

# Creating a Line Chart

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**Chris B. Behrens**

SOFTWARE ARCHITECT

@chrisbbehrens [www.chrisbehrens.rocks](http://www.chrisbehrens.rocks)



# Introduction



An asset to get your work done



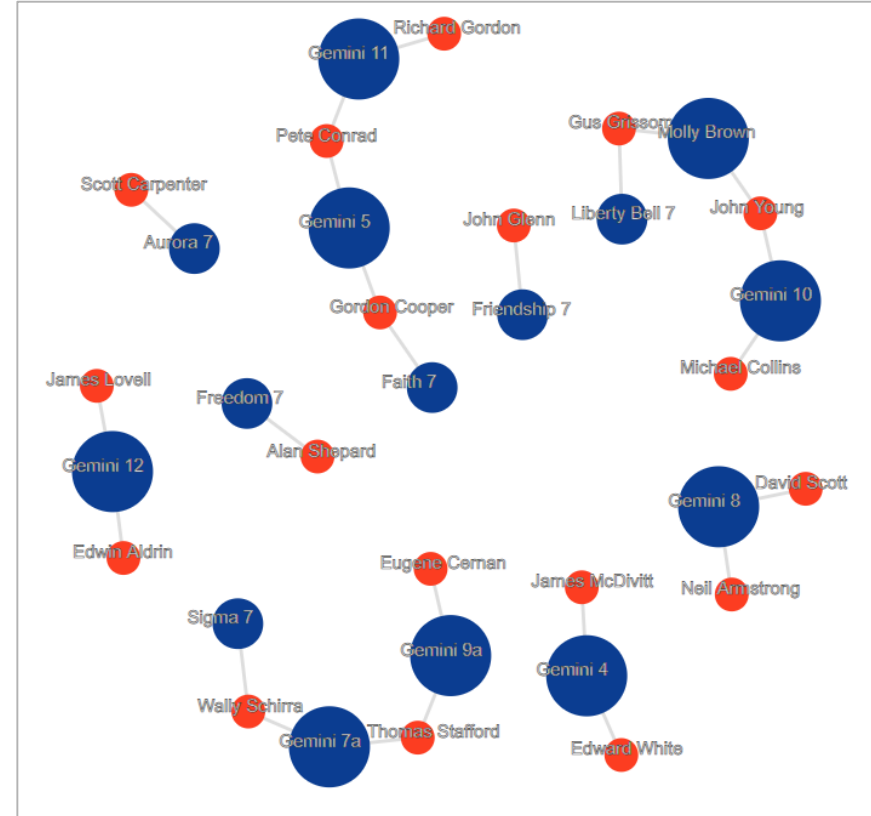
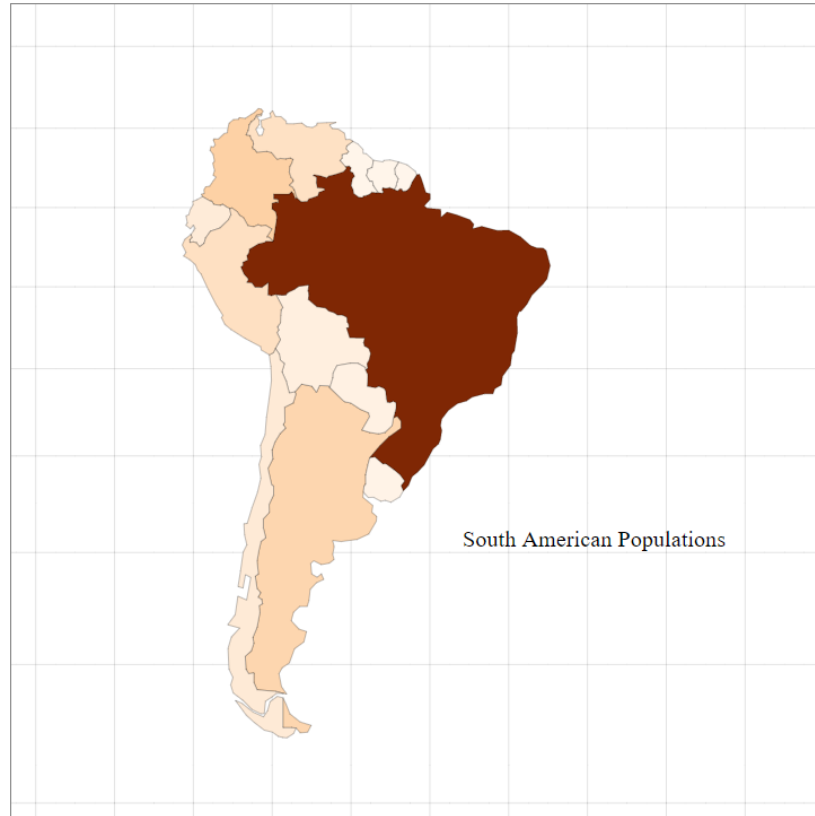
The most-used visualization – a line chart



With some aspects in detail



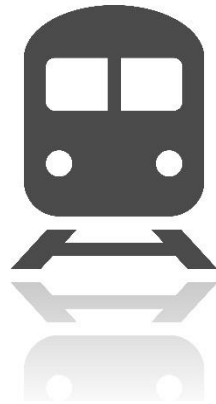
# Scale



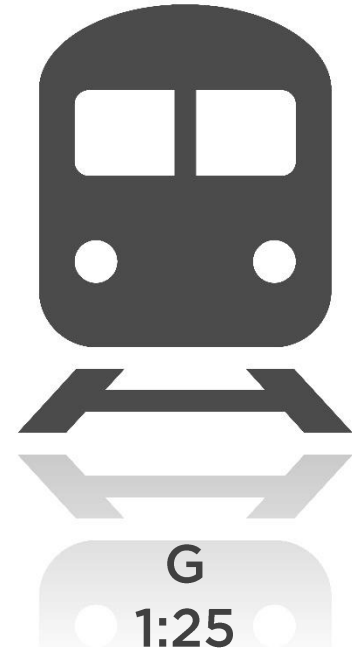
# Model Train Scales



HO (half-o)  
1:87



O  
1:48



G  
1:25



# A Toy Train



A scale is a mapping of input values from a domain to the output values of a specified range



# Model Train Scales







What is “mapping”?

A function, that when applied...

- Transforms an input value
- To an output value

Divide by eighty-seven

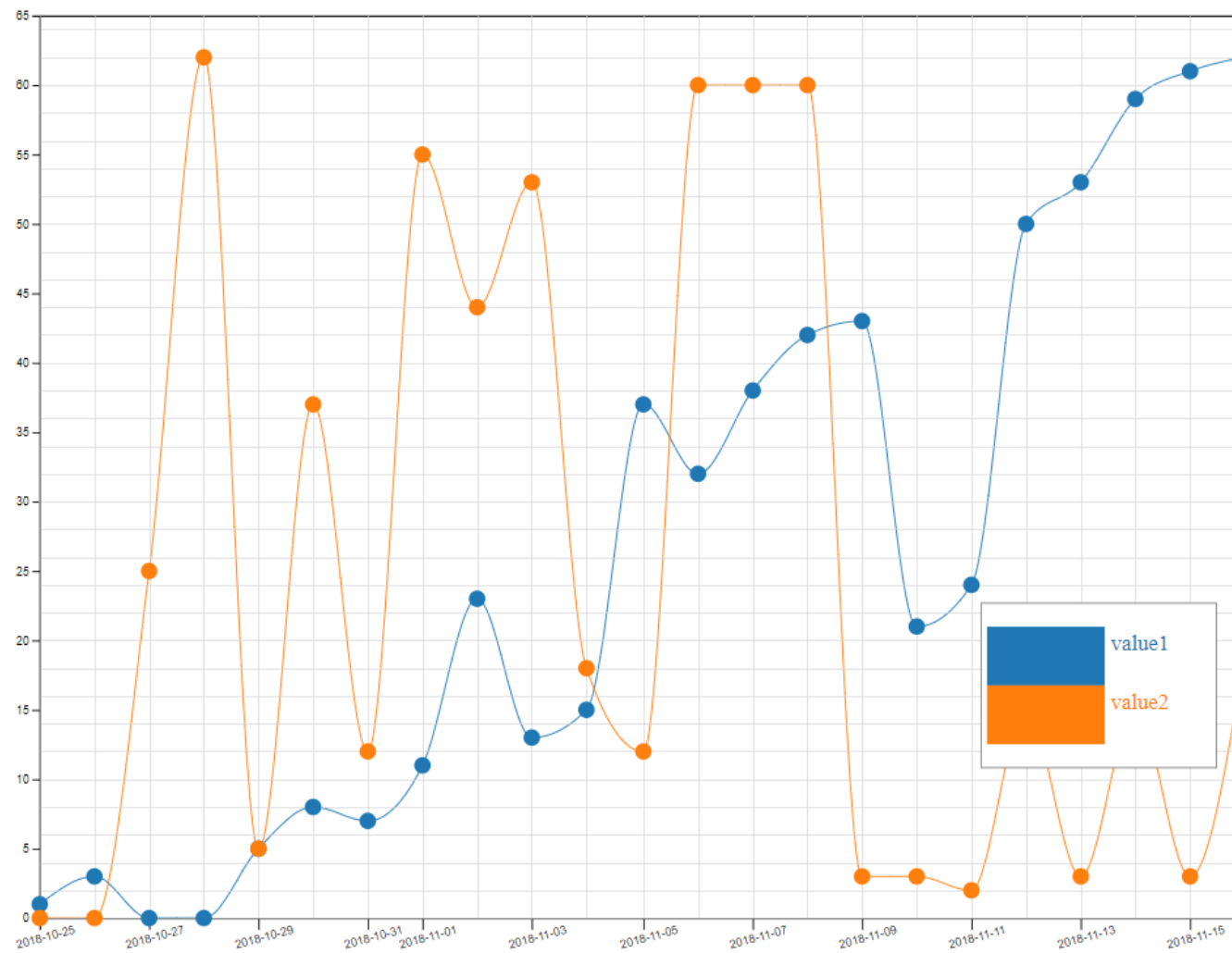




A scale is a function which,  
when applied to a series of  
input domain values,  
produces a series of output  
range values



# Line Chart Scales



# Line Chart X-axis



```
var data = [{ date: "10/25/2018", value1: 1, value2: 0 },
{ date: "10/26/2018", value1: 3, value2: 0 },
{ date: "10/27/2018", value1: 0, value2: 25 },
{ date: "10/28/2018", value1: 0, value2: 62 },
{ date: "10/29/2018", value1: 5, value2: 5 },
{ date: "10/30/2018", value1: 8, value2: 37 },
{ date: "10/31/2018", value1: 7, value2: 12 },
{ date: "11/01/2018", value1: 11, value2: 55 },
{ date: "11/02/2018", value1: 23, value2: 44 },
{ date: "11/03/2018", value1: 13, value2: 53 },
{ date: "11/04/2018", value1: 15, value2: 18 },
{ date: "11/05/2018", value1: 37, value2: 12 },
{ date: "11/06/2018", value1: 32, value2: 60 },
{ date: "11/07/2018", value1: 38, value2: 60 },
{ date: "11/08/2018", value1: 42, value2: 60 },
{ date: "11/09/2018", value1: 43, value2: 3 },
{ date: "11/10/2018", value1: 21, value2: 3 },
{ date: "11/11/2018", value1: 24, value2: 2 },
{ date: "11/12/2018", value1: 50, value2: 15 },
{ date: "11/13/2018", value1: 53, value2: 3 },
{ date: "11/14/2018", value1: 59, value2: 15 },
{ date: "11/15/2018", value1: 61, value2: 3 },
{ date: "11/16/2018", value1: 62, value2: 19 }];
```



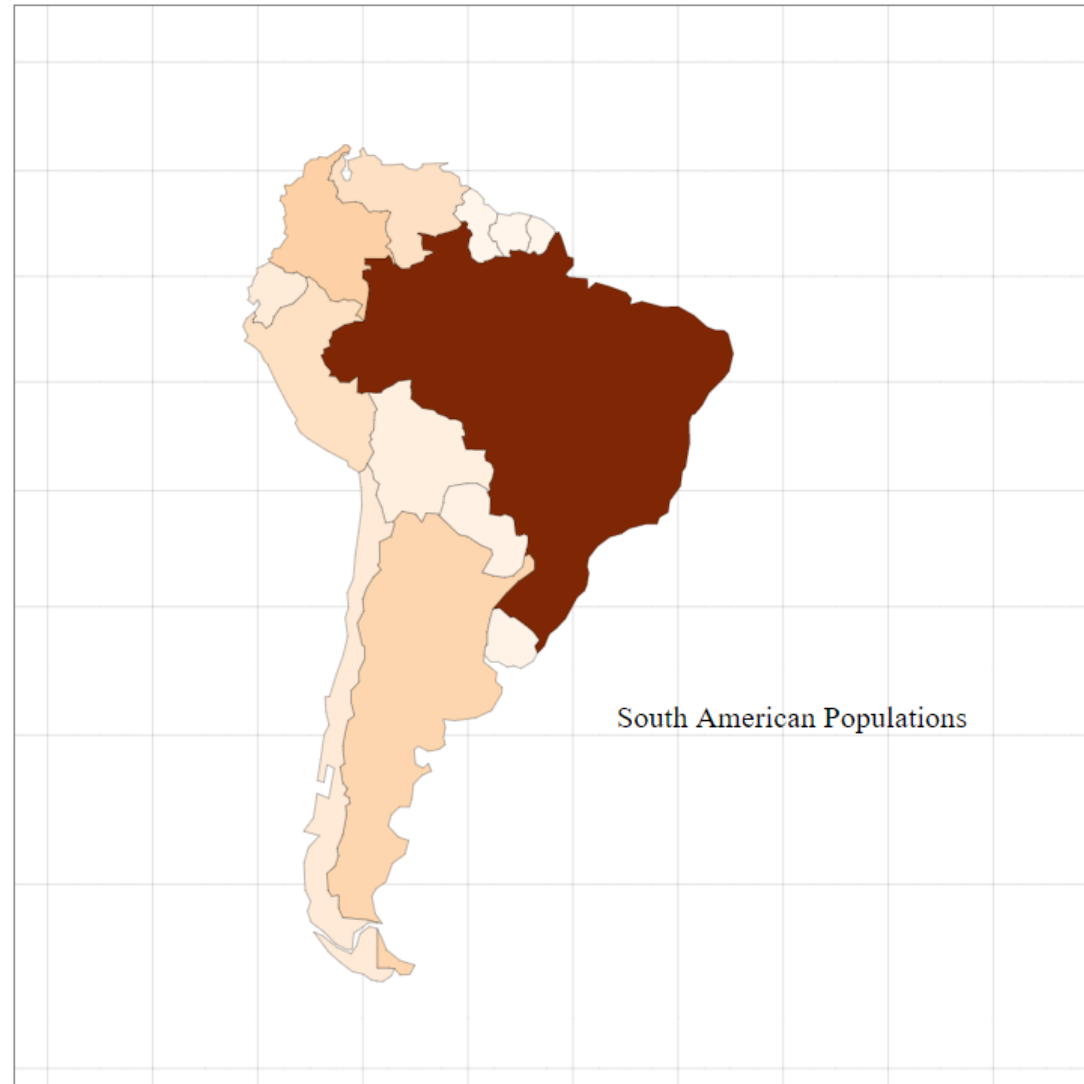
# Line Chart Y-axis



```
var data = [{ date: "10/25/2018", value1: 1, value2: 0 },  
  { date: "10/26/2018", value1: 3, value2: 0 },  
  { date: "10/27/2018", value1: 0, value2: 25 },  
  { date: "10/28/2018", value1: 0, value2: 62 },  
  { date: "10/29/2018", value1: 5, value2: 5 },  
  { date: "10/30/2018", value1: 8, value2: 37 },  
  { date: "10/31/2018", value1: 7, value2: 12 },  
  { date: "11/01/2018", value1: 11, value2: 55 },  
  { date: "11/02/2018", value1: 23, value2: 44 },  
  { date: "11/03/2018", value1: 13, value2: 53 },  
  { date: "11/04/2018", value1: 15, value2: 18 },  
  { date: "11/05/2018", value1: 37, value2: 12 },  
  { date: "11/06/2018", value1: 32, value2: 60 },  
  { date: "11/07/2018", value1: 38, value2: 60 },  
  { date: "11/08/2018", value1: 42, value2: 60 },  
  { date: "11/09/2018", value1: 43, value2: 3 },  
  { date: "11/10/2018", value1: 21, value2: 3 },  
  { date: "11/11/2018", value1: 24, value2: 2 },  
  { date: "11/12/2018", value1: 50, value2: 15 },  
  { date: "11/13/2018", value1: 53, value2: 3 },  
  { date: "11/14/2018", value1: 59, value2: 15 },  
  { date: "11/15/2018", value1: 61, value2: 3 },  
  { date: "11/16/2018", value1: 62, value2: 19 }];
```



# The Choropleth



The domain of the map is the set of the physical boundaries and border of these countries in the real, physical world.

The range is the x and y representation of these boundaries with lines on your computer screen.



# The Color Scale of the Choropleth





# Why This Matters

**Scale selection is the foundation of data visualization**

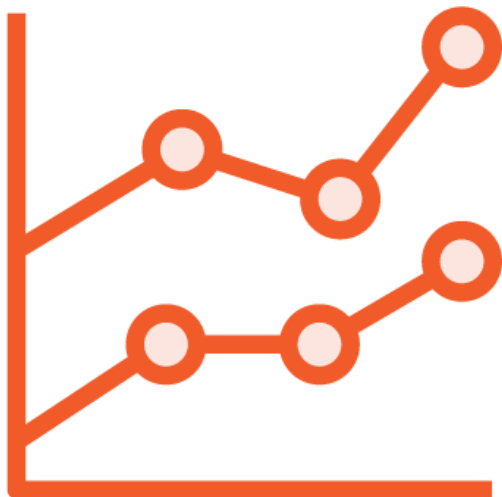
**Masterpieces invoke multiple and partial scales**

**You probably will never be called to create highly sophisticated scales**

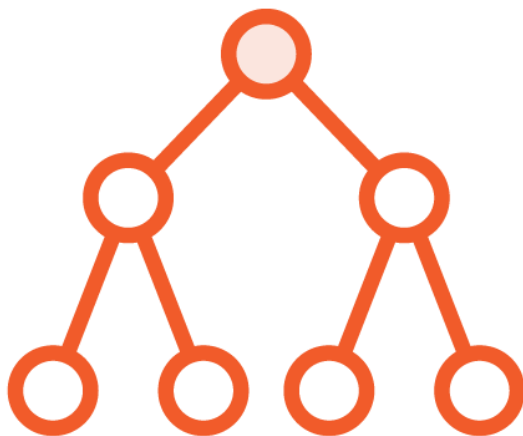
**But by understanding scales profoundly, you can be more effective at creating them**



# “Chart” vs. “Graph”



A line chart



A graph



Another chart

An ordered pair comprising  
a set of nodes together  
with a set of edges



Start with the data.

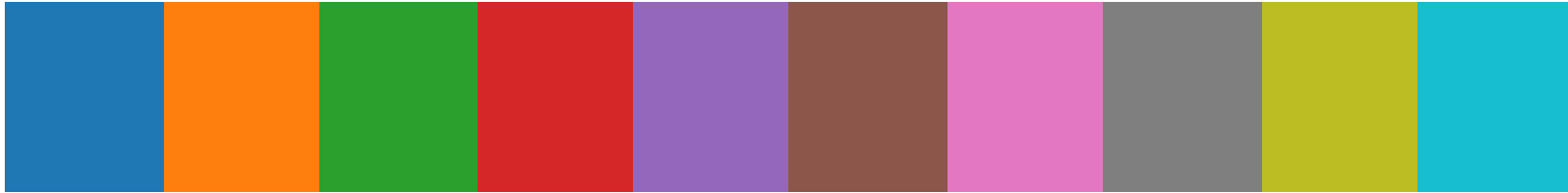


# Our Data

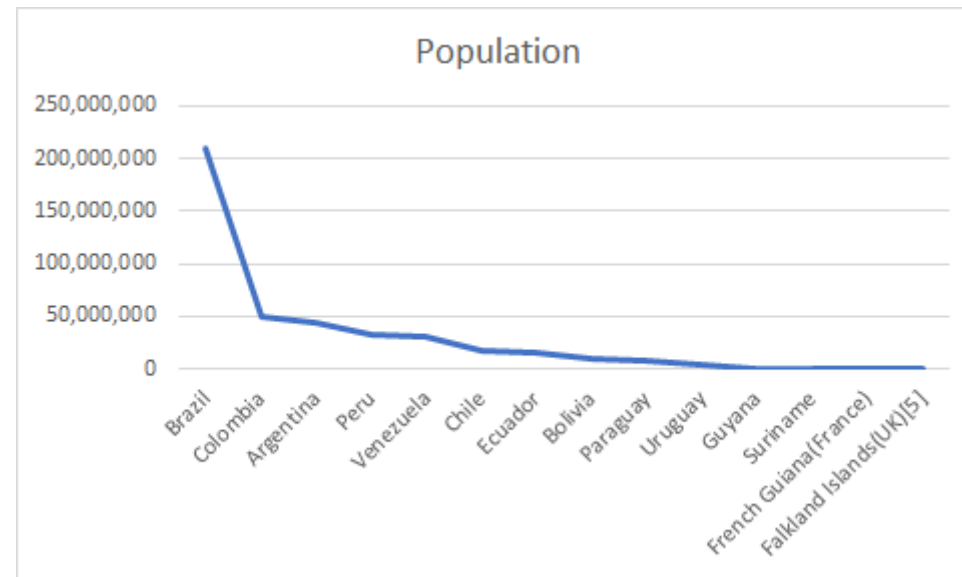
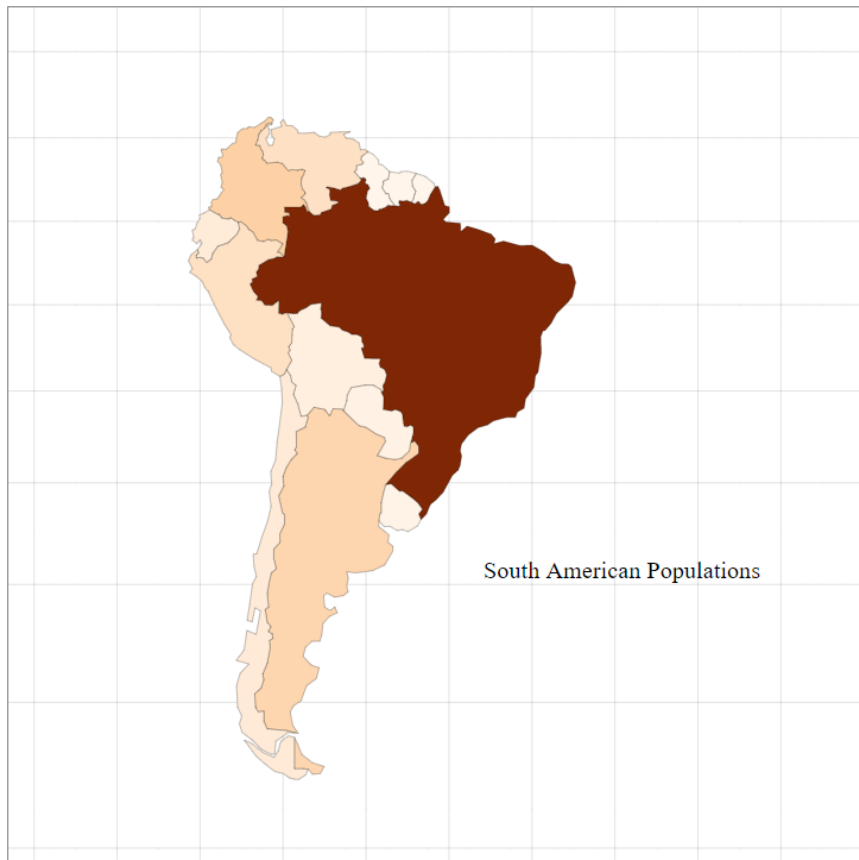
```
var data = [{ date: "10/25/2018", value1: 1, value2: 0 },
{ date: "10/26/2018", value1: 3, value2: 0 },
{ date: "10/27/2018", value1: 0, value2: 25 },
{ date: "10/28/2018", value1: 0, value2: 62 },
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{ date: "10/30/2018", value1: 8, value2: 37 },
{ date: "10/31/2018", value1: 7, value2: 12 },
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{ date: "11/13/2018", value1: 53, value2: 3 },
{ date: "11/14/2018", value1: 59, value2: 15 },
{ date: "11/15/2018", value1: 61, value2: 3 },
{ date: "11/16/2018", value1: 62, value2: 19 }];
```



# D3-Scale-Chromatic

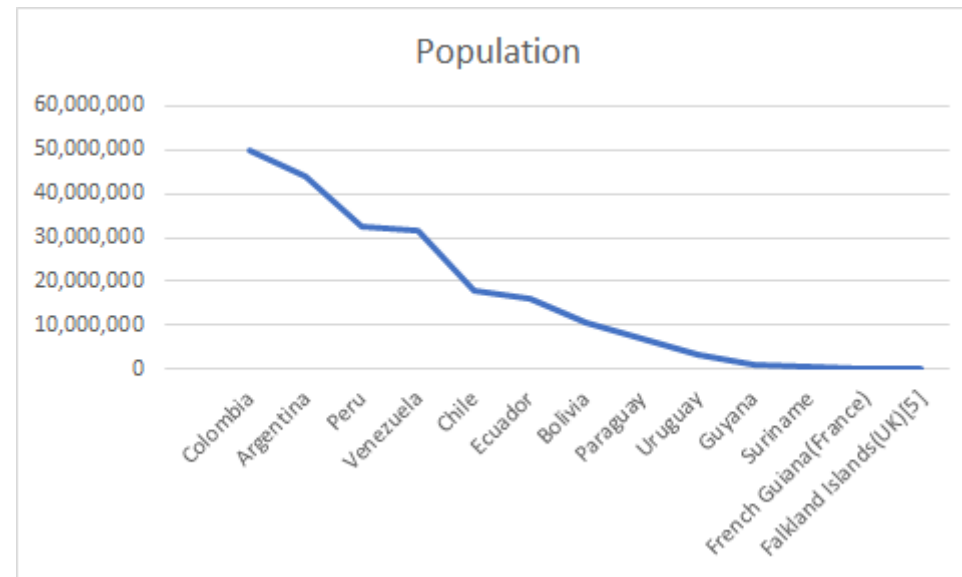
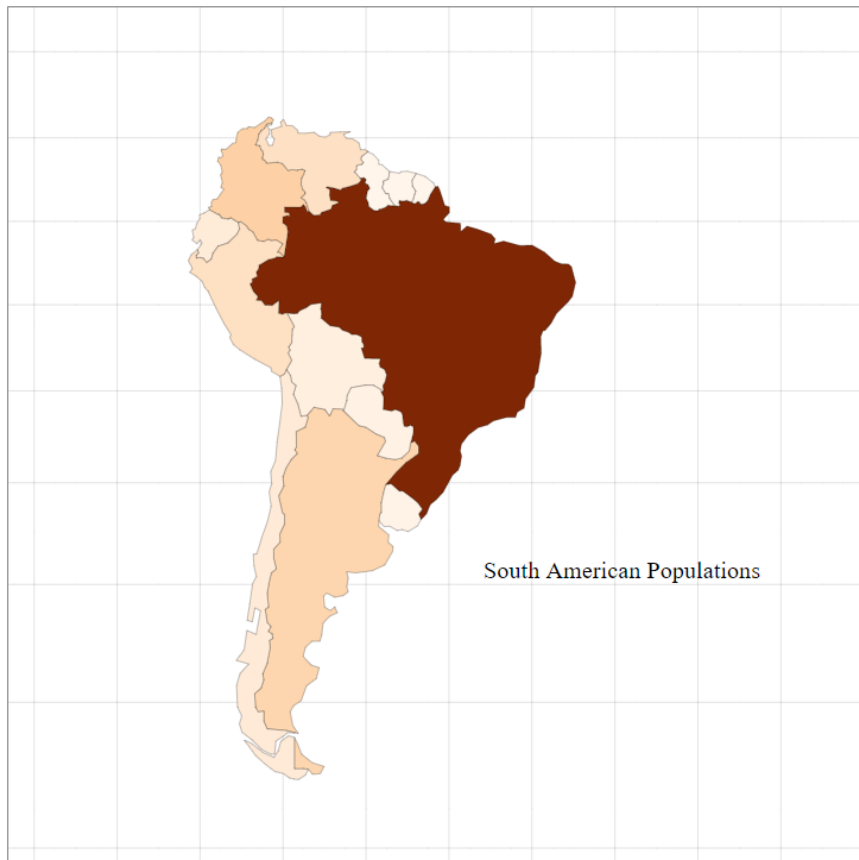


# Another Look at the Choropleth Color Scale

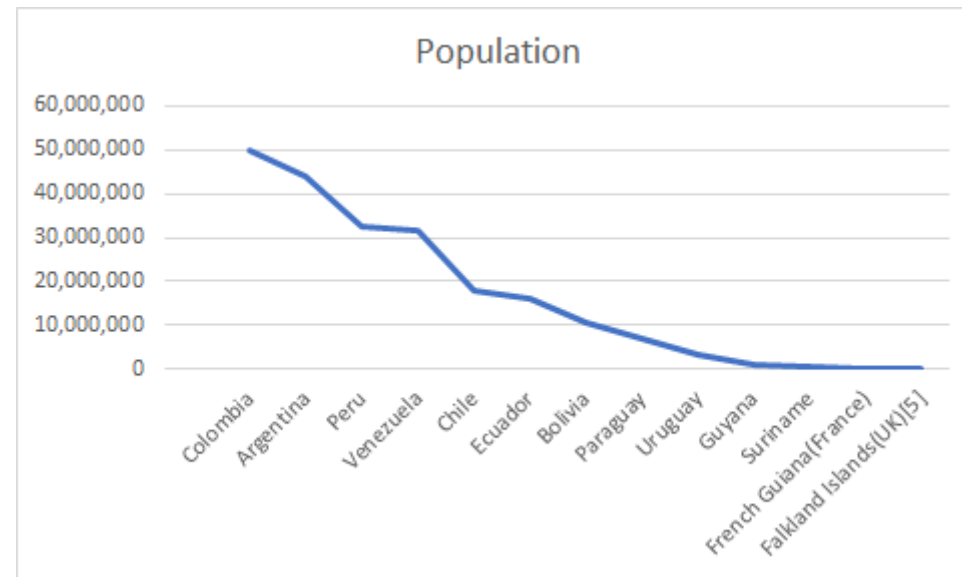




# Another Look at the Choropleth Color Scale



# Another Look at the Choropleth Color Scale



# Alternate Scales

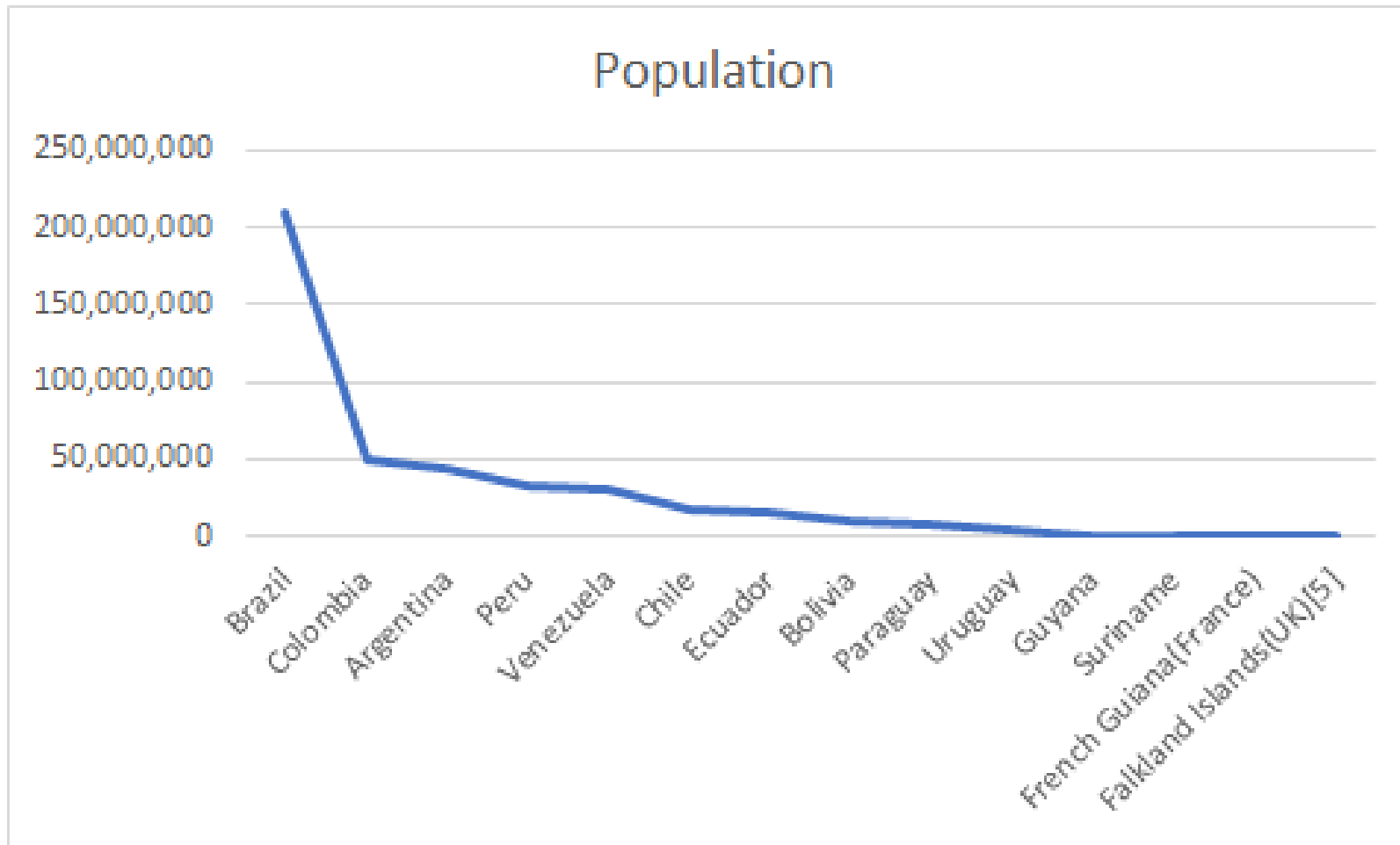
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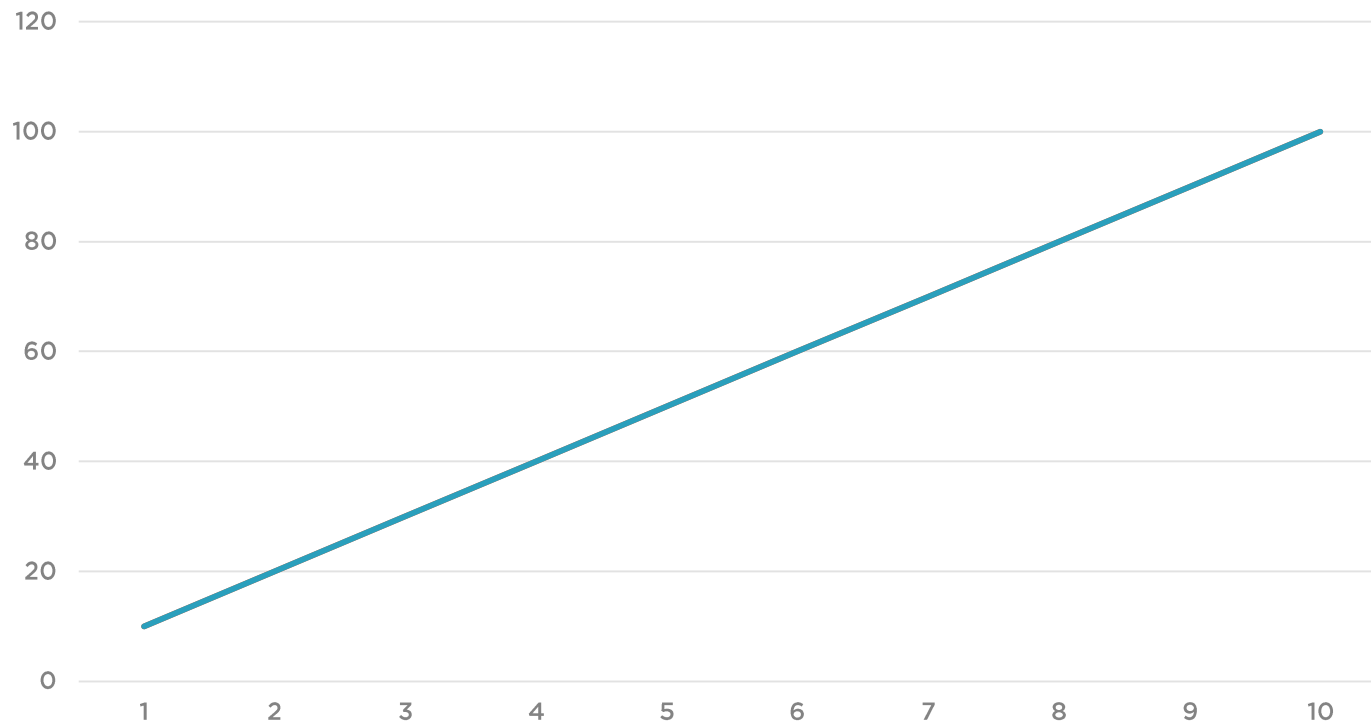
Keep the perceptual limits  
of your user in mind as  
you design your  
visualization



# Chart with an Outlier



# A Linear Scale



# The Log Function

$$\text{Log}_{10} 1000 = 3$$





# Summary



## The concept of scale in depth

- Domain - the input range of values
- Range - the output range of values
  - Sometimes this is color
  - Sometimes this is space
  - Sometimes it's other stuff
- Selecting scales is the foundation of your data visualizations

## Line chart

- SVG
  - With paths
  - Using the SVG path language {We used D3's advanced}
- Color schemes
  - To generate colors for multiple lines
- Alternatives to Linear scales
  - Log
  - Pow
  - How to avoid lying with scale distortion

