



UNCC x EdX Data Analytics Bootcamp

North Carolina Crime Data Investigation

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Project Overview

Research on all available Violent Crimes data from all agencies in NC from 2013 – 2022 using the FBI's Crime Data Explorer(CDE). This web service allows agencies across the United States to report data using either the Summary Reporting System or the National Incident Based Reporting System.

why did we choose this data?

Many of us are either directly or indirectly affected by crime, regardless of where we live. Not only can we be victimized, but we are affected by the laws that are created as a result of crime rates. It is important for us to be aware of the prevalence of crime in our communities.

Technology Used

- Python
- GitHub: for version control and collaboration
- FBI Crime Data API
- Libraries and Modules:
 - Requests: to make HTTP requests from API
 - NumPy: for numerical calculations
 - JSON: handles JSON formatted datasets
 - PPrint: pretty-prints data structures
- Integrated Development Environment(IDE):
 - Jupyter Notebook: for writing, testing, and debugging.

Cleaning Process

- Imported libraries
- Defined url
- Redefined url using agency, state, and api key
- Requested all agency data and created a DF
- Captured all ORIs into a list
- Requested violent crimes data for all ORIs and created a DF
- Merge the DFs (agency & crime)
- Saved merged DF in output folder as CSV

Data Source

- We are using 2 API-derived datasets for this project(from <https://api.usa.gov/crime/fbi/cde/>):
- All data available for all agencies across NC (for 10 years)
- Violent Crimes data using the Originating Agency Identifier (ORI) number

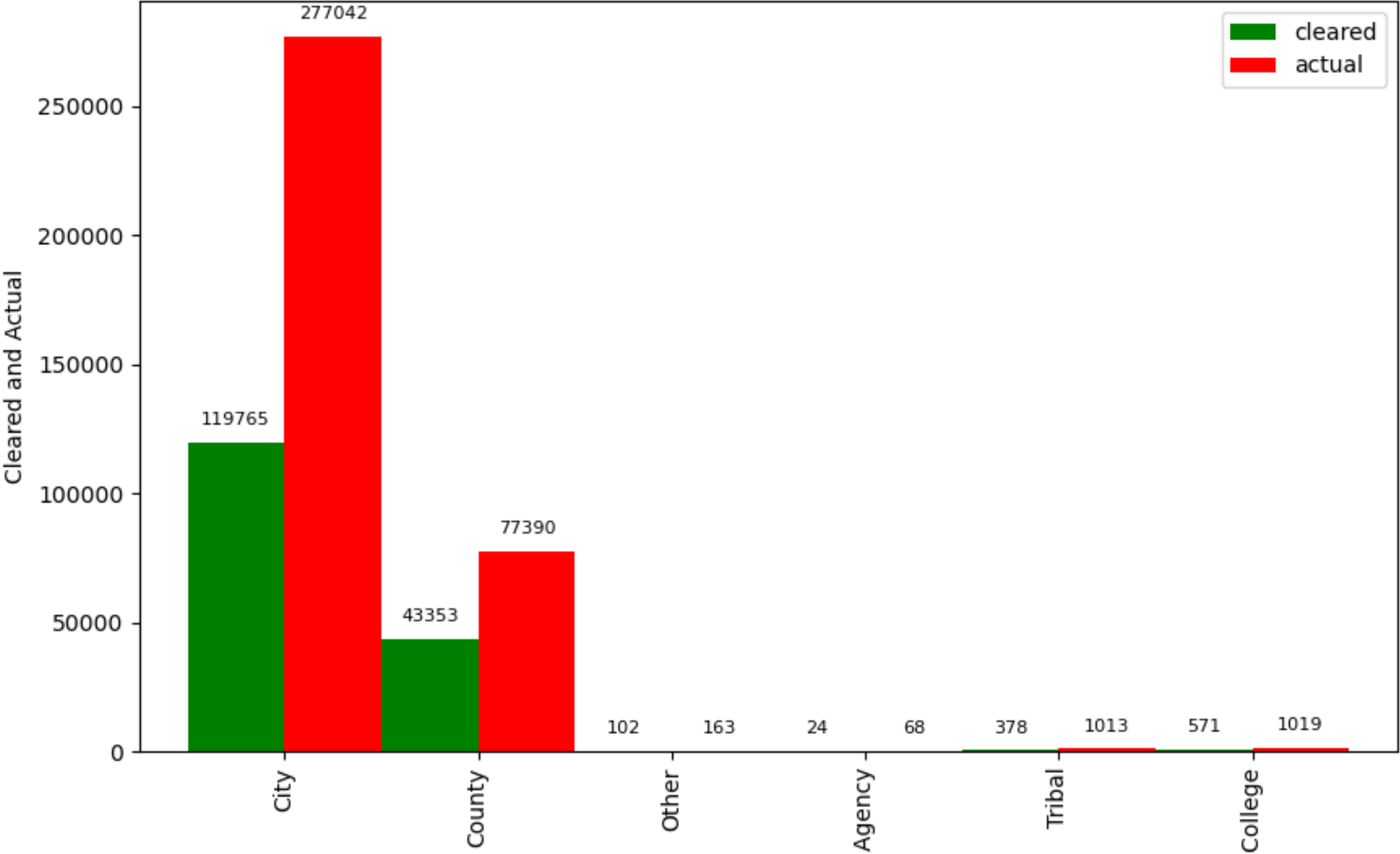
Cleared v. Actual Violent Crimes by Agency

Bar graph showing the total violent crimes actual vs cleared based on agency type.

City agencies account for ~ 77% of violent crimes committed and ~ 73% of all solved



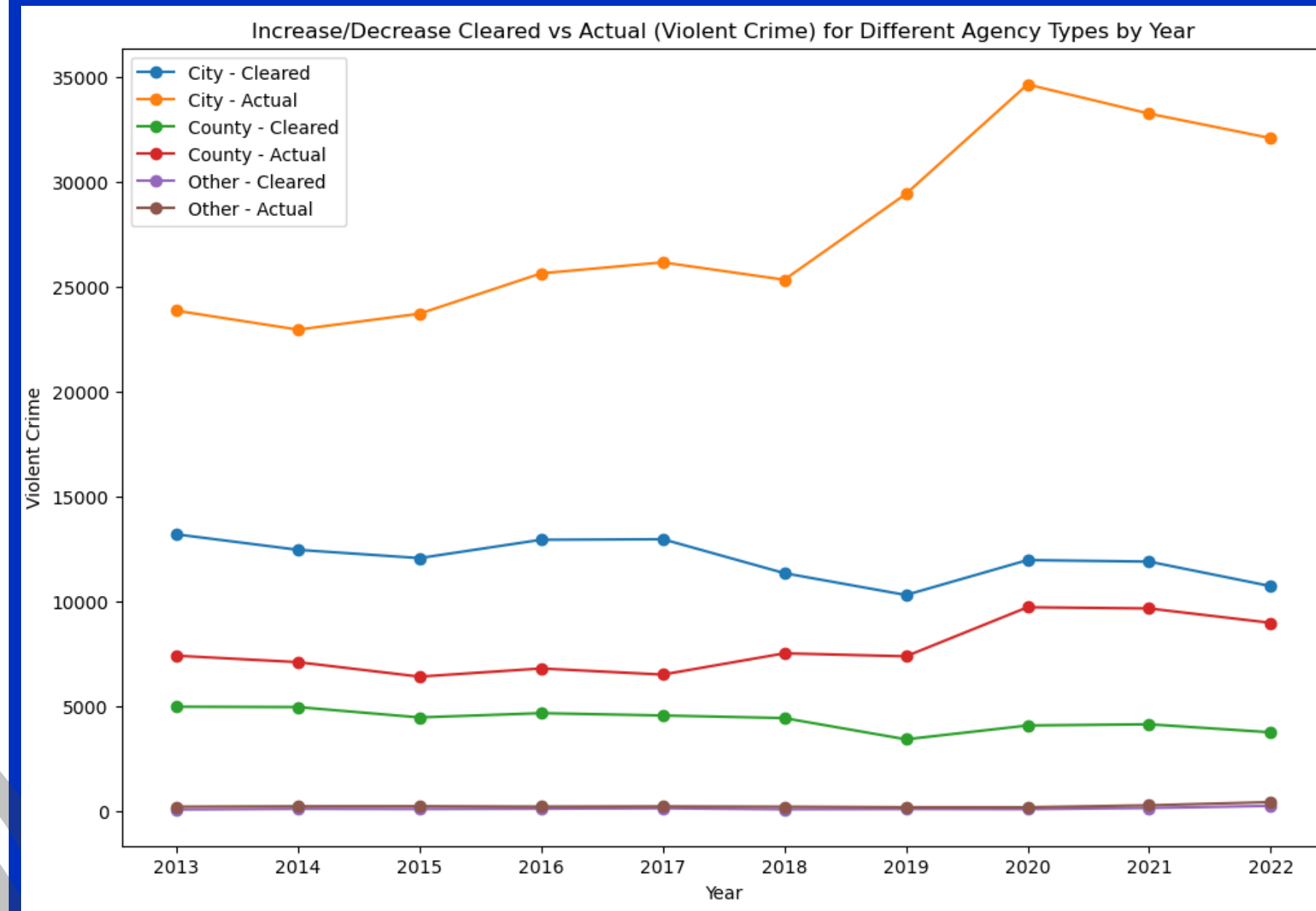
Violent Crime Total: Actual vs Cleared for each agency type from the years 2013-2022



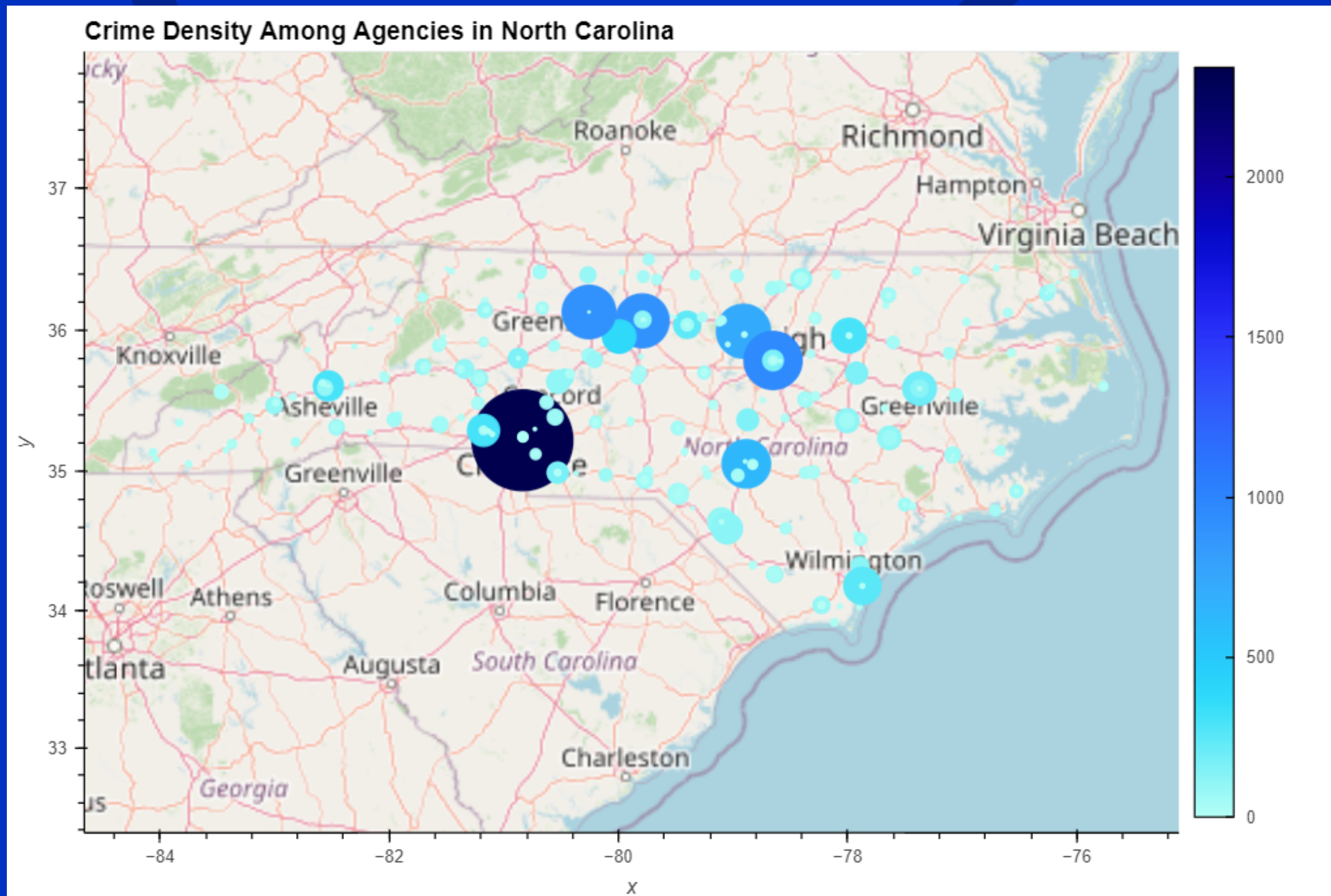
Cleared v. Actual Violent Crimes by Agency

Write a significant observation

- City, County and Other Violent Crime over 10 years.
- Large jump from 2019-2020
- City and County solved lines follow the same line



Crime Density Among Agencies in NC



This map shows all of the agencies in the state and their crime rates relative to each other in the form of colored markers. The larger and darker the marker, the more crime.

- The smaller the dot, the less crime there is.
- Agency with the largest marker and number of crimes: Charlotte-Mecklenburg Police Department

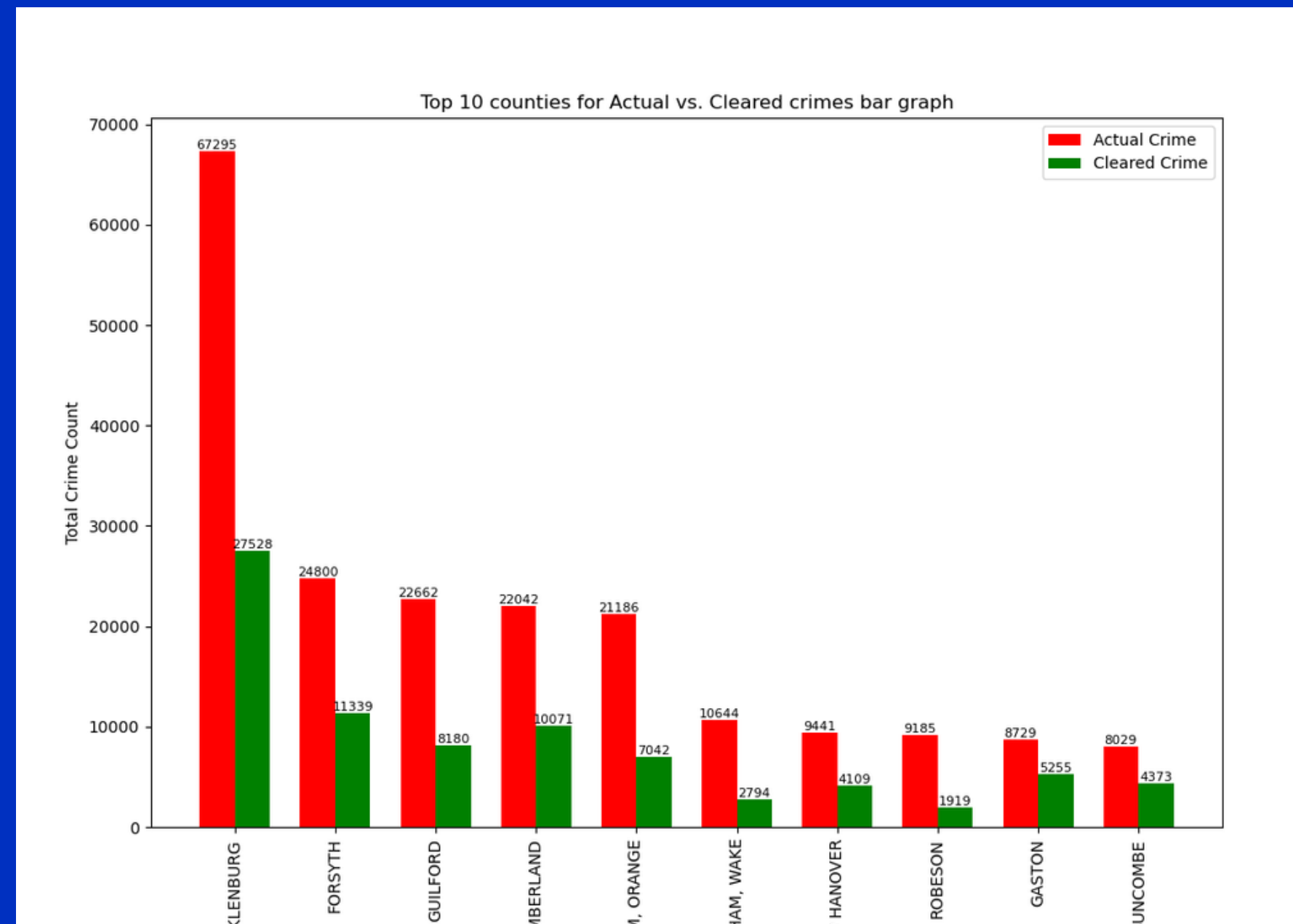
Top 10 Counties W/ the Highest Crime Rates

Observation 1:

It is seen that Mecklenburg county has the most crimes.

Observation 2:

Mecklenburg has highest number of cleared crimes as well but that is not even 50% (~41%) of the total crimes committed in Mecklenburg County

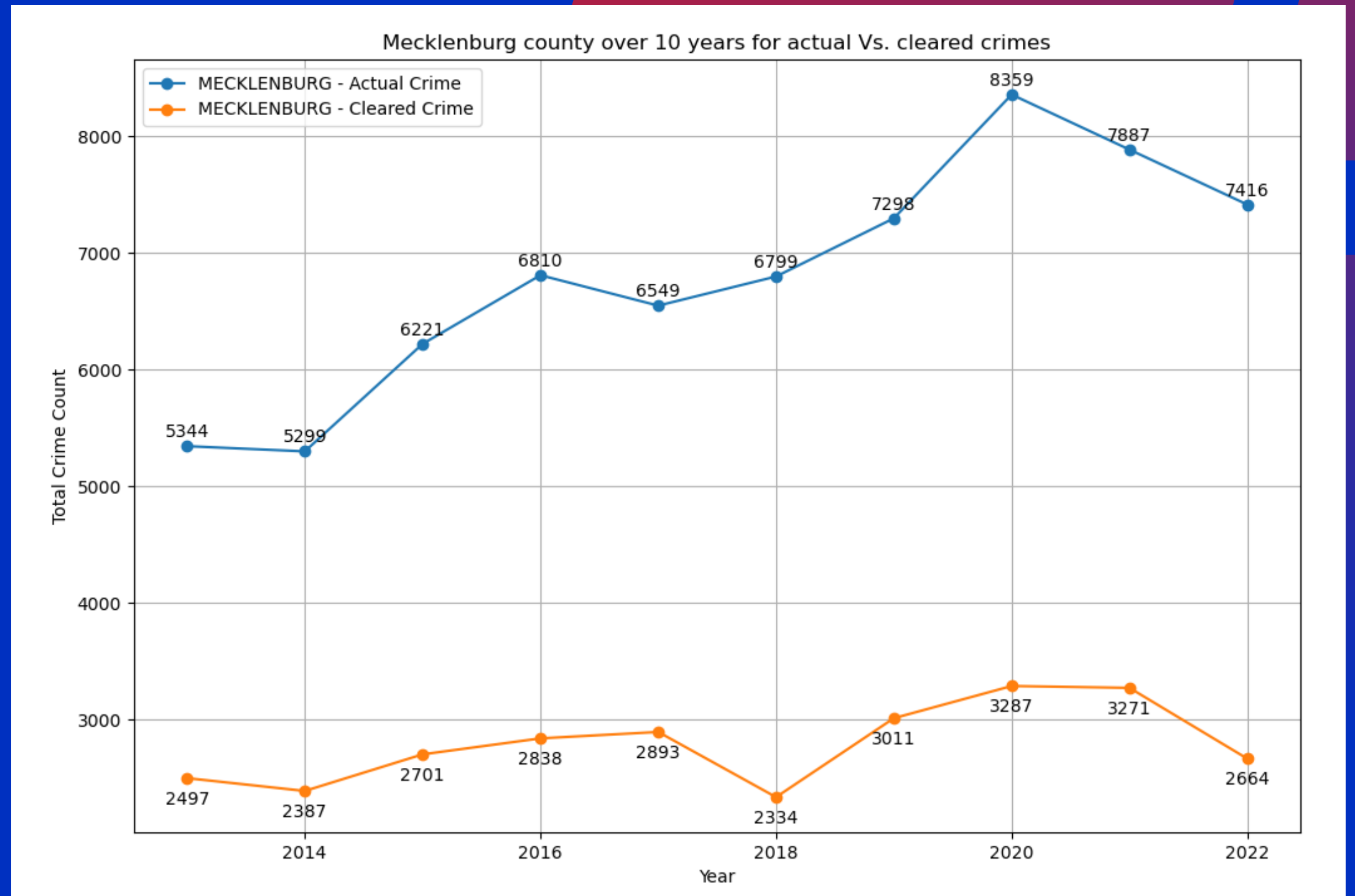


The #1 County for Highest Number of Violent Crimes Among 10 Years

Observation:

There is a steep increase in crimes from 2019 to 2020 during COVID-19, however cleared crime only increases by few numbers.

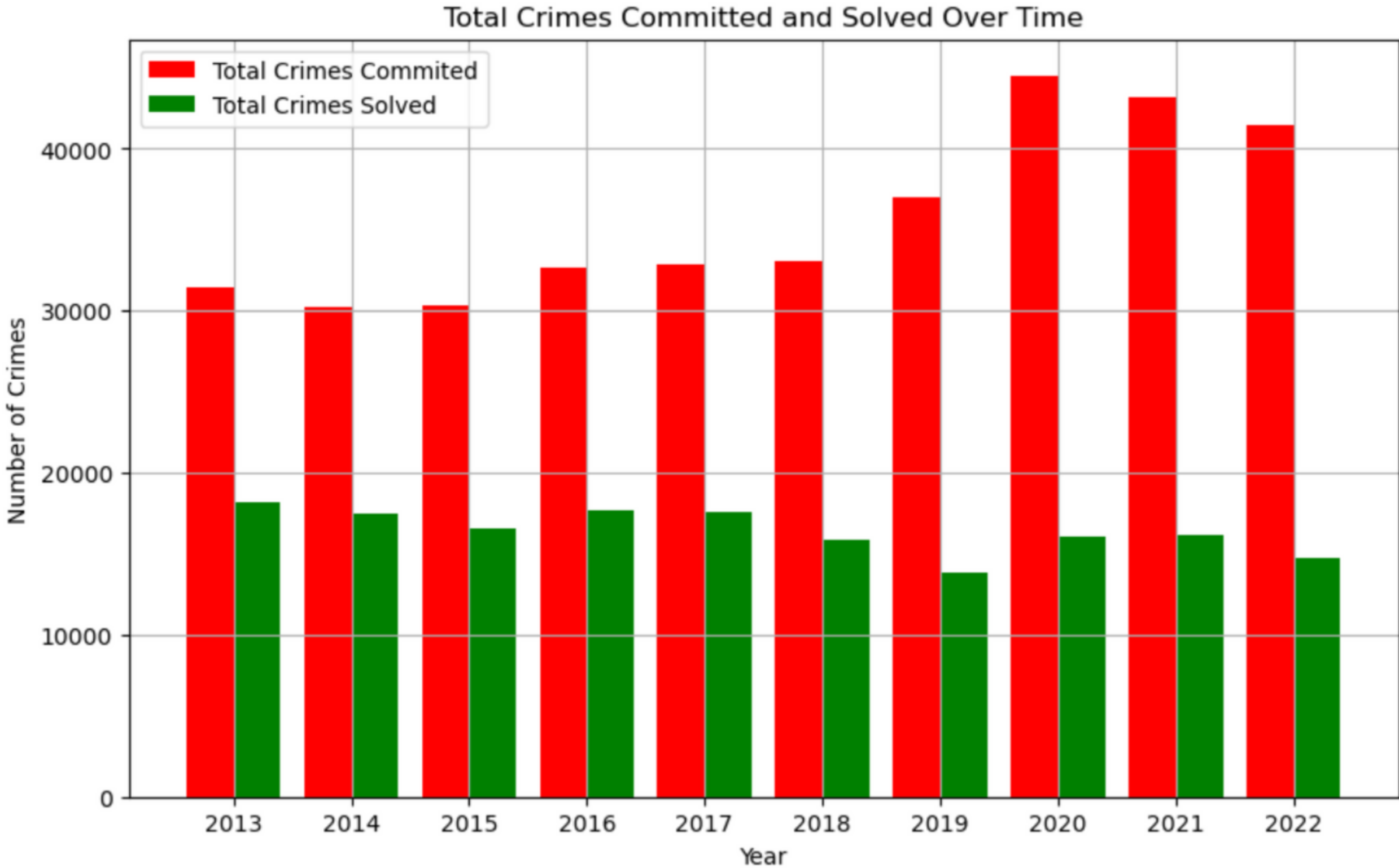
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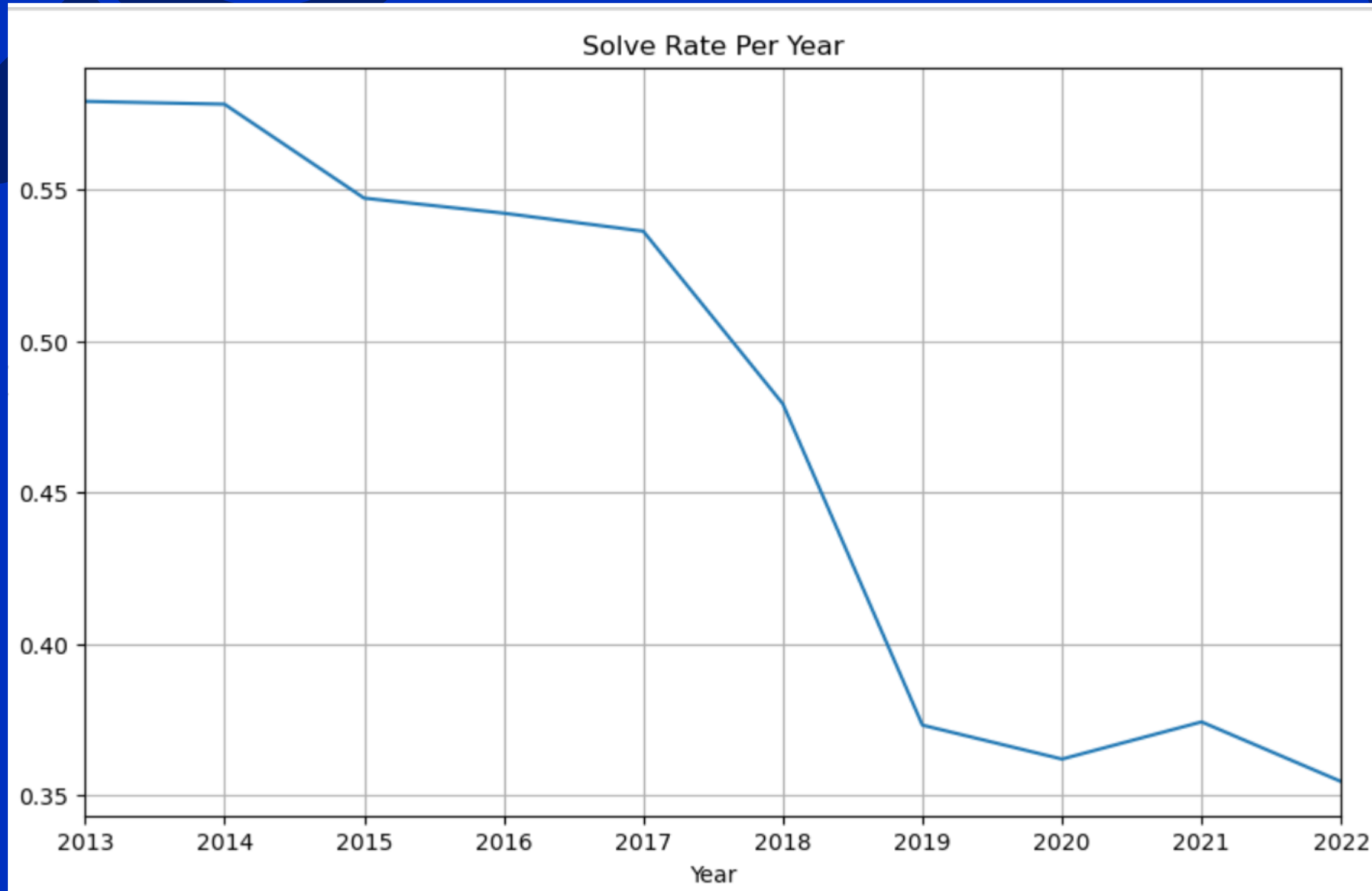
Total Crimes Committed and Solved over 10 years

Bar graph showing the total crimes committed and solved over the past 10 years.

- There is a flagrant increase of crime in from years 2018 to 2020.
- The rate of crimes solved is either stagnant or decreasing.



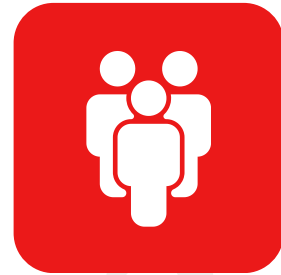
North Carolina Violent Crime Solve Rate Over the Years



Crimes solved rate per year

- Considerably decreasing over the years from a little over 55% to almost 35%.

Conclusions



Violent Crimes x Agency Type

We can see that "City" agencies account for ~ 77% of violent crimes committed and ~ 73% of all solved. We can also see that "County" agencies have the second most number of actual and cleared crimes



Mecklenburg County Actual V. Cleared

There is a steep increase in crimes from 2019 to 2020 when it was COVID time, however cleared crime totals only increased a small amount relative to the normal cleared rate for Mecklenburg County.



Crime Density in NC

We observe that Agency with the largest marker and number of crimes is the Charlotte-Mecklenburg Police Department. The runner-ups are in order: Raleigh, Durham, Greensboro, Winston-Salem, Fayetteville



Crimes Committed and Solved Over Time

We can see that crime has steadily increased over the years 2013-2020. From 2020 to 2022, the actual crime counts have dropped.



Top 10 Crime-Ridden Counties

Mecklenburg County as a whole, has the most crime in NC over the 10 year period. The runner-ups are in order: Forsyth County, Guilford County, Cumberland County.



Crimes Solved Rate Over Time

We see here that the rate of crimes solved has significantly decreased over the 10-year period consistently.

Implications/Limitations

It is important for figures like statisticians, criminologists, policymakers, and other criminal justice professionals to study crime to anticipate increased risk of crime. This can be followed up by law enforcement intervention to prevent the predicted crimes from occurring or laws and rules can be proposed to reduce or manage crime.



This analysis does not factor in exact population counts or demographics

In order to effectively study crime and crime rates, it's important to take into consideration population demographics so that agencies can better tailor their level of care to the populations they serve.



What about unreported crimes in NC?

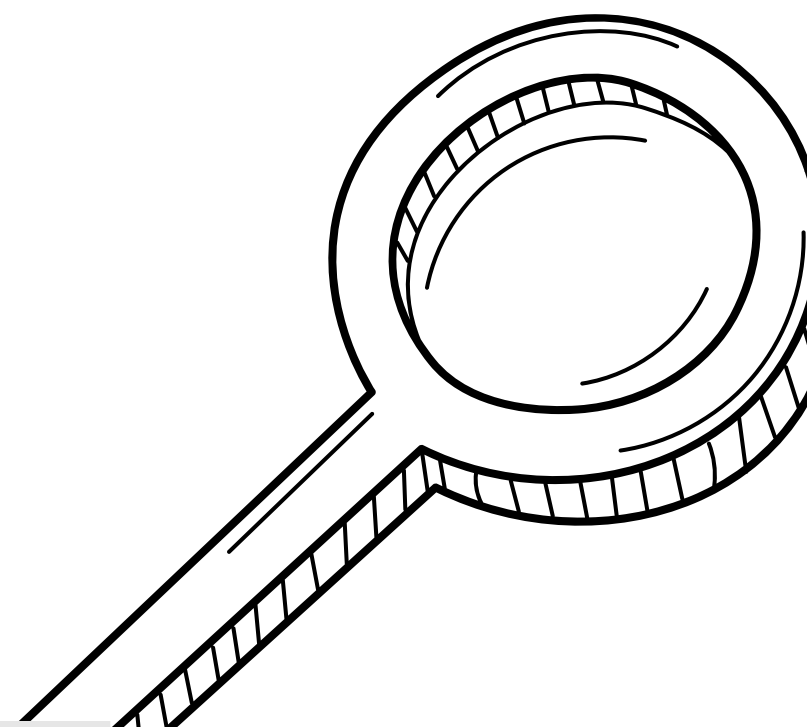
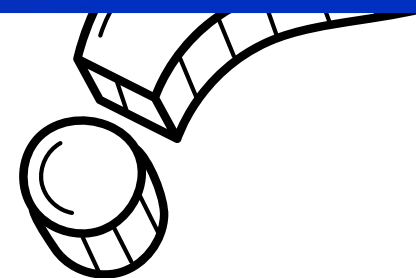
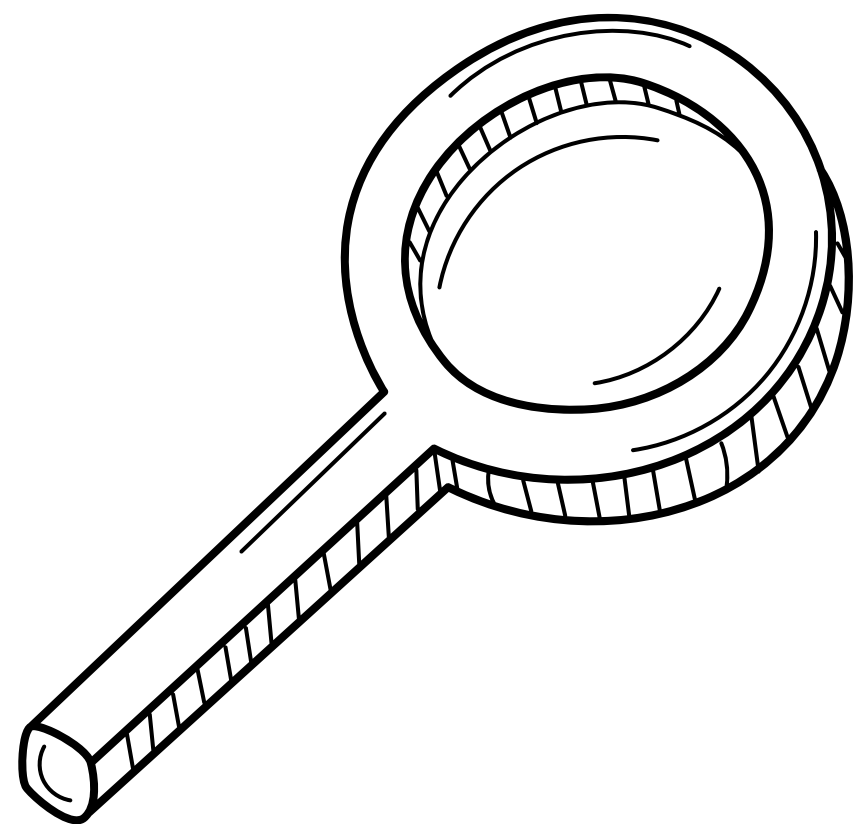
About 40% of crimes in 2019 were not reported! Every year, there is a staggering number of cases not being reported to law enforcement. We can never accurately measure crime in a population because of reporting bias.



We are unaware of agency resources

Because we do not know things about the agencies like their officer count, budget, and other resources, we are unable to determine the efficacy of agencies outside of their solve rates.

Questions



Thank You

https://github.com/brittnwatts/Project_1.git