

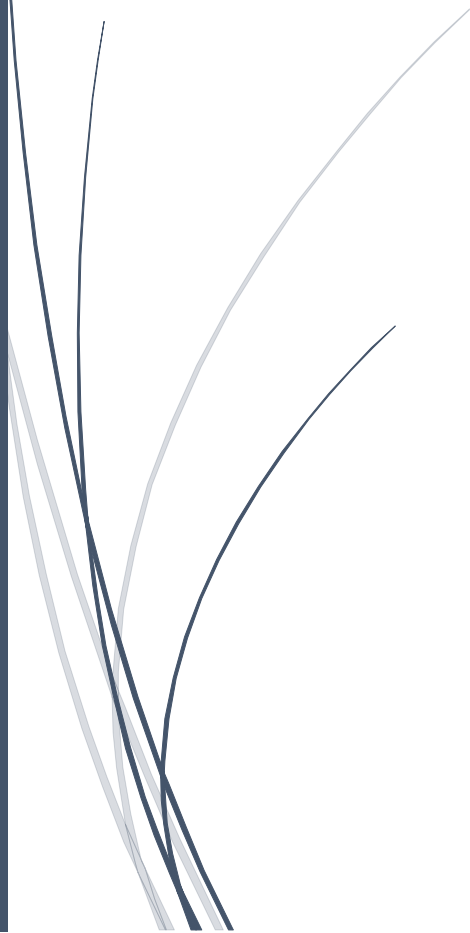


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# Applied Data Science-1

## Assignment-1

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**Repo : Visualization**

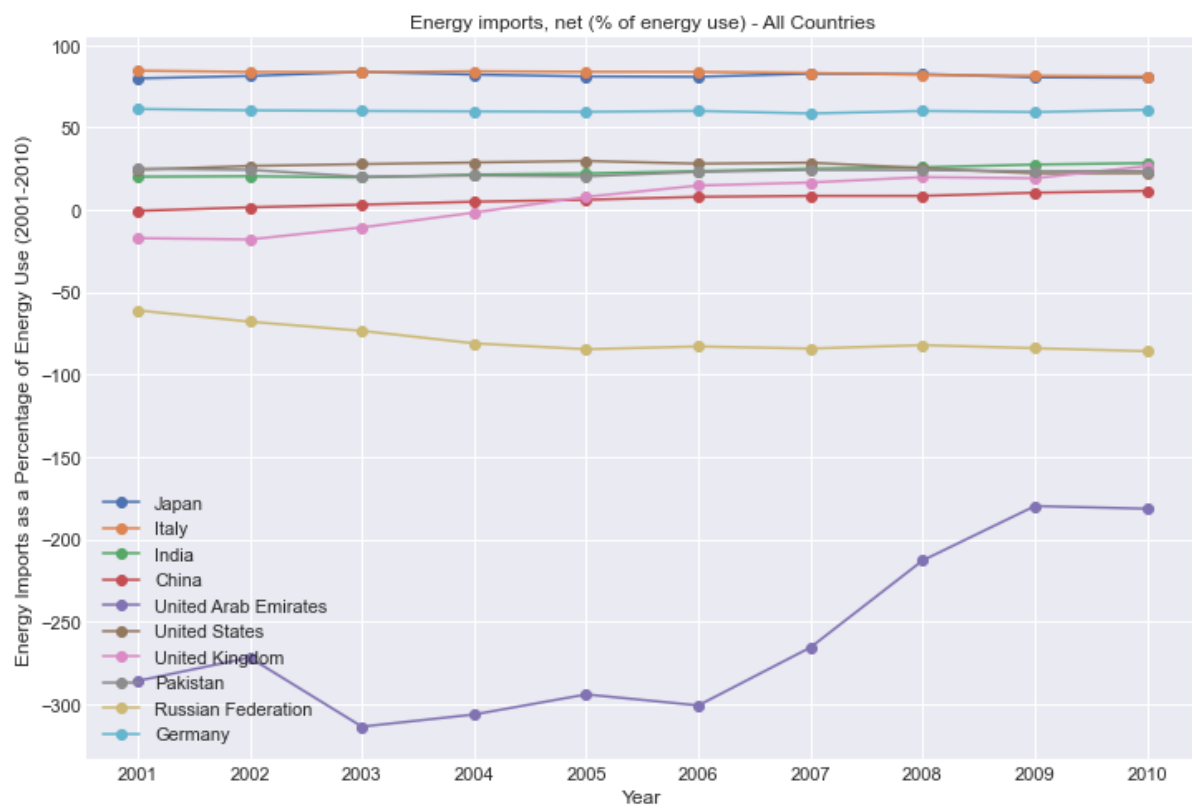


## Data Source:

The data source for this project is a CSV file containing energy imports data from the World Bank. The dataset provides information on energy imports as a percentage of energy use for multiple countries over a span of years (2001-2010). This data is essential for analyzing and comparing energy consumption patterns globally.

## Description of Line Plot:

The line plot illustrates the energy imports as a percentage of energy use for ten countries (Japan, Italy, India, China, United Arab Emirates, United States, United Kingdom, Pakistan, Russian Federation, Germany) during the years 2001 to 2010. The specific values for each country in the respective years provide detailed insights into their energy consumption patterns:



**Japan and Italy:** Both countries maintain relatively stable energy import percentages, with Japan ranging from approximately 79.72% (2001) to 80.14% (2010) and Italy from 81.00% (2010) to 84.42% (2001).

**India and China:** India's energy imports start at 20.08% (2001) and increase steadily to 28.35% (2010), while China's percentages rise from -0.67% (2001) to 11.45% (2010), showcasing substantial growth.

**United States:** The U.S. maintains consistent values around 25-29% throughout the decade, indicating stable energy imports.

**United Kingdom:** The UK experiences fluctuations, starting at -17.24% (2001), reaching 26.57% (2010), reflecting dynamic energy policies and economic changes.

**United Arab Emirates:** UAE's values fluctuate from -285.94% (2001) to -181.46% (2010), suggesting variations in energy production and consumption.

**Pakistan:** Pakistan's energy imports range from 20.91% (2001) to 24.91% (2010), indicating moderate growth in energy consumption.

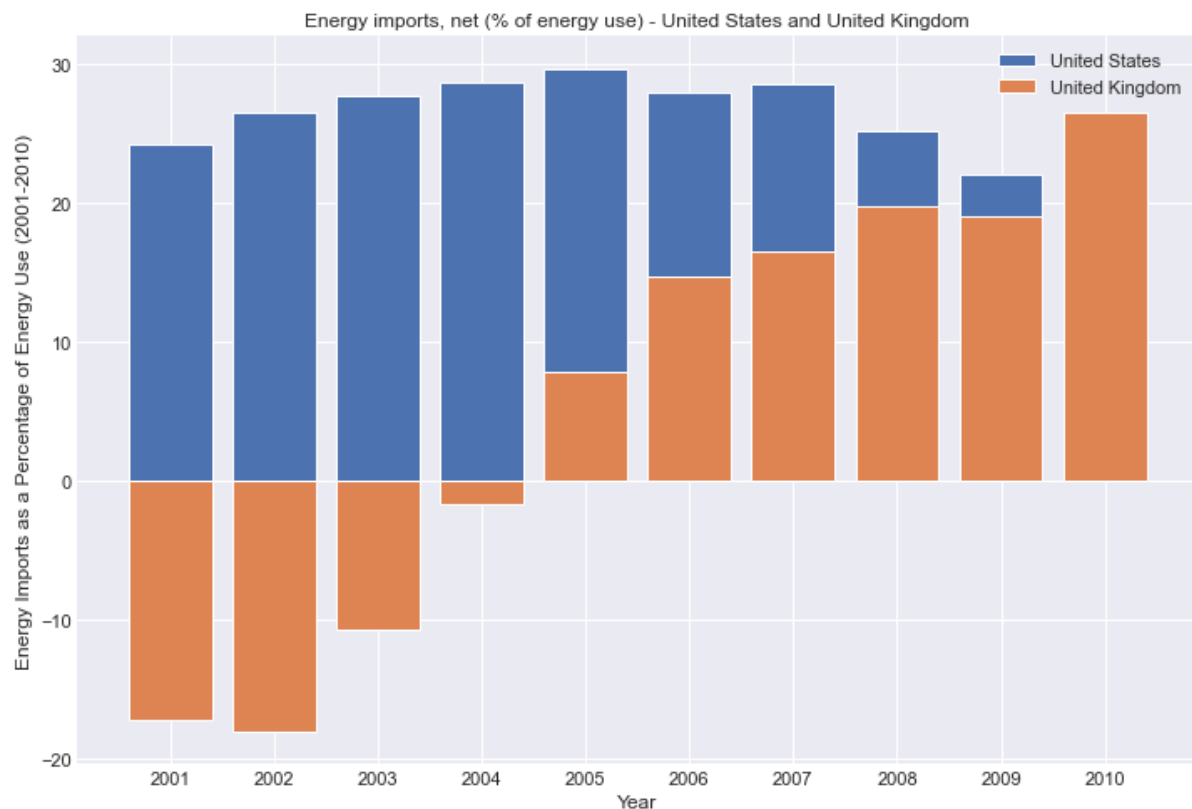
**Russian Federation:** Russia maintains consistent values, starting at -61.06% (2001) and decreasing marginally to -85.85% (2010).

**Germany:** Germany's energy imports rise from 59.32% (2009) to 60.66% (2010), indicating a gradual increase in energy dependence.

These specific figures provide a detailed view of each country's energy import dynamics, enabling a comprehensive analysis of their energy policies and economic trends during the specified period.

### **Why I select this Plot (Bar Plot):**

Choosing a bar plot for visualization is like picking the right tool to show comparisons among different things. It's a good choice when you want to see how various countries compare in terms of energy imports as a percentage of energy use. Here's why: Imagine each country as a separate bar on a graph. The height of each bar shows the proportion of energy imports relative to energy use for that country. So, taller bars mean a higher percentage, and shorter bars mean a lower percentage. This type of plot is excellent for comparing the energy import patterns across different countries. You can easily see which countries have higher or lower percentages, and it's clear to interpret. It's like lining up all the countries side by side, and you can quickly notice the differences or similarities in their energy import behaviors. So, in simple terms, a bar plot is like a visual aid that makes it easy to understand how different countries stack up in terms of energy imports, helping you spot trends or disparities.



### Description of Bar plot:

The bar plot presents a comprehensive view of the net energy import percentages for the United States and the United Kingdom over the period spanning from 2001 to 2010. The x-axis delineates the years, ranging from 2001 to 2010, while the y-axis depicts the percentage of energy imports.

For the United States, the data reveals a series of fluctuations in energy import percentages. Noteworthy is a substantial decrease around the year 2009. The specific values for each year are as follows: 24.30% (2001), 26.60% (2002), 27.73% (2003), 28.70% (2004), 29.66% (2005), 27.97% (2006), 28.59% (2007), 25.26% (2008), 22.12% (2009), and 22.21% (2010).

Conversely, the United Kingdom exhibits diverse trends with both negative and positive growth in different years. A notable increase is observed in 2010. The specific annual values for the United Kingdom are as follows: -17.24% (2001), -18.02% (2002), -10.72% (2003), -1.71% (2004), 7.86% (2005), 14.71% (2006), 16.55% (2007), 19.82% (2008), 19.12% (2009), and 26.57% (2010).

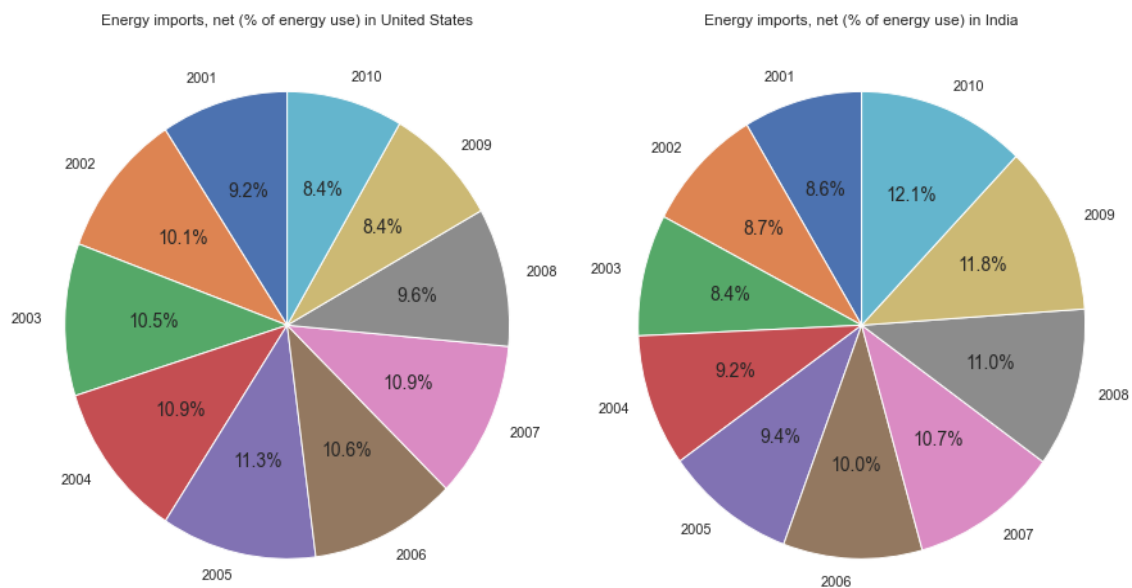
This graphical representation allows for a comparative analysis of the energy import dynamics for both countries, highlighting fluctuations and trends within the specified timeframe.

### Why I select this Plot (Pie Plot):

Selecting a pie plot is a suitable choice when the objective is to visualize the distribution of a whole in terms of its constituent parts. Pie charts are particularly effective when representing percentages or proportions of a total. In the context of your data on energy imports, the pie chart provides a clear depiction of how different components contribute to the overall energy import for a specific country.

The circular nature of a pie chart allows for a quick and intuitive understanding of the relative sizes of each component. Each wedge of the pie corresponds to a particular year, and its size reflects the percentage of energy imports for that specific year. This visual representation enables easy identification of dominant and minor contributors to the total energy import over the given time period.

In summary, you chose a pie plot because it effectively communicates the proportional distribution of energy imports across different years, offering a concise and visually appealing way to grasp the composition of the whole dataset.



## Explanation of Combined Box Plot:

The pie chart illustrates the percentage distribution of energy imports for a specific year (2010) for two countries: the United States and India. Each wedge of the pie represents the proportion of energy imports for a particular country. The values are displayed on each wedge as percentages, and the chart is titled with the corresponding country name. This visualization offers a concise snapshot of the relative contributions of each country to the total energy imports in the specified year.

The pie plots for energy imports as a percentage of total energy use in the United States and India provide an insightful overview of the annual distribution, with distinct patterns in the contribution of each year.

### United States:

In the United States, the data reveals fluctuating percentages over the years. The lowest recorded percentage occurred in 2009, with energy imports constituting 22.1% of total energy use. On the other hand, the highest percentage was observed in 2005, reaching 29.7%. This variability indicates a noteworthy shift in energy import dynamics, with a significant dip in 2009 and a peak in 2005.

**India:**

For India, the pie chart exposes a more consistent trend. The lowest percentage was registered in 2003, accounting for 19.7% of total energy use. The highest percentage occurred in 2010, reaching 28.3%. Unlike the United States, India's data suggests a gradual increase over the years, with 2010 representing the peak of energy imports.

Comparing these findings between the two countries, the United States demonstrates greater volatility in annual energy import percentages, while India displays a more steady upward trajectory. These insights into the lowest and highest values contribute to a comprehensive understanding of the energy import dynamics in each country over the specified period.