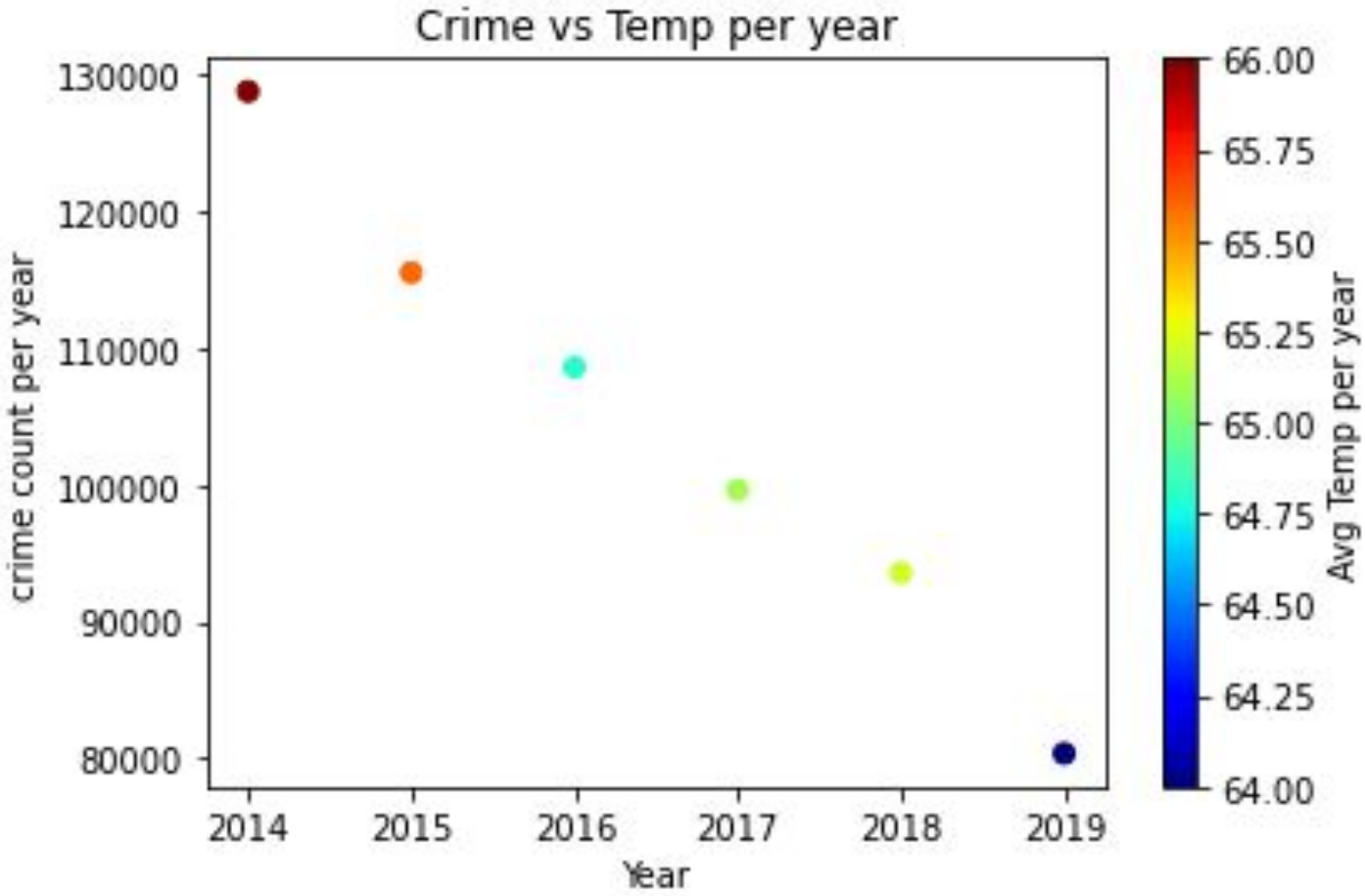
Cime Count

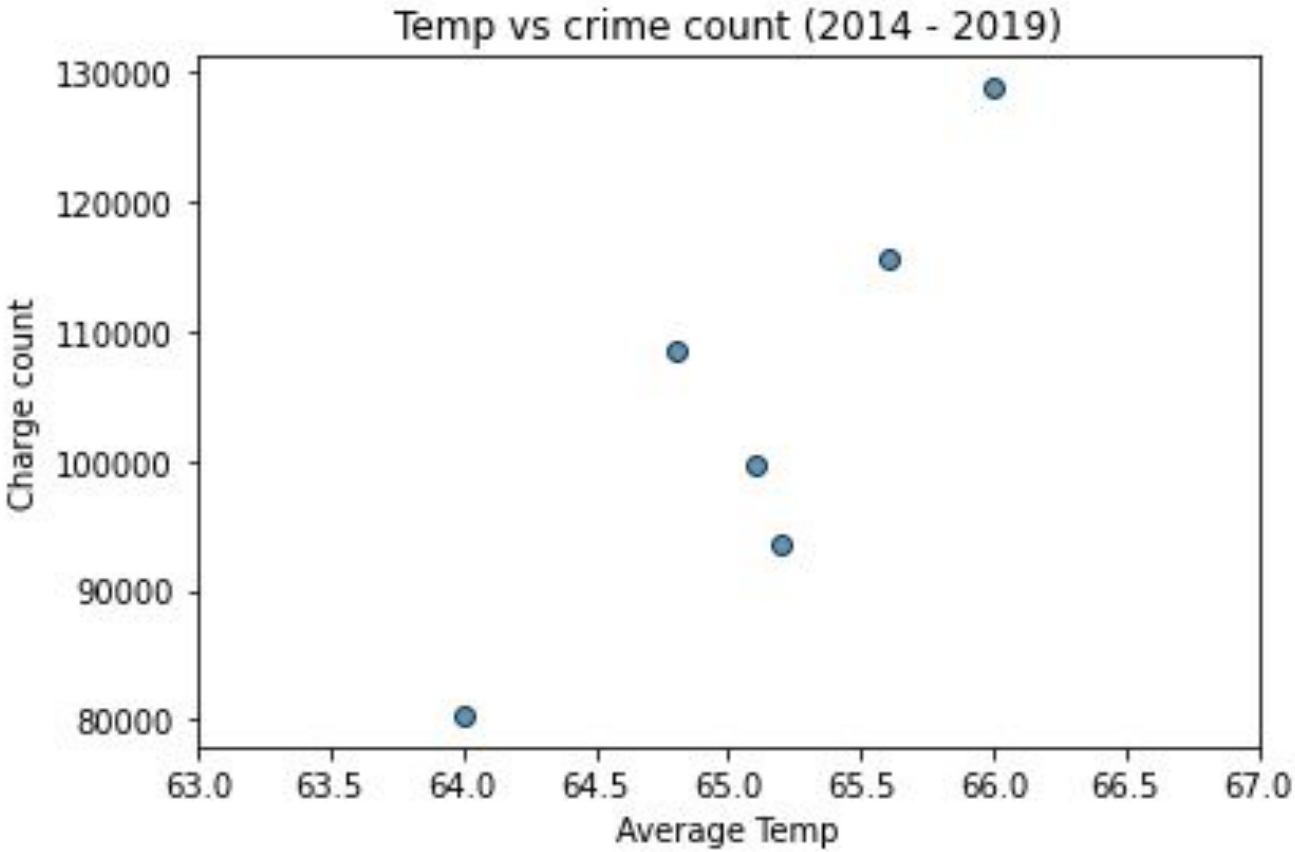
Out[52]:

Miscellaneous Other Violations	114811
Narcotic Drug Laws	77778
Driving Under Influence	63179
Aggravated Assault	52727
Other Assaults	41613
Drunkeness	38553
Larceny	36724
Liquor Laws	31613
Moving Traffic Violations	26072
Disorderly Conduct	23034
Prostitution/Allied	22154
Weapon (carry/poss)	18791
Vehicle Theft	16866
Robbery	15288
Burglary	12362
Sex (except rape/prst)	7579
Fraud/Embezzlement	5903
Against Family/Child	5217
Receive Stolen Property	3194
Forgery/Counterfeit	3187
Pre-Delinquency	1955
Non-Criminal Detention	1875
Rape	1775
Homicide	1427
Gambling	1189
Disturbing the Peace	1062
Federal Offenses	145

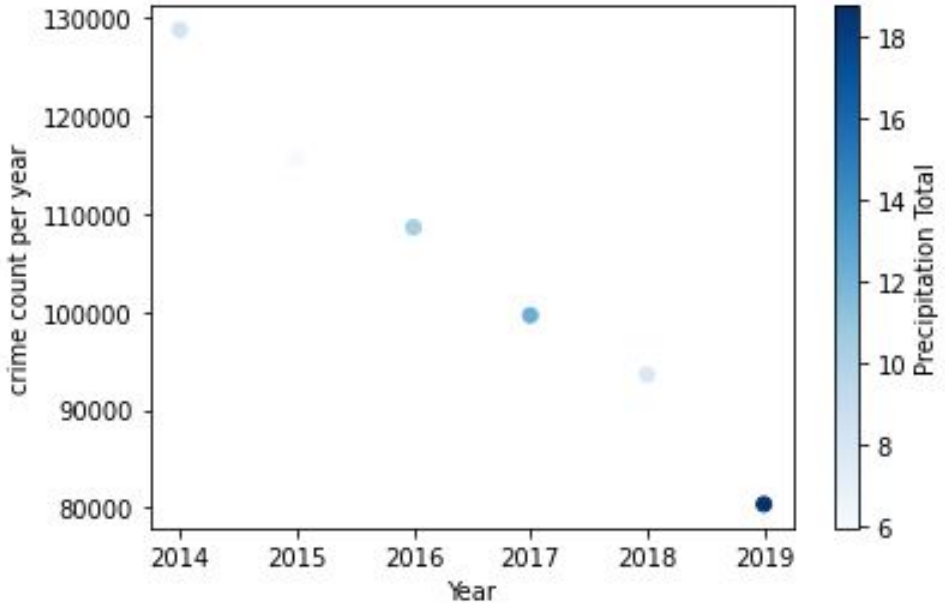

Temp vs year
66.00
65.75
65.50
65.25
65.00
64.75
64.50
64.25
64.00
Average Temp
2014
2015
2016
2017
2018
2019
year


Crime count per year
130000
120000
110000
100000
90000
80000
crime count
2014
2015
2016
2017
2018
2019
year

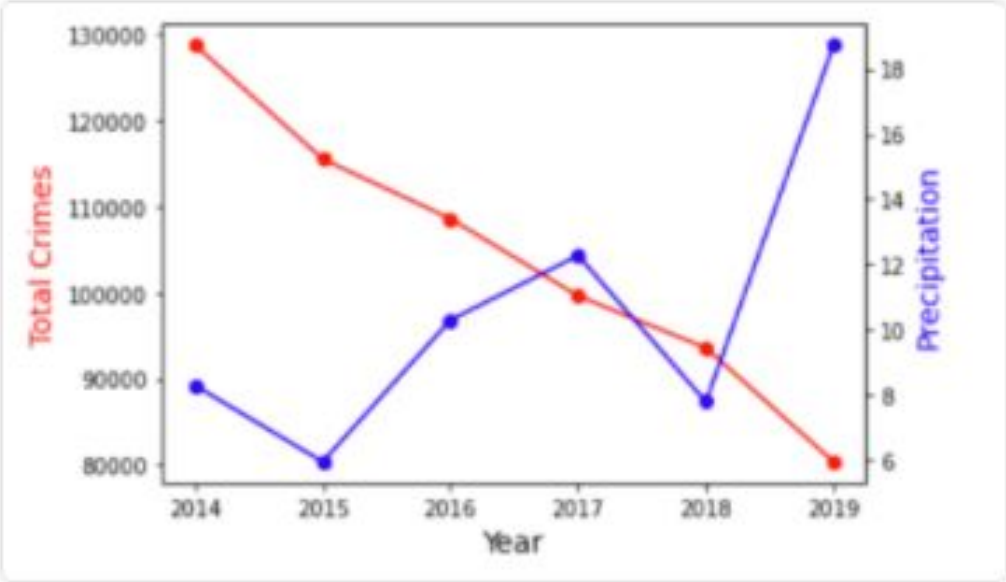

Crime vs Temp per year
130000
120000
110000
100000
90000
80000
crime count per year
2014
2015
2016
2017
2018
2019
Year
66.00
65.75
65.50
65.25
65.00
64.75
64.50
64.25
64.00
Avg Temp per year


Temp vs crime count (2014 - 2019)
Charge count
130000
120000
110000
100000
90000
80000
63.0
63.5
64.0
64.5
65.0
65.5
66.0
66.5
67.0
Average Temp

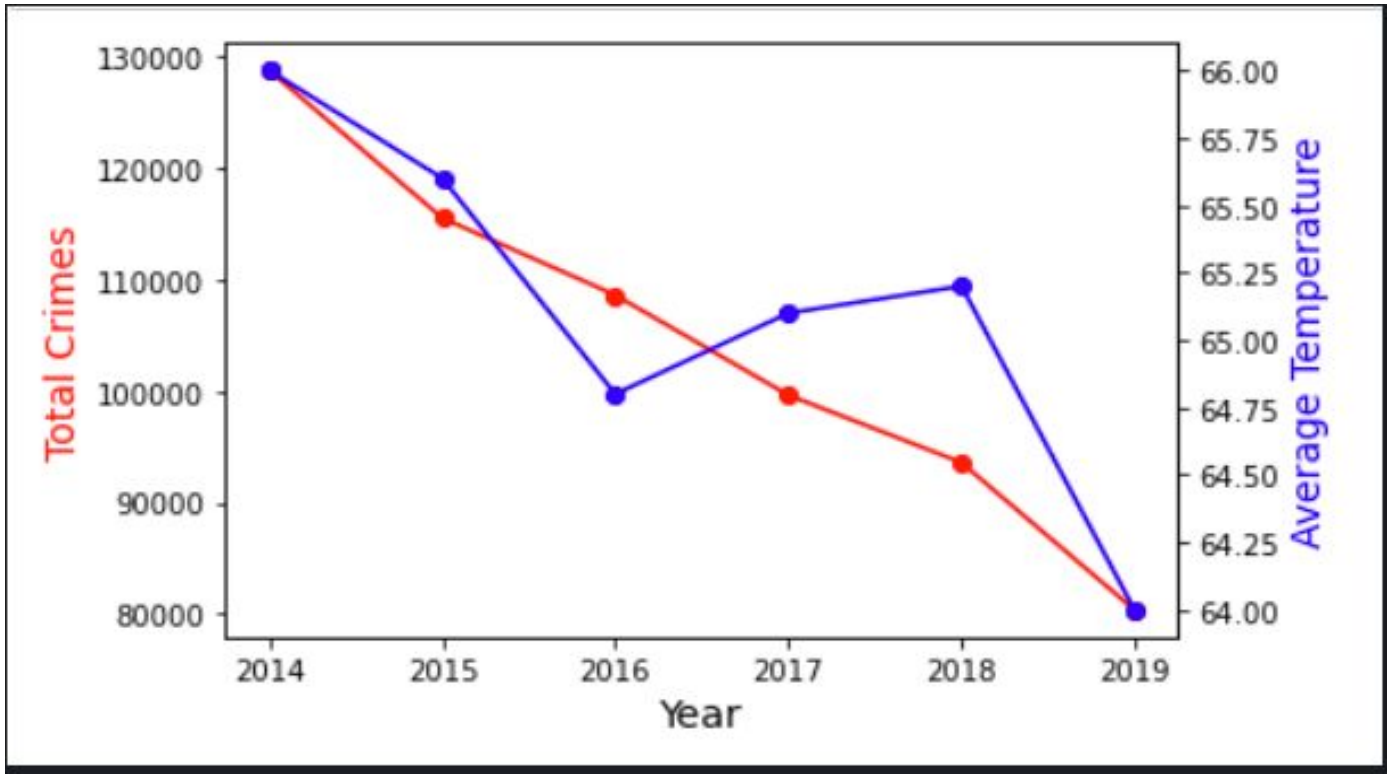
Crime count per year vs Precipitation Total



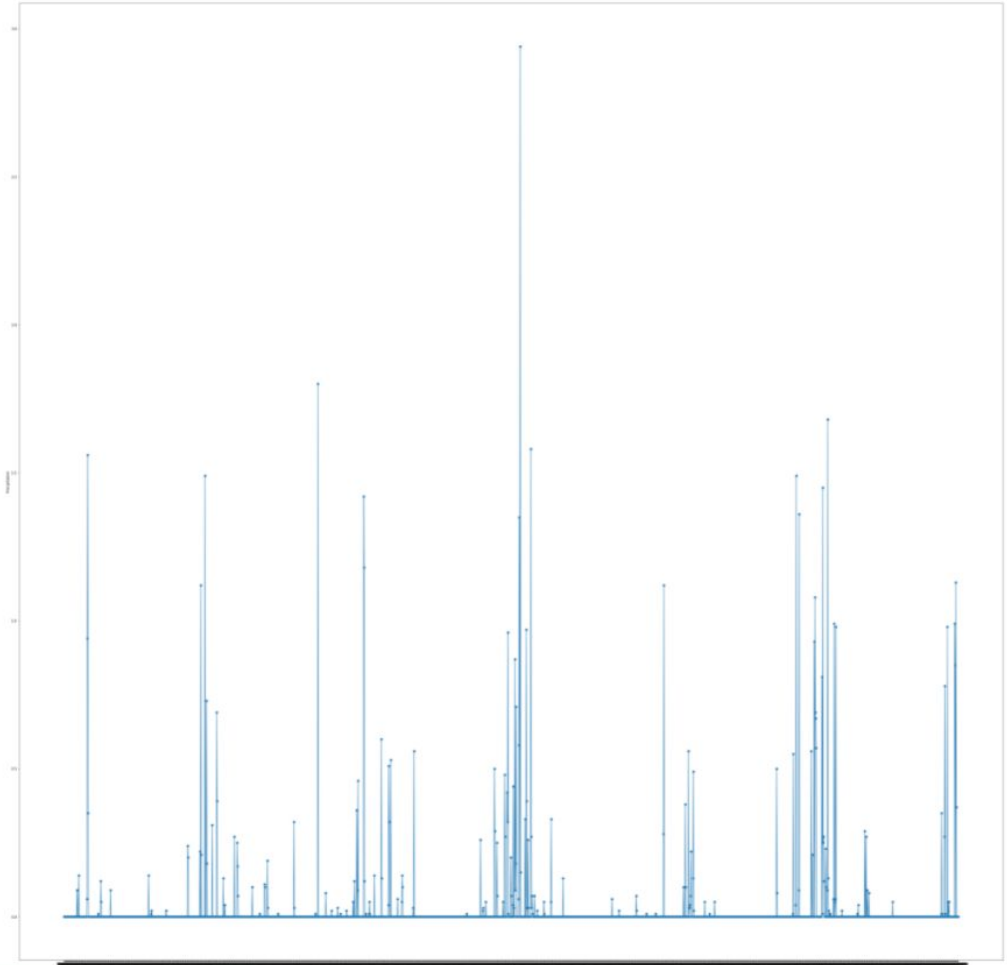
Crime vs Precipitation



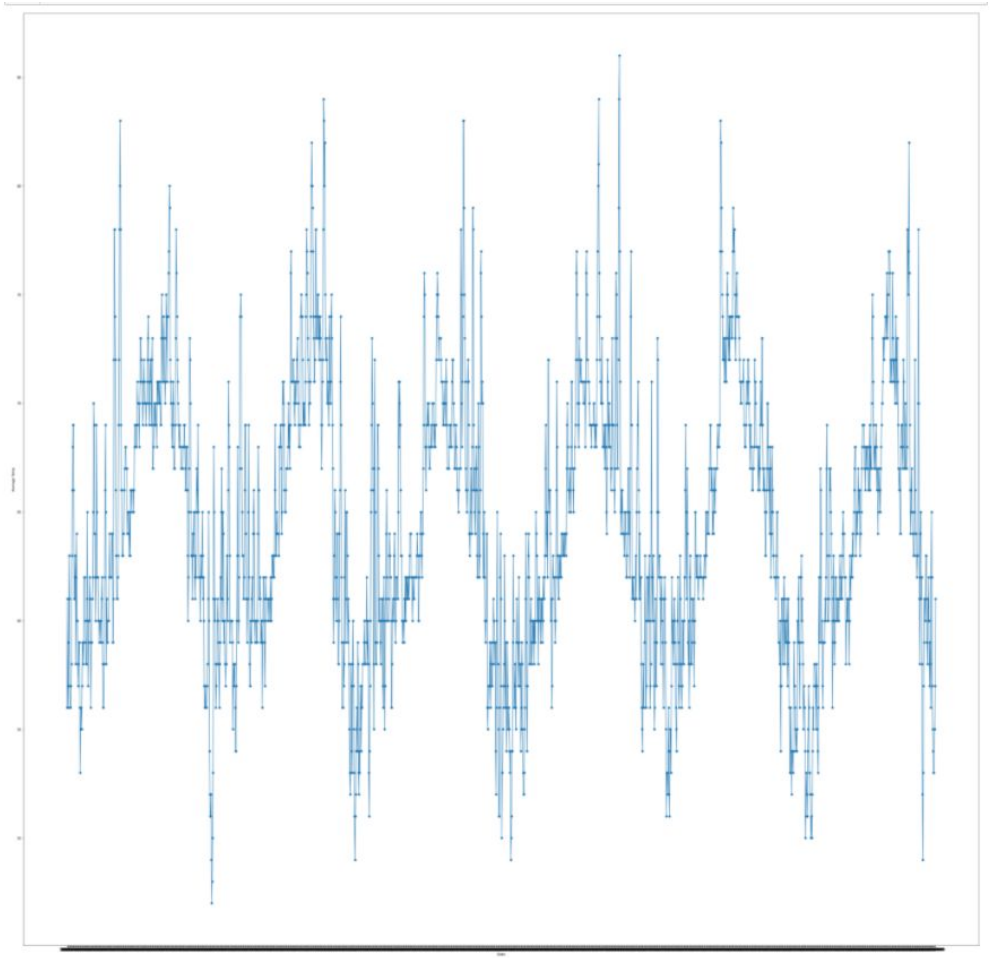
Total Crime vs Average Temperature



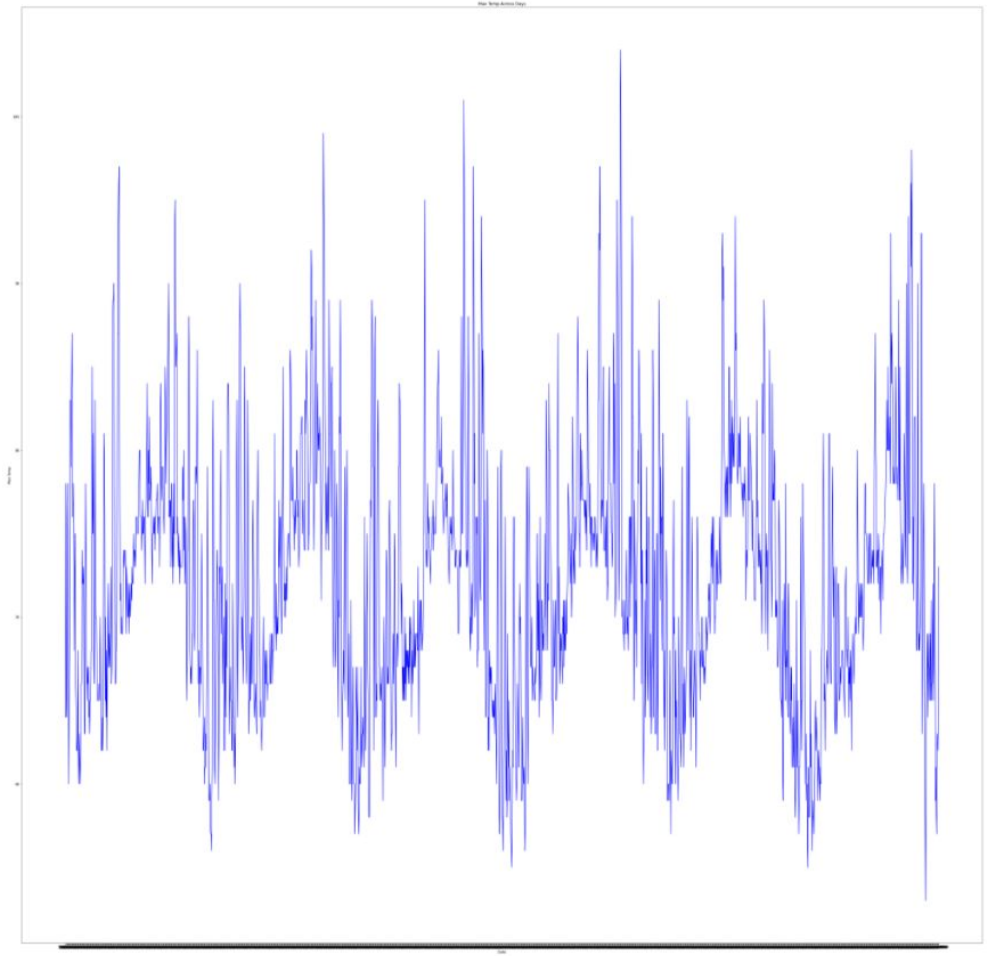
Daily precipitation over dataset



Avg Temp over dataset



Max Temp over dataset



Shortcomings

- Annual graphs do not show a significant amount of data, resulting in not a lot of data points.
- Finding a good and relative crime csv to use.
- Trying to display large sets of data.
- As we were analyzing, we realized how important it is to recognize how many different factors would impact crime besides temperature.
- The climate of Los Angeles is relatively stable
- Timeliness is a major factor
- Possible incomplete data for 2019

Conclusions

Regardless of the temperature, we found it interesting that the crime has seemed to go down significantly.

Despite the lack of perfect data, the graphs show that there is the possibility of a relationship between crime and temperature.

While there seems to be a possible relationship between crime and temperature it would be incomplete to not acknowledge all of the other factors involved. Other possible contributing factors to this relationship could be average income, population disbursement, and policies/politics etc.

Without further analysis we cannot conclude that there is a direct relationship or correlation.

Conclusions Continued

Based on our limited results, it seems relatively safe to say that there is not a relationship between crime and precipitation. While we would need further statistical analysis, the graphs seem to indicate this.