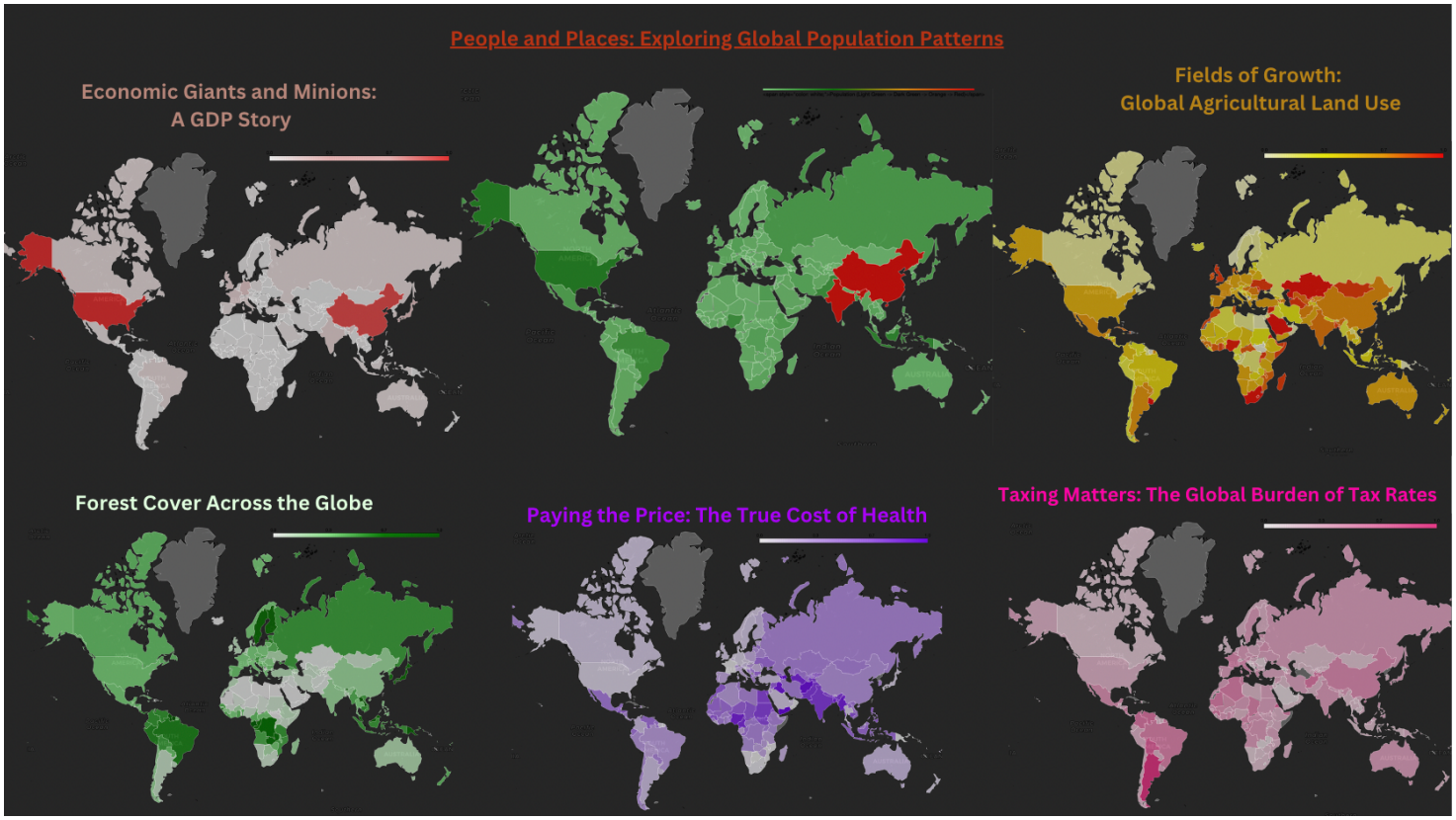
Visualizing Our World: Stories Told Through Data

A Comprehensive Dataset Empowering Cross-Country Insights – Submitted by Shusrita Venugopal (SHV73)

This project explores diverse global patterns and trends using six key indicators, visualized through interactive world maps. Each map reveals unique global patterns:



Key Findings:

GDP: Economic Giants and Minions - The GDP map compares the total economic output of countries. Light Grey represents lower values and red is higher values. Developed nations like the United States, China, and Germany dominate this visualization, while developing countries are shown with more subdued colors.

Population: Total Population of the Country - The population map showcases the distribution of people across the globe. Heavily populated countries, such as China and India, are highlighted with Red color, reflecting their status as global population hubs. The population gradients from light green (lower population) to red (higher population).

Agricultural Land (%): Fields of Growth - This map highlights the percentage of land dedicated to agriculture in each country. Regions like Sub-Saharan Africa and parts of Asia show high agricultural land use, reflecting the dependence of their economies on agriculture. Gradients from light yellow (lower use of agricultural land) to Red (higher use of agricultural land).

Forested Area (%): Forest Cover Across the Globe - The forest cover map illustrates the proportion of a country's landmass covered by forests. Countries like Finland, Zambia, Brazil and the Democratic Republic of the Congo are highlighted for their vast rainforest regions, critical for biodiversity and climate regulation. On the other hand, arid or heavily urbanized regions show minimal forest cover. Gradients from light grey (low % of forested land) to dark green (high % of forested land).

Out-of-Pocket Health Expenditure (%): Paying the Price - This map depicts the burden of out-of-pocket health expenditures as a percentage of total health spending. Countries with high percentages, often in the developing world, signify limited access to universal healthcare systems, leading to significant financial strain on individuals. Wealthier nations typically show lower percentages, indicating comprehensive health coverage. Gradients from light purple (lower out of pocket expenditure) to dark purple (higher out of pocket expenditure).

Total Tax Rate: Taxing Matters - The tax rate map shows the total tax burden as a percentage of commercial

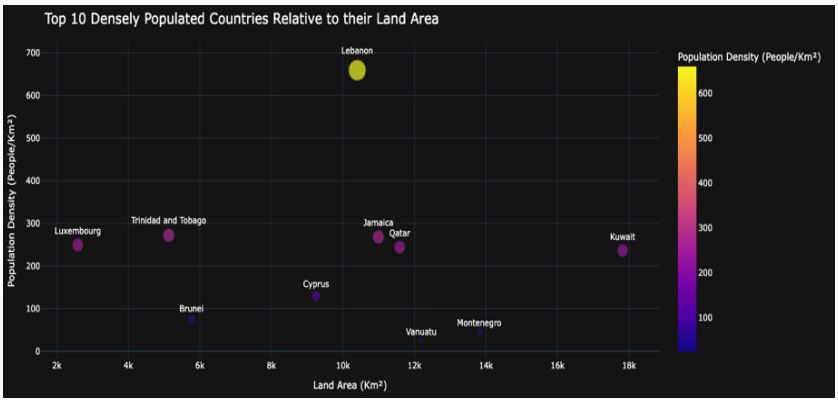
profits. Nations with high tax rates are highlighted, illustrating the diverse fiscal policies employed across the globe. This map sparks insights into the trade-offs between government revenue generation and the ease of doing business. Gradients from light pink (lower total tax rates) to dark pink (high total tax rates).

Other Explorations with Cross Country Comparisons

Correlation Between Land Area and Population Density Across Countries

Key Findings:

- This graph examines the relationship between land area and population density.
- This scatter plot shows countries like Lebanon and Trinidad & Tobago having high population densities despite relatively small land areas.

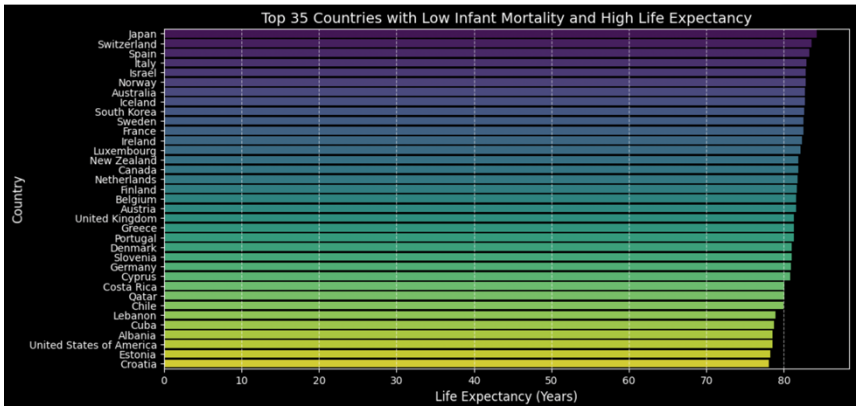


Significance: Governments in these countries can use the bar graph to prioritize policies addressing overcrowding, equitable housing, and sustainable urbanization

Analysis of the Top 35 Countries with Low Infant Mortality and High Life Expectancy

Key findings:

- To analyze the factors contributing to low infant mortality and high life expectancy in the top 35 countries, highlighting successful healthcare systems and social policies.
- This bar chart highlights countries like Japan and Switzerland leading in life expectancy while maintaining low infant mortality rates.



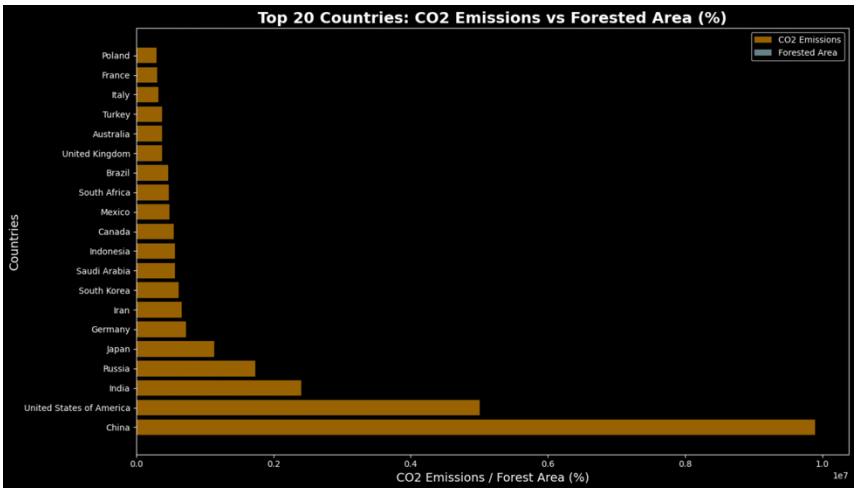
Significance:

1. **Model for Success:** Identifies countries with effective healthcare and social policies that can serve as benchmarks for others.

Comparing the environmental impact (CO2 emissions) and forest conservation efforts (Forested Area) among the leading nations.

Key Findings:

- Compares CO2 emissions and forest conservation efforts among the top 20 nations, analyzing the balance between environmental impact and forested land.
- Countries like China and the USA producing the highest emissions relative to their forest cover.



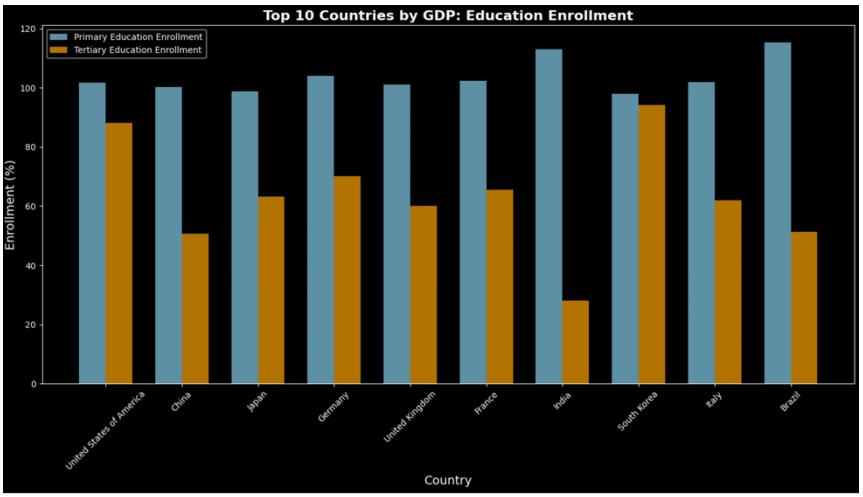
Significance:

1. **Understanding Correlation:** Highlights the relationship between CO2 emissions and forest cover, identifying whether emissions are mitigated by forest conservation efforts.
2. **Environmental Prioritization:** Provides insights for climate action, helping countries focus on balancing industrial activities with reforestation and sustainable practices.

Educational Enrollment and Human Capital Development

Key Findings:

- Analyze the relationship between education (enrollment rates), economic growth(GDP), and societal well-being (life expectancy), focusing on primary and tertiary education in top 10 GDP countries.
- All the top 10 DGP countries have highrates of primary education enrollment but varying tertiary education enrollment levels.



Significance:

1. **Insights into Economic Growth:** Highlights how tertiary education enrollment contributes to human capital development, driving innovation and economic advancement.
2. **Educational Priorities:** Contrasts primary and tertiary enrollment rates, revealing disparities in focus and development stages across nations.

Data and Method

Data:
To explore the global data, I have used the dataset **Global Country Information Dataset 2023** from Kaggle**.** A global dataset covering extensive attributes of all countries, enabling in-depth analyses and cross-country comparisons.

Method:

1. The dataset was cleaned and transformed using libraries like pandas.
2. **Folium** was employed for creating interactive, zoomable maps.
3. **Matplotlib** was used for non-geographic visualizations like bar and scatter plots.
4. For choropleth maps, Folium's Choropleth function was utilized to bind data to geographic regions.
5. The **shapely.geometry** library allowed spatial computations like overlaying boundaries, calculating areas, and merging datasets with geographic attributes.

Significance

This project offers a global perspective on critical issues by visualizing diverse datasets, enabling better understanding of complex patterns and trends across countries. It highlights disparities in economic, environmental, and social indicators, facilitating targeted policy interventions and resource allocation. The visualizations serve as a tool for researchers, policymakers, and educators to derive actionable insights and drive evidence-based decisions. Ultimately, the project promotes informed discussions on global challenges, fostering collaboration for a more equitable and sustainable future.

GitHub Link https://github.com/shusritavenugopal/Global-Country-Information-Dataset-2023

Data https://www.kaggle.com/datasets/nelgiriyewithana/countries-of-the-world-2023

Google Colab Link https://colab.research.google.com/drive/12qufLAzb9nEPyBzSTEdpD-vO9Z5Jrdti