Data Types and Plotting

In data visualization, understanding the different types of data is crucial for selecting the appropriate plotting technique. Data can generally be categorized into several types, each with its own characteristics and implications for visualization.

1. Categorical Data Categorical data represents distinct categories or groups. It can be further divided into nominal and ordinal data:

- **Nominal Data**: This type of categorical data has no inherent order. Examples include gender, color, or brand names.
- **Ordinal Data**: This type has a defined order but not a consistent difference between categories. Examples include rankings (e.g., first, second, third) or satisfaction ratings (e.g., satisfied, neutral, dissatisfied).

Common plots for categorical data include:

- **Bar Charts**: Used to compare quantities across different categories.
- **Pie Charts**: Used to show proportions of a whole.

2. Numerical Data Numerical data consists of measurable quantities and can be classified as discrete or continuous:

- **Discrete Data**: These are countable values that often represent whole numbers (e.g., number of students in a class).
- **Continuous Data**: These can take any value within a range and are often measurements (e.g., height, weight).

Common plots for numerical data include:

- **Histograms**: Used to display the frequency distribution of numerical values.
- **Scatter Plots**: Used to examine relationships between two numerical variables.

3. Time-Series Data Time-series data is a specific type of numerical data where observations are collected at regular time intervals. It is essential for analyzing trends over time.

Common plots for time-series data include:

- **Line Graphs**: Ideal for showing trends over time.
- **Area Charts**: Useful for visualizing cumulative totals over time.

When choosing the right plot type, consider the nature of your dataset and the insights you wish to convey. For example:

- Use bar charts when comparing categorical variables.
- Use line graphs when displaying trends over time.
- Use scatter plots to explore relationships between two numerical variables.

By understanding these fundamental concepts of data types and their corresponding visualization techniques, one can effectively communicate insights derived from the analysis.
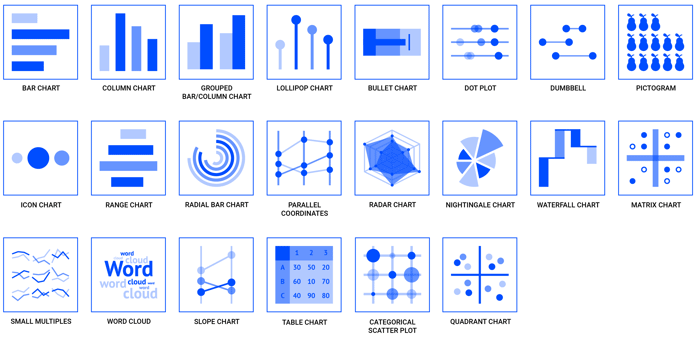

Data Types for Plotting

When it comes to data visualization, understanding the types of data you are working with is crucial for selecting the appropriate plot type. Here are the main data types relevant for plotting:

1. **Categorical Data**: This type of data represents categories or groups. Categorical data can be nominal (no inherent order, e.g., colors, names) or ordinal (with a defined order, e.g., rankings). Common visualizations for categorical data include bar charts and pie charts.

2. **Numerical Data**: Numerical data consists of quantifiable values that can be measured. It can be further divided into:

   - **Discrete Data**: This is countable data that takes on specific values (e.g., number of students in a class). Suitable visualizations include bar charts and histograms.

   - **Continuous Data**: This type includes any value within a range (e.g., height, weight). Line graphs and scatter plots are often used to visualize continuous data.

3. **Ordinal Data**: A special case of categorical data where the categories have a meaningful order but no fixed interval between them (e.g., satisfaction ratings from 1 to 5). Bar charts and box plots can effectively represent ordinal data.

4. **Time-Series Data**: This is a sequence of data points collected or recorded at specific time intervals (e.g., stock prices over time). Time-series data is typically visualized using line graphs to show trends over time.

5. **Geospatial Data**: This type involves geographical information that can be plotted on maps (e.g., population density by region). Heatmaps and choropleth maps are commonly used for geospatial visualization.

6. **Mixed Data Types**: Sometimes datasets contain multiple types of variables, such as both categorical and numerical variables. In such cases, bubble charts or grouped bar charts may be useful to display relationships between different types of data.

By understanding these various data types, one can make informed decisions about which visualization techniques will best convey the insights from the dataset being analyzed.
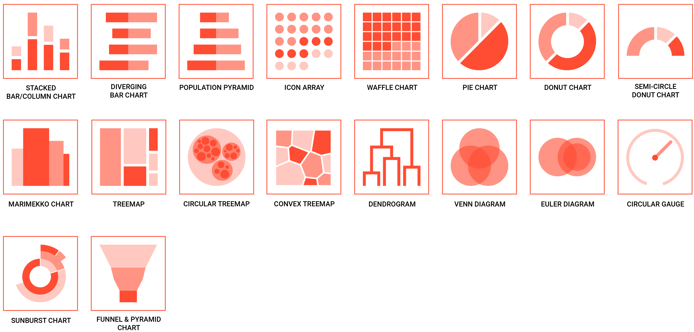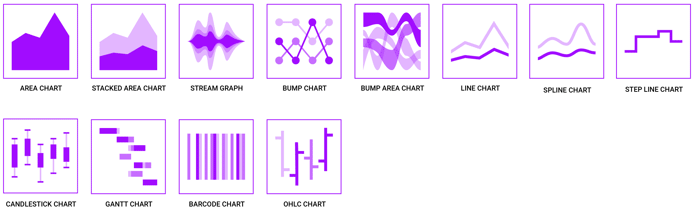
COMPARISON

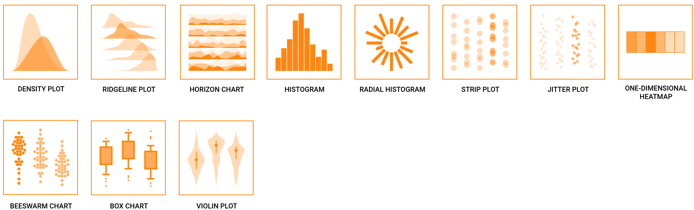|							
BAR CHART	COLUMN CHART	GROUPED BAR/COLUMN CHART	LOLLIPOP CHART	BULLET CHART	DOT PLOT	DUMBBELL	PICTOGRAM
ICON CHART	RANGE CHART	RADIAL BAR CHART	PARALLEL COORDINATES	RADAR CHART	NIGHTINGALE CHART	WATERFALL CHART	MATRIX CHART
SMALL MULTIPLES	WORD CLOUD	SLOPE CHART	TABLE CHART	CATEGORICAL SCATTER PLOT	QUADRANT CHART		

CORRELATION

HEATMAP	BUBBLE CHART	SCATTER PLOT	CONNECTED SCATTER PLOT	HEXAGONAL BINNING	CONTOUR PLOT

PART-TO-WHOLE & HIERARCHICAL

STACKED BAR/COLUMN CHART	DIVERGING BAR CHART	POPULATION PYRAMID	ICON ARRAY	WAFFLE CHART	PIE CHART	DONUT CHART	SEMI-CIRCLE DONUT CHART
MARIMEKKO CHART	TREEMAP	CIRCULAR TREEMAP	CONVEX TREEMAP	DENDROGRAM	VENN DIAGRAM	EULER DIAGRAM	CIRCULAR GAUGE
SUNBURST CHART	FUNNEL & PYRAMID CHART						

DATA OVER TIME (TEMPORAL)

AREA CHART	STACKED AREA CHART	STREAM GRAPH	BUMP CHART	BUMP AREA CHART	LINE CHART	SPLINE CHART	STEP LINE CHART
CANDLESTICK CHART	GANTT CHART	BARCODE CHART	OHLC CHART				

DISTRIBUTION

DENSITY PLOT	RIDGELINE PLOT	HORIZON CHART	HISTOGRAM	RADIAL HISTOGRAM	STRIP PLOT	JITTER PLOT	ONE-DIMENSIONAL HEATMAP
BEESWARM CHART	BOX CHART	VIOLIN PLOT					

GEOSPATIAL & OTHER

GEOGRAPHIC HEATMAP	CHOROPLETH MAP	TILE MAP	CHORD DIAGRAM	ARC DIAGRAM	SANKEY	NETWORK DIAGRAM	FLOWCHART