# Visualization with Tableau

data visualization

Advanced data visualization goes beyond the basic bar and pie charts. It delves into interactive elements, storytelling through data, and using the right visual format to communicate complex ideas. Here are some key principles of advanced data visualization:

1. **Know Your Audience:** As with any communication, understanding your audience is crucial. What is their level of data literacy? What are their goals in viewing the visualization? Tailor the complexity of the visualization and the level of detail to their needs.
2. **Start with a Clear Purpose:** What story are you trying to tell with your data? What insights do you want viewers to take away? Having a clear purpose will guide you in choosing the right chart type, design elements, and level of interactivity.
3. **Choose the Right Chart Type:** There are many chart types available, each with its strengths and weaknesses. Some common advanced chart types include:
   - **Scatter Plots:** Effective for showing relationships between two or more variables.
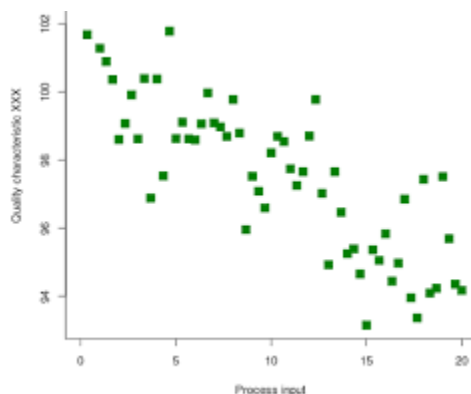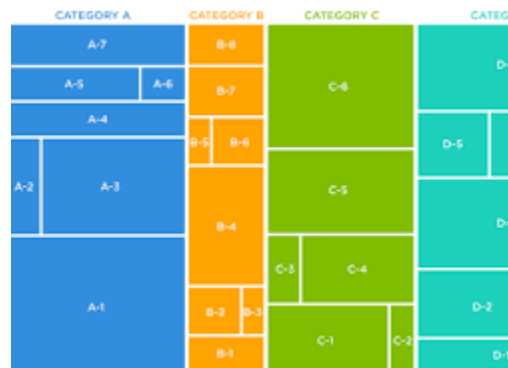

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   - Scatter Plot
   - pen_spark
   - **Heatmaps:** Used to represent data where two or more variables are measured on a continuous scale.
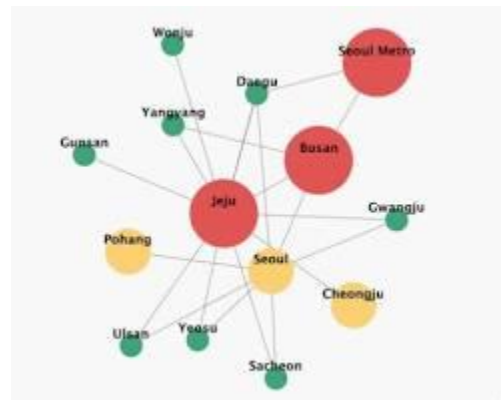
Example of a color-coded heat map
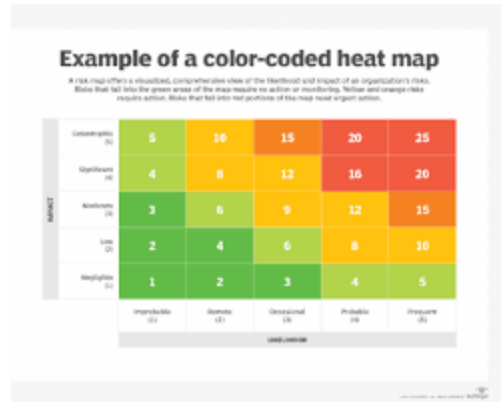
- Heatmap
- **Treemaps:** Useful for visualizing hierarchical data structures.

- Treemap
- **Network Graphs:** Show relationships between nodes (data points).

- Network Graph
4. **Highlight the Most Important Information:** Don't overwhelm viewers with too much data. Use visual cues like size, color, and position to draw attention to the most important elements.
5. **Use Color Effectively:** Color can be a powerful tool to encode information and make visualizations more engaging. However, it's important to use color thoughtfully. Avoid too many colors, and ensure good contrast for viewers with color blindness.
6. **Consider Interactivity:** Interactive visualizations allow viewers to explore the data in more depth. This can be particularly useful for complex datasets.
7. **Data Storytelling:** Advanced data visualization is about more than just creating a pretty chart. It's about using data to tell a story. Use clear labels, titles, and annotations to guide viewers through the data and help them understand the insights you want to convey.
8. **Accessibility:** Make sure your visualizations are accessible to everyone. Use appropriate color contrast, provide alternative text descriptions for images, and consider using keyboard navigation for interactive elements.
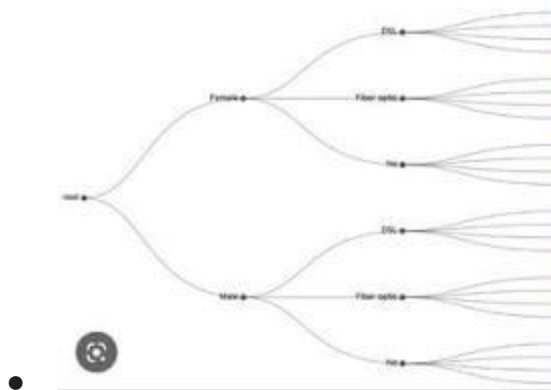
Hierarchical and network data visualization are two techniques used to represent data that involve relationships between elements. However, the way these relationships are structured is fundamentally different.

Hierarchical Data Visualization

Hierarchical data visualization depicts data organized in a tree-like structure, where elements have a parent-child relationship. Each element, except for the root element at the top, has one parent element. A common example is a file system on a computer, where folders contain files and subfolders.

Here are some common types of hierarchical data visualization:

- **Tree Diagram:** This is the most basic and intuitive way to represent hierarchical data. Nodes represent elements, and edges connect parent and child nodes.
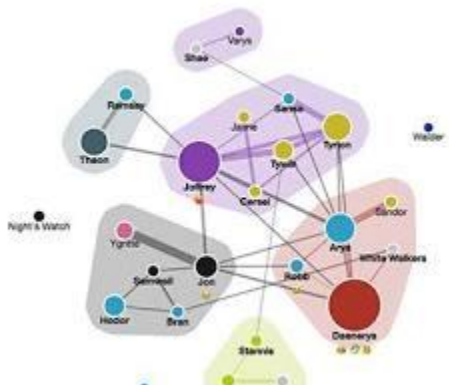
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- Tree Diagram hierarchical data visualization
- **Organization Chart:** An organization chart depicts the structure of an organization, showing how employees report to one another.

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- Organization Chart hierarchical data visualization
- **Mind Map:** A mind map visually outlines ideas or tasks, radiating from a central concept.

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● Mind Map hierarchical data visualization

Network Data Visualization

Network data visualization shows elements connected by links, not necessarily in a strict parent-child hierarchy. Elements can have multiple connections to other elements. Networks are useful for representing relationships between people, social media connections, or product recommendations.

Here are some common types of network data visualization:

● **Force Directed Layout:** Nodes are positioned based on the strength of their connections, with stronger connections pulling nodes closer together.

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● Force Directed Layout network data visualization
● **Node-Link Diagram:** Nodes represent elements, and edges represent connections between them. Edges can be directed or undirected, and their visual properties can encode additional information, like strength or type of connection.

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- NodeLink Diagram network data visualization
- **Matrix View:** This view represents connections between elements in a grid, where the intersection of a row and column shows the connection between the corresponding elements.

- Matrix View network data visualization

Choosing the right data visualization technique depends on the nature of your data and the insights you want to communicate. Hierarchical visualizations are well-suited for showing parent-child relationships, while network visualizations are better for exploring complex interconnected systems.