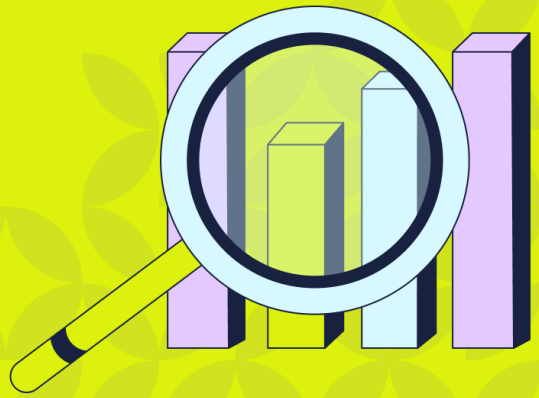
Final Project

Mark Mariscotes

Introduction: Our goal is to identify the state with the best potential business expansion by state income and corruption rates.



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About

- This project aims to explore the potential relationships between different socioeconomic factors (such as income levels) and crime rates (represented by convictions per capita) across different US states.
- The dataset used in this project contains data from various states across the US, detailing average, minimum, and maximum incomes, as well as crime rates measured in terms of convictions per capita. Other features such as total state income and state percentages of income and convictions are also included.
- Analysis Steps:

  I. Data Cleaning: Check for missing or inconsistent data.

  II. Exploratory Data Analysis (EDA): Perform initial exploration of the data, generate statistical summaries, and create visualizations to understand the distribution and relationships of data.

  III. Hypothesis Testing: Formulate hypotheses based on the observations from EDA.

  IV. Correlation Analysis: Determine the correlation between different socioeconomic factors and crime rates.

  V. Insights and Conclusions: Draw conclusions based on the results of the analysis. Identify key socioeconomic indicators that have a significant association with crime rates.

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Postgres

Preliminary Findings:

We found that, states with higher average incomes tend to have slightly lower convictions per capita, and vice versa. However, this relationship is weak and may not be statistically significant.

Highest Income States

State	Avg. Income	% Convictions
Maryland	89,392	1.63%
Massachusetts	82,427	2.68%
New Jersey	81,740	2.24%
California	80,440	1.29%
Connecticut	79,287	2.37%

Lowest Income States

State	Avg. Income	% Convictions
West Virginia	46,254	6.66%
Mississippi	47,131	2.87%
New Mexico	48,701	2.53%
Arkansas	48,829	3.56%
Kentucky	50,675	1.89%

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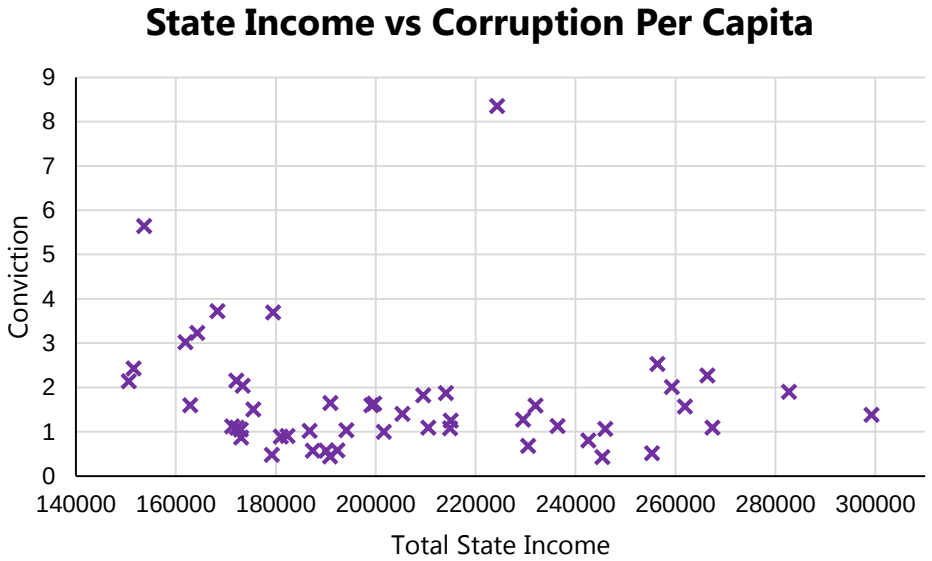
Excel

Correlation Analysis:

The correlation between the total state income and corruption convictions per capita is approximately -0.14. This suggests a weak negative relationship between the two variables. In other words, as the total state income increases, the number of corruption convictions per capita tends to decrease slightly, but the relationship is weak.

- correlation close to 1 indicates a strong positive relationship.
- A correlation close to -1 indicates a strong negative relationship.
- A correlation close to 0 indicates no linear relationship.



Correlation coefficient between state income and corruption convictions per capita.

Correlation:	-0.14

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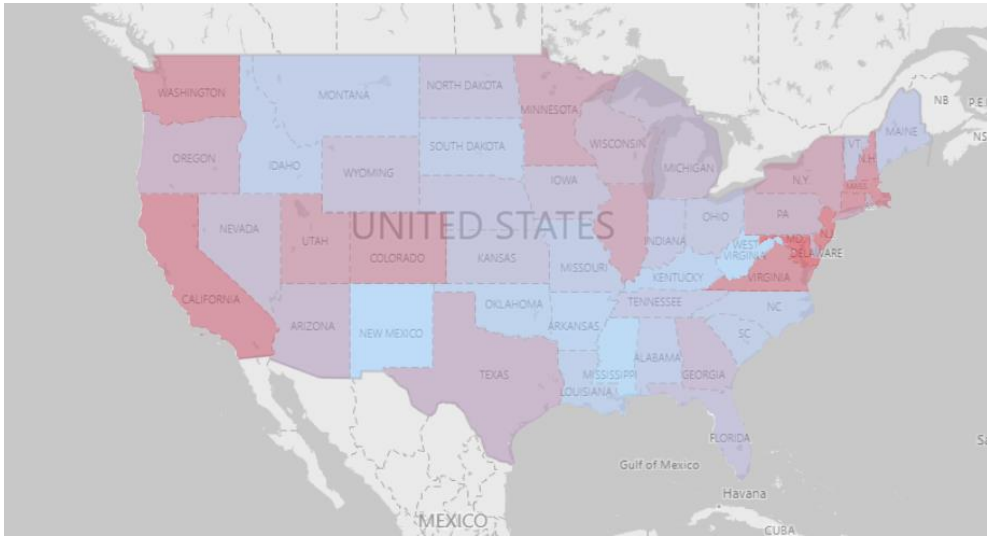
Power BI

Geographic Income Distribution:

The map displays the location of each state, with darker colors representing higher income and lighter colors indicating lower income. By examining the map, we can observe that states with higher incomes tend to be situated along the seaside.



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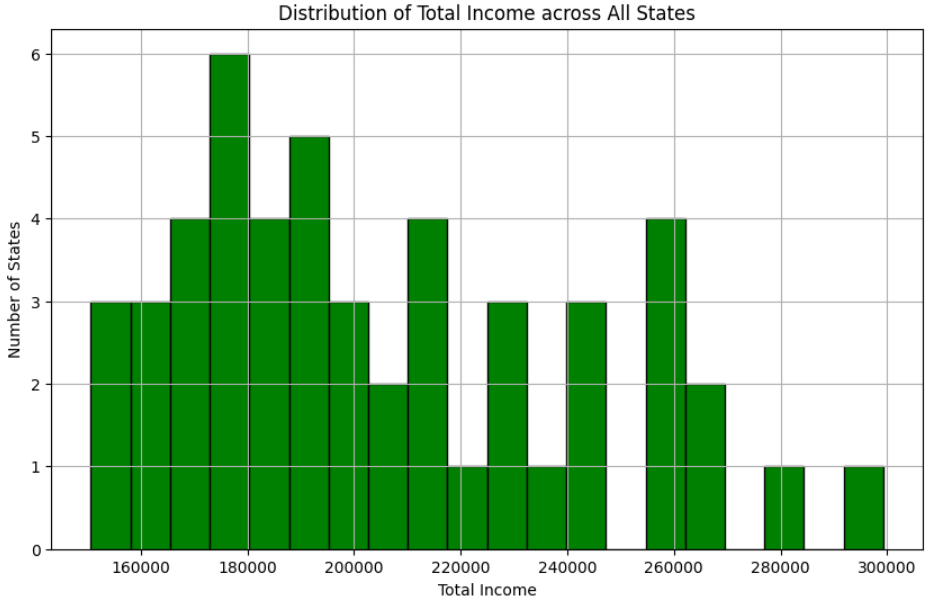
Python

Histogram of Total Income Distribution:

The histogram shows the distribution of total income across all states. We can observe that the distribution is somewhat skewed to the right, with a larger number of states having lower total incomes and a smaller number of states having higher total incomes



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Findings

From these results, we can say that there is a slight tendency for states with higher incomes to have lower conviction rates, but the relationship is not strong. It is therefore important to consider other factors such as tax rates, labor costs, and market demand, should also be considered.

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Insights

The analysis suggests that Maryland, with the highest average income, may have fewer convictions per capita compared to other states. This could be attributed to the possibility that states with higher average incomes tend to allocate more resources to law enforcement, education, and social services, or that the culture in these states is less tolerant of criminal behavior. Conversely, West Virginia, with the lowest average income, may have higher convictions per capita due to potential resource constraints or different social dynamics.

Answers to Business Questions

In the process of selecting optimal locations for business expansion, I highly recommend considering states such as California, New Hampshire, and Hawaii. These states have demonstrated a potent combination of high average incomes and low conviction rates, making them prime candidates for business expansion.

High average incomes in these states suggest a strong local economy and a potential customer base with significant purchasing power. This could translate into a higher demand for your products or services, contributing to increased sales and profits. Furthermore, a thriving economic environment often indicates a supportive infrastructure for businesses, including well-established transportation, logistics, and communications systems.

Recommendations

- States with high average incomes like Maryland, indicating a strong economy and potential customer base with significant purchasing power.
- States with low conviction rates like Hawaii, potentially indicating lower levels of corruption and a more reliable business environment.
- States with low income disparity like New Mexico, suggesting a more balanced consumer base and stable socio-economic conditions.
- States with both high incomes and low conviction rates, such as California, New Hampshire, and Hawaii, which might be favorable candidates for business expansion.

However, it is emphasized that these recommendations are general and must be complemented with detailed market research, feasibility studies, and an understanding of local laws and regulations to make an informed decision specific to the particular business scenario.

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Challenges Encountered During the Analysis

The analysis faced challenges with determining causal relationships due to the correlation versus causation issue. Additionally, the dataset had limited variables, omitting important factors like education, unemployment rates, and demographic data. The accuracy and completeness of the provided data played a crucial role in the analysis, as any inaccuracies or missing information could have affected the results. Moreover, the insights derived were general and might not be applicable to all businesses or specific scenarios, as business expansion decisions require a more comprehensive understanding of the market and business environment.

Recommendations for Future Research

To improve the analysis, include a more comprehensive set of variables that could influence income levels and conviction rates, such as education levels, unemployment rates, population demographics, cost of living, tax rates, and local laws and regulations.

To gain a deeper understanding of the trends over time, consider obtaining data from multiple years for a longitudinal analysis, which can help investigate whether changes in one variable lead to changes in another.

Thank You!

For your Attention

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