Applied Data Science 1 (7PAM2000-0901)

Statistics and Trends Based on World Bank Data (RANGE FROM YEAR 2000 - 2020)

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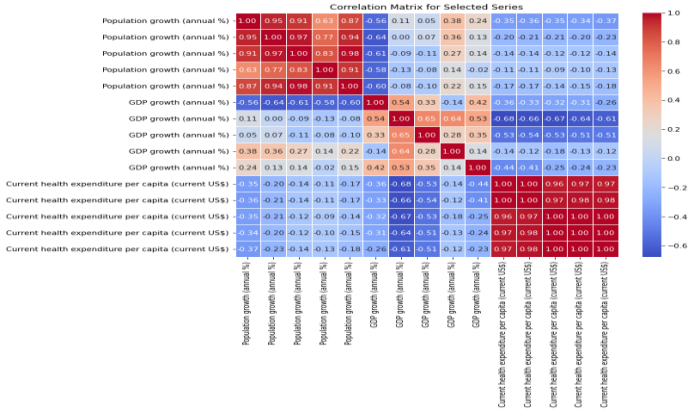
DATA SOURCE:
https://databank.worldbank.org/reports.aspx?source=2&series=SP.POP.GROW&country=IND,NGA,GBR,BRA,ZAF,RUS,AUS,PAK,CHN#

GITHUB LINK: https://github.com/taladesuru/UH-codeworks

Abstract

This assignment 2 is developed to analyze the trends and statistics using data obtained from the World Bank database using the year range from year 2000 and 2020. The relationship based on Agriculture, forestry, and Fishing, Value Added (annual % growth), Current Health Expenditure per capita (current US$), GDP Growth (annual %), Labor Force, Total, Population Growth (annual %), Total Population of nine countries across the globe were selected and studied. The analysis of these factors revealed that there are some relationships observed in the following countries; Australia, Brazil, China, India, Nigeria, Pakistan, Russian Federation, South Africa and United Kingdom.

1. THE HEATMAP PLOT:



The heatmap plot explains the correlation matrix for a selection of indicators: **'Population growth** (annual %)', **'GDP growth** (annual %)', and **'Current health expenditure per capita** (current US$)'. The plot provides a graphical symbol that occur in pairs correlations among these indicators. Key observations from the heatmap includes:

Population Growth vs. GDP Growth:
The correlation for Population growth (annual %) coefficient with GDP growth (annual %) looks adequate, signifying a visible but not hugely solid relationship. The color strength on the heatmap displays a correlation value, with warmer tones representing a positive correlation and cooler tones representing a negative correlation.

Population Growth vs. Current Health Expenditure:
The correlation for Population growth (annual %) and Current health expenditure per capita (current US$) is obviously not strong, with the correlation coefficient that appears to be close to be zero. This indicates that differences in population growth are not strongly connected with the differences in per capita health expenditure.

GDP Growth vs. Current Health Expenditure:
The correlation for GDP growth (annual %) and Current health expenditure per capita (current US$) also looks moderate. This indicates the possibilities of the relationship between the economic growth in a country and the health expenditure per capita.

The heatmap, in conclusion offers a brief summary of the relationships between the selected economic indicators. It's important also to note that correlation does not imply causation, and further analysis would be needed to understand the nuanced dynamics between these variables. The color gradient and numerical annotations on the heatmap offer a quick and intuitive way to interpret the strength and direction of these correlations.

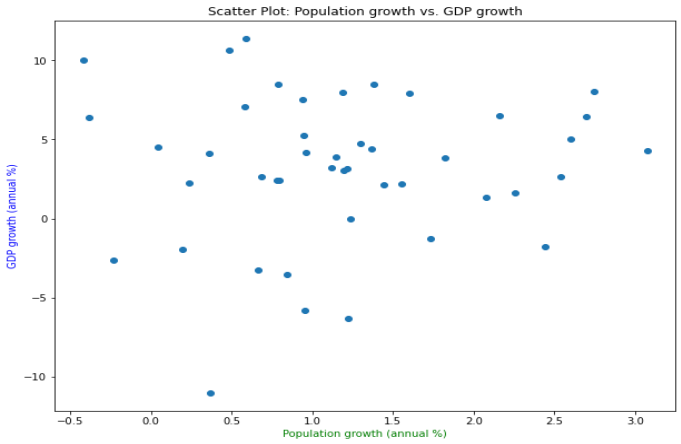
2. THE SCATTER PLOT:

Different Nations, Different Paths: In the scatter plot, each dot represents a nation, a unique entity with its path of population and economic growth. Looking at the scatter plot, the differences among nations becomes obvious. Some dots lie in close proximity, while others are scattered across the picture, reflecting many pathways countries tread in their developmental journeys.

The Central Tendency: A Positive Drift A noticeable trend arises as we draw an imaginary line through the midst of these dots. On average, nations experience a positive correlation between Population Growth and GDP Growth. Dots gather in a way that suggests, regularly, when a nation observes an increase in population growth, there's a corresponding rise in economic output.

The Essential Trend: A Positive Point A noticeable trend arises as we draw an imaginary line through the midst of these dots. On average, nations experience a positive correlation between Population Growth and GDP Growth. Dots gather in a way that

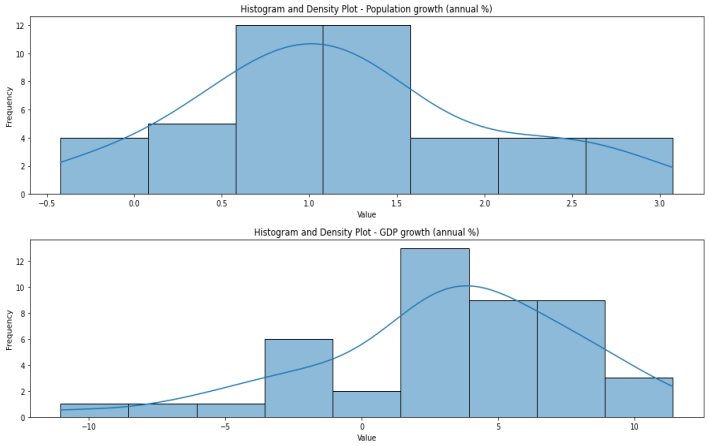
suggests, regularly, when a nation observes an increase in population growth, there's a corresponding rise in economic output.
Outliers: The Rebelling Nations Outliers scatters this narrative. Some nations challenge the rule, standing as rebels on the work. They show economic growth that doesn't support with their population trends. Although, these outliers indicate further exploration, appealing to uncover the unique lies and guidelines that set them apart.
The Blue and Green: The Strength of Growth The vivid hues of blue and green add hint to the exploration. Darker shades convey instances where both Population Growth and GDP Growth are robust, while lighter hues signify more moderate growth. This interplay of colors enriches our understanding, highlighting nations with varying intensities of development.
Challenges and Opportunities: The more understanding the scatter plot, the more importantly to know that correlations do not suggest actions. Observed positive trend suggests a statistical association, but understanding the underlying fundamental instruments requires a deeper dive into the socio-economic, political, and cultural backgrounds of each nation.
However, scatter plots serve as an introduction, enticing any observer to inquire deeper within and beyond the dots. It calls for questions, suggestions, and further analysis.



3. HISTOGRAM and DENSITY PLOT

The Histogram and Density Plot in the Visualization shows the trend identifies the patterns in the distribution of growth rates, providing more tone insights.

Key Points:
Population Growth: • Various Patterns - The histogram tells the various distribution of Population growth rates, while many countries experience moderate growth, others exhibit spikes and dips, suggesting unique demographic challenges.
GDP Growth: • Developing Economies - The GDP growth histogram highlights a right-skewed distribution, indicating that a few countries, particularly developing economies, drive higher economic growth rates.



4. THE LINE PLOT:

Introduction: The world a diverse place of many nations, and its own unique economic and demographic features. The story starts by visualizing the time-series data of population and GDP growth for selected countries.
Visualization: The visualization captures periods of data, and the line plot above captures the routes Population growth (annual %) and GDP growth (annual %) for countries like Australia, Brazil, China, India, and Nigeria.
Insights:
Population Growth (annual %): • Global Trends: The global population has experienced different growth rates over time like: China, India, and possibly Nigeria with great amount of populations, show some fluctuating but largely positive growth trends. In contrast, developed nations like Australia shows a steady and adequate increase in population.
GDP Growth (annual %): • Developing Economies: The line plot highlights the fast economic expansions in countries like Brazil, China, and India, and these nations have seen significant GDP growth, reflecting their emergence as major players in the world economy. • Developed Nations: Like Australia, with a steady and advanced economy, showcases a more consistent but moderate GDP growth compared to its counterparts.