

COMPREHENSIVE RETAIL SALES ANALYSIS

Sergejs Kopils
Data Analytics and Artificial Intelligence
Data Mining
4303MDA

Riga 2025

Large Scale North American Retailer Analysis

Stakeholders

Store Managers and Regional Directors:

Individuals managing brand stores or regional operations who need to understand local trends, performance metrics, and areas for improvement.

- What is the **Geographic Distribution** of vendor-based sales in the U.S.?
- **Who are the Top Vendors**, and how do their sales figures compare?
- **What are the Top** orders by value, and which products are included in these orders?
- **Which products are the Top** performers in terms of sales revenue?
- **Who are the Top Customers** based on purchase volumes?
- + more...

Data Exploration and Preparation

- **Data Cleaning:** Initial examinations revealed inconsistencies and missing values that were subsequently standardized and corrected.
- **Handling Missing Values:** Techniques such as mean substitution and interpolation were employed to address missing data points, ensuring comprehensive data integrity.
- **Data Pre-processing:** This included normalization to standardize various data attributes and encoding categorical variables to facilitate analysis.
- **Data Compilation:** Investigating data compilation helped me grasp the sources and methods used, including transaction records and inventory logs.
- **Enhancements in Data Structure:** I introduced calculated fields to enhance data utility, such as metrics for average purchase values and customer loyalty.
- **Data Characteristics:** An extensive exploration of data distribution, trends, and outliers set the stage for deeper analysis.

```
1 # Filling missing values
2 data['ITEM_DESCRIPTION'].fillna('Description Not Available', inplace=True)
3
4 # Converting date fields from integer to datetime
5 data['INVOICE_DATE'] = pd.to_datetime(data['INVOICE_DATE'], format='%Y%m%d')
6 data['ORDER_DATE'] = pd.to_datetime(data['ORDER_DATE'], format='%Y%m%d')
```

Part of Python code for Data Exploration and Preparation

Challenges

Creating Harmony in **Graphic Style**

BLUE

RED



TRANSPORTA
UN SAKARU
INSTITŪTS



Adobe Color

Adobe Color

CREATEEXPLORETRENDSLABLIBRARIES

★🌙🌈?🗨️🔍📱🔄

Color WheelExtract ThemeExtract GradientAccessibility Tools

🖼️ Replace Image

Extract using Color Mood

☐ Colorful




☐ Bright


☒ Muted

☐ Deep

☐ Dark

☐ None





#F21D2F📄

#F2A2A9📄

#E9EEF2📄

#164F73📄

#7794A6📄

Save toStock Templa...+

Name

color theme_Screenshot 202...

Tags

Enter or Select from below

Blue +

Pink +

Red +

White +

Black +

☒ Publish Theme

Save

Adobe Color

Color Wheel Extract Theme **Extract Gradient** Accessibility Tools

Replace Image

Gradient Stops: 3

Reset



WE Bristol University of the West of England

TSI TRANSPORTATION SCIENCE INSTITUTE

UN SAKAGUCHI INSTITUTE

Color 1	Color 2	Color 3
#F5898D	#2D5B83	#CED8E2
RGB 245, 137, 141	RGB 45, 91, 131	RGB 206, 216, 226
HSB 358, 44, 96	HSB 208, 66, 51	HSB 210, 9, 89
CMYK 0, 44, 42, 4	CMYK 66, 31, 0, 49	CMYK 9, 4, 0, 11
LAB 69, 41, 16	LAB 37, -2, -27	LAB 86, -1, -6

Save to: Stock Template... +

Name: gradient_Screenshot 2025-01-...

☒ Publish Theme

Save

Color Tool for Tableau

The screenshot displays the 'Color Tool for Tableau' web application. The interface is divided into several sections:

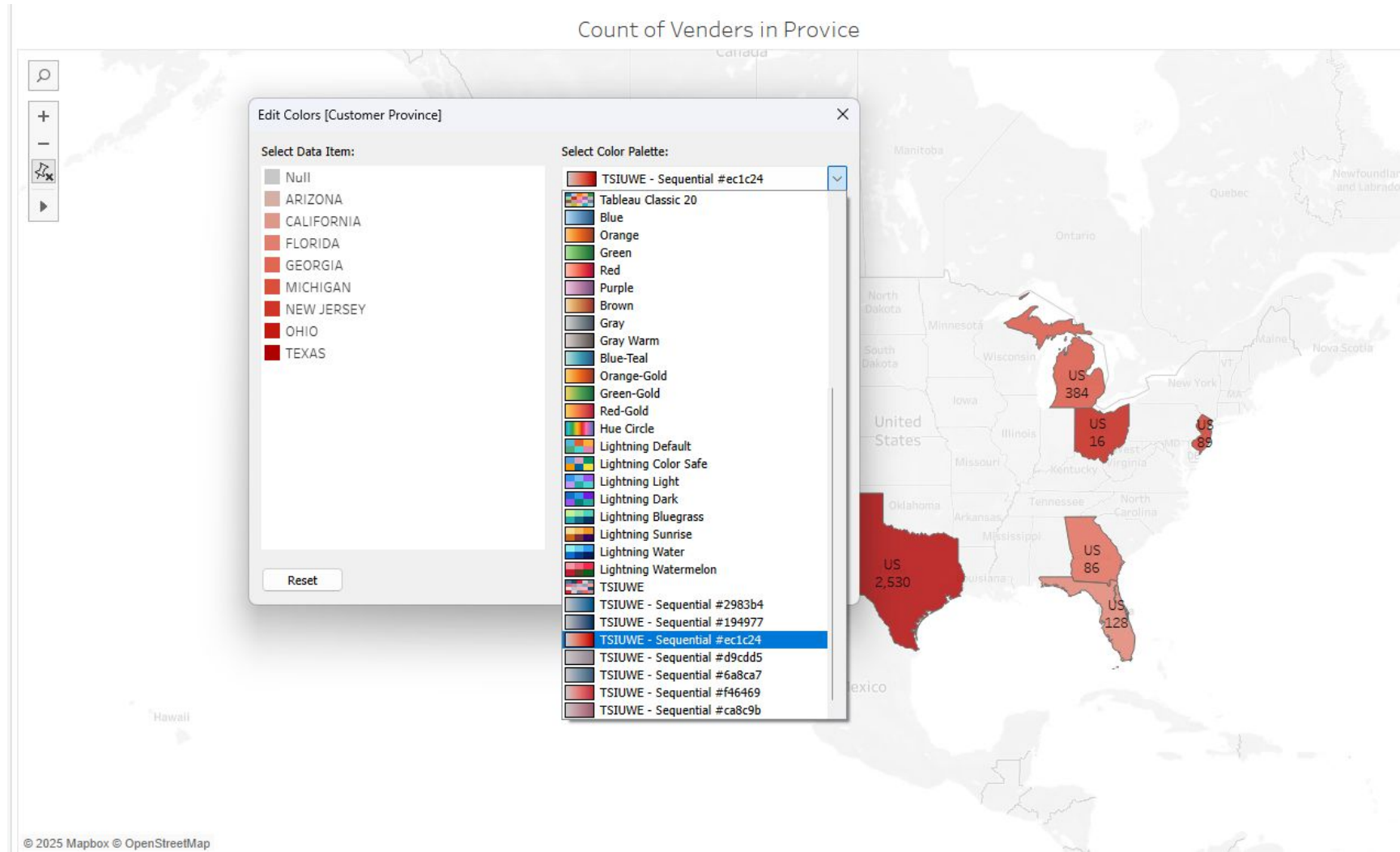
- Header:** Features the 'Color Tool for Tableau' logo, the name of the selected palette 'TSIUWE', and buttons for 'Download' and 'Copy to Clipboard'.
- Choose a Preset:** A sidebar on the left with options: Complementary, Split Complementary, Triad, Tetrad, and Analogous, each with a corresponding color swatch.
- Match an Image:** A section below the presets with a dashed box for an image and a progress bar. Below it, text says 'Drag and drop an image above to generate colors.'
- Color Selection:** A central area with four columns: 'Input', 'Regular', 'Sequential', and 'Diverging'. Each column shows a color swatch and a gradient. The 'Regular' column is currently selected.
- Tableau Preferences File Output:** A panel on the right showing the XML code for the selected palette. The code includes a color palette named 'TSIUWE' with 15 colors.

The XML output is as follows:

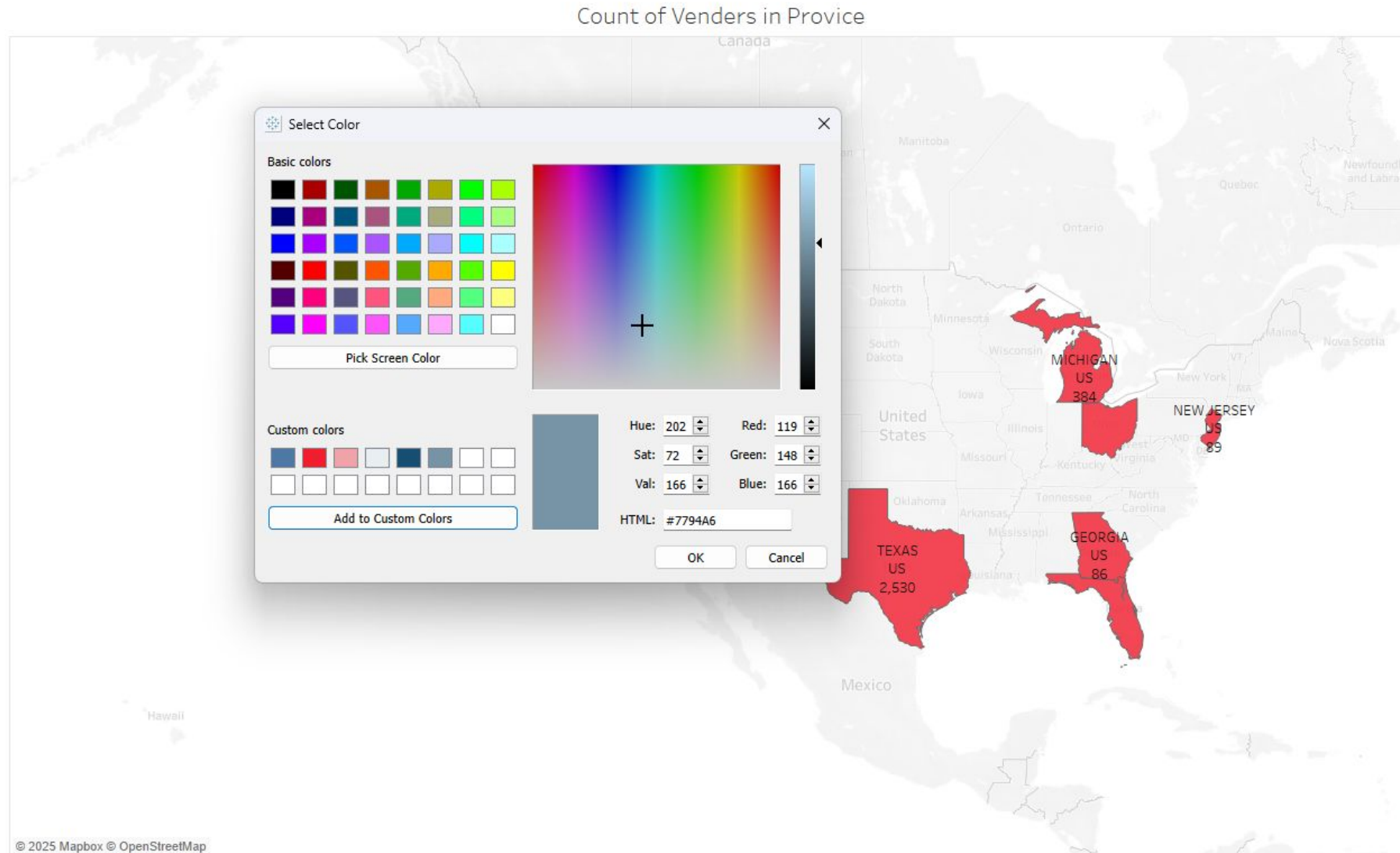
```
<?xml version='1.0'?>
<workbook>
  <preferences>
    <color-palette name="TSIUWE" type="regular">
      <color>#2983b4</color>
      <color>#194977</color>
      <color>#ec1c24</color>
      <color>#d9cdd5</color>
      <color>#6a8ca7</color>
      <color>#f46469</color>
      <color>#ca8c9b</color>
      <color>#a0bfd9</color>
      <color>#909fb9</color>
      <color>#ff9e8c</color>
      <color>#ece6ea</color>
      <color>#b4c4d2</color>
      <color>#ffb4b1</color>
      <color>#e6c5cc</color>
      <color>#194977</color>
      <color>#ec1c24</color>
      <color>#d9cdd5</color>
      <color>#6a8ca7</color>
      <color>#f46469</color>
      <color>#ca8c9b</color>
    </color-palette>
    <color-palette name="TSIUWE" type="sequential">
      <color>#2983b4</color>
      <color>#194977</color>
      <color>#ec1c24</color>
      <color>#d9cdd5</color>
      <color>#6a8ca7</color>
      <color>#f46469</color>
      <color>#ca8c9b</color>
    </color-palette>
  </preferences>
</workbook>
```

A yellow tooltip message is overlaid on the bottom right of the XML output, stating: 'Your color palette has downloaded. Place it in: C:\Users\<username>\Documents\My Tableau Repository\ Restart Tableau. (Click to dismiss.)'

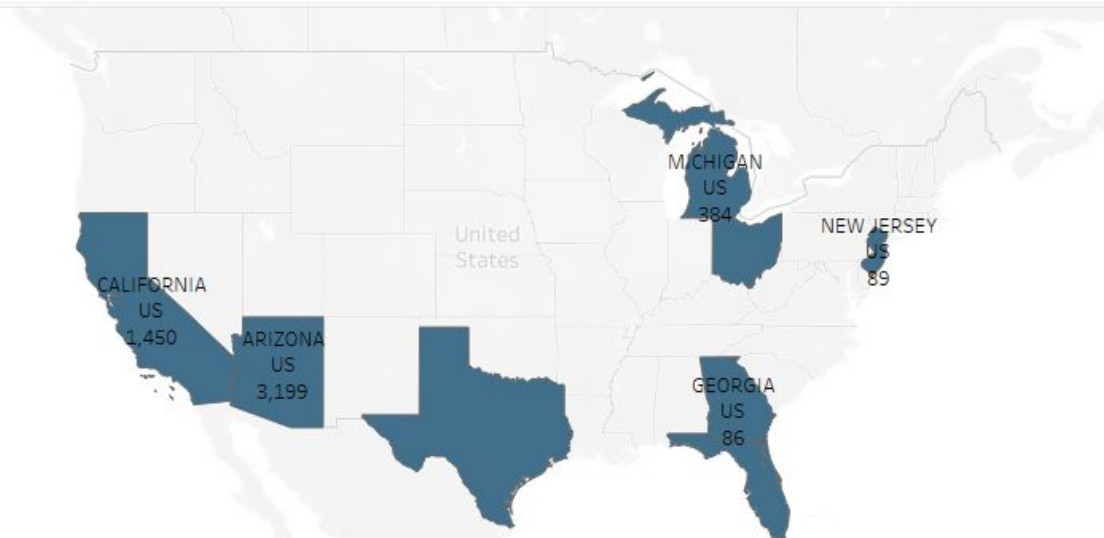
Custom Color Palette



Custom Color Palette



Count of Venders in Provice



© 2025 Mapbox © OpenStreetMap

Filters

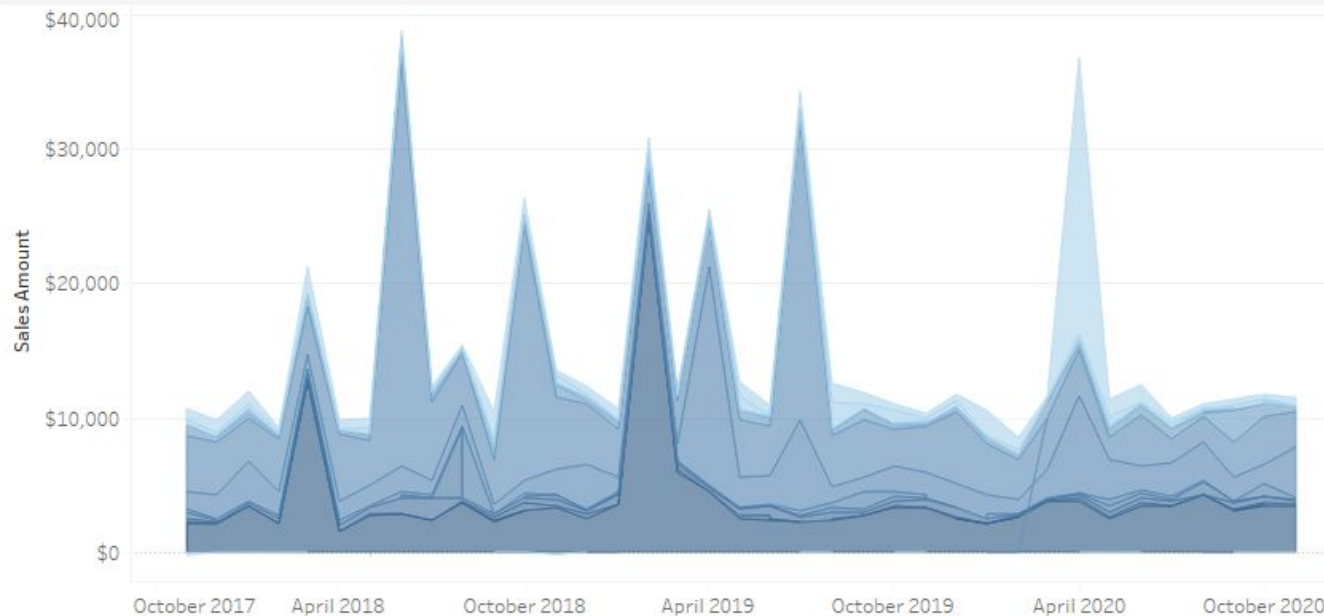
Vendor City

(All)

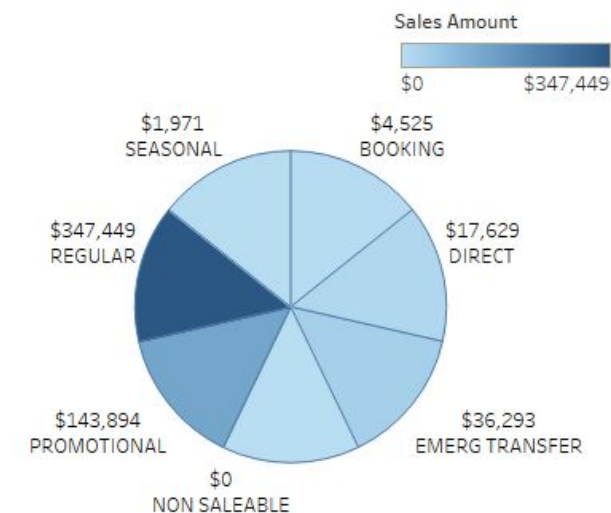
Vendor Country, Custom..

- ?, Null
- ?, ARIZONA
- ?, CALIFORNIA
- ?, FLORIDA
- ?, GEORGIA
- ?, MICHIGAN
- ?, NEW JERSEY
- ?, OHIO
- ?, TEXAS
- US, Null
- US, ARIZONA
- US, CALIFORNIA
- US, FLORIDA

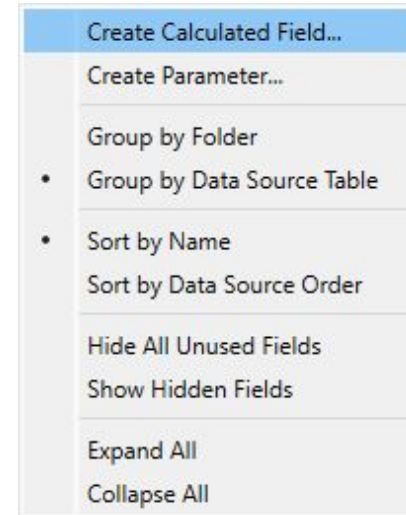
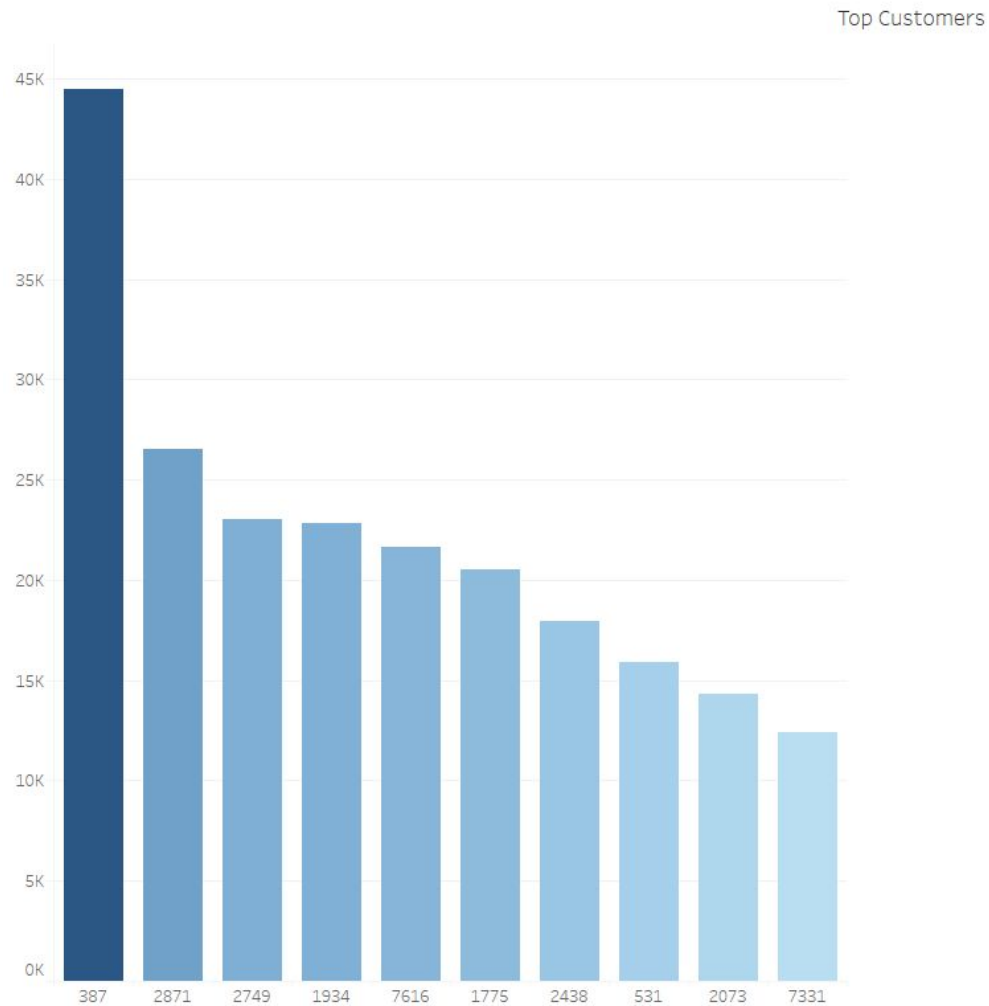
Sales by Month



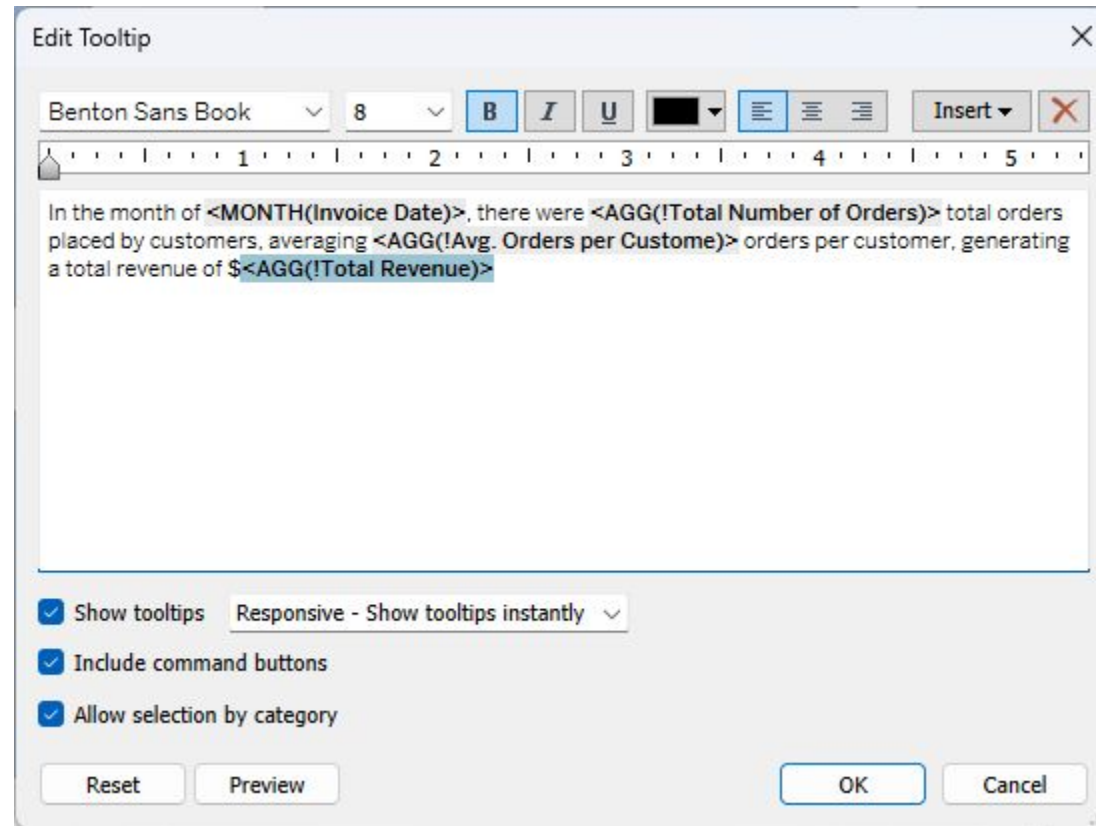
Sales by Order Type



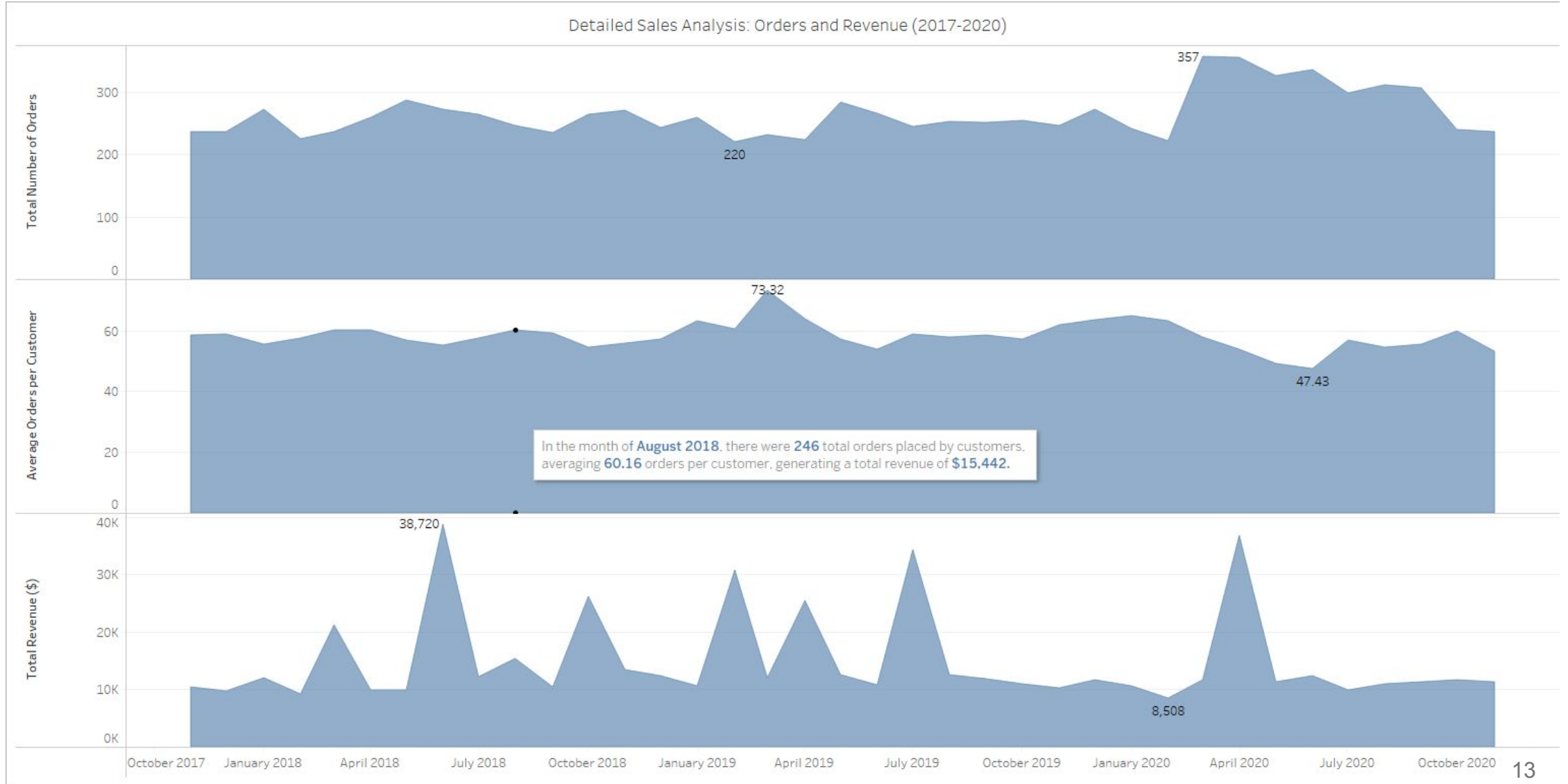
Create Custom Field



Clear and readable



Clear and readable



Dashboard settings

Format Dashboard

Dashboard Shading

Default:

Dashboard Title

Font:

Tableau Book, 18pt

Alignment:

Left

Shading:

Border:

Worksheet Titles

Font:

Tableau Book, 15pt

Shading:

Text Objects

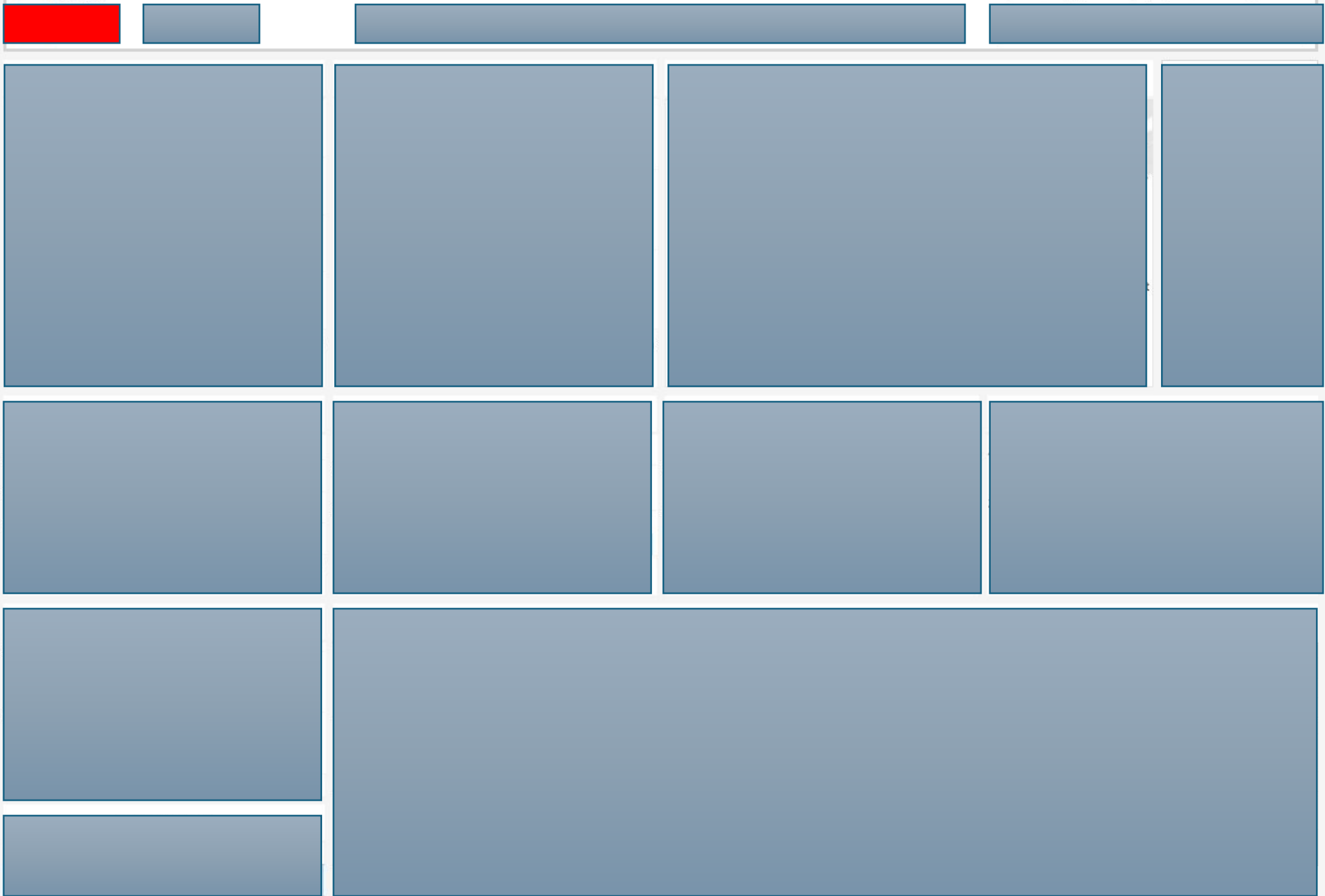
Font:

Tableau Book, 9pt

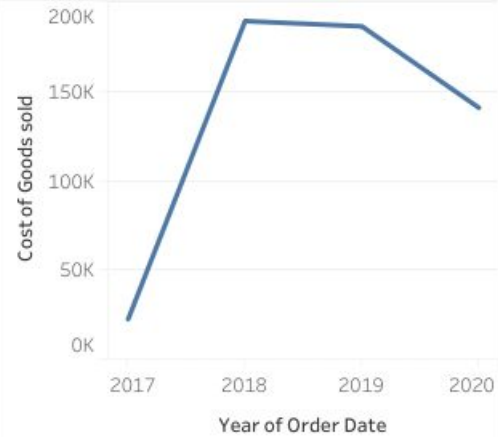
Alignment:

Left

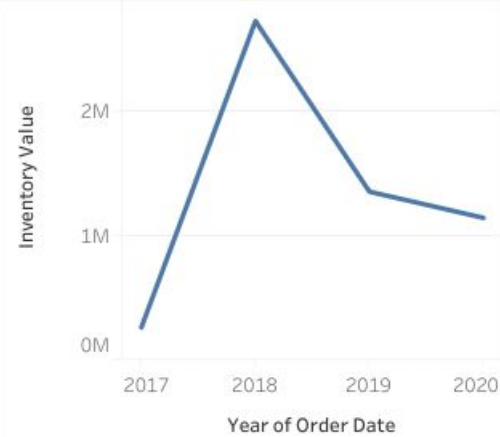




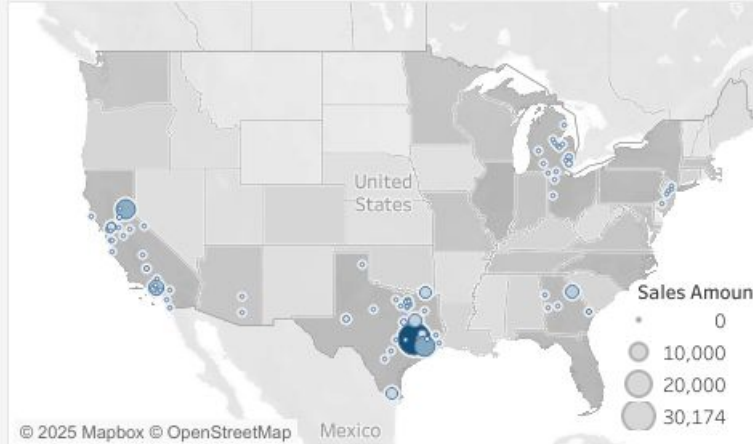
Cost of Goods Sold



Inventory Value in Hand



Geographic Distribution of Vendor-Based Sales in the U.S.



Filters

Customer Province

All

Vendor City

All

Invoice Date

All

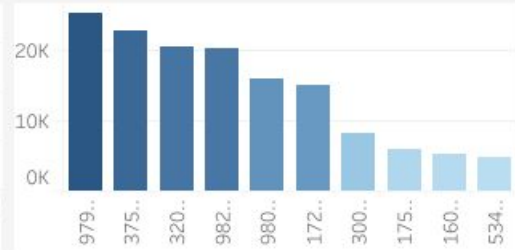
Top Dimension

10

Top Vendors



Top Orders



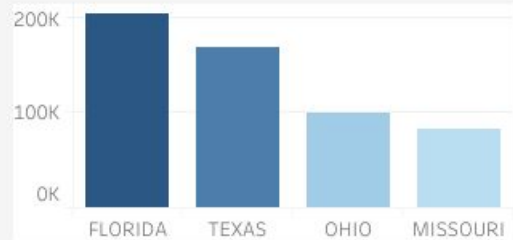
Top Products



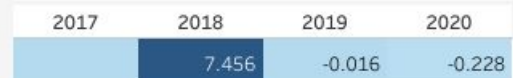
Top Customers



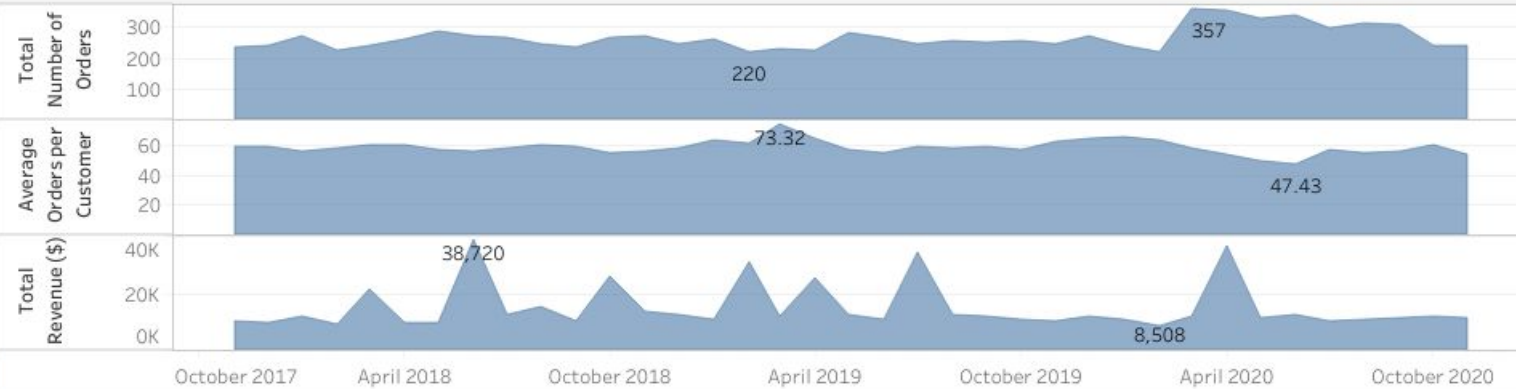
Top Regions



YoY Growth



Detailed Sales Analysis: Orders and Revenue (2017-2020)



THANK YOU!

[Access the Dashboard Here: Comprehensive Retail Sales Analysis](https://issuu.com/sergekop/docs/issuu_business_intelligence_and_data_visualisation)

https://issuu.com/sergekop/docs/issuu_business_intelligence_and_data_visualisation