Bharatiya Vidya Bhavan's

Sardar Patel Institute of Technology

(Autonomous Institute Affiliated to University of Mumbai)
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India

Name: Vinit Madhyan
Batch : I
UId :2021300070
Expt_No. : 8

Aim: **Experiment Design for Creating Visualizations using D3.js on a Forest Dataset**

- **Dataset Link:** Forest Area Dataset
- **Dataset Description:**

This dataset comprises forest area statistics for 83 countries, detailing forest cover across several years—1990, 2000, 2010, 2015, and 2020. Key columns include `CountryID`, `Country_Area` (country name), `Total_Land_Area_2020` (land area in 2020), and annual forest areas. It also offers the percentage of land covered by forests (`Forest_Area_Proportion`), deforestation rates between 2015 and 2020 (`Deforestation_2015-2020`), and forest areas affected by fire in 2015 (`Total_Forest_Area_Affected_by_Fire_2015`). This dataset provides an overview of forest area trends, forest density, and environmental challenges related to deforestation and fire impact on global forests.

- **Graphs and Explanation:**

- **Line Chart:**

- **Description:** This line chart illustrates changes in forest area over time (from 1990 to 2020) for a specific country.
- **Insights:**

- The forest area shows a declining trend over the years, indicating possible deforestation or land-use changes affecting the forest cover.
- The rate of decline seems steady, suggesting a persistent reduction in forest area over the selected period.

 Dataset Relation: This chart is derived from the time-series data of forest area in the dataset, allowing an analysis of forest cover changes for individual countries over three decades.

• Scatter Plot:

 Description: This scatter plot shows the relationship between total land area and forest area for each country.

 Insights:

- Countries with larger land areas tend to have higher forest areas, evident from the clustering of points in the upper right corner.
- Some countries with extensive land areas have relatively small forest cover, suggesting variations in land use or environmental factors.

 Dataset Relation: This plot utilizes the Total_Land_Area_2020 and Forest_Area_2020 columns, highlighting the correlation between a country's total land area and its forest cover size.

• Word Cloud:

 Description: This word cloud represents countries by their forest area in 2020, with larger text sizes for countries with greater forest cover.

 Insights:

- Spain and Norway stand out prominently, indicating significant forest coverage in these countries.
- Smaller countries, shown in smaller fonts, indicate relatively lower forest areas, allowing a quick visual comparison among nations.

 Dataset Relation: The word cloud is based on the Forest_Area_2020 data, showcasing a comparative view of forest cover across different countries.

- **Bar Chart:**

  - **Description:** This bar chart displays the forest area (in thousands of hectares) for the top 10 countries with the largest forest areas in 2020.
  - **Insights:**
    - Brazil has the highest forest area, significantly surpassing other countries.
    - Countries like Canada and the United States follow, showcasing substantial forest areas compared to other nations.
    - Nations such as China and the Democratic Republic of the Congo show relatively lower forest areas among the top 10, indicating a smaller forest cover compared to the leaders.
  - **Dataset Relation:** The chart is derived from the forest area data in the dataset, emphasizing the extent of forest cover in various countries and identifying those with the largest forest reserves.

Conclusion:

The visualizations created using D3.js effectively illustrate key insights about forest cover and land use across different countries over time. The line chart reveals trends in forest area for individual countries, highlighting those facing steady declines due to deforestation or land-use changes. The scatter plot provides a broader perspective, showing the correlation between a country's total land area and its forest cover, with some large countries having relatively low forest density. The word cloud offers a quick comparison of forest sizes across countries, emphasizing nations with significant forest resources. Finally, the bar chart ranks the top 10 countries by forest area, underscoring global leaders in forest cover.