Geospatial Analysis of Crime Rates

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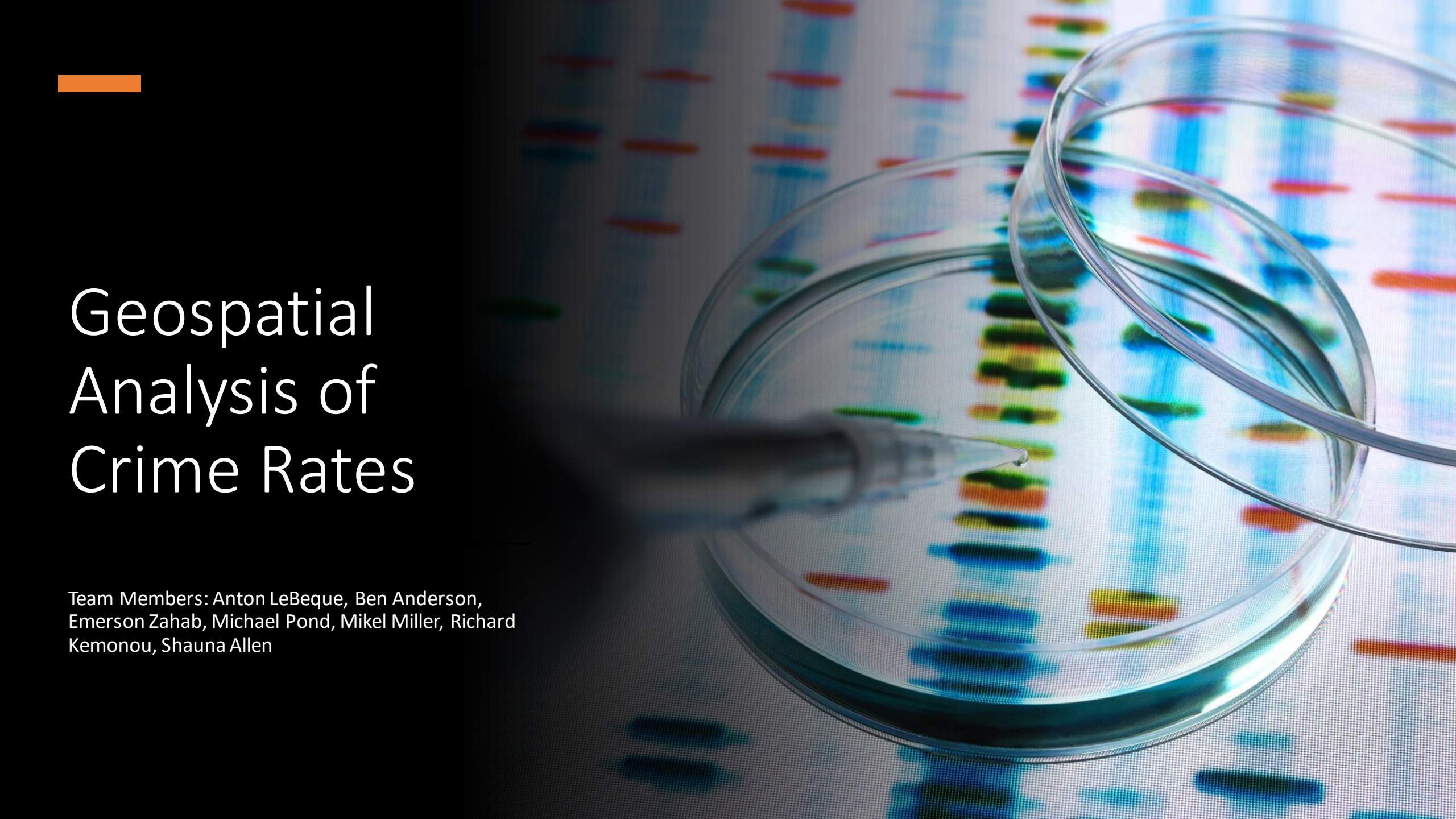
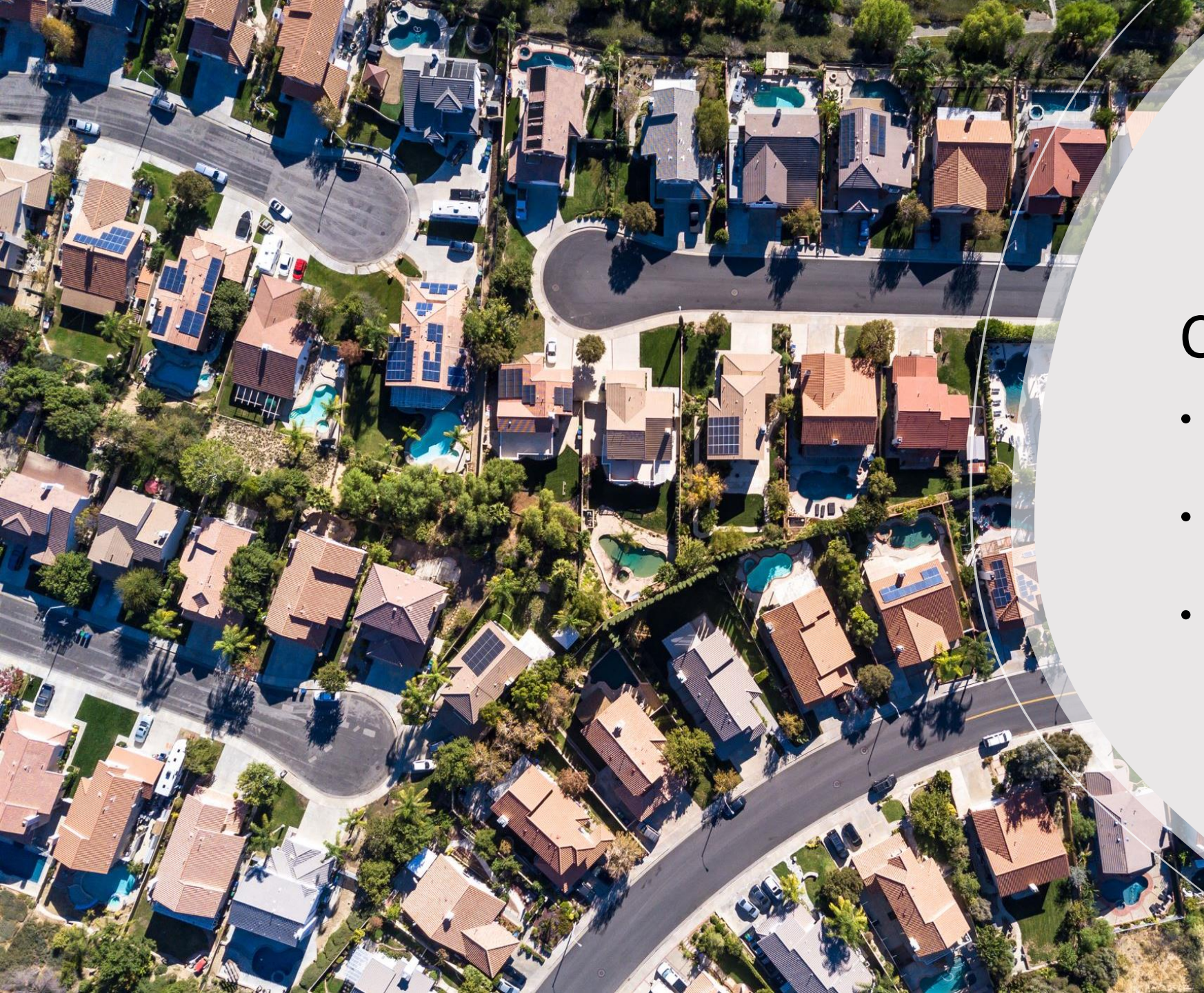




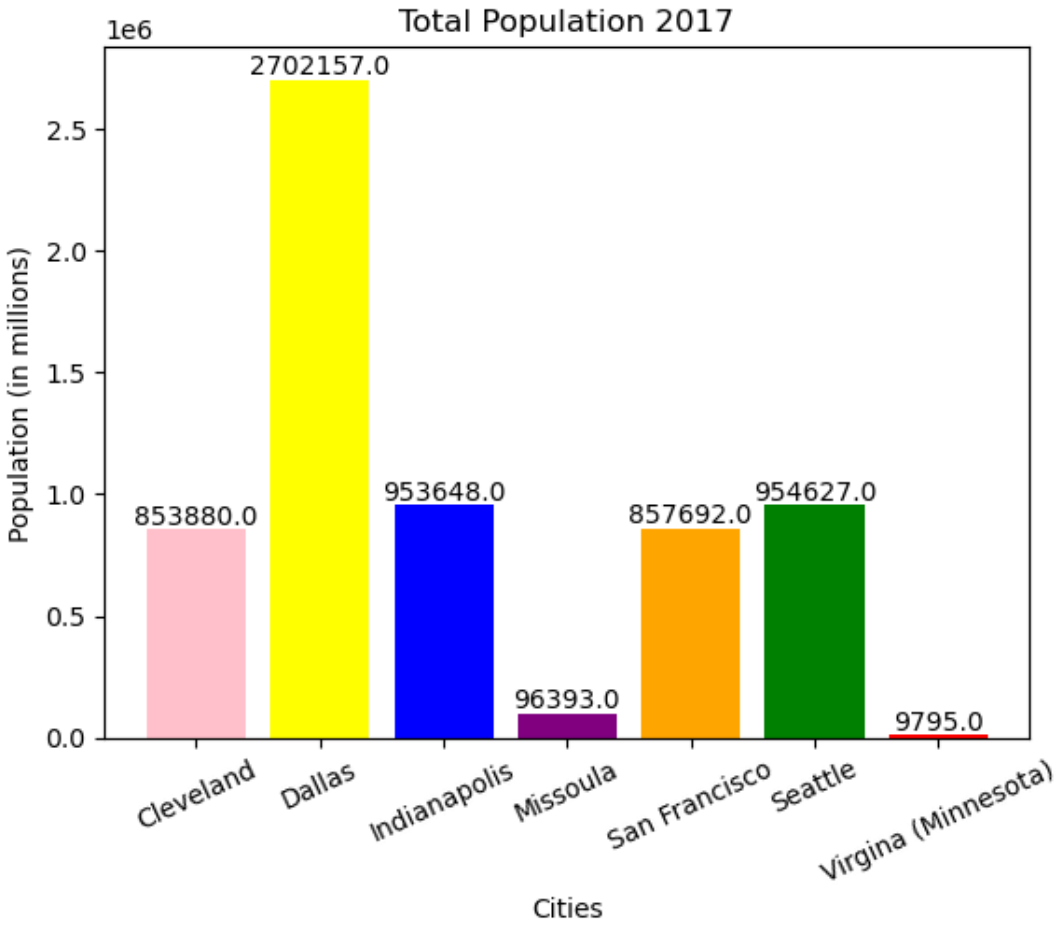
Crime and Covid

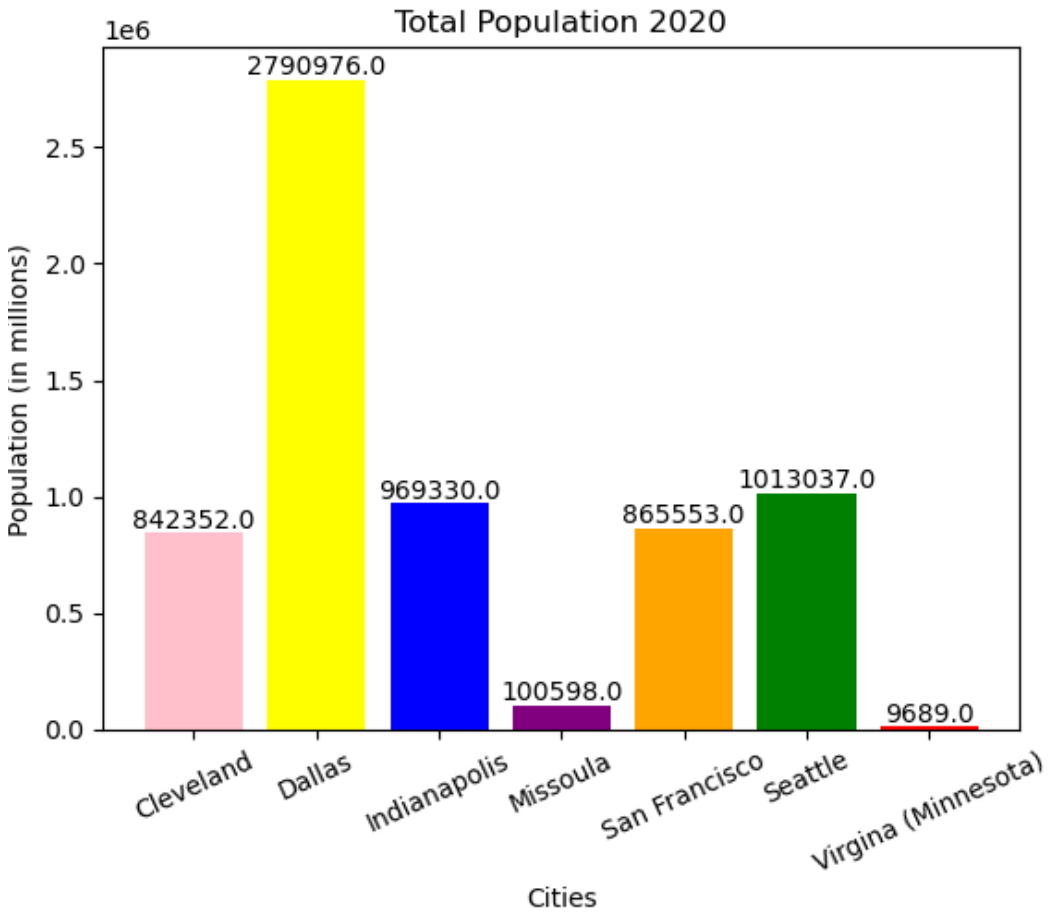
- What happened to crime across the country?
- What happened to specific types of crime?
- What happened to differently populated areas?

Hypothesis and Null Hypothesis

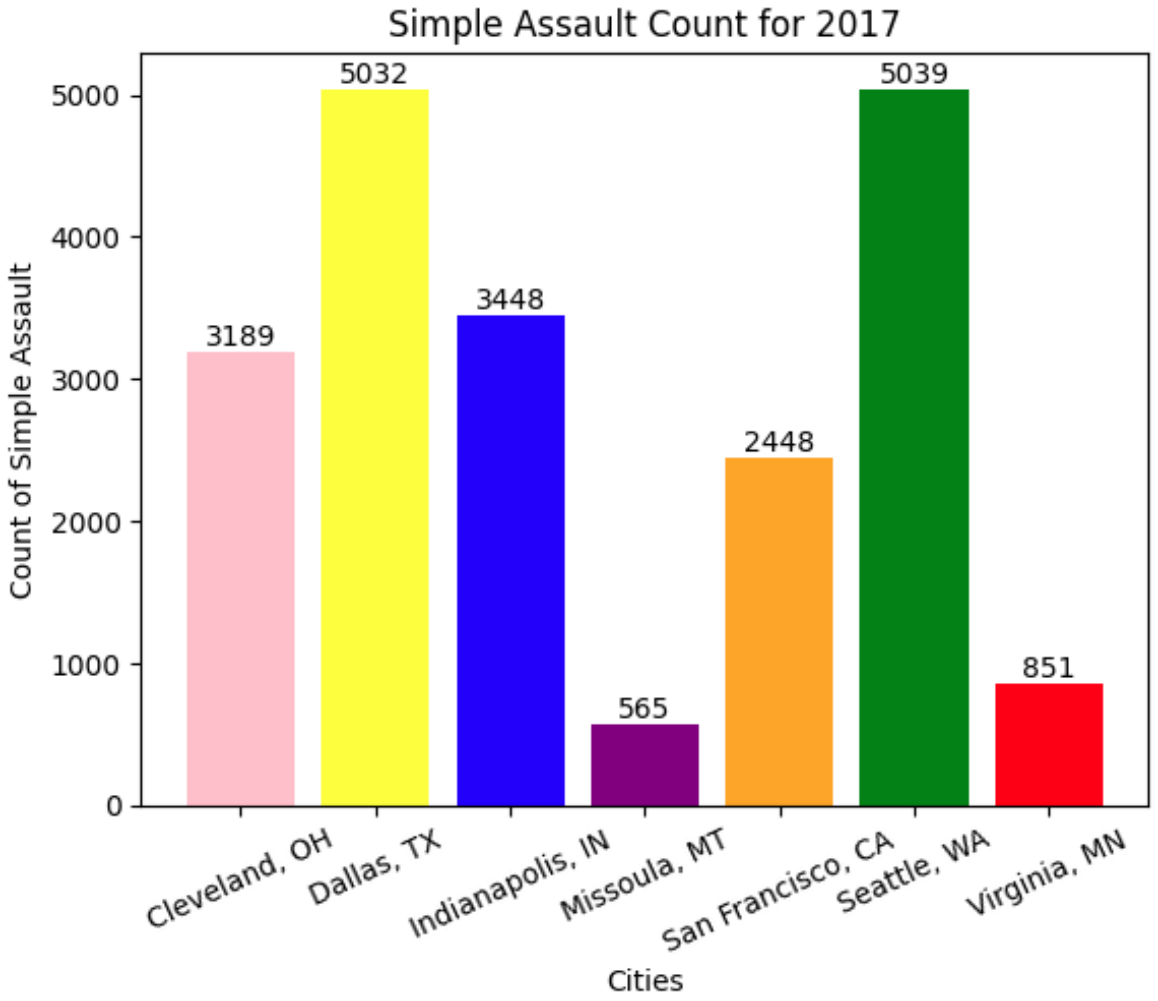
- Null Hypothesis: There is not a correlation between crime rates for the years 2017 and 2020.
- Alternative Hypothesis: There is a positive or negative correlation between crime rates for the years 2017 and 2020.

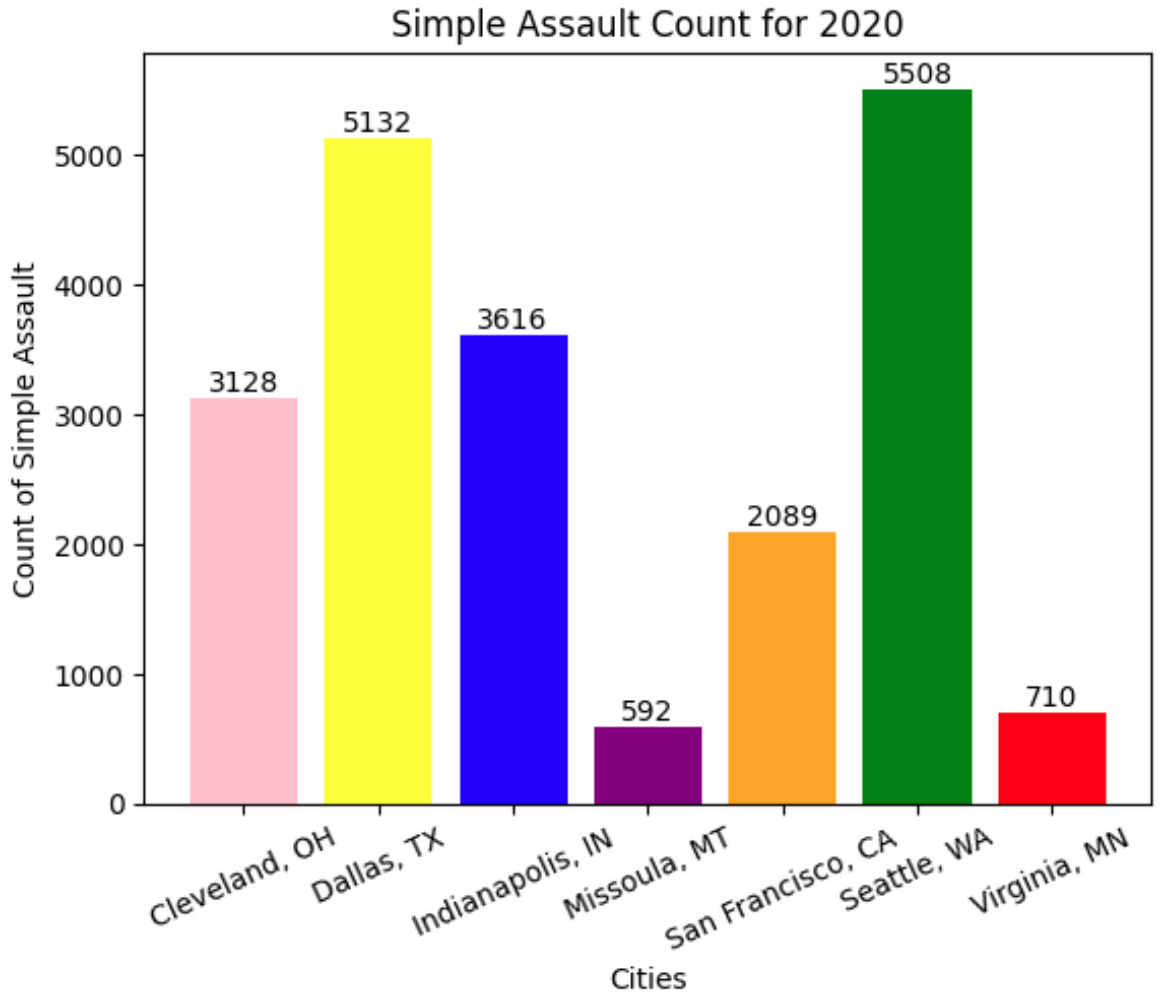
Total Population



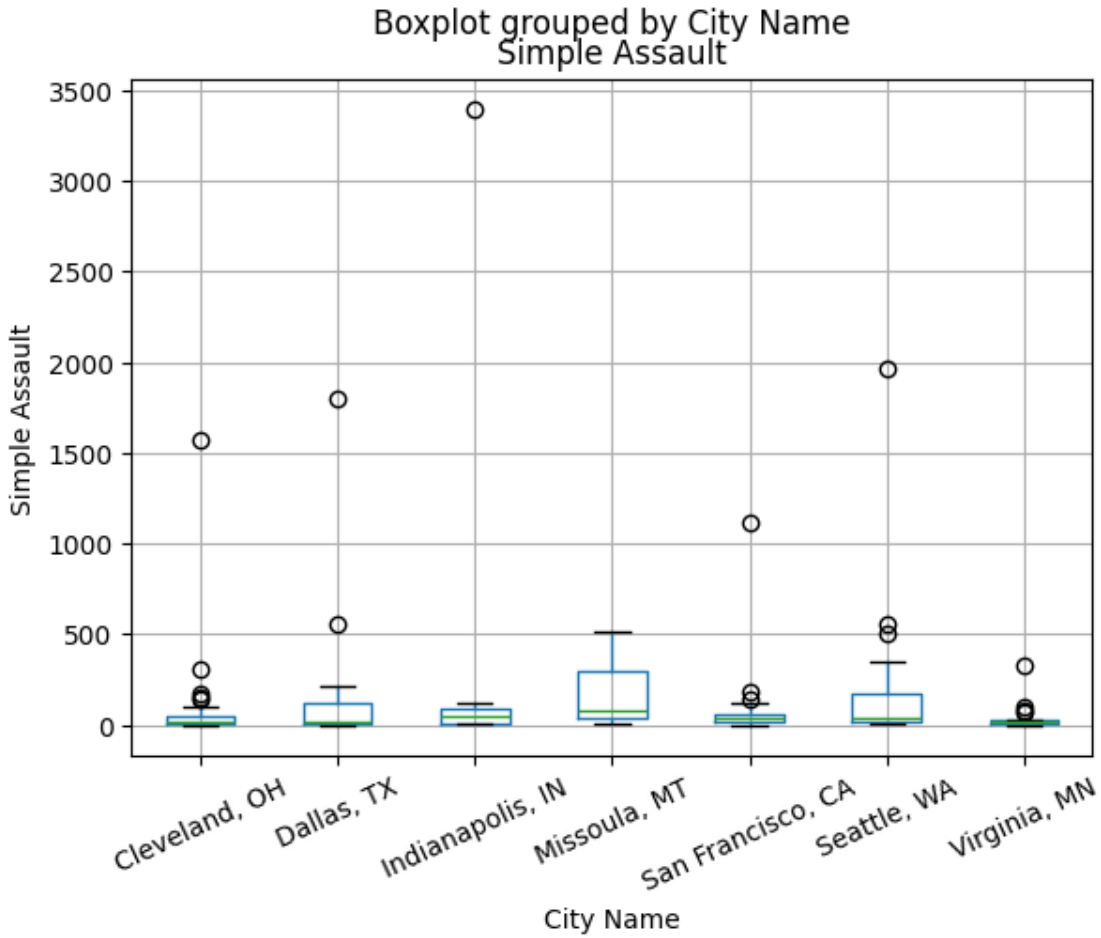


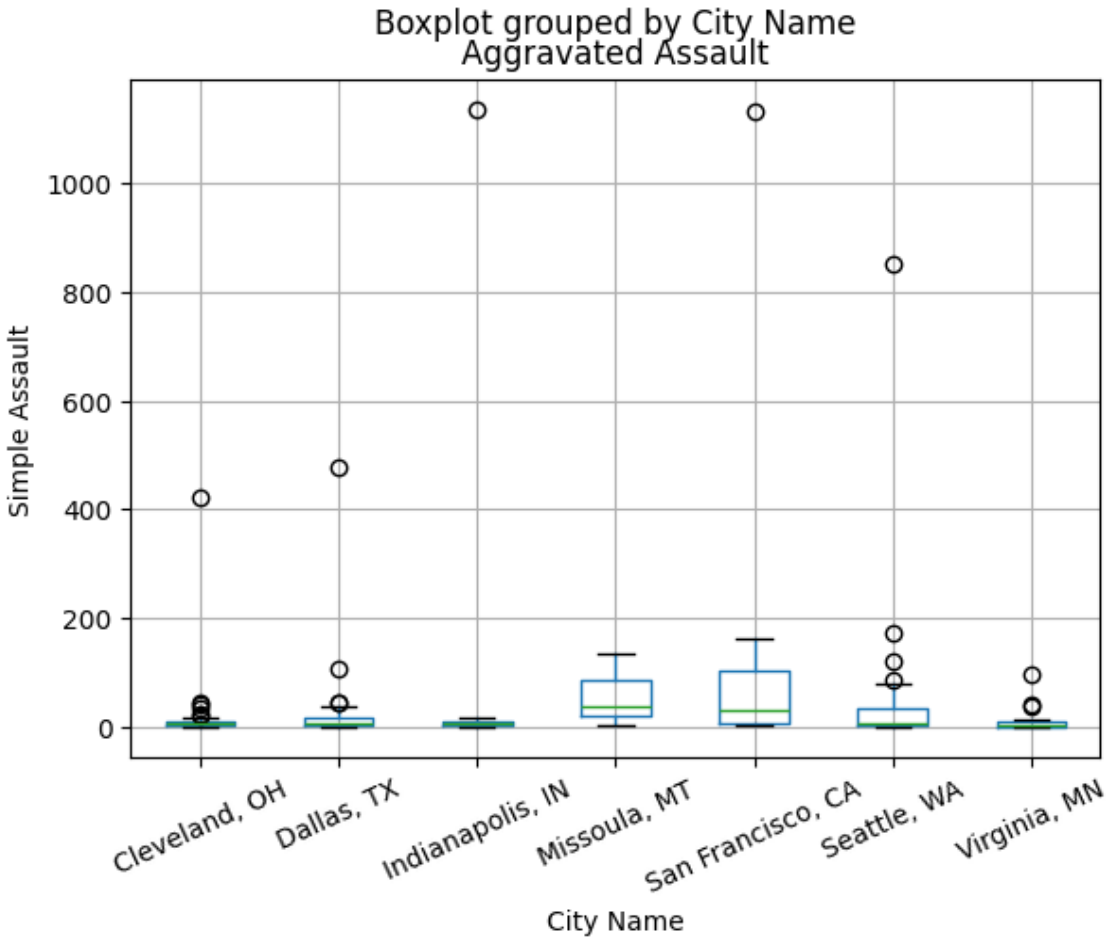
Simple Assault Graphs for 2017 and 2020





Looking at potential outliers for simple and aggravated assault





	Simple Assault	Aggravated Assault	Robbery	Murder	Manslaughter	Agency	Year	City Name
0	1230	1570	360	38	1	CA0380100	2017	San Francisco, CA
1	3	0	1	0	0	CA0380300	2017	San Francisco, CA
2	70	12	8	0	0	CA0380500	2017	San Francisco, CA
3	36	8	0	0	0	CA0389700	2017	San Francisco, CA
4	138	125	25	1	0	CA0410000	2017	San Francisco, CA
...	...	...	...	...	...	...	...	...
162	6	0	0	0	0	IN0490400	2017	Indianapolis, IN
164	3304	2194	749	70	4	INIPD0000	2017	Indianapolis, IN
165	65	32	0	0	0	MT0320000	2017	Missoula, MT
166	492	60	8	2	0	MT0320100	2017	Missoula, MT
167	8	1	0	0	0	MT0320300	2017	Missoula, MT

	Simple Assault	Aggravated Assault	Robbery	Murder	Manslaughter	Year	City Name
0	1111	1132	249	34	2	2020	San Francisco, CA
4	141	156	23	1	0	2020	San Francisco, CA
10	104	161	43	0	0	2020	San Francisco, CA
13	41	56	4	0	0	2020	San Francisco, CA
14	116	135	19	0	0	2020	San Francisco, CA
15	57	64	10	0	0	2020	San Francisco, CA
16	179	107	29	4	1	2020	San Francisco, CA
17	61	117	25	0	0	2020	San Francisco, CA
21	44	84	4	1	0	2020	San Francisco, CA
25	328	97	19	0	0	2020	Virginia, MN
39	501	173	30	5	1	2020	Seattle, WA
40	349	78	37	2	0	2020	Seattle, WA
43	554	86	59	3	0	2020	Seattle, WA
49	324	70	27	1	0	2020	Seattle, WA
63	298	120	54	3	1	2020	Seattle, WA
66	213	60	17	2	0	2020	Seattle, WA
73	1962	851	317	17	1	2020	Seattle, WA
117	1571	423	107	20	0	2020	Cleveland, OH
127	551	105	32	3	0	2020	Dallas, TX
141	1802	477	57	9	3	2020	Dallas, TX
179	3391	1135	400	59	7	2020	Indianapolis, IN
181	514	132	20	3	0	2020	Missoula, MT

Geospatial Info for St. Louis County MN

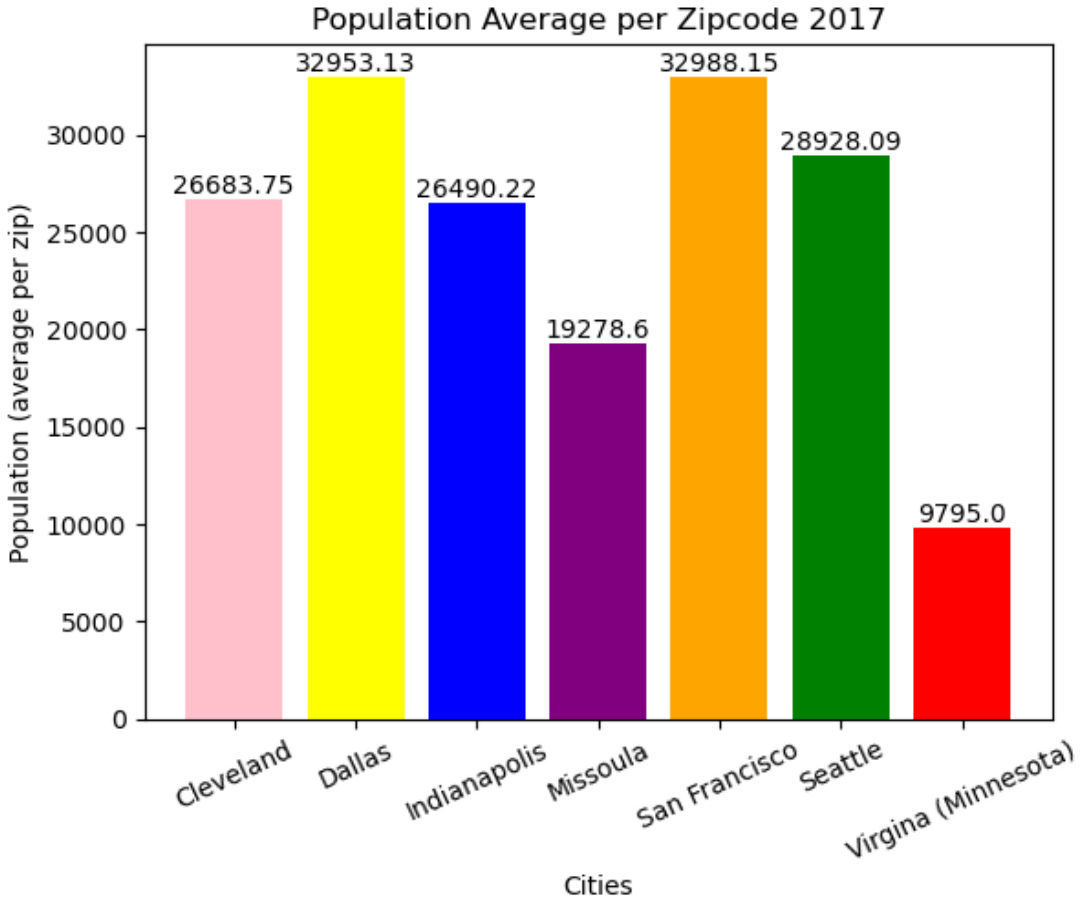
Statistical Analysis Summary

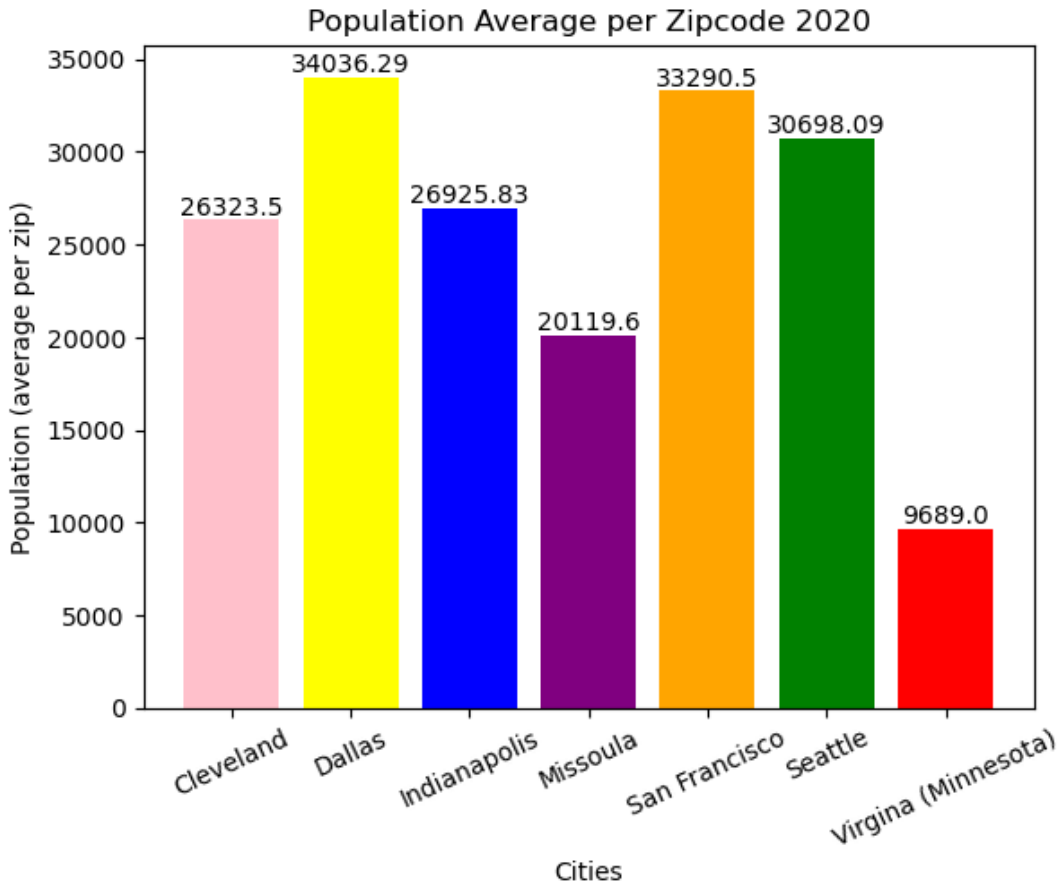
Null Hypothesis: There is not a correlation between crime rates for the years 2017 and 2020.

- T-test results suggest that there is a significant difference between the mean number of manslaughter cases in 2017 and 2020.
- The results also suggest that all listed crimes were more common in 2020 with the exception of manslaughter this is shown by its negative t-value.

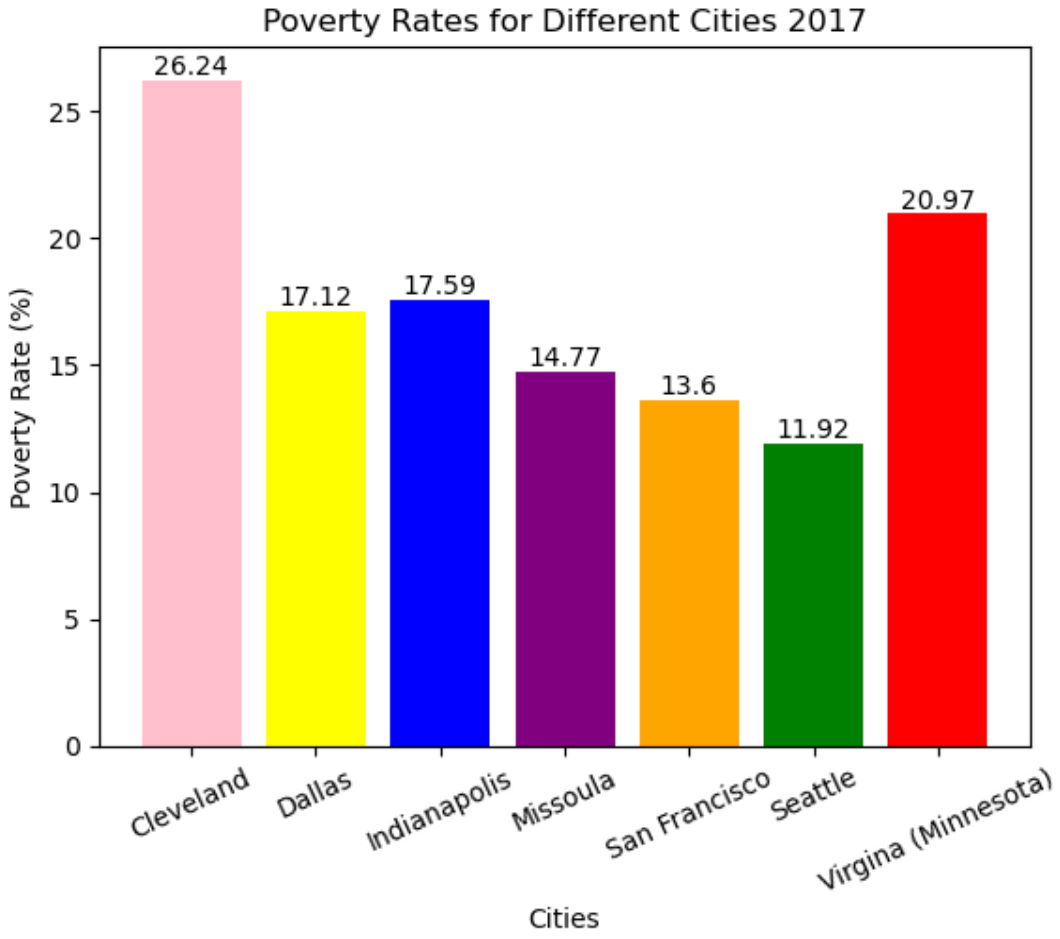
```
T-test resuls for simple assault in 2017 and 2020 include TtestResult(statistic=0.3673383541517043, pvalue=0.7138709618251482, df=154)
T-test resuls for aggravated assault in 2017 and 2020 include TtestResult(statistic=0.6236669670510698, pvalue=0.5337689882162937, df=154)
T-test resuls for robbery in 2017 and 2020 include TtestResult(statistic=0.8271378969434836, pvalue=0.4094387170996685, df=154)
T-test resuls for murder in 2017 and 2020 include TtestResult(statistic=0.43758429604037385, pvalue=0.6623007303287021, df=154)
T-test resuls for manslaughter in 2017 and 2020 include TtestResult(statistic=-1.9946155618253274, pvalue=0.047849517019395035, df=154)
```

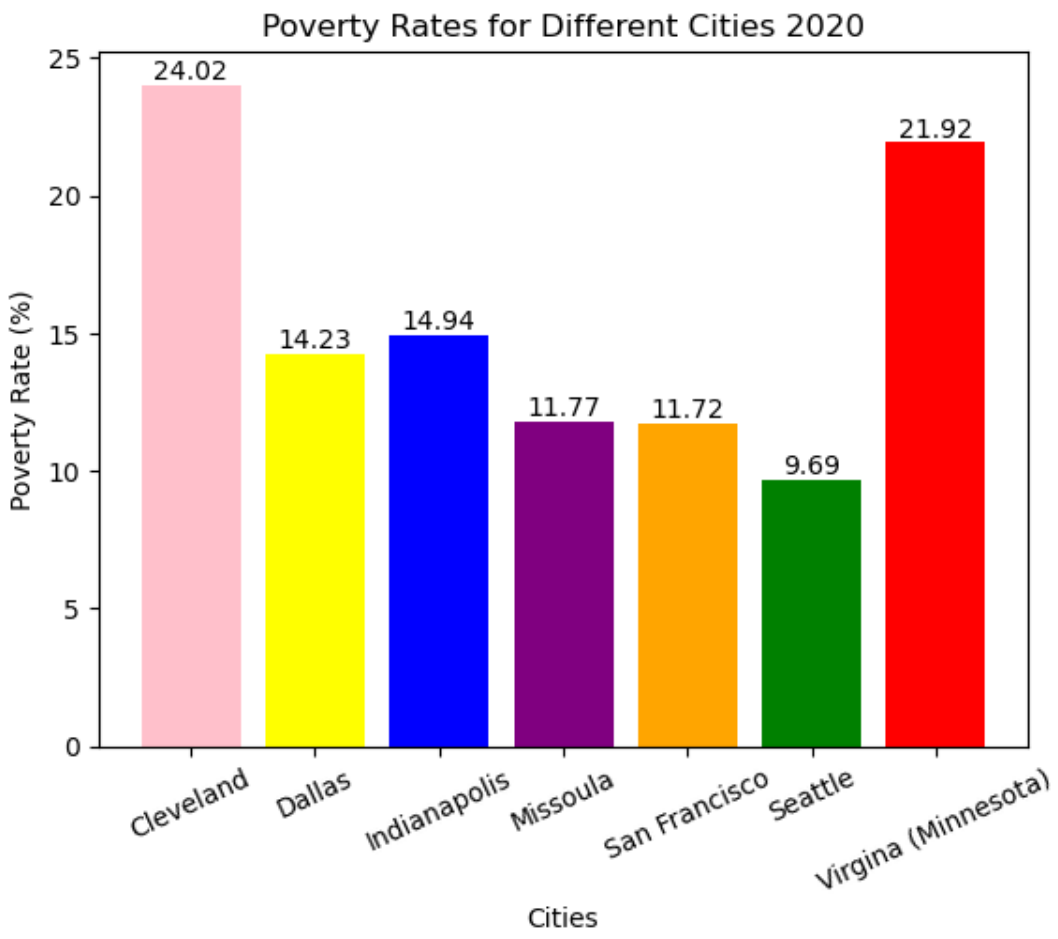
Average population per Zip code for 2017 and 2020





Poverty Rates for 2017 and 2020





Overall Poverty Rates (2017 & 2020)

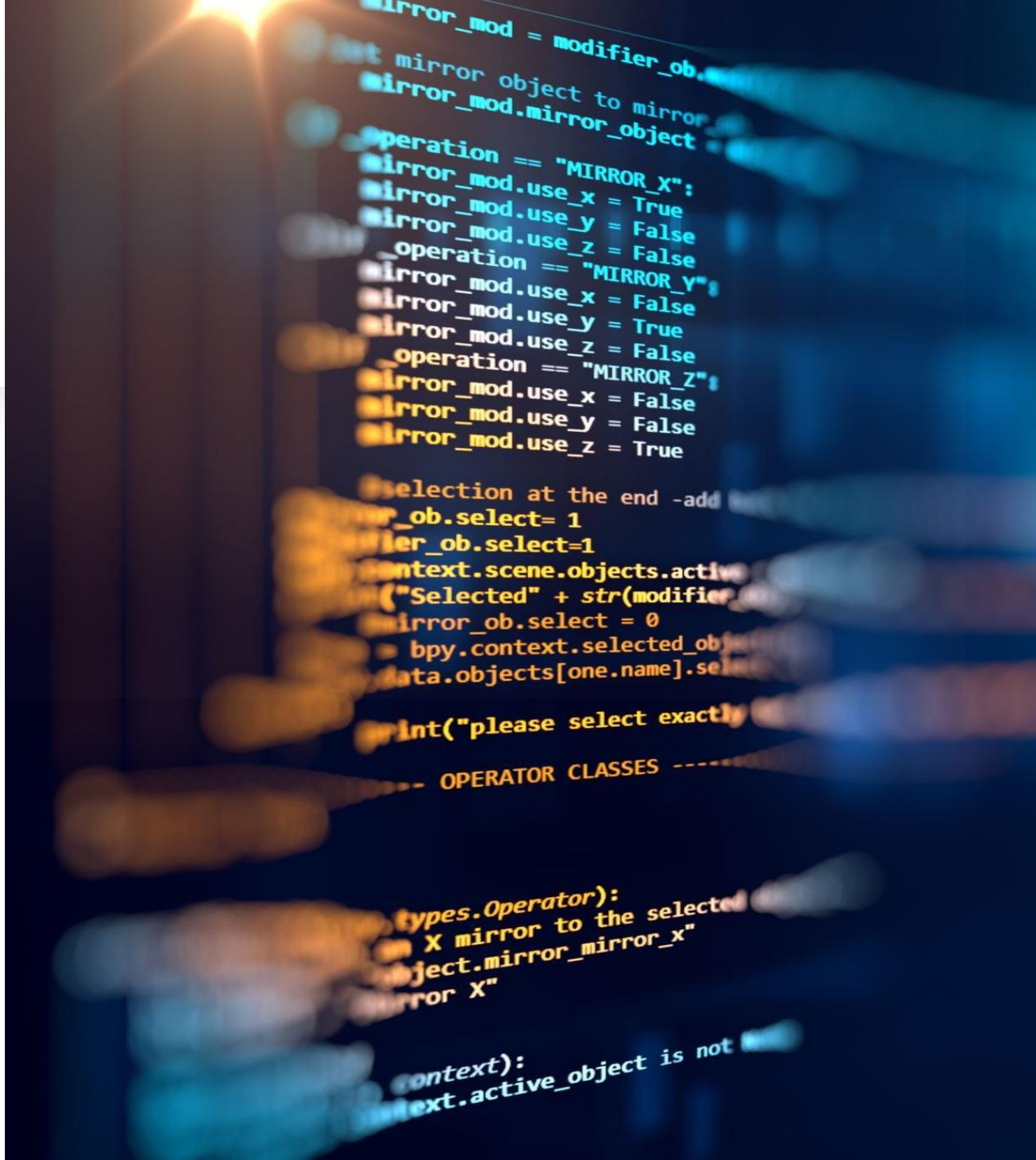
Data Frames Used

- Crime Data:

https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/explorer/crime/crime-trend

Census Data (same one we used in class!):

https://www.census.gov/data/developers/guidance/api-user-guide.html



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