

HELP International NGO Report

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Briefing

HELP International is an international humanitarian NGO that is committed to fighting poverty and providing the people of backward countries with basic amenities and relief during the time of disasters and natural calamities.

- It runs a lot of operational projects from time to time along with advocacy drives to raise awareness as well as for funding purposes.
- Have been able to raise around \$ 10 million.
- The significant issues that come while making this decision are mostly related to choosing the countries that are in the direst need of aid.

Mission

To help CEO of **HELP International** to categorize the countries using some socio-economic and health factors that determine the overall development of the country and thus choose the countries that are in the direst need of aid.



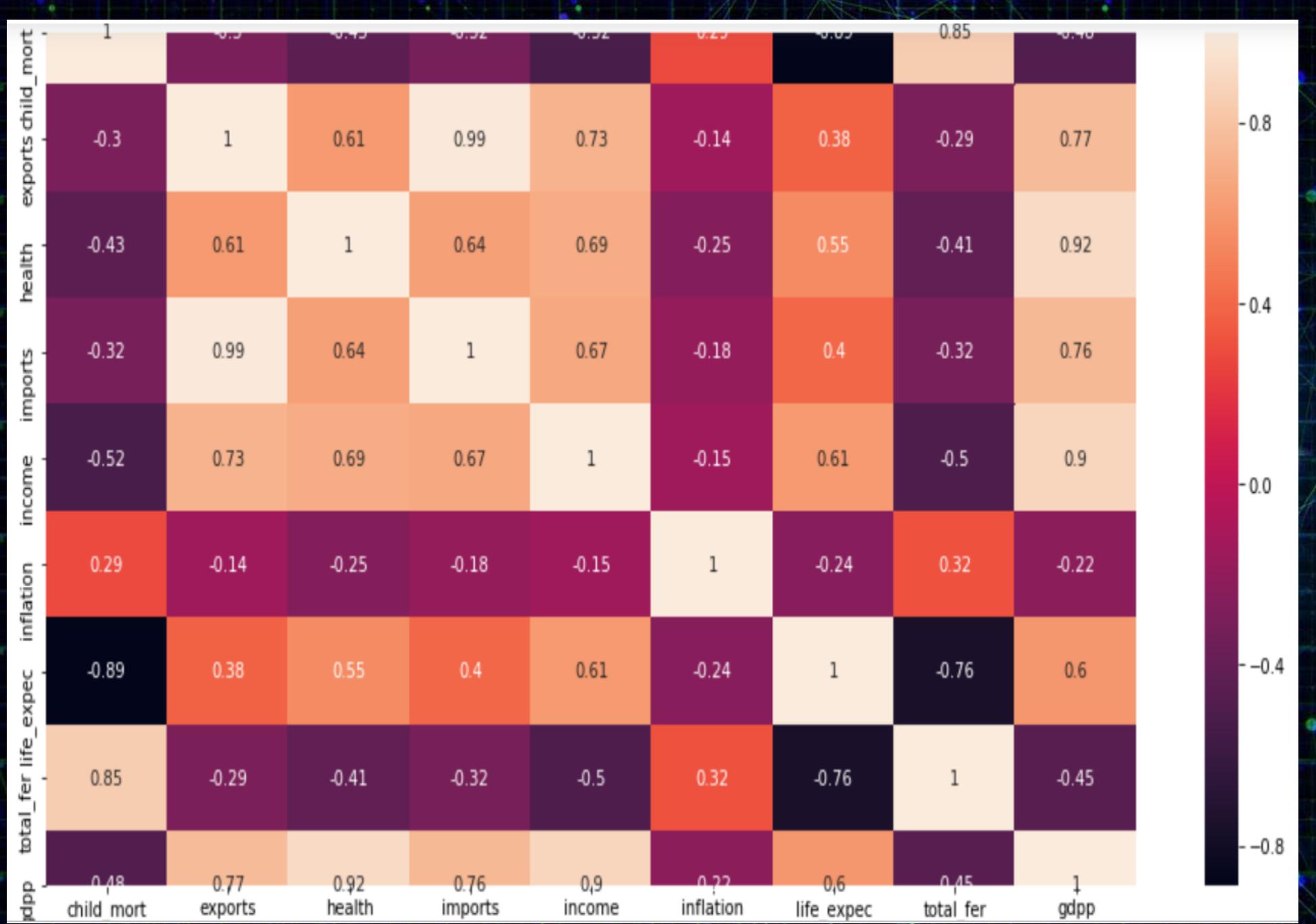
AGENDA

01 Principal Components Analysis

02 Outlier Analysis

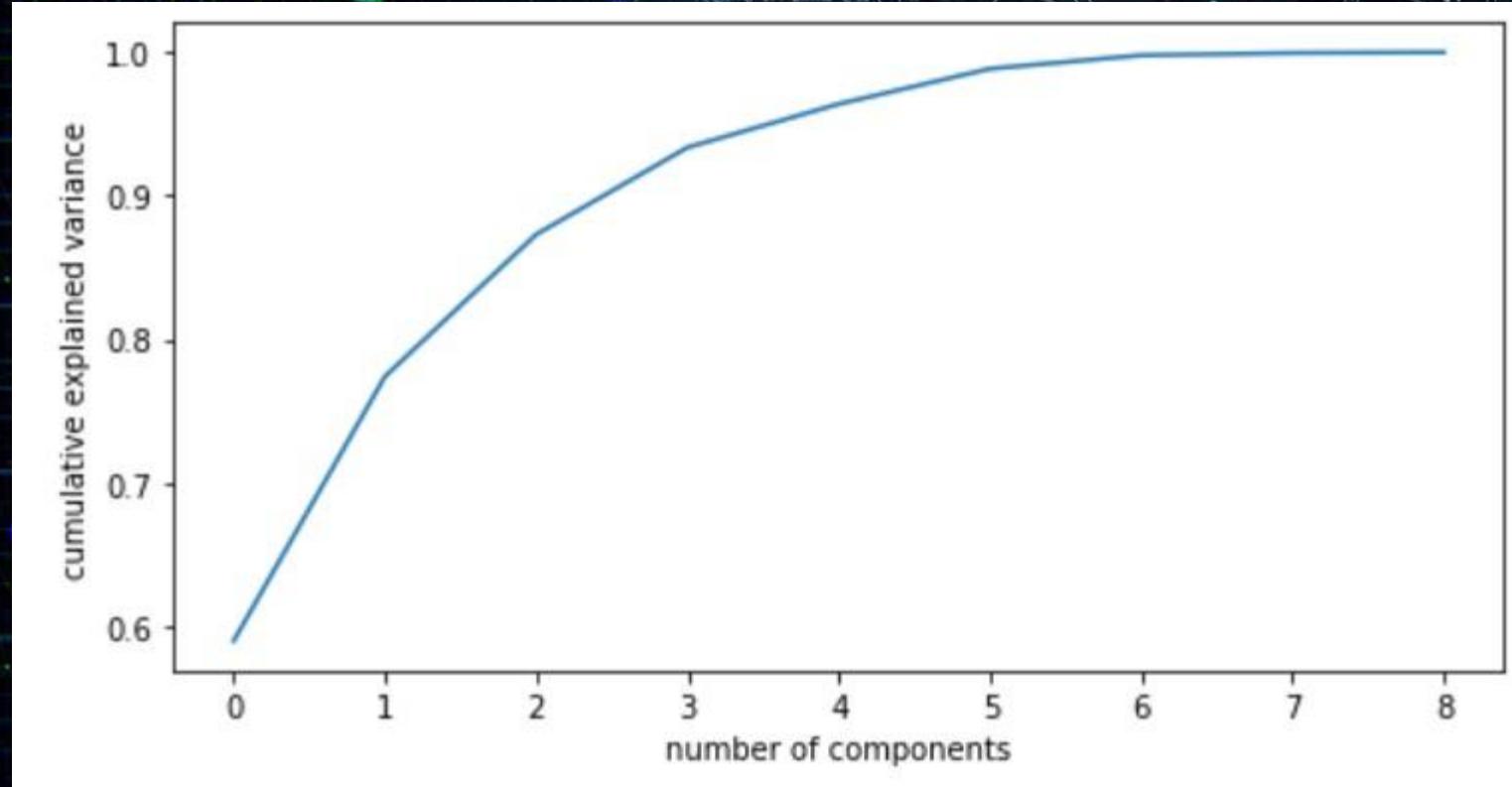
03 K-means and Hierarchical clustering

04 List of countries

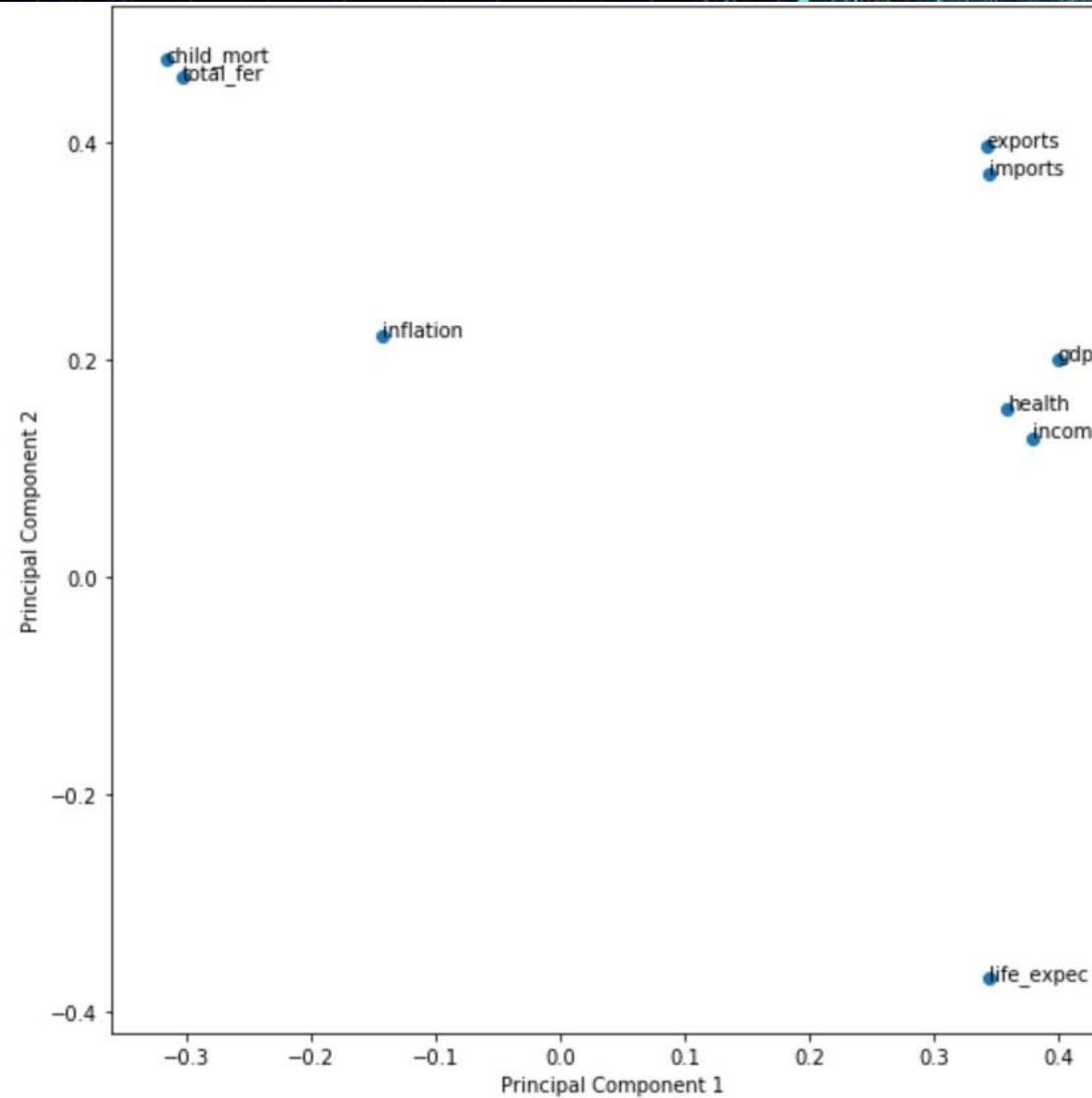


- A lot of highly correlated variables exist.
- Hence the usage of PCA is justified.
- Like GDP is highly correlated with income, health.

Scree plot

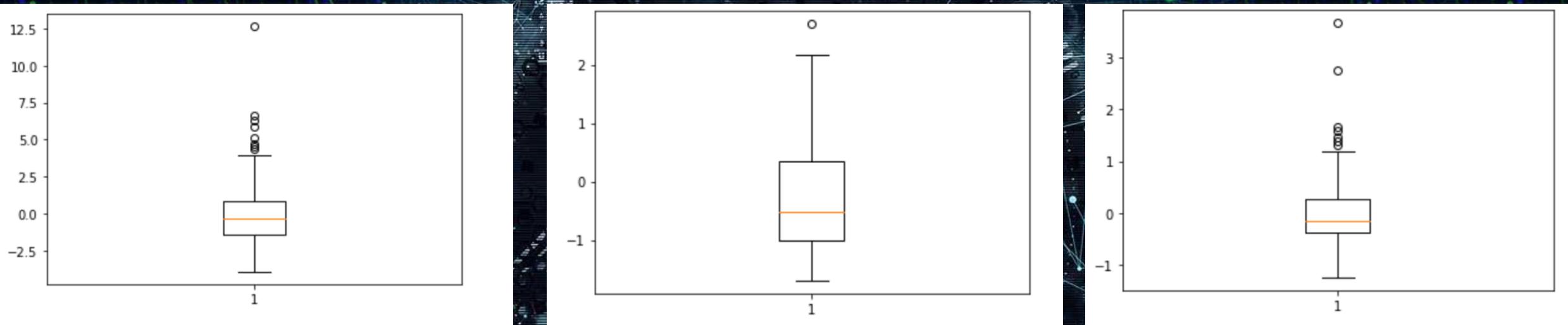


- Scree plot analysis tells the variance in the data
- From the graph about 90% variance is explained by top 3 components



- A lot of variables have a good loading score on the first principal component.
- Similarly Child mortality and total fertility is well explained by the 2nd principal component.

Outlier Analysis

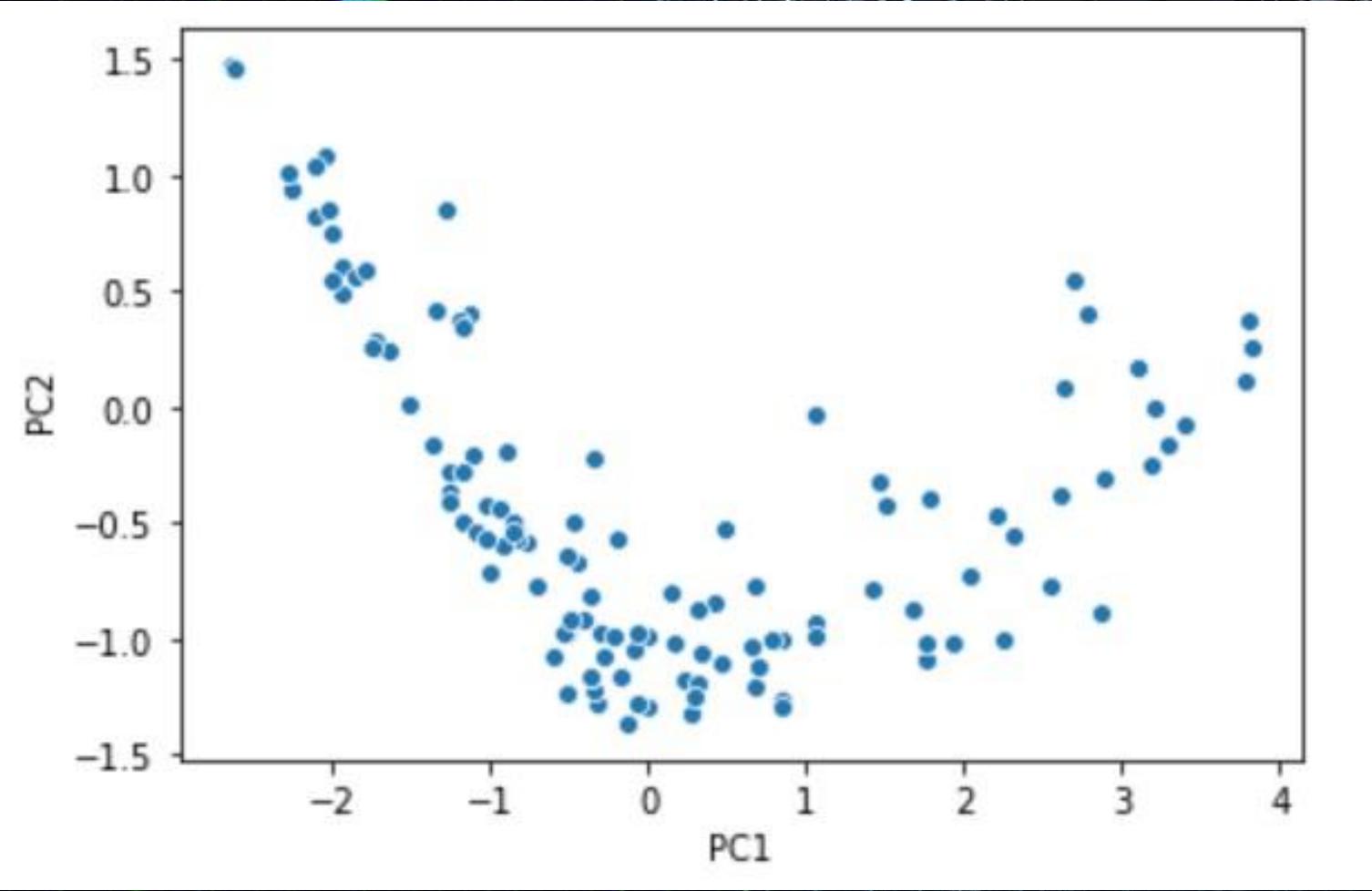


PC1

PC2

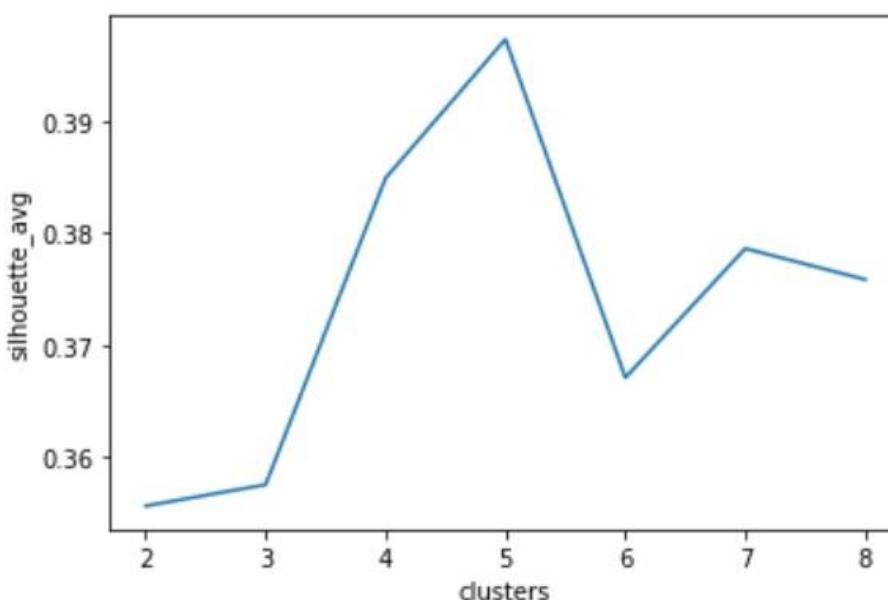
PC3

From the above box plots we can see there are lot of outlier are present. But their percentage is less. Thus we remove them for the data set.



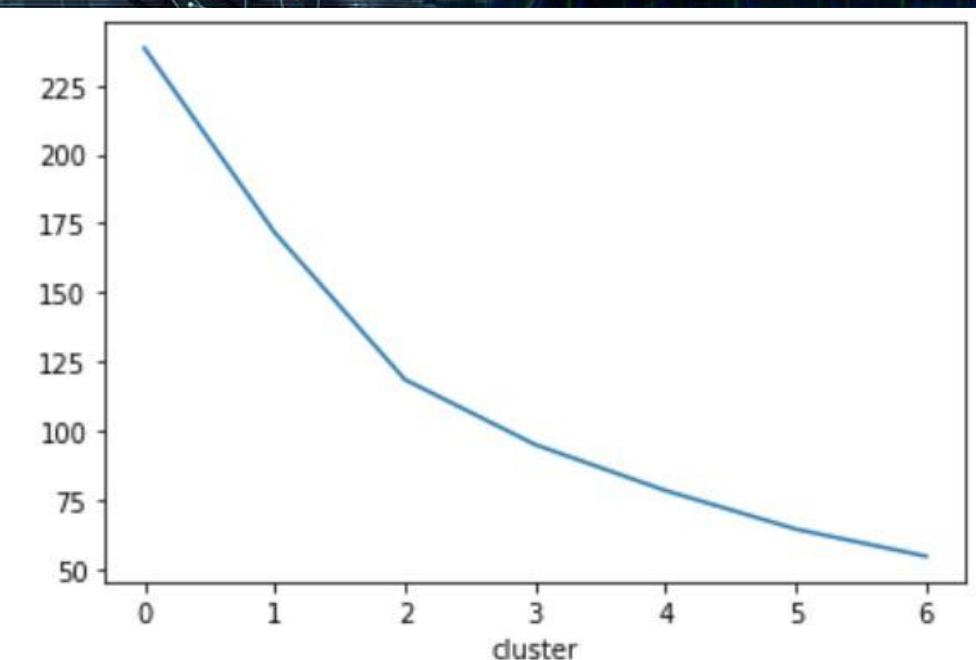
As we check the spread of data after PCA is performed we can see a lot of data is explained by PC1 and PC2.

Finding the optimal cluster using silhouette analysis and elbow curve

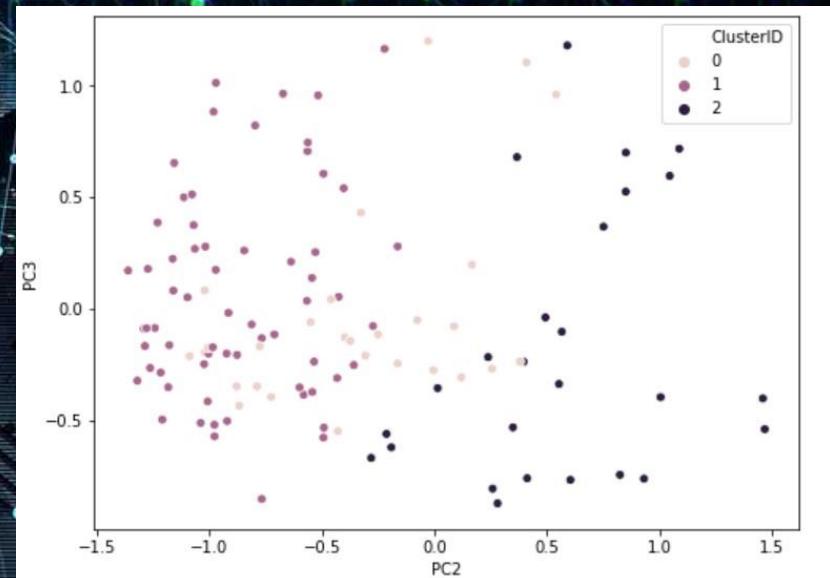
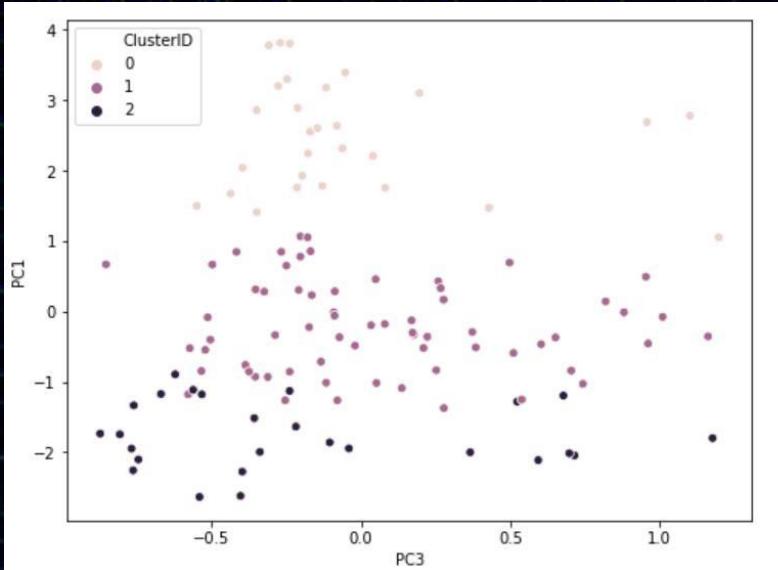


From the silhouette analysis the cluster comes out to be 5.

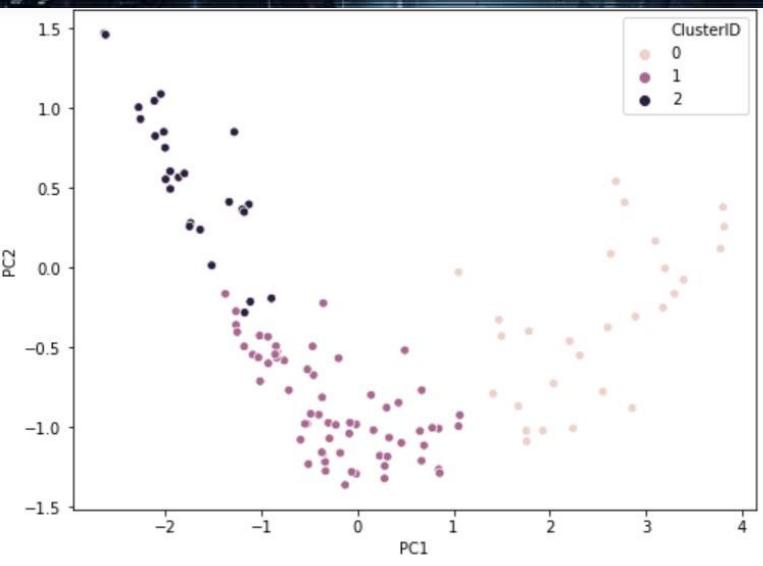
- From the Elbow Curve analysis the cluster comes out to be 3.
- As the variation is less after cluster 3.
- Thus we choose 3 optimal cluster.



Clustering



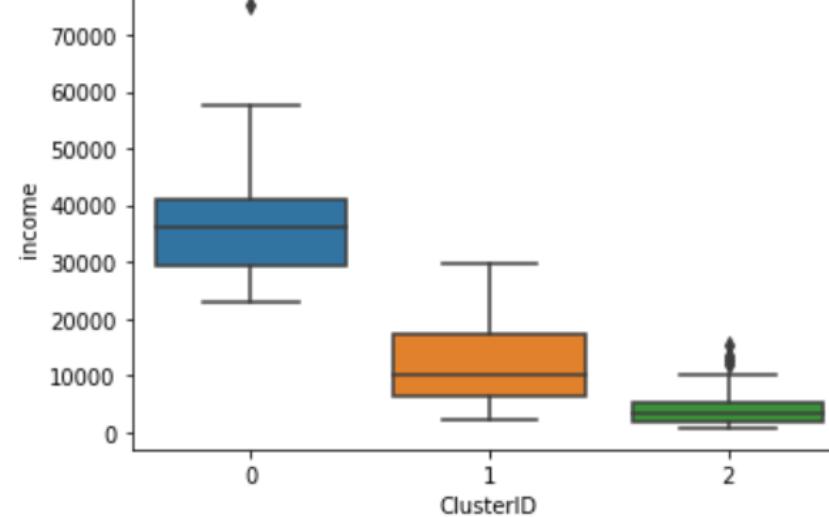
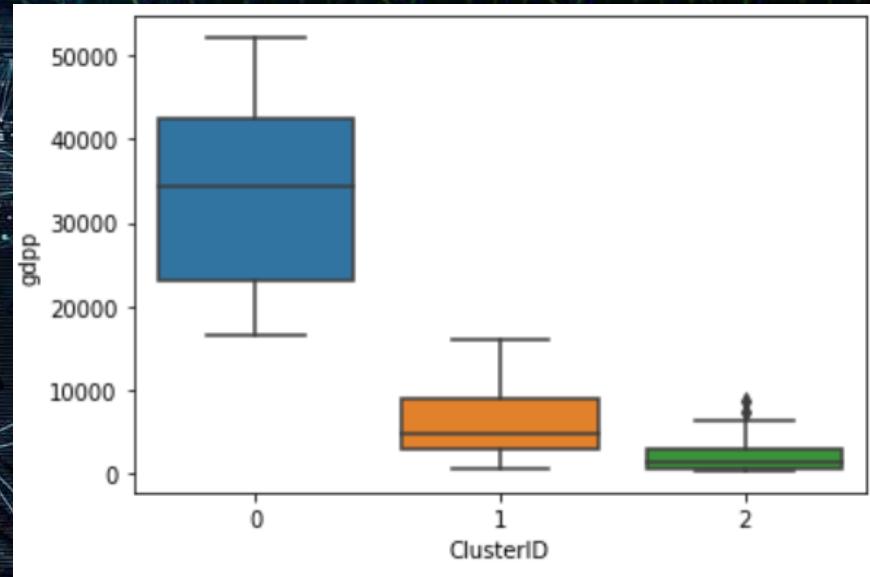
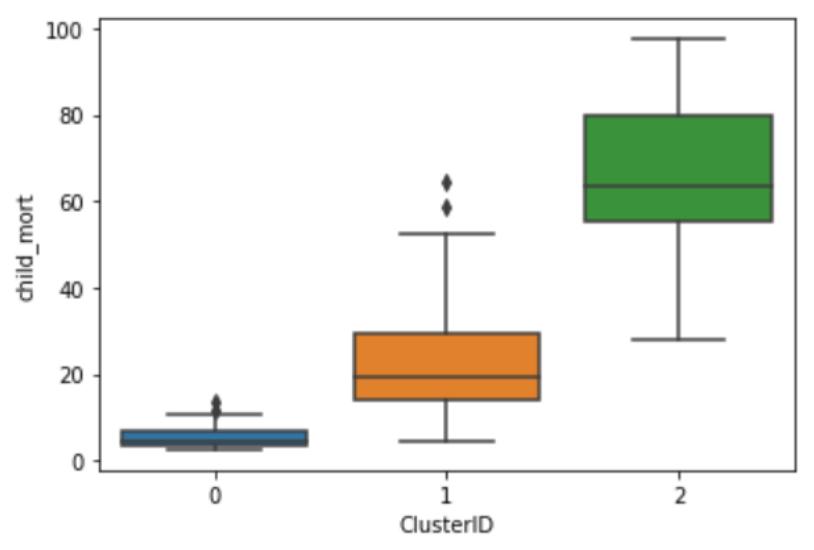
PC3 vs PC1



PC2 vs PC1

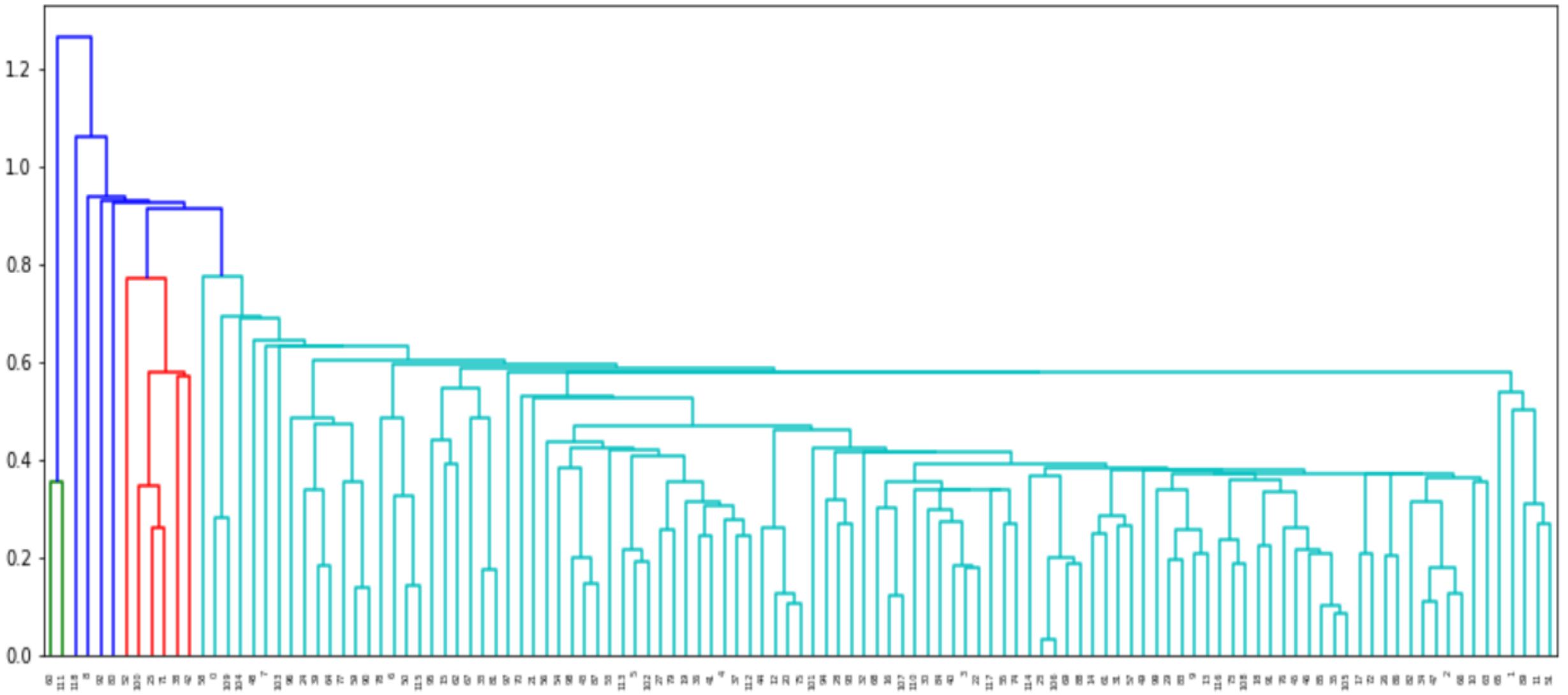
From the above three graph we can see in PC1 VS PC 2 there is a nice group of cluster formed.

Analysing the cluster on the dataset

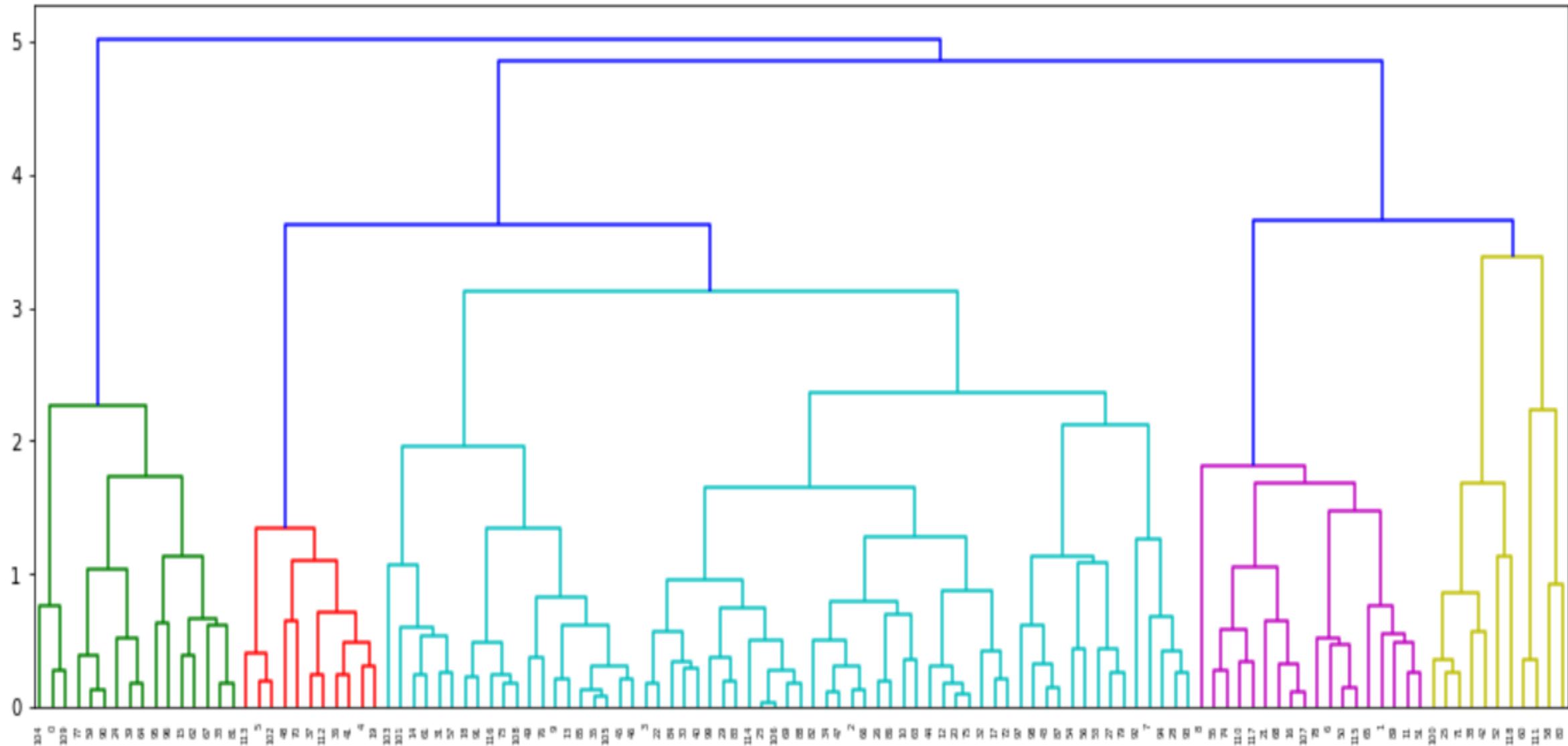


From the above three box plot it is clear that the cluster 2 are the countries that should be considered.

Hierarchical clustering– Single Linkage



Hierarchical clustering– Complete Linkage



Countries that need financial aid

Niger

Central African Republic

Guinea-Bissau

Sierra Leone

Liberia

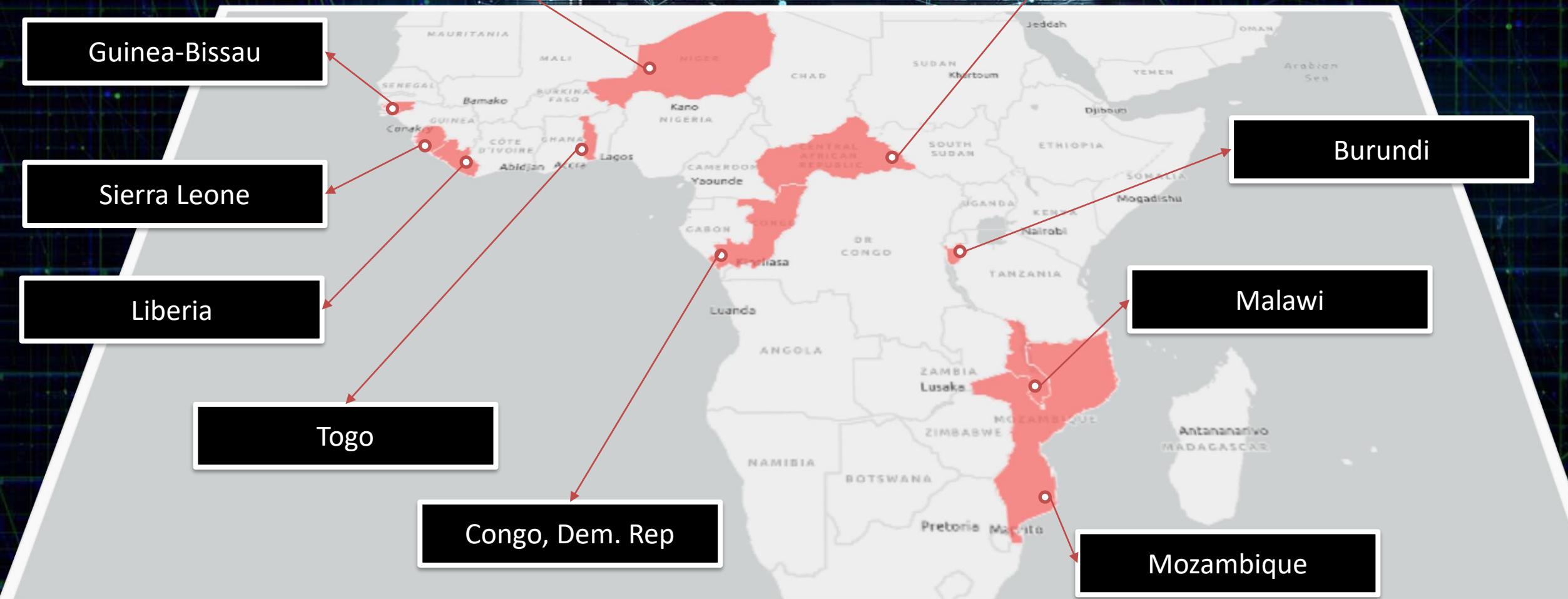
Togo

Congo, Dem. Rep

Burundi

Malawi

Mozambique





THANK YOU

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