Analyzing the Relationship Between Unemployment Rates and Crime Incidents in the U.S. (2004-2014)

1 Introduction

1.1 Key Question:

Does a higher unemployment rate correlate with higher crime rates in the U.S.?

1.2 Description:

Unemployment and crime are rather interlinked, with many suggesting that high unemployment may be the cause of a rise in crime. This report strives to investigate this relationship in the United States during the period between 2004 and 2014. We analyze the unemployment rate and crime incident datasets for patterns and correlations that will provide valuable insights for policymakers.

2 Data Used

2.1 Data Sources

- **Source-1:** "Unemployment in America Per US State" dataset from Kaggle.
- **URL:** https://www.kaggle.com/datasets/justin2028/unemployment-in-america-per-us-state
- **Description:**

  The unemployment data provides monthly unemployment percentages for U.S. states from the period 1976 to 2022. Key columns include `State`, `Year`, `Month`, and `Percent (%) of Labor Force Unemployed`.

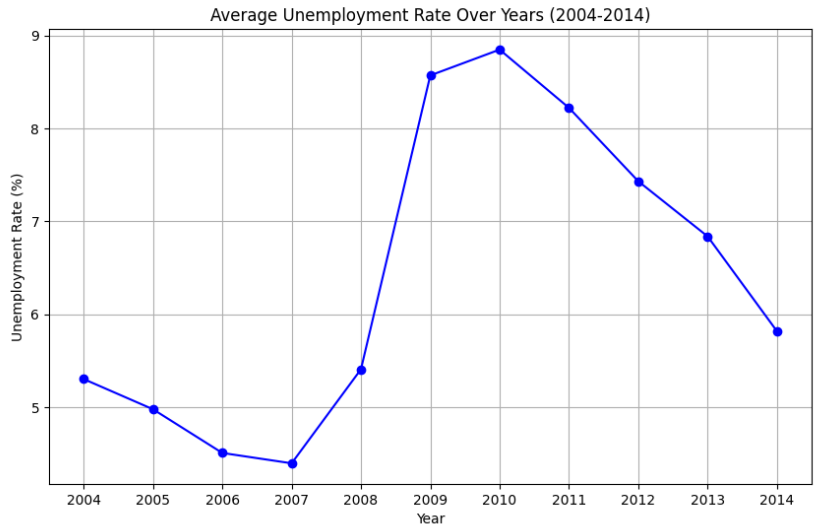
- **Source-2:** "US Crime Dataset" from Kaggle.
- **URL:** https://www.kaggle.com/datasets/mrayushagrawal/us-crime-dataset
- **Description:**

  The crime dataset contains detailed records of crime incidents across states from the periods 1980 to 2014. Key columns include `State`, `Year`, `Month`, and `Incident`.

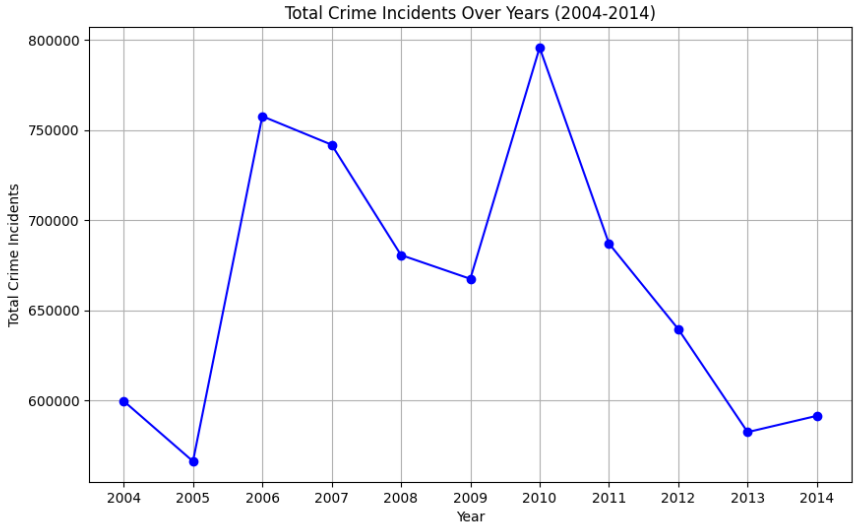
2.2 Data Structure

This will be important for the project as it brings integrity and consistency in the analysis. The unemployment dataset includes the columns of interest: State, Year, Month, and Percentage of Labor Force Unemployed that could be used to analyze the temporal trend of unemployment across different regions. The crime dataset, having key columns such as State, Year, Month, and Incident counts, allows us to analyze the trend of crimes across time. This organized method will enable us to efficiently transform and merge data in order to find significant relationships between unemployment rates and crime incidents. Proper understanding of the structure of the data leads to strong, reproducible results and allows one to make correct decisions based on the analysis.

- **Line Graph for Average Unemployment Rate Over the Years:**



- **Line Graph for Crime Incidents Over the Years:**



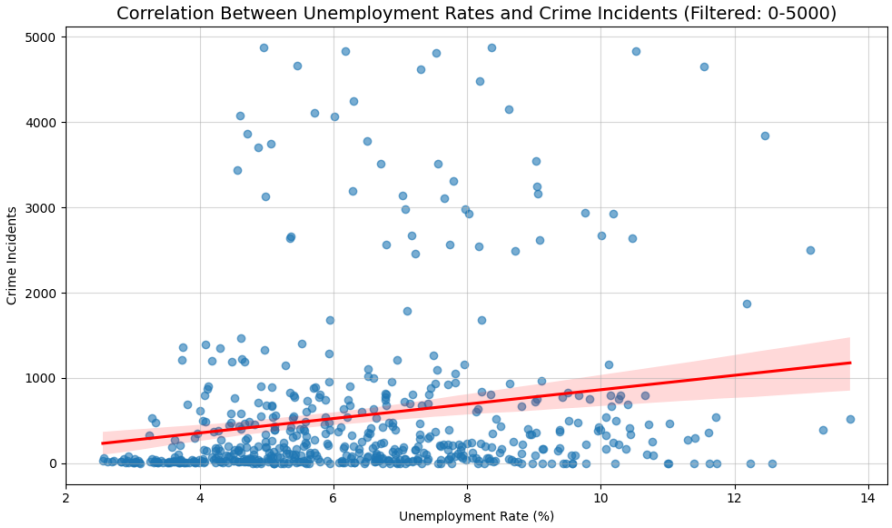
3 Analysis

3.1 Methods

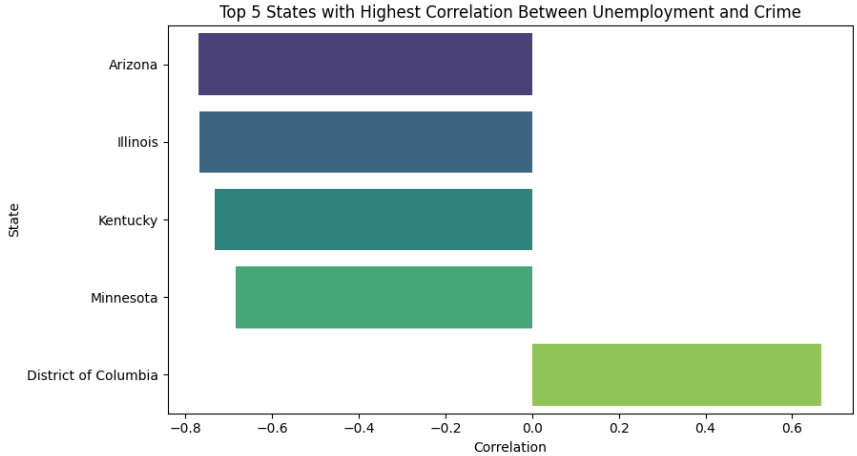
- Datasets were merged on `State`, `Year`, and `Month`.
- Aggregation was performed to calculate:
  - Average unemployment rate per state per year.
  - Total crime incidents per state per year.
- Correlation analysis and visualization techniques were applied to uncover trends and relationships among the top states as there are more in number in result it will be difficult to interpret all the states.

3.2 Results

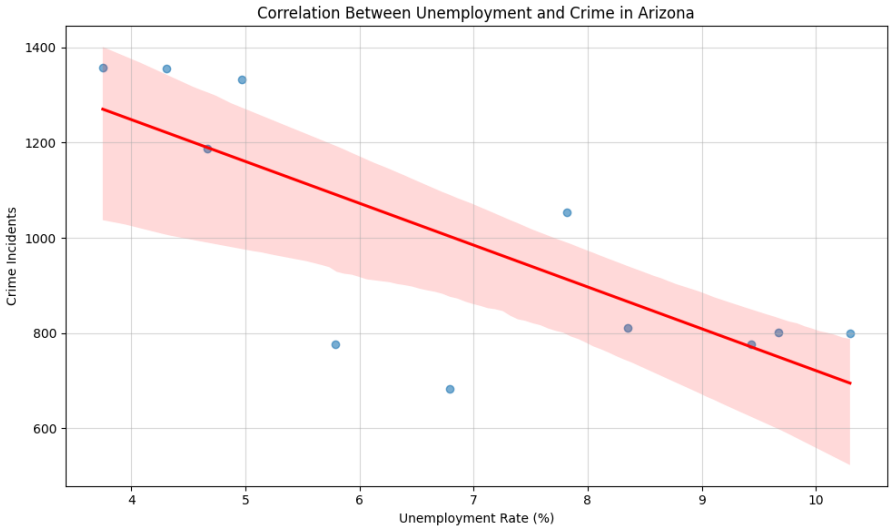
- **Considering crime incidents from 0 to 5000 as there is no correlation exists beyond 5000**



- **Correlation Analysis: Top 5 States Linking Unemployment and Crime**



- **Considering Arizona state as example which shows unemployment rate might be the reason for crimes.**



The analysis indicates that states with consistently high unemployment rates like Arizona may tend to have higher crime incidents but the other states showed almost null correlation between the unemployment and crime incidents, though exceptions exist. The observed positive correlation was observed but it is not deterministic.

4 Conclusions

- Further analysis was made on unemployment rates and the levels of crime incidence; the degrees of their correlation change in different states. Some evidence showed a positive relationship between crime incidences, associated with higher levels of unemployment; however, several revealed negative or trivially small incidences of any.

- This was further understood through scatter plots for each state, which showed clearer indications of the aforementioned correlations. States like Arizona had very high positive correlations, while other states reflected negative or no clear correlation at all. Such visualizations therefore underscore how important regional differences and socio-economic contexts are in the analysis of the linkage between unemployment and crime.

- This may, in turn, widen the scope for further research needed to explore other variables that may influence the relationship between unemployment and crime. It would be interesting if the factors of poverty, education level, and social support systems could be included in developing a holistic view of what drives crime.