Assignment 2: Statistics and trends

Title: Investigative Analysis and Graphical Representation of World Bank Data
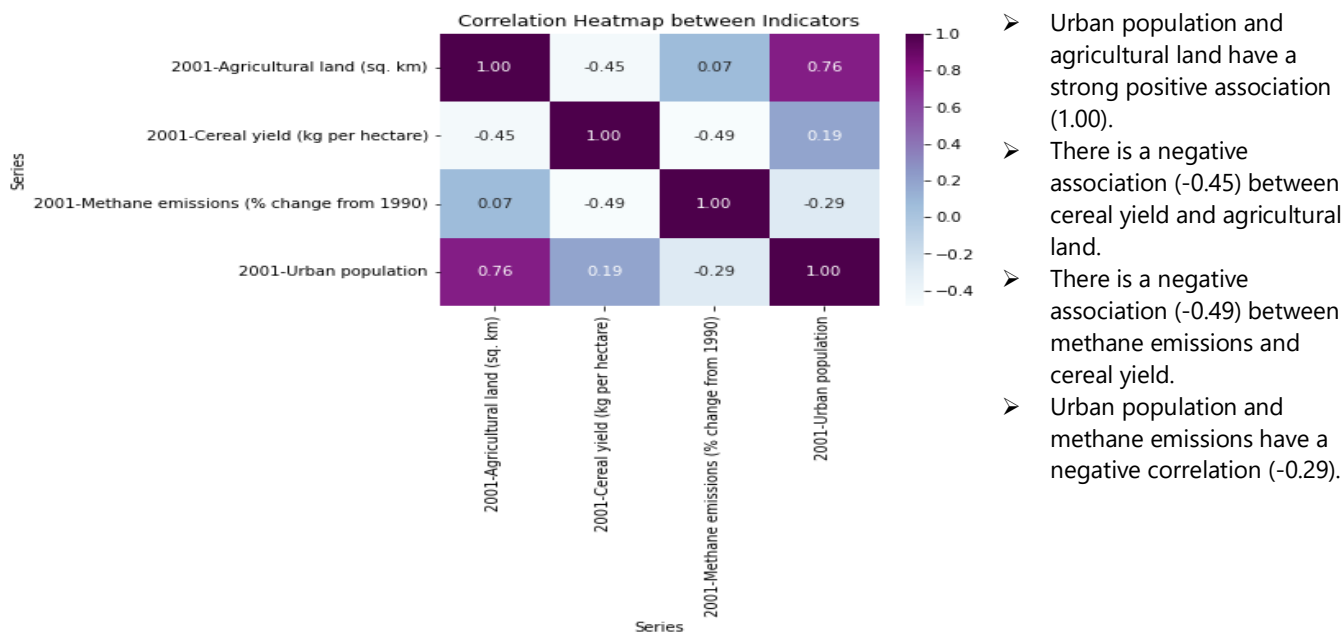
Abstract:

This visualisation explores and exploratory analysis of a variety of World Bank-sourced indicators. The code does statistical analysis, graphical representations, and data cleaning using the pandas, matplotlib, seaborn, and a NumPy libraries. Cleaning of data and transposing, summary statistics computation (mean, median, skewness, and kurtosis), correlation heatmap generation. It produces bar graphs that indicate changes in cereal yield and agricultural land as well as line plots that illustrate changes in urban population and methane emission over time for a few chosen nations.

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➢ Data Reference Link – https://data.worldbank.org/topic/climate-change
➢ Repository Link – https://github.com/Susai23/ADS-Assignment-2

Visualisation 1: Correlation heatmap between indicators (Year-2001)

Correlation Heatmap between Indicators

- ➤ Urban population and agricultural land have a strong positive association (1.00).
- ➤ There is a negative association (-0.45) between cereal yield and agricultural land.
- ➤ There is a negative association (-0.49) between methane emissions and cereal yield.
- ➤ Urban population and methane emissions have a negative correlation (-0.29).

Visualisation 2 & 3: Agricultural land and Cereal Yield across countries

Italy's land area decreased somewhat from 51,750 to 53,210 sq.km because of land abandonment brought on by soil degradation and development.

The Russian Federation's land area decreased dramatically from 268,180 sq.km to 152,730 sq.km because of economic causes, land abandonment, and conversion to forestry and mining.

Finland's area significantly decreased from 223,600 to 155,020 sq.km because of economic factors, forestry conversion, and land abandonment.

Brazil's area slightly shrank from 52,130 sq.km to 53,760sq.km, most likely because of urbanisation and conversion to forests and mining.

Kenya's total area increased slightly from 22,180 to 22,014 sq.km because of land being converted from other purposes, such as grazing land.

Japan's area decreased little from 264,580 to 266,710 sq.km because of urbanisation and land abandonment due to soil erosion

Agricultural Land across Countries


Cereal yield across Countries
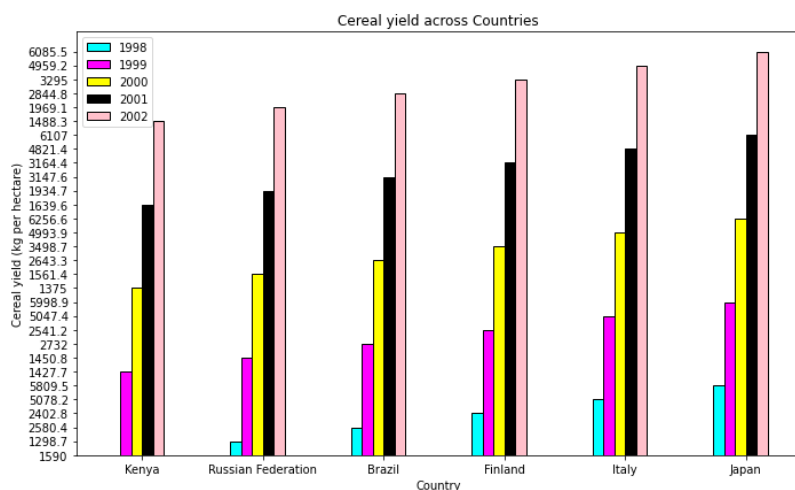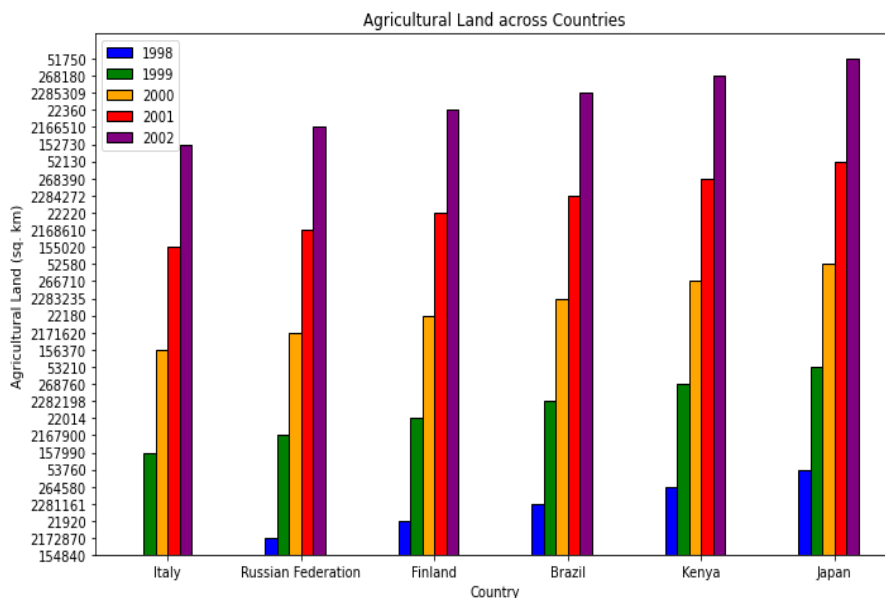
In 1998, the yield of cereals varied greatly between nations. The largest yields were recorded in Finland, Italy, and Japan, perhaps because of their ideal temperatures, rich soils, and cutting-edge farming techniques. On the other hand, Brazil, the Russia, and Kenya had lower yields; it may be due to poor weather and a lack of technological developments. Most countries had a rise in crop yield between 1998 and 1999. The countries with the biggest improvements were Kenya, Brazil, and the Russia se gains were probably the result of a mix of factors, including improved weather and maybe advances in farming practices. Cereal yields are generally influenced by a few variables, including soil quality, climate, agricultural technology, and governmental regulations. But it is crucial to remember that these yields might vary greatly from year to year because of several factors.

Visualisation 4: urban population across countries
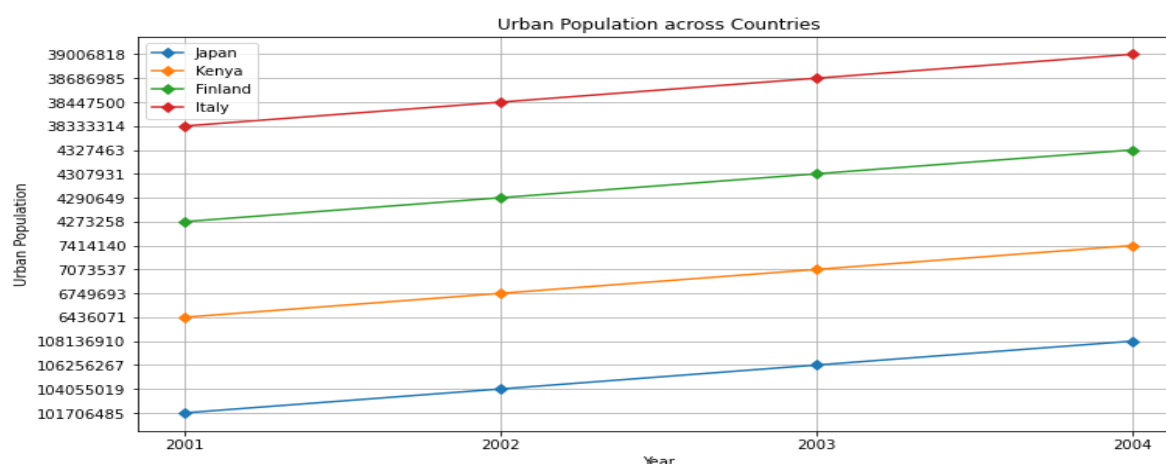
The line graph shows the trends in urban population across several nations between 2001 and 2004. Populations in all countries increased, although at different rates of the countries with urban populations in 2001, Finland had the lowest number (4.2 million) and Japan the most (101 million). Finland experienced the highest rate of urban population growth (1.3% yearly), while Japan had the weakest rate (0.3%). Global trends towards urban living are shown in the overall growth in urbanisation from 49.7% in 2001 to 51.2% in 2004.

Visualisation 5: methane emissions across countries
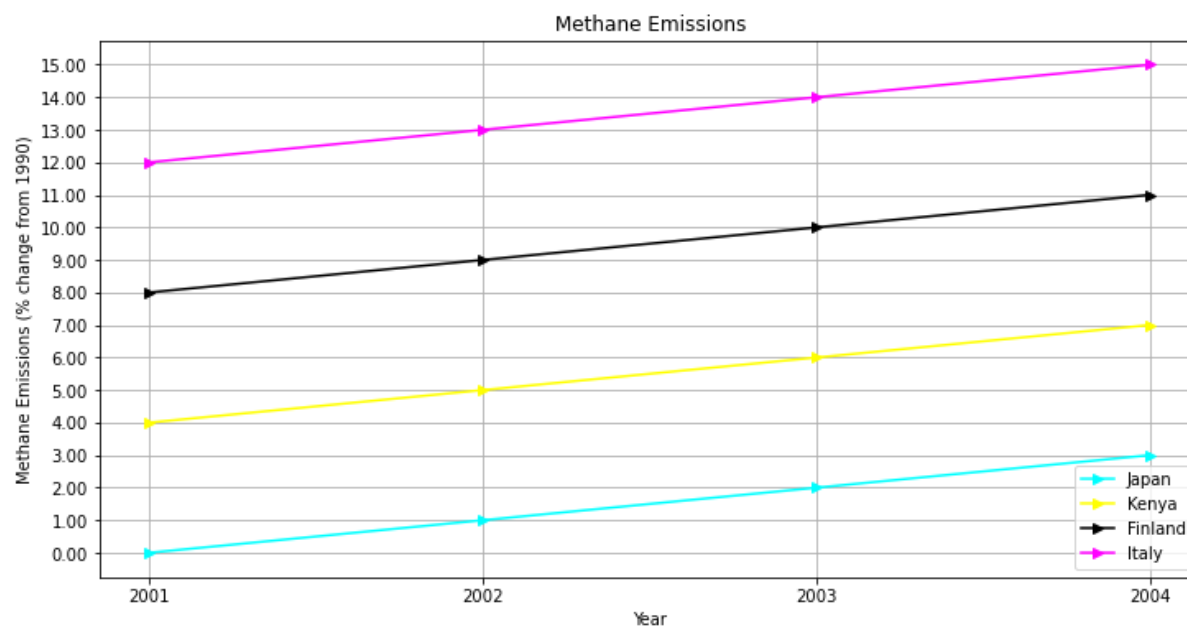
The graph displays the yearly rise in methane emissions from various countries such as Japan, Kenya, Finland, and Italy are displayed in the data, which spans the years 2001 to 2004. The graph indicates that during the four years, methane emissions from fossil fuels and alternative power sources increased in each of the four nations. Italy saw the biggest growth, followed by Finland, Kenya, and Japan. The graphic indicates an overall increase in methane emissions from fossil fuels and alternative power sources. The result of a mix of factors, including improved weather and maybe advances in farming practices.