**Objective**

The objective of this analysis is to explain GDP and its significance in measuring a country’s economic performance. It explores the relationship between GDP, population, literacy rate, and infant mortality, highlighting their interconnected impact on development. By analysing key economic indicators, the presentation aims to provide insights into how these factors influence overall growth and living standards. Additionally, it emphasizes the importance of data-driven policies for sustainable economic progress.

**Contents of the Dataset**

**Data from SQL:**

* Country & Country code – The country’s name and the country’s code which is just an abbreviation of the country name
* Region – The region or the continent to which the country belongs to
* Population - The total population of the country
* Population Density - number of individuals per unit area (like square kilometers or miles)
* GDP Per Capita – Economic output per person
* Birth rate – Annual number of Births from the country
* Death rate – A nation’s death number for the year
* Infant Mortality - number of children who die before their first birthday
* Literacy – Number of people who can read and write
* Agriculture - Contribution of agriculture to the economy, including GDP share
* Area - Total land area of a country in square kilometers
* Climate - Weather patterns influencing economic activities and living conditions
* Coastline Ratio - Length of a country's coastline relative to its land area
* Industry - Economic output from manufacturing, mining, and construction sectors
* Net Migration - Difference between immigrants and emigrants in a country
* Service - Economic contribution of the service sector, including trade and finance.

**Data from Excel:**

* Country & Country code - The country’s name and the country’s code which is just an abbreviation of the country name
* Years – The dataset has GDP from the years 1960 - 2016
* GDP – GDP of all the countries from the year 1960 to 2016
* Indicator code
* Indicator name
* **Population – Population of countries from 1960 - 2016**
* **Region – Geo location of the countries**
* **Income Group – Income category of the country such as Low Income, High Income, Medium Income**
* **Special notes – Details of the countries.**

**Data Cleansing and Importing**

**Excel**

* Vlookup – GDP data from all the three sheets were bought into one sheet using vloookup so that it would be easy for the user to import it into Power Bi.
* Removal of Duplicates – Duplicates are removed using conditional formatting to make sure there are no duplicated countries.

**SQL**

* The query provided has been executed in the MySQL workbench so that it is available to import to Power Bi from the SQL Server database.

**Power Query**

* The datasets from both MySQL and Excel were imported into Power BI and transformed using Power query
* Blank or cells with 0 were rectified by changing them to null
* The null values are then filled using “Fill up” & “Fill down”
* There were few outliers such as Niger’s literacy rate was more than 40k which was removed and the country’s literacy rate at the end of year 2016 was updated, the same was done for other countries whose values were incorrect
* Data type was regularized for all the columns, duplicates from the SQL queries were rectified
* From the Excel’s dataset, the GDP columns were unpivoted so that all the details can be under single column which can be identified using the year
* The same was done for the population from the population table, to make sure we do not have separate columns for separate years, at the end, we were able to minimize the year and the population to two columns.

**Power BI**

* The datasets were applied to power BI for data visualization and insights derivation using the option “Get Data”.

**Dax’s Used**

* Mean Population = AVERAGE(Population[Population])
* Median Population = MEDIAN(Population[Population])
* Mode Population = VAR ModeTable = ADDCOLUMNS (SUMMARIZE(Population, Population[Population], "Count", COUNT(Population[Population])), "Rank", RANKX(ALL(Population[Population]), [Count],, DESC, Dense))VAR ModeValue = FILTER(ModeTable, [Rank] = 1) RETURN MAXX(ModeValue, Population[Population])
* StdDev Population = STDEV.P(Population[Population])
* GDP Per Capita = SUM(GDP[GDP])/SUM(Population[Population]))
* Avg GDP Per Capita by Country = CALCULATE(AVERAGE(GDP[GDP Per Capita]), GROUPBY(GDP, GDP[Country Name]))
* Avg GDP Per Capita by Region = CALCULATE(AVERAGE(GDP[GDP Per Capita]), GROUPBY(GDP, GDP[Region]))
* Country with Highest GDP = VAR MaxGDP = MAXX(FILTER(GDP, GDP[Year] = 2016), GDP[GDP]) VAR Country = CALCULATE(FIRSTNONBLANK(GDP[Country], 1),GDP[Year] = 2016, GDP[GDP] = MaxGDP) RETURN Country & " - " & FORMAT(MaxGDP, "0,0")
* Country with Lowest GDP = VAR MinGDP = MINX(FILTER(GDP, GDP[Year] = 2016), GDP[GDP]) VAR Country = CALCULATE( FIRSTNONBLANK(GDP[Country], 1), GDP[Year] = 2016, GDP[GDP] = MinGDP) RETURN Country & " - " & FORMAT(MinGDP, "0,0")
* Min Infant Mortality = MIN(countries\_countries\_world[Infant Mortality])
* Max Infant Mortality = MAX(countries\_countries\_world[Infant Mortality])
* Range Infant Mortality =

[countries\_countries\_world[Max Infant Mortality] - countries\_countries\_world[Min Infant Mortality]]

* StdDev Infant Mortality = STDEV.P(countries\_countries\_world[Infant Mortality])
* Avg Literacy Rate by Country = CALCULATE(AVERAGE(countries\_countries\_world[Literacy]), GROUPBY(countries\_countries\_world, countries\_countries\_world[Country Name]))
* Avg Literacy Rate by Region = CALCULATE(AVERAGE(countries\_countries\_world[Literacy]),GROUPBY(countries\_countries\_world, countries\_countries\_world[Region]))
* Literacy GDP Correlation =

CORREL(countries\_countries\_world[Literacy], GDP[GDP])

* GDP Growth Rate = GDP Growth % = VAR PreviousYearGDP = CALCULATE(SUM(GDP[GDP]),FILTER(GDP,GDP[Country] = EARLIER(GDP[Country]) &&GDP[Year] = EARLIER(GDP[Year]) - 1))RETURN IF(ISBLANK(PreviousYearGDP), BLANK(), FORMAT(((GDP[GDP] - PreviousYearGDP) / PreviousYearGDP), "0.00%"))
* Population Growth Rate = Population Growth % = VAR PreviousYearPopulation = CALCULATE(SUM(Population[Population]), FILTER(Population,Population[Country] = EARLIER(Population[Country]) && Population[Year] = EARLIER(Population[Year]) - 1))RETURN IF(ISBLANK(PreviousYearPopulation), BLANK(), FORMAT(((Population[Population] - PreviousYearPopulation) / PreviousYearPopulation), "0.00%"))

**Summary of the Dashboard: Global Economic and Demographic Analysis**

The dashboard provides an interactive visualization of global economic and demographic trends, focusing on GDP, population, and related indicators.

**Charts Used & Key Insights**

1. World Map (GDP Representation)

* Chart Type: Map with data points
* Insights:
  + Countries with high GDP are concentrated in North America, Europe, and Asia.
  + Developing regions, such as Africa and parts of South America, have relatively smaller GDP sizes.

2. Key Point Indicators

* Metrics Displayed:
  + Number of Countries: 173
  + Total Population: 6,732.07M
  + Average GDP: 44,737,759K
  + Country with Highest GDP: United States ($18.6T)
  + Country with Lowest GDP: Tuvalu ($34.2M)
* Insights:
  + The GDP disparity between the highest and lowest countries is significant.
  + Global economic activity is heavily concentrated in a few major economies.

3. GDP & Population Across Time (Bubble Chart)

* Chart Type: Animated Bubble Chart
* Insights:
  + China and the United States dominate in GDP growth over time.
  + Emerging economies such as India and Indonesia show steady population growth alongside economic expansion.

4. Life Cycle (Donut Chart)

* Chart Type: Donut Chart
* Insights:
  + Infant mortality remains a significant issue in some regions despite declining birth and death rates.
  + Birth rates are higher than death rates globally, leading to population growth.

5. Region & Population Density (Pie Chart)

* Chart Type: Pie Chart
* Insights:
  + Population density varies significantly across regions, with Asia and Western regions having higher concentrations.
  + Some regions with lower population densities may have larger landmasses but fewer inhabitants.

6. Income vs Countries (Pie Chart)

* Chart Type: Pie Chart
* Insights:
  + High-income and upper-middle-income countries dominate the global economy.
  + Low-income nations make up a smaller portion of the world economy, reinforcing economic disparities.

7. GDP vs Population (Bar & Line Chart)

* Chart Type: Bar and Line Chart Combination
* Insights:
  + The U.S. leads in GDP, while China and India have the largest populations.
  + Some countries, like Switzerland and Singapore, have high GDP relative to their population size, indicating high per capita income.

This dashboard effectively presents economic disparities, population trends, and key economic indicators, offering valuable insights into global development patterns.

**Presentation Summary**

**Objective of the Presentation**

* The objective is to:
  + Explain **GDP's role** in measuring economic performance.
  + Analyse its relationship with **population, income, literacy, and infant mortality**.
  + Identify **regions performing well** in GDP growth.
  + Provide **data-driven insights** for policy decisions.

**2. Key Indicators**

* **Countries with Highest and Lowest GDP:**
  + USA has the **highest GDP**, while Tuvalu has the **lowest**.
* **Population Insights:**
  + China and India are the **most populated**, while Tuvalu has the **least population**.
* **Global Stats:**
  + **173 countries** and **11 regions** Analysed.
  + **Total population:** 6,732.07M.
  + **Average GDP:** 44,73,77,599K.

**3. DAX Formulas Used**

* **Statistical Measures:**
  + Mean, median, mode, and standard deviation of population.
* **GDP Analysis:**
  + Average GDP, GDP per capita.
* **Infant Mortality:**
  + Minimum, maximum, and standard deviation.
* **Literacy:**
  + Average literacy by country and region.
* **Additional DAX:**
  + Total population, GDP, and region-wise analysis.

**4. Life Cycle Analysis**

* **Country Insights:**
  + **Highest death rate:** Serbia.
  + **Lowest death rate:** Estonia.
  + **Highest birth rate:** Sweden.
  + **Lowest birth rate:** China.
* **Infant Mortality:**
  + **Highest:** Saudi Arabia.
  + **Lowest:** Singapore.
* **Regional Trends:**
  + Western Europe performs better in all fields.
  + **Latin America** has the **highest death rate**, while **Baltics** has the **lowest**.

**5. Income Classification**

* **Baltics**: The only region with **all high-income countries**.
* **Western Europe:**
  + **50% of the countries** are high-income.
* **Sub-Saharan Africa:**
  + More **low-income countries**.
* **Diverse Regions:**
  + Eastern Asia, Latin America, and Sub-Saharan Africa contain countries from all income categories.

**6. Regional Analysis**

* **Population Density:**
  + **Highest:** Western Europe, Eastern Asia.
  + **Lowest:** Northern Africa.
* **Population Insights:**
  + Eastern Asia is the **most populated region**.
  + Baltics is the **least populated**.
* **GDP Distribution:**
  + **Northern America** has the **highest GDP**.
  + Eastern Asia ranks **third** in GDP but **first in population**.

**7. Progression Timeline (1960 – 2016)**

* **1960 – 1980:**
  + USA, Japan, and Germany had the **highest GDP**.
  + China and India had the **highest population**.
* **1981 – 1999:**
  + Same top GDP countries.
  + Japan faced a **setback in 1998 – 2000** but remained in the top tier.
  + UK, France, Canada, and Italy steadily rose.
* **2000 – 2016:**
  + USA maintained the **highest GDP**, followed by **China**.
  + India ranked **2nd** in population but **7th** in GDP.
  + Brazil showed consistent **GDP and population growth**.

**8. Global Comparison**

* **Literacy Rates:**
  + **7 countries** (Australia, Andorra, Liechtenstein, Luxembourg, Finland, Denmark, Norway) have **100% literacy**.
  + **Niger** has the **lowest literacy rate**.
  + **Baltics** has the **highest average literacy rate**.
  + **Sub-Saharan Africa** has the **lowest average literacy rate**.
* **Net Migration:**
  + **Baltics, Latin America, and North Africa** show **negative net migration**.
  + **Western Europe and North America** have high positive net migration.
  + Countries with highest net migration: **Belgium, Italy, Switzerland, UK, UAE, Malta, Andorra**.

**9. GDP and Population Analysis**

* **USA** had the **highest GDP** from **1960 to 2016**.
* **China** became the **second-largest economy** after surpassing Japan post-2010.
* **Tuvalu** has the **lowest GDP**.
* **Northern America** dominates GDP, while **Eastern Asia** leads in population.
* **Baltics** have the **lowest GDP and population**.

**10. Sectors**

1. **Agriculture:**

* **Top Arable-Agriculture Pairs:** **Gabon & Algeria**
* **Low Arable-Agriculture Pairs: Tuvalu** **&** **Gibraltar**.

1. Industry & Service:

* **Top Industry-Service Pairs: Equatorial Guinea, Qatar**
* **Low Industry-Service Pairs: Cayman Islands & Comoros.​**

1. Area:

* **Country with Vast area – Canada & USA**
* **Country with smallest area – Monaco & Gibraltar.**

1. Coastline:

* **37 countries in total does not have a coastline ratio including Mali and Burkin Faso.**

1. Phones:

* **Countries with less phones in average for 1000 members mostly face network connectivity problems leading to minimized usage of the said appliance, example Burkin Faso, Sierra Leone.**

**10. Final Insights & Recommendations**

* **GDP vs. Population:**
  + A larger population does not guarantee higher GDP per capita.
  + **Recommendation:** Invest in **infrastructure, education, and job creation**.
* **Literacy & Economic Growth:**
  + Higher literacy correlates with better GDP per capita.
  + **Recommendation:** Prioritize **education reforms and digital literacy**.
* **Infant Mortality & Economic Conditions:**
  + Lower infant mortality is linked with higher GDP per capita.
  + **Recommendation:** Invest in **healthcare and child nutrition**.
* **Coastline & Economic Influence:**
  + Coastal nations have better trade and tourism opportunities.
  + **Recommendation:** Develop **ports and maritime trade policies**.
* **Sector Contributions:**
  + Countries with high service sector contributions have higher GDP.
  + **Recommendation:** Diversify by **modernizing agriculture and boosting digital services**.

**Conclusion**

The PowerPoint presentation and dashboard together provide a comprehensive economic and demographic analysis, offering deep insights into global GDP distribution, population trends, and economic disparities. The interactive dashboard enhances the analysis by enabling real-time exploration of data, while the PowerPoint summarizes key findings with visual storytelling.