MUST

Wisdom & Virtue

MIRPUR UNIVERSITY OF SCIENCE AND TECHNOLOGY (MUST)

Data Visualization

Lecture 3: Types of chart in Data Visualization

COURSE TEXTBOOKS

- **Data Visualization: A Practical Introduction** by Kieran Healy
- **Storytelling with Data** by Cole Nussbaumer Knaflic
- **The Visual Display of Quantitative Information** by Edward R. Tufte
- **Fundamentals of Data Visualization** by Claus O. Wilke

Lecture Contents

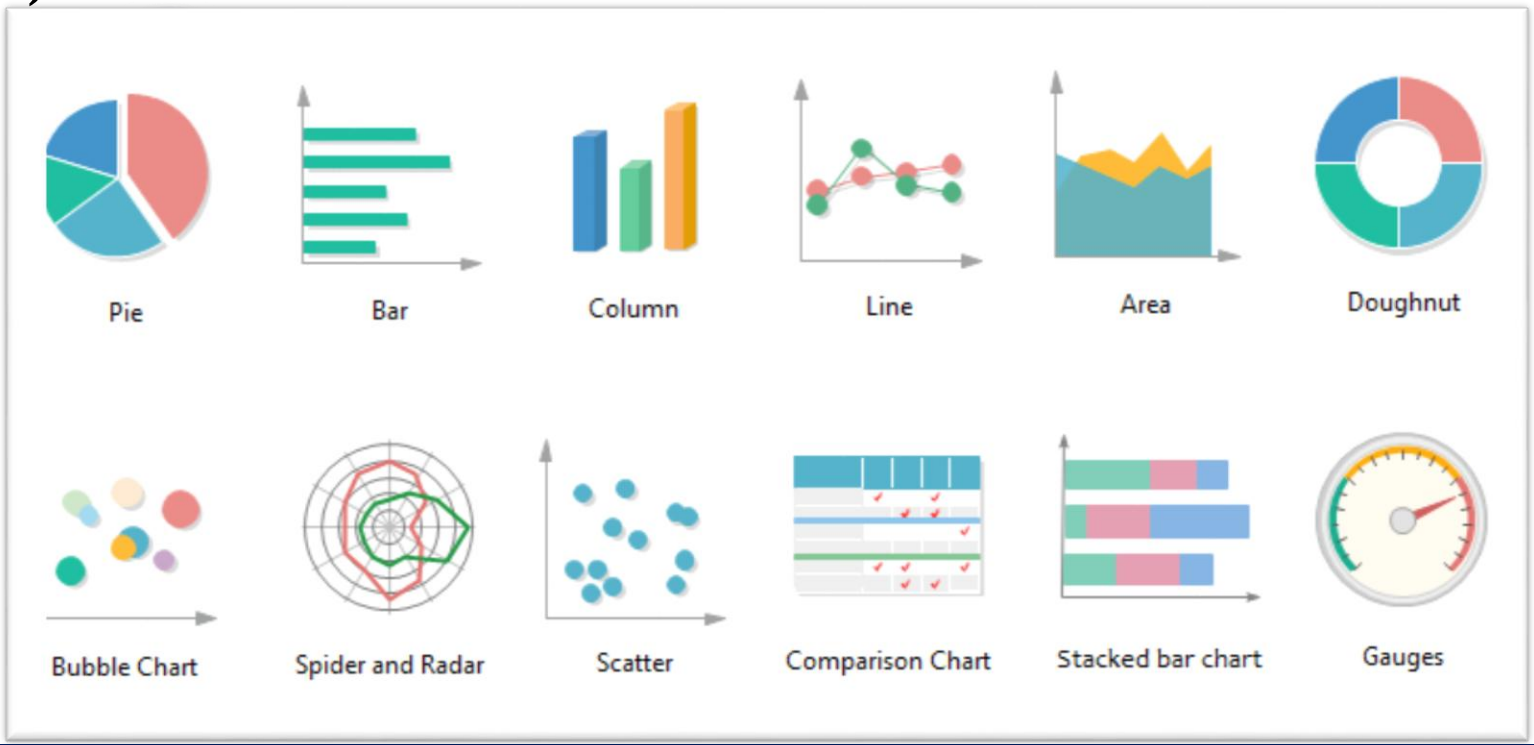
1. Types of Charts

Chart

- A **chart** is a visual representation of data designed to make information easier to understand, analyze, and interpret.
- Charts are used to present numerical data, relationships between variables, and trends over time in a way that is clearer and more accessible than raw numbers.
- In a chart, data is typically represented through various visual elements such as bars, lines, dots, or segments. Charts can be used to compare different categories, show relationships, reveal patterns, or track changes.

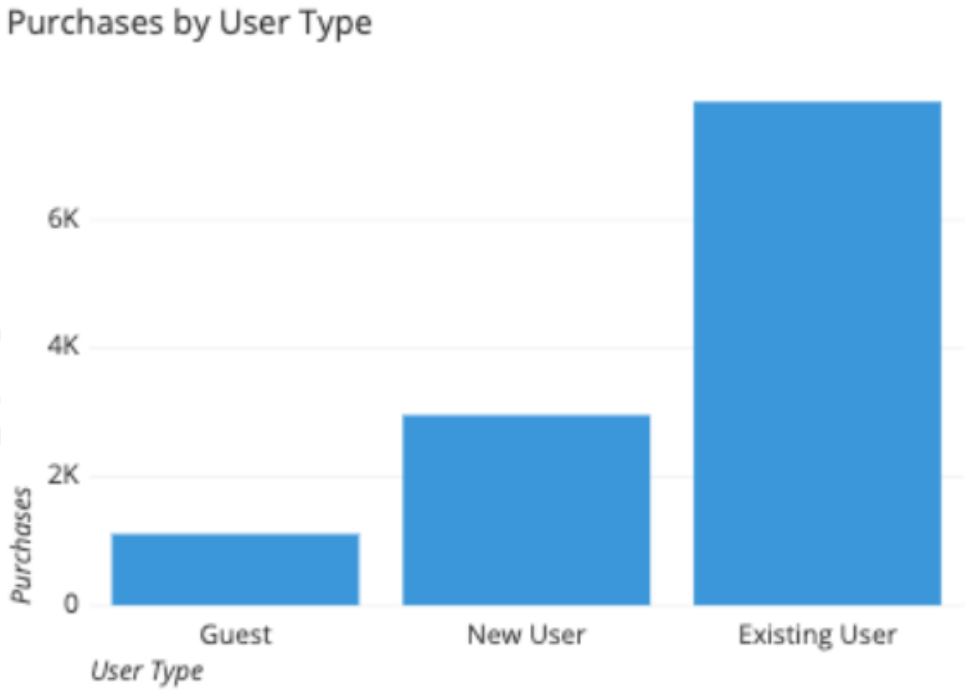
Types of Charts

- **Bar Chart**
- **Pie Chart**
- **Line Chart**
- **Histogram**
- **Box Plot (Box-and-Whisker Plot)**
- **Scatter Plot**
- **Area Chart**
- **Stacked Bar Chart**
- **Stacked Column Chart**
- **Radar Chart (Spider Chart)**
- **Heatmap**
- **Treemap**
- **Funnel Chart**
- **Waterfall Chart**
- **Dot Plot**



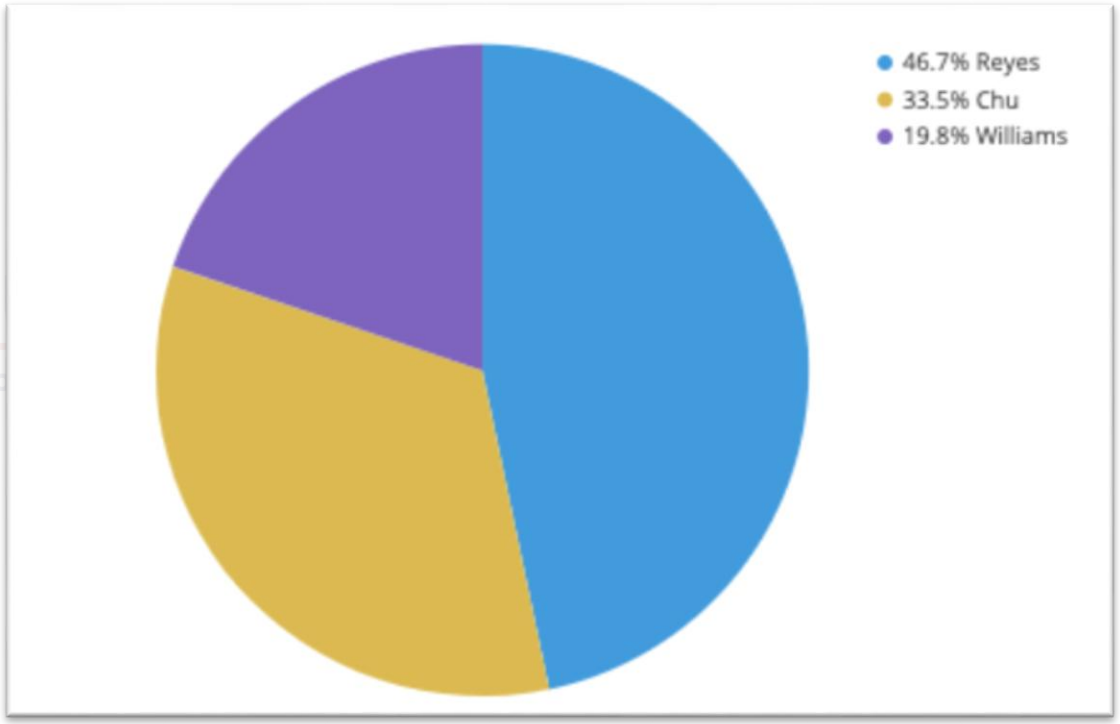
Bar Chart

- A bar chart uses rectangular bars to show comparisons between categories.
- The length of each bar represents the value or frequency.
- Bars can be vertical or horizontal.



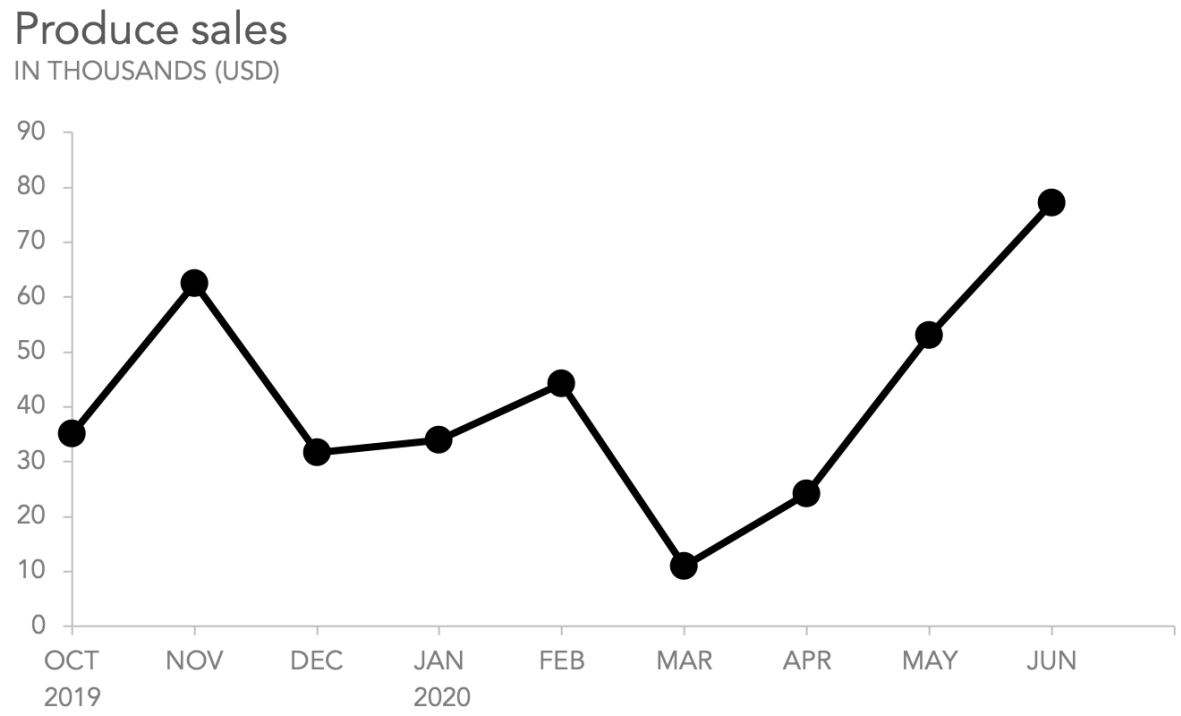
Pie Chart

- A pie chart is a circular chart divided into slices.
- Each slice shows a part of the whole.
- It’s useful for showing percentage or proportion data.



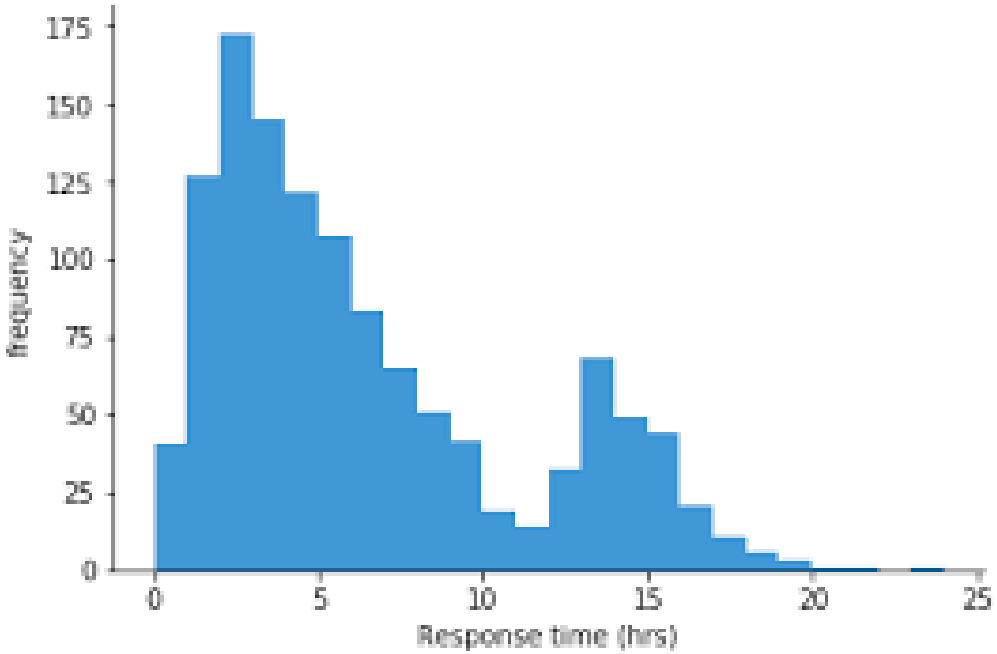
Line Chart

- A line chart connects data points with a line.
- It shows trends over time.
- Commonly used for time-series data (e.g., monthly sales).



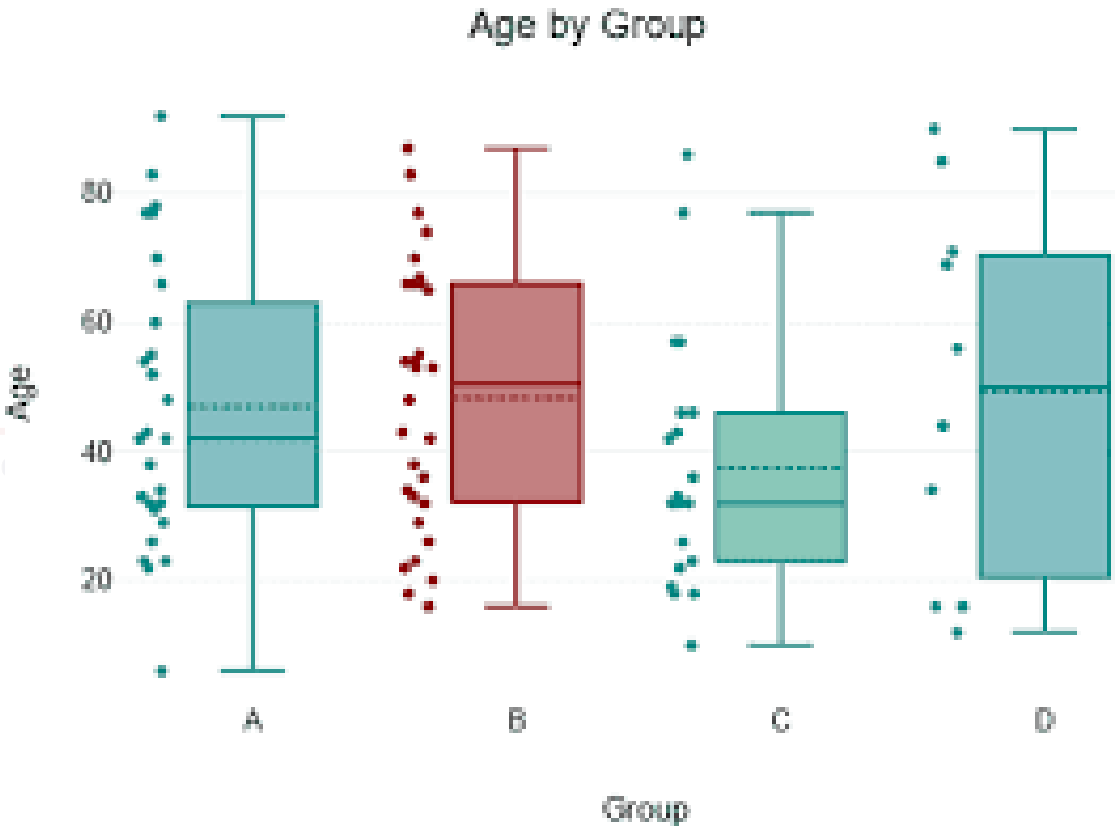
Histogram

- A histogram looks like a bar chart but groups numbers into ranges (called bins).
- It shows the distribution of numerical data.
- Useful for seeing patterns like skewness or spread.



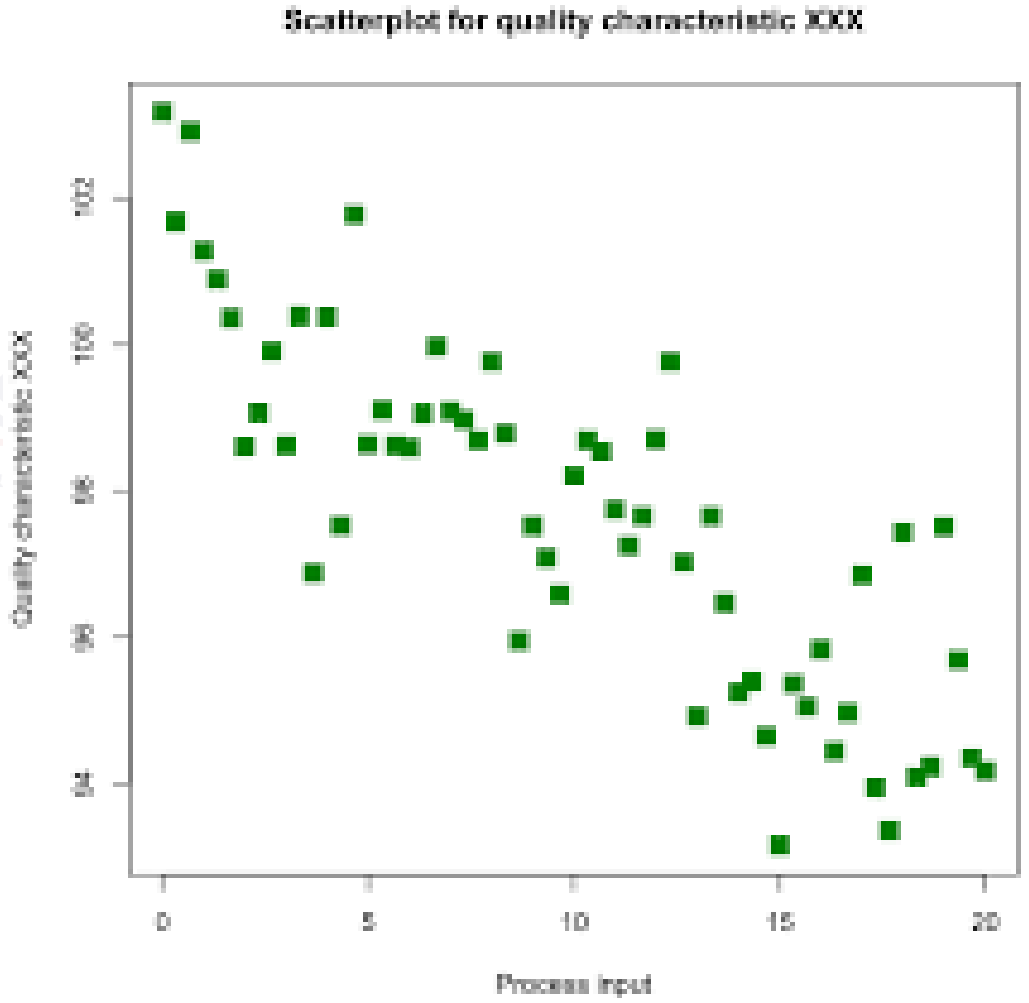
Box Plot (Box-and-Whisker Plot)

- A box plot shows the distribution of data based on five points: minimum, first quartile, median, third quartile, and maximum.
- It is useful to detect outliers and spread.
- Helpful for comparing multiple datasets.



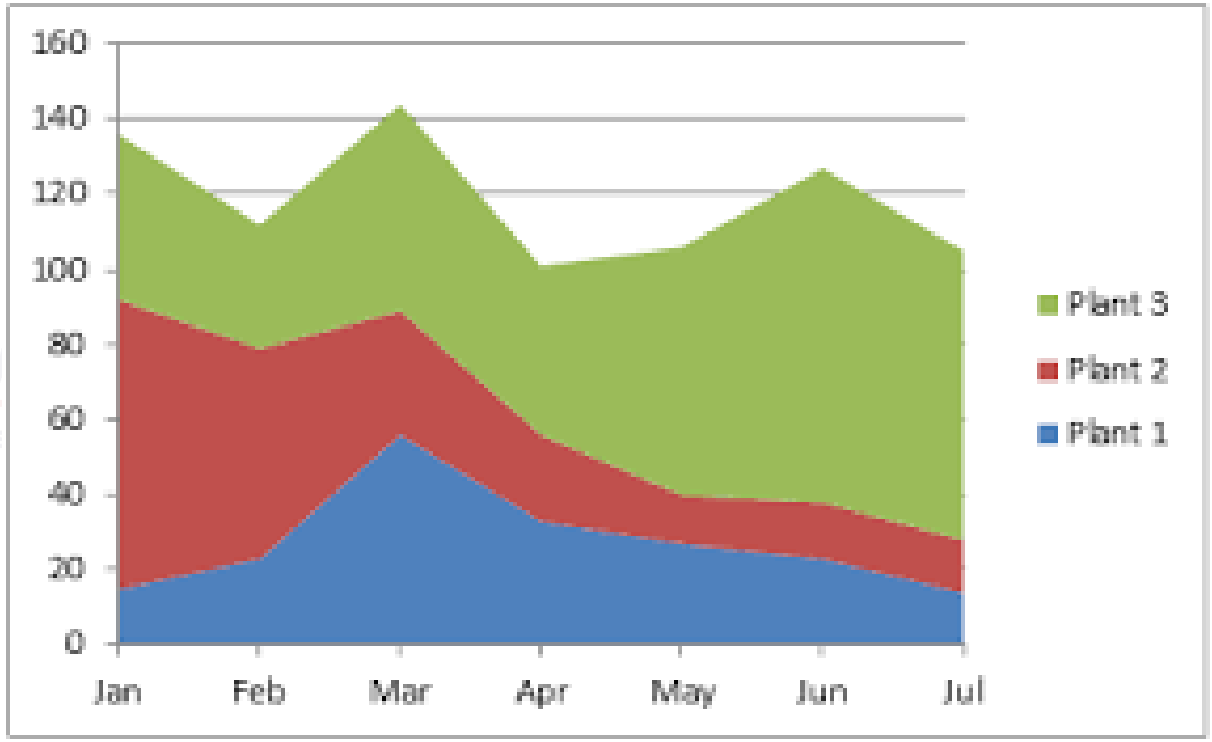
Scatter Plot

- A scatter plot uses dots to show the relationship between two variables.
- It helps in identifying correlations or patterns.
- Each point represents one observation.



Area Chart

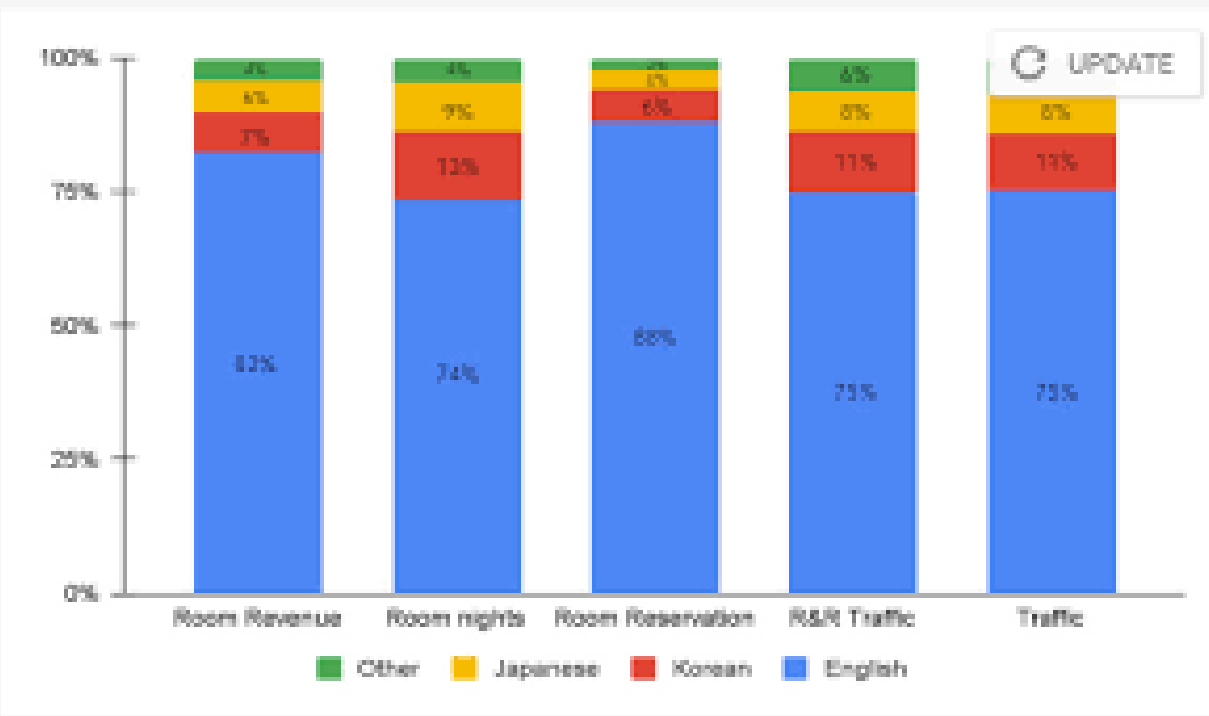
- An area chart is like a line chart but the area under the line is filled with color.
- It shows cumulative values over time.
- Good for visualizing total value trends.



Stacked Bar Chart

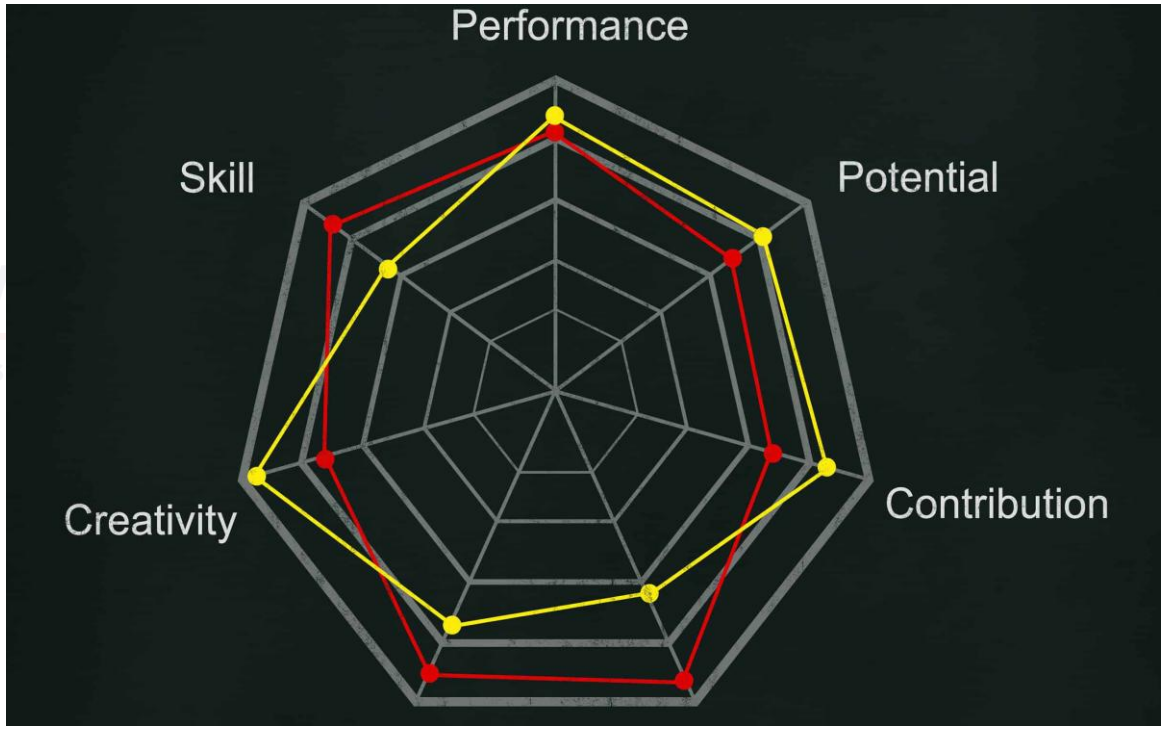
Stacked Bar Chart

- A stacked bar chart shows different groups on top of one another in a single bar.
- It displays the total and the parts that make up the total.
- Useful for part-to-whole comparisons.



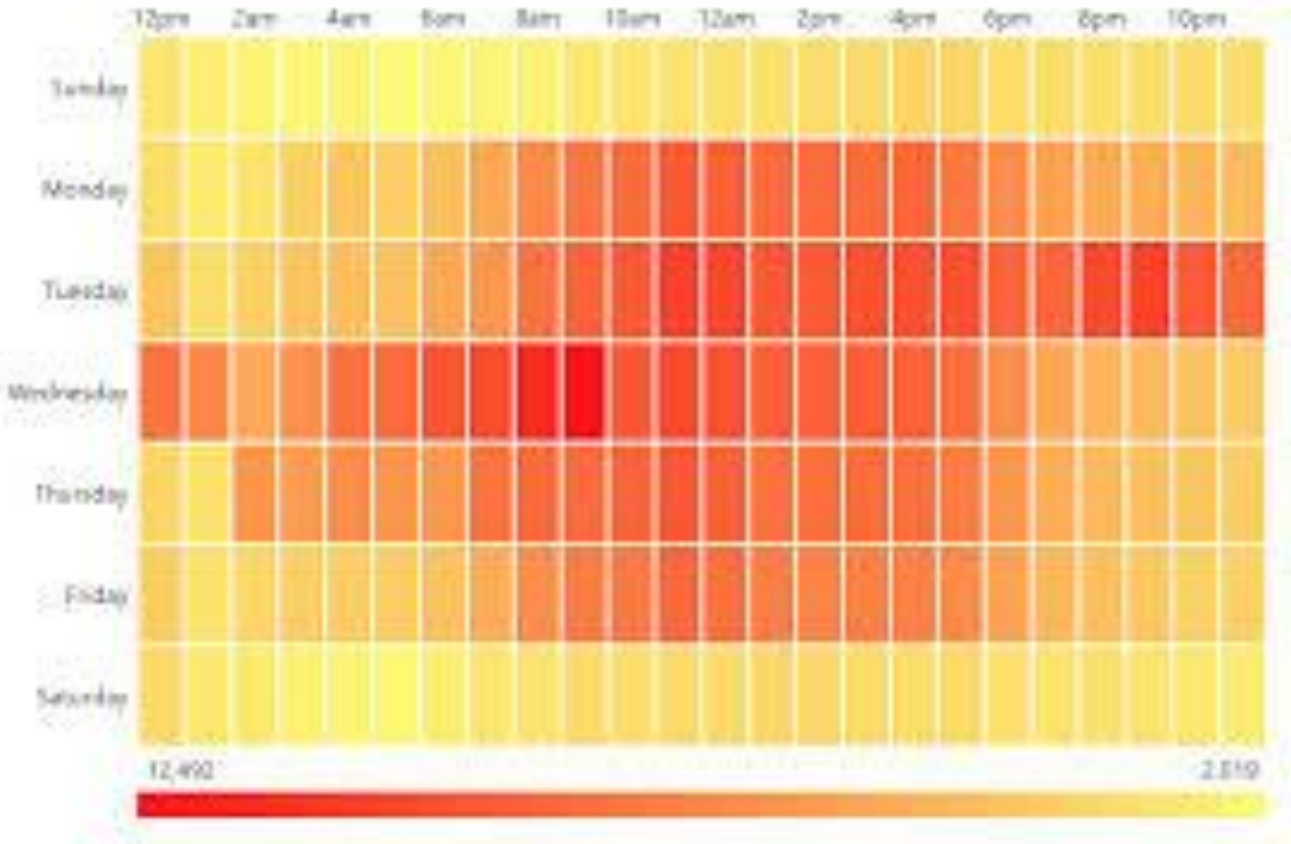
Radar Chart (Spider Chart)

- A radar chart shows multiple variables on a web-like graph.
- It helps in comparing several items at once.
- Each axis represents a different variable.



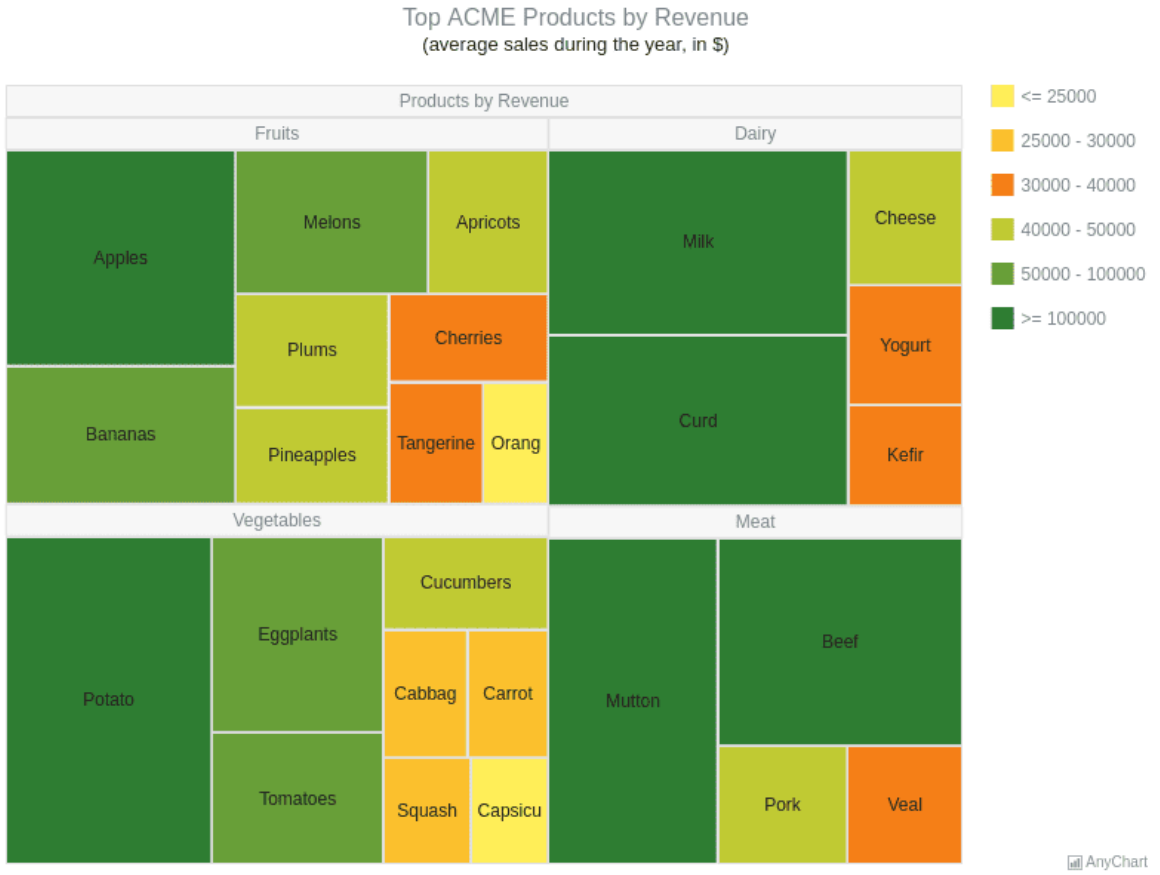
Heatmap

- A heatmap uses color to represent values in a matrix.
- Darker or lighter colors show higher or lower values.
- Often used to show patterns or correlations.



Treemap

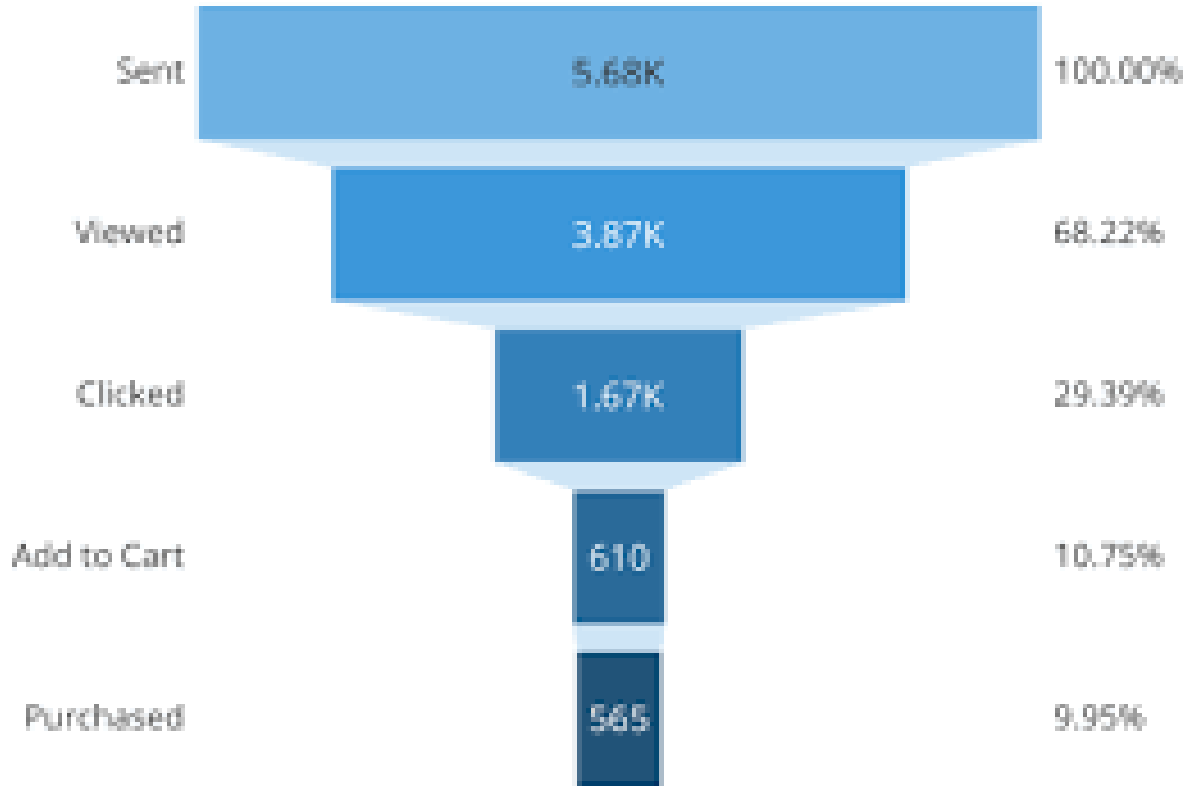
- A treemap displays data as nested rectangles.
- The size of each rectangle is proportional to its value.
- Good for showing large datasets in a compact space.



Funnel Chart

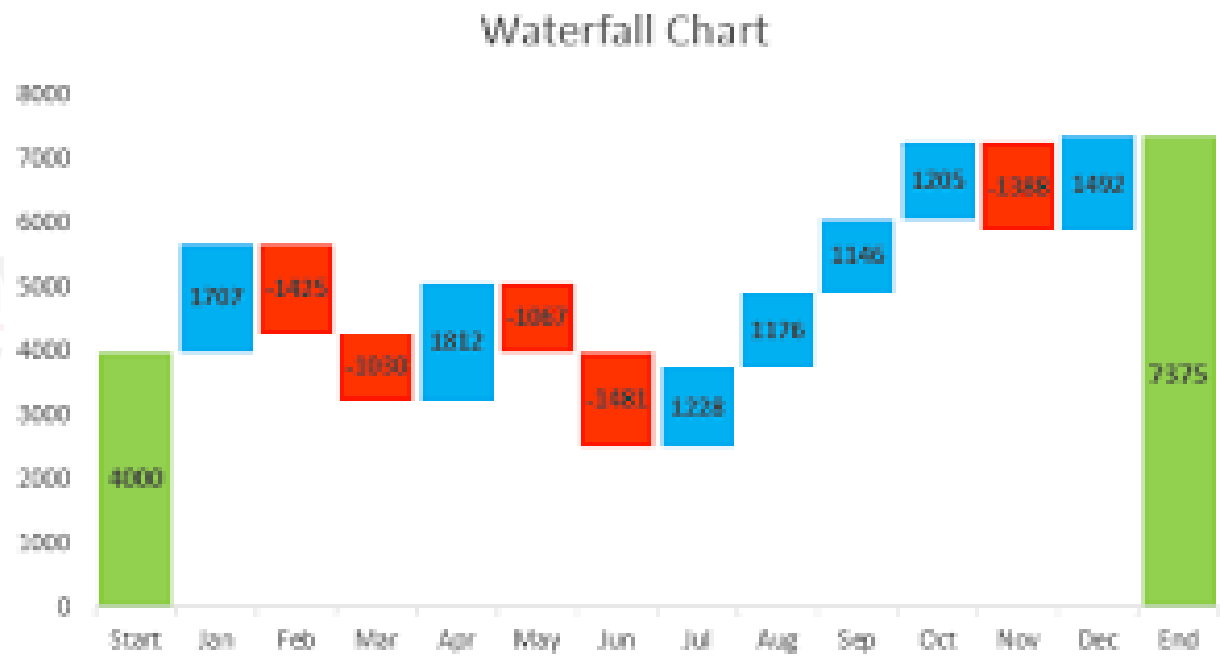
Funnel Chart

- A funnel chart shows a process that starts wide and narrows.
- Useful for sales pipelines, process steps, or conversion rates.
- Each stage of the funnel shows a quantity reduction.



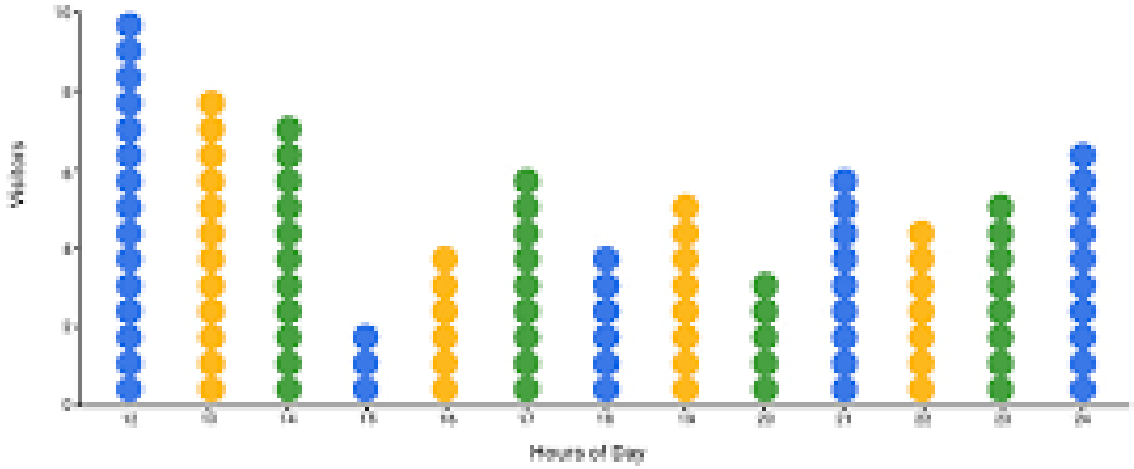
Waterfall Chart

- A waterfall chart shows how an initial value changes with positive and negative values.
- Good for financial analysis (e.g., profit/loss).
- It shows additions and subtractions clearly.



Dot Plot

- A dot plot uses dots to show frequency or distribution.
- Each dot represents one data point.
- It’s a simple way to display small datasets.



How Dot Plots Transform Numbers into Narratives?

THANKS