# Shaping Our Future: Understanding the Impacts of Climate Change

❑ **OBJECTIVE: Our objective** is to uncover valuable insights that shed light on the relationship between key indicators and their impact on CO2 emissions, population growth, renewable energy consumption, forest area, and agricultural practices.

❑ **METHODS:**

- Data Preparation
- Clustering Analysis
- Curve Fitting Models
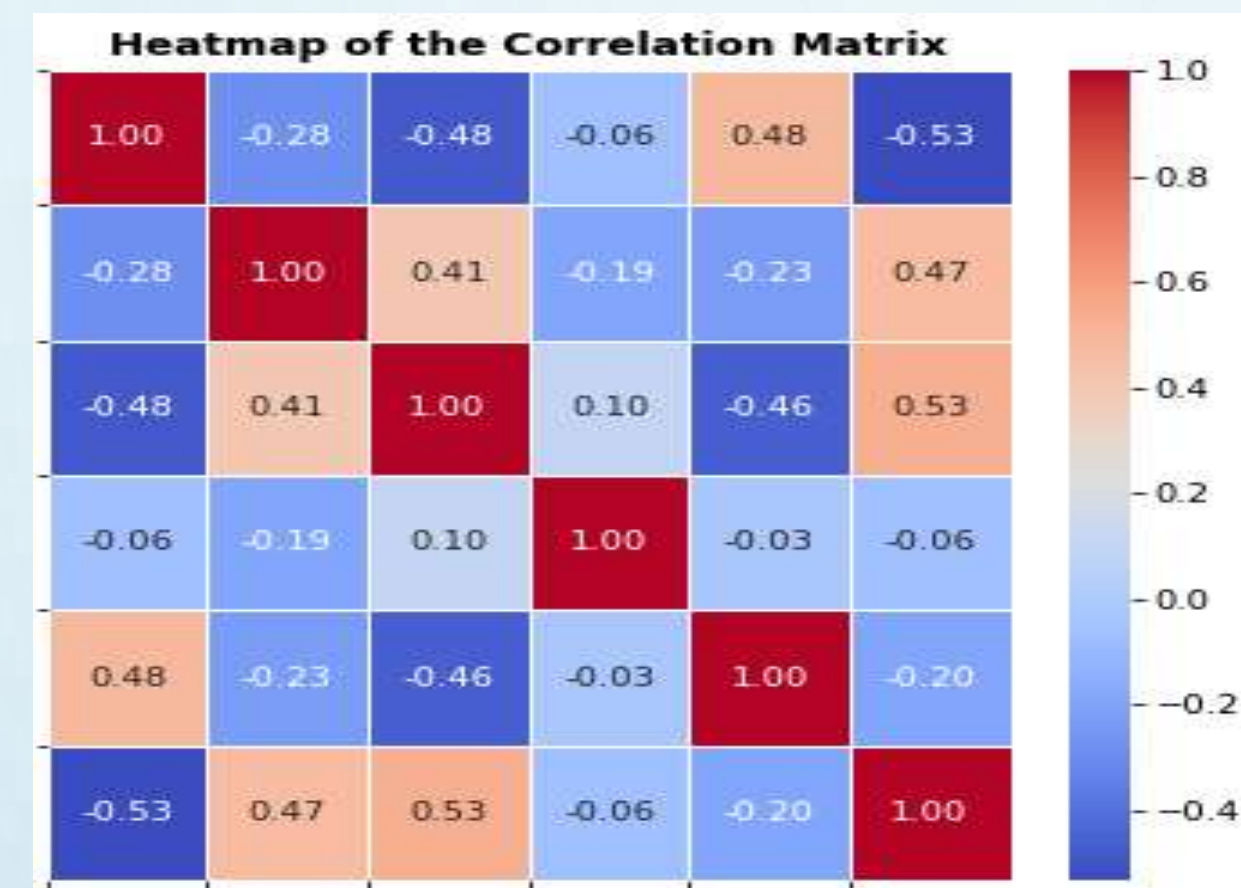- Comparative Analysis
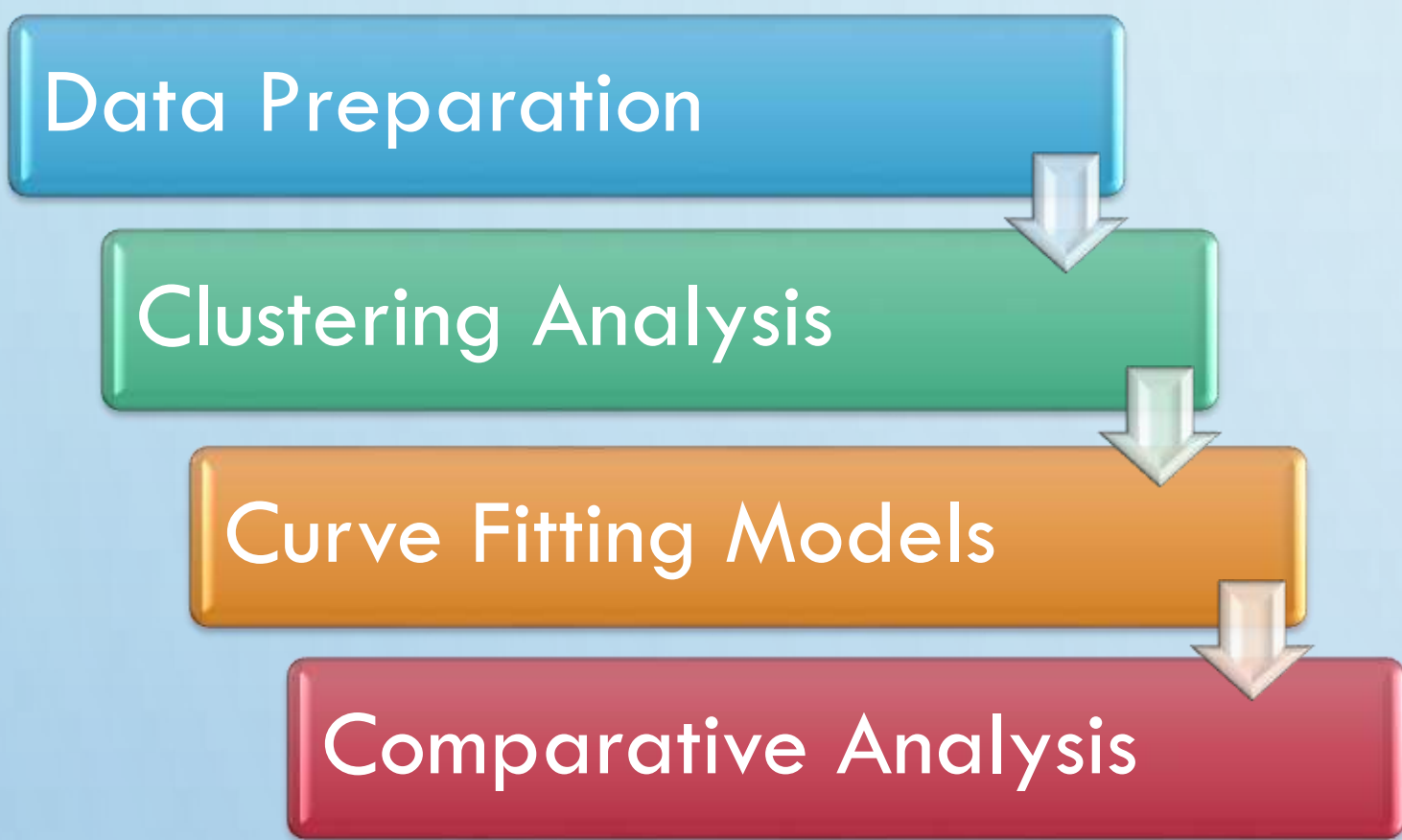
❑ **Climate change** is a pressing global issue with far-reaching implications for our planet and future generations. In this analysis, we delve into the complex dynamics of climate change by leveraging data and employing various analytical techniques.

❑ **Data Selection and Pre-processing:** To begin our analysis, we carefully selected a set of indicators related to climate change. By focusing on these indicators, we aim to capture the multifaceted nature of climate change.

❑ **Visualizing the Correlation Matrix:** To gain a comprehensive understanding of the relationships among our selected indicators, we created a heatmap of the correlation matrix. This visualization enables us to identify patterns, trends, and potential dependencies between variables.

HEATMAP OF CORRELATION

Heatmap of the Correlation Matrix

❑ **Clustering Countries for Comparative Analysis:** To explore further, we applied a clustering technique called K-means to group countries based on the similarities of their indicator profiles. By partitioning the data into distinct clusters, we can identify countries that exhibit similar patterns and characteristics regarding climate change.

Clustering of Countries - CO2 emissions (metric tons per capita)
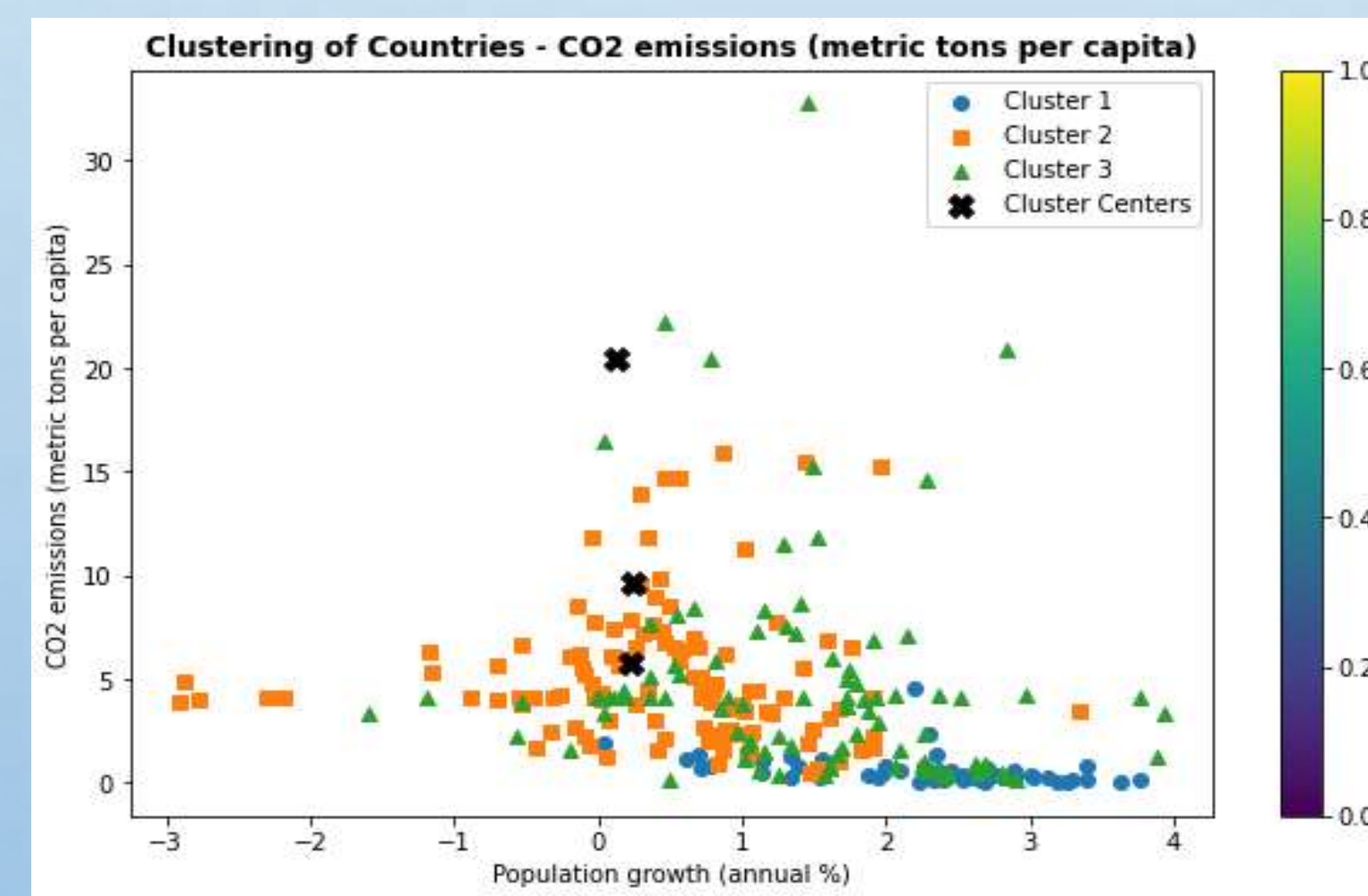
❑ **Insights from Clustering:** By visualizing the clustering results, we can uncover intriguing insights into the relationships between different indicators. Each cluster represents a unique profile of countries with distinct characteristics and policy implications.

❑ By examining the composition of these clusters, we gain valuable insights into commonalities and disparities in CO2 emissions, population growth.

This clustering approach helps us discern underlying trends and variations across regions, providing a basis for comparative analysis. This is the prediction values used for analysis.

Prediction	Prediction	Prediction	Prediction	Prediction
5.388	5.343	5.291	5.233	5.168
5.017	4.932	4.84	4.741	4.635
4.404	4.278	4.146	4.007	3.861
3.549	3.383	3.211	3.031	2.845
2.453	2.246	2.033	1.814	1.587

Modelling the Impact of Population Growth on CO2 Emissions:

Polynomial Regression
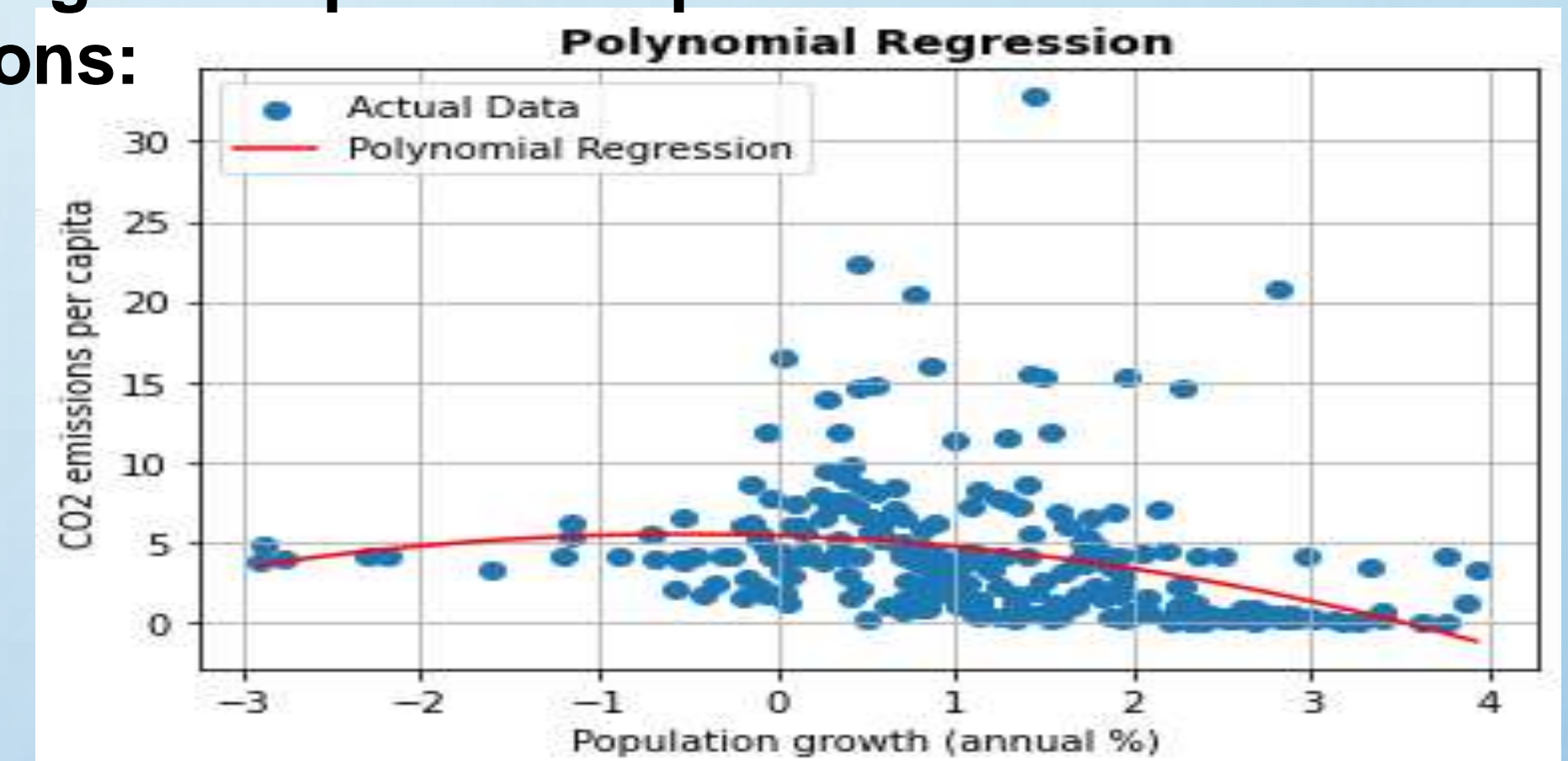
Prediction for New Data: The polynomial regression model provided a means to predict values for selected indicators based on the relationships identified.

The insights gained can inform policy formulation, strategic planning, and resource allocation to foster sustainable development.

❑The analysis provided valuable insights into the dataset, uncovering patterns, relationships, and variations among countries.

Conclusion

The findings assist researchers in identifying areas of interest for further investigation.

The findings can contribute to a better understanding of socio-economic factors, aid policy-makers in decision-making.

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DATA : CLIMATE CHANGE Climate Change | Data (worldbank.org)

REPO LINK : BineeshaBaby/Clustering_and_Fitting (github.com)