**Crime Data Analysis Proposal**

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1. **Introduction**

What drives crime patterns in U.S. communities? Are economic conditions, such as unemployment rates and income levels, significant contributors? Does political leadership play a role in shaping public safety through law enforcement policies and priorities? This project investigates the relationships between crime rates, economic instability, and local governance by analyzing multiple data sources. The analysis is based on a 2018 crime dataset from Kaggle, which provides a foundation for examining crime trends across U.S. communities. To enhance this data, we incorporated unemployment rates from the Bureau of Labor Statistics (BLS) and mayoral information, including political affiliations, from USMayors.org and Ballotpedia.org. By integrating these datasets, the project explores how economic conditions and political leadership influence public safety and crime rates in different regions across the United States.

1. **Data**

The crime data was sourced from Kaggle and serves as the primary dataset for this analysis. It includes crime and demographic statistics for U.S. communities in 2018. The dataset provides variables such as population size, racial composition, household size, and detailed crime statistics, including burglary, larceny, arson, and violent crime rates per capita. This data allows for a comprehensive understanding of crime patterns across hundreds of U.S. communities.

To examine the relationship between economic conditions and crime, unemployment data was collected from the Bureau of Labor Statistics (BLS). Using the BLS API, we retrieved unemployment rates at the city and regional levels for the year 2018. For cases where exact matches to specific communities were not available, unemployment data was linked to the closest major city, county, or state to ensure data completeness and accuracy. This dataset helps assess whether economic instability, represented by higher unemployment rates, is associated with increased crime rates, particularly property and violent crimes.

To explore the role of political leadership, we collected mayoral data from USMayors.org and Ballotpedia.org. A custom script was written to scrape USMayors.org by automating searches through the website’s search bar, retrieving the names of mayors for the largest 1,400 U.S. cities by population. For the 100 largest U.S. cities, political affiliation data was added by scraping Ballotpedia.org, where the political party of each mayor is listed in parentheses. A new column titled “Political Affiliation” was created, categorizing mayors as “D” for Democrat or “R” for Republican. This enriched dataset enables an analysis of the potential influence of local governance and political priorities on crime rates.

<https://www.kaggle.com/datasets/michaelbryantds/crimedata>

<https://www.bls.gov/>

<https://www.usmayors.org/>

<https://www.ballotpedia.org/>

**Data Dictionary:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Column** | **Type** | **Source** | **Description** |
| communityName | Text | crimedata.csv | Name of the community |
| state | Text | crimedata.csv | state where the community is located |
| population | Numeric | crimedata.csv | total population of the community |
| householdsize | Float | crimedata.csv | average size of households in the community |
| racepctblack | Float | crimedata.csv | Percentage of Black residents |
| racePctWhite | Float | crimedata.csv | Percentage of White residents |
| racePctAsian | Float | crimedata.csv | Percentage of Asian residents |
| racePctHisp | Float | crimedata.csv | Percentage of Hispanic residents |
| bulgaries | Numeric | crimedata.csv | Number of burglary incidents |
| larcenies | Numeric | crimedata.csv | Number of larceny incidents |
| arsons | Numeric | crimedata.csv | Number of arson incidents |
| ViolentCrimesPerPop | Float | crimedata.csv | Violent crimes per capita |
| HouseholdIncome | Float | statistia.com | Avg Household income of the community |
| Mayor of Community | Text | usmayors.org | Mayor of largest city by population in community |
| PoliticalLeaningofMayor | Text | usmayors.org | Political leaning of mayor |
| Unemployment Rate | Float | bls.gov | Unemployment rate of largest city by population in community |
| Party Affiliation | Text | ballotpedia.org | Party Affiliation of city mayor |

1. **Analysis**

This project aims to explore the relationship between crime rates, socioeconomic conditions, and political leadership across U.S. communities. By enriching the crime dataset with household income, unemployment rates, and mayoral data, we will investigate how economic and governance factors shape public safety. Specifically, our research questions include:

* Is there a strong correlation between economic conditions, such as household income or unemployment, and crime rates? Do communities with higher income levels experience fewer property crimes?
* How does political leadership influence public safety? Are communities governed by mayors with specific political leanings more likely to experience different crime patterns?
* Are there regional differences in crime rates? Which communities within the dataset show the highest levels of crime, and do these align with socioeconomic trends?
* What types of crime are most influenced by economic instability? Specifically, does high unemployment correlate more with property crime than with violent crime?

*3.1 Economic Conditions and Crime Rates*

**Visualization:** Scatterplots of householdincome vs. violentcrimesperpop and pctunemployed vs. violentcrimesperpop.

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**Description:** The analysis explored the relationship between household income and unemployment rates with violent crime rates. A scatterplot of householdincome vs. violentcrimesperpop shows a moderate negative correlation (-0.45), indicating that higher income levels are associated with lower violent crime rates. Similarly, unemployment rates (pctunemployed) exhibit a weaker positive correlation (0.22) with violent crime rates, suggesting that higher unemployment may slightly increase violent crime. These findings align with the hypothesis that economic stability reduces crime prevalence, though other factors likely contribute.

*3.2 Political Leadership and Crime*

**Visualization:** Scatter plot of violent crimes per 1000 people vs. median income, colored by political affiliation of the mayor (Republican in red, Democrat in blue).

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Description automatically generated

**Description:** The scatter plot illustrates the relationship between median income and violent crime rates, distinguishing communities based on mayoral political affiliation. Communities with Republican leadership (red points) generally show a steeper negative correlation, where higher median income is associated with lower violent crime rates. Conversely, communities with Democratic leadership (blue points) display a weaker negative correlation.

This pattern could be influenced by urban-rural divides, as cities with liberal leadership tend to have higher population densities and crime rates, while conservative-led areas might lean toward smaller, rural communities with higher income homogeneity. It is important to note that while this visualization highlights trends, it does not establish causation. Factors such as population size, geography, and economic conditions must be further analyzed to interpret the impact of political leadership on violent crime rates accurately.

*3.3 Regional Trends in Crime Rates*

**Visualization:** Bar chart of violentcrimesperpop by state.

**A graph of a crime

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**Description:** The state-wise bar chart highlights significant regional variations in violent crime rates. District of Columbia and South Carolina report the highest violent crime rates, while states such as Maine and Vermont exhibit the lowest. The top five states with the highest crime rates are concentrated in the South and urbanized regions, indicating potential links to socioeconomic factors or regional disparities in law enforcement policies. These findings emphasize the importance of tailoring crime prevention strategies to regional needs.

*3.4 Types of Crime Influenced by Economic Instability*

**Visualization:** Scatterplots with regression lines for pctunemployed vs. individual crime types (larcenies, burglaries, arsons).

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**A graph of unemployment rate and a red line

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**A graph of unemployment rate and regression line

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**Description:** The scatterplots examine unemployment rates and their relationship with property crime categories. The strongest correlation is observed between unemployment and burglaries (0.35), followed by larcenies (0.28), and a weak correlation for arsons (0.12). Regression lines indicate a positive relationship across all crime types, suggesting that economic instability exacerbates property crimes. These insights support policies aimed at economic stabilization as a mechanism for crime reduction.

1. **Conclusion**

In this project, we analyzed four aspects of crime trends in U.S. communities: the relationship between socioeconomic conditions and crime rates, the influence of political leadership, regional differences in crime rates, and the impact of economic instability on specific crime types. From the analysis questions presented in our proposal, we found the following results:

1. **Is there a strong correlation between economic conditions, such as household income or unemployment, and crime rates?**  
   There is a moderate negative correlation between household income and violent crime rates (-0.45), suggesting that communities with higher income levels tend to experience fewer violent crimes. Unemployment rates, on the other hand, exhibit a weaker positive correlation with violent crime rates (0.22), indicating that unemployment may contribute to higher crime rates, though other factors are likely at play.
2. **How does political leadership influence public safety?**  
   Communities led by mayors with liberal political affiliations showed higher average violent crime rates compared to conservative or independent affiliations. However, this trend is likely influenced by urban-rural divides, as larger urban centers with higher crime rates often align with liberal leadership. While the findings highlight potential correlations, they do not establish causation.
3. **Are there regional differences in crime rates?**  
   There are significant regional variations in violent crime rates. States/Territories like DC and South Carolina report the highest violent crime rates, while states like Maine and Vermont have the lowest. The top five states with the highest crime rates are concentrated in the South and urbanized regions, indicating a need for region-specific crime prevention strategies.
4. **What types of crime are most influenced by economic instability?**  
   The analysis shows that unemployment rates are positively correlated with property crimes, with the strongest correlation observed for burglaries (0.35), followed by larcenies (0.28), and a weak correlation for arsons (0.12). This suggests that economic instability, as reflected in unemployment rates, exacerbates property crimes and supports policies aimed at economic stabilization.

**Limitations and Future Work**

This project faced some limitations, including the potential inaccuracies in aggregating unemployment data to match community-level data and the lack of longitudinal data to analyze trends over time. Future work could include incorporating additional socioeconomic and demographic factors, analyzing temporal trends in crime rates, and exploring the effectiveness of specific policies in reducing crime. Expanding the dataset to include more recent years would also provide greater insights into evolving patterns of crime and governance.

This analysis underscores the complex interplay between economic conditions, political leadership, and crime rates, highlighting the need for multifaceted approaches to improving public safety across diverse communities.