

Clustering and fitting

NAME: BHASKAR CHERUKU

STUDENT ID: 22003064

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GITHUB REPOSITORY LINK: https://github.com/bc22aba/applied_data_science/tree/main/assignment-3

INTRODUCTION:

Analysis Related To Public Data From The World Bank, And Specifically Country-by-country Indicators Related To Climate Change, [Datalink](#). For The Visualization Perspective The Additional Relevant Indicators Are Used For GDP Per Capita ([Additional Datalink](#)). From The Data Retrieved From The Internet Find The Cluster Visualization For The Relevant Features.

DATA EXPLORATION:

Data Was Downloaded From The Mentioned Datalink, Dataset Contains The Total 66 Features And 266 Samples Are There, From The Year 1960 To 2021 Data Was Shared. Mainly Data Is Having The Country Name, Code, Indicator And Different Year CO2 Emission Data. Emission Data Has Been Observed During Different Year And Country, Idea Is To Explore The Data Clustering.

VISUALIZATION:

K-means Clustering algorithm applied to check the Co2 emission data total 4 different clusters are formed.

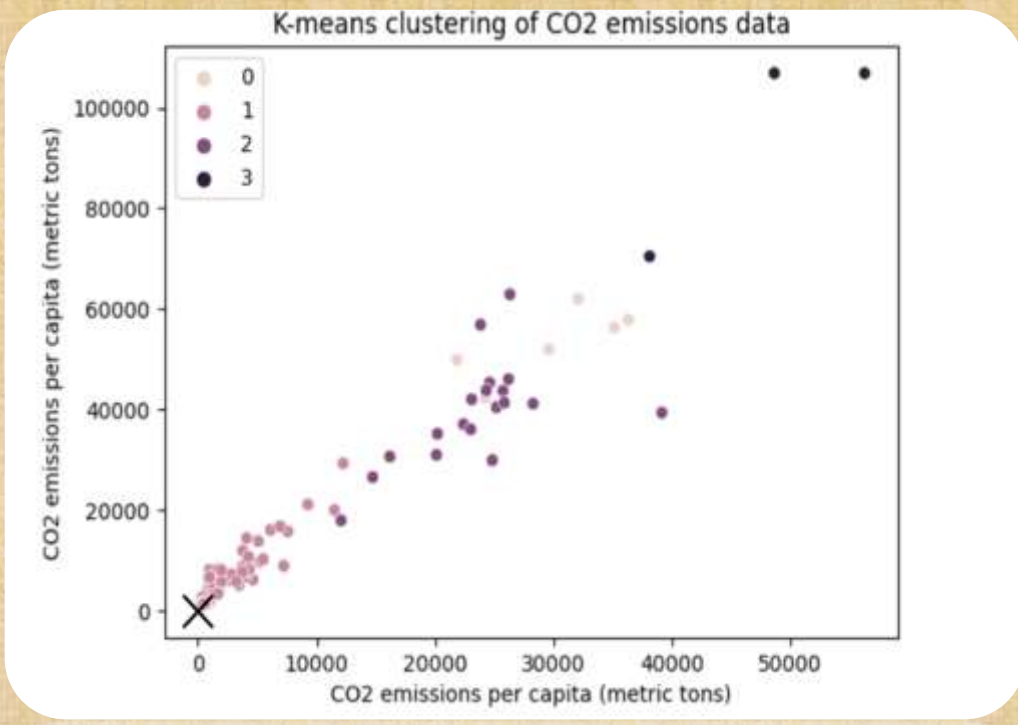


Figure 1. Overall Clustering Formatic

Since the dataset is containing information about the different year wise carbon emission for the particular Country Per capita. Carbon emission values are in terms of metric tons.

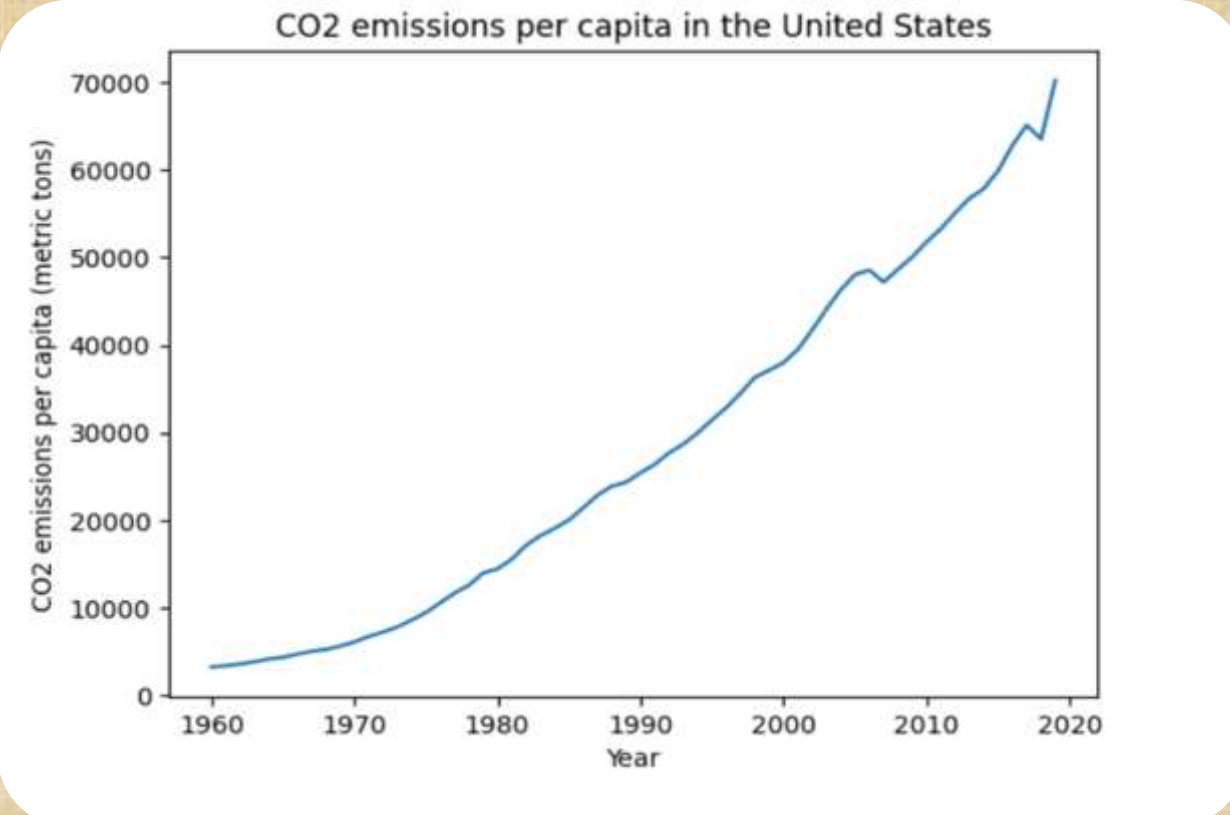


Figure 2. CO2 emissions per capita during 1960 to 2020

It has been observed that during each and every year the co2 emissions value is increasing.

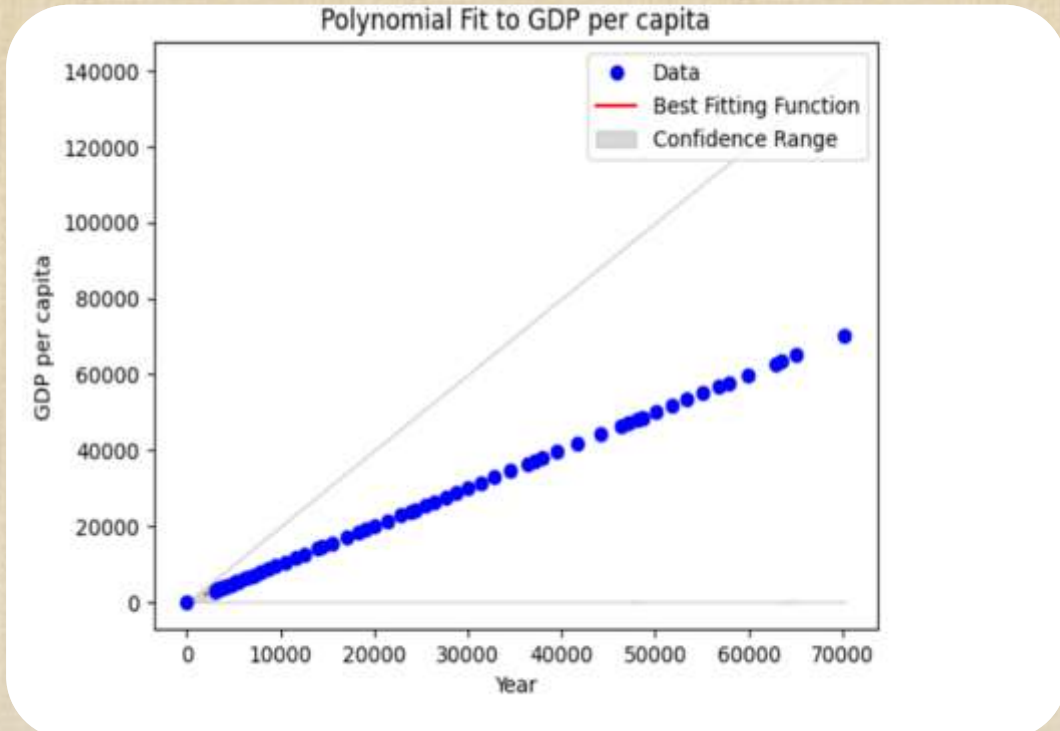


Figure 3. Polynomial Fit to GDP per capit

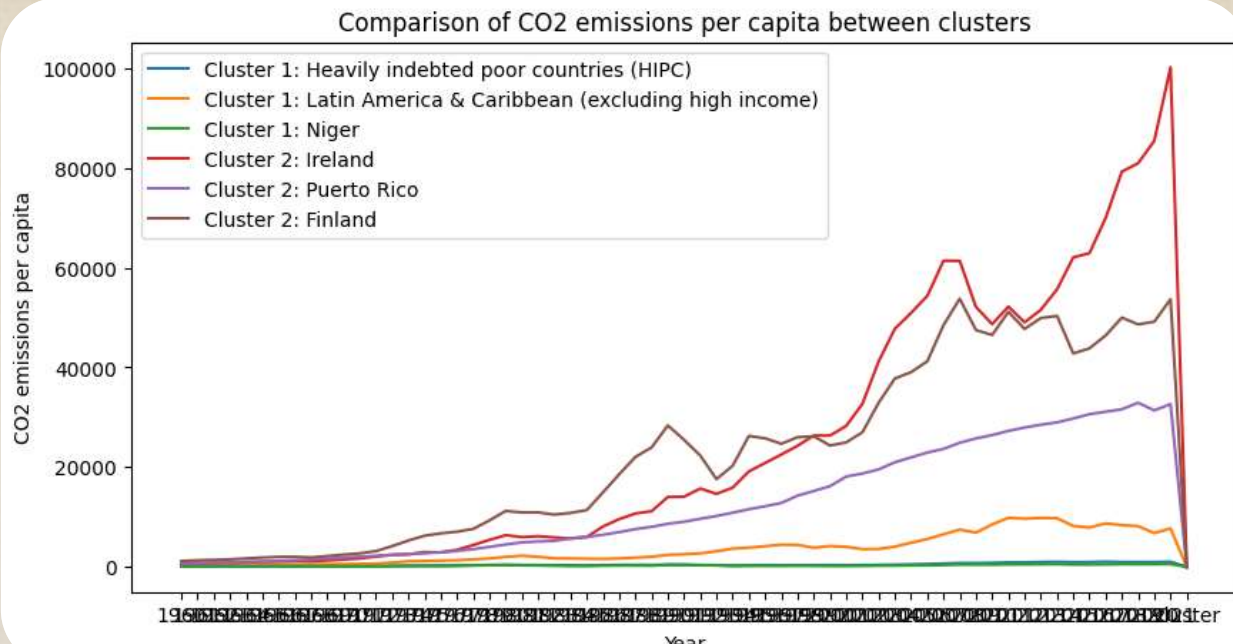


Figure 4. Different comparison of co2 emissions per capita between two different clusters country and based on the country cluster comparisons are made.

Here, data

Distribution is distributed

in a linearly Increasing

manner, so line fitting

function will be able to fit
line properly.

After getting the cluster

Formation and country

Distribution according to Cluster wise.

for the Visualization purpose. Sample country from

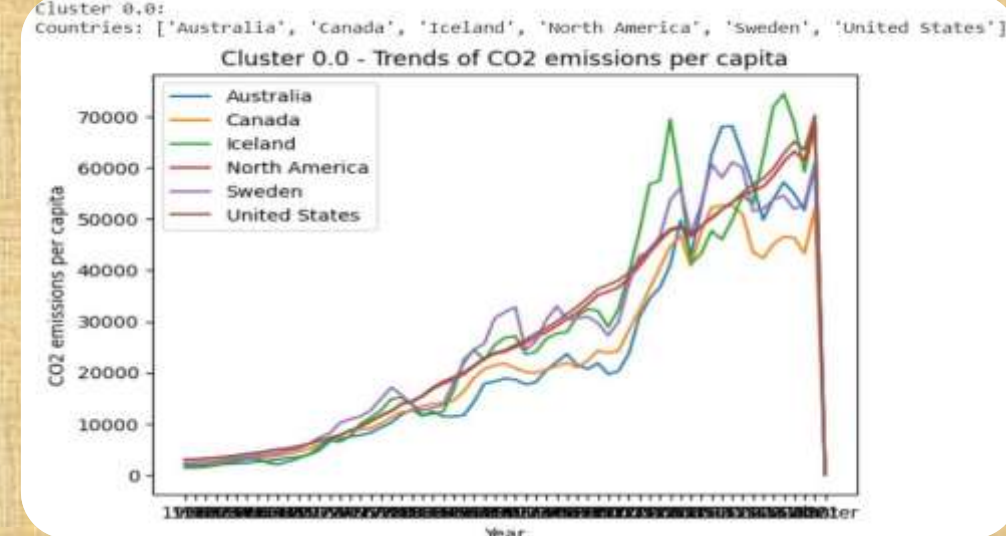


Figure 5: Cluster 0 country Trends CO2 emissions per capita

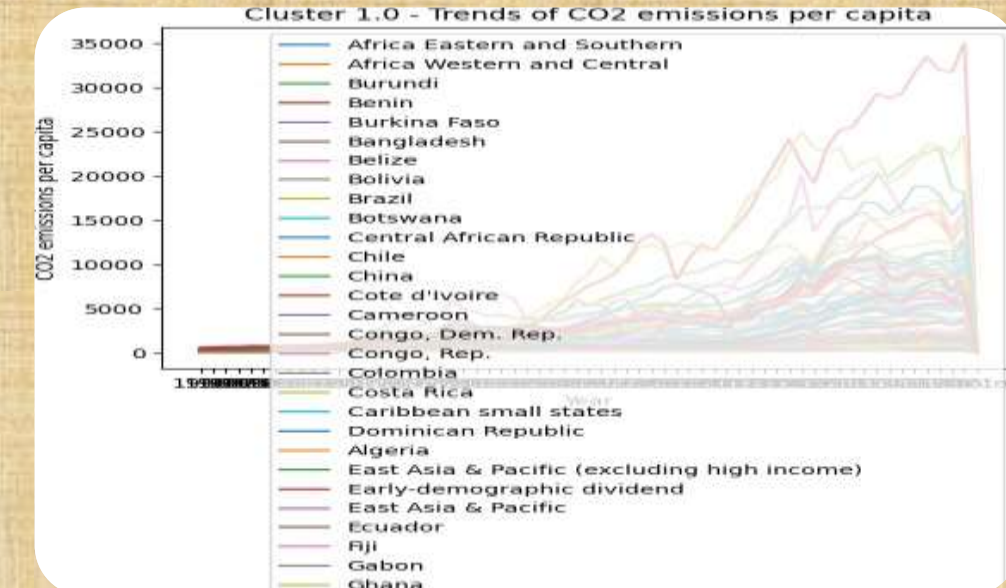


Figure 6: Cluster 1 country Trends CO2 emissions per capita

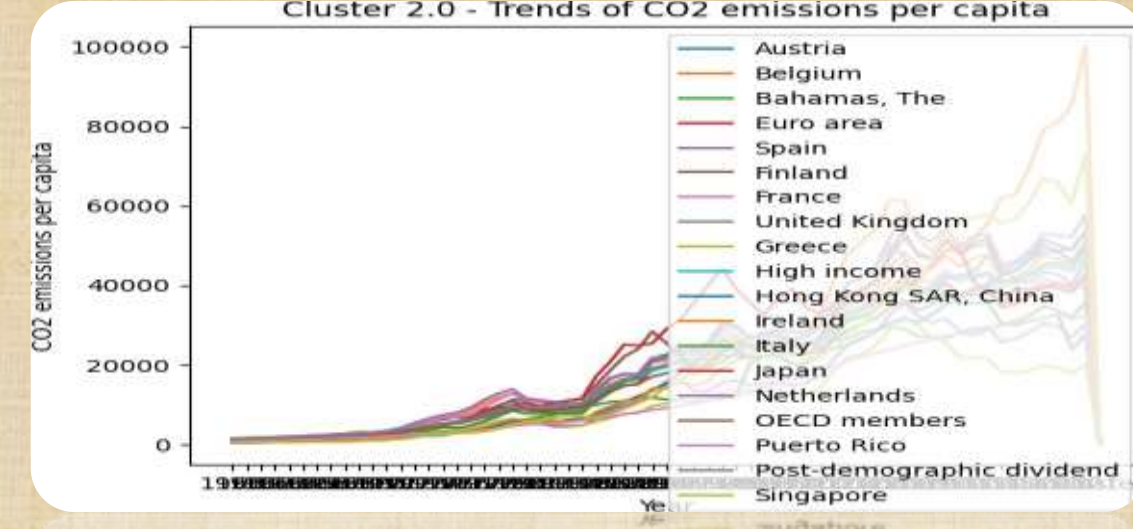


Figure 7: Cluster 2 country Trends CO2 emissions per capita

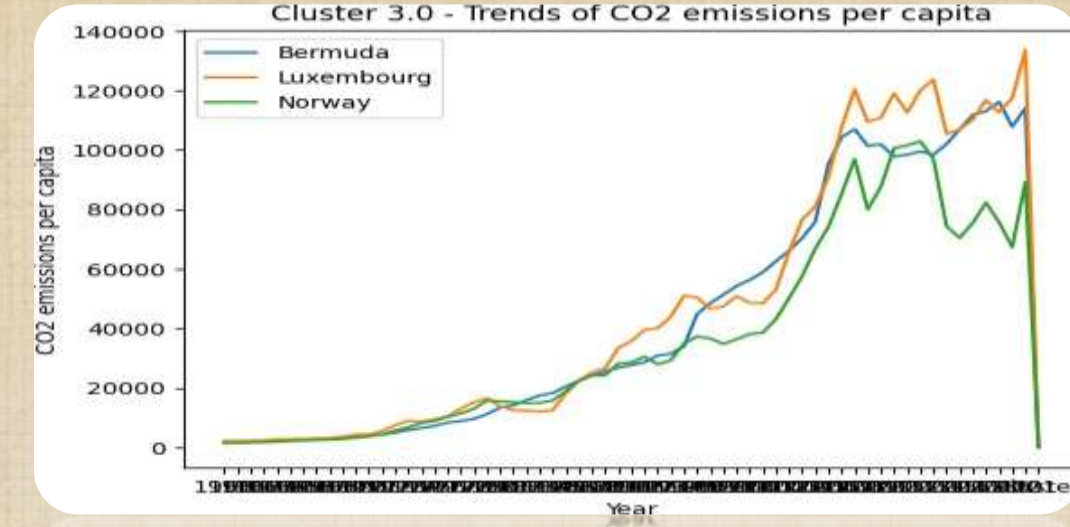


Figure 8: Cluster 3 country Trends CO2 emissions per capita

Cluster Number	Country Name
0	Countries: [Australia, 'Canada, 'Iceland, 'North America', Sweden, 'United States]
1	Countries: [Africa Eastern and Southern, 'Africa Western and Central', Burundi, 'Benin, Burkina Faso, 'Bangladesh, 'Belize, 'Bolivia, 'Brazil, 'Botswana, 'Central African Republic, 'Chile, 'China, 'Cote d'Ivoire, 'Cameroon, 'Congo, Dem. Rep., 'Congo, Rep., 'Colombia, 'Costa Rica, 'Caribbean small states, 'Dominican Republic, 'Algeria, 'East Asia & Pacific (excluding high income), Early-demographic dividend, 'East Asia & Pacific, 'Ecuador, 'Fiji, 'Gabon, 'Ghana, 'Guatemala, 'Guyana, 'Honduras, 'Heavily indebted poor countries (HIPC), 'Haiti, 'IBRD only, 'IDA & IBRD total, 'IDA total, 'IDA blend, 'IDA only, 'India, 'Jamaica, 'Kenya, 'St. Kitts and Nevis', 'Korea, Rep., 'Latin America & Caribbean (excluding high income), 'Latin America & Caribbean, 'Low income, 'Si Lanka, 'Lower middle income, 'Low & middle income, 'Lesotho, 'Late-demographic dividend, 'Morocco, 'Madagascar, 'Mexico, 'Middle income, 'Malawi, 'Malaysia, 'Niger, 'Nigeria, 'Nicaragua, 'Nepal, 'Pakistan, 'Panama, 'Peru, 'Philippines, 'Papua New Guinea, 'Pre-demographic dividend, 'Portugal, 'Rwanda, 'South Asia, 'Sudan, 'Senegal, 'Sierra Leone, 'Sub-Saharan Africa (excluding high income), 'Sub-Saharan Africa, 'Suriname, 'Eswatini, 'Seychelles, 'Chad, 'East Asia & Pacific (IDA & IBRD countries)', 'Togo, 'Thailand, 'Timor-Leste, 'Tanzania, 'Tunisia, 'Turkmenistan, 'Uganda, 'Upper middle income, 'Uruguay, 'St. Vincent and the Grenadines, 'World, 'South Africa, 'Zambia, 'Zimbabwe]
2	Countries: [Austria, 'Belgium, 'Bahamas, The, 'Euro area, 'Spain, 'Finland, 'France, 'United Kingdom, 'Greece, 'High income, 'Hong Kong SAR, China, 'Ireland, 'Italy, 'Japan, 'Netherlands, 'OECD members, Puerto Rico, 'Post-demographic dividend, Singapore]
3	Countries: [Bermuda, 'Luxembourg, 'Norway]

Figure . Cluster number and country details in table format

