American Crime and Incarceration

STA 199 Final Project

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Synoposis

This research project is aimed to further understand and analyze American prison incarceration and crime in the 50 states between 2001 and 2016. Analysis was done by focusing specifically on state prisoners (as opposed to federal) and the types of crimes that prisoners had been convicted of. The data set used observes 7 types of crimes that can be classified into violent crimes and property crimes.

Introduction and Data

The United States currently has the highest prison population in the world at around 2,094,000. This situation can be traced back to the 1970s, when politicians like Richard Nixon, Ronald Reagan, and more began the War on Drugs and their "tough on crime" agendas. Since then, rates of imprisonment have continued to increase under the guise of "public safety." However, the reality is that the US' crime rates are comparable to countries with similar economies, yet the rate of incarceration is significantly higher. The US has only 5% of the world's population, and yet it houses 25% of the world's incarcerated persons.

In this project we aim to understand...

Data Description

"The Bureau of Justice Statistics administers the National Prisoners Statistics Program (NPS), an annual data collection effort that began in response to a 1926 congressional mandate. The Uniform Crime Report (UCR) has served as the FBI's primary national data collection tool since a 1930 congressional mandate directed the Attorney General to 'acquire, collect, classify, and preserve identification, criminal identification, crime, and other records.' The FBI collects this information voluntarily submitted by local, state, and federal law enforcement agencies."

The user who updated this data set used the raw data from the NPS and wrangled it in Python to create the variables and observations. Within the data set there are 816 rows and 17 variables. The variables included in the set are US state, whether or not the data for that entry includes jails, the year, prisoner count on December 31st, whether or not the state in the data entry changed their system for reporting crime in comparison to previous years, whether or not crime totals are estimated, and numbers of: total state population, violent crimes, murders or manslaughter, rapes (using the old definition), rapes (using the new definition), robberies, aggravated assaults, property crime, burglaries, larceny, and vehicle theft.

Methodology

The following variables, from the original data set, were used to address the research questions above:
- `jurisdiction`: a categorical variable for federal jurisdiction and the 50 states.
- `year`: a numerical variable for the year of each observation, 2001 through 2016.
- `prisoner_count`:a numerical variable for the number of prisoners in each state for the given year.
- `state_population`: a numerical variable for the population of each state in a given year.
- `violent_crime_total`: a numerical variable for the total number of violent crimes (equals the sum of `murder_manslaughter`, `rape_legacy`, `rape_revised`, `robbery`, and `agg_assault`).
- `murder_manslaughter`: a numerical variable for the numbers of murders and manslaughters.
- `rape_legacy`: a numerical variable for the number of rapes (using the old definition).
- `rape_revised`: a numerical variable for the number of rapes (using the new revised definition).
- `robbery`: a numerical variable for the number of robberies.
- `agg_assault`: a numerical variable for the number of aggravated assaults.
- `property_crime_total`: a numerical variable for the total number of property crimes (equals the sum of `burglary`, `larceny`, and `vehicle_theft`).
- `burglary`: a numerical variable for the number of burglaries.
- `larceny`: a numerical variable for the number of larcenies.
- `vehicle_theft`: a numerical variable for the number of vehicle thefts.

Summary Statistics and Visualizations

First, in this project we aim to understand the extent of the issue of mass incarceration through summary statistics and visualizations. In Figure 1, we visualize the total number of prisoners in the US from 2001 to 2016. As we can see the graph shows a steady incline from 2001 to 2008 and then a steady decline followed by a sharp decline thereafter. In Figure 2, we visualize the amount of crime in the US and notice that it decreases quite steadily between 2001 and 2016.

In Figure 4, we mapped out the proportion of each state's population that is imprisoned to get a clearer idea of which states contribute most the issue of mass incarceration. Most noticeably, Delaware, Oklahoma, and Arizona have have much higher imprisonment proportions than the rest of the country.

Figure 1: Total US Prisoners

between 2001 and 2016

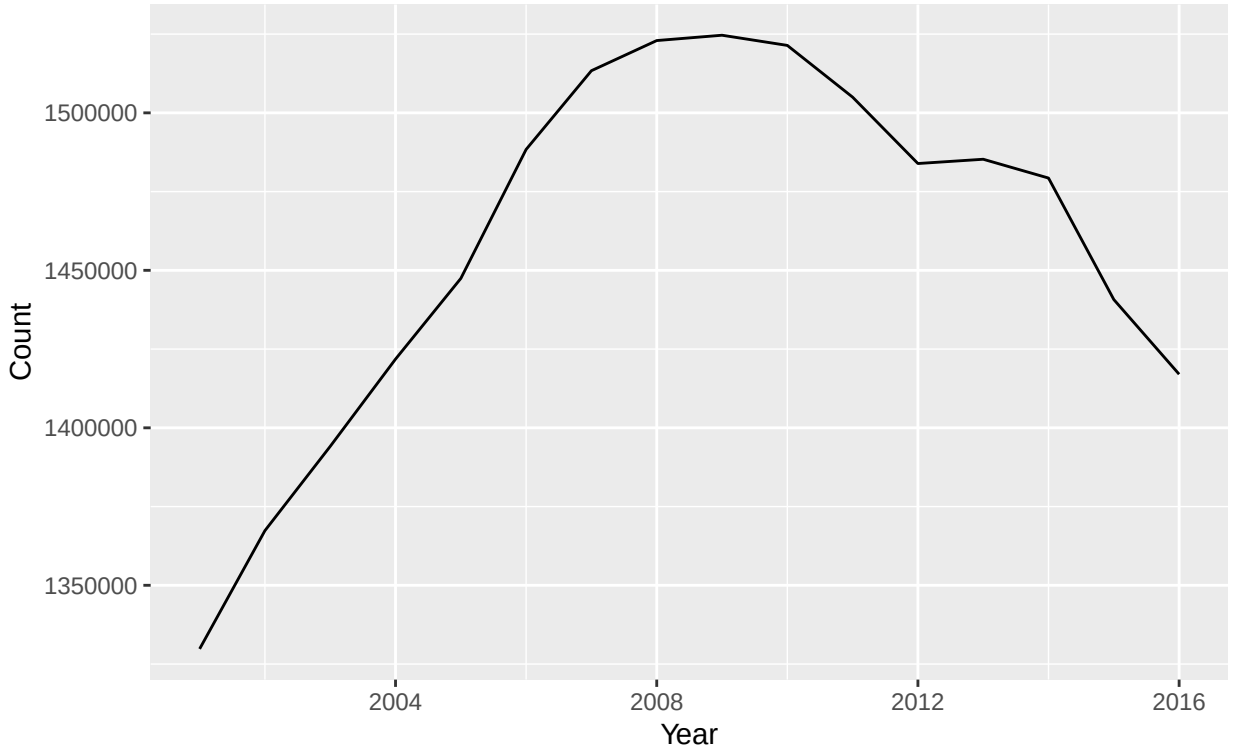


Figure 2: Total Crime in the US

from 2001 to 2016

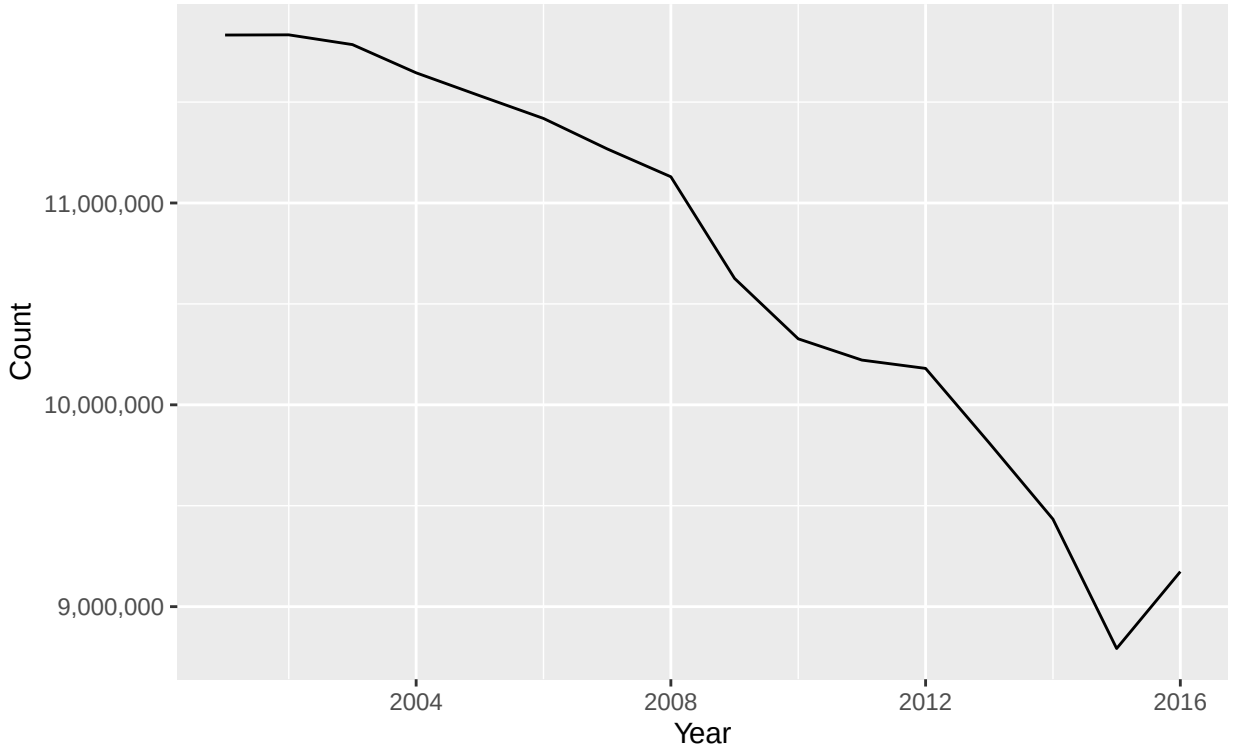


Figure 3: Percent Population Incarcerated

between 2001 and 2016

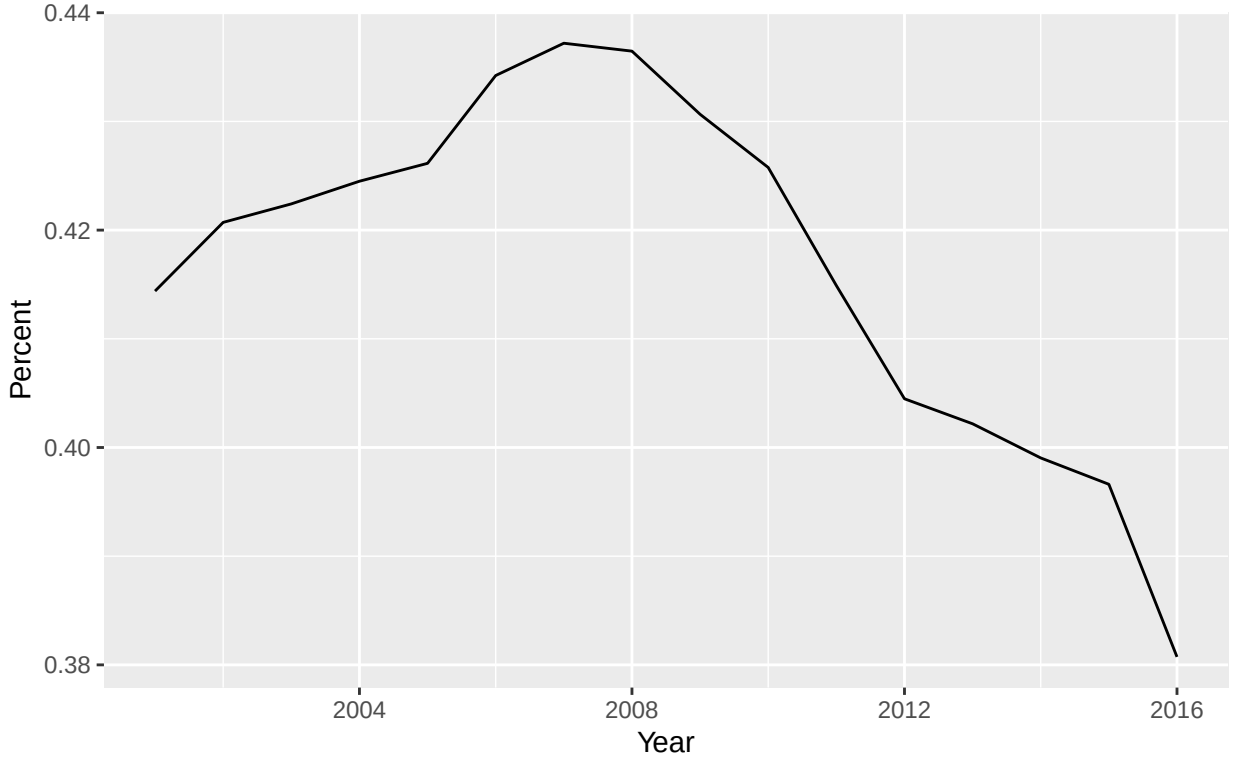
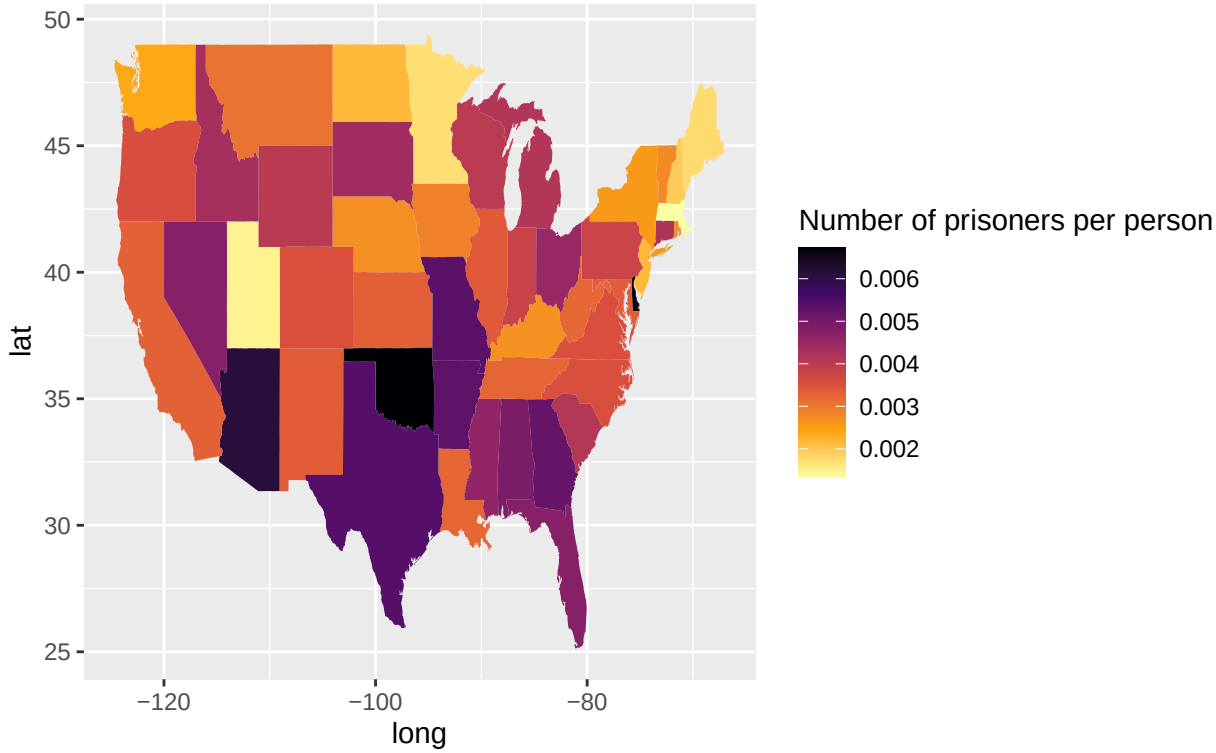


Figure 4: 2016 Prisoner Proportions

by state



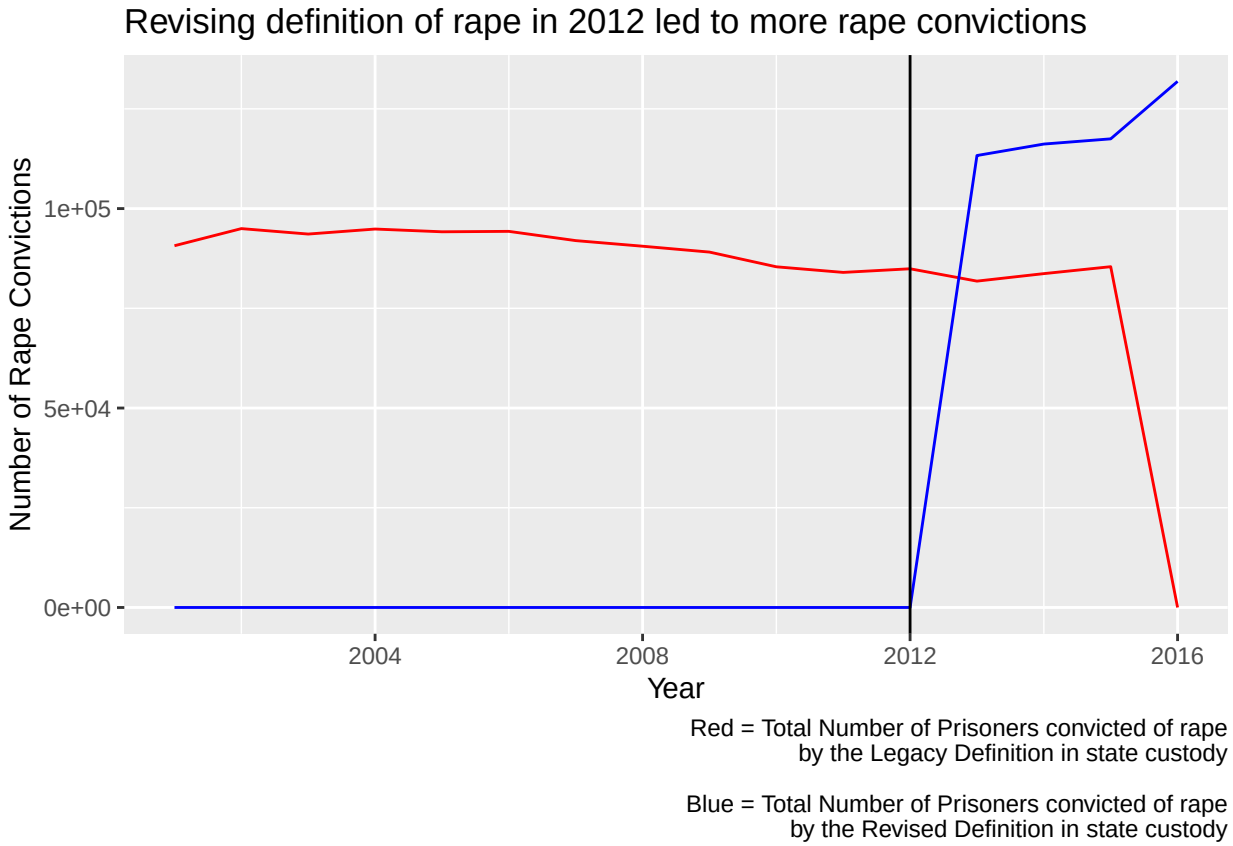
Are the increasing incarceration numbers due to increasing crime rates?

Political rhetoric that has come to the forefront in recent decades is the idea of law and order, being tough on crime, and ensuring punishment to the fullest extent of the law. We went into this project knowing that the number of incarcerated individuals in the US is the highest of any other developed country with a similar economy and governmental system. Knowing this, we would assume that if the US has a strong belief that we need to be tough on crime, the high rates of incarceration are due to high crime rates, violent or otherwise. With this in mind, we wanted to find if the data would support this hypothesis.

Figure 1 and 2:
What is immediately evident is that even when crime of all types was sharply increasing, the number of incarcerated individuals was still steadily decreasing. Based on this alone, though we cannot definitively draw this conclusion, it would appear that rates of incarceration are actually not due to how much or how little crime is being committed and is instead due to other factors which we will explore later in our analyses. Possible explanations might be policy changes, new sentencing guidelines, amount of policing, and a plethora of other reasons.

Figure 3 and 4:
After drawing the previous conclusion, we thought there may be another explanation, even if crime was going down it could be that US population was increasing, when we graphed it above, it would appear that the percent of the US population which is imprisoned shows very strong similarities to the Total US Prison Population graph. However, that being said, even if the population is increasing, if the crime rate is staying the same, or decreasing as we observed previously, there is still no valid reason to incarcerate more people.

How does policy impact incarceration? This will be explored through the lens of changing definition of rape



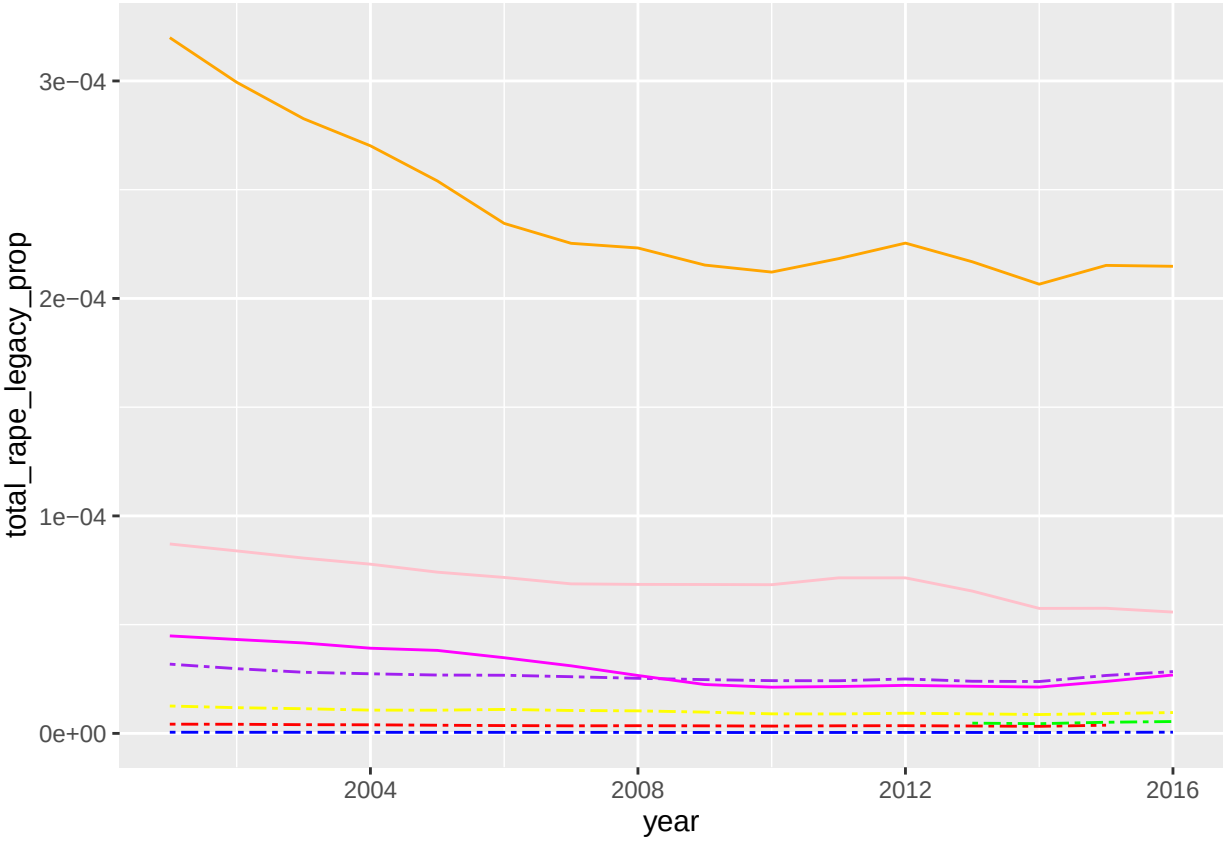
In 2012 the FBI changed their definition of rape from: "The old definition was 'The carnal knowledge of a female forcibly and against her will.' Many agencies interpreted this definition as excluding a long list of sex offenses that are criminal in most jurisdictions, such as offenses involving oral or anal penetration, penetration with objects, and rapes of males.

to: The new Summary definition of Rape is: 'Penetration, no matter how slight, of the vagina or anus with any body part or object, or oral penetration by a sex organ of another person, without the consent of the victim.'"

We wanted to see how the change in definition affected the number of prisoners convicted for rape. Based on the graph, it seems like after the new definition was implemented, the number of prisoners who are incarcerated for rape increased. We will perform tests to find the p-value and try to determine if this is a correlation relationship or a causal relationship.

https://ucr.fbi.gov/recent-program-updates/new-rape-definition- frequently-asked-questions

Proportions of Crime in the United States




```
## $x
## [1] "Year"
##
## $y
## [1] "Proportion of prisoners convicted of each crime\n           (not including federal incarcerate
##
## $title
## [1] ""
##
## $caption
## [1] "Red = Proportion of Rape by legacy definiton\n               Blue = Proportion of murder/mansl
##
## attr(,"class")
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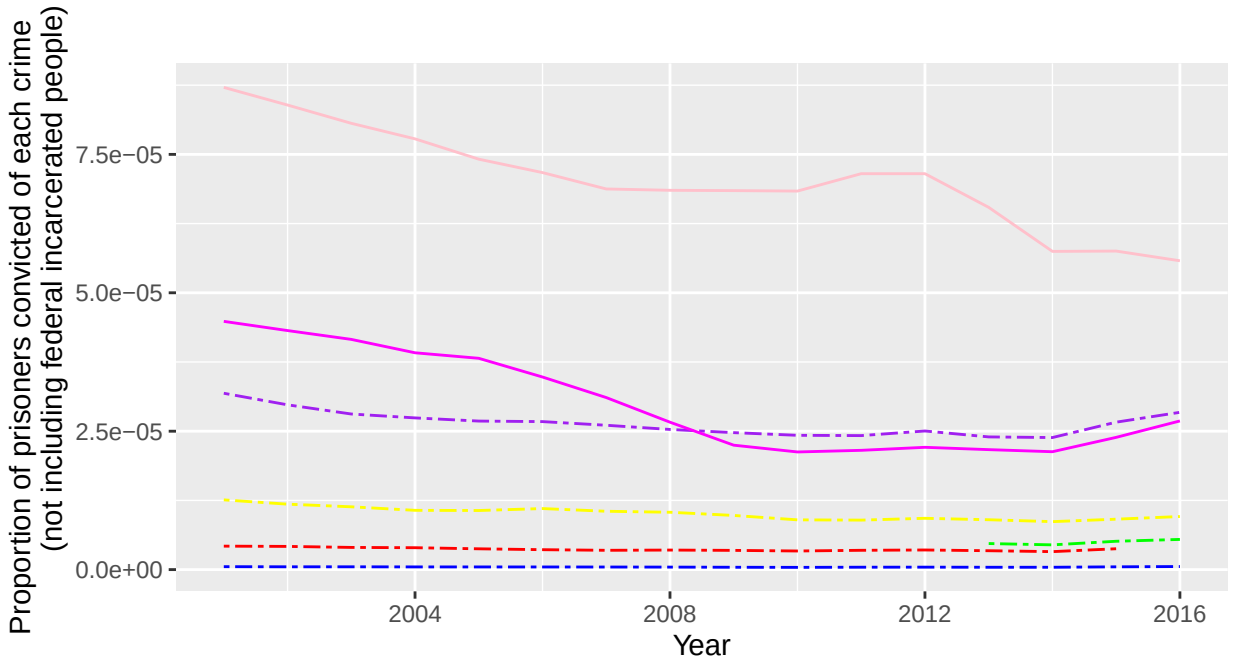
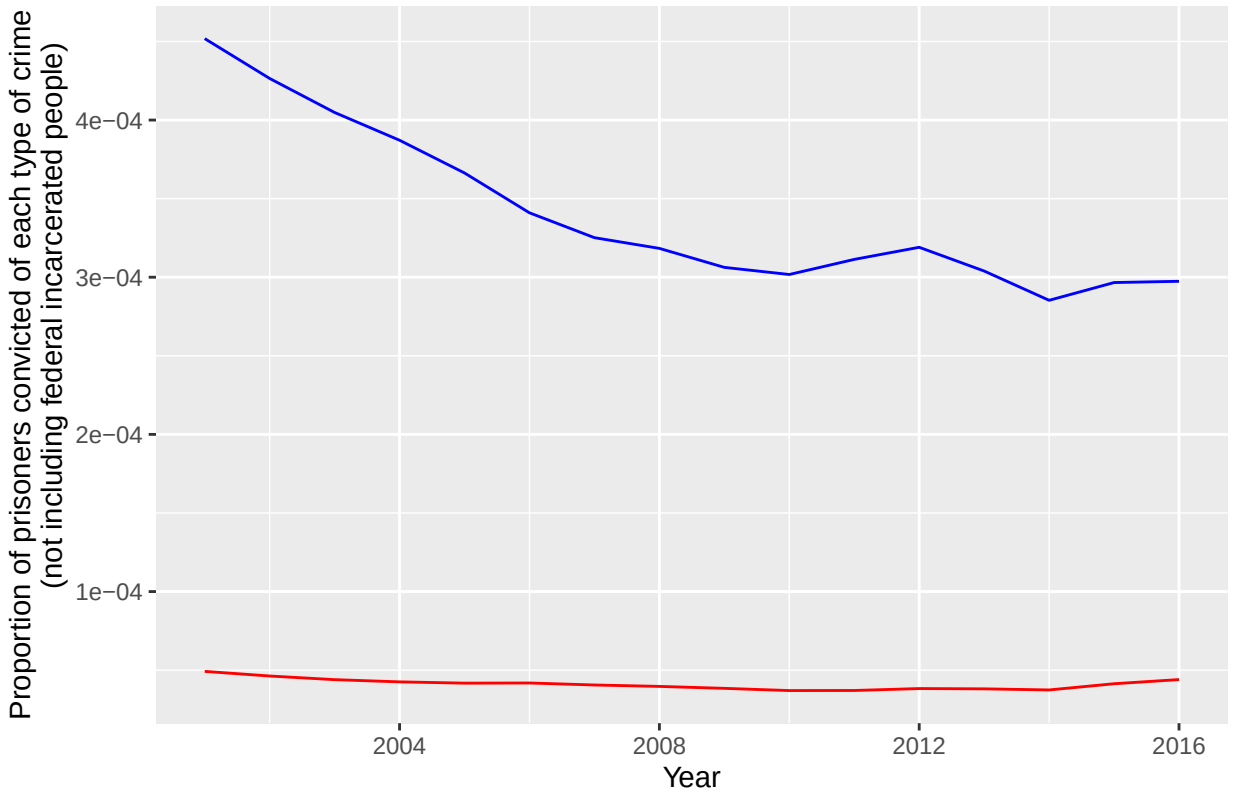
###STEVEN CAN YOU FIX THIS GRAPH TO NOT HAVE COMMENT LOOK WEIRD?



Red = Proportion of Rape by legacy definiton
Blue = Proportion of murder/manslaughter
Green = Proportion of Rape by revised definition
Yellow = Proportion of robbery
Purple = Proportion of aggravated assault
Pink = Proportion of burglary
Magenta = Proportion of vehicle theft



We wanted to see how the proportions of crimes were divided among the prior population. Also we wanted to see whether violent or non-violent crimes were represented more among the prison population. It appears

that non violent crimes make up a larger proportion of the prison population than violent crimes. Generally, violent and non-violent crimes are decreasing in regards to proportion of the prison population. Nonviolent crimes seem to be decreasing at a faster rate than violent crimes. Larceny makes up the largest proportion of crimes in the prison population. So we took it out for the second visualization to get a better look at the other crimes. Murder and manslaughter make up the smallest proportion.

###How does what you did tie into the original rape question you were finding answers to?

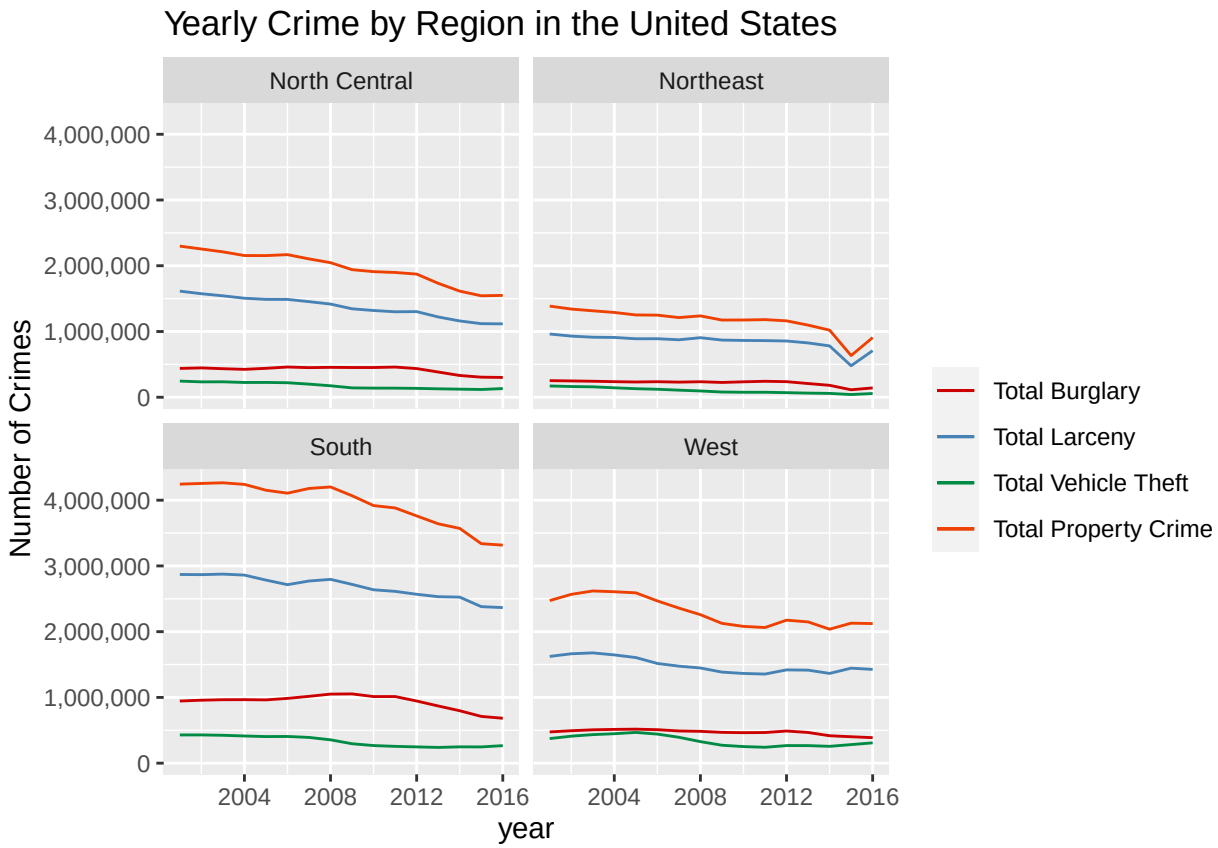
Research Question #3

How do trends in different crimes compare to each other? Do they move together or do they change individually?

Last, we created linear models for each crime to see how they each changed between 2001 and 2016. Notice, all of these 7 crimes have a negative slope meaning they overall decreased during this time period. The slopes vary in magnitude from about -7000 crimes/year to about -180,000 crimes/year.

Research Question #4

How does crime differ for different regions of the US?



To see how crime differs by region, we made a variable called `region` which splits up the United States into 4 distinct regions (North Central, Northeast, South, and West). We decided to look at only property crime (burglary, larceny, and vehicle theft) and so we plotted the total buglary, total larceny, total vehicle theft, and overall total property crime from 2000-2016 on each regional graph to see what the trends looked like.

One positive note with these graphs is that each region has a overall general decline in the amount of property crime throughout 2000-2016. This is only a speculation, but this would suggest that trends of property crime does not differ throughout each region but it does for each crime.

The south overwhelmingly has the total highest property crime total burglary, and total larceny.

An outlier seems to be in the northeast graph in 2015 when there was sharp decrease with larceny and burglary, and thus total property crime. There must have been policy that affected the Northeast only during that time period that lessened crime

Because of the high number of crimes in the south and the downward spime for the northwest graph that the north central and west regions are most similar in numbers of crimes committed over this 16 year span.

It is also interesting to see that the types of crimes themselves are seemingly related. But this we mean that for each graph, from the highest number to the lowest number, the crimes are larceny, burglary, then vehicle theft.

If you were looking at a region to live in the united states and buy a house or car, it seems that the best place to do that would be in the North East, followed closely by the north central and west region. Thus it would be advised to not choose the south, although they are on a decline in property crimes committed.

###Should we ask Yue if it's ok to have multiple research questions that are seperate or do we need to tie them together with one central one?