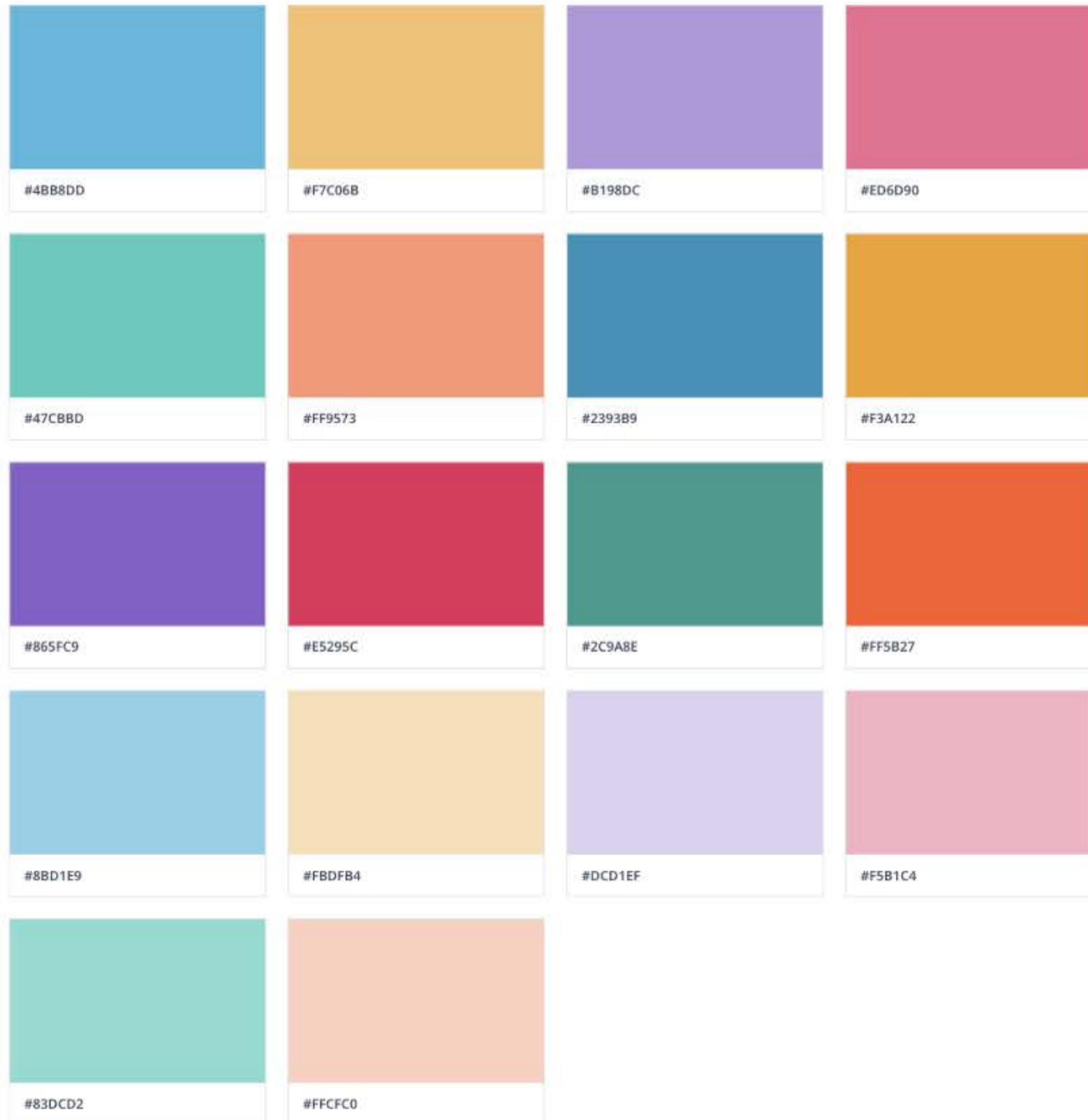


TABLES & CHARTS

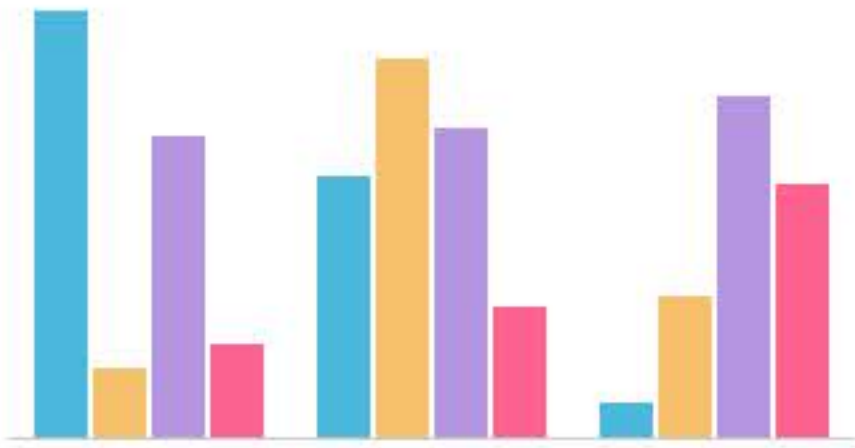
BEST PRACTICES

DATA PALETTE



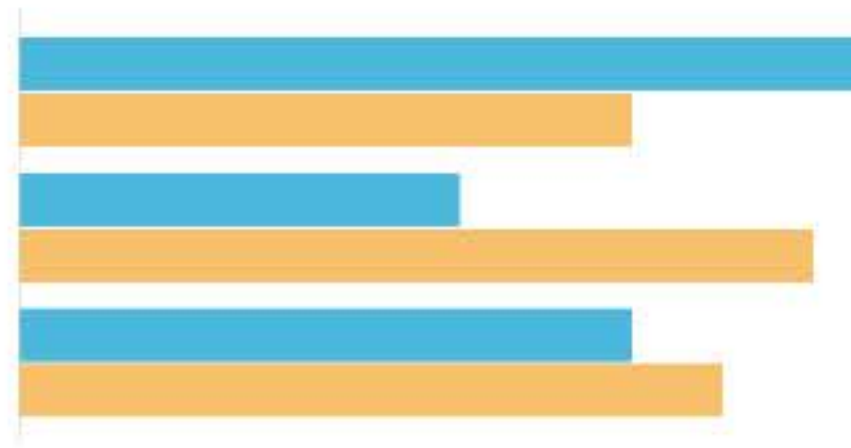
BAR CHART

Bar charts are very versatile. They are best used to show change over time, compare different categories, or compare parts of a whole.



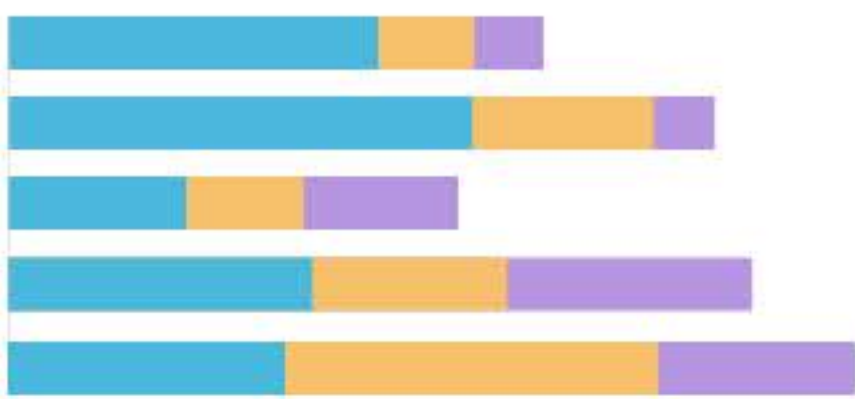
VERTICAL

Best used for chronological data (time-series should always run left to right), or when visualizing negative values below the x-axis.



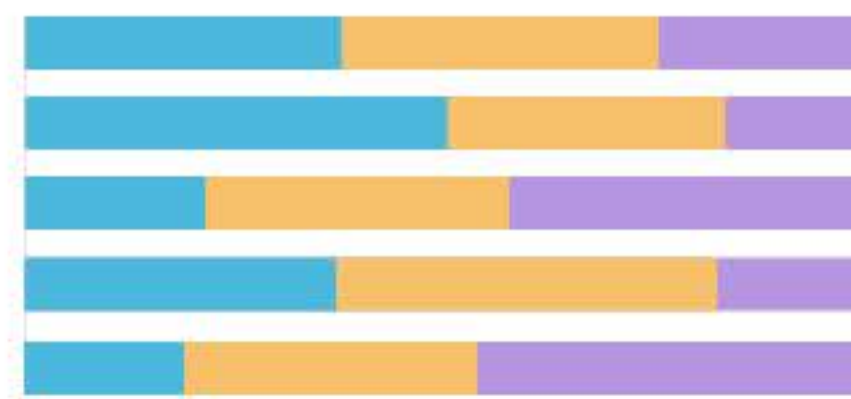
HORIZONTAL

Best used for data with long category labels.



STACKED

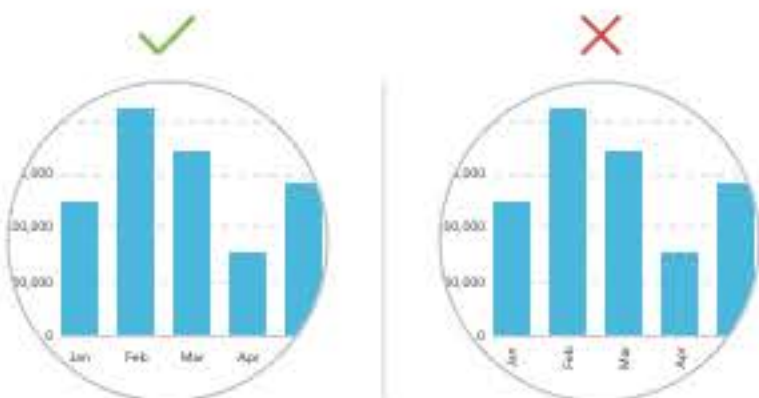
Best used when there is a need to compare multiple part-to-whole relationships. These can use discrete or continuous data, oriented either vertically or horizontally.



100% STACKED

Best used when the total value of each category is unimportant and percentage distribution of subcategories is the primary message.

DESIGN BEST PRACTICES



USE HORIZONTAL LABELS

Avoid steep diagonal or vertical type, as it can be difficult to read.



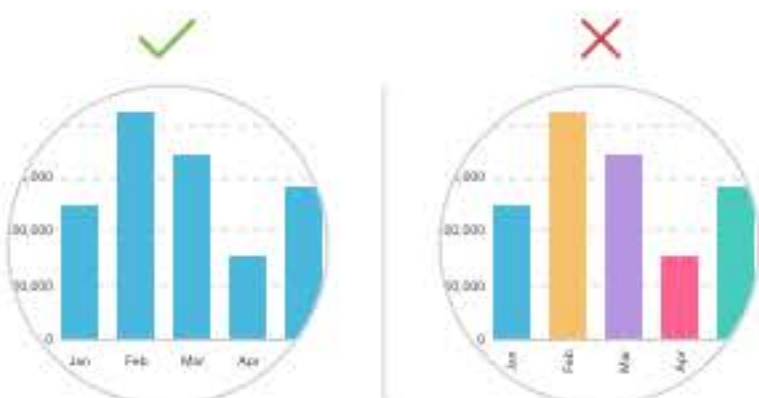
SPACE BARS APPROPRIATELY

Space between bars should be $\frac{1}{2}$ bar width.



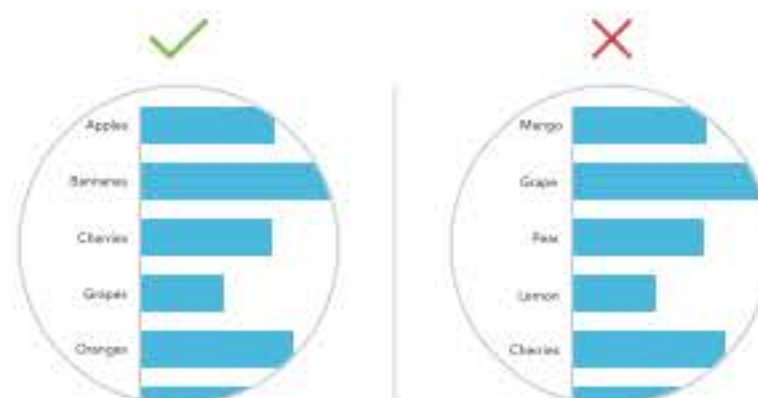
START THE Y-AXIS VALUE AT 0

Starting at a value above zero truncates the bars and doesn't accurately reflect the full value.



USE CONSISTENT COLORS

Use one color for bar charts. You may use an accent color to highlight a significant data point.



ORDER DATA APPROPRIATELY

Order categories alphabetically, sequentially, or by value.

DATA DESIGN DOS AND DON'TS

Designing your data doesn't have to be overwhelming. With a basic understanding of how different data sets should be visualized, along with a few fundamental design tips and best practices, you can create more accurate, more effective data visualizations. Follow these 10 tips to ensure your design does your data justice.

DO ✓

Use one color to represent each category.

Order data sets using logical hierarchy.

Use callouts to highlight important or interesting information.

Visualize data in a way that is easy for readers to compare values.

Use icons to enhance comprehension and reduce unnecessary labeling.

DON'T ✗

Don't use high contrast color combinations such as red/green or blue/yellow.

Don't use 3d charts. they can skew perception of the visualization.

Don't add chart junk. unnecessary illustrations, drop shadows, or ornamentations distract from the data.

Don't use more than 6 colors in a single layout.

Don't use distracting fonts or elements (such as bold, italic, or underlined text).

AREA

Area charts depict a time-series relationship, but they are different than line charts in that they can represent volume.



AREA CHART

Best used to show or compare a quantitative progression over time.



STACKED AREA

Best used to visualize part-to-whole relationships, helping show how each category contributes to the cumulative total.



100% STACKED AREA

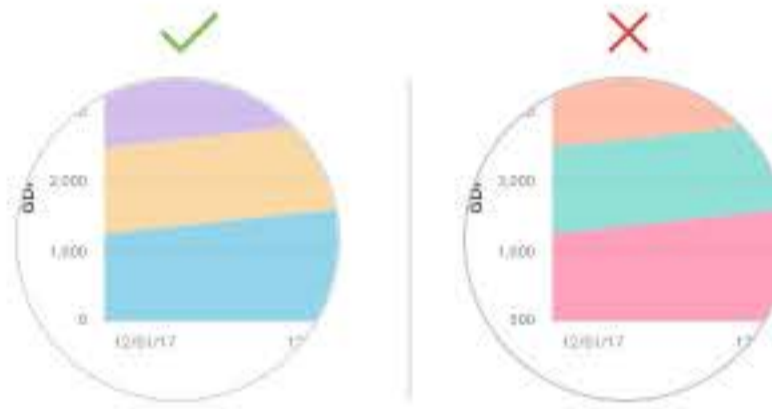
Best used to show distribution of categories as part of a whole, where the cumulative total is unimportant.

DESIGN BEST PRACTICES



MAKE IT EASY TO READ

In stacked area charts, arrange data to position categories with highly variable data on the top of the chart and low variability on the bottom.



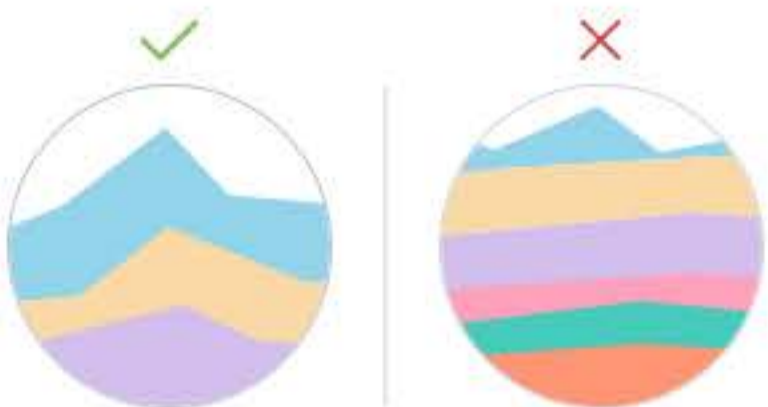
START Y-AXIS VALUE AT 0

Starting the axis above zero truncates the visualization of values.



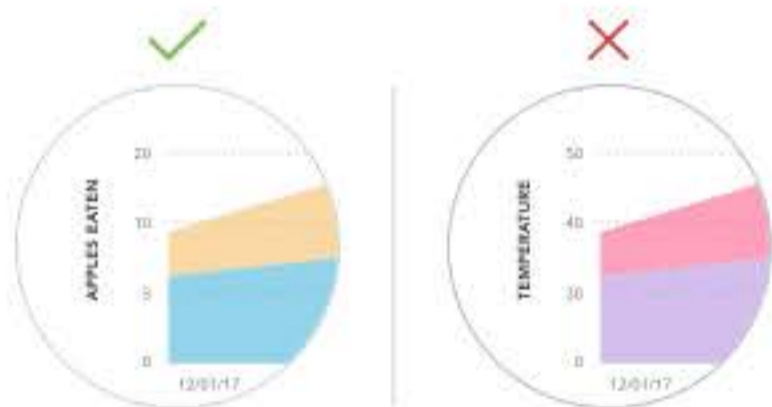
USE TRANSPARENT COLORS

In standard area charts, ensure data isn't obscured in the background by ordering thoughtfully and using transparency.



DON'T DISPLAY MORE THAN 4 DATA CATEGORIES

Too many will result in a cluttered visual that is difficult to decipher.

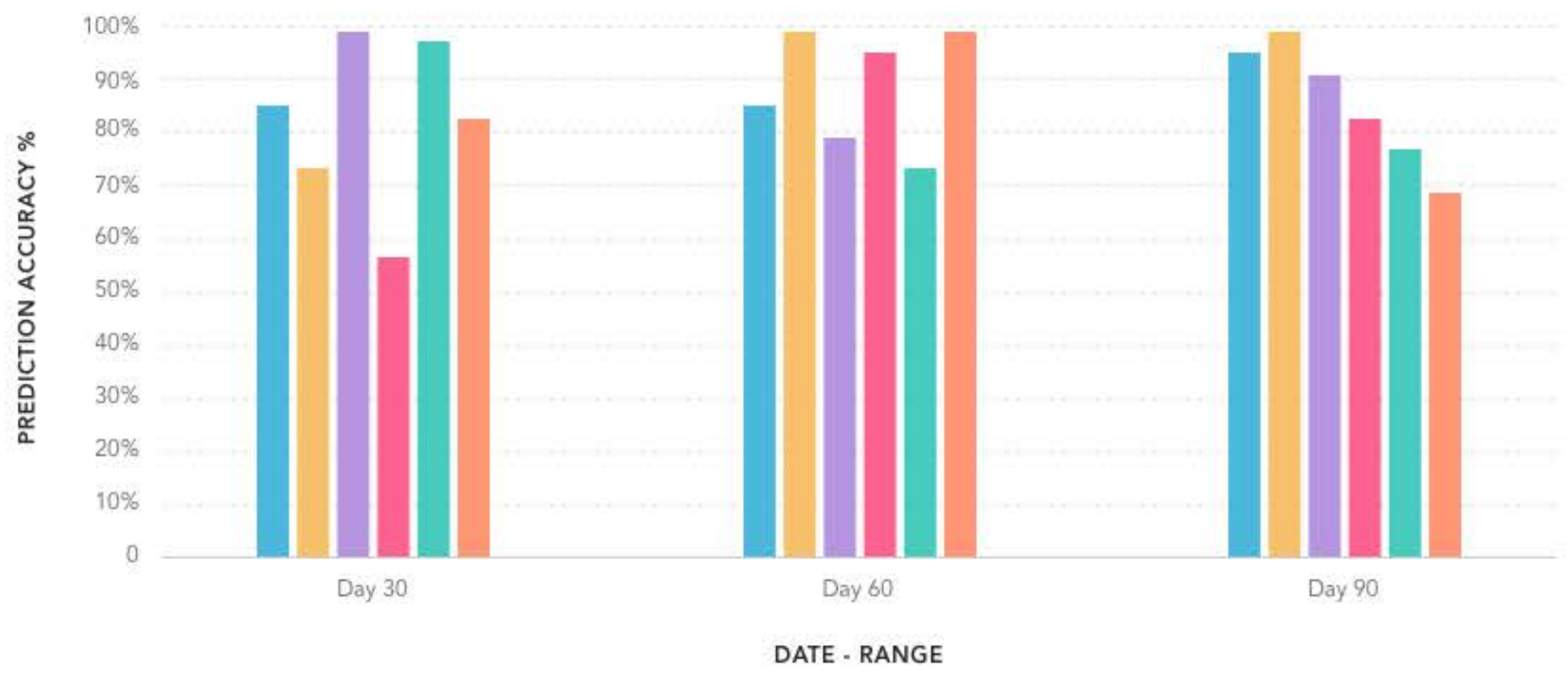


DON'T USE AREA CHARTS TO DISPLAY DISCRETE DATA

The connected lines imply intermediate values, which only exist with continuous data.

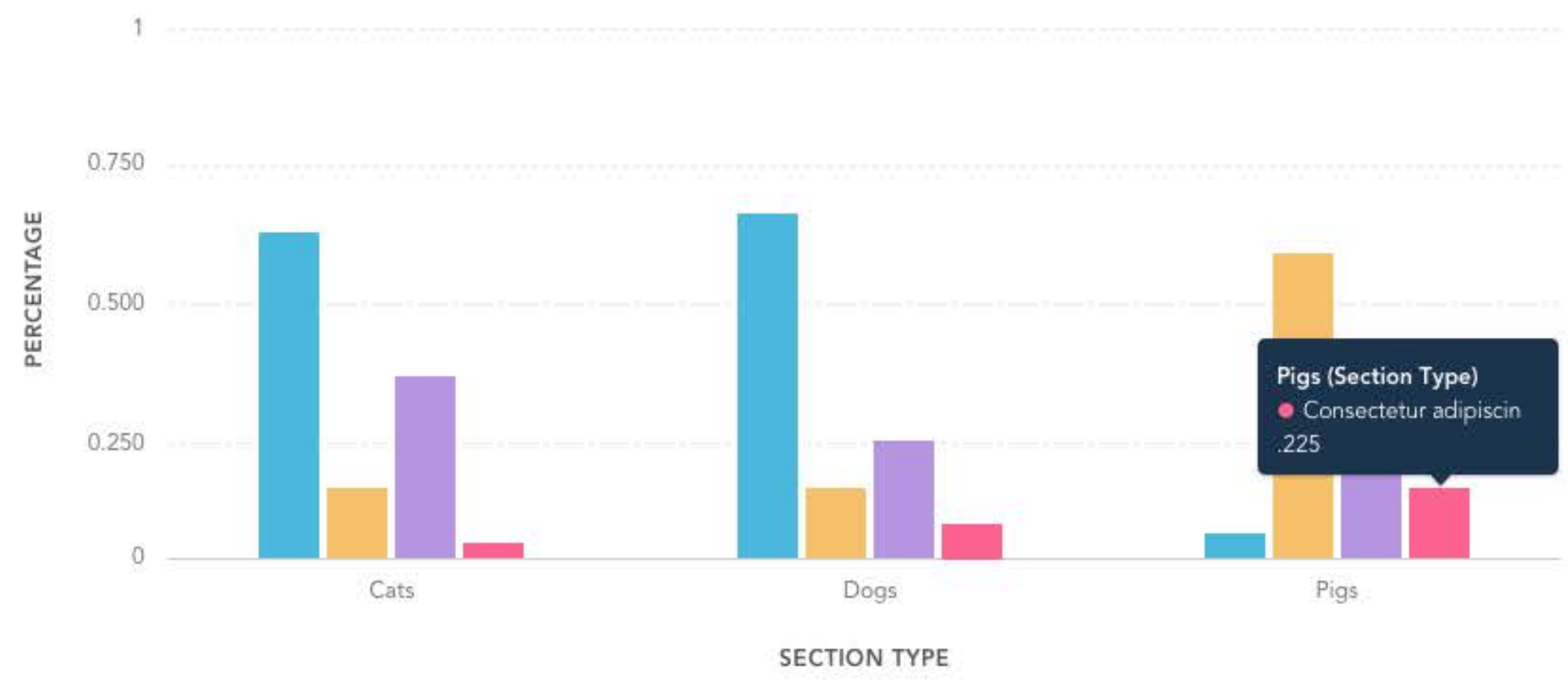
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● 1 ● 2 ● 3 ● 4 ● 5 ● 6



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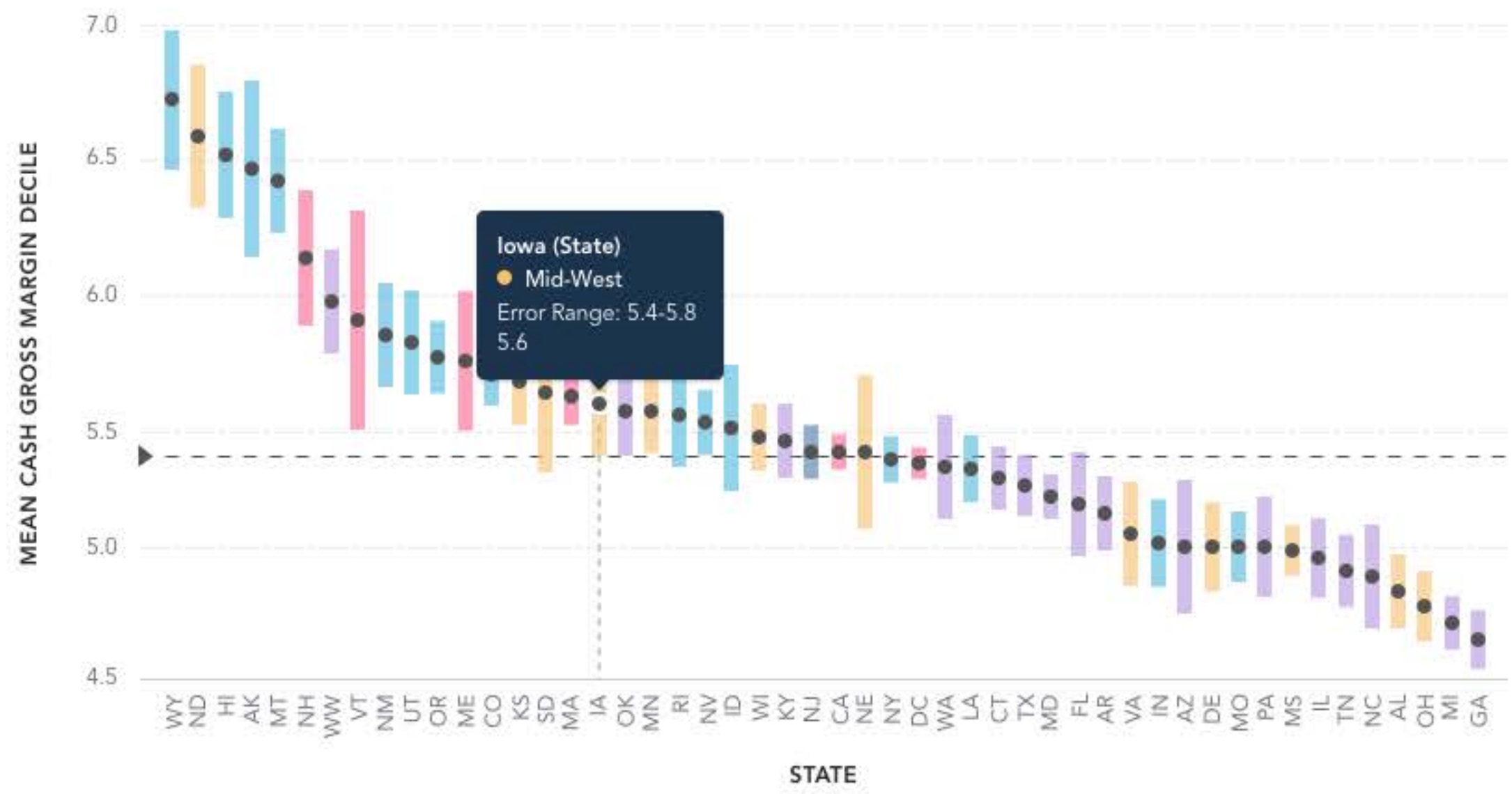
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Disney Exploring Decile Differences by State

Dotted line shows US avg.

● West ● Mid-West ● South ● Northeast

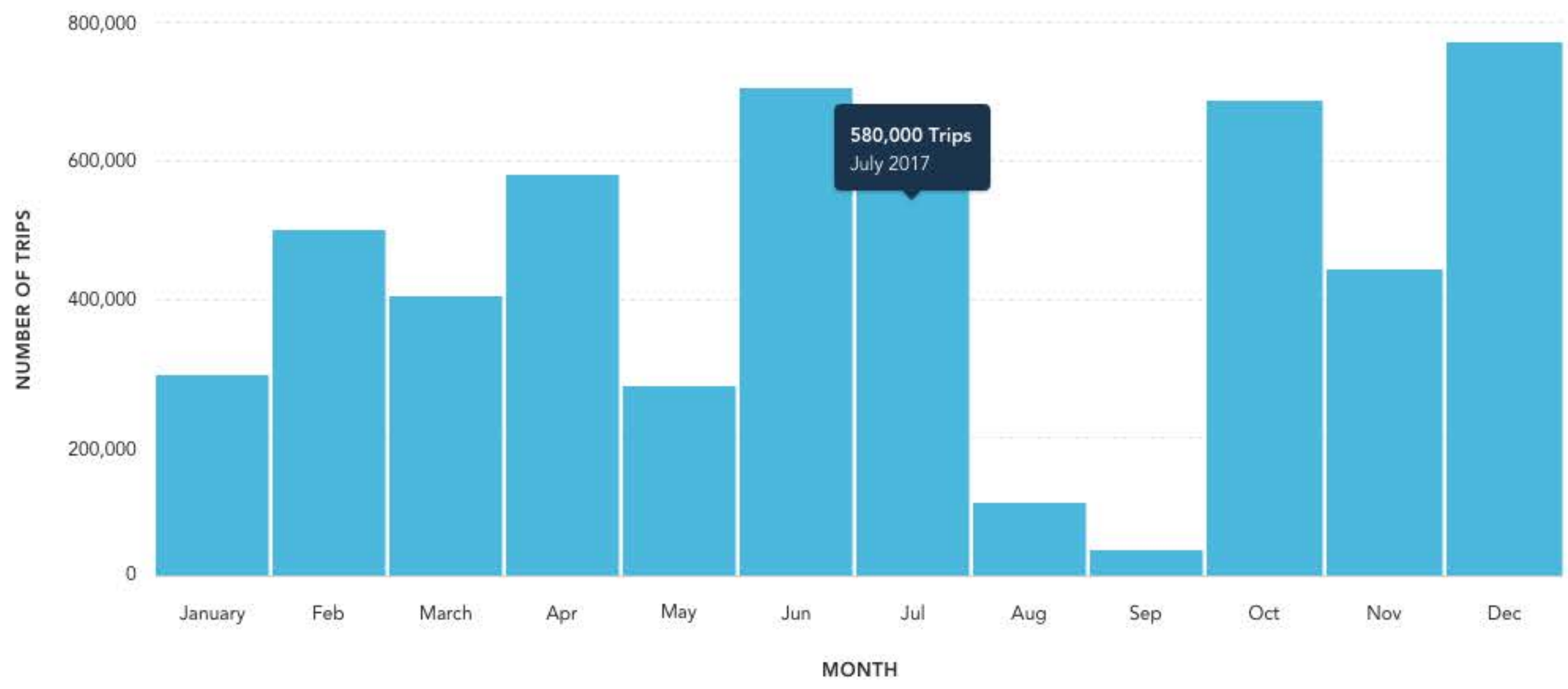


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● 25% ● Mean ● 50% ● 75%



2017 Disneyland Trips



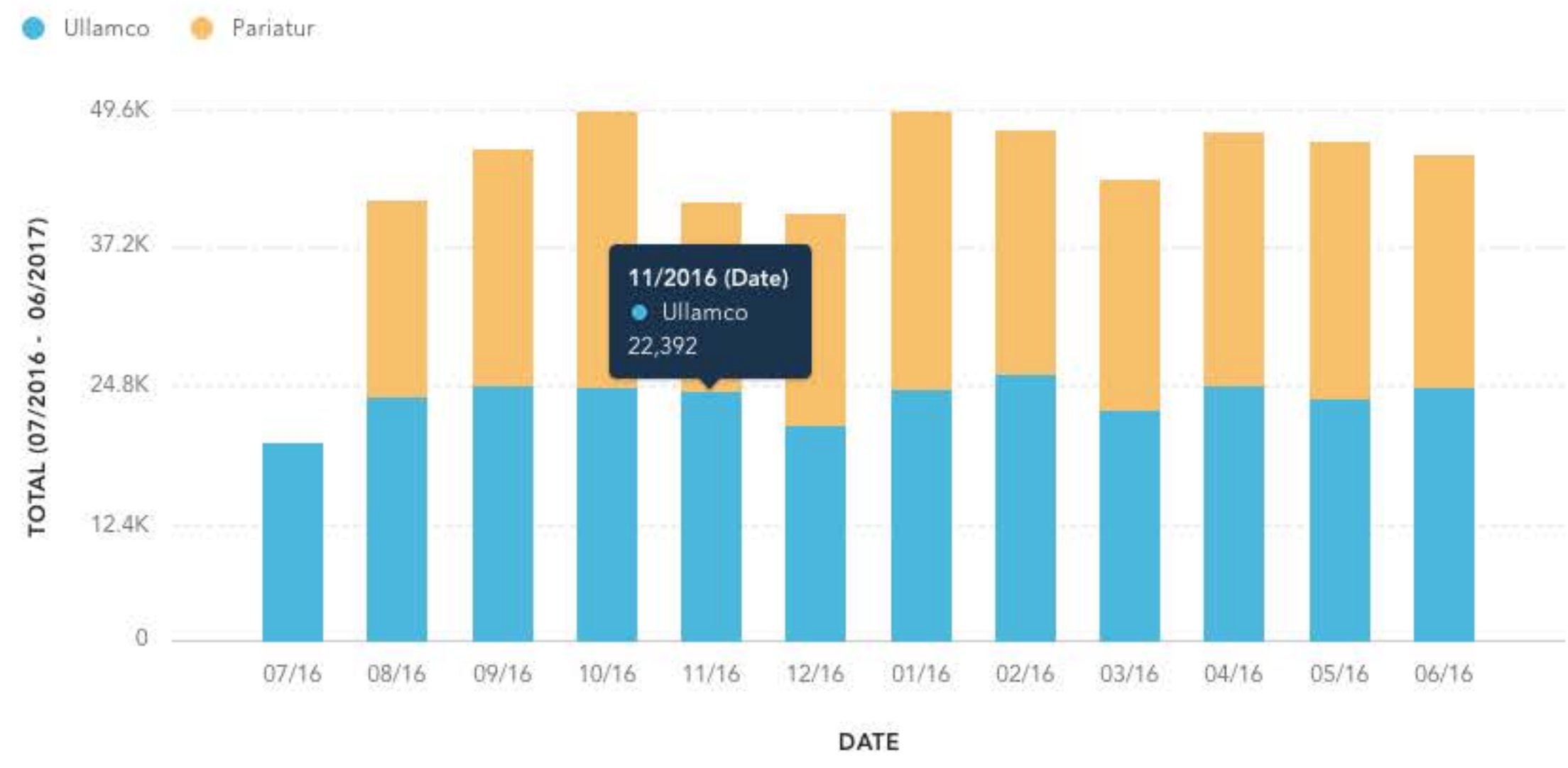
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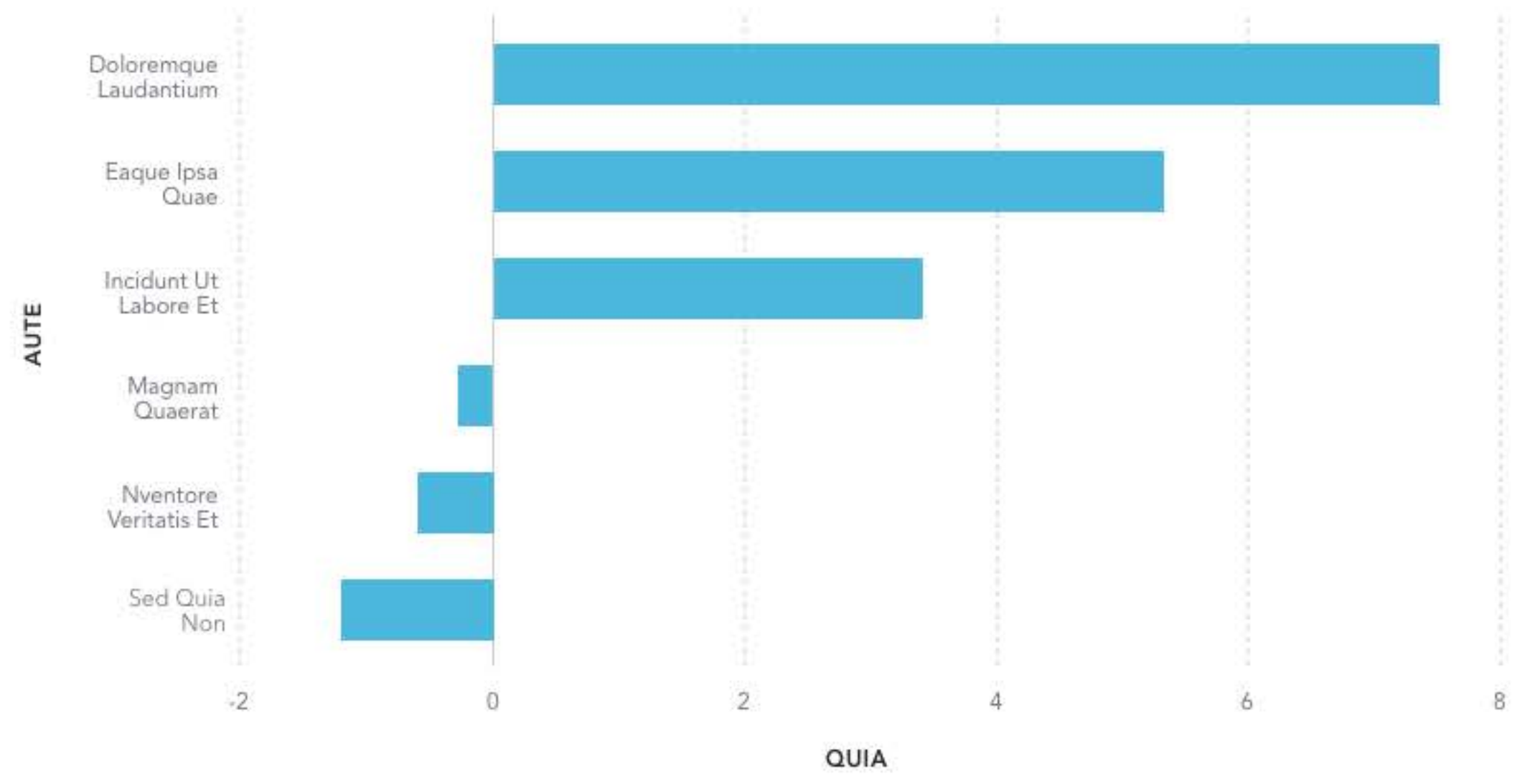


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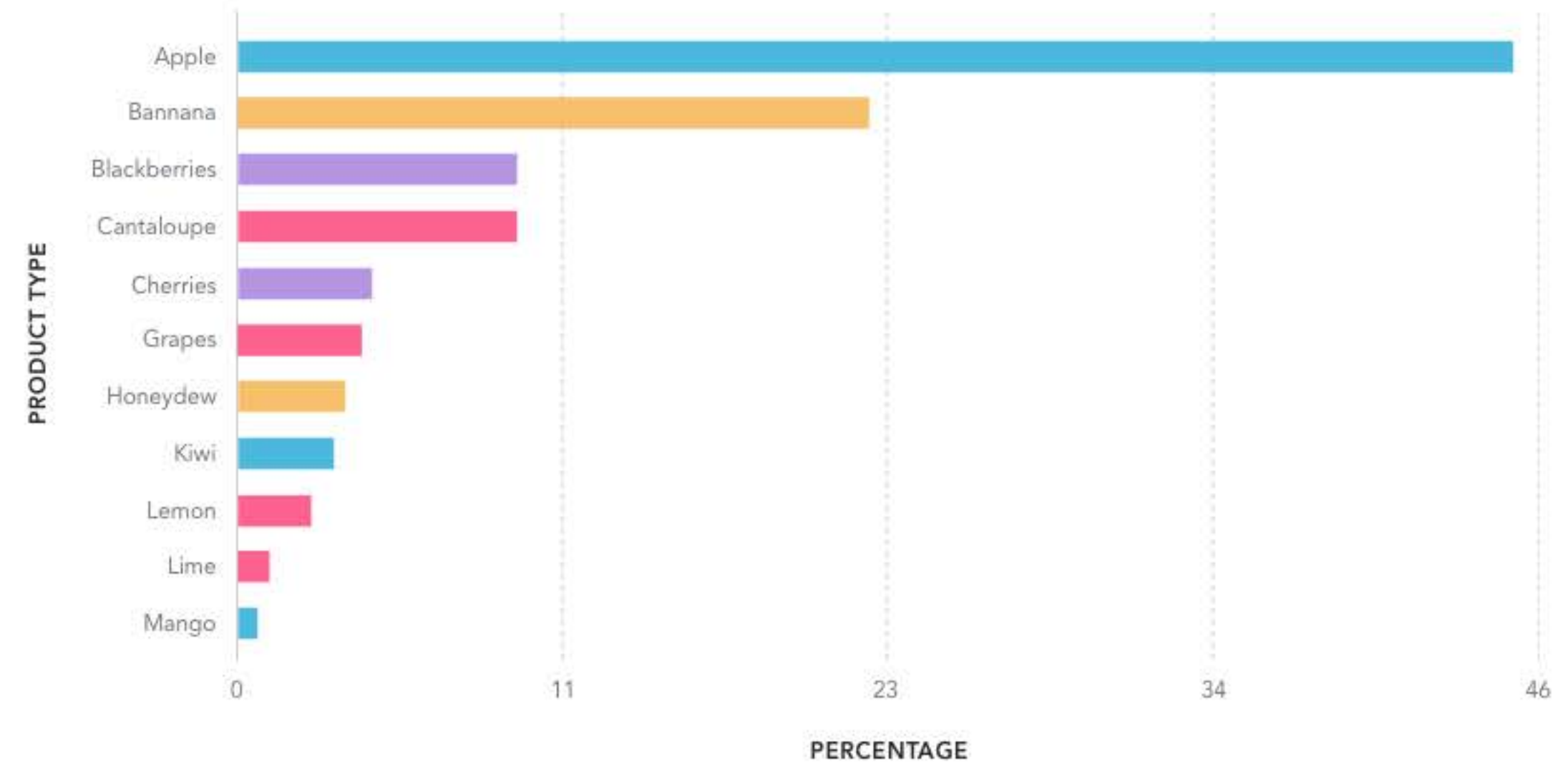
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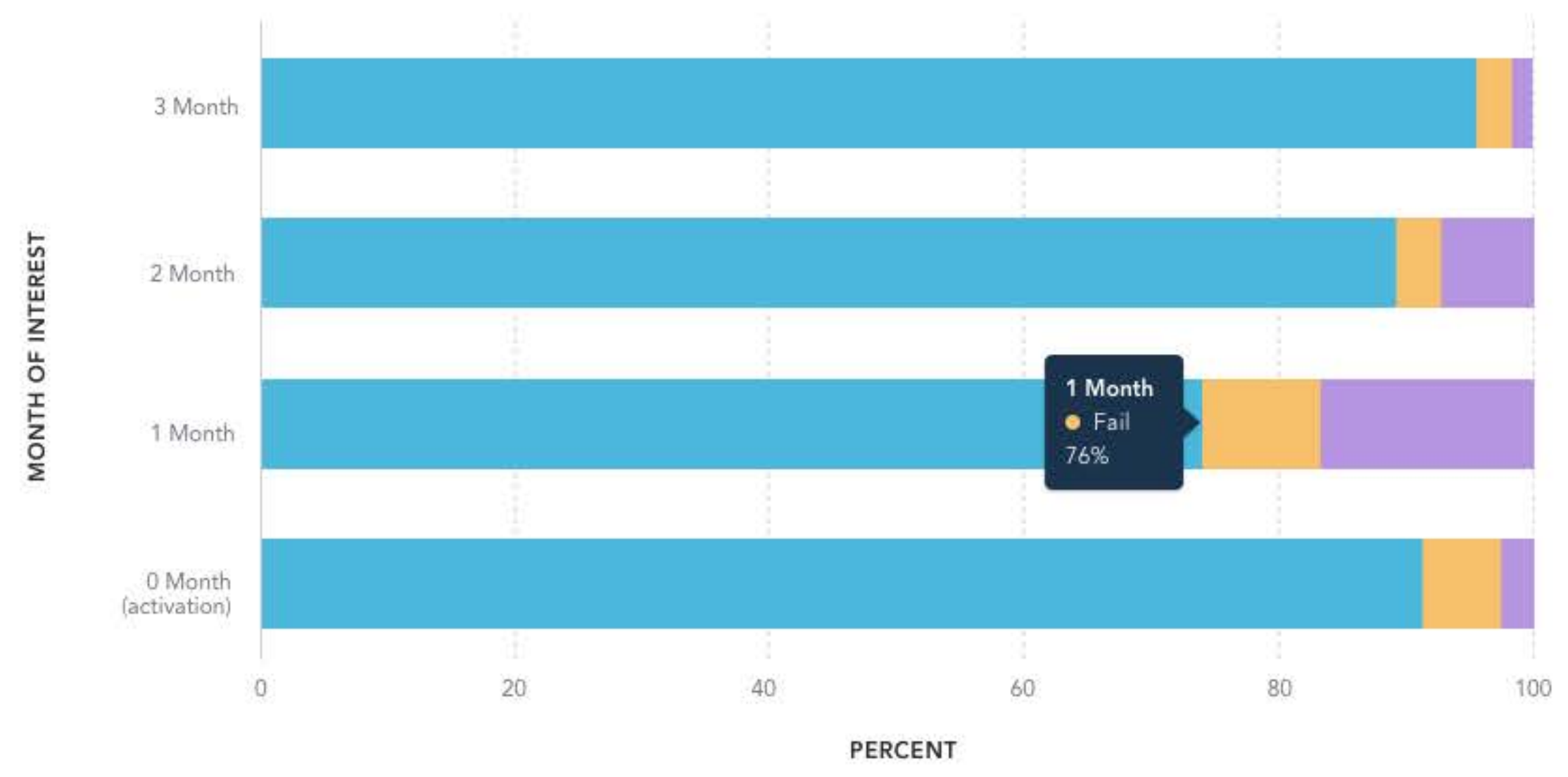
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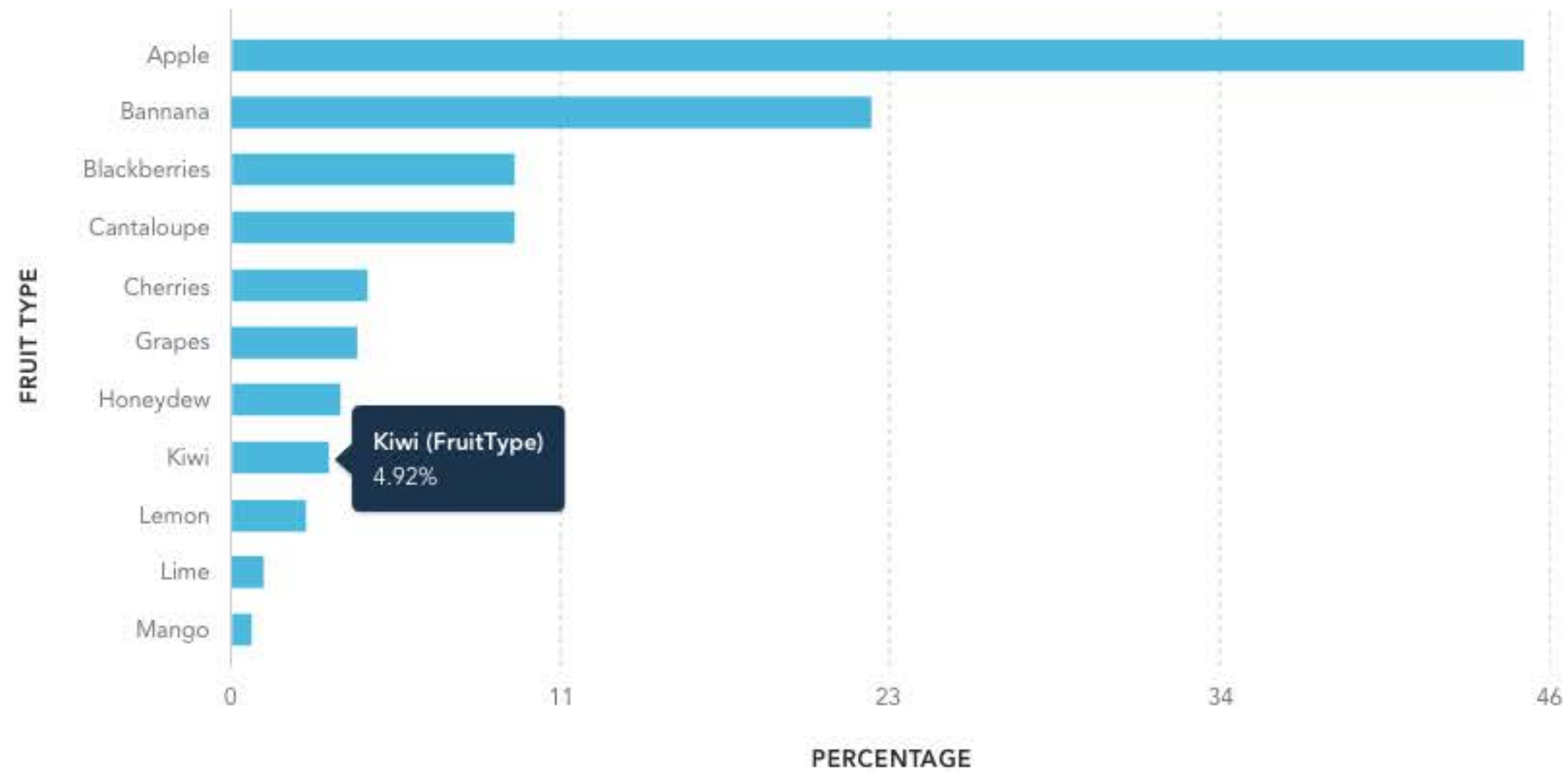
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Steady Fail Rise



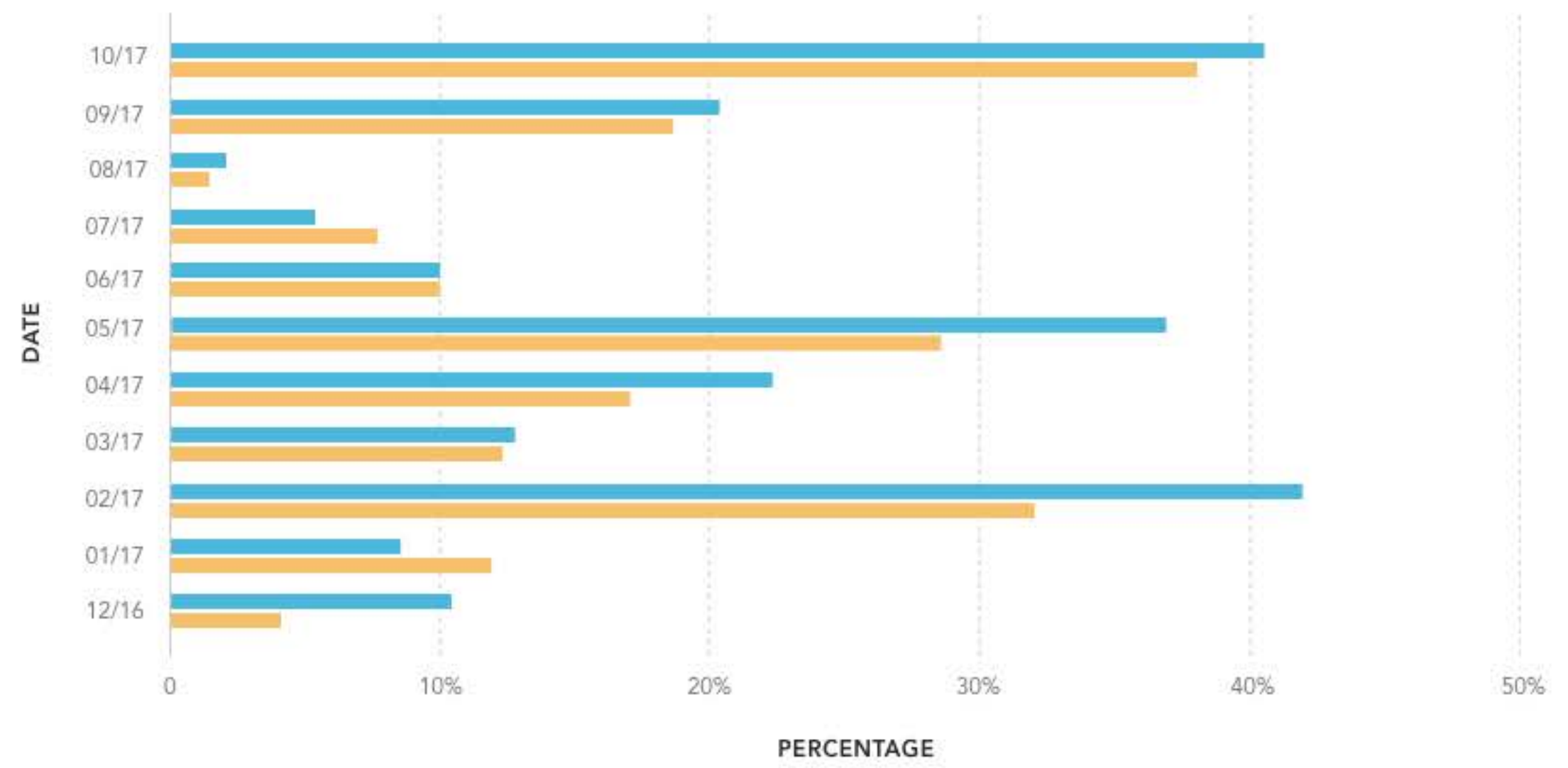
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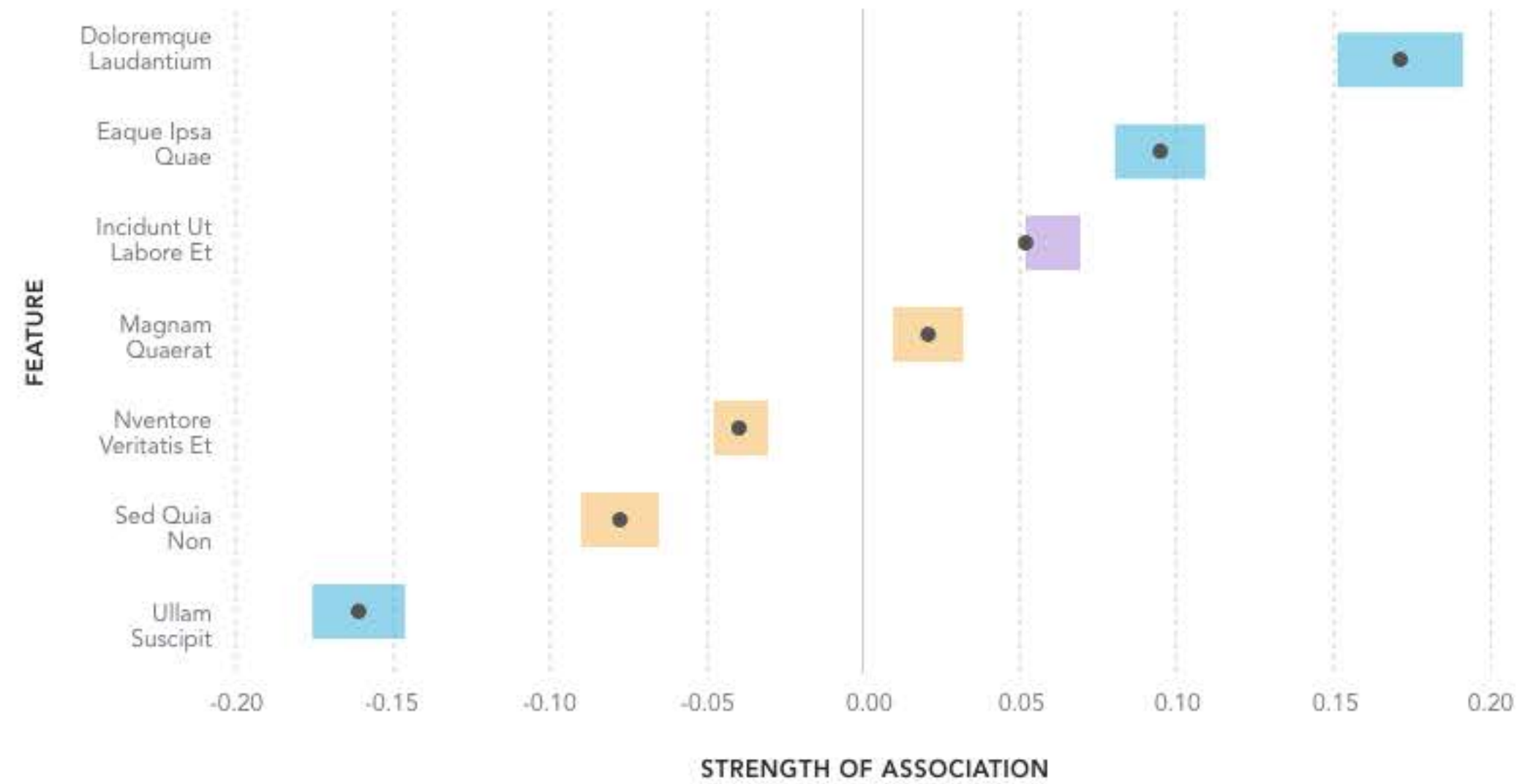
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● Strong Association ● Medium Association* ● Weak Association



* Medium Association - Needs further investigation

HEAT MAP

Heat maps display categorical data, using intensity of color to represent values of geographic areas or data tables.



DESIGN BEST PRACTICES



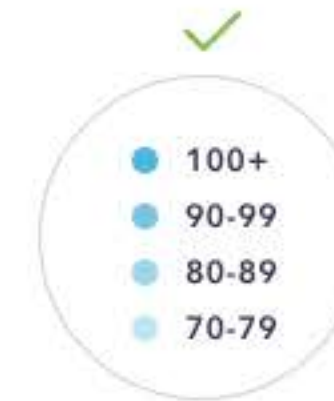
USE A SIMPLE MAP OUTLINE

These lines are meant to frame the data, not distract.



USE PATTERNS SPARINGLY

A pattern overlay that indicates a second variable is acceptable, but using multiple is overwhelming and distracting.



CHOOSE APPROPRIATE DATA RANGES

Select 3-5 numerical ranges that enable fairly even distribution of data between them. Use +/- signs to extend high and low ranges.



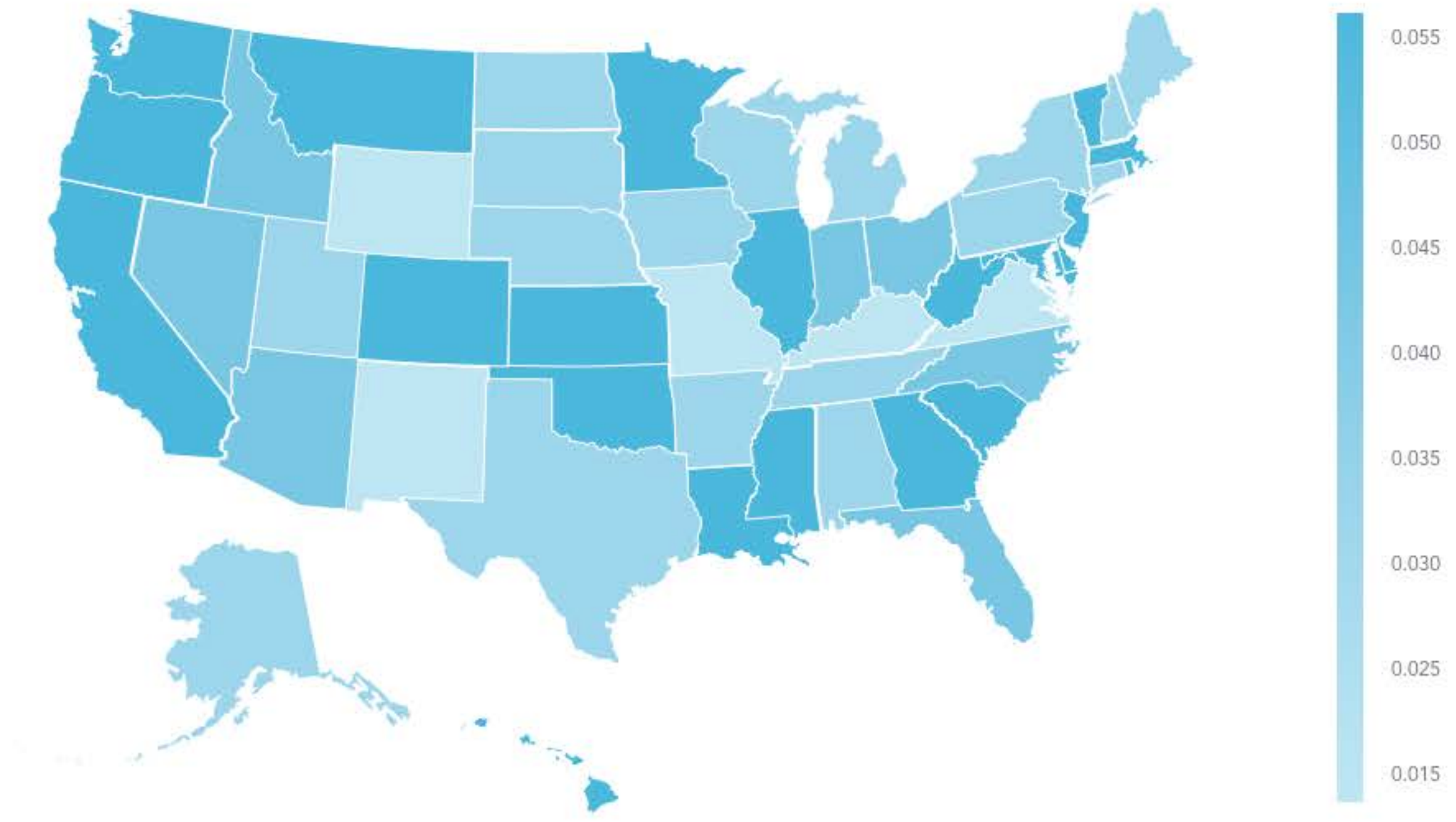
SELECT COLORS APPROPRIATELY

Some colors stand out more than others, giving unnecessary weight to that data. Instead, use a single color with varying shade or a spectrum between two analogous colors to show intensity. Also remember to intuitively code color intensity according to values.



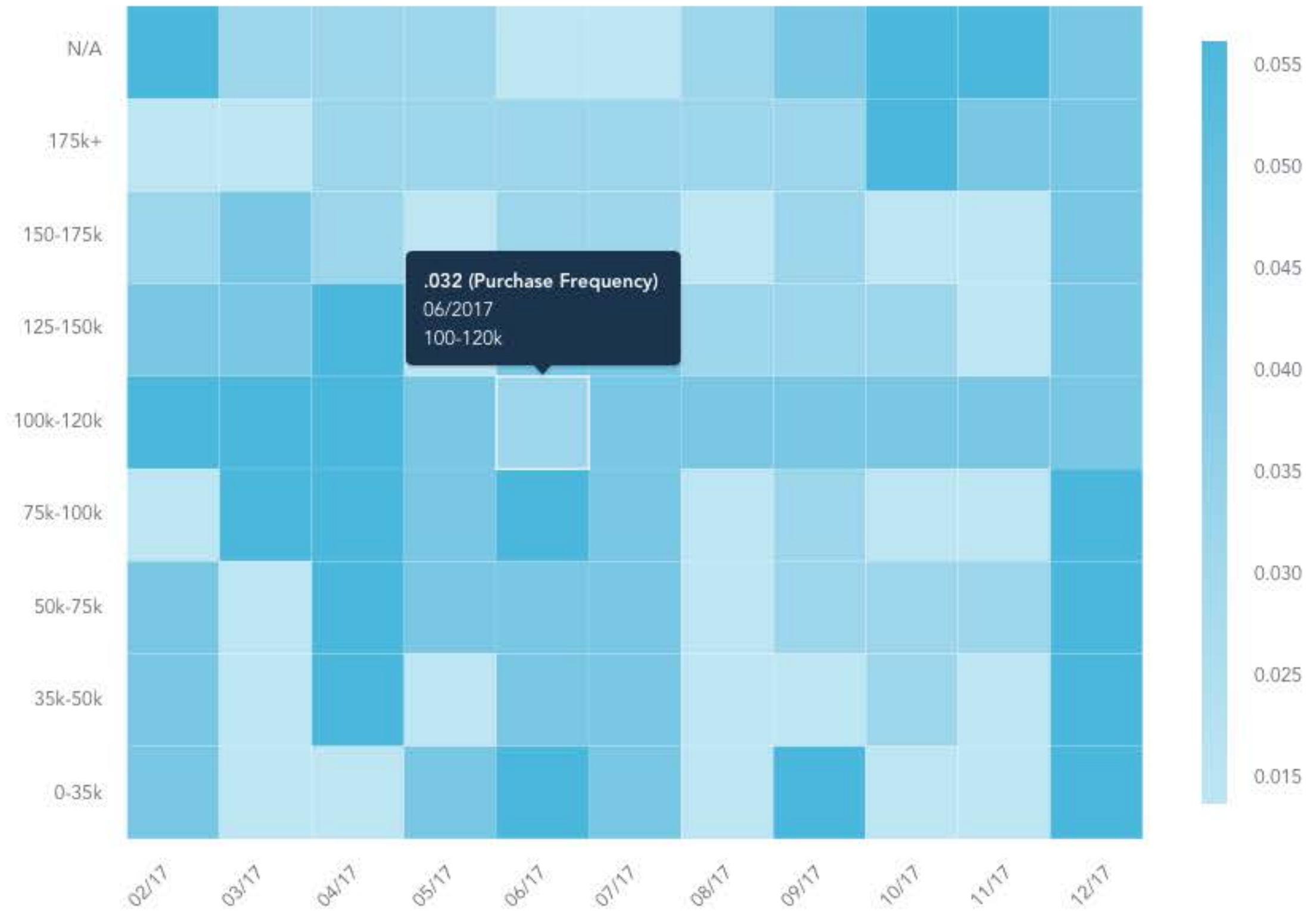
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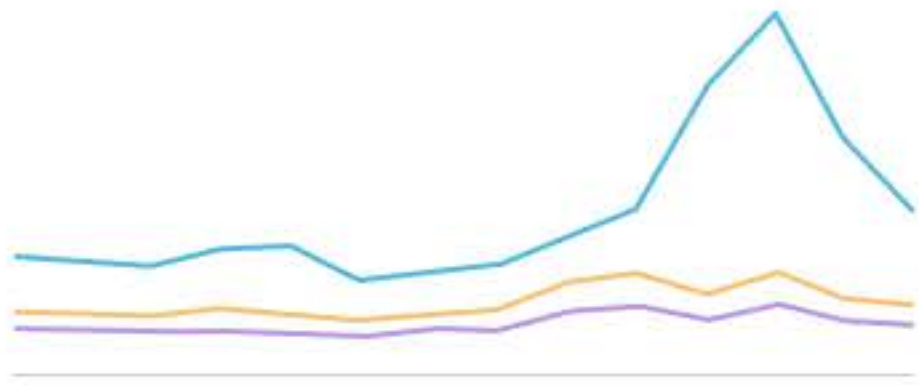
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Range / Date / Purchase Frequency

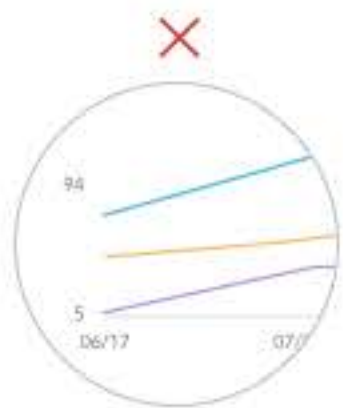
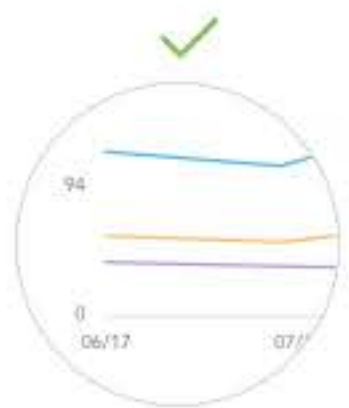


LINE CHART

Line charts are used to show time-series relationships with continuous data. They help show trend, acceleration, deceleration, and volatility.

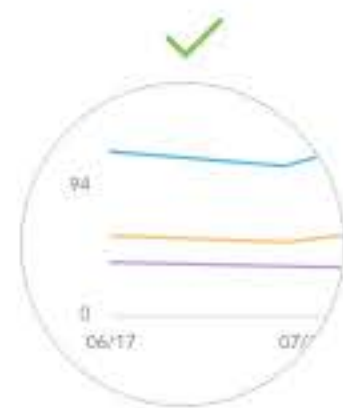


DESIGN BEST PRACTICES



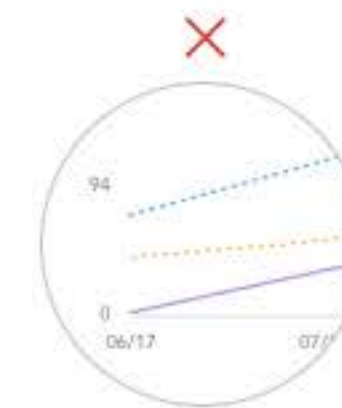
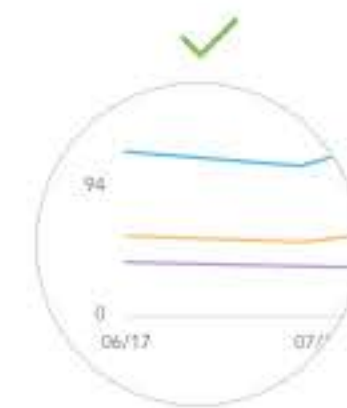
INCLUDE A ZERO BASELINE IF POSSIBLE

Although a line chart does not have to start at a zero baseline, it should be included if possible. If relatively small fluctuations in data are meaningful (e.g., in stock market data), you may truncate the scale to showcase these variances.



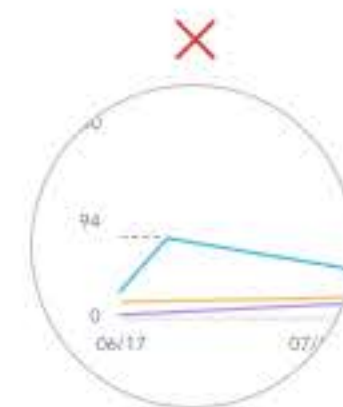
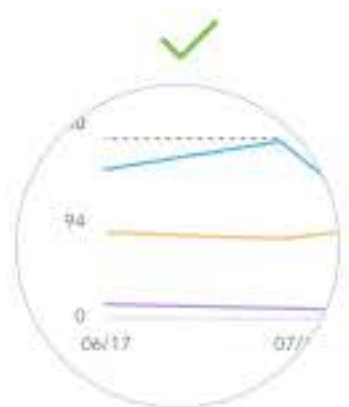
DON'T PLOT MORE THAN 4 LINES

If you need to display more, break them out into separate charts for better comparison.



USE SOLID LINES ONLY

Dashed and dotted lines can be distracting.

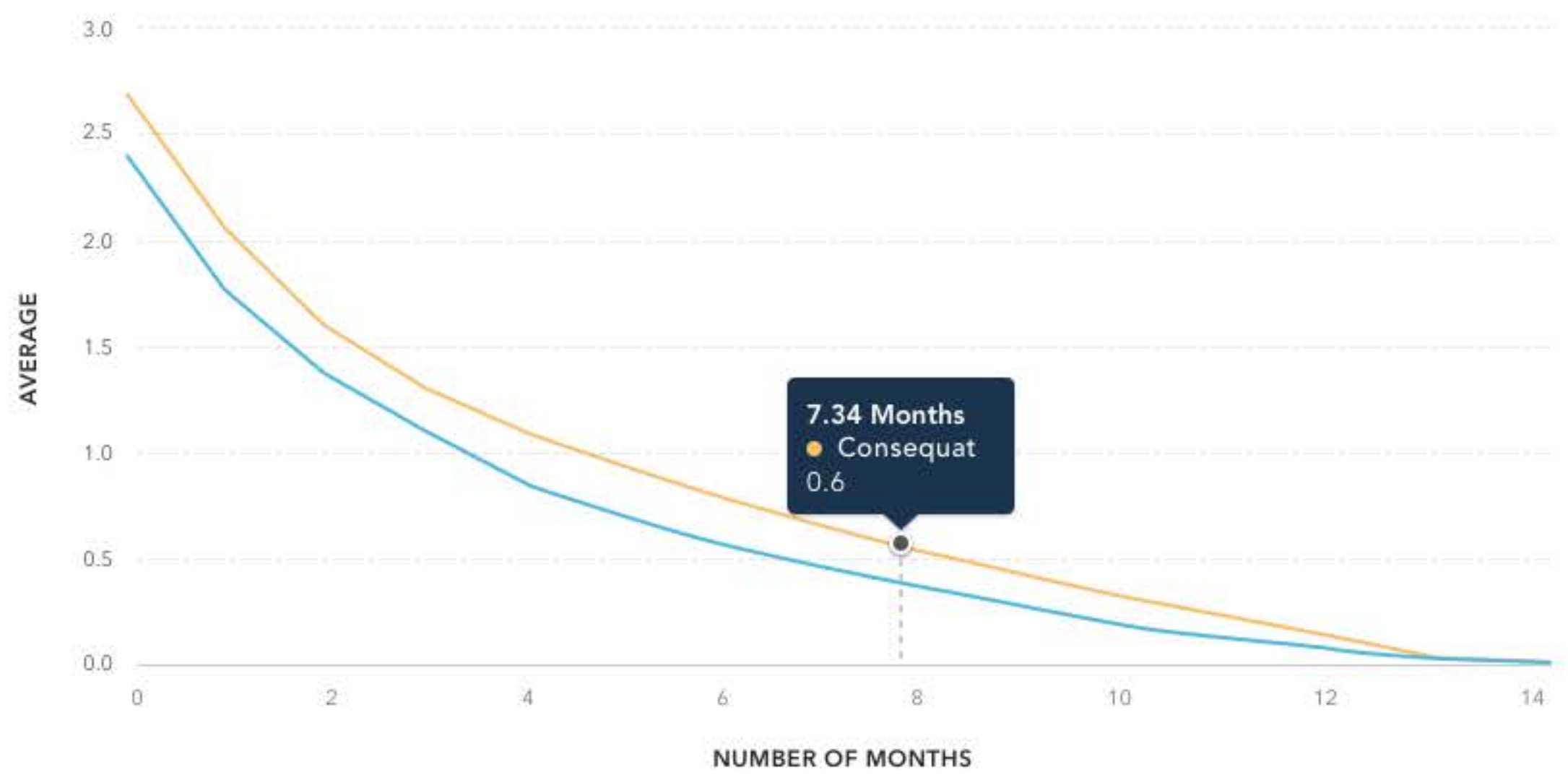


USE THE RIGHT HEIGHT

Plot all data points so that the line chart takes up approximately two-thirds of the y-axis' total scale.

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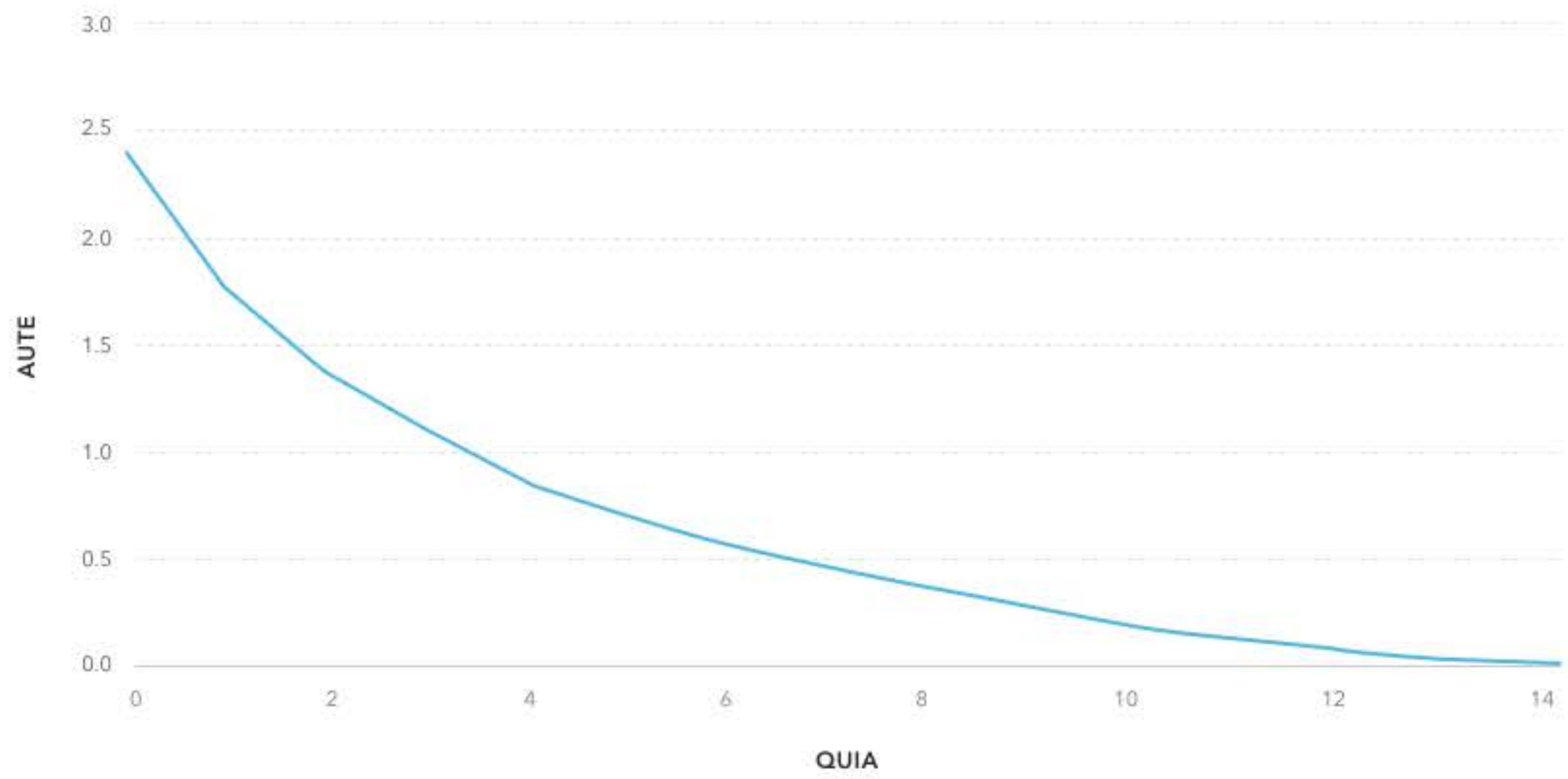
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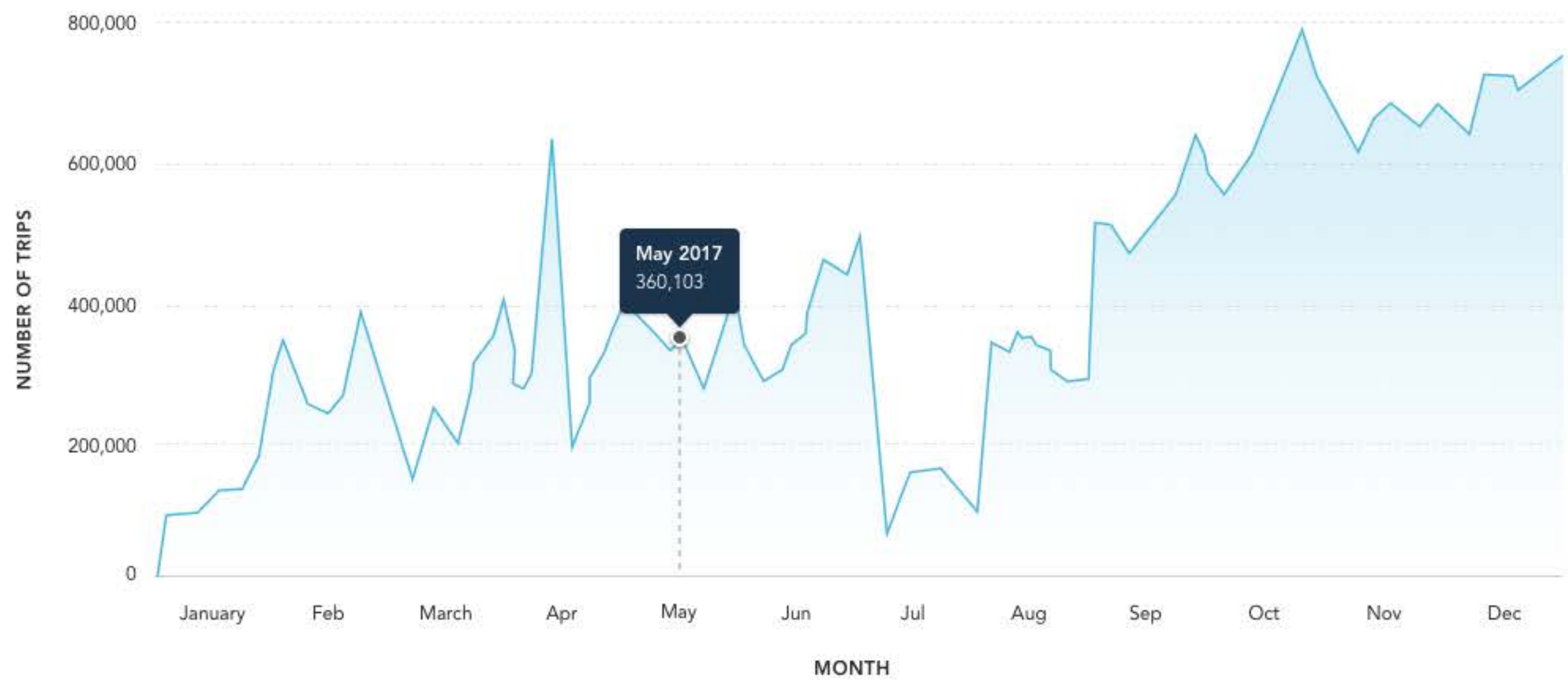
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2017 Disneyland Trips



PIE CHART

Pie charts are best used for making part-to-whole comparisons with discrete or continuous data. They are most impactful with a small data set.



STANDARD

Used to show part-to-whole relationships.



DONUT

Donut charts and pie charts are basically the same, except that in addition to slice size & color pie charts include angles that can be evaluated to make more sense of the data

DESIGN BEST PRACTICES



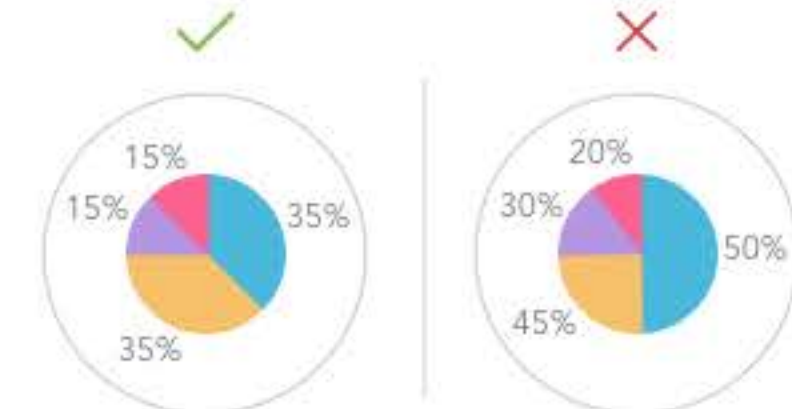
VISUALIZE NO MORE THAN 5 CATEGORIES PER CHART

It is difficult to differentiate between small values; depicting too many slices decreases the impact of the visualization. If needed, you can group smaller values into an "other" or "miscellaneous" category, but make sure it does not hide interesting or significant information.



DON'T USE MULTIPLE PIE CHARTS FOR COMPARISON

Slice sizes are very difficult to compare side-by-side. Use a stacked bar chart instead.



MAKE SURE ALL DATA ADDS UP TO 100%

Verify that values total 100% and that pie slices are sized proportionate to their corresponding value.



ORDER SLICES CORRECTLY

There are two ways to order sections, both of which are meant to aid comprehension.

OPTION 1

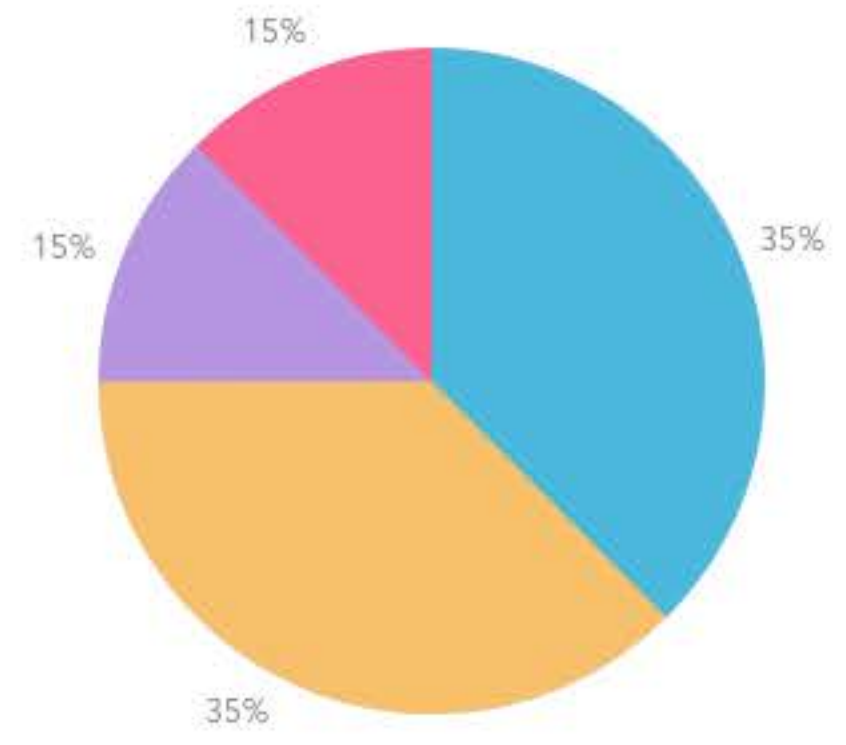
Place the largest section at 12 o'clock, going clockwise. Place the second largest section at 12 o'clock, going counterclockwise. The remaining sections can be placed below, continuing counterclockwise.

OPTION 2

Place the largest section at 12 o'clock, going clockwise. Place the second largest section at 12 o'clock, going counterclockwise. The remaining sections can be placed below, continuing counterclockwise.

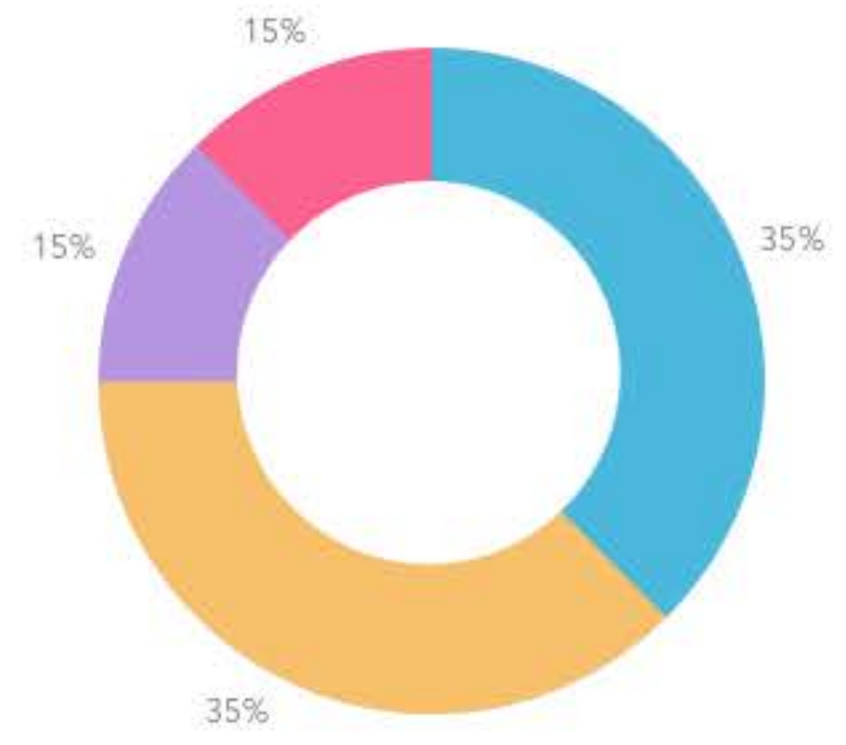
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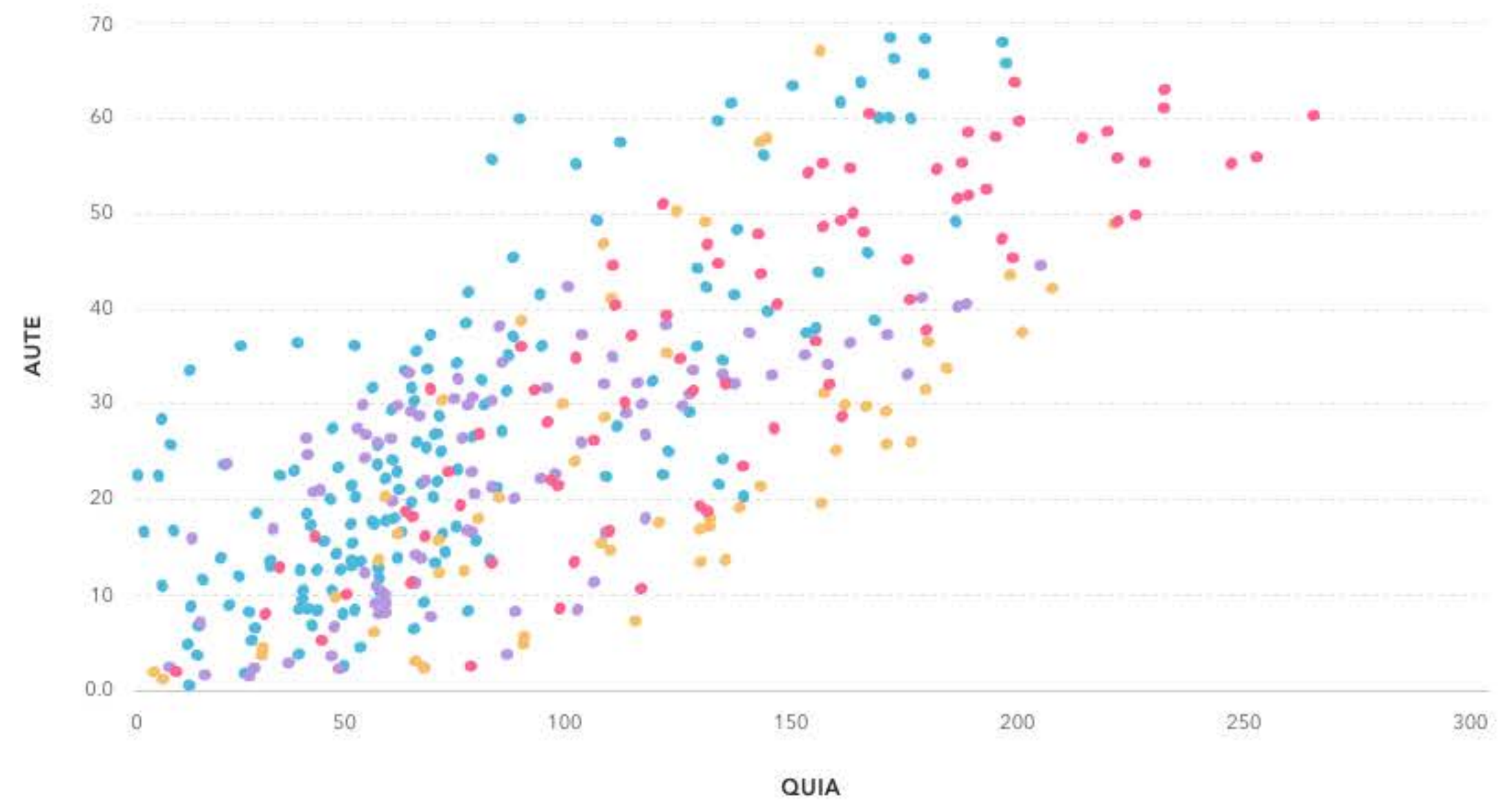
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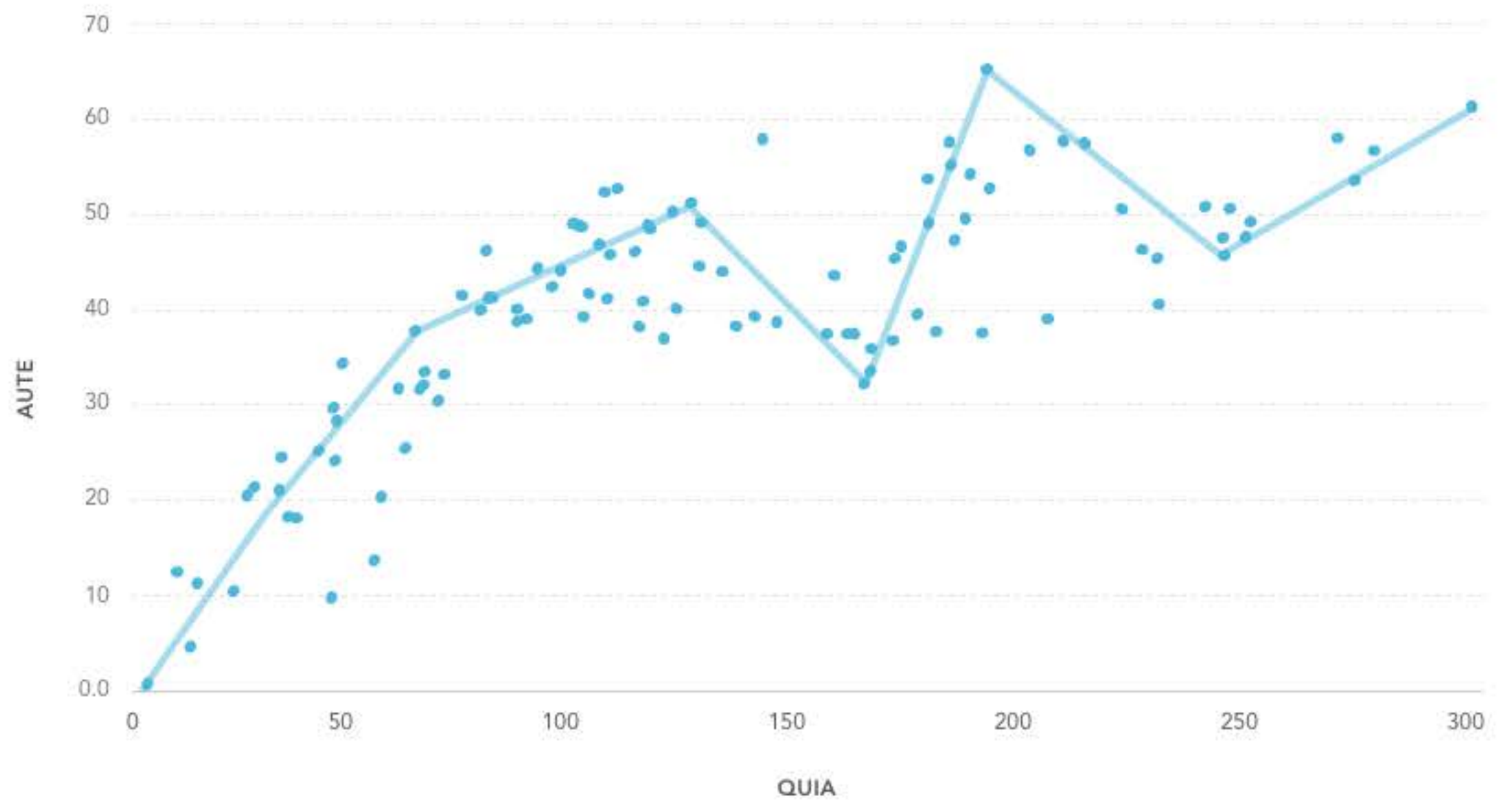


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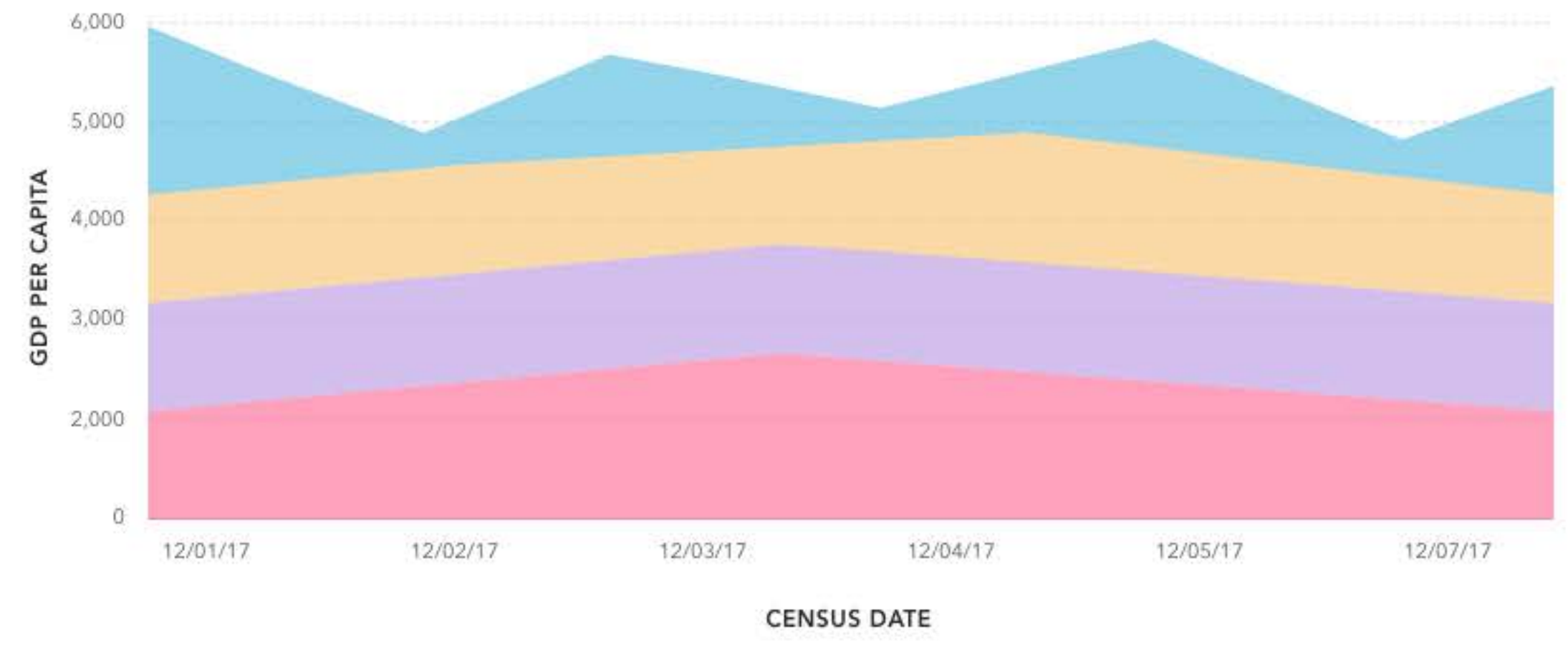


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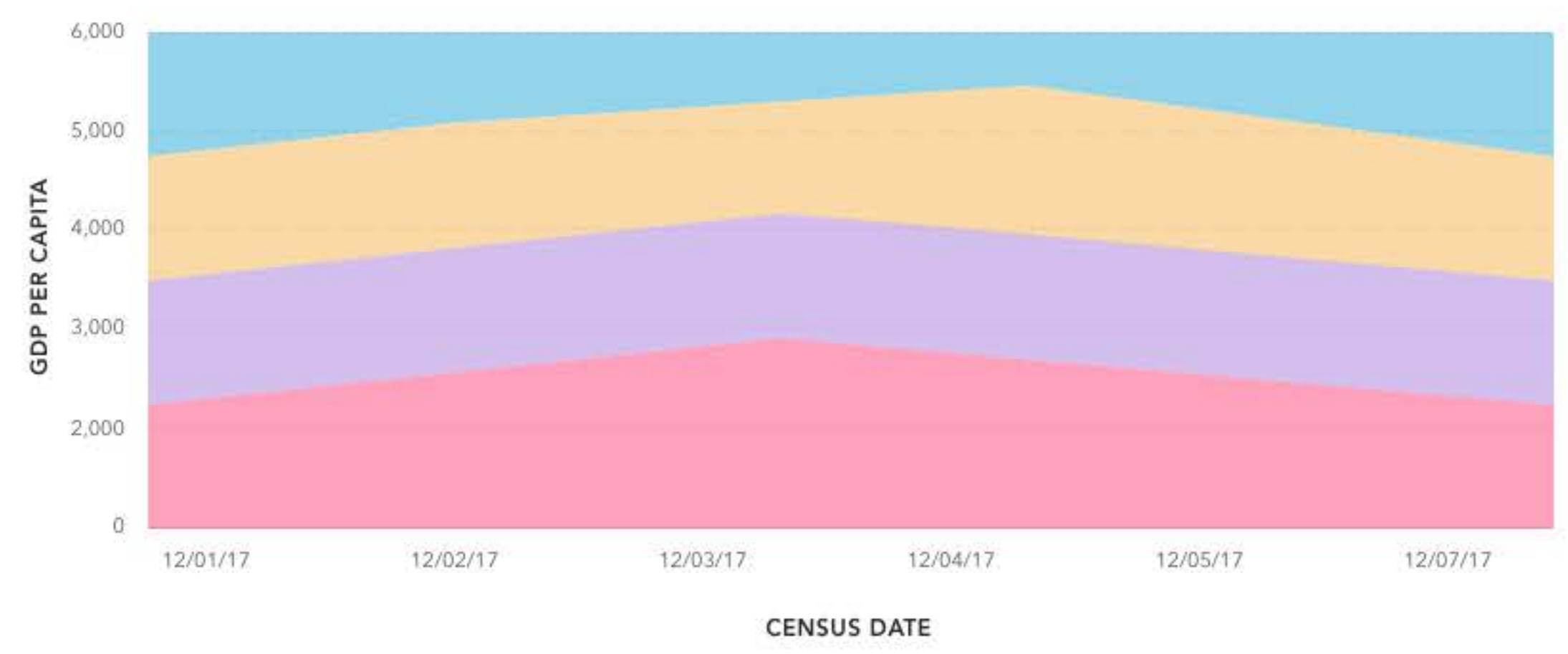
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Zambia Luxembourg Malawi Virgin Islands



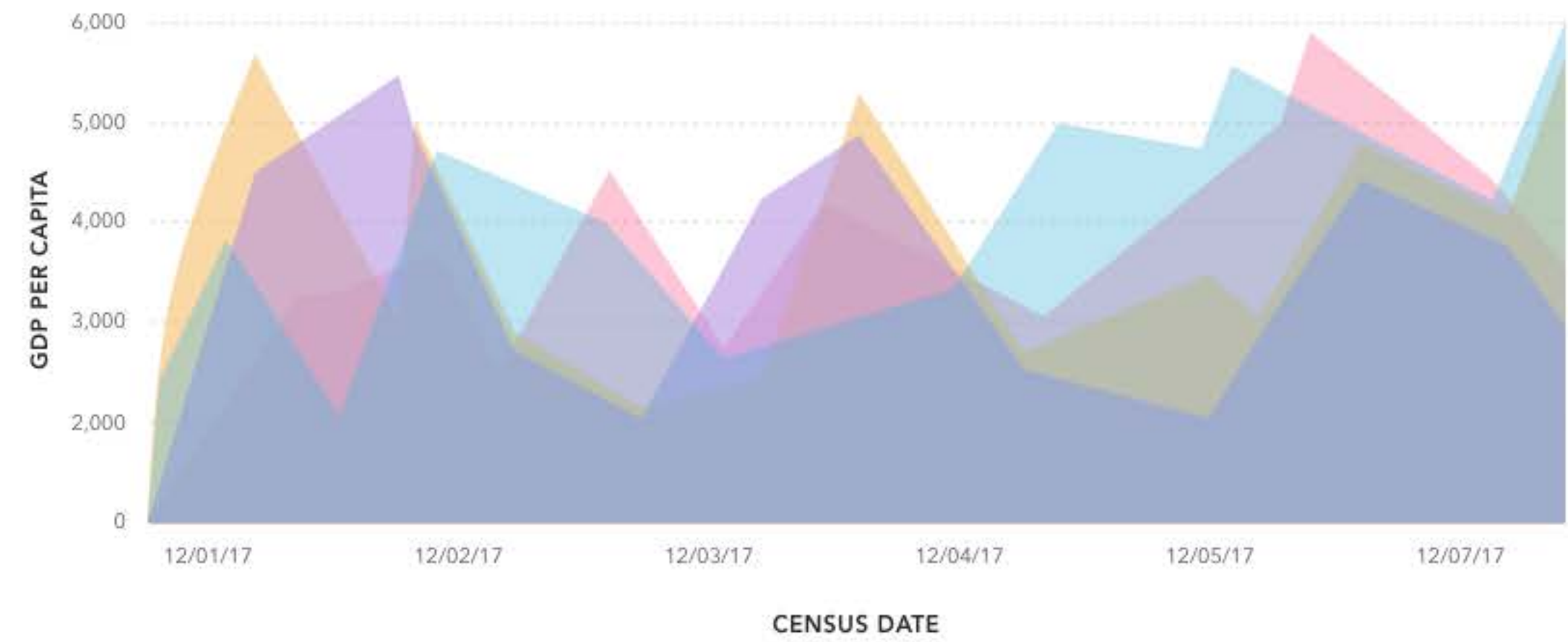
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Zambia Luxembourg Malawi Virgin Islands



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Zambia Luxembourg Malawi Virgin Islands



BUBBLE CHART

Bubble charts are good for displaying nominal comparisons or ranking relationships.



BUBBLE CHART

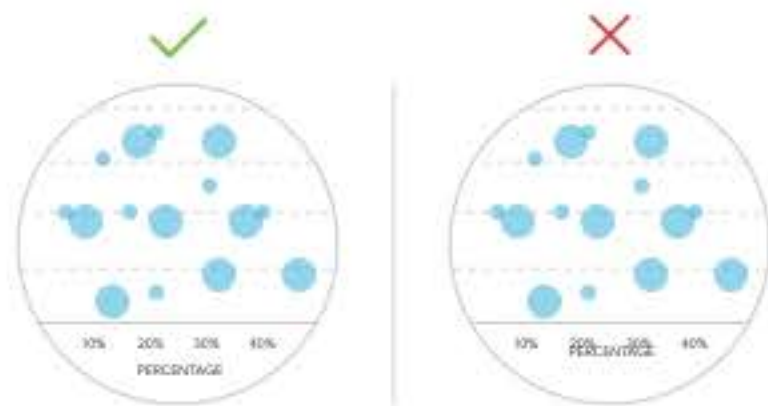
This is a scatter plot with bubbles, best used to display an additional variable.



BUBBLE MAP

Best used for visualizing values for specific geographic regions.

DESIGN BEST PRACTICES



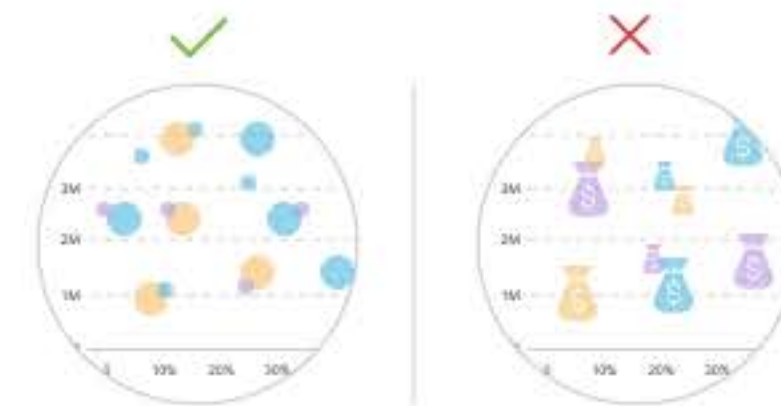
MAKE SURE LABELS ARE VISIBLE

All labels should be unobstructed and easily identified with the corresponding bubble.



SIZE BUBBLES APPROPRIATELY

Bubbles should be scaled according to area, not diameter.



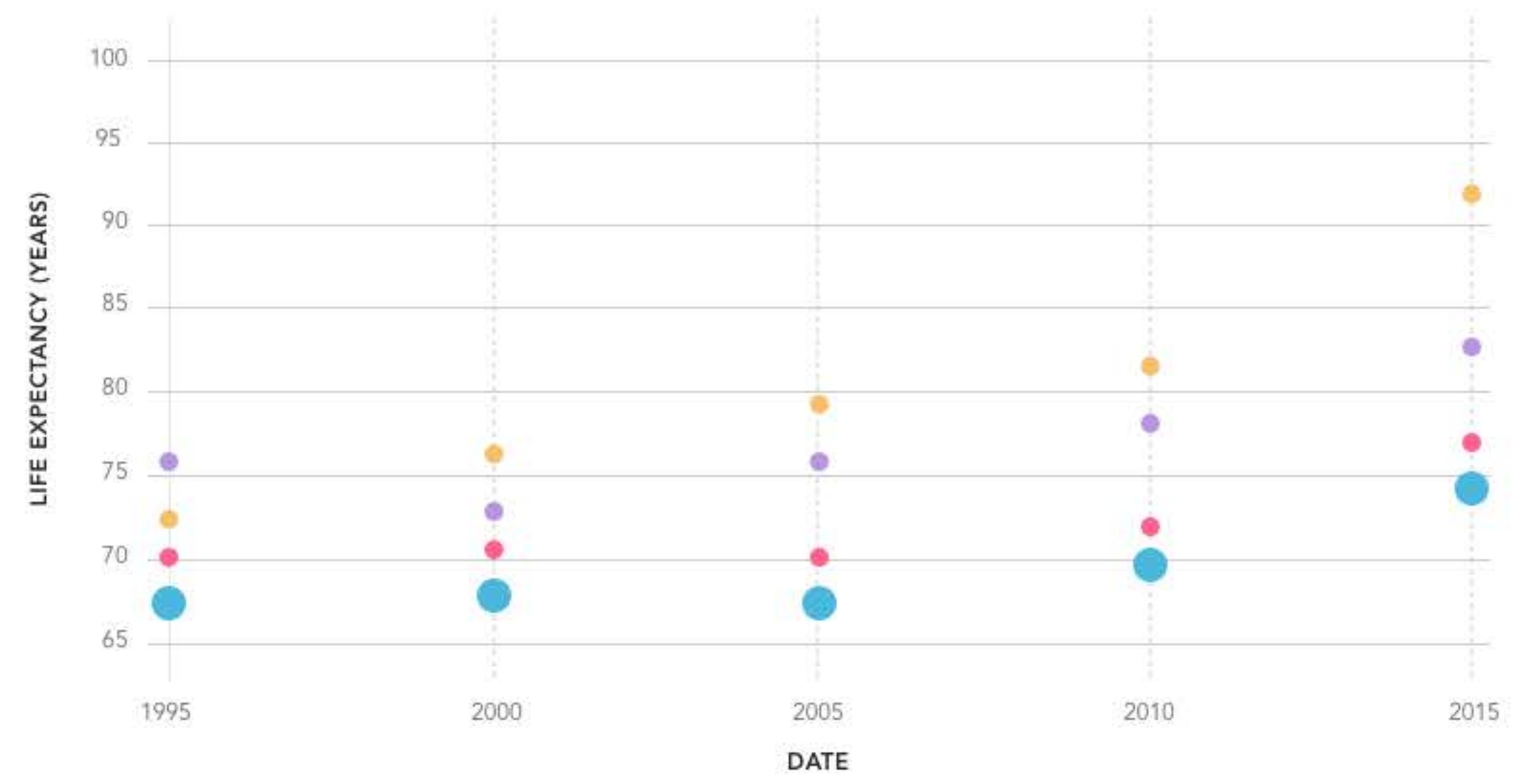
DON'T USE ODD SHAPES

Avoid adding too much detail or using shapes that are not entirely circular; this can lead to inaccuracies.

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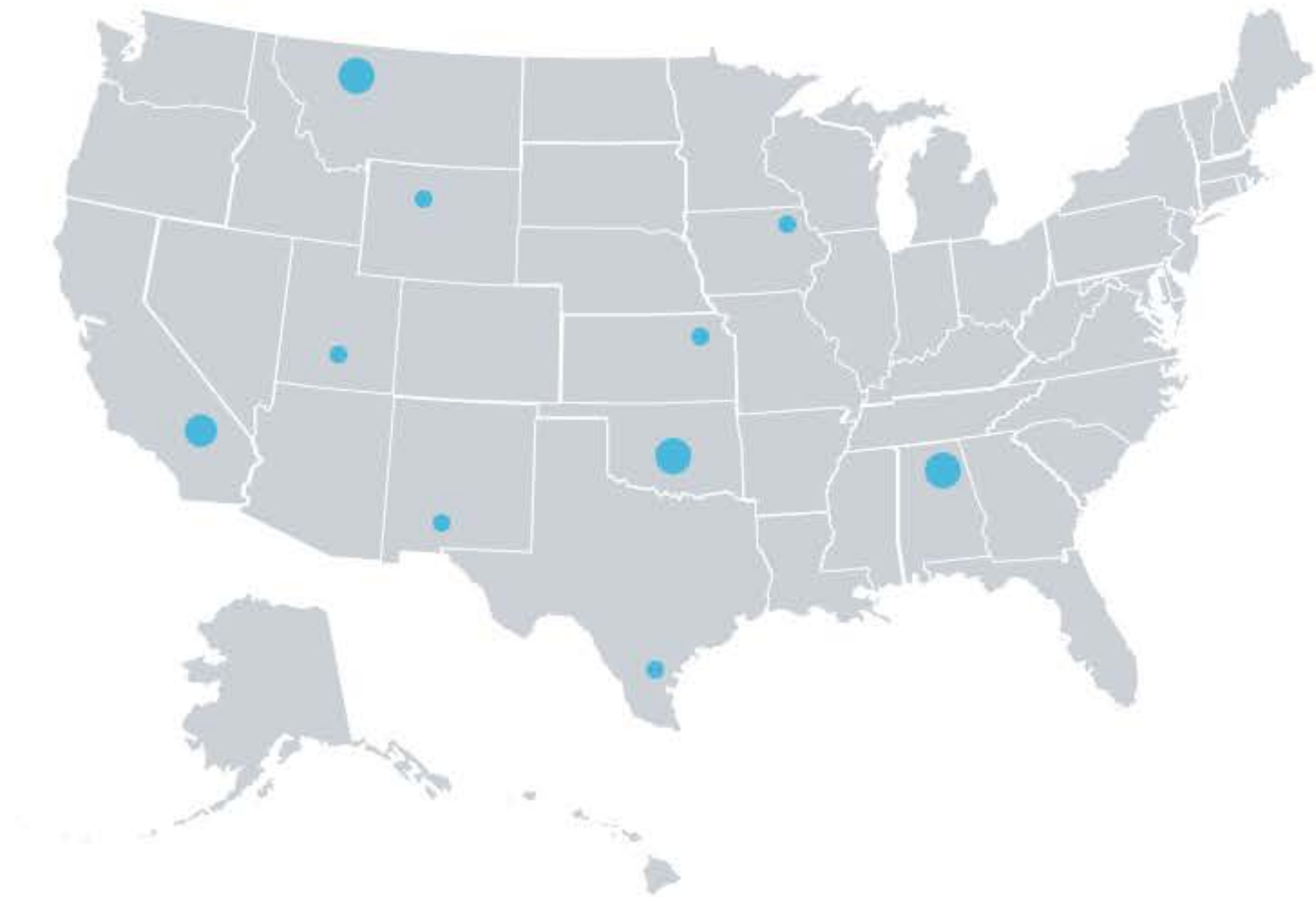
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● Germany ● United States ● France ● United Kingdom



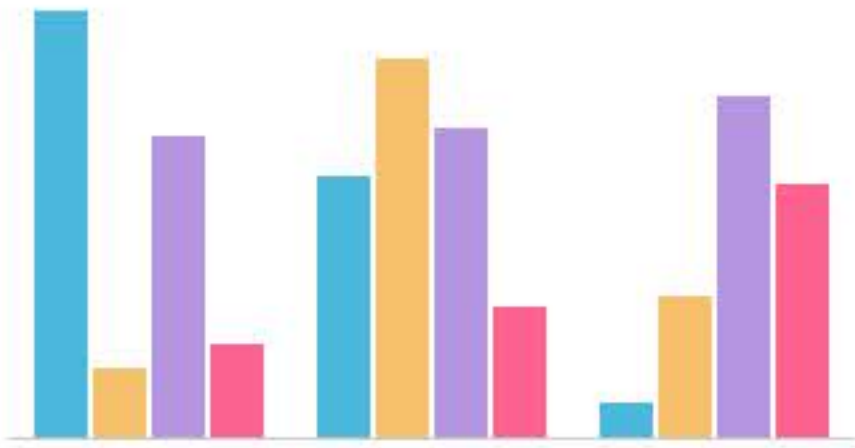
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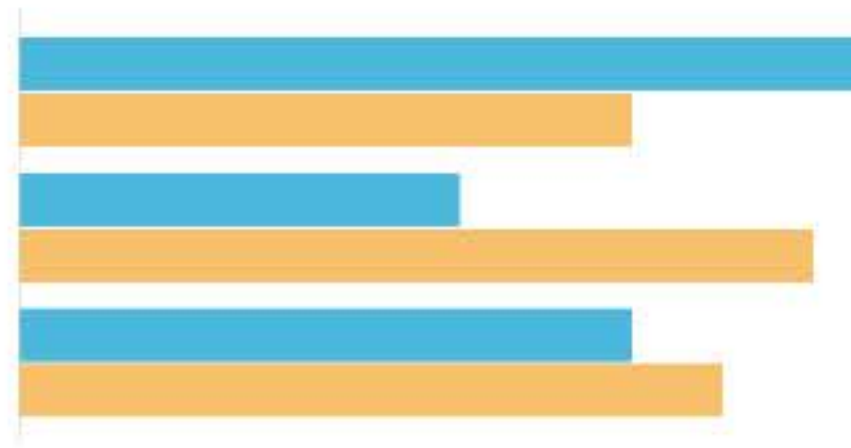
BAR CHART

Bar charts are very versatile. They are best used to show change over time, compare different categories, or compare parts of a whole.



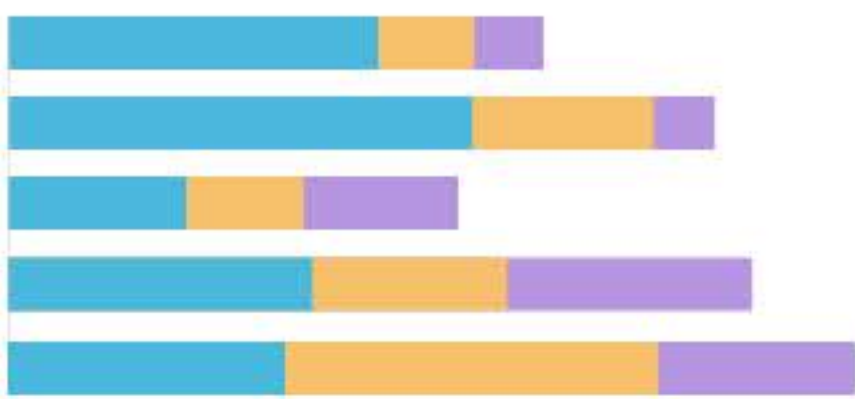
VERTICAL

Best used for chronological data (time-series should always run left to right), or when visualizing negative values below the x-axis.



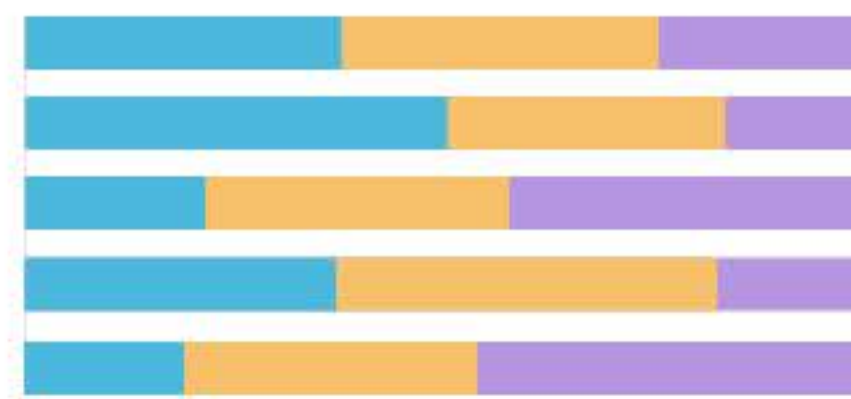
HORIZONTAL

Best used for data with long category labels.



STACKED

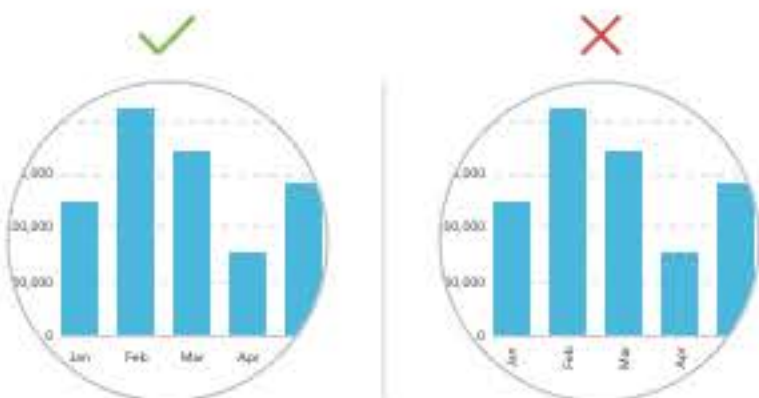
Best used when there is a need to compare multiple part-to-whole relationships. These can use discrete or continuous data, oriented either vertically or horizontally.



100% STACKED

Best used when the total value of each category is unimportant and percentage distribution of subcategories is the primary message.

DESIGN BEST PRACTICES



USE HORIZONTAL LABELS

Avoid steep diagonal or vertical type, as it can be difficult to read.



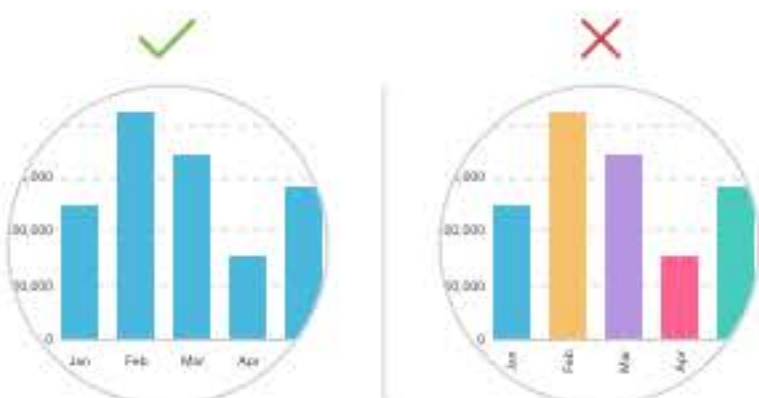
SPACE BARS APPROPRIATELY

Space between bars should be $\frac{1}{2}$ bar width.



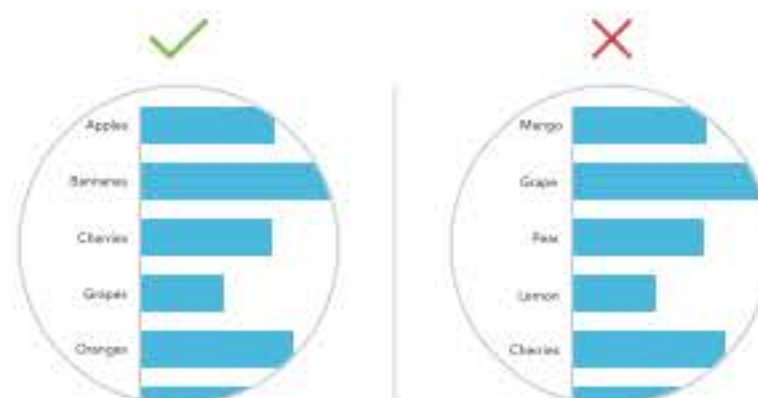
START THE Y-AXIS VALUE AT 0

Starting at a value above zero truncates the bars and doesn't accurately reflect the full value.



USE CONSISTENT COLORS

Use one color for bar charts. You may use an accent color to highlight a significant data point.

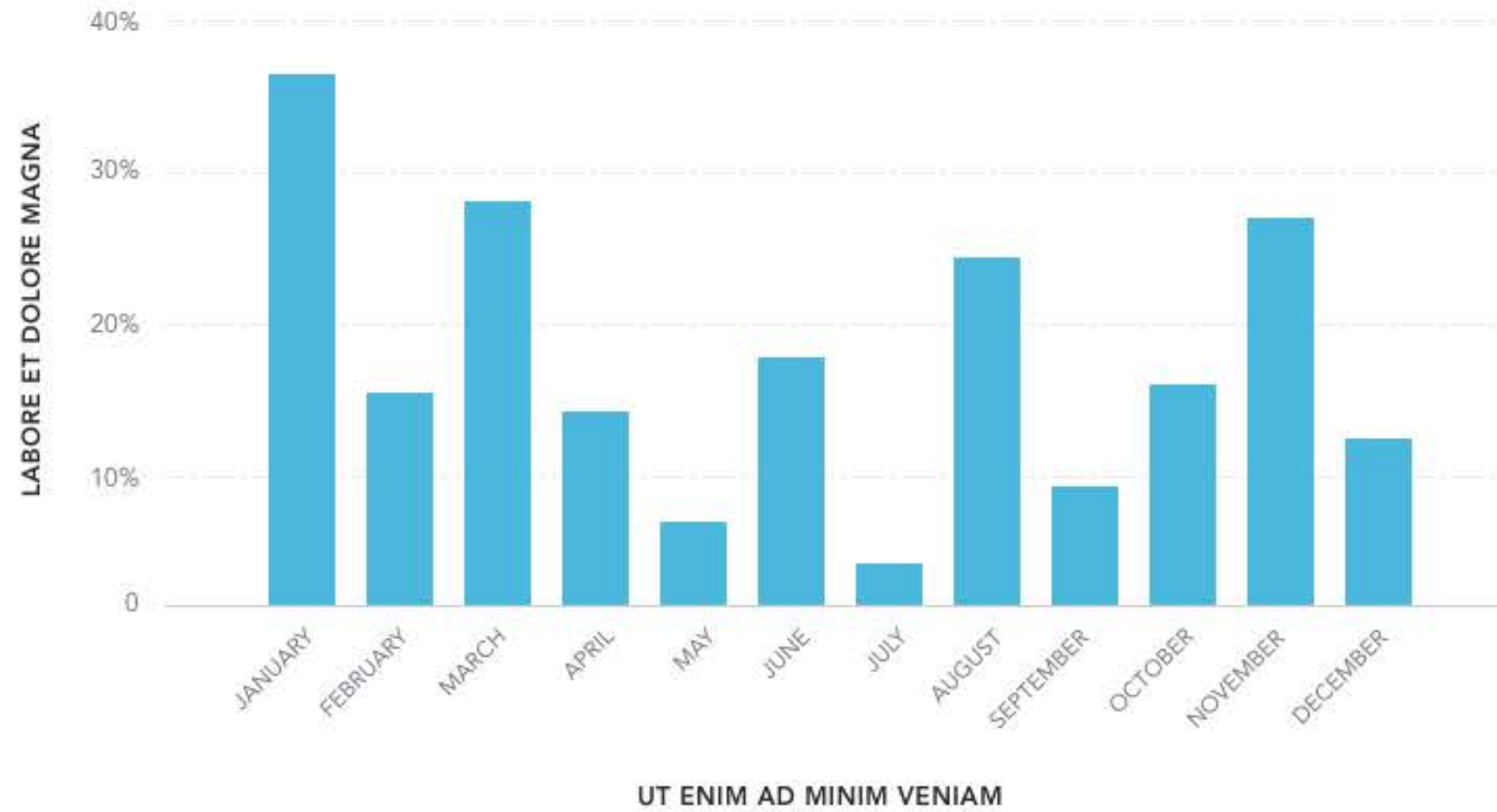


ORDER DATA APPROPRIATELY

Order categories alphabetically, sequentially, or by value.

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Customer type and gender breakdown of Disneyland Trips for 2017

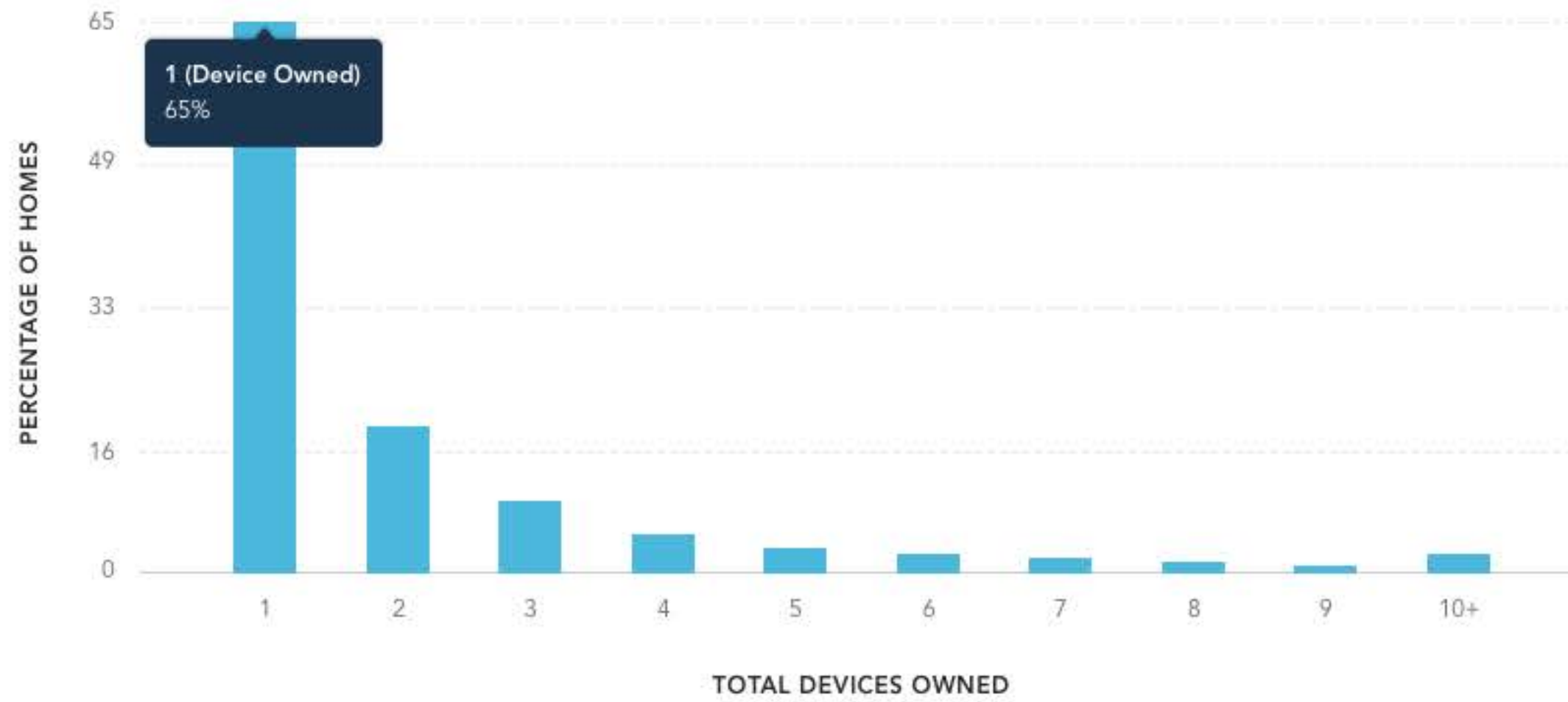
Total Trips / Customer Type

● Annual Pass ● Regular



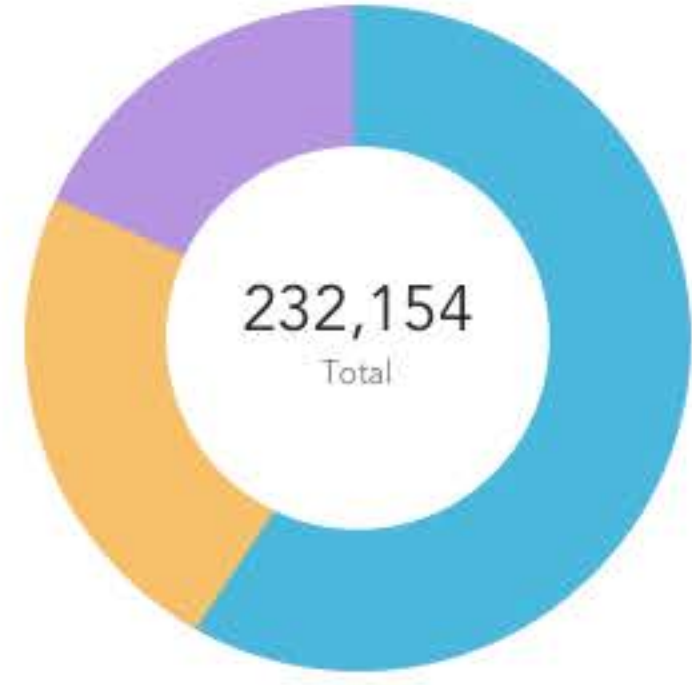
Devices per Home

Percentage of devices owned in each home



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150,900	58,028	34,823
Germany	United States	France
65%	25%	15%

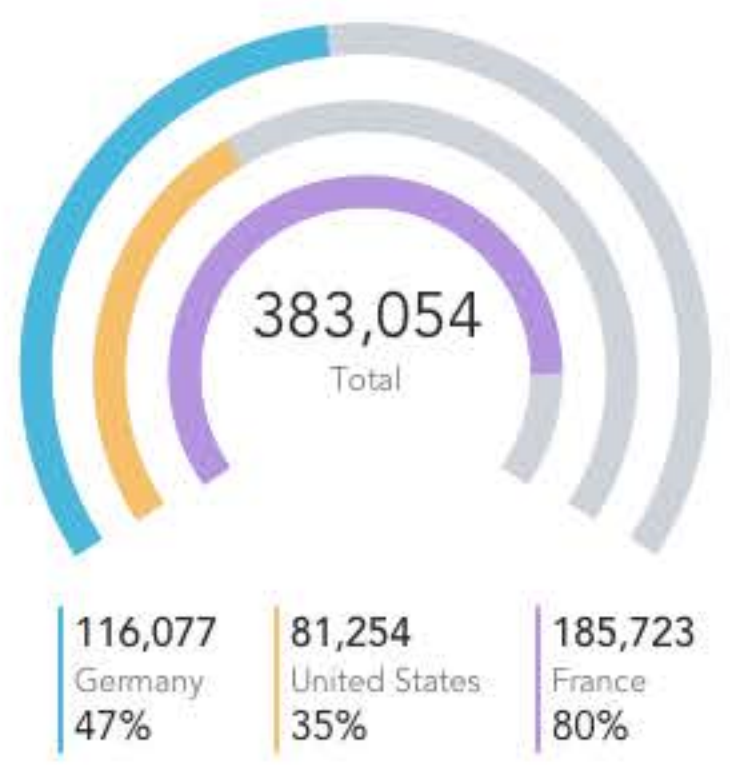
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● Aspernatur ● Consequat ● Duis



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Total: 123,456



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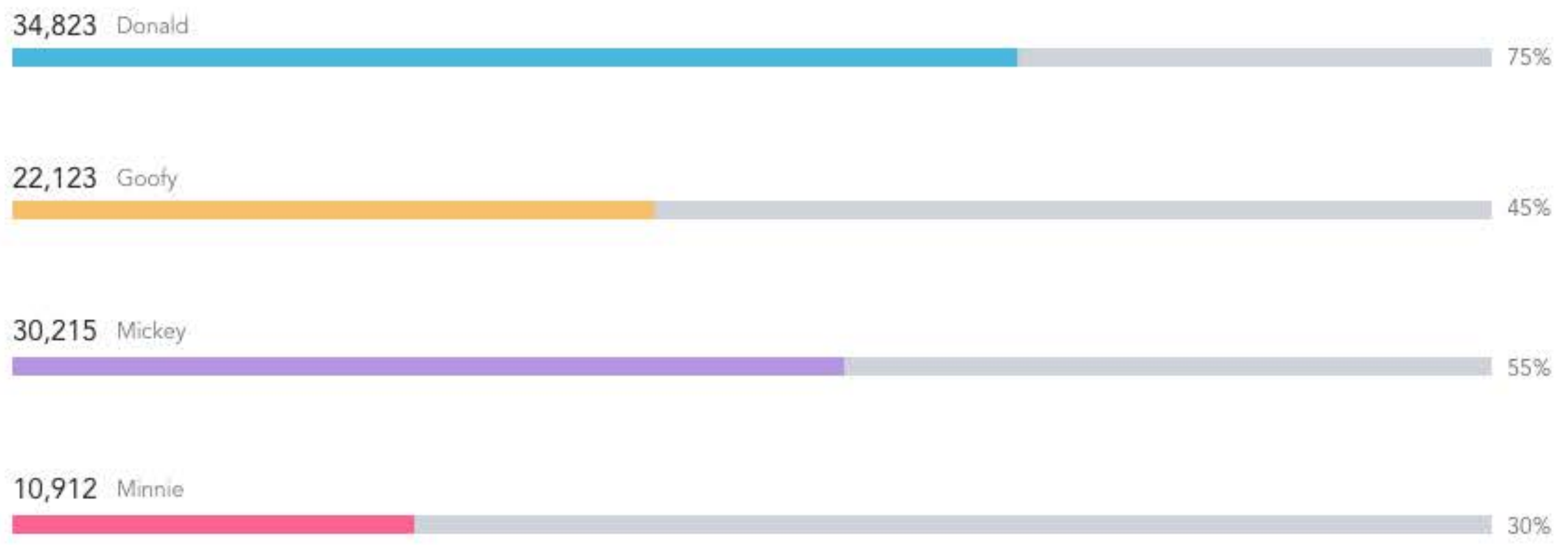
Total: 123,456



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● Captain America ● Hulk ● Iron Man ● Thor

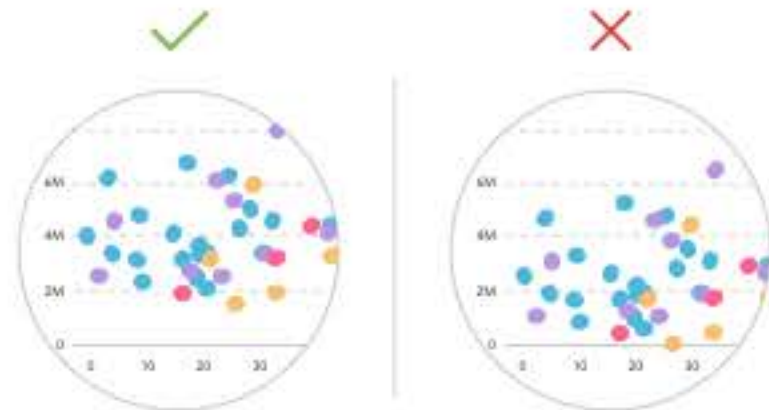


SCATTER PLOT

Scatter plots show the relationship between items based on two sets of variables. They are best used to show correlation in a large amount of data.

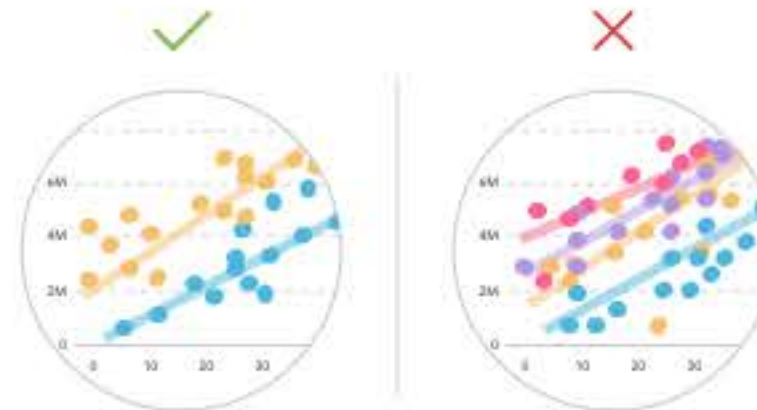


DESIGN BEST PRACTICES



START Y-AXIS VALUE AT 0

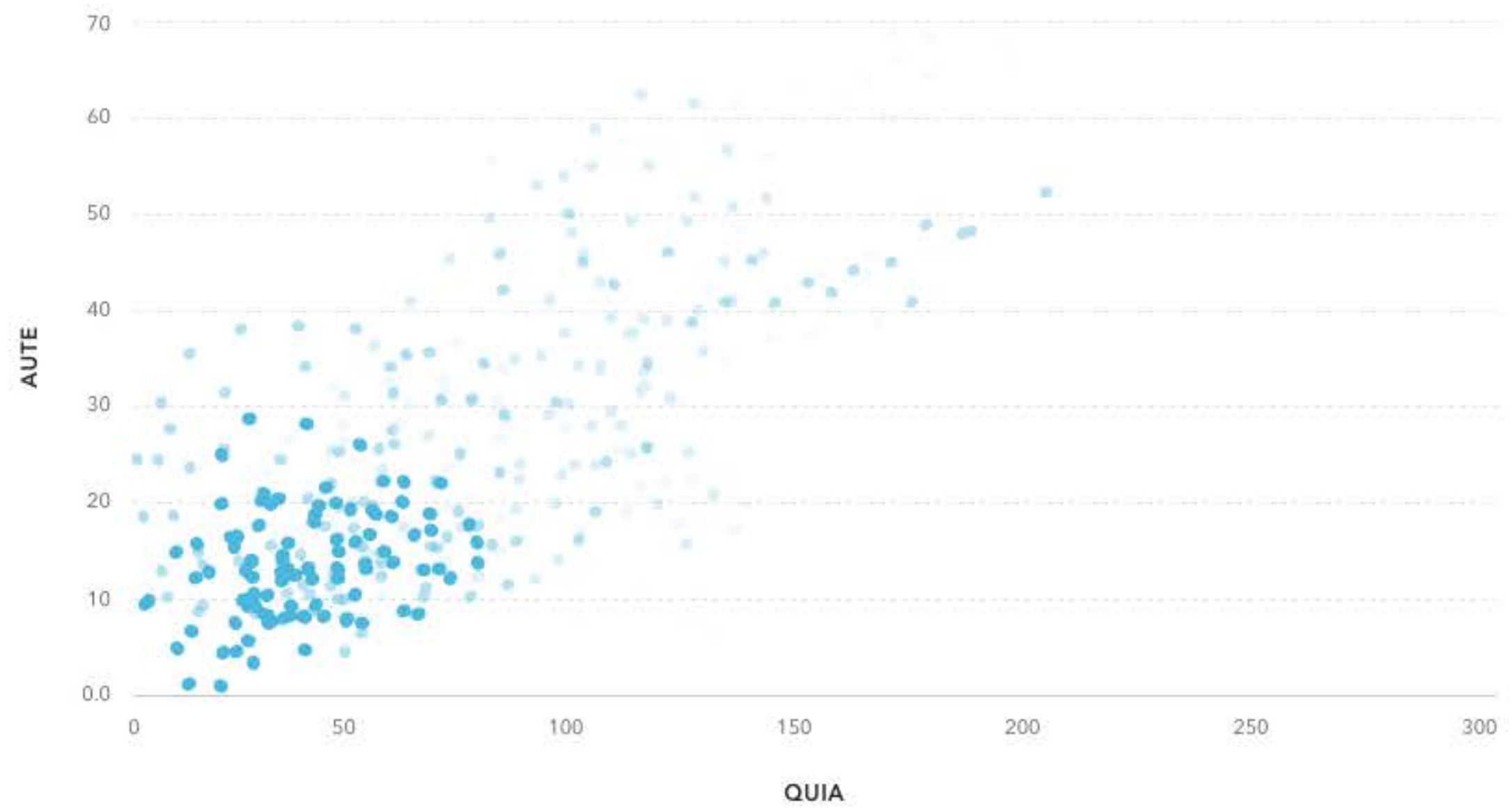
Starting the axis above zero truncates the visualization of values.



DON'T COMPARE MORE THAN 2 TREND LINES

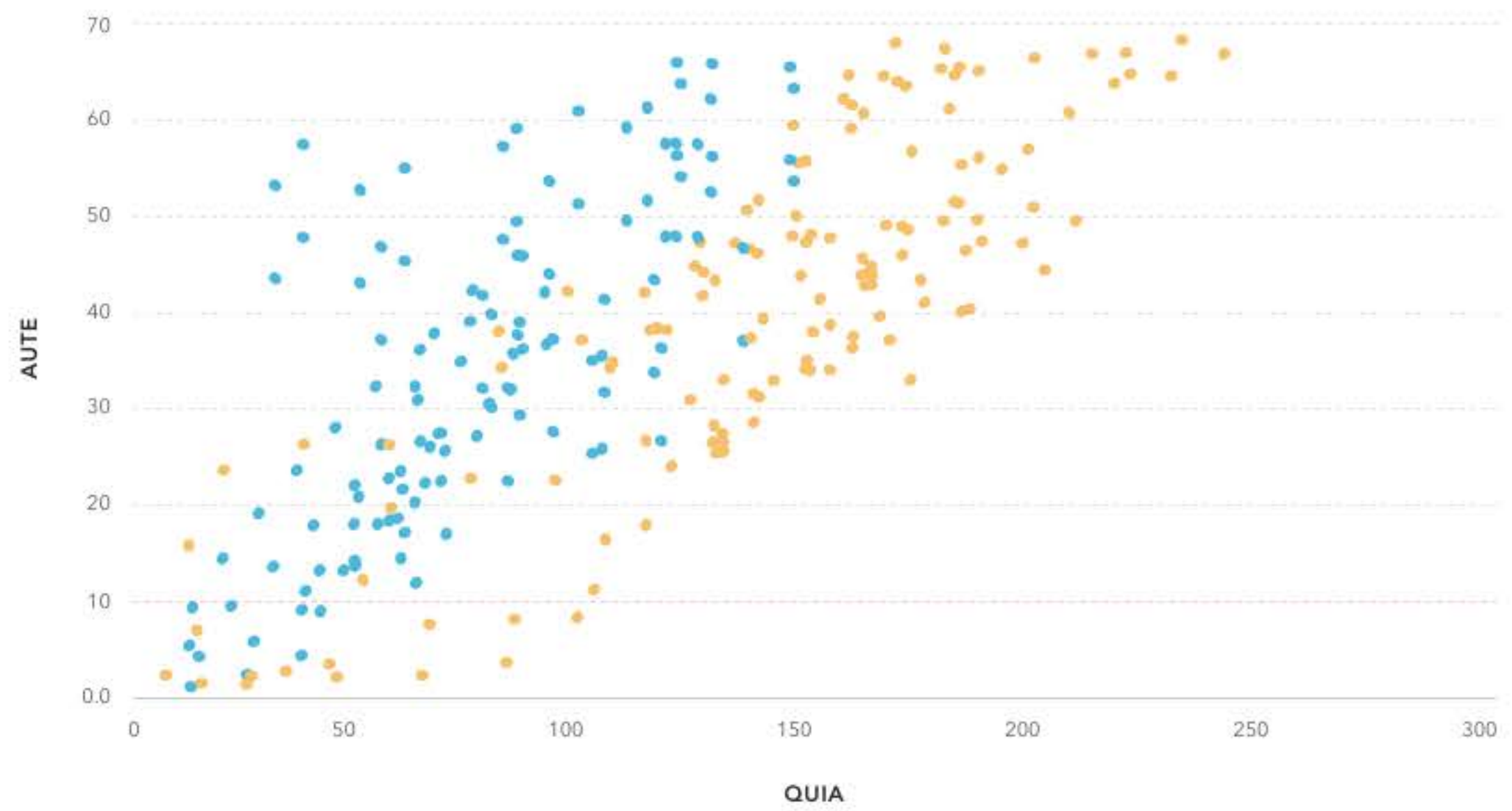
Too many lines make data difficult to interpret.

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