ASSIGNMENT 02: Statistics and Trends

NAME: - DILPREET SINGH MAHAL   **SUBJECT: - APPLIED DATA SCIENCE**

STUDENT ID: - 22014268

ABSTRACT

The report provides an overview of a Python script that utilizes the Pandas, Matplotlib, and Seaborn libraries to analyze an environmental change dataset from the World Bank. The script demonstrates its ability to clean the data and select specific markers for analysis. The analysis includes various visualizations such as line plots to depict the trend of CO_2 emissions over time for each country, scatter plots to visualize the relationship between CO_2 emissions and other markers, and a heatmap to show the correlation between each marker. Moreover, the report focuses on the importance of reduction of electric consumption and population growth to address environmental changes.

Github Link: https://github.com/dsmgoooner/Climate_Change

EXPLANATION OF CODE

The provided Python script is intended for analysing a dataset in CSV format. It utilizes the Pandas, Matplotlib, and Seaborn libraries to accomplish this task. The script's initial step is to define a function called "clean_data," which processes the CSV file by removing unnecessary columns, filling in missing values, and resetting the index.

Next, the script selects specific indicators from the cleaned data and stores their statistics in separate variables. The "depict" function is then employed to print the measurements for each marker. The script generates line plots to display the trend of CO_2 emissions over time for each of the chosen countries.

The script concatenates the statistics for all three indicators and creates a correlation matrix. Two scatter plots are then created to display the correlation between CO_2 emissions and the other two indicators (Electric Consumption and Population Growth). Finally, the Seaborn library's "heatmap" function is used to generate a heatmap to show the correlation matrix. The heatmap is color-coded using the "cool warm" color map and annotated with relationship values.

PLOTTING OF DATA

- **Line Plot:**

The line plots illustrate the trend of CO2 emissions over a period of time for four different nations. Moreover, the graphs show how the CO2 emissions have altered over time whether they have fluctuated or remained stable. Furthermore, it depicts the comparison between the four countries in term of CO2 emissions. Given below are the graphs for each country.

Australia	United Kingdom
Canada	India
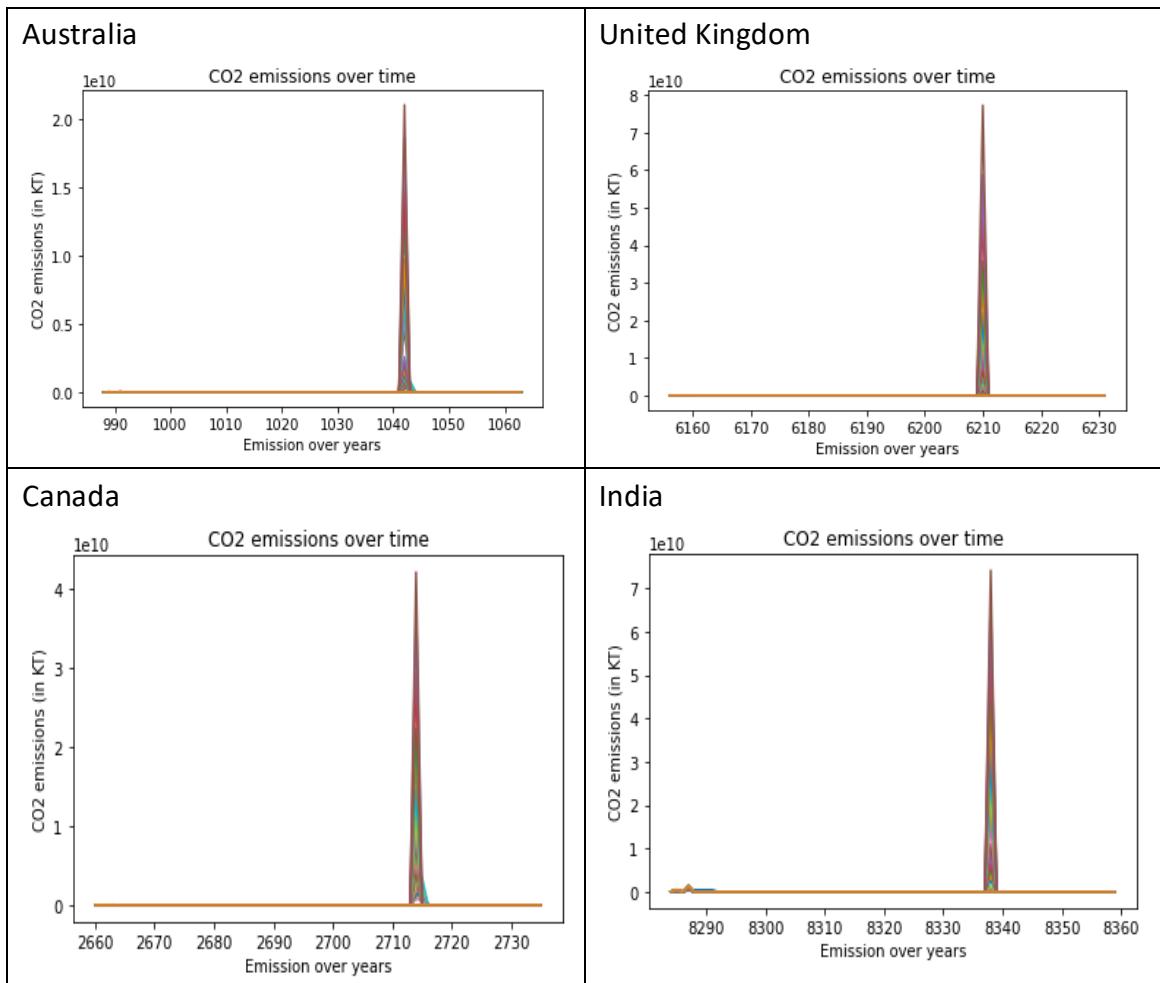
- **Scatter Plot:**

The Scatter plot depicts the visualization of CO2 emission in relation to Population Growth and Electric Consumption of the world. In addition to this, one can comprehend that with the increase in population growth the electric consumption also increases which tends to increase the emission of CO2. The visualization indicates how the CO2 emissions vary around the world. The rising trend of population and electricity consumption has led to the increased emissions of the climate-changing greenhouse gases which are the major factor affecting the global average temperature. The negative effects of climate change are exacerbated by rapid population growth, particularly in regions with limited resources. This is due to the increased demand for resources and the heightened vulnerability of larger populations to climate-related risks. As a result, low-resource regions are particularly susceptible to the adverse impacts of climate change caused by population growth.
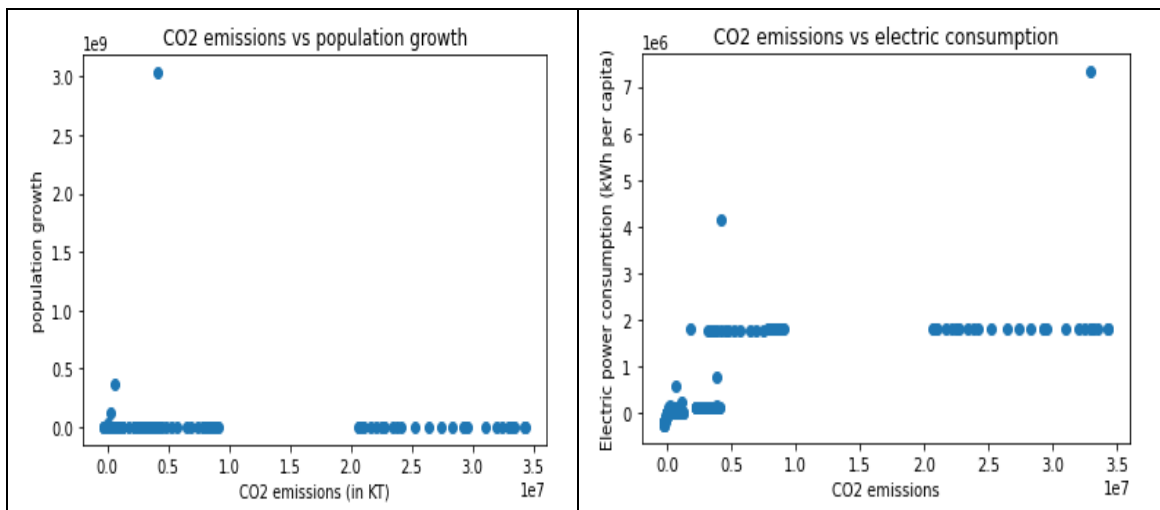
- **Heat Map:**

Heat map to comprehend the correlation between each indicator on our environment. The graph is shown below.