# Module Name : Applied Data Science -1

# Assignment 2

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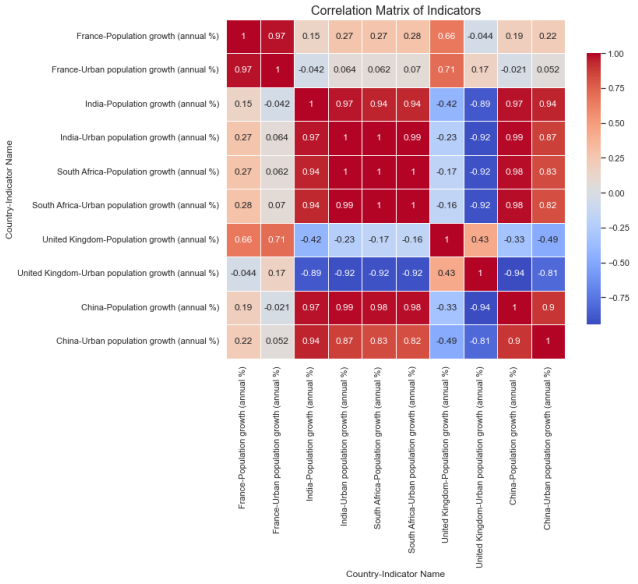
**Git Link: https://github.com/RAVIAPTISWETHA/statistics-ads-2**

## Title: "Global Insights: Unraveling Demographic Dynamics, Environmental Trends, and Land Use Transformations (1990-2000)

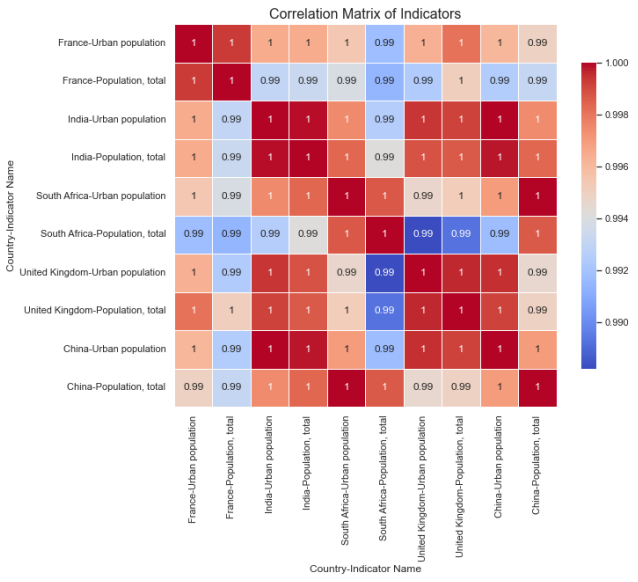
**Abstract:**

This comprehensive exploration delves into global demographic shifts, environmental dynamics, and evolving land use patterns from 1990 to 2000. Analyzing key indicators, including population growth, urbanization, energy consumption, and land utilization across five diverse nations (France, India, South Africa, United Kingdom, China), the study unveils nuanced trends. The findings showcase variations in energy consumption, renewable integration, and land use strategies, offering valuable insights into each country's developmental trajectory. Through pie charts, line plots, and bar graphs, the research visually portrays demographic distributions and environmental transformations, providing a concise yet detailed narrative of societal and ecological transitions during the specified decade.

**Exploring Demographic Dynamics: A Comprehensive Analysis of Population Growth and Urbanization Trends:** The summary statistics for key indicators related to population growth and urbanization across several countries. Focusing on France as an example, the indicator "Population growth (annual %)" has a mean growth rate of 0.61%, with a standard deviation of 0.24%, suggesting a relatively stable growth pattern. The minimum growth rate observed is 0.26%, while the maximum reaches 1.12%.

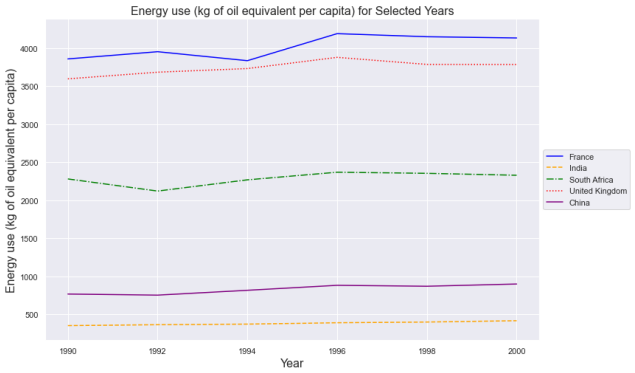



In the context of urbanization, the "Urban population growth (annual %)" for France has a mean of 1.06%, with a standard deviation of 0.68%. Notably, the maximum urban population growth rate is 2.96%, indicating significant urbanization during certain periods.

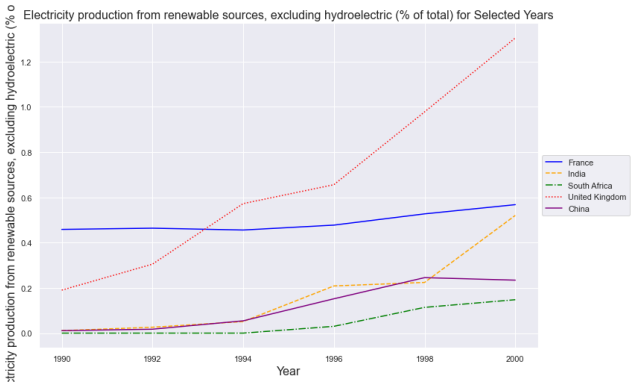



Examining the year-over-year changes, the dataset provides a comprehensive overview of the dynamics in these indicators. For instance, the highest observed population growth in France occurred in 1998, reaching 1.12%, while the lowest was recorded in 1996 at 0.26%.

**Analyzing Energy Trends: A Comprehensive Overview of Consumption and Renewable Integration Across Nations:** The line plots illustrate energy-related trends for selected countries, shedding light on their energy consumption patterns and the integration of renewable sources.




Energy Use (kg of oil equivalent per capita): France's consumption remained relatively stable, while India and China saw significant increases, reaching 416.08 kg and 898.99 kg, respectively, in 2000. South Africa experienced fluctuations, and the United Kingdom exhibited consistent stability.

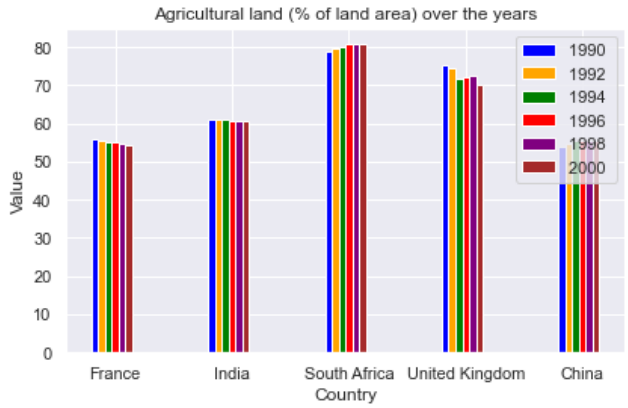



Renewable Electricity Production (% of Total): France demonstrated a continuous shift towards renewables, reaching 0.57% in 2000. India and China showcased remarkable growth, with India starting at 0.01% in 1990 and reaching 0.52% in 2000. South Africa and the United Kingdom also increased their renewable share, with the UK leading at 1.30% in 2000.

**Key Insights:** France and the UK maintained stable energy use, while India and China underwent notable increases. All countries embraced renewable energy, with the UK leading in the share of renewables. China stood out with the highest energy use in 2000, and India exhibited the lowest energy

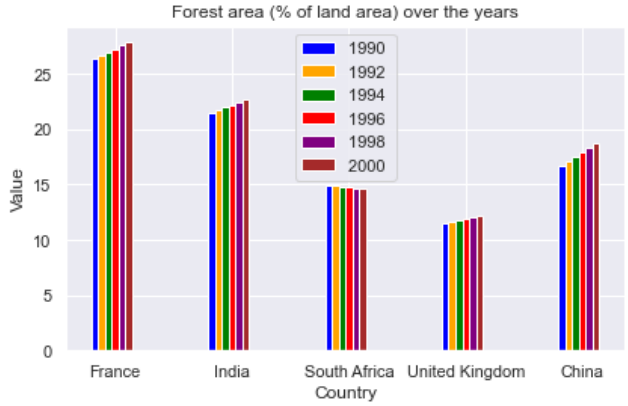
use in 1990. The UK attained the highest share of renewables in 2000, while South Africa and China started with minimal shares in 1990

**Land Use Dynamics: Agricultural and Forest Area Trends (1990-2000)**




The bar plot illustrates the evolution of agricultural land (% of land area) and forest area (% of land area) across five countries (France, India, South Africa, United Kingdom, China) from 1990 to 2000.

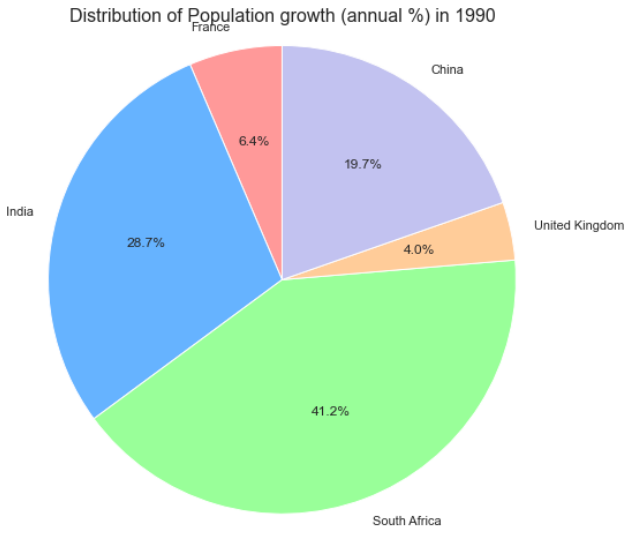
In terms of agricultural land, South Africa consistently maintains the highest percentage, peaking at 80.89% in 2000, indicating a significant portion of its land dedicated to agriculture. On the other hand, the United Kingdom experiences a decline from 75.24% in 1990 to 70.12% in 2000, suggesting a decrease in the proportion of land used for agriculture.



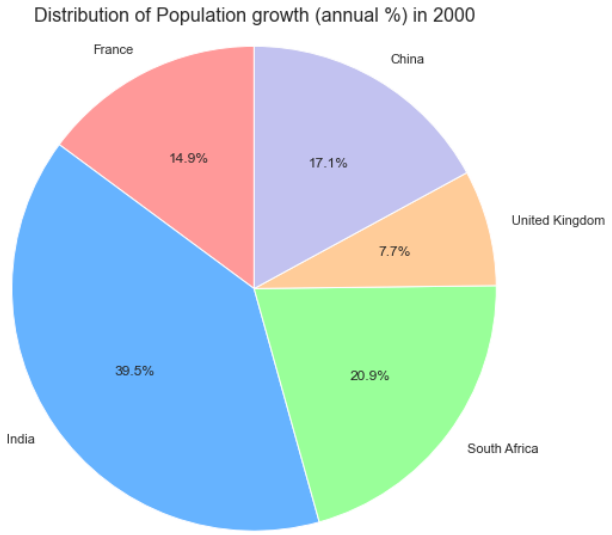

Regarding forest area, India displays a steady increase from 21.50% in 1990 to 22.73% in 2000, showcasing a positive trend in forest conservation. China also sees growth in forest area, reaching 18.78% in 2000, indicating efforts toward environmental sustainability. In contrast, the United Kingdom maintains a relatively low percentage of forest area throughout the period, with a slight increase from 11.48% in 1990 to 12.21% in 2000.

**Population Growth Distribution: A Comparative Analysis of Selected Countries in 1990 and 2000:**

The pie charts represent the distribution of population growth rates (annual %) for selected countries in the years 1990 and 2000. In 1990, France had a population growth rate of 0.48%, India exhibited a higher rate at 2.14%, South Africa had a substantial growth rate of 3.08%, the United Kingdom experienced a modest rate of 0.30%, and China recorded a rate of 1.47%.




In the year 2000, the population growth rates shifted slightly. France's rate increased to 0.69%, India's rate decreased to 1.82%, South Africa's rate dropped to 0.96%, the United Kingdom's rate increased marginally to 0.36%, and China's rate declined to 0.79%.




The pie charts visually convey the proportional distribution of population growth rates across these nations, highlighting variations and trends over the selected years. Notably, South Africa had the highest growth rate in 1990, while India experienced a notable decline by 2000. These visualizations provide a succinct overview of population dynamics in the specified years.