Sardar Patel Institute of Technology

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EXPERIMENT 8

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BATCH:	CSE(DS) - D

Aim:
To design interactive dashboards and create visual storytelling using D3.js on a dataset related to Environment/Forest cover, covering basic and advanced charts.

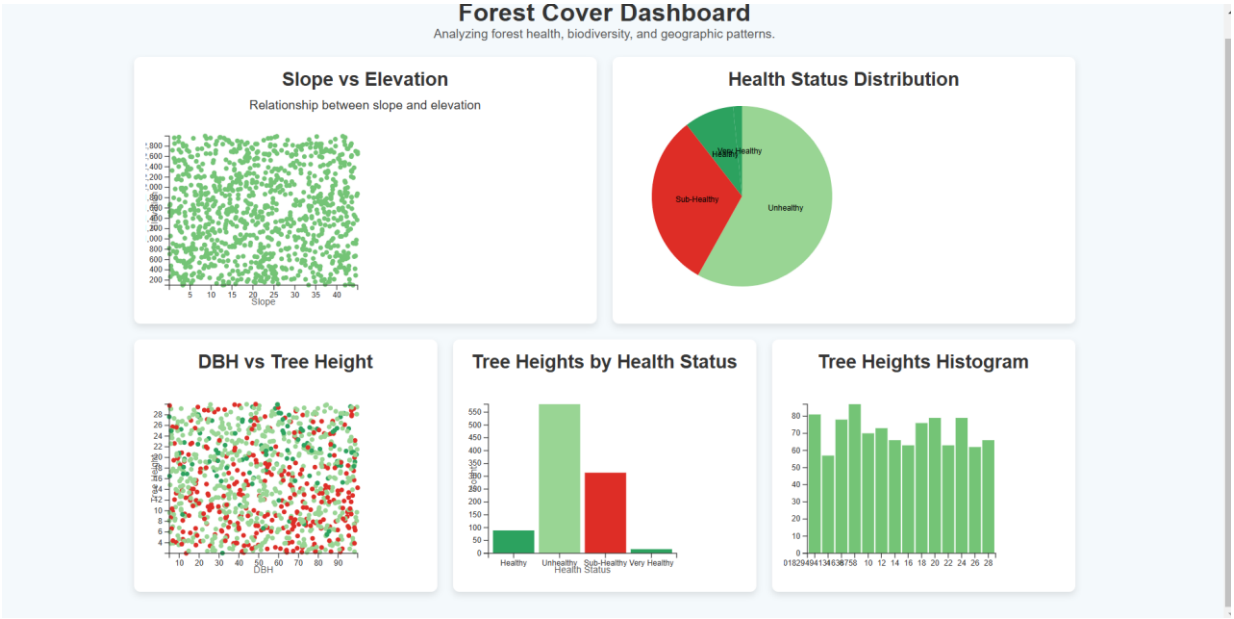
Objectives:

1. To understand how to use D3.js for data visualization.
2. To implement basic charts like Bar chart, Pie chart, Histogram, Timeline chart, Scatter plot, and Bubble plot.
3. To implement advanced charts like Word chart, Box and whisker plot, Violin plot, Regression plot (linear and nonlinear), 3D chart, and Jitter.
4. To draw observations and insights from each chart.
5. To create an interactive storytelling dashboard using the above visualizations.

DATASET:

https://www.kaggle.com/datasets/arjunprasadsarkhel/forest-cover-in-india

Dataset provides a comprehensive view of ecological and environmental metrics for trees and plots. Each record includes a location identifier (plot ID) with latitude and longitude to distinguish between sites. Tree characteristics like diameter at breast height (DBH), total height, and crown width in both north-south and east-west directions give insight into tree size and health. Site conditions—including slope, elevation, temperature, and humidity—highlight environmental influences on growth. Soil nutrient measurements cover total and available nitrogen and phosphorus levels, essential for assessing soil fertility. Biodiversity is gauged through Menhinick and Gleason indices, reflecting species richness and abundance. Disturbance level (categorized from low to high) and a fire risk index point to ecological pressures, while health status (healthy or unhealthy) indicates each tree's condition. Altogether, the dataset captures a detailed picture of tree and ecosystem health, influenced by environmental factors, biodiversity, and disturbance levels.



Slope vs Elevation Scatter Plot:

- The data points show a scattered distribution with no clear pattern, suggesting little to no correlation between slope and elevation.

Health Status Distribution (Pie Chart):

- A large portion of the trees are classified as "Unhealthy," with fewer in "Sub-Healthy" and even fewer in "Very Healthy" categories, indicating a potential concern for forest health.

DBH vs Tree Height Scatter Plot:

- Trees with larger diameters at breast height (DBH) and greater heights generally appear healthier. However, there are still unhealthy trees across various DBH and height ranges.

Tree Heights by Health Status (Bar Chart):

- "Unhealthy" trees dominate across all height ranges, while "Very Healthy" trees are relatively rare, suggesting that height alone may not be a reliable indicator of health status.

Tree Heights Histogram:

- Tree heights are distributed across multiple ranges, with certain height intervals showing a higher frequency, indicating common height ranges within this fores