



Cool Pandas Group

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Project Background

CPG Consulting will look at crime data and compare it to the Census data to find correlations and answer questions.

CPG was hired as the consulting group to help the US government look into the crime rate in the US and look for correlations with Census demographics. Looking at crime data from the FBI and the Census Bureau data from 2019, CPG Consulting will look for relationships between crime rate and other factors such as household income, average age, level of education, unemployment rates, and other economic indicators.

These findings will be put into a final report with visualizations to aid the government in assessing what they can do to potentially lower crime rates.



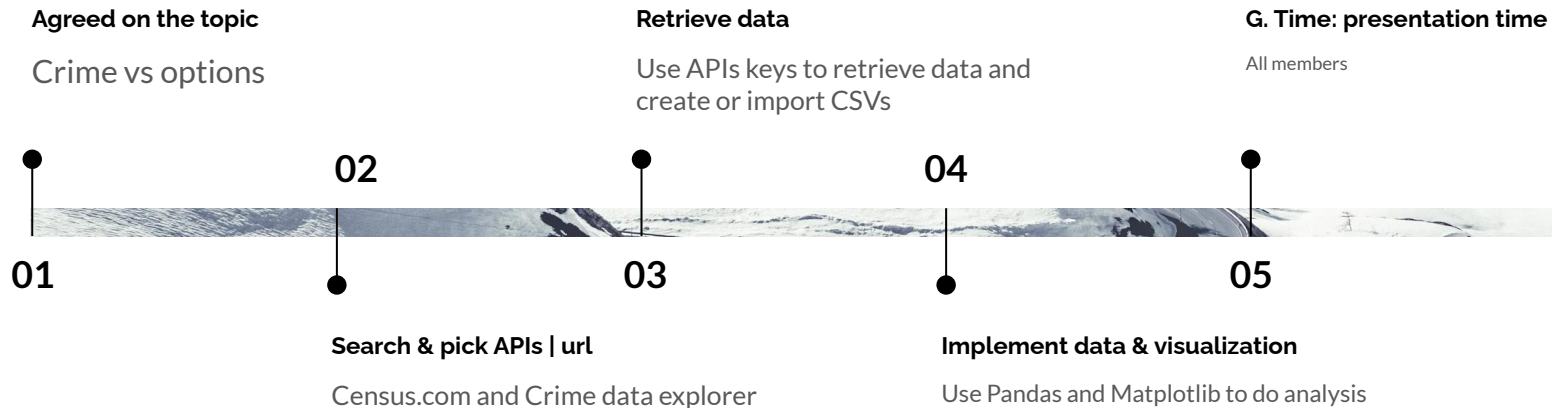


Research questions to answer

1. Look for correlation between crime rate and poverty rate
2. Compare crime rate to level of education
3. Find relationship between crime rate and unemployment
4. Compare crime rate to concentration of veterans
5. Look for correlation between crime rate and average age



Project Roadmap



Sources of Datasets

1. FBI Crime Data (source: <https://crime-data-explorer.fr.cloud.gov/pages/docApi>)
2. United States Census Bureau data (source: <https://www.census.gov/data/developers/data-sets.html>)
3. College completion rates (source: <https://data.world/databeats/college-completion>)



1. Crime Rate & Poverty Rate analysis

Definitions

Violent Crime

Violent crime is composed of four offenses: homicide (murder and nonnegligent manslaughter), rape, robbery, and aggravated assault. Violent crimes involve force or threat of force.

Property Crime

In a property crime, a victim's property is stolen or destroyed, without the use or threat of force against the victim. Property crimes include burglary and theft as well as vandalism and arson.

Crime Count

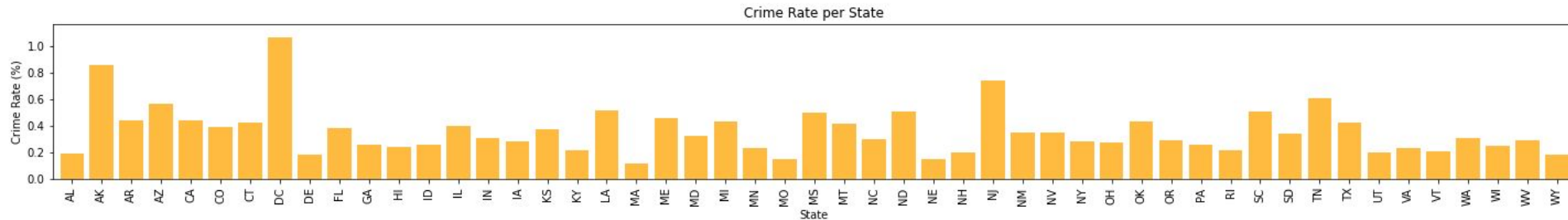
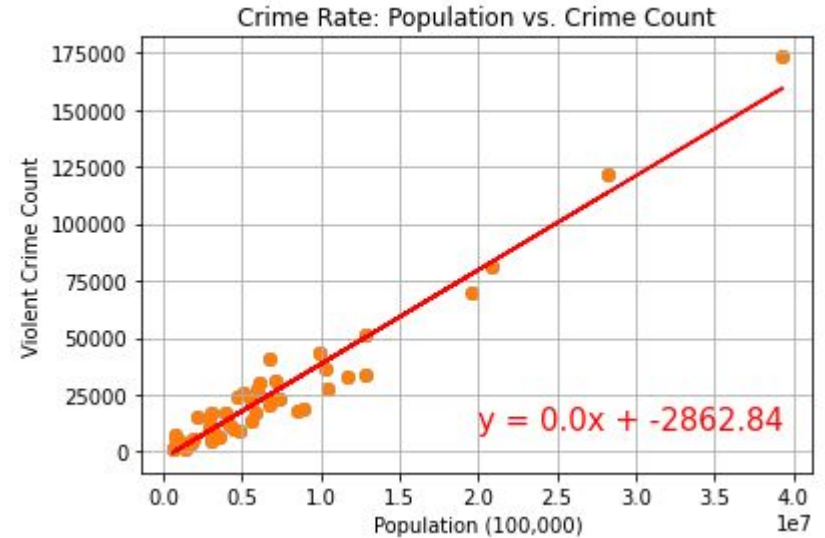
This data reflects the hierarchy rule, which requires that only the most serious offense in a case be counted. The descending order of violent crimes are homicide, rape, robbery, and aggravated assault, followed by the property crimes of burglary, larceny-theft, and motor vehicle theft. Although arson is also a property crime, the hierarchy rule does not apply to it. In cases in which an arson occurs in conjunction with another violent or property crime, both crimes are reported.

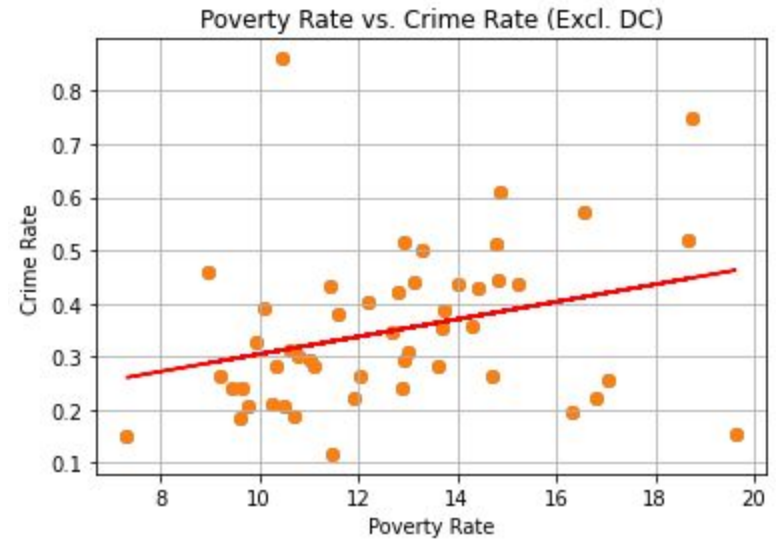
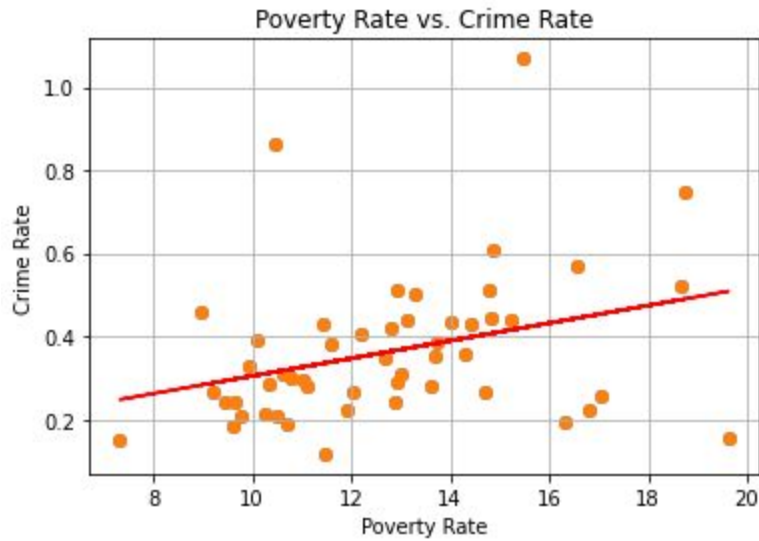
Poverty

Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then every individual in that family is considered in poverty. The official poverty thresholds do not vary geographically. The official poverty definition uses money income before taxes and does not include capital gains or noncash benefits.

Crime rate

The crime count is directly correlated to the population of an area. The **Crime Rate** is a percentage calculated by the total crime count of a state over the population of the state.





Removing the outlier, Washington D.C., there is not much change in the comparison between **poverty rate** and **crime rate** for each state.

Poverty vs Crime rate, r-value is: 0.3247255888412339

Excl. DC, the r-value is: 0.30040947950587876

2. Crime rate & Education completion



Definitions

Violent Crime

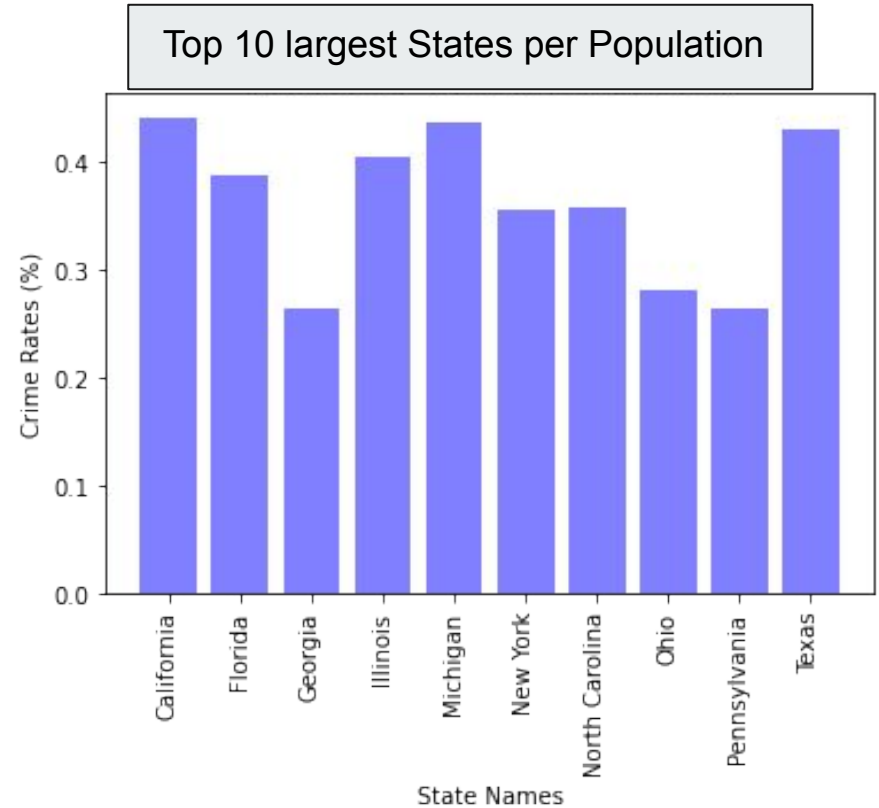
Crime Rate

College Completion rate

From data.world we got the report of the 4-year-college-graduates for all State in 2019 that used for this analysis to find how close the relationship between the Crime and the 4-year-college completion in the **10 largest (per population) States**.

The crime rate in 2019 per top 10 biggest States in the US

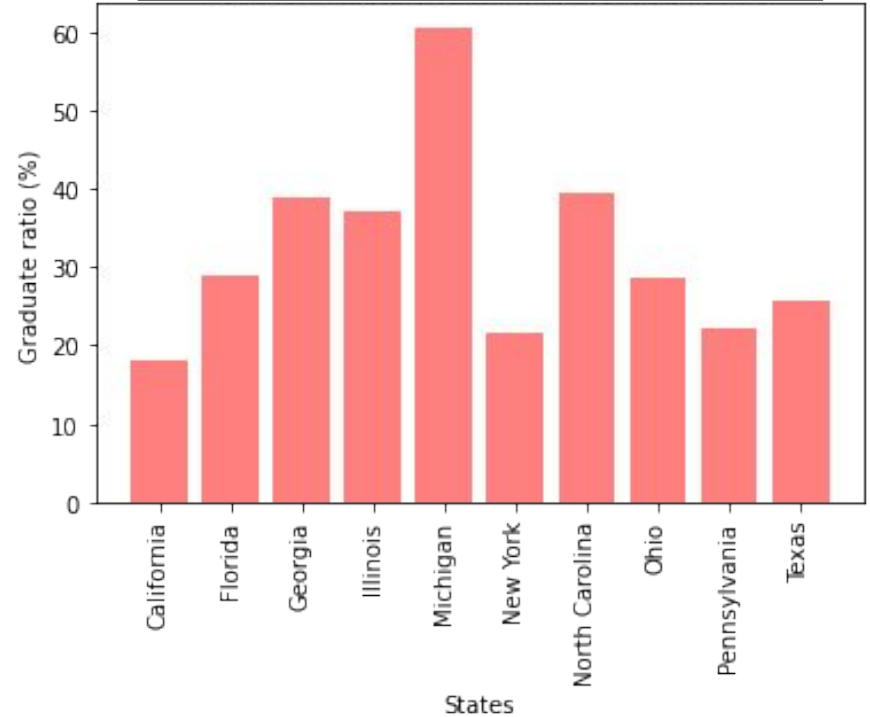
- The State with highest Crime rate is California :(
- The lowest Crimes “prize” is belong to Georgia

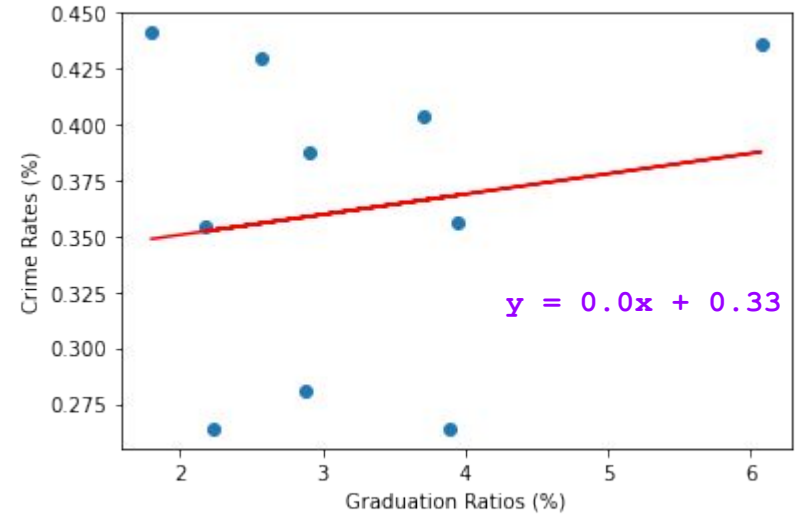
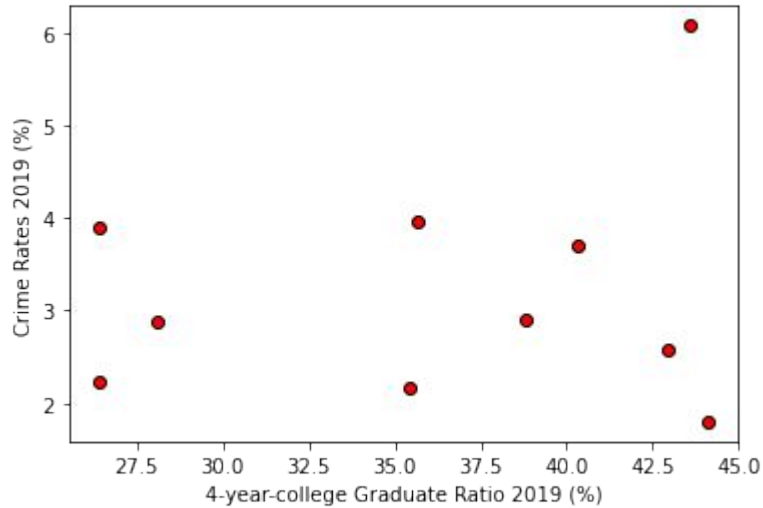


The College Completion ratio in Top 10 biggest States in the US

- The state with highest College Completion ratio is Michigan
- The lowest ratio in College Completion is California :(

Top 10 largest States per Population





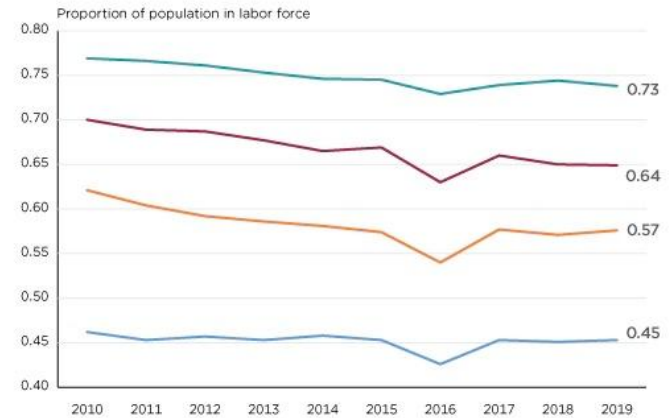
- The scatter plots to represent the relationship between the Crime and the College Completion ratio
- The correlation between the two factors: the pearson index between the Crimes and the College Completion ratio is **0.16** which shows the relationship between those two factors is **not much closed** to each other than common thoughts.

- This graph would explain more about the not-much-closed relationship between Crimes and College Completion factors ; People without College degrees are still able to participate in the Labor Force in the US
- That's mean, the unemployment ratio is not just depending on the College Graduates.
- In our next teammate presentation would show you the another factor: Unemployment that should be the closer relationship with Crime.

Labor Force Participation by Level of Education Among Population Age 25 and Older



— Not a high school graduate — Some college or associate degree
— High school graduate or equivalent — Bachelor's degree or higher



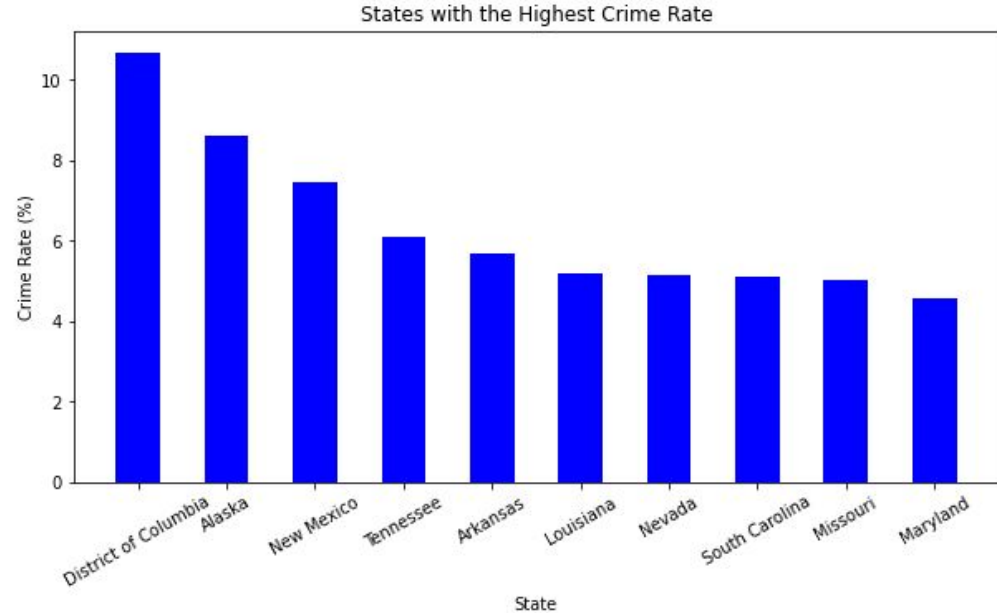
3. Crime rate & Unemployment



Top 5 Most Common Crimes

- Larceny / Theft
- Breaking and entering
- Motor Vehicle Theft
- Aggravated Assault
- Robbery

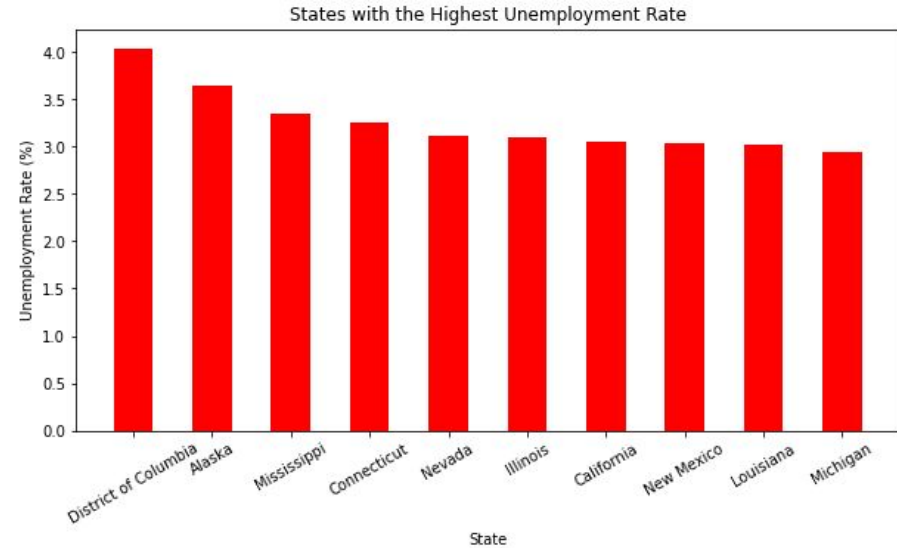
Top 10 (2019)



Causes of Unemployment

- Demographic Factors
- Technological Advancement
- Globalization and Sourcing
- International Trade Policy
- World Health

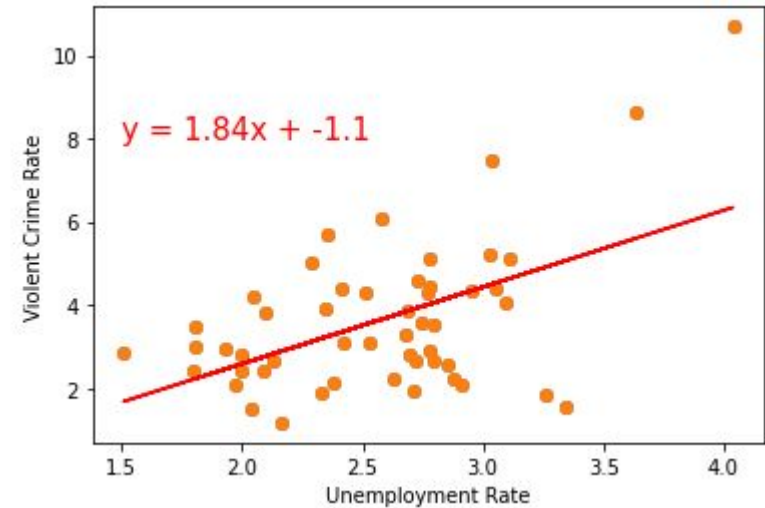
Top 10 (2019)



Positive correlation between crime and unemployment rate

There is a moderate correlation between crime rate and unemployment (0.52)

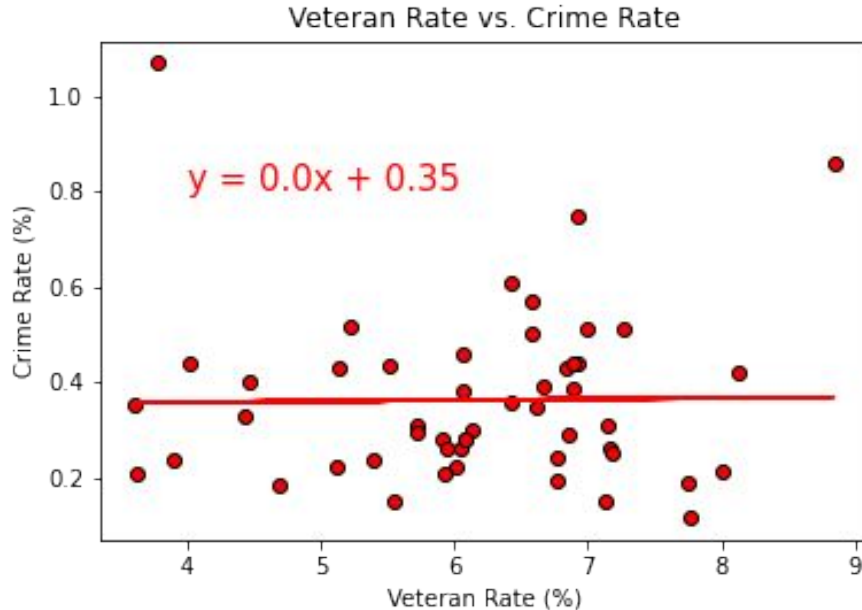
"Idle hands are the devil's workshop"



5. Crime rate & Veteran rate



Veterans and Violent Crime: Do they have any relation?



The resounding answer? No.

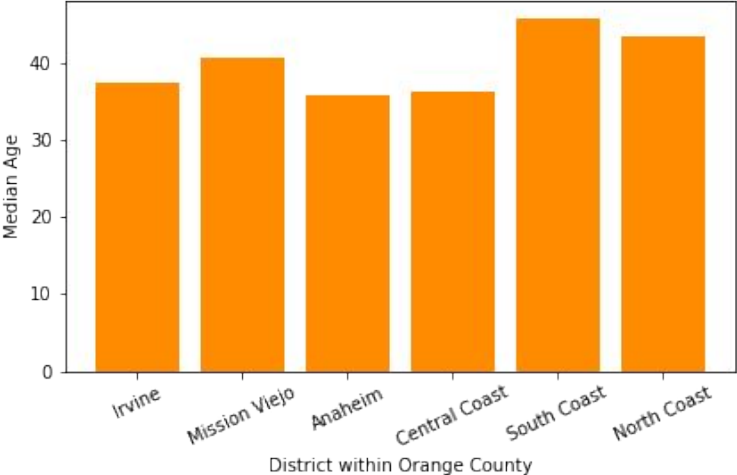
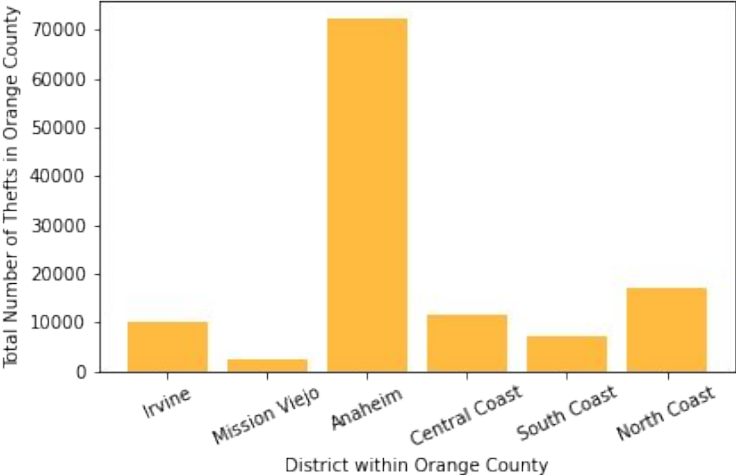
The r-squared is: 0.00021974765873770133

No significant correlation between rate of Veterans in the population and rate of crime committed by population

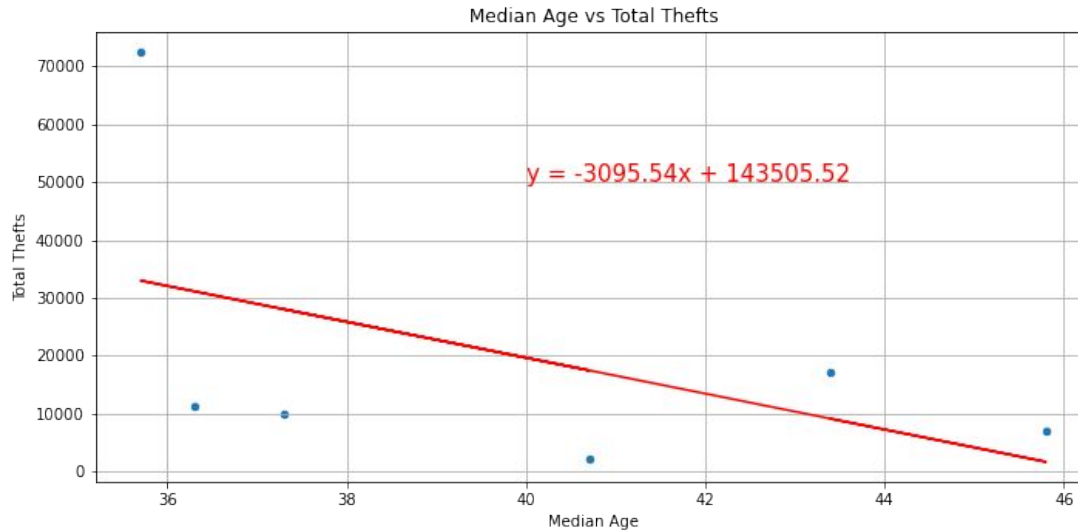
4. Crime rate & Average age



Total Number of Thefts and Median Age in Districts within Orange County



Total Number of Thefts and Median Age in Districts within Orange County



The correlation between median age and theft counts is -0.49.

This shows that there is no correlation between median age and theft crimes.

Overall Conclusion & Recommendations

- There is not a strong correlation between Census demographics and a state's crime rate. There is a moderate correlation between a state's unemployment rate and crime rate.
- Solution: create more job | lower the unemployment rate



Thank you.

