

## **Assignment 1 – Visualization**

Name: P. R. W. M. R.Y. Weerakotuwa

Student D: 21090263

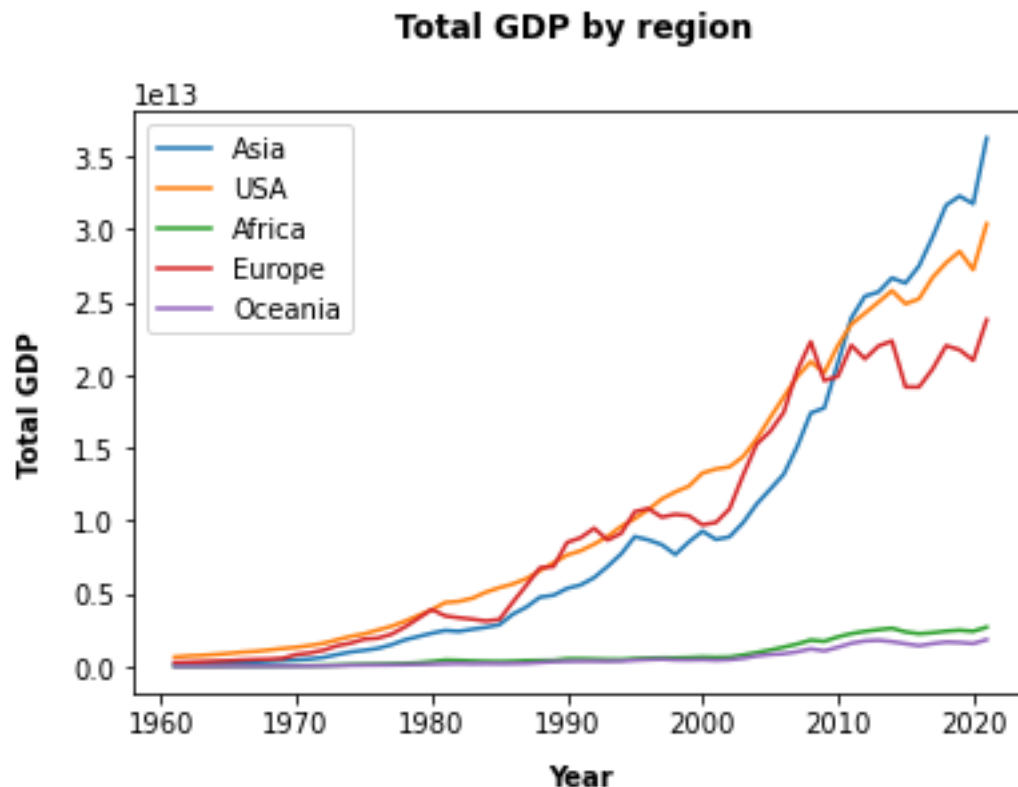
Link for the datasets:

[PIB-GDP Global by countries since 1960 to 2021](#)

[Population world since 1960 to 2021](#)

Link for the GitHub repository:

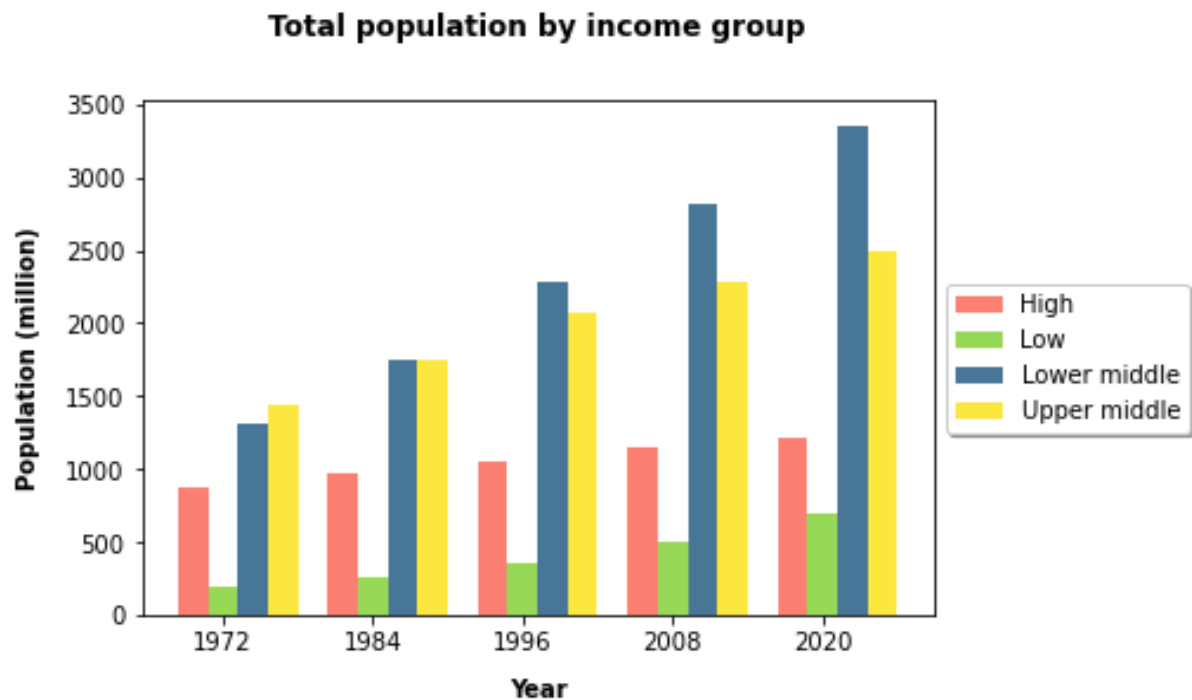
[RidmieWee\(Github\)](#)

Visualization 01: Total GDP of regions

A multiple-line graph can be used to show trends or changes over time in multiple sets of data.

This line graph illustrates the total GDP (gross domestic product) of five regions over the last 61 years.

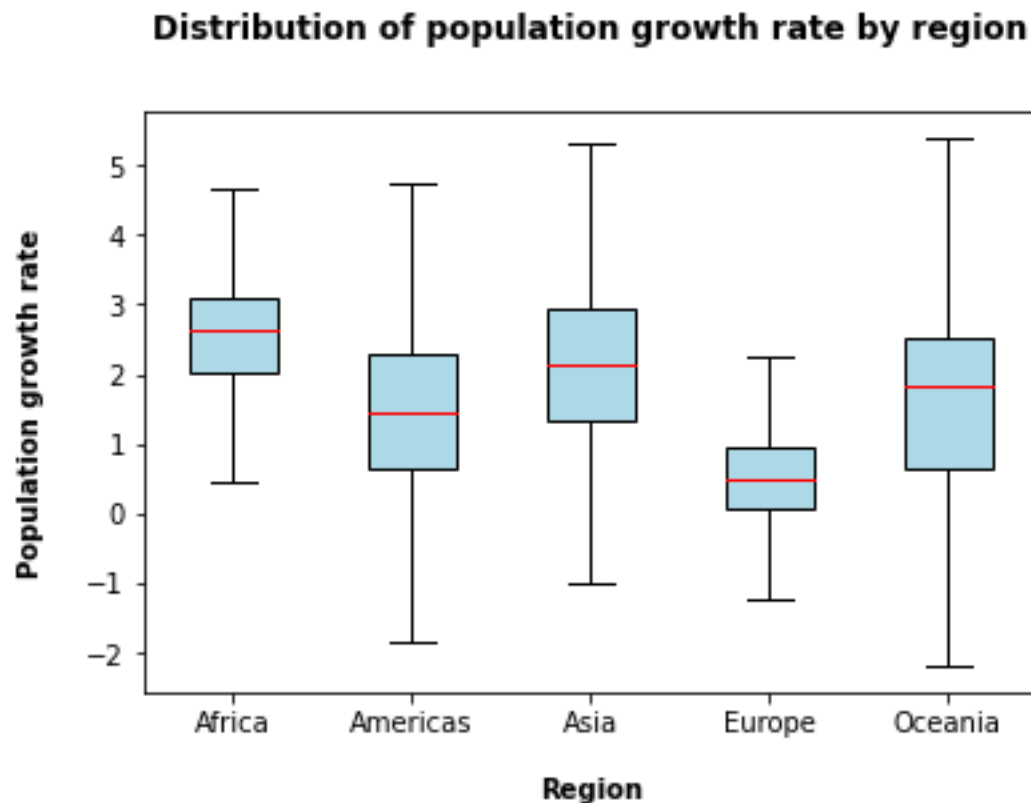
Over the given time period, the total GDP of all five regions increased. The United States had the highest GDP at the start of the period, but Asia surpassed it after 2010. After 1970, the total GDP of Asia, Europe, and the United States increased significantly. In comparison to Asia, Europe, and the United States, Africa and Oceania's total GDP remained stagnant over the period.

Visualization 02: Total population by income group

Grouped bar charts are useful for comparing the values of multiple variables within different categories. We can easily compare the values of each variable by grouping the bars together. In addition, grouped bar chart help identify patterns in data that may be missed by other types of charts. As an example, to compare the population of different income groups in different years, a grouped bar chart can show which income group has the most people in each year.

This grouped bar chart shows the total population in millions in four different categories of income in Asia, Europe, Africa, Oceania, and the USA over a period of 1972, 1984, 1996, 1998, and 2020.

Overall, the population of the lower middle-income group has grown considerably throughout the length of time in compared to the other groups. The population was highest in the upper middle-income group in 1972, but by 1984, the population of the lower middle-income group had increased to equal the population of the upper middle-income group. Following 1984, the population of the lower middle-income group surpassed the population in the upper middle-income group. The population of the high and low-income groups is much lower than that of the lower middle and upper middle groups, and throughout the specified time period, the low income group had the lowest population.

Visualization 03: Distribution of population growth rate by region

Boxplots can be used to display the minimum and maximum values, the median, and the interquartile range of a set of data, as well as its distribution and variability. This makes it easier to spot probable outliers and evaluate the data's general distribution. The ability to compare collections of data and identify variations in their central tendency and variability is also helpful. Plotting many boxplots side by side makes it easier to compare how each region's population growth rate is distributed.

This figure shows 5 boxplots representing the population growth rates of 5 different regions, including Africa, America, Asia, Europe, and Oceania.

Among the five regions, Africa has the highest median population growth rate and the closest interquartile range. The median growth rate is the same across America, Asia, and Oceania, with Europe having the lowest median growth rate. The population growth rates in Oceania span the largest range, with the upper whisker reaching up to 5.4 and the lower whisker reaching down to -2.3. The upper whiskers are similar in America and Asia, measuring 4.8 and 5.2, respectively. With an upper whisker of 2.4 and a lower whisker of -1.1, Europe has the narrowest range.

Generally, the boxplots indicate that there are significant regional differences in the rates of population growth, with Africa indicating the highest growth rate and Europe indicating the lowest. Africa has the narrowest interquartile range compared to Oceania, which suggests a more steady growth rate than in the other regions. Oceania has the widest range of growth rates.