CURVE FITTING AND CLUSTERING

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Abstract :

In order to forecast the future trend of oil rents as a percentage of GDP, this research investigates the clustering of nations based on important socioeconomic factors and applies a low-order polynomial model. The study models the historical trend and projects future values using curve fitting and uses K-means clustering to find discrete groups among the countries. The purpose of the report is to forecast the course of a certain economic indicator and offer insights into global economic trends.

Introduction :

Policymakers, researchers, and businesses need to understand how countries behave based on socio-economic indicators in an era of rapidly changing global economic conditions. This paper explores two main analyses: utilizing a low-order polynomial model to forecast the future trajectory of oil rents as a proportion of GDP and clustering countries based on specific parameters.

Clustering :

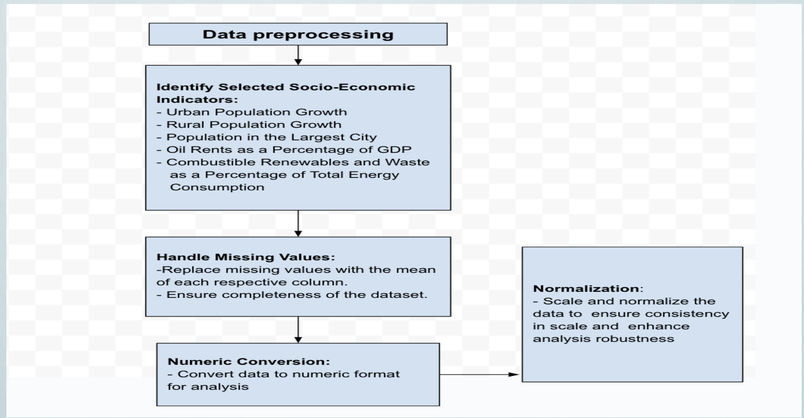
Using preprocessed data, the K-means algorithm is used in the clustering analysis to divide the countries into different groups. The results of the clustering analysis are informative. Based on factors like oil rents and the increase of the urban and rural populations, countries are categorized. Obtaining a silhouette score of 0.6613 for six clusters shows a respectable level of separation between the clusters created using k-means clustering.

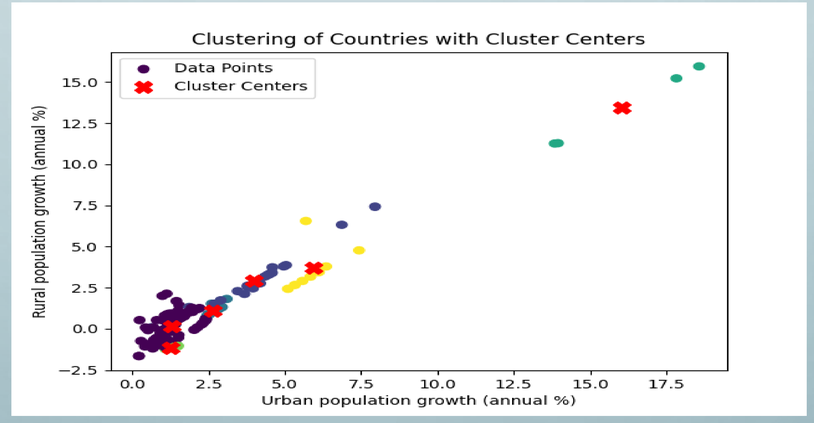
Modelling Oil Rents :

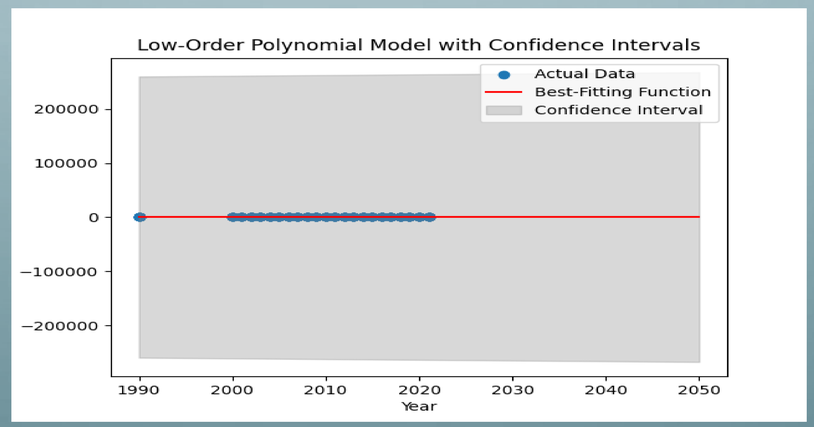
The study that follows aims to forecast the oil rents' future trend. Applying a low-order polynomial model while accounting for past data The method of curve fitting is used to produce projections for the future. The err_anges function is utilised to compute confidence intervals, which enhance the forecasts by offering a spectrum of possible results.

Conclusion :

The importance of careful data preparation in guaranteeing the validity of later analysis is highlighted in this study. A thorough grasp of global economic patterns is aided by the combined outcomes of curve fitting and clustering approaches. The results provide decision-makers with insightful information for formulating strategies and policies.







Year1	Prediction of Oil rents
2038	1.73826903
2039	1.71349458
2040	1.69117297
2041	1.67130421
2042	1.65388828
2043	1.6389252
2044	1.62641496
2045	1.61635756
2046	1.608753
2047	1.60360128
2048	1.60090241
2049	1.60065638
2051	1.60286318

DataSource_Link : https://databank.worldbank.org/reports.aspx?source=2&series=AG.LND.FRST.ZS&country=#

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