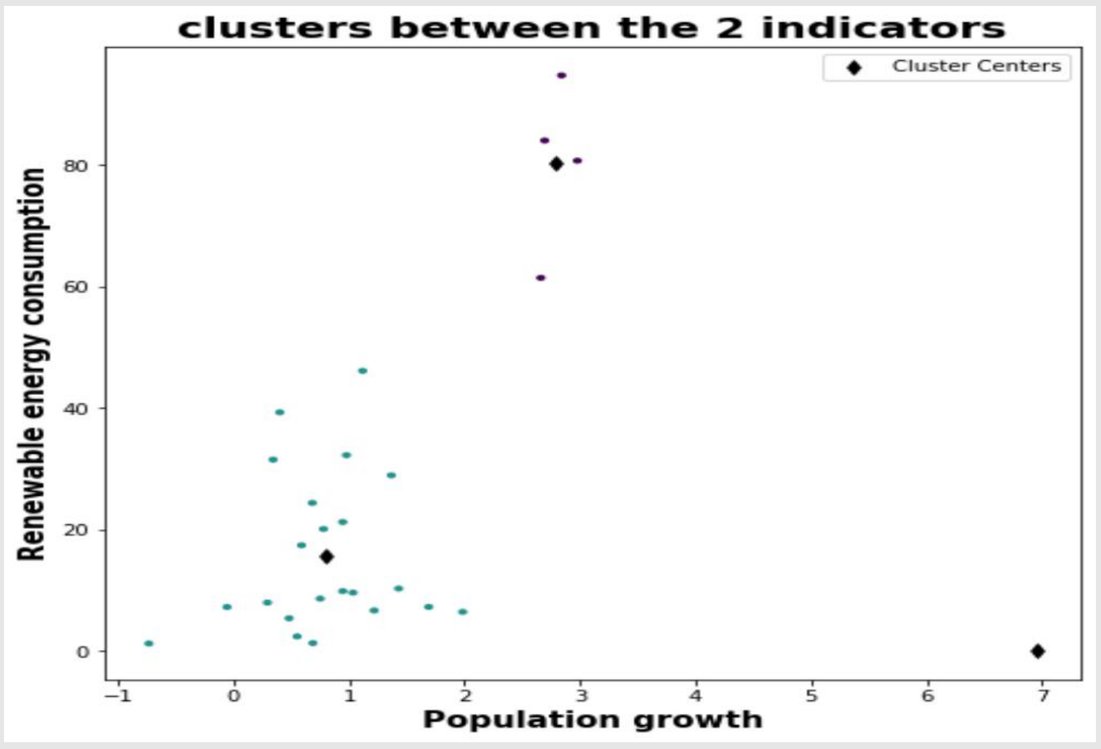
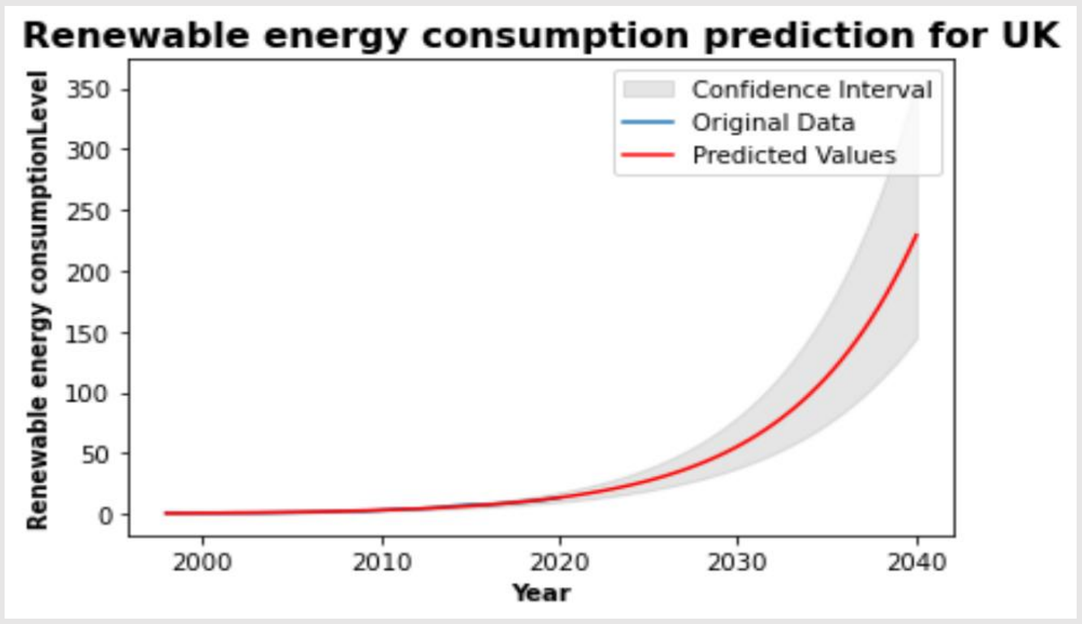
INTERACTION OF CLIMATE CHANGE INDICATORS USING CLUSTERING AND FITTING TECHNIQUES.

OLUSOJI PETER SOWUNMI [22073997]

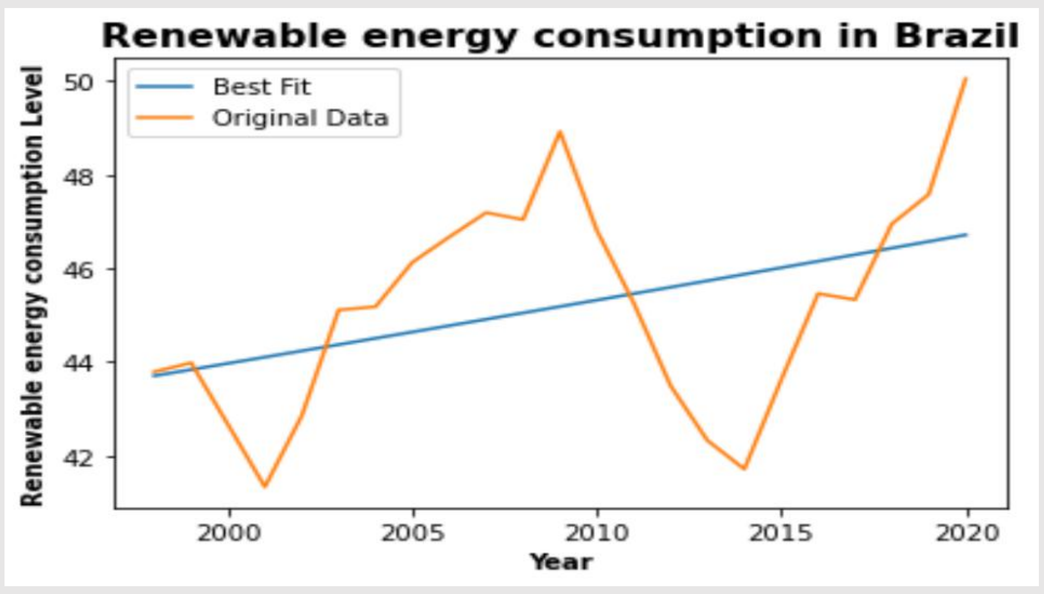
Abstract: This study examines the interactions between the climate change indicators of various countries using clustering techniques, specifically KMeans. The primary areas of focus include GDP growth, population expansion, CO2 emissions, electricity production from natural gas sources, and use of renewable energy. This research identifies two factors that have less connection, which is significant information for guiding future budgetary and environmental strategy. The results provide useful information that enhances our understanding of the intricate dynamics of climate change.

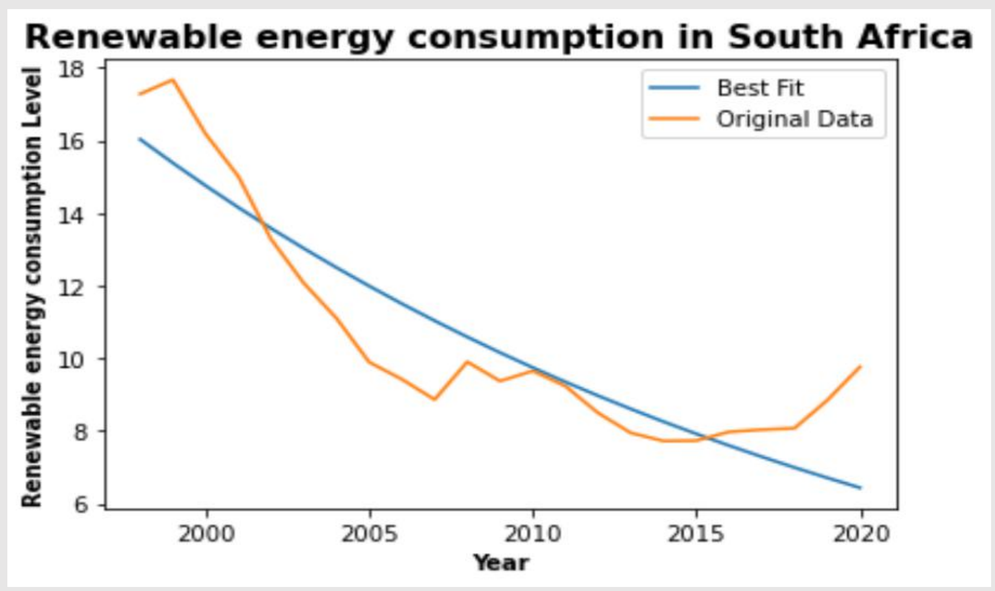
Introduction: The complex dynamics of climate change require a thorough knowledge because it is a global concern with far-reaching effects. This research explores the interplay of critical climate change indicators in several nations. The indicators that were chosen, which include population growth, GDP growth, CO2 emissions, electricity production from natural gas sources, and the use of renewable energy, provide a comprehensive understanding of the complex nature of climate change.

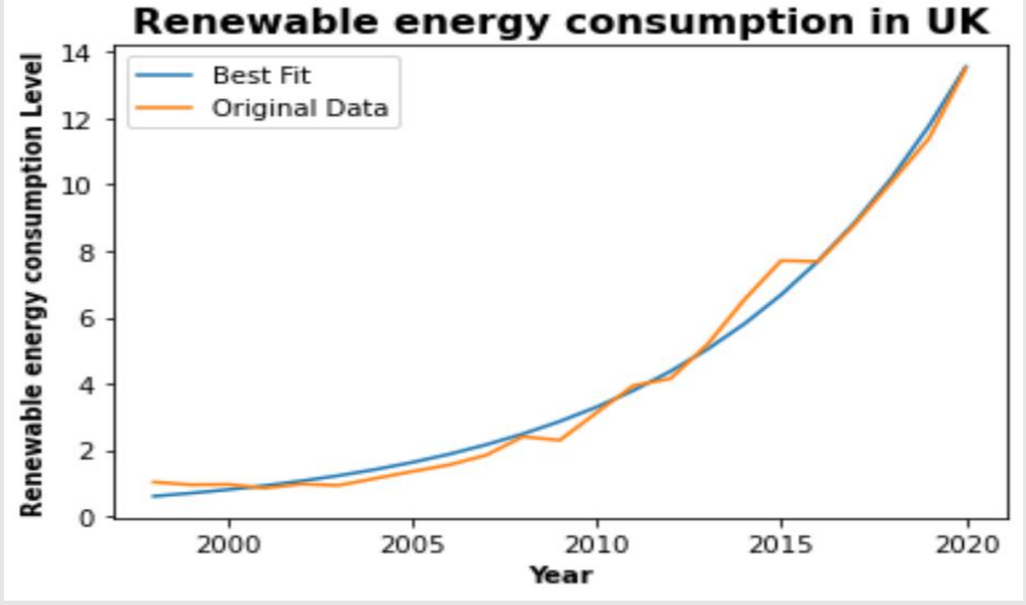




Interpretation of my findings







A significant observation occurred after a thorough data cleaning procedure and the use of a heatmap to evaluate the association between indicators. Population and consumption of renewable energy show less correlation, according to the data. Using clustering algorithms, I was able to identify significant patterns among the countries according to population and renewable energy use in my analysis. The purple, green, and final clusters were the three primary clusters visible in the clustering plot graph.

Purple Cluster: Low population growth and a high proportion of renewable energy usage.

Green Cluster: Population growth percentage below average and over 50% renewable energy usage.

Last Cluster: Extremely high population growth proportion and extremely low percentage of consumption of renewable energy.

This clustering graph offers important insights into how different nations display distinct trends in population and renewable energy consumption. Three countries, the United Kingdom, Brazil, and South Africa were chosen for an in-depth analysis from the green cluster. The fitting graph analysis of these nations' utilisation of renewable energy consumption produced some intriguing findings:

United Kingdom: Indicates a steady rise in the usage of renewable energy.demonstrates which of the chosen nations fits the best.

Brazil: Shows varying patterns in the use of renewable energy over time.

South Africa: Shows a downward trend in the use of renewable energy.The forecast study for the renewable energy consumption in the United Kingdom points to an ongoing growing trend. Drawing further conclusions from this forecast, it is projected that by 2040, the UK's share of renewable energy use will have increased significantly. Understanding the dynamics of renewable energy consumption and population developments across nations is made possible with the use of this information. Stakeholders and policymakers can use these insights to help them make well-informed decisions about future planning and sustainable energy practices.

In conclusion, this comprehensive analysis provided practical insights for future environmental and economic planning in addition to illuminating the complex dynamics of climate change indicators. The report analyzes data on population and renewable energy consumption, revealing a weaker correlation. Three clusters are identified: Purple, Green, and Final. Purple shows low population growth and high renewable energy usage, Green shows below-average growth with over 50% usage, and Final has extremely high population growth and low renewable energy usage. The United Kingdom shows steady renewable energy usage, Brazil varies, and South Africa declines. The forecast predicts continued growth by 2040.

GitHub:

https://github.com/Sowunmi-p/-INTERACTION-OF-CLIMATE-CHANGE-INDICATORS-USING-CLUSTERING-AND-FITTING