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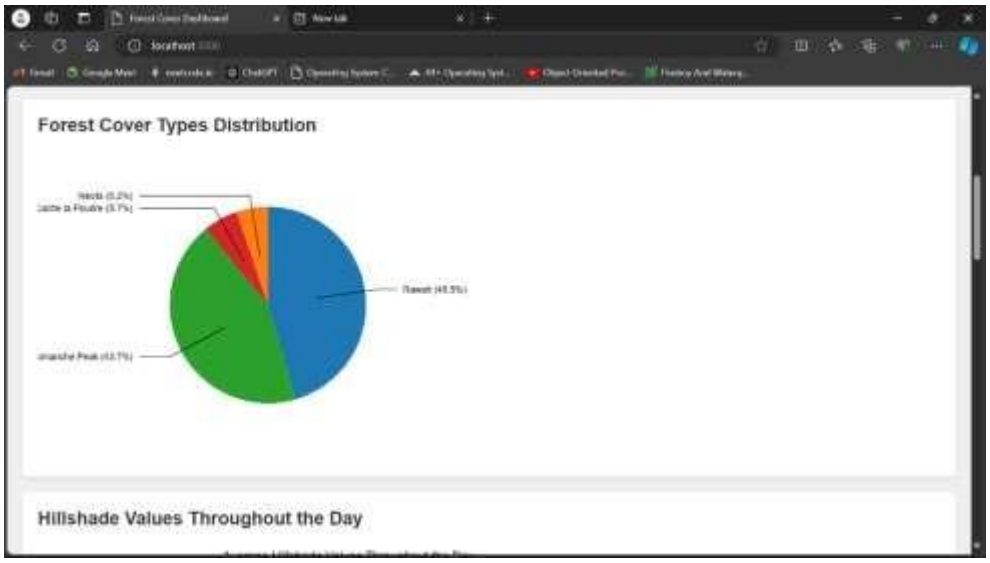
Experiment 8: To design interactive dashboards and create visual storytelling using D3.js on a dataset related to Environment/Forest cover, covering basic and advanced charts	
AIM	**Objectives:** 1. To understand how to use D3.js for data visualization. 2. To implement basic charts like Bar chart, Pie 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. **Expected Outcomes:** 1. Ability to create various types of visualizations using D3.js. 2. Interactive dashboards demonstrating different types of charts. 3. Insights from the Environment/Forest cover the dataset through visual storytelling.
DATA:	The forest cover dataset provides valuable information on various environmental and topographical features of forested regions. It includes attributes such as elevation, aspect, slope, and distances to hydrology and roadways, which together help in understanding forest ecology and identifying specific cover types. Additionally, data on soil types, wilderness areas, and sunlight exposure (hillshade values) at different times of the day are present, offering insights into the unique characteristics and diversity within forested landscapes. This dataset is often used for ecological studies, conservation planning, and machine learning tasks in environmental science.

CODE :

OBSERVATIONS:

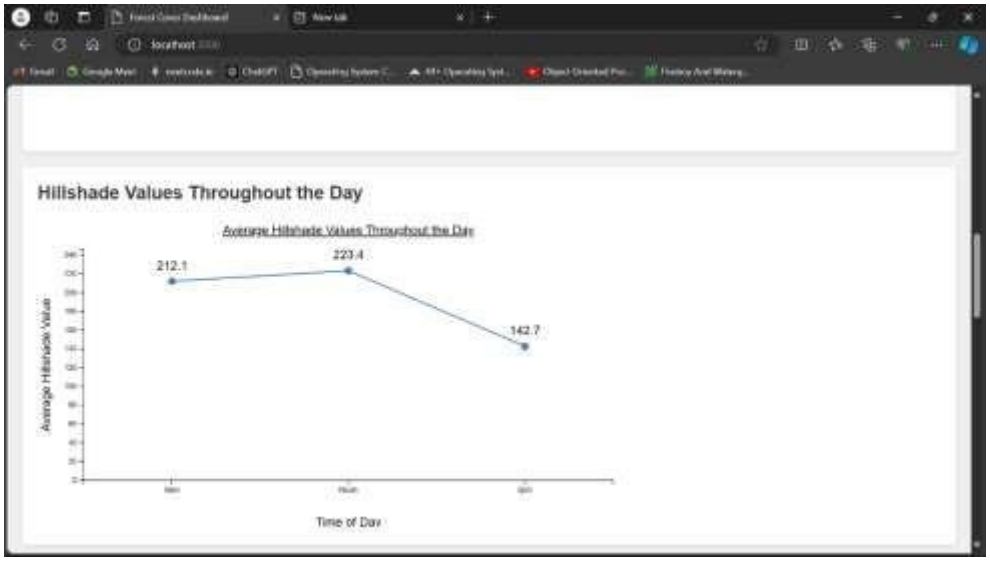
- Neota area has the highest average elevation (approximately 3200m)
- Cache la Poudre shows the lowest average elevation (approximately 2300m)
- Rawah and Comanche Peak have similar elevations (around 3000m)
- There's a significant elevation difference of about 900m between the highest and lowest areas



OBSERVATIONS:

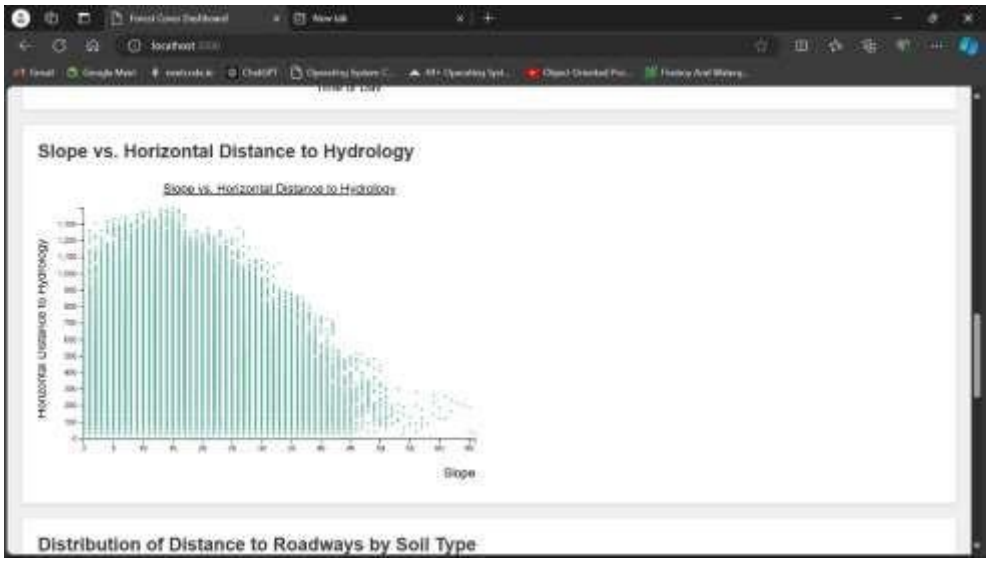
- Rawah dominates with 45.5% of the forest cover
- Comanche Peak follows closely at 43.7%

- Neota and Cache la Poudre are relatively minor, at 5.2% and 5.7% respectively
- The distribution shows that two main forest types account for nearly 90% of the coverage area



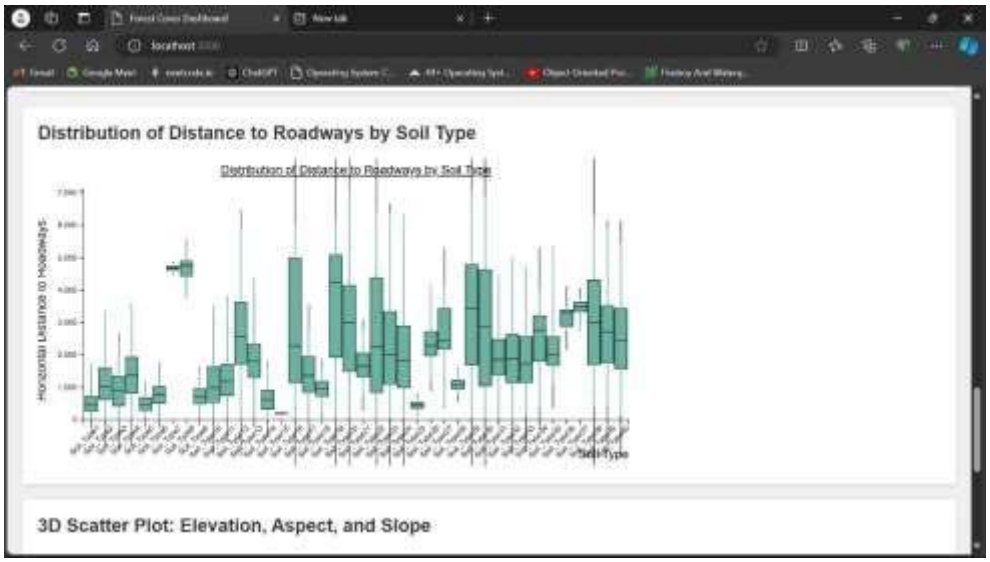
OBSERVATIONS:

- Peak hillshade value occurs at noon (223.4)
- Morning values start moderately high (212.1 at 9am)
- Significant drop in hillshade values in the afternoon (142.7 at 3pm)
- The pattern suggests optimal sunlight exposure during midday hours, which could impact forest growth and species distribution



OBSERVATIONS:

- There's a clear negative correlation between slope and distance to hydrology
- The maximum distance to hydrology decreases as slope increases
- The densest concentration of points is in the 0-30 degree slope range
- Areas with steep slopes (>40 degrees) are almost always close to water bodies, suggesting that steep terrain is often associated with water features



	OBSERVATIONS: • Most soil types show median distances between 1000-3000 meters from roadways • There is significant variation in distances across different soil types, indicated by the large box sizes and whiskers • Some soil types show extreme outliers, reaching up to 7000 meters from roadways • The data suggests that certain soil types are more likely to be found further from roads, possibly due to terrain or development patterns

CONCLUSION:

- The visualizations effectively demonstrate the complex relationships between various environmental factors in the forest ecosystem
- There are clear patterns in how terrain features (slope, elevation) relate to water proximity and forest cover types
- The data suggests that forest distribution is heavily influenced by elevation and access to resources (water, sunlight)
- The implementation successfully used various D3.js chart types to reveal different aspects of the forest cover dataset, from distributions to relationships to temporal patterns