

# Which Visualization?

# A Quick Reference

You have the following data (sample):

Discrete Categories,  
Ordered categories,  
and Continuous Metrics

Here's how to plot them

Categories	Ordered Cats	Continuous Metrics					
City	Airline	Class	PriceBracket	Month	Distance	FlightTime	Price
Alphaville	XeroTrip	Coach	\$	1	300	120	250
Betastan	YoloFly	Business	\$\$	2	500	185	1,525
Chicago	ZeusAir	First	\$\$\$	3	650	240	4,023
...	...	...	...	...	...	...	...

## Discrete Categories

## Ordered Categories

## Continuous Metrics

Metric, grouped by 1 category

**Bar (Row)**  
A  
B  
C Price  
Sideways layout means readable labels

**Dot Plot**  
A  
B  
C

**Benchmark Bar**  
A  
B  
C Budget

**Bar (Column)**  
\$ \$\$ \$\$\$ Class  
Histogram. Boxes help convey the underlying bins

**Bar (Column)**  
1 2 3 Month  
Increasing values move horizontally. So use Column, not Row

**Area**  
A  
1 2 3  
Adds continuity to x-axis.

**Line**  
A  
1 2 3  
A non-zero y-axis base may be less misleading here

Metric, grouped by 2 categories

**Bar Table X,Y,Z...**  
A  
B  
C X Y Z  
Compare X to Y to Z, 'Small multiples'. Please use this more

**Bar Table X,Y, Delta**  
A  
B  
C X Y Delta  
Comparisons are slow. Plot critical Deltas explicitly

**Benchmarks Bar**  
A  
B  
C Xs Ys  
Compare X to Y. Fancier version called a 'Bullet graph'

**2D Size Price**  
Class  
A  
B  
C Price Bracket  
2D Bubble

**Bar Table**  
A  
B 1 2 3  
Compare a metric across an ordered category

**Slopegraph**  
A  
B  
C 1 2  
With two values, slope encodes delta

**Bar Line Table**  
Price  
Distance  
1 2 3  
Better than what's below

**Line Table**  
A  
B  
C 1 2 3  
Trends visible, but use Lines (below) to compare heights

**Interleaved Bar**  
A  
B  
C X Y Z  
Interleaves two categories into one spatial dimension. Typically better to use Bar Table (above) instead

**Mirror Bar**  
A  
B  
C X Y  
Compare X to Y, leverages human symmetry perception

**2D Heat**  
Class  
A  
B  
C Price Bracket  
2D Histogram. Similar in spirit to a bar table, but ordered categories.

**Dual Axis**  
Price  
Distance  
1 2 3  
Use (above) instead. This invites apples-to-oranges comparisons

**Lines**  
A  
B  
C 1 2 3  
Getting spaghetti? Split into subset or Line-Table (above)

Part-to-Whole, grouped by 1 category

**Pie**  
A  
B  
C  
Screams 'Percentages!'

**Stacked Bar (Row)**  
A B C  
More precise and flex, but less screaming

**Stacked Bar (Col)**  
A  
B  
C  
Now I'm standing

**Waterfall**  
A B C  
Waterfalls are vertical stacked bars that narrate financial values in a (typically) artificially imposed ordering across fantasy-time

... by 2 categories

**MultiPie**  
X Y Z  
Please don't... (not recommended)

**Stacked Bars (R)**  
A  
B  
C X Y Z  
...Use this instead

**[Mari]Mekko**  
A  
B  
C X Y Z  
Stacked bars but now with X, Y, Z info. Here XYZ might be absolute values of a market, ABC are company % market shares

**Stacked Bars (C)**  
A  
B  
C X Y Z  
Horizontal flow implies an ordering

**... with lines**  
A  
B  
C X Y Z  
Added lines suggest continuity, help depict changes

**Stacked area**  
A  
B  
C 1 2 3  
Now it's definitely continuous

... by hierarchies

**Breakout Bar**  
A B C  
A1 A2 A3  
Let's zoom in here. Use different colors. Global at top or left.

**Treemap**  
A B C  
Hierarchy, ~3 levels max of bento boxes going all Inception within other bentos. Size+Color better code different metrics. Typically misused. 95% sure you actually wanted a Bar Table (above)

Beware of an illusion for lines: seeing differences (lines), or category values (stacked area) can be difficult and even misleading

These lines are identical, with equal Y separation at each X slice, but it doesn't look that way!

**Look at this number. Just look at it.**

Dot Array

Dot Array %

43%

Huge Number

Icon Array (ISOTYPE)

Icon Array %

Connecting Lines imply continuous data

USA Dutch      USA Dutch

"Dutch people are taller than Americans"      "People get taller as they get more Dutch"

Same data, ask people, "What do you see?"      Zacks & Tversky, 1997

Metrics: relationships to other metrics

**Scatter Price**

Month

An elegant graph, from a civilized age

**Connected Scatter Price**

Distance

A scatterplot, connected into a journey over time

**Parallel Coordinates Price Time Month**

Price Time Month

Beyond 2 perpendicular Cartesian axes, Parallel format allows more axes

**Map Space**

Space

Maps and Roslings share the same DNA. Color = Flight Time. Size = Price

**Hans Rosling Scatter Distance**

Month

Watch Rosling's TED talk. Take XY scatter and adds two more metrics (color and size), and then moves in time

**Rosling Comet Distance**

Month

Show two or more X+Y history values for comparison over time