La Guardia Community College

# DATA 203
# DATA VISUALIZATION USING TABLEAU

## Class 8

# LEARNING OBJECTIVES

**BEST PRACTICES FOR VISUALIZATION**

1. Types of Visualizations
2. Design Principles
3. Colors that Matter
4. Visual Perception

# COLORS THAT MATTER

1. The goal when designing visualization is the quick dissemination of key insights using color.
2. Colors **can help** your audience understand the meaning and impact of information presented.
3. Color **can distract** your audience from the story your visualization is trying to tell.
4. We want our visuals to look beautiful, but the primary objective is not too ‘look pretty”

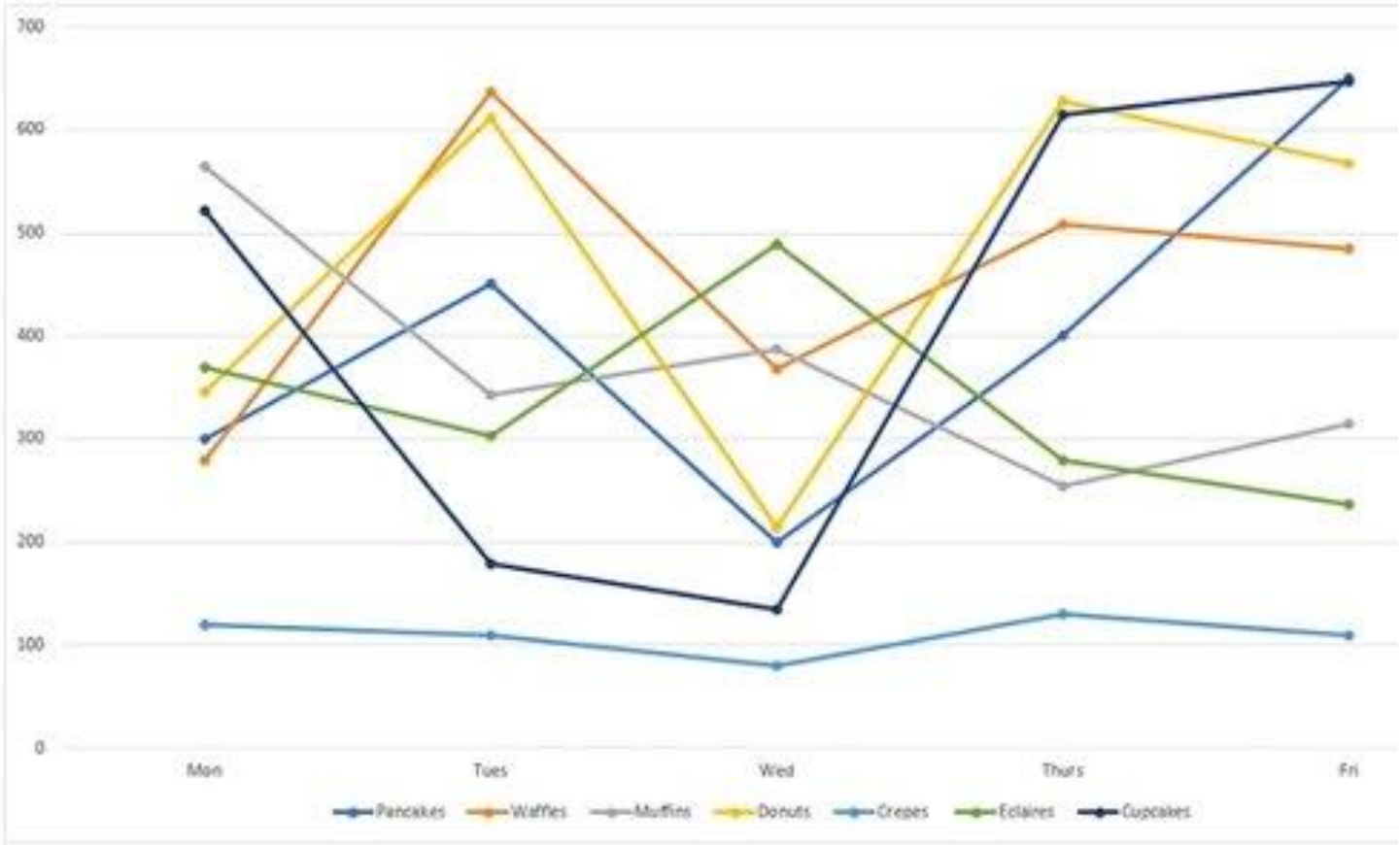
# COLORS THAT MATTER - QUALITATIVE PALATTE

- Qualitative Palette is used when the variable is **Categorical.**
- Categorical variables take on distinct labels without an inherent ordering.
- Examples: country, state, gender, ice cream flavors etc.
- Each possible value of the variable is assigned one distinct color from a qualitative palette.
- Rule of Thumb – limit palette size to about 7 or less colors and never going above 10 colors.
  - Group smaller categories into an Other Section

# COLORS THAT MATTER

# QUALITATIVE PALATTE

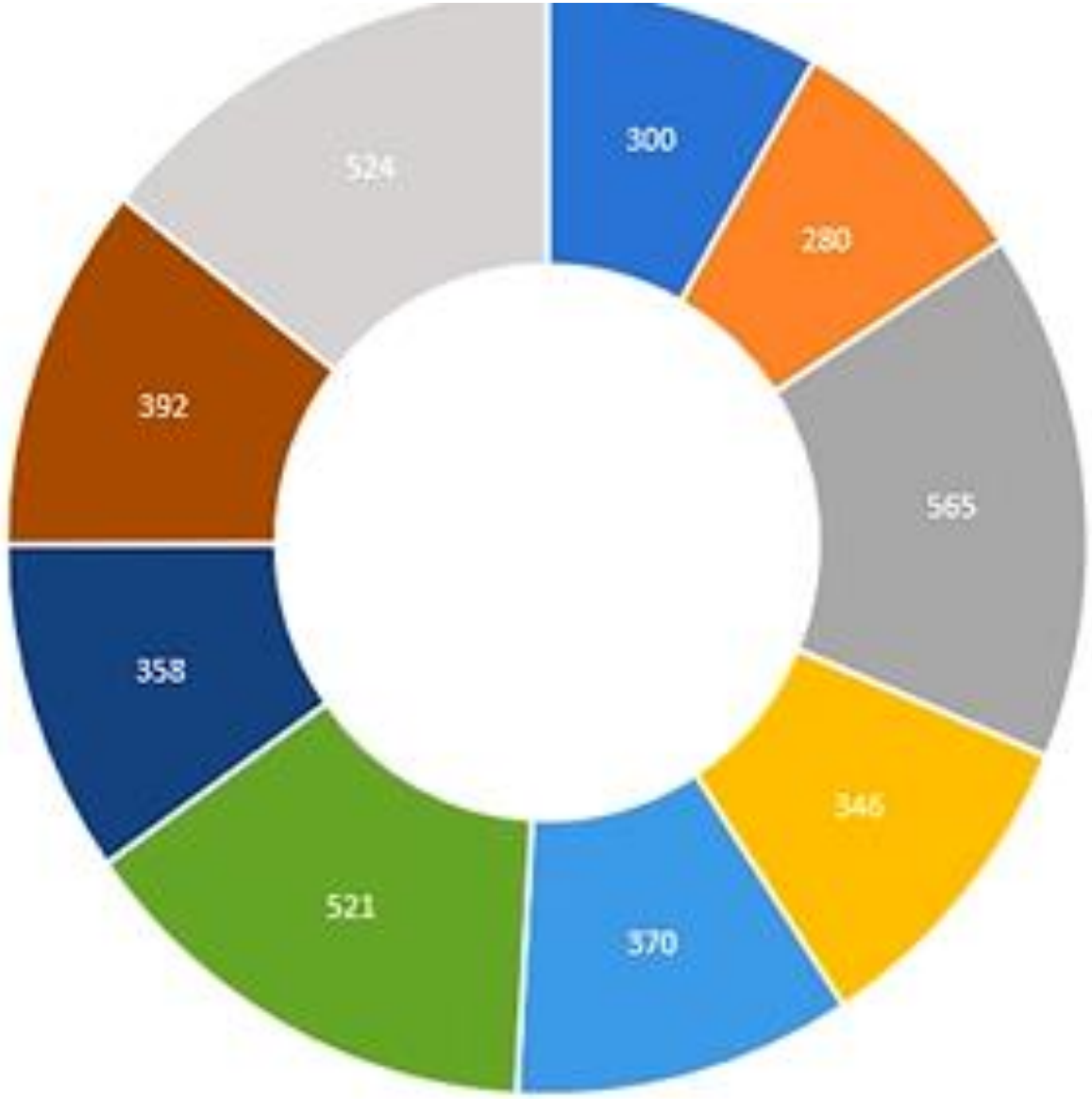
Example of sales of baked goods over a week



# COLORS THAT MATTER

# QUALITATIVE PALATTE

- Bringing distinctiveness based on
  - Distinct colors
  - Lightness and saturation within the same color
- Too much of a difference in color might suggest that some colors are more important than other colors

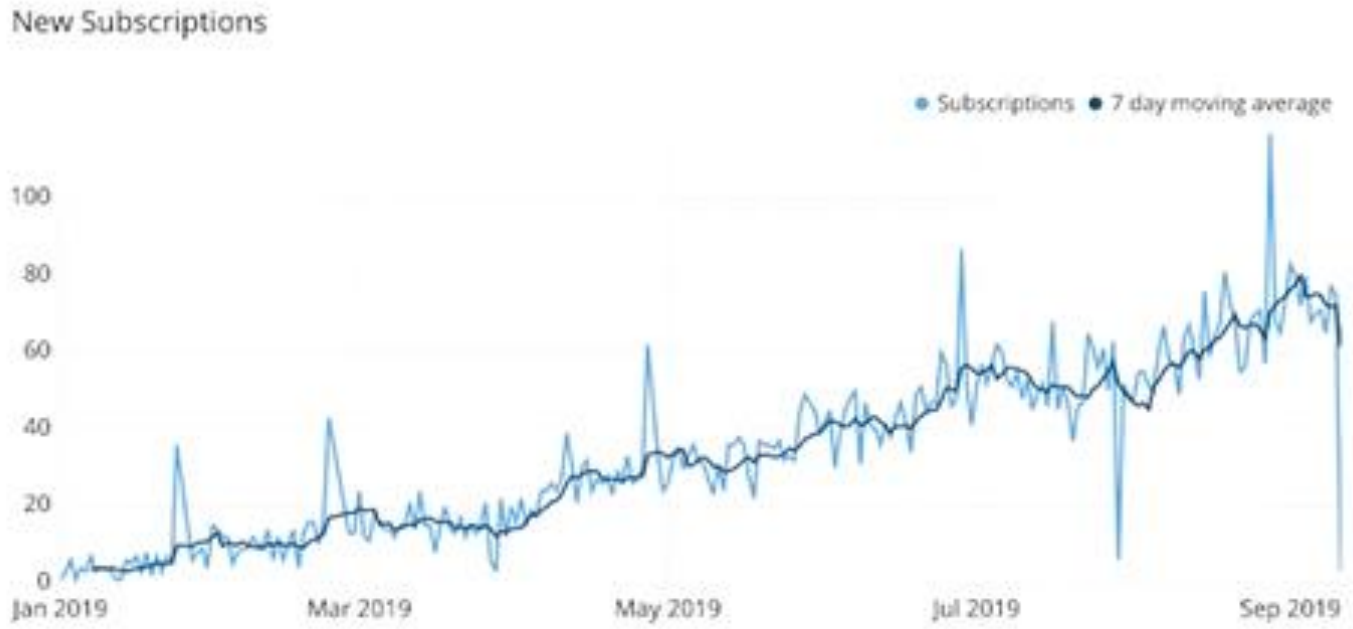


# COLORS THAT MATTER

# QUALITATIVE PALATTE

- Having the same the color with different saturation indicate the values associated with those colors are related.

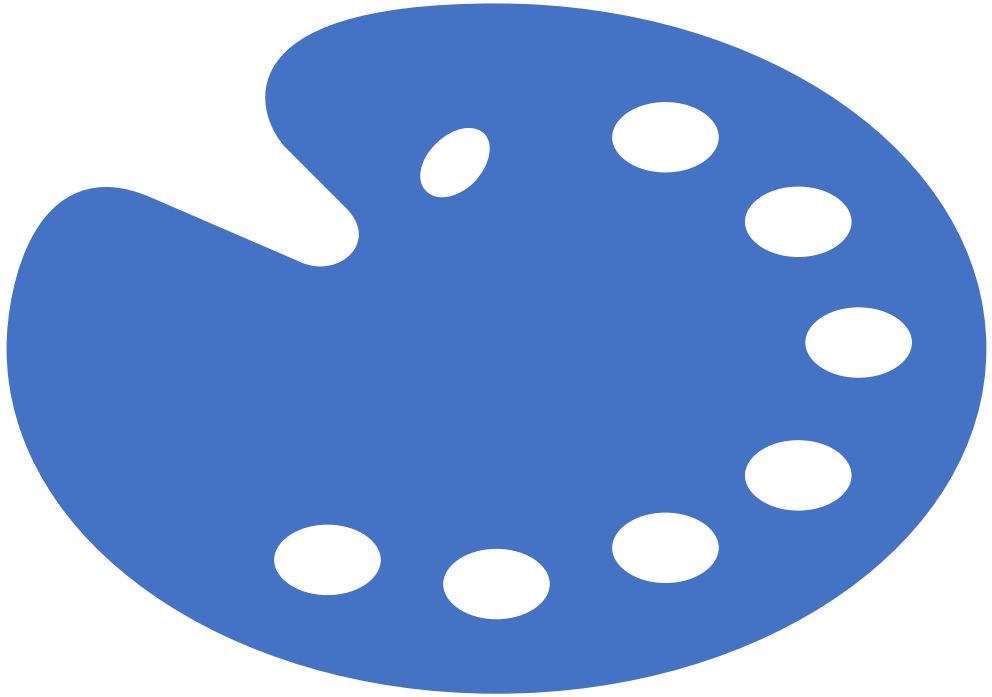
- In the line graph below you see daily readings in a light color line and the weekly rolling average in a darker shade.

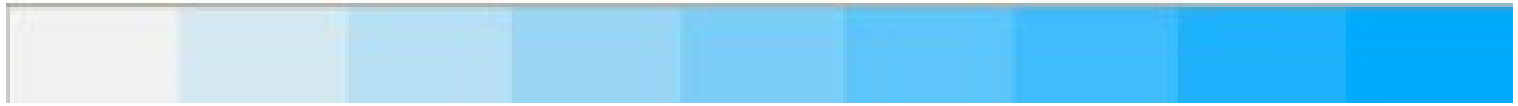


## COLORS THAT MATTER

## SEQUENTIAL PALATTE

1. Sequential Palette is used when the variable is **Numeric or is inherently ordered**
2. Colors are assigned to data values in a continuum, usually based on hue, lightness, or both.

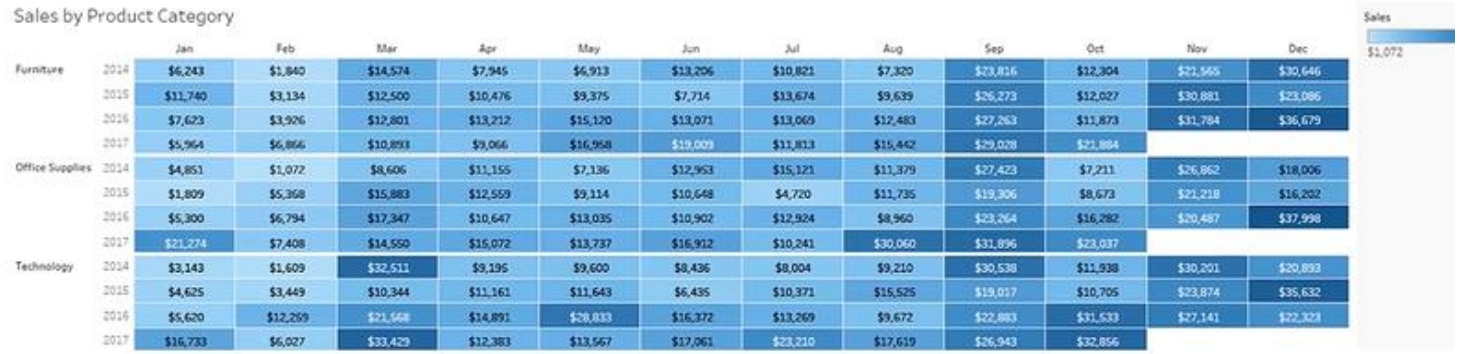




# COLORS THAT MATTER

# SEQUENTIAL PALATTE

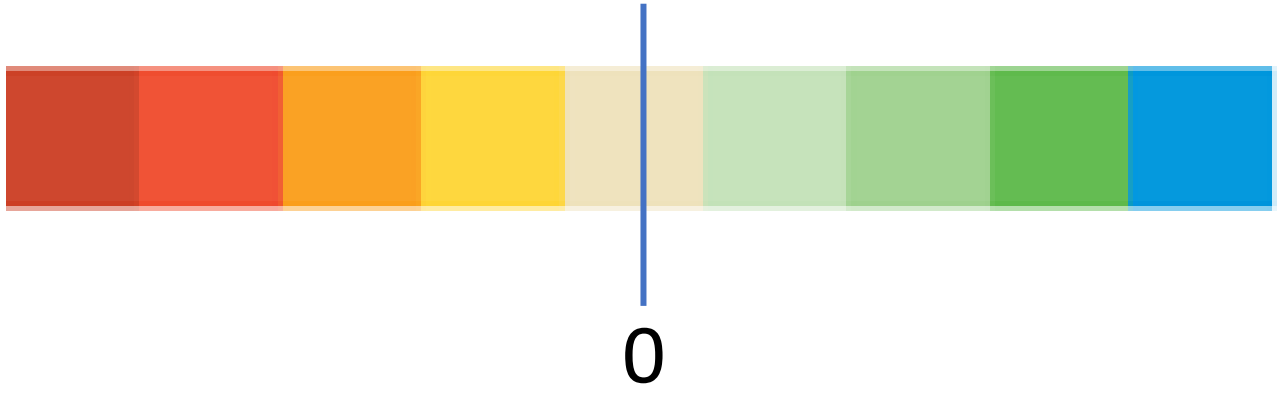
- Product sales where a change in the lightness of the same color highlights lowest to highest sale.
- Lighter Blue – lower the sales
- Darker Blue - higher the sales



# COLORS THAT MATTER

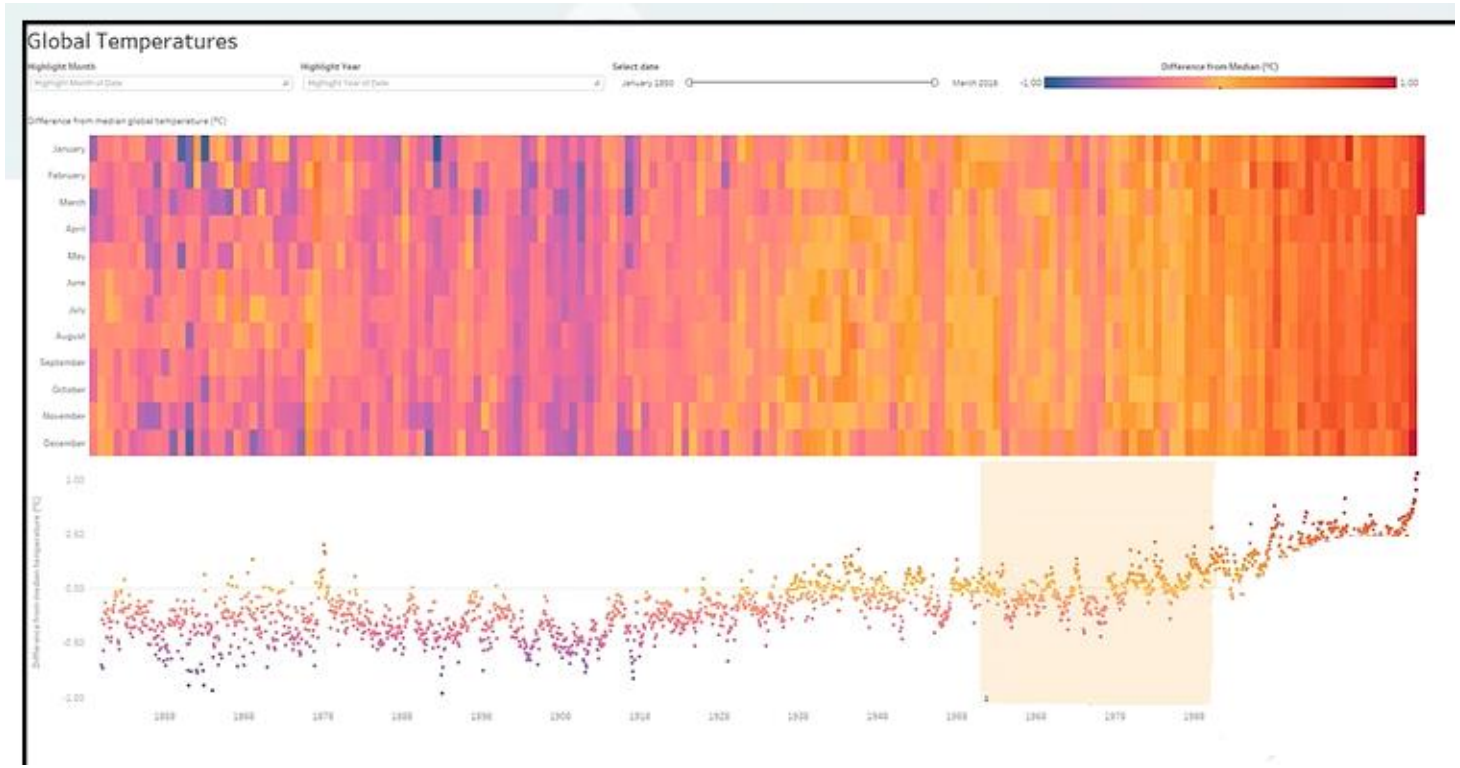
# DIVERGING PALATTE

1. Combination of two sequential palette with a shared end point.
2. The shared end point is a **meaningful central value** usually 0
3. Larger values are to the right of zero
4. Smaller values are to left of zero.
5. Central value will always be lighter, and the darker color indicates distance from the central value.



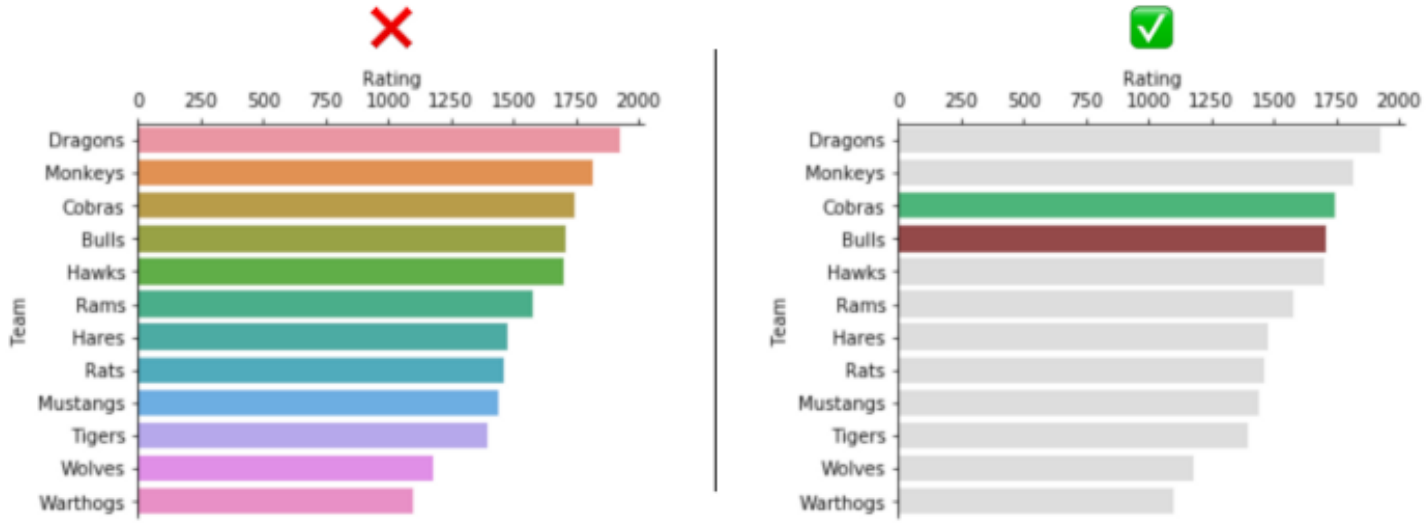
# COLOR MATTER – DIVERGING PALETTE

- Deviation across different months and years from the median global temperature.
- The central value is depicted in orange yellow Cooler values are assigned a blue and warmer values are assigned a red



# COLORS THAT MATTER
# TIPS ON USING COLOR

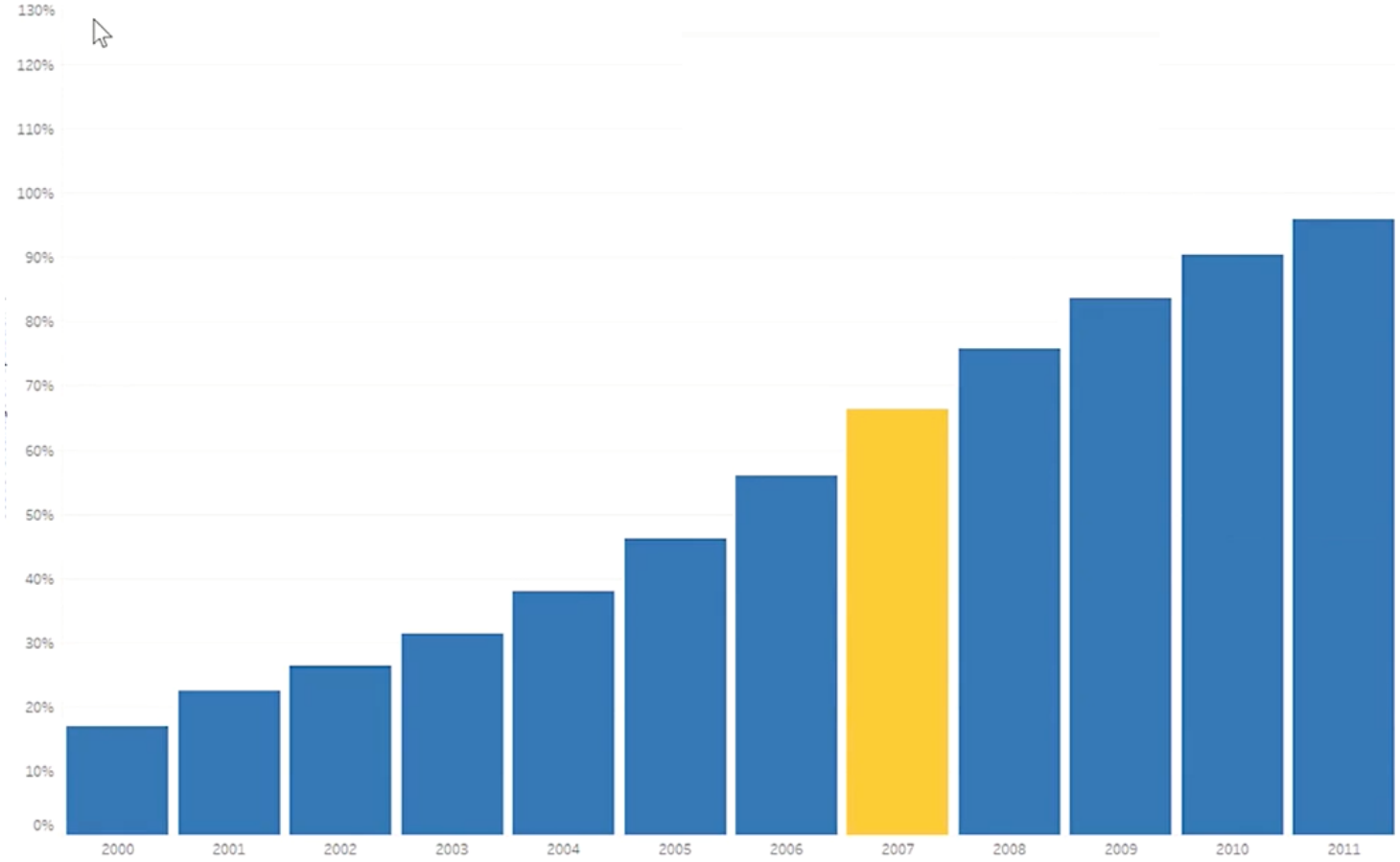
- Use color strategically
- Use restraint. Not every graph will require multiple color



# COLORS THAT MATTER

# TIPS ON USING COLOR

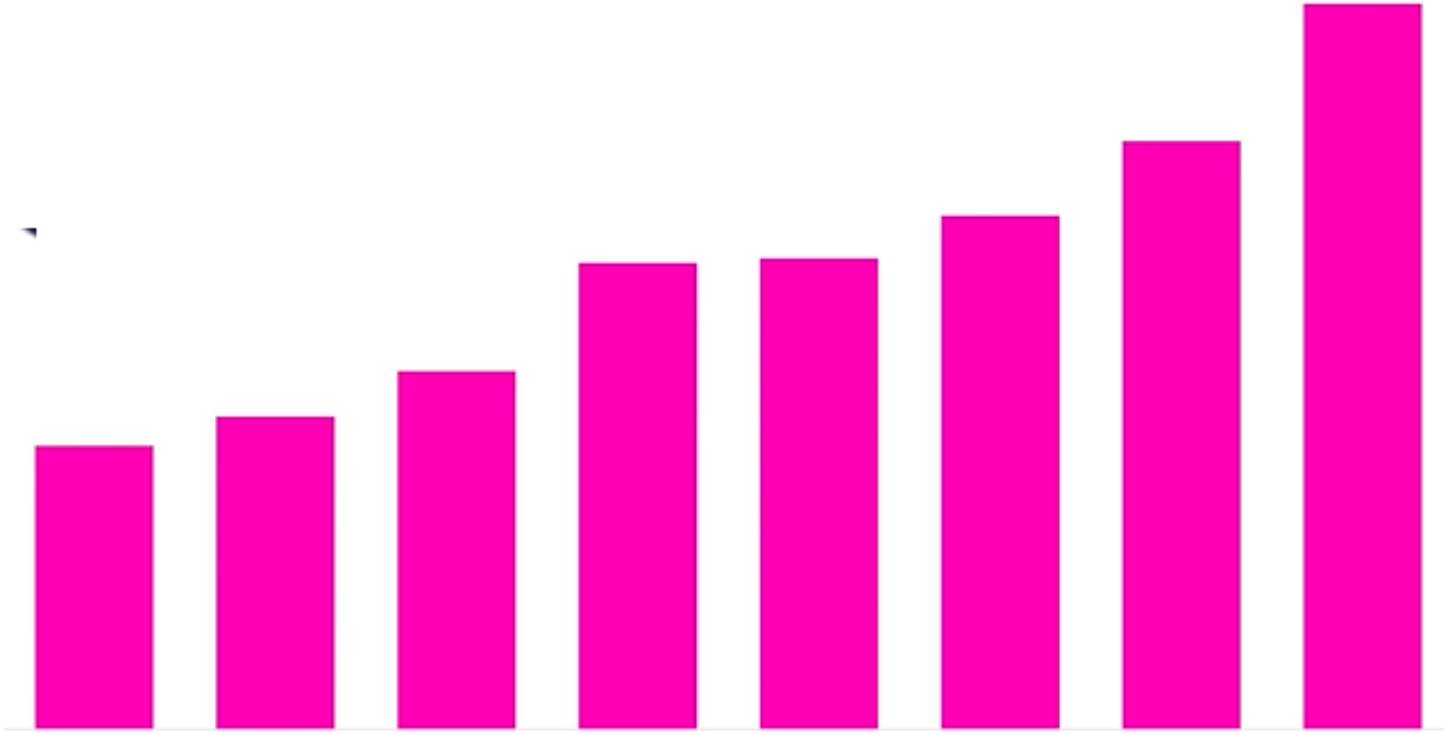
- Avoid unnecessary color usage.
- Highlight a difference
- Use a bright or saturated color for highlighting



## COLORS THAT MATTER

## TIPS ON USING COLOR

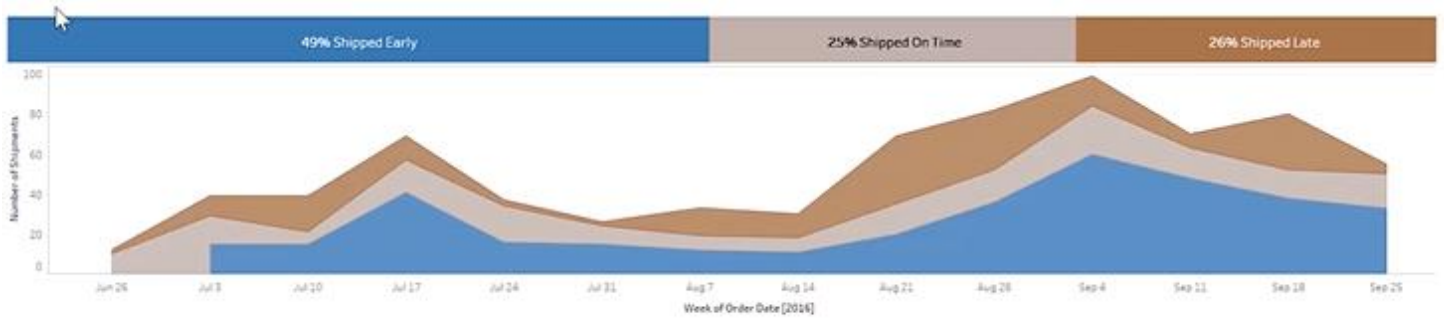
**AVOID** – high color saturation and bright colors



# COLORS THAT MATTER

# TIPS ON USING COLOR

- Be consistent with colors for the same element between charts.
- When colors change for the same element between charts, your audience will find it hard to understand that a relationship exists between them.




# COLORS THAT MATTER
# TIPS ON USING COLOR

- Leverage meaningfulness of colors.
- Leverage how color are perceived.
- If the categories that you are plotting have inherent color conventions, using appropriate color makes it easier for your audience.
  - Sports Teams, political parties
- Do not use you color for Design and Performance.
- Confirm and verify what your audience's preferences are when it comes to colors.

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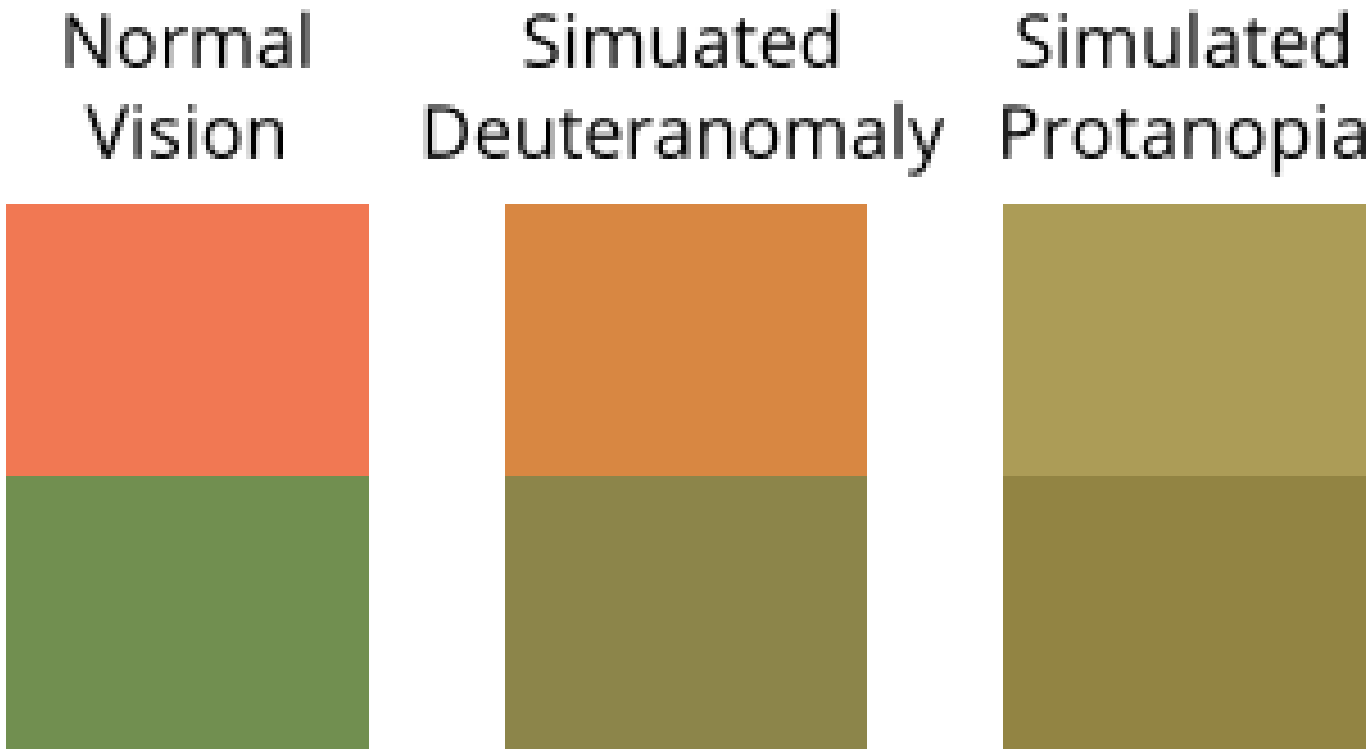
# COLORS THAT MATTER

# COLOR ACCESSIBILITY

- According to WHO, an estimated 253M people live with some form of vision impairment.
- **Color Blindness**
  - 1 in 12 men and 1 in 200 women are color blind
  - There are different levels and types of color blindness

.



# COLORS THAT MATTER

# COLOR ACCESSIBILITY

**Color Palette**

- Color Palette Generator

**Color Blindness Simulator**

- Coblis: https://www.color-blindness.com/coblis-color-blindness-simulator/

**Color Pallets for Color Blindness**

- ColorBrewer: https://colorbrewer2.org
- Viz Palette: https://projects.susielu.com/viz-palette
- Cartocolors: https://carto.com/carto-colors

# COLORS THAT MATTER

# CUSTOM PALETTES

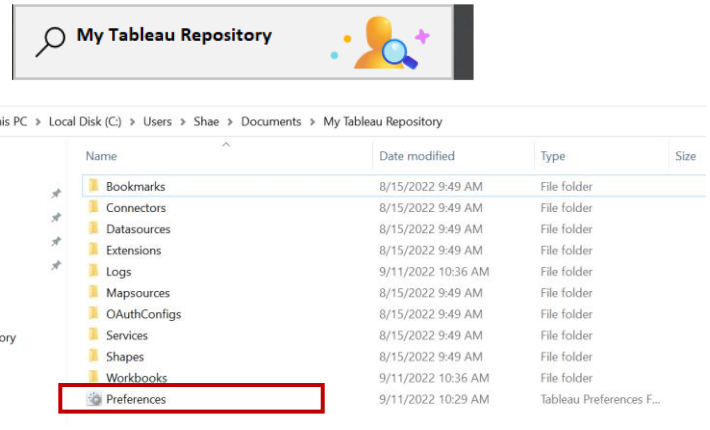
- Create and use your own custom palettes in Tableau
- Modify the **Preference.tps** file that comes with Tableau desktop to add new custom palettes.
- You can add as many custom palettes as you like to your Preference.tps file
- The limit of colors in each palette is 20.
- If you need more than 20 colors, then add a new custom palette.
- Use the standard HTML format for the new colors
- Use the hexadecimal value #RRGGBB or Red Green Blue format to add the color

# COLORS THAT MATTER

# CUSTOM PALETTES

**Preference.tps**

- File is located in your **“My Tableau Repository”**
- It’s a basic XML file that you can open in a text editor
- In your computer search bar type “My Tableau Repository”

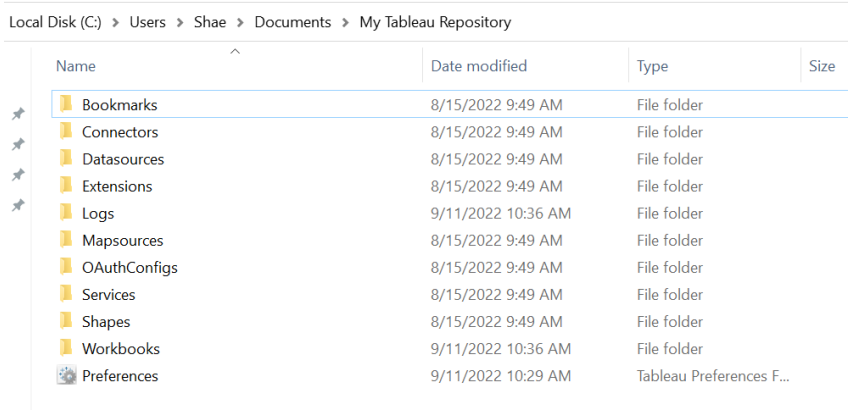


# COLORS THAT MATTER

# CUSTOM PALETTES

**Preference.tps**

- File is located in your **“My Tableau Repository”**
- It’s a basic XML file that you can open in a text editor
- In your computer search bar type “My Tableau Repository”
- Open Preference.tps with a text Editor  i.e. Note Pad

# COLORS THAT MATTER

# CUSTOM PALETTES

**Modify Preference.tps**

- Between the opening and closing workbook tags, you are going to add opening and closing preference tags.
- From

```
<? xml version='1.0’?>
<workbook>
</workbook>
```

To

```
<? xml version='1.0’?>
<workbook>
      <preferences>
      </preferences>
</workbook>
```

# COLORS THAT MATTER

# CUSTOM PALETTES

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      </preferences>
      <preferences>
      </preferences>
      <preferences>
      </preferences>
</workbook>
```

# COLORS THAT MATTER

# CUSTOM PALETTES

**Categorical Color Palette**

- Contains several distinct colors that can be assigned to discrete dimension members.
- In the **Preferences.tps** file, between the "**preferences**" tags (set 1), paste the following.

Use **straight quotation marks <u>not</u> curly quotation marks**, to delimit the palette's name and type.

```
<color-palette name="My Categorical Palette"
type="regular">
    <color> #eb912b </color>
    <color> #7099a5 </color>
    <color> #c71f34 </color>
    <color> #1d437d </color>
    <color> #e8762b </color>
    <color> #5b6591 </color>
    <color> #59879b </color>
</color-palette>
```

- Save Preferences.tps

# COLORS THAT MATTER

# CUSTOM PALETTES

**Sequential Color Palette**

- Shows a single color, varying in intensity and used for continuous fields, typically for measures
- You must specify at least two variants of the color in the sequential color range
- In the **Preferences.tps** file, between the "**preferences**" tags (set 2), paste the following.

Use **straight quotation marks <u>not</u> curly quotation marks**, to delimit the palette's name and type.

```
<color-palette name="My Sequential Palette"
type="ordered-sequential">
    <color> #eb912b </color>
    <color> #eb9c42 </color>
    <color> #ebad67 </color>
    <color> #eabb86 </color>
    <color> #eacba8 </color>
    <color> #ebd8c2 </color>

    </color-palette>
```

- Save Preferences.tps

# COLORS THAT MATTER

# CUSTOM PALETTES

**Diverging Color Palette**

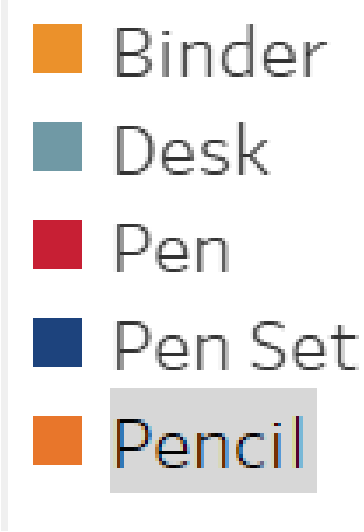
- Shows two ranges of values using color intensity to show the magnitude of the number and the actual color to show which range the number is from.
- Used to show the difference between positive and negative numbers
- In the **Preferences.tps** file, between the "**preferences**" tags (set3), paste the following.

Use **straight quotation marks <u>not</u> curly quotation marks**, to delimit the palette's name and type.

```
<color-palette name="My Diverging Palette"
type="ordered-diverging">
<color> #eb912b </color>
<color> #59879b </color>
</color-palette>
```

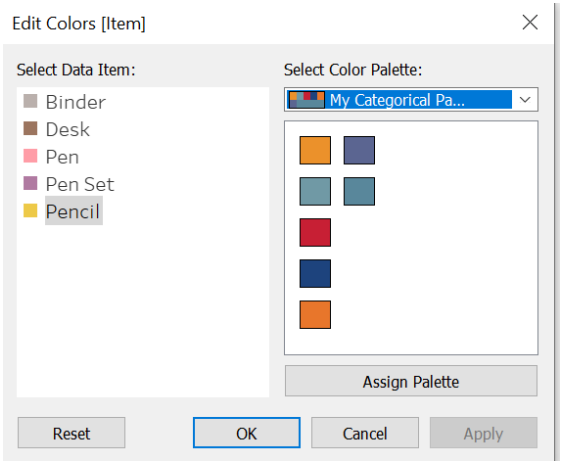
- Save Preferences.tps
- **RESTART YOUR COMPUTERS**

# COLORS THAT MATTER
# CUSTOM PALETTES




**Categorical Color Palette**

1. Open up Office Supply workbook on Tableau
2. Open up a new worksheet and name it Categorical Palette
3. Column Shelf – Add order date (at Quarter level)
4. Row Shelf – Add Region
5. Marks Color Card - Add Item
6. Select Gantt View of the chart
7. Edit Color and Select My Categorical Palette
8. Click Assign to see the results.
9. Click OK

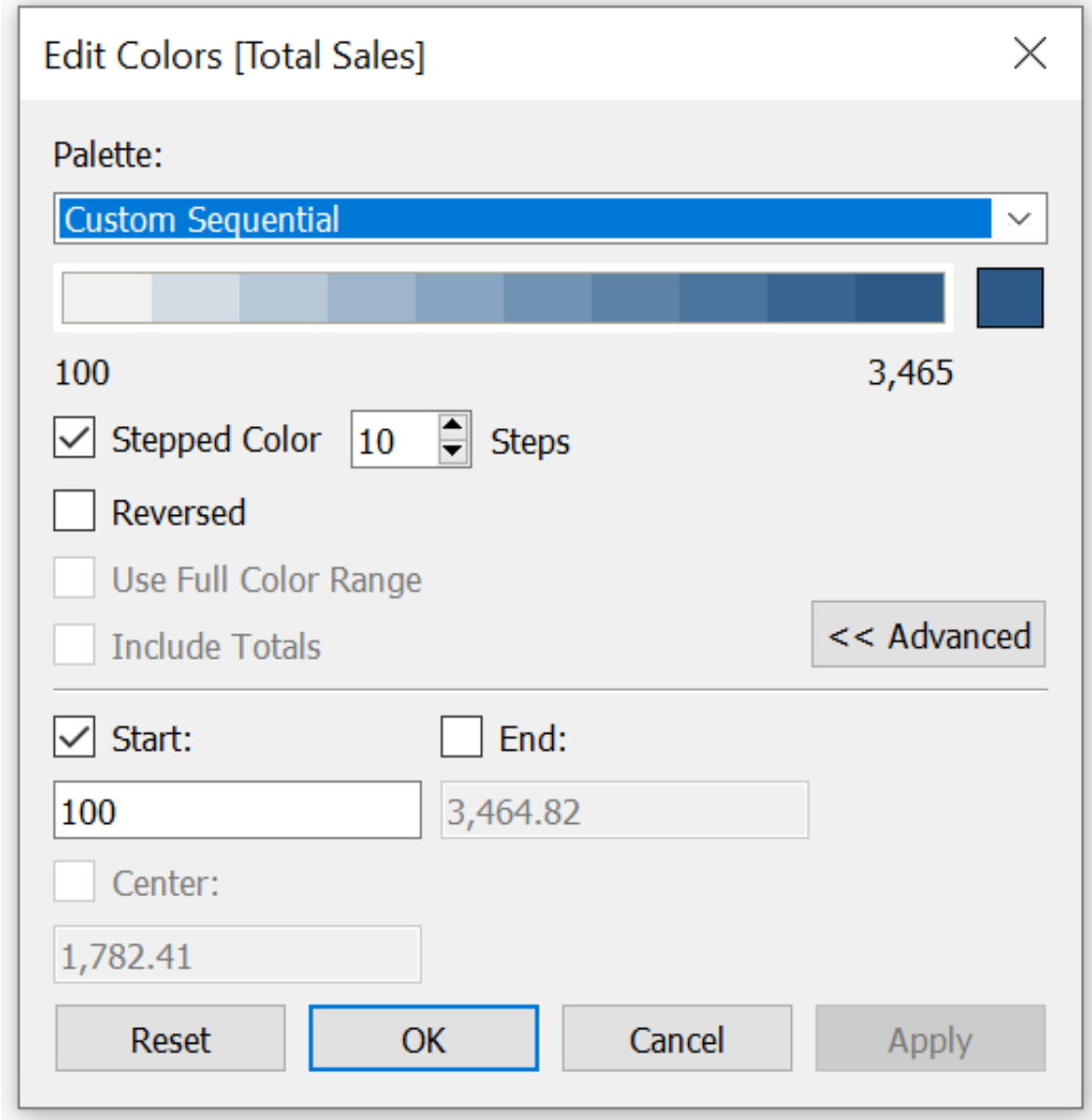


# COLORS THAT MATTER

# CUSTOM PALETTES

**Sequential Color Palette**

1. Open up a new worksheet and name it Sequential Palette
2. Column Shelf – Add order date (at Quarter level)
3. Row Shelf – Add Item
4. Marks Color Card - Add Total Sales
5. Edit Color and Select Custom Sequential
    1. Color Gradation - check on Stepped Color
    2. Steps – Add number of step gradation you want.
6. Click Advanced
    1. Check Start and enter 100
7. Click Apply – to see the result
8. Click OK



# COLORS THAT MATTER

# CUSTOM PALETTES

**Diverging Color Palette**

1. Duplicate Sequential Palette worksheet and name it Diverging Color Palette
2. Column Shelf – Add order date (at Quarter level)
3. Row Shelf – Add Item
4. Marks Color Card - Add Total Sales
5. Edit Color and Select Custom Diverging
    1. Color Gradation - check on Stepped Color
    2. Steps – Add number of step gradation you want.
6. Click Advanced
    1. Check Start and enter 0
    2. Check Center and enter 1732.41
7. Click Apply – to see the result
8. Click OK