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Lab8

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.**

DashBoard:
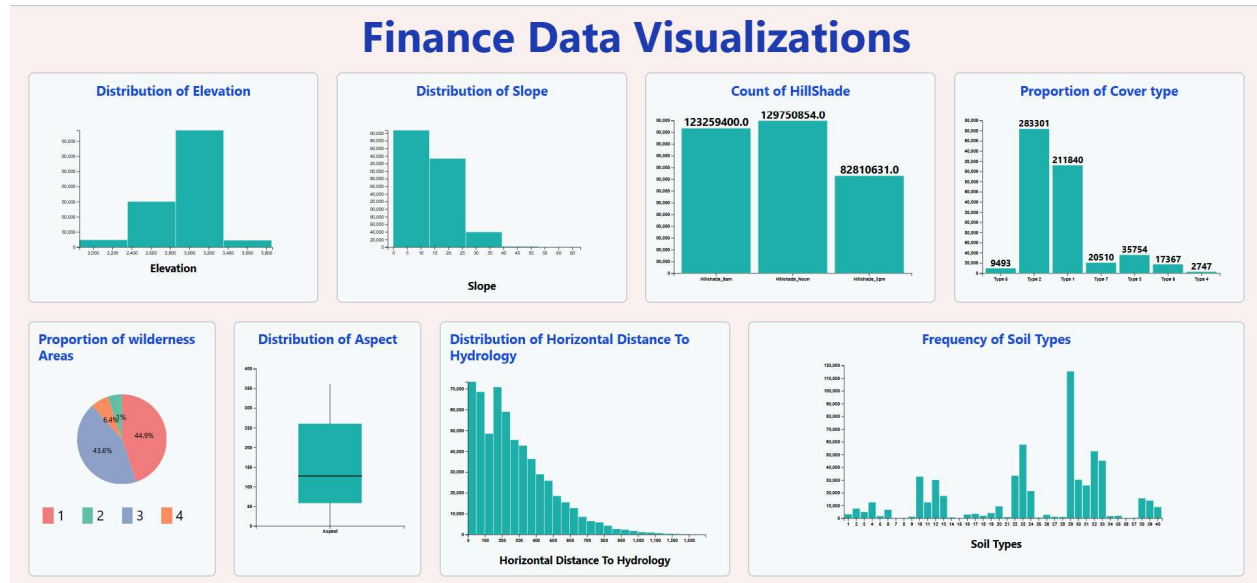
Here are observations for each diagram:

1. **Distribution of Elevation**: This bar chart shows that the majority of elevations in the dataset are concentrated between 2,400 and 3,000 units, with a significant spike around the middle. The elevation distribution indicates the presence of more landmass in this

range, suggesting that most geographical areas covered in this dataset might have higher elevation levels compared to low-lying areas.

2. **Distribution of Slope**: The chart reveals that the slope in most regions falls within the 0-20 degree range, with a clear decline as the slope increases beyond 20 degrees. This suggests that the terrain is generally mild and less steep, which could indicate suitability for construction or agriculture in such areas.

3. **Count of HillShade**: This bar chart highlights the distribution of HillShade values at different times of day—8 AM, Noon, and 3 PM. The HillShade at noon shows the highest count, suggesting that more regions are exposed to the sun at this time, followed by 8 AM. The lower count at 3 PM indicates a decrease in sun exposure, potentially due to terrain factors like hills or mountains.

4. **Proportion of Cover Type**: The cover type distribution is uneven, with Type 2 and Type 1 dominating the landscape, while Type 6, Type 3, Type 7, and others account for much smaller proportions. This indicates that certain vegetation or land cover types are more prevalent, likely reflecting specific environmental conditions favorable for them.

5. **Proportion of Wilderness Areas**: The pie chart shows that nearly half of the area falls under Wilderness Area 1, with Area 2 covering 43.6%, and much smaller proportions for Areas 3 and 4. This suggests that Wilderness Area 1 dominates the region, likely contributing to specific ecological or conservation-focused initiatives.

6. **Distribution of Aspect**: The box plot shows that the aspect (which indicates the compass direction of slopes) is relatively evenly distributed around the median, with a broad range but few extreme outliers. This suggests a diverse range of orientations for slopes, which might affect factors like sun exposure and vegetation growth.

7. **Distribution of Horizontal Distance to Hydrology**: The bar chart reveals a heavy concentration of areas within short distances from hydrology features (rivers, lakes, etc.), with the majority falling under 400 units. As distance increases, the number of observations significantly declines, indicating that most of the areas are located relatively close to water bodies.

8. **Frequency of Soil Types**: This chart indicates a high frequency of certain soil types (like Type 29), while others have much lower counts. This suggests that specific soil types dominate the dataset, potentially influencing vegetation, land use, and agricultural practices in these regions.