DATAcated

DATAcated Chart Selector Guide

The *DATAcated® Chart Selector Guide* is meant to be used as a guide selecting charts to use in your data visualizations

DATAcated® Chart Selector Guide

What type of data would you like to present?

Specific Value

Single Value

Show the raw number prominently displayed

Table

Show the exact values and compare pairs of related values

Highlight Table

Show the exact values and use color to convey relative magnitude

Heatmap

Compare values by encoding the marks with color and size

Comparison

Single Line Chart

Display trends over a period of time for a single category

Multiple Lines

Display trends over a period of time for multiple categories

Bar Chart

Shows comparisons among discrete categories

Grouped Bar Chart

Shows comparisons among discrete categories and sub-categories

Stacked Bar Chart

Shows comparisons among discrete categories and sub-categories

Dual Axis Chart

Show the relationship between two variables with different magnitudes and scales

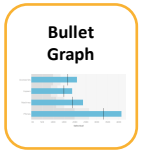
Radar

Plots one or more series of values over multiple quantitative variables

Slope Graph

Compares a data point, typically between two points in time

Bullet Graph



Compares data against historical performance or pre-assigned thresholds

Relationship

Scatter Plot

Shows the relationship between two variables

Bubble

Shows relational value without regards to axes

Word Cloud

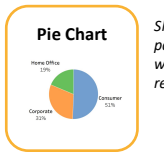
Shows the relative frequency of words in our data

Composition

Tree Map

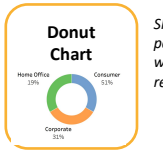
Shows a hierarchical part-to-whole relationship

Pie Chart



Shows a part-to-whole relationship

Donut Chart

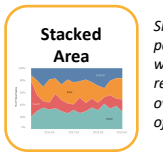


Shows a part-to-whole relationship

Stacked Bar 100%

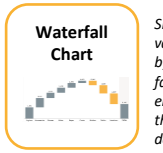
Shows a part-to-whole relationship across categories

Stacked Area



Shows a part-to-whole relationship over a period of time

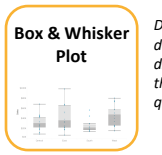
Waterfall Chart



Shows how a value changes by various factors that either increase the value, or decrease it

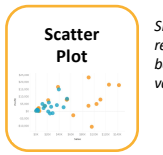
Distribution

Box & Whisker Plot



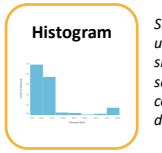
Displays the data distribution through quartiles

Scatter Plot



Shows the relationship between two variables

Histogram



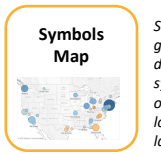
Show the underlying shape of a set of continuous data

Geographic

Filled Map

Shows geographic data using shading on a country or state basis to indicate relationships

Symbols Map



Shows geographic data using a symbol plotted over a longitude and latitude

The *DATAcated® Chart Selector Guide* is meant to be used as a guide selecting charts to use in your data visualizations

Chart Selector Guide: **Single Value**

Show the raw number prominently displayed

Best Practices

- ✓ Make the values big enough to catch attention and stand out.
- ✓ If you're using multiple single value items in your dashboard, it's important to keep the font size and type consistent.
- ✓ Proper placement on a dashboard is important to make sure that the audience finds it quickly.

Chart Selector Guide: **Table**

Show the exact values and compare pairs of related values

Table

Region	A	B	C	Grand Total
Central	$163,797	$167,026	$170,416	$501,240
East	$208,291	$205,516	$264,974	$678,781
South	$117,299	$125,651	$148,772	$391,722
West	$252,613	$220,853	$251,992	$725,458
Grand Total	$742,000	$719,047	$836,154	$2,297,201

Best Practices

- ✓ Arrange time-based data horizontally across in separate columns. If you're showing a ranking, arrange the items vertically with the most important ones at the top.
- ✓ Design both the layout and the labeling of your tables in a straightforward fashion, so the attention is on the substantive points to be conveyed by your data.
- ✓ Column headers, at the top of the table, should identify the data presented in each column of the table and provide any relevant metadata.
- ✓ Columns should be evenly spaced and not too far apart. The table should only be as wide as the data content requires.

Chart Selector Guide: **Highlight Table**

Show the exact values and use color to convey relative magnitude

Highlight Table

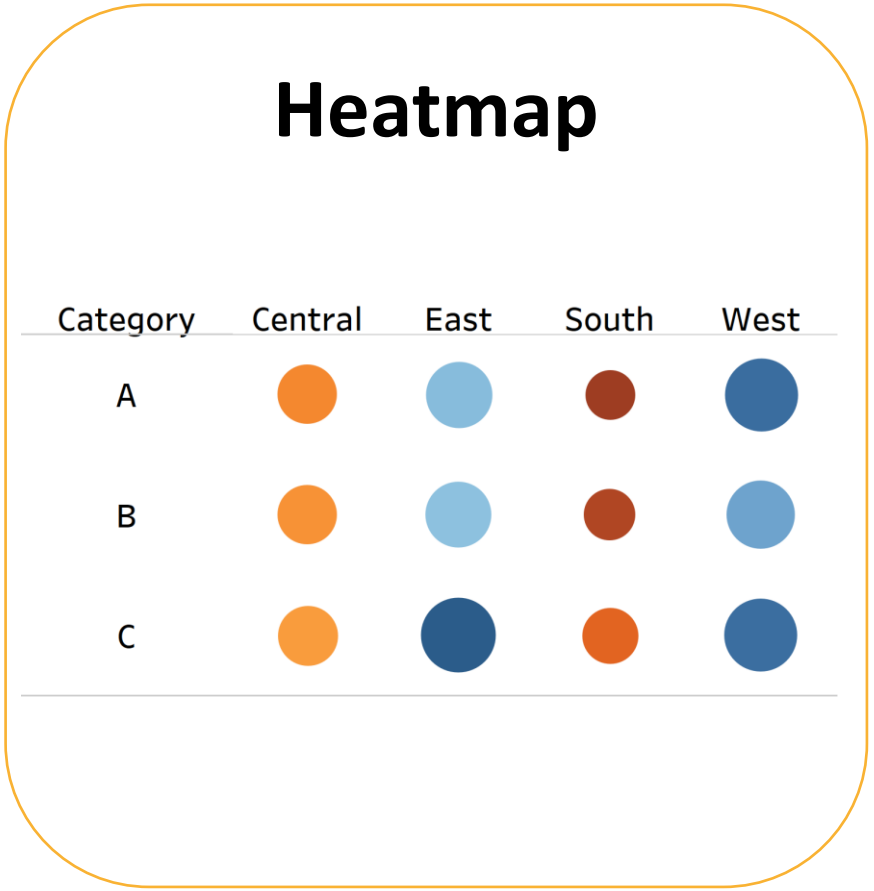
Region	A	B	C
Central	$163,797	$167,026	$170,416
East	$208,291	$205,516	$264,974
South	$117,299	$125,651	$148,772
West	$252,613	$220,853	$251,992

Best Practices

- ✓ Color is a core component of this type of table. Choose an appropriate color palette to match the data.
- ✓ It is common to use a sequential color; where lighter colors correspond to smaller values and darker colors to larger values.
- ✓ Also refer to *Table* for additional best practices.

Chart Selector Guide: **Heatmap**

Compare values by encoding the marks with color and size



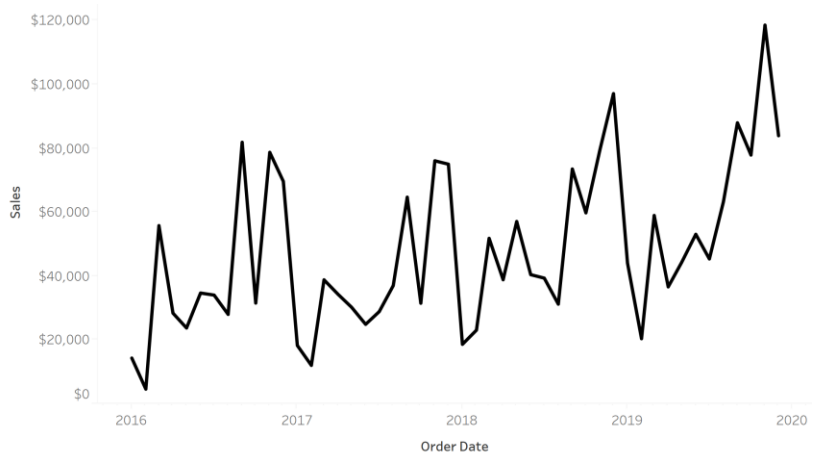
Best Practices

- ✓ Ensure proper sizing of the marks in the view and intuitive use of color.
- ✓ Add data labels into the view, when necessary.
- ✓ Be aware that this type of mixed and double encoding can be confusing for your audience - ensure that you provide a clear color and size legend.
- ✓ Also refer to *Table* and *Highlight Table* for additional best practices.

Chart Selector Guide: **Single Line Chart**

Display trends over a period of time for a single category

Single Line Chart



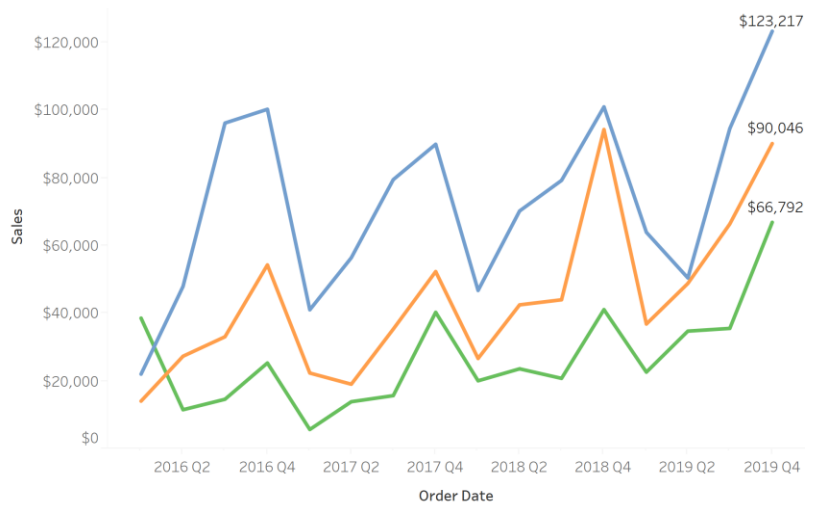
Best Practices

- ✓ Select the right interval for your data; you need to find the right balance by relying on your domain knowledge of the data.
- ✓ In most cases, the y axis will start at zero, if it doesn't, you'll need to clearly demonstrate this to avoid confusing your audience.
- ✓ Clearly label your axes, remove redundant grid lines, and in some cases, you might need to add data labels to the starting and ending points or min and max values in your view.

Chart Selector Guide: **Multiple Lines Chart**

Display trends over a period of time for multiple categories

Multiple Lines Chart

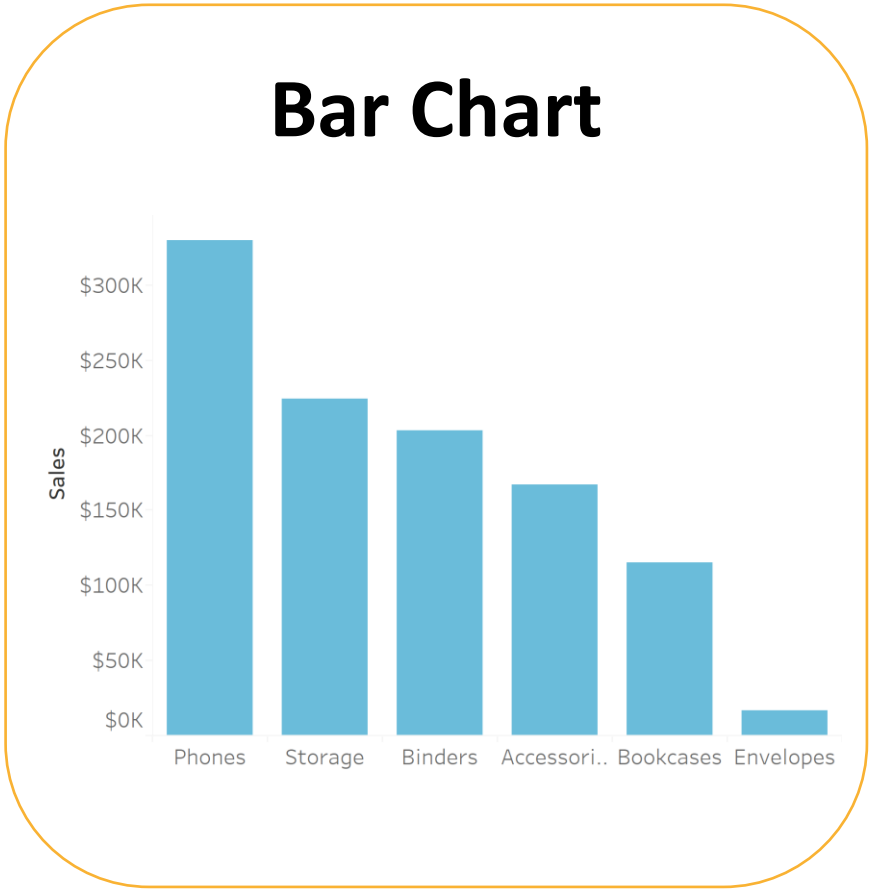


Best Practices

- ✓ Avoid comparing more than 5 lines in your chart, as the number of lines increases, so does the amount of time it takes the reader to understand what they are looking at.
- ✓ Use color to help differentiate the various lines in the view.
- ✓ Avoid using sequential colors to minimize confusion. Using colors that are distinct from each other is best.
- ✓ Also refer to *Single Line Chart* for additional best practices.

Chart Selector Guide: **Bar Chart**

Shows comparisons among discrete categories



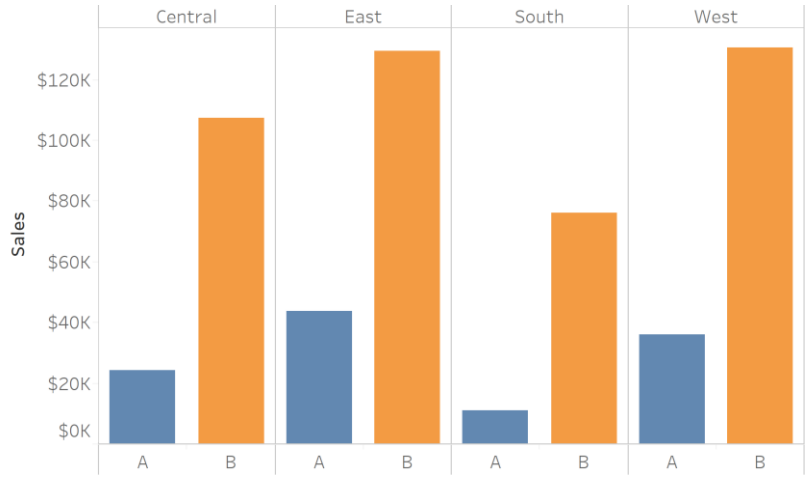
Best Practices

- ✓ Sort your data either from greatest to smallest or the other way around - to help your audience spot the differences.
- ✓ Avoiding using different colors for each bar as it will confuse your audience
- ✓ Use a horizontal bar chart for displaying many categories or if you're using lengthy data labels.
- ✓ Sometimes it makes sense to add data labels directly on the bars
- ✓ Maintain a zero baseline.
- ✓ Ensure there is enough space between the bars.
- ✓ The bar thickness needs to be appropriate for the visualization.
- ✓ Avoid 3D bar charts because they can distort the perception of the data.

Chart Selector Guide: **Grouped Bar Chart**

Shows comparisons among discrete categories and sub-categories

Grouped Bar Chart

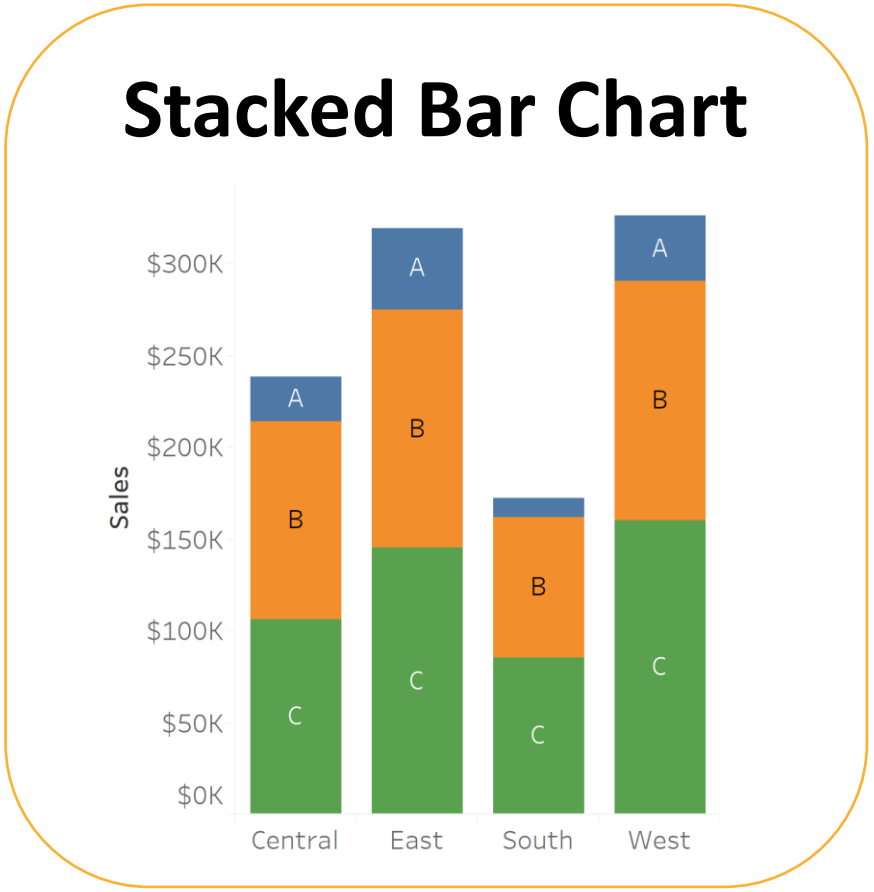


Best Practices

- ✓ Be careful about not showing too much information which can result in a complicated visualization.
- ✓ Effective use of color to distinguish the categories.
- ✓ Also refer to *Bar Chart* for additional best practices.

Chart Selector Guide: **Stacked Bar Chart**

Shows comparisons among discrete categories and sub-categories



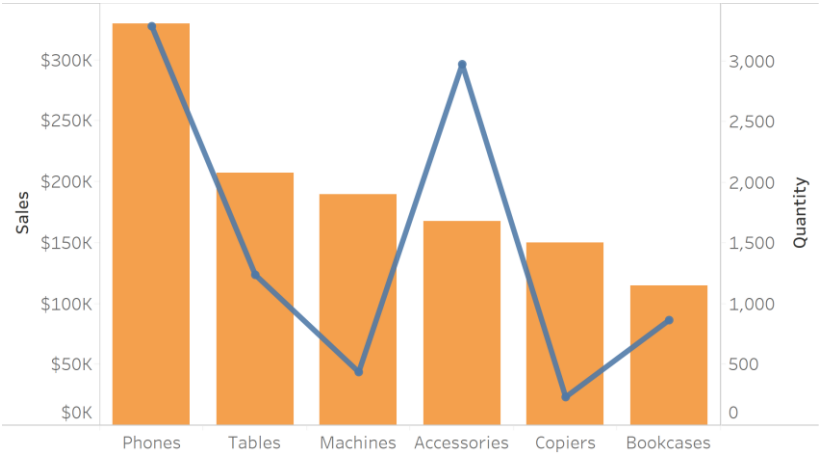
Best Practices

- ✓ Only use 2-3 categories per group otherwise it'll become difficult to see patterns in the data.
- ✓ If you have negative values, you should avoid this chart as there is no way to show negative spaces.
- ✓ Effective use of color to distinguish the categories.
- ✓ Also refer to *Bar Chart* for additional best practices.

Chart Selector Guide: **Dual Axis Chart**

Show the relationship between two variables with different magnitudes and scales

Dual Axis Chart



Best Practices

- ✓ Ensure that the y axes are related - the chart should help tell a story effectively.
- ✓ Place the primary y axis on the left - we are used to looking at the y axis on the left first.
- ✓ Use contrasting colors to make it easier for your audience to understand the difference.
- ✓ Also refer to *Bar Chart* and *Line Chart* for additional best practices.

Chart Selector Guide: **Radar Chart**

Plots one or more series of values over multiple quantitative variables

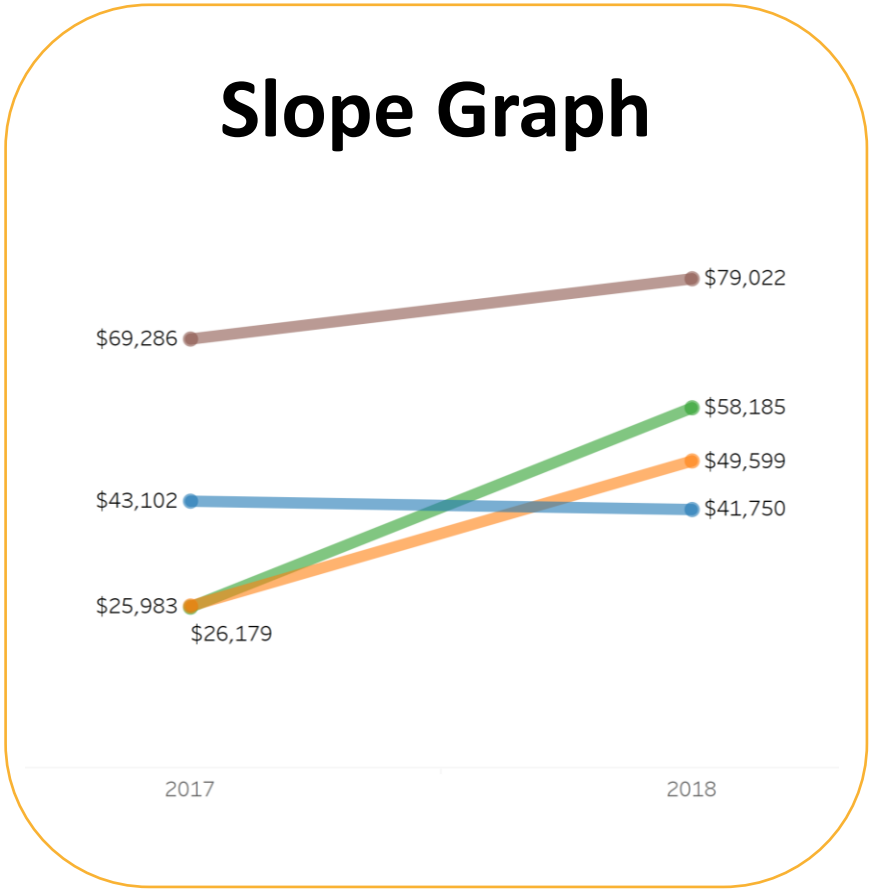
Radar Chart

Best Practices

- ✓ Be aware that multiple polygons in one chart makes it confusing and difficult for the audience to read the chart.
- ✓ Generally do not attempt to compare more than three groups on one radar chart.
- ✓ Avoid displaying more than ten factors on one radar chart.
- ✓ These charts should be used sparingly as they may end up confusing your audience.

Chart Selector Guide: **Slope Graph**

Compares a data point, typically between two points in time



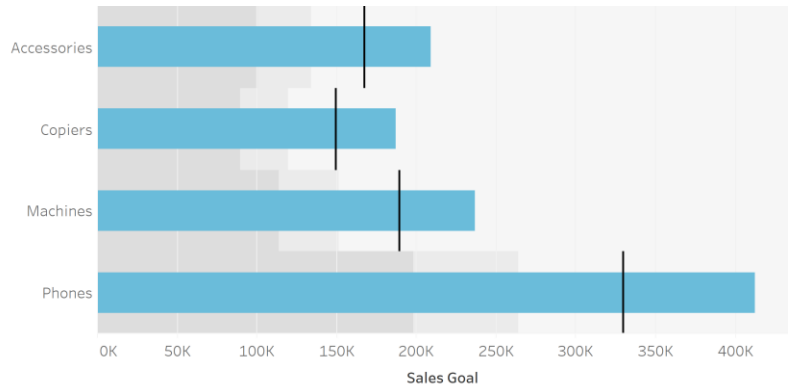
Best Practices

- ✓ Slope graphs are most useful if there are notable changes / differences to highlight. If there are not, they can look like ladder and not be as engaging.
- ✓ Add labels to the start and end points of the slop graph to help your reader get insights quicker.
- ✓ The lines in this type of chart are typically a bit thicker than a normal line graph.
- ✓ Also refer to *Single Line Chart* for additional best practices.

Chart Selector Guide: **Bullet Graph**

Compares data against historical performance or pre-assigned thresholds

Bullet Graph



Best Practices

- ✓ Use primary color palette shades or additional range colors.
- ✓ Use contrasting colors to highlight how the data is progressing.
- ✓ Use one color in different shades to gauge progress.
- ✓ Remove anything that isn't adding information: borders, gridlines, etc.
- ✓ Also refer to *Bar Chart* for additional best practices.

Chart Selector Guide: **Scatter Plot**

Shows the relationship between two variables

Scatter Plot

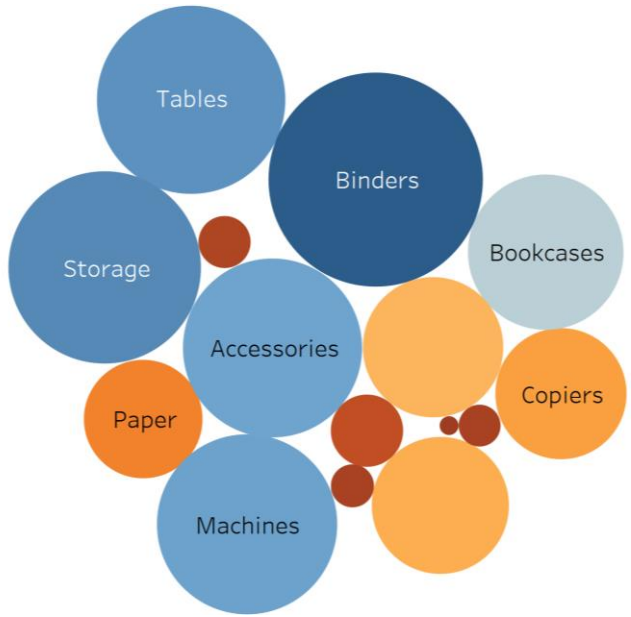
Best Practices

- ✓ Formatting the marks in the view can really help in making your scatter plots stand out. You can use color to identify different categories in the view.
- ✓ Make the mark a bit transparent - this allows the audience to see what's behind the marks.
- ✓ Reduce overlapping marks and see more individual plots.
- ✓ Independent variables need to be placed on the x-axis and dependent variables on the y axis.
- ✓ Consider including a trend line to define the correlation.
- ✓ Use custom shapes in place of the typical circles that you are likely familiar with, as applicable

Chart Selector Guide: **Bubble Chart**

Shows relational value without regards to axes

Bubble Chart

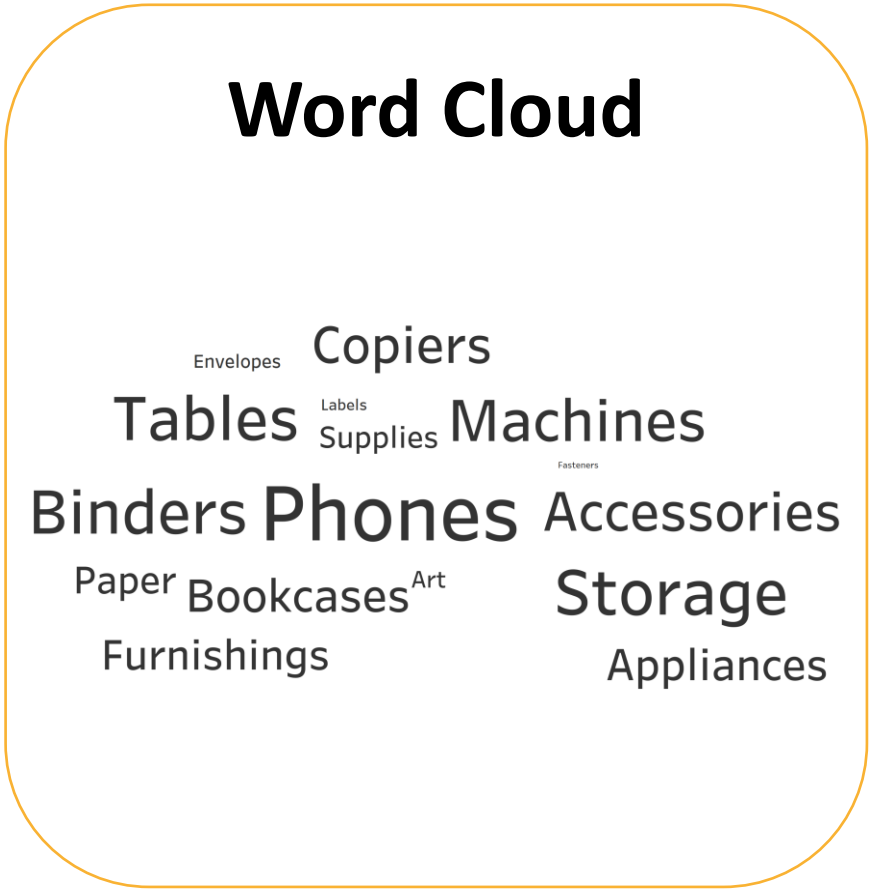


Best Practices

- ✓ Use this chart grab attention and engage your audience.
- ✓ Use text labels and colors to make the chart more effective.
- ✓ Consider using bubbles as a navigation element to filter data in an interactive dashboard view.
- ✓ Use bubbles to accentuate data in a scatterplot or as an overlap on a map (only if you have 2 variables)
- ✓ Use circular shapes only.
- ✓ Remove anything that isn't adding information: borders, gridlines, etc.

Chart Selector Guide: **Word Cloud**

Shows the relative frequency of words in our data



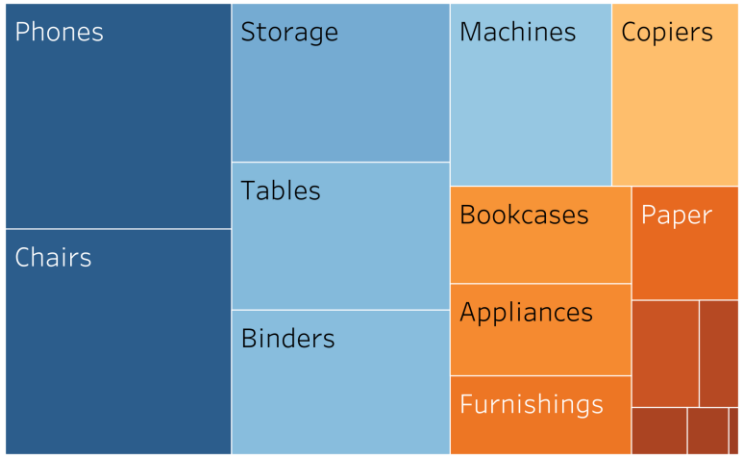
Best Practices

- ✓ Avoid using fancy font types and use color sparingly.
- ✓ Remove common words like “the”, “and”, etc.
- ✓ Word clouds do not provide a clear differentiation between words of similar sizes, unlike a bar chart.
- ✓ Also refer to *Bubble Chart* for additional best practices.

Chart Selector Guide: **Treemap**

Shows a hierarchical part-to-whole relationship

Treemap

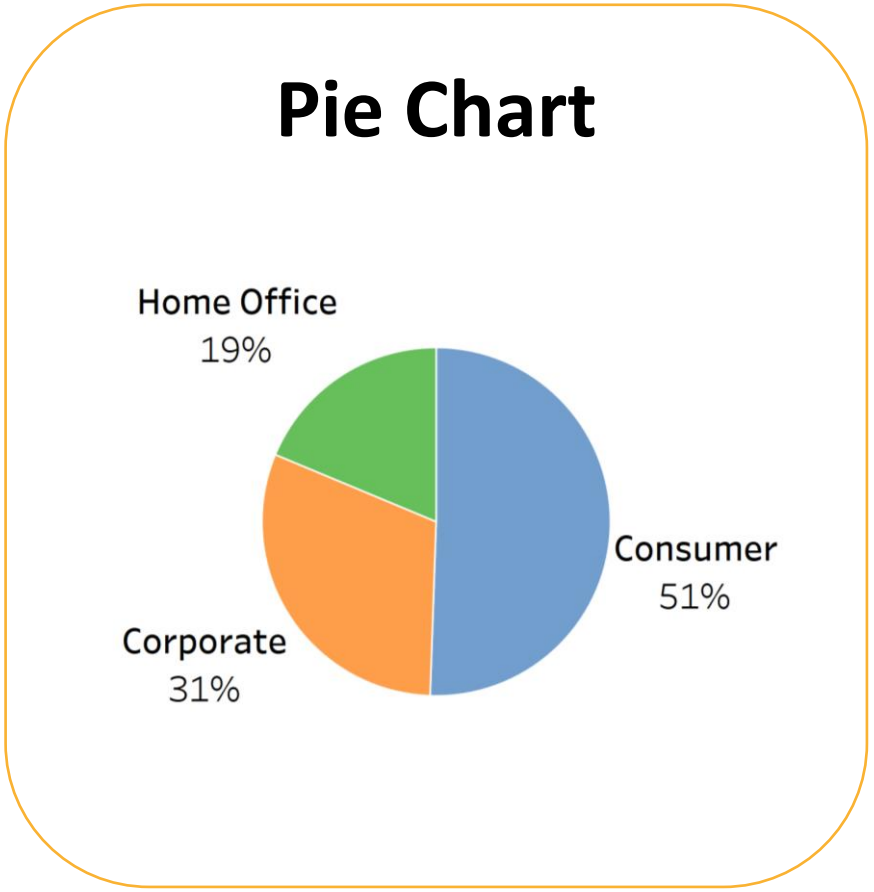


Best Practices

- ✓ Use labels sparingly, only show labels on the boxes that are big enough to fit them (typically the largest items in the view will have a label.
- ✓ Consider including borders in the Treemap can help view each of the rectangles more clearly.
- ✓ Size of the boxes should be a quantity measure. The measures should sum up along the hierarchical structure of the data.
- ✓ Color of the boxes is best suited to a measure of performance.

Chart Selector Guide: **Pie Chart**

Shows a part-to-whole relationship

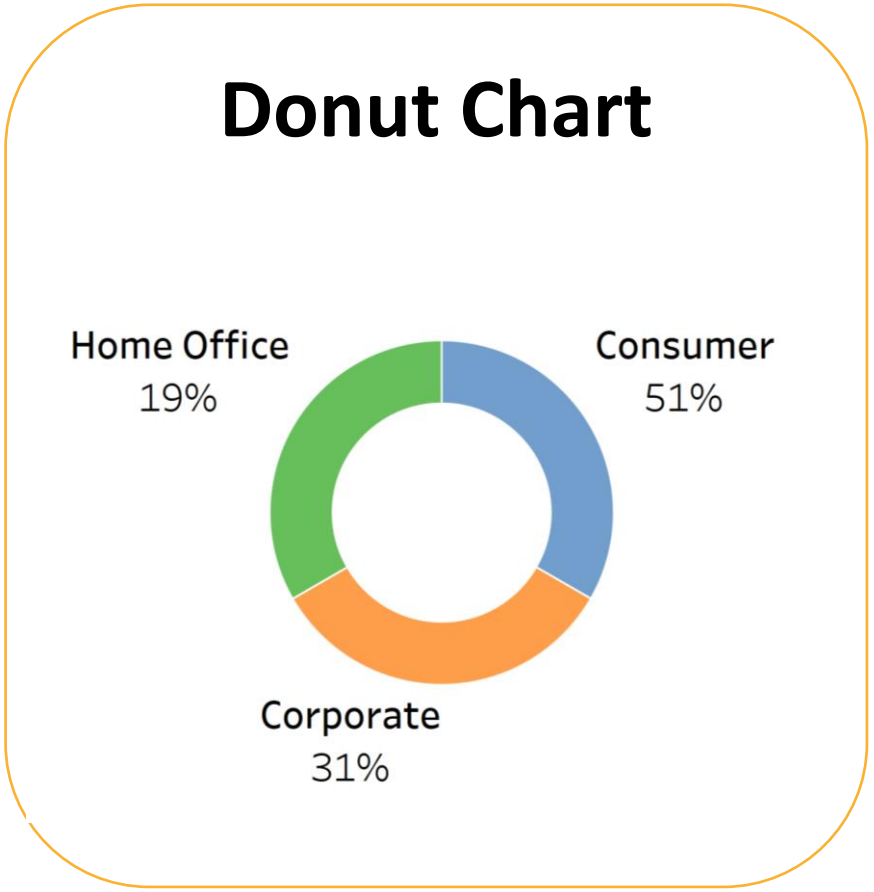


Best Practices

- ✓ Limit the number of categories to 4-5
- ✓ Use colors to make your most important value stand out.
- ✓ Consider grouping slices together in one bigger slice (e.g. "others") to clean up the overall look of the chart.
- ✓ Verify that values total 100% and order the slices greatest to smallest
- ✓ When appropriate, remove color the legend and put the data labels on or outside the chart slices.
- ✓ Avoid 3D pie charts because they can distort the perception of the data.

Chart Selector Guide: **Donut Chart**

Shows a part-to-whole relationship



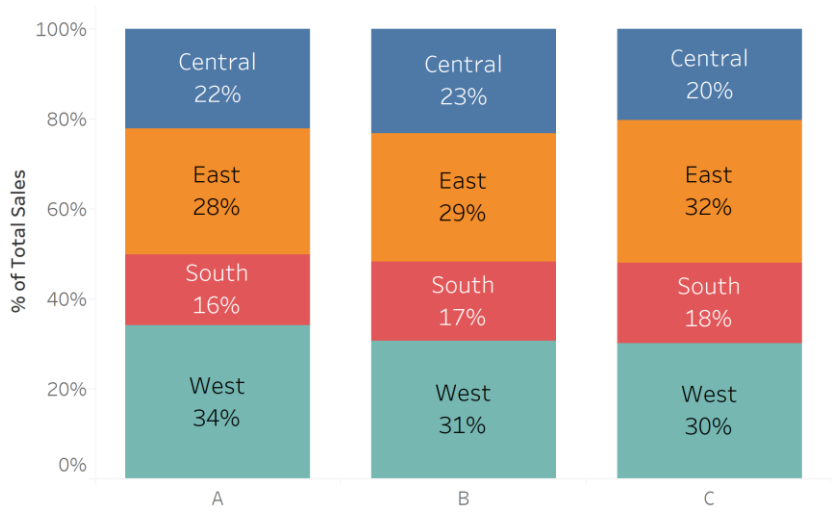
Best Practices

- ✓ Find the right balance in size of the donut parts and the whole in the middle.
- ✓ The donut chart is not good at displaying time series data. So only use it to display one point in time.
- ✓ Well-formatted and informative labels are essential because the information conveyed by circular shapes alone is not enough and is imprecise..
- ✓ It is a good practice to sort the slices, which makes a donut chart clearer for comparison.
- ✓ Also refer to *Pie Chart* for additional best practices.

Chart Selector Guide: **Stacked Bar 100%**

Shows a part-to-whole relationship across categories

Stacked Bar 100%



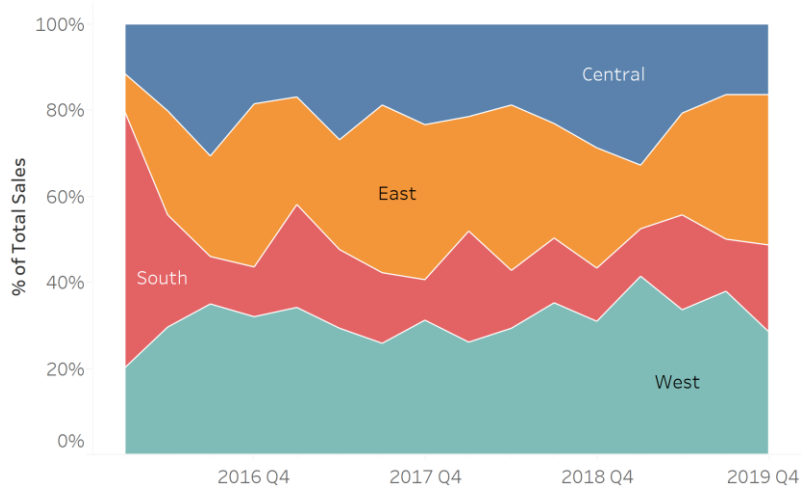
Best Practices

- ✓ This chart can become visually complex as categories or series are added.
- ✓ Verify that column values total 100%.
- ✓ Also refer to *Bar Chart* for additional best practices.

Chart Selector Guide: **Stacked Area 100%**

Shows a part-to-whole relationship over a period of time

Stacked Area 100%



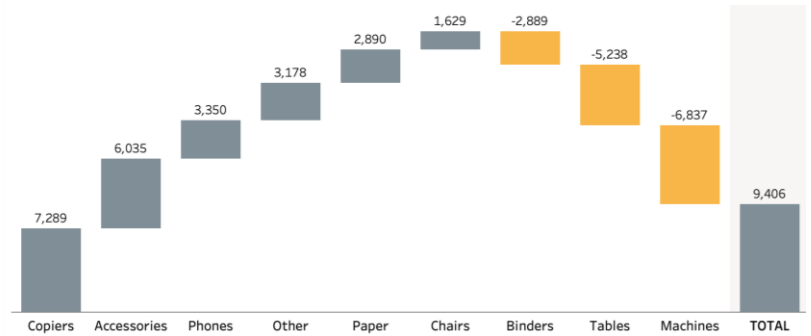
Best Practices

- ✓ Keep in mind that the shapes of the middle series – those not attached to a bottom or top baseline – will be influenced by the values above and below, as well their own.
- ✓ Bring the most important value to the bottom of the chart and use color to make it stand out.
- ✓ Make sure your dates have the same intervals.
- ✓ Also refer to *Line Chart* for additional best practices.

Chart Selector Guide: **Waterfall Chart**

Shows how a value changes by various factors that either increase the value, or decrease it

Waterfall Chart



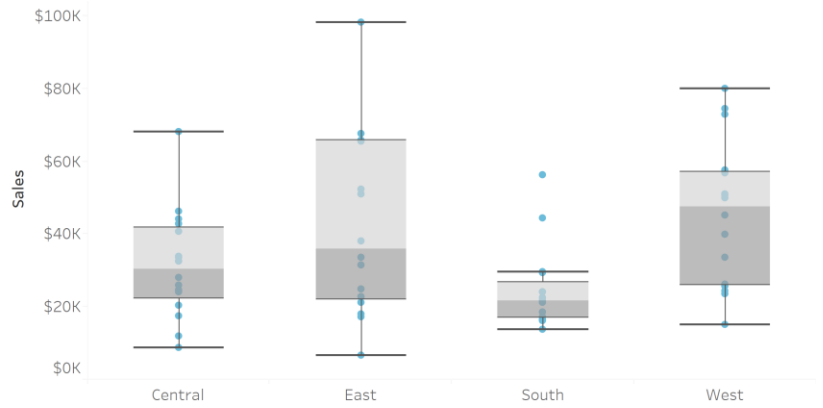
Best Practices

- ✓ Format positive and negatives using color.
- ✓ The bars do not have a consistent baseline; therefore, our eyes don't do a great job of accurately comparing segments that are close in size -> consider labeling the values explicitly to aid in interpretation.
- ✓ Remove anything that isn't adding information: borders, gridlines, etc.
- ✓ Also refer to *Bar Chart* for additional best practices.

Chart Selector Guide: **Box & Whisker Plot**

Displays the data distribution through quartiles

Box & Whisker Plot



Best Practices

- ✓ If the groups plotted in a box plot do not have an inherent order, then you should consider arranging them in an order that highlights patterns and insights.
- ✓ Experiment with the use of color to tell the story.
- ✓ Remove anything that isn't adding information: borders, gridlines, etc.

Chart Selector Guide: **Scatter Plot**

Shows the relationship between two variables

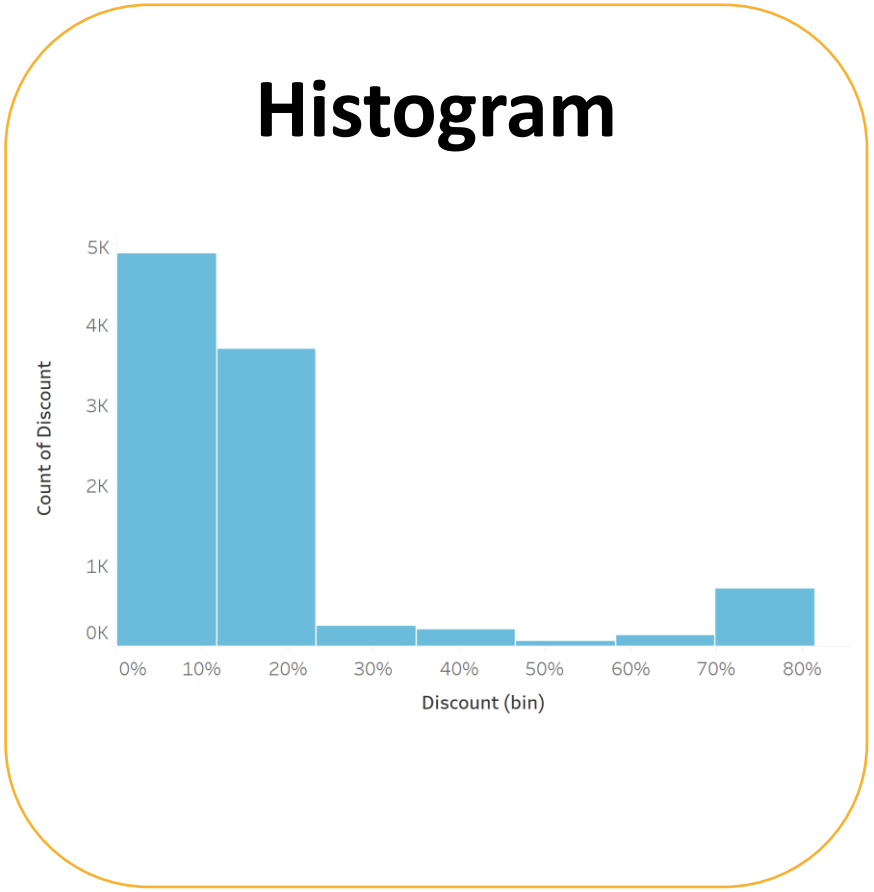
Scatter Plot

Best Practices

- ✓ Formatting the marks in the view can really help in making your scatter plots stand out. You can use color to identify different categories in the view.
- ✓ Make the mark a bit transparent - this allows the audience to see what's behind the marks.
- ✓ Reduce overlapping marks and see more individual plots.
- ✓ Independent variables need to be placed on the x-axis and dependent variables on the y axis.
- ✓ Consider including a trend line to define the correlation.
- ✓ Use custom shapes in place of the typical circles that you are likely familiar with, as applicable

Chart Selector Guide: **Histogram**

Show the underlying shape of a set of continuous data



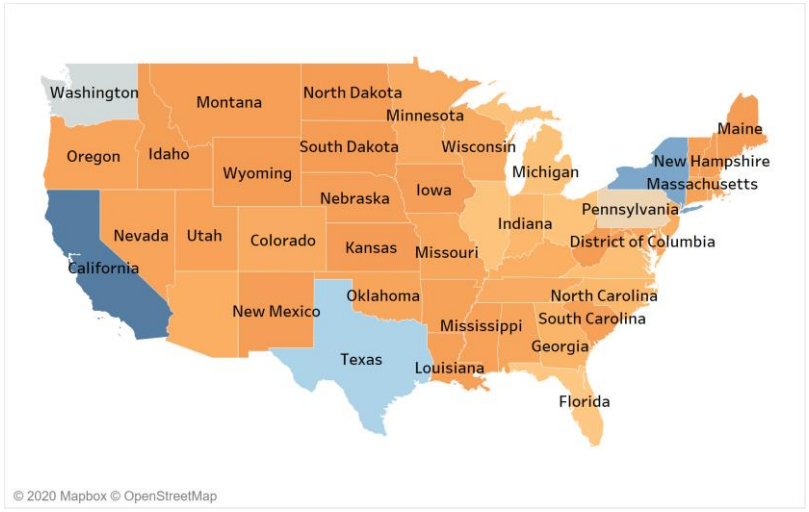
Best Practices

- ✓ Plot with a zero-valued baseline; since the frequency of data in each bin is implied by the height of each bar, changing the baseline or introducing a gap in the scale will skew the perception of the distribution of data.
- ✓ Choice of bin size has an inverse relationship with the number of bins. The larger the bin sizes, the fewer bins there will be to cover the whole range of data.

Chart Selector Guide: **Filled Map**

Shows geographic data using shading on a country or state basis to indicate relationships

Filled Map



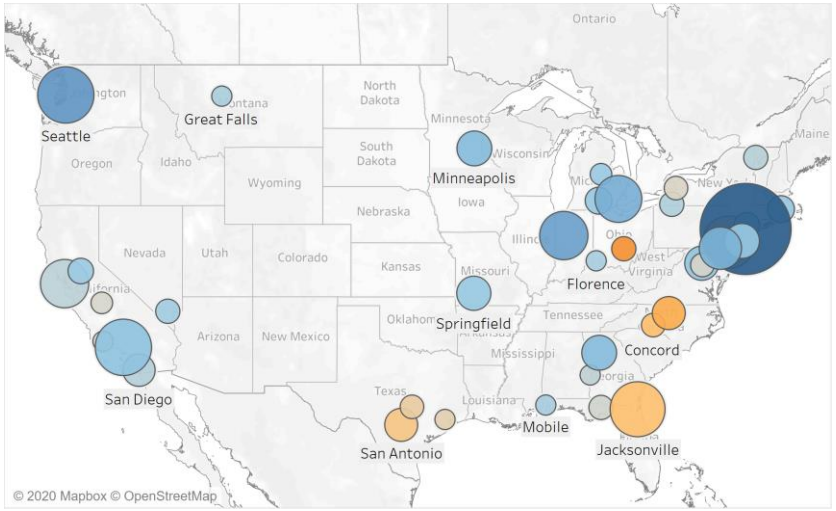
Best Practices

- ✓ Reduce any background layers that might be distracting from the data story. Only include the necessary data labels.
- ✓ Use borders to provide further differentiation between states or countries
- ✓ Use color effectively to help tell the story.

Chart Selector Guide: **Symbols Map**

Shows geographic data using a symbol plotted over a longitude and latitude

Symbols Map



Best Practices

- ✓ Consider changing the opacity of the marks to allow for viewing of the overlapped marks.
- ✓ Play with the size of the marks to ensure clear visibility.
- ✓ Also refer to *Filled Map* for additional best practices.

DATAcated

Data Visualization Courses: If you're interested in courses on data visualization – go ahead and check out the DATAcated Circle. Some of our popular courses include: *DATAcated Storytelling*, and a series of 'Data to Dashboard' courses including several of the tools discussed in this document.

Tools Guide: You can also check out the FREE DATAcated Tools Guide; it outlines some of the features for each tool to provide a method of comparison for those looking for a good data visualization tool to explore. There is a one-page summary of each of the data visualization tools, including - cost & trial information, data connections, chart types, formatting options, ease of use, mobile access, and more!

DATAcated YouTube: Subscribe to our YouTube channel here; we have hundreds of awesome data tutorials/ and interviews that can help you on your data journey.