7PAM2000: APPLIED DATA SCIENCE

Assignment 2: Statistics and Trends

Github Link: https://github.com/Badri1220/ADS1-ASSIGNMENT2

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Climate Change Data Analysis Based on World Bank Data

Abstract

In a time of globalization, it is critical to comprehend the social and economic dynamics of many nations. The World Bank offers a wealth of information that encompasses a range of metrics for countries all around the world. In this investigation, we examine important metrics for several nations by carefully going over the World Bank dataset. To discover patterns and links, the path entails data manipulation, investigation, and perceptive visualizations.

Some nations and metrics catch our eye as we go through the dataset. Focus areas for examination include nations like Argentina, Afghanistan, and India as well as metrics like GDP, death rates, and energy imports. Equipped with this carefully selected subset, we started on a visual exploration to find trends and connections.

Introduction

We start our search with the raw World Bank data, which is a massive amount of data that is just waiting to be discovered. We set out on a mission to organize the data understandably by utilizing the capabilities of pandas and Python. We were able to differentiate between the variety among nations and the indicators' temporal progression by transposing the Data Frame. We concentrate on a small number of countries, each with a distinct history and a set of markers that guide them along their developmental path. The economic landscapes of nations like Argentina, Afghanistan, India, and others entice us to investigate, and metrics like GDP, mortality rates, and energy imports provide a sophisticated prism through which we attempt to comprehend their disparate paths. This journey aims to unravel the patterns and connections that support the socio-economic fabric of our globalized world by fusing the rigorous methodology of data analysis with the creative storytelling of the human condition.

Visuals Revealed:

The first graphic we see is a box plot that shows how net energy imports are distributed among the nations. The differences across the countries are striking and provide a picture of the differences in energy dynamics.

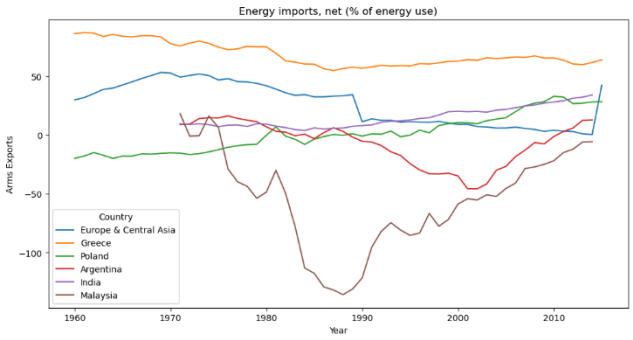

Figure 1 Energy import indicator value

The evolution of net energy imports for various countries throughout time is then explored chronologically using line charts. The lines' ebb and flow depict the path taken by each country in managing its energy resources.

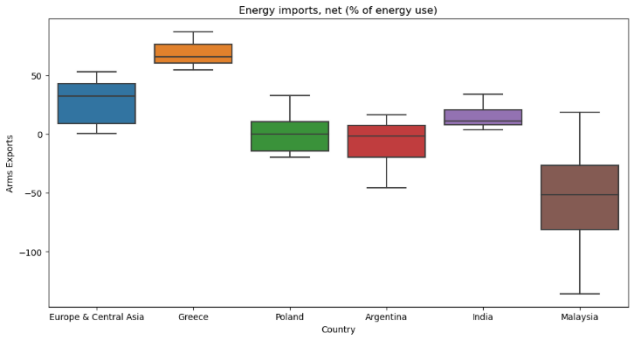

Figure 2 Bar plot for energy imports

Connection and Understanding:

Correlation matrices are what we go to for deeper insights. By revealing the connections between markers, these visualizations assist us in identifying patterns that may not be immediately obvious.

Heatmaps provide a concise summary of the relationships between several indicators, showing how they move or dance together.

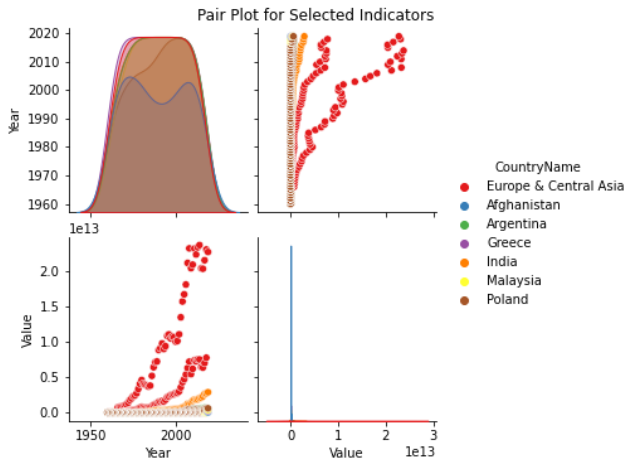

Figure 3 Pair plot for the selected indicators

The heatmap for multiple indicators was plotted representing the year and value of the indicator.

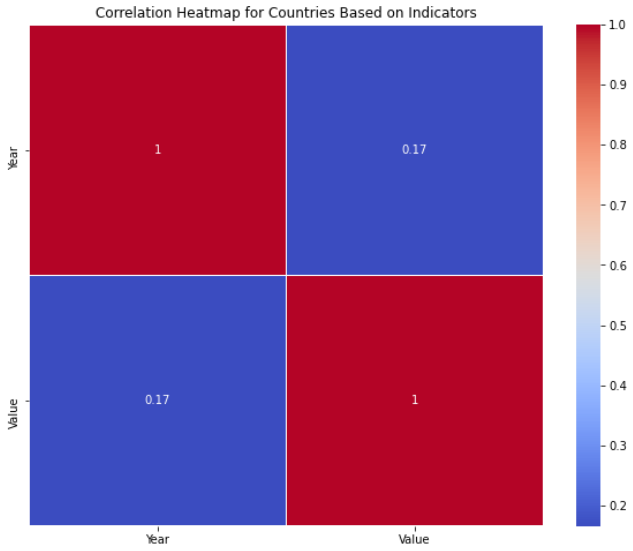

Figure 4 Heatmap for the selected indicator

Investigation by nation:

By focusing on certain nations, we can reveal their distinct narratives. The temporal dynamics of chosen variables are displayed in the time series plots, providing a rich tapestry of each country's social and economic development.

The time series plot depicts the forecasting of the indicator values for the multiple indicator codes following the multiple years

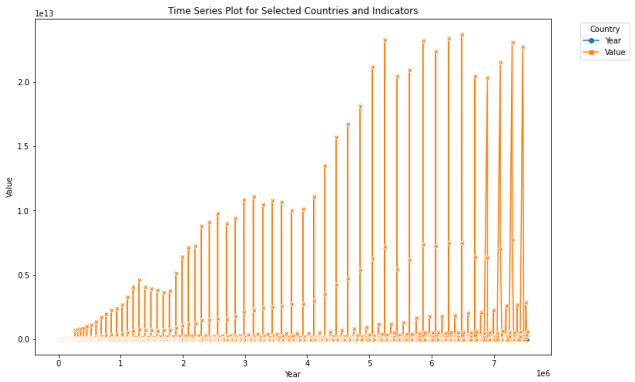

Figure 5 Time series plot for the countries and the indicator

Comparative Evaluation:

We turn our attention to the correlation heatmap that includes all indications for a comprehensive perspective. It becomes clear how different economic measures interact, offering a broad view of the connections between many aspects of a country's progress.

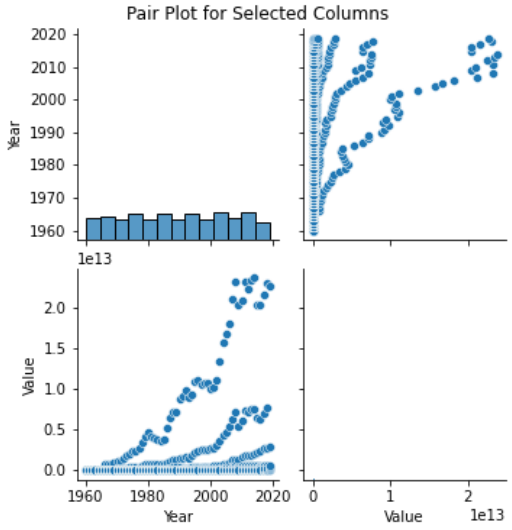

Figure 6 Pair plot for comparative evaluation