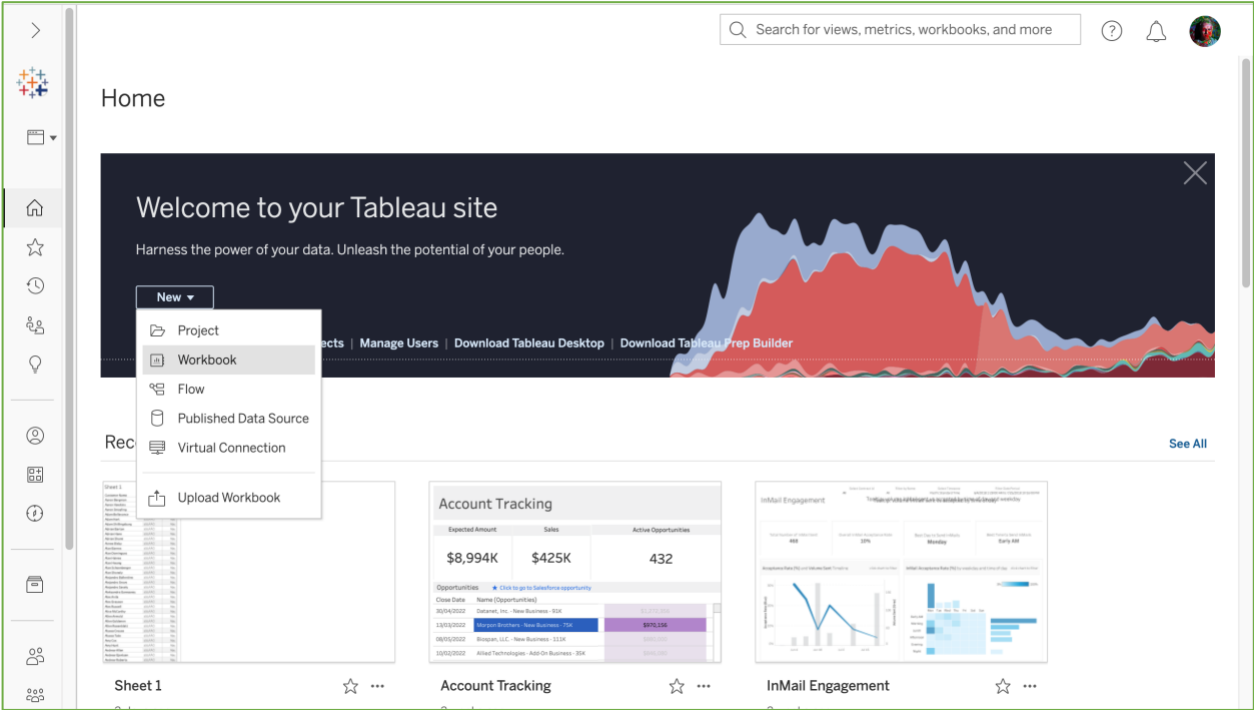
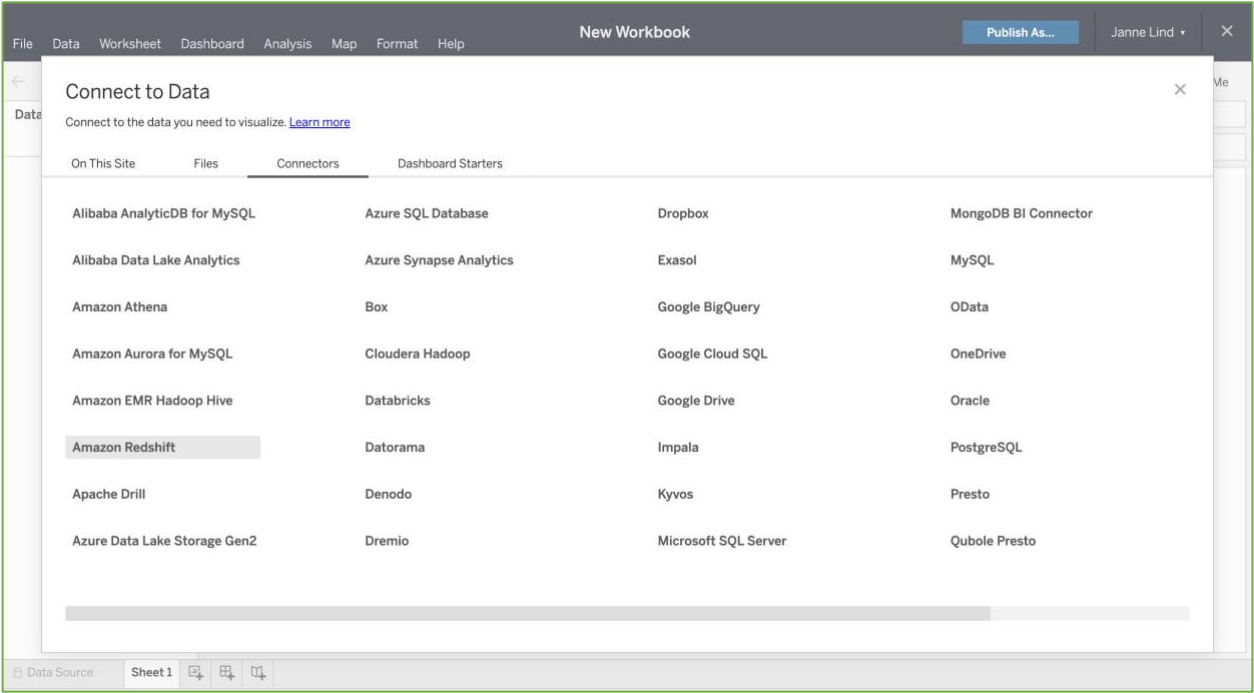
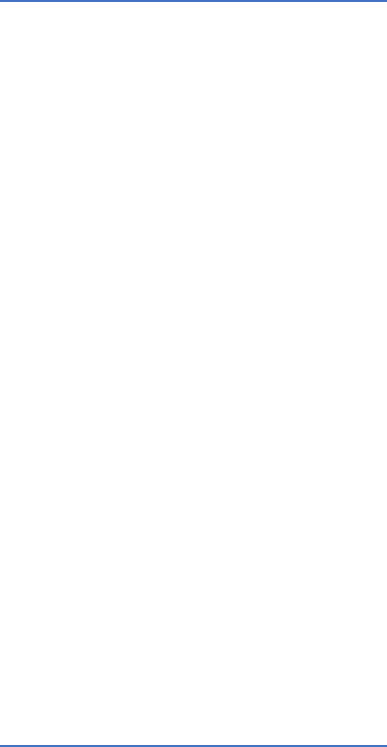


How to use this document:

The below script has three columns: **Do**, **Learn**, and **See**. When you’re in class, don’t worry about focusing too much on the granular “**Learn**” writeup. This section dives into the deeper mechanics and reasoning for why certain things work the way they do. Instead, follow the instructor’s clicks through the “**Do**” section. The “**See**” section should help you keep pace with the instructions.

Do	Learn	See
<p>From the Welcome Banner of the homepage of Tableau Online, find the button with the text New.</p> <p>Click this New button and choose Workbook</p>	<p>Tableau Online is Tableau’s cloud-based SaaS offering. Tableau customers have the choice to host their own Tableau environment on-premises or Tableau Server or to let Tableau host the systems using Tableau Online.</p> <p>Similarly, our end-users have many options they can choose when building new content. A developer might want to work offline using the Tableau Desktop client, but typical end-users could work in a browser-based content authoring environment.</p> <p>Today we are using Tableau Online’s web authoring to build a dynamic Tableau dashboard.</p>	
<p>From Connect to Data dialog, choose the Connectors tab.</p> <p>Go back to On This Site tab and choose Superstore Data Source and click Connect</p>	<p>Tableau has a big-and-growing list of native connectors to all modern and many legacy data sources. Here Tableau Online shows a subset of connectors Tableau can connect to.</p> <p>If you’re a company looking to create or improve a lacking analytics strategy, it is conceivable to think your data lives in many places. While Tableau is not a database software, the platform <i>does</i> possess an underlying database technology (you may have heard it referred to as “Hyper” or a “Tableau Extract”) and can act as a medium for bringing your many sources into one analyzable dataset.</p> <p>For the workshop, we are skipping the process of having everyone “go find that Excel file deep in your Tableau directory,” although you’re welcome to do that too, using the Excel connector. In general, whether you’re connecting to a flat file (upper section) or a database or SaaS platform (“To A Server” section), the resulting screen is largely the same.</p>	



Observe the beauty that is Tableau Web Authoring’s blank canvas 😊

Click on the little arrow next that appears when hovering over the words “**Superstore Datasource**” to open this Data Source’s dropdown menu in the top left.

Choose **Edit Data Source**.

Alternatively, you can double-click the name of the data source.



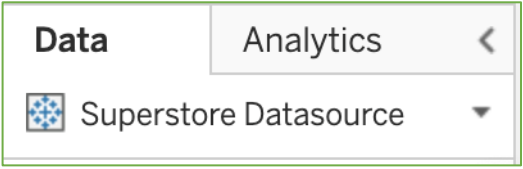
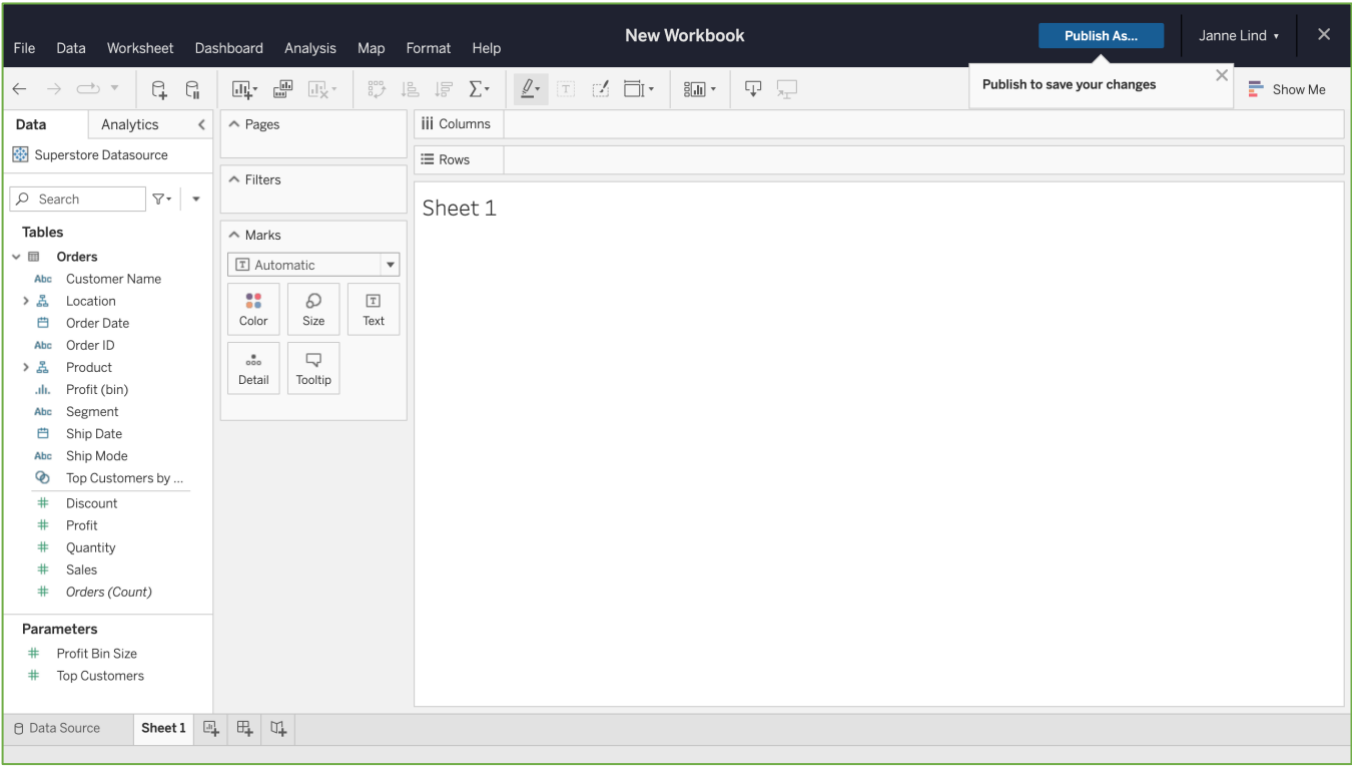
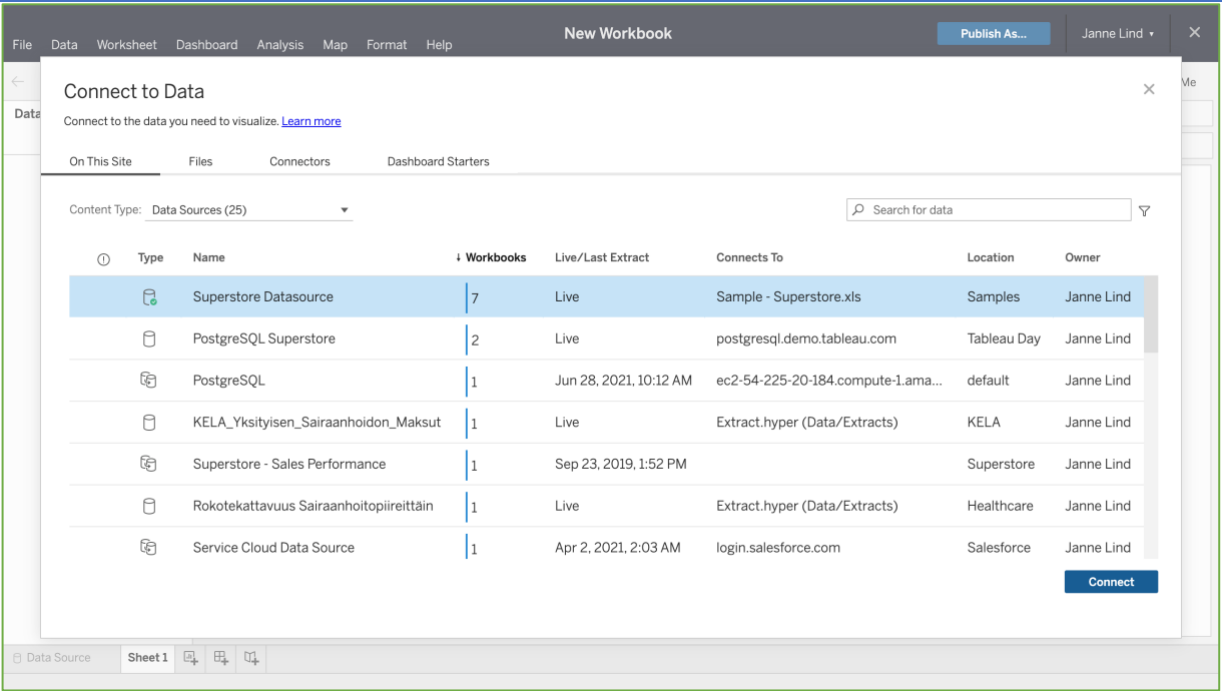
Welcome to Tableau Web Authoring!

Beginning in the top-left, see the sample ”Superstore Datasource” data source. This name is clickable to expose a variety of Data

Source-related options and actions: these options can also be found in the “Data” toolbar dropdown at the top. Tableau can connect to multiple separate Data Sources at a time. Your selected Data Source’s fields/columns will show in the pane below.

As we have connected to a Saved Data Source, there is more here than we would find ~~had we~~ connected directly to the raw Excel file. Some fields are grouped into folders and hierarchies, and there are a few extra elements like Sets, Parameters, a Bin, and a Calculated Field (can you identify which is which?). We’ll define them later.

Before we carry on in the Data pane, let’s take a quick step back by double-clicking Data source or drop-down menu -> Edit Data Source, in the top-left.



Not much to do here for now, just some good old knowledge transfer.

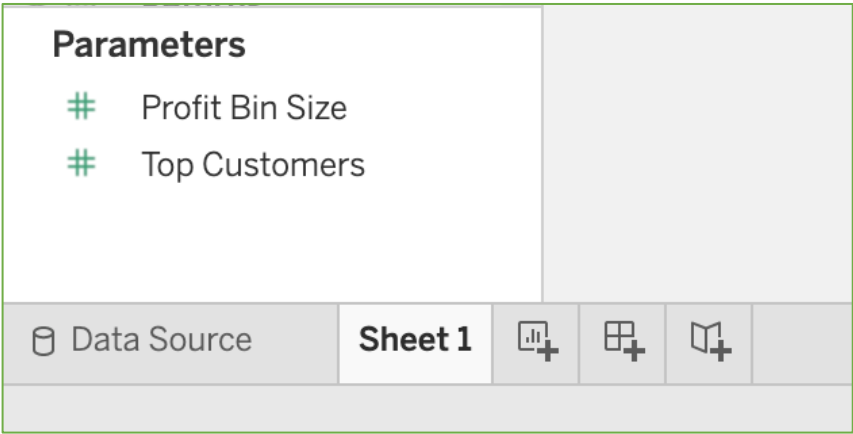
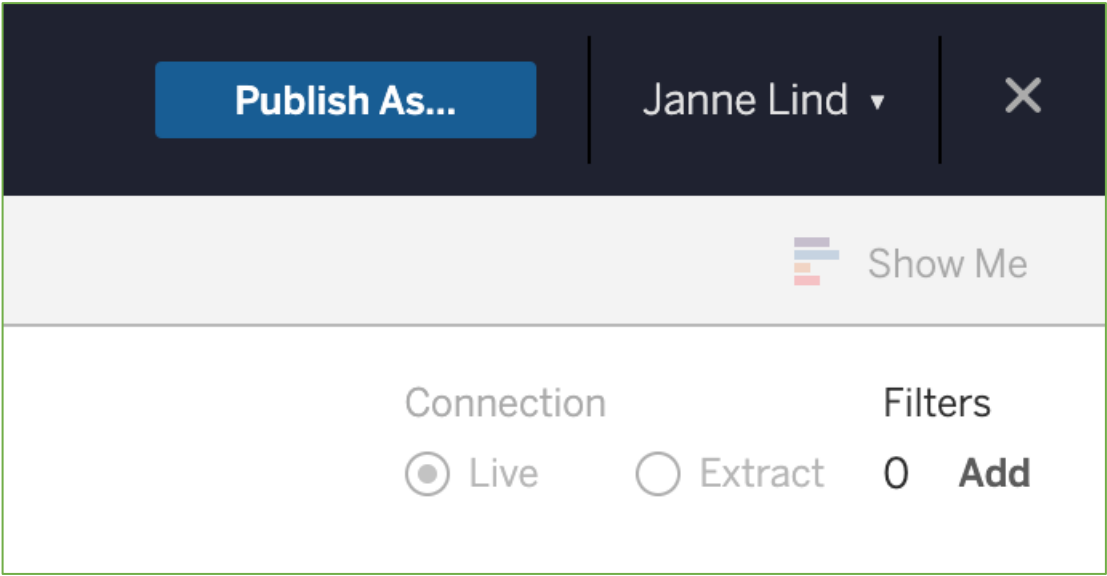
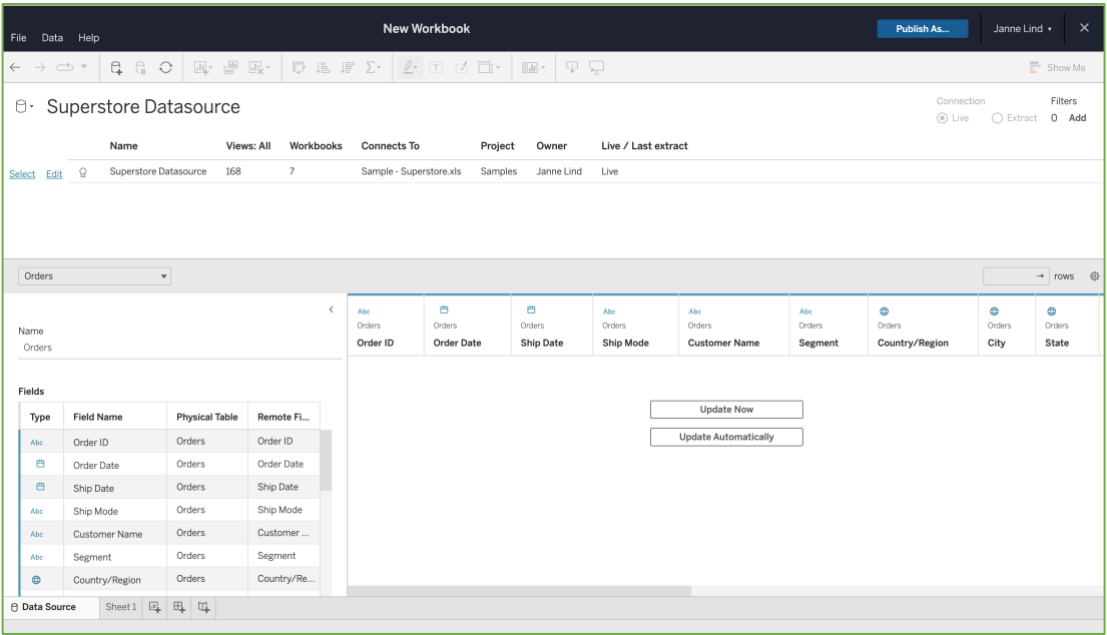
Click the **Sheet 1** tab at the bottom left corner of the screen to get back into action.

Had we connected directly to our Data Source without taking the shortcut, we would land on this screen before going into the workspace. While it is important to be aware that Tableau has a data preparation tool called Tableau Prep (both client and browser-based) that will allow for greater control over your data preparation, this is a space in which one can join/union together data from many places.

In the top-right, you can find a toggle for your connection type: Live or Extract. As the titles suggest, you have the option of live-connecting to your data, having Tableau pass queries to the source at the time of user interaction, or you can ‘snapshot’ your data using an Extract. The extract can offer benefits like mobility, compression, and localization of work (not relying on foreign databases to handle workload), and neither setting needs to be permanent. In either case, the Tableau platform encourages you to keep data fresh, and users who select “Extract” will be prompted to schedule a recurring, automated refresh upon publish.

In the far top-right is an area to add Data Source filters. Tableau’s order of operations offers many different places where filters can be applied – taking advantage of this properly is essential to mastering Tableau, while poor filtering practices can lead to needlessly long query and render times.

That’s the Data Source tab! Click the Sheet 1 tab at the bottom left corner of the screen to get back into action.



Double-click on the “Sales” Measure

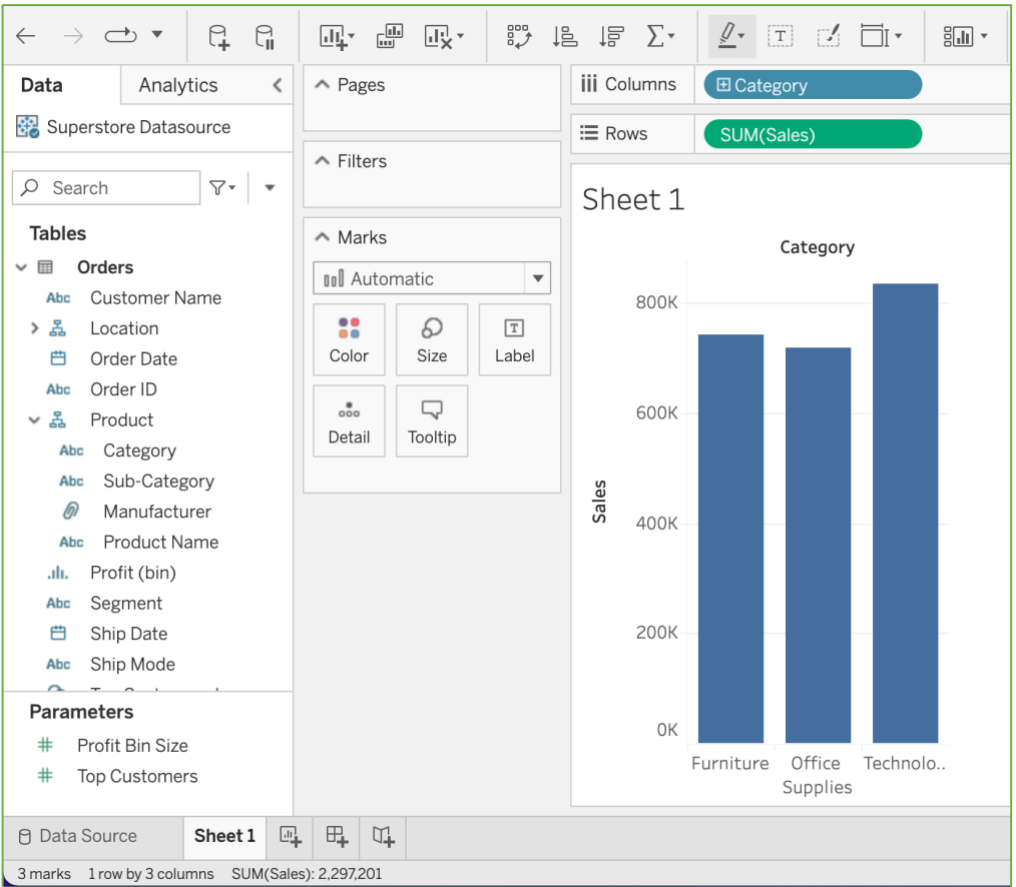
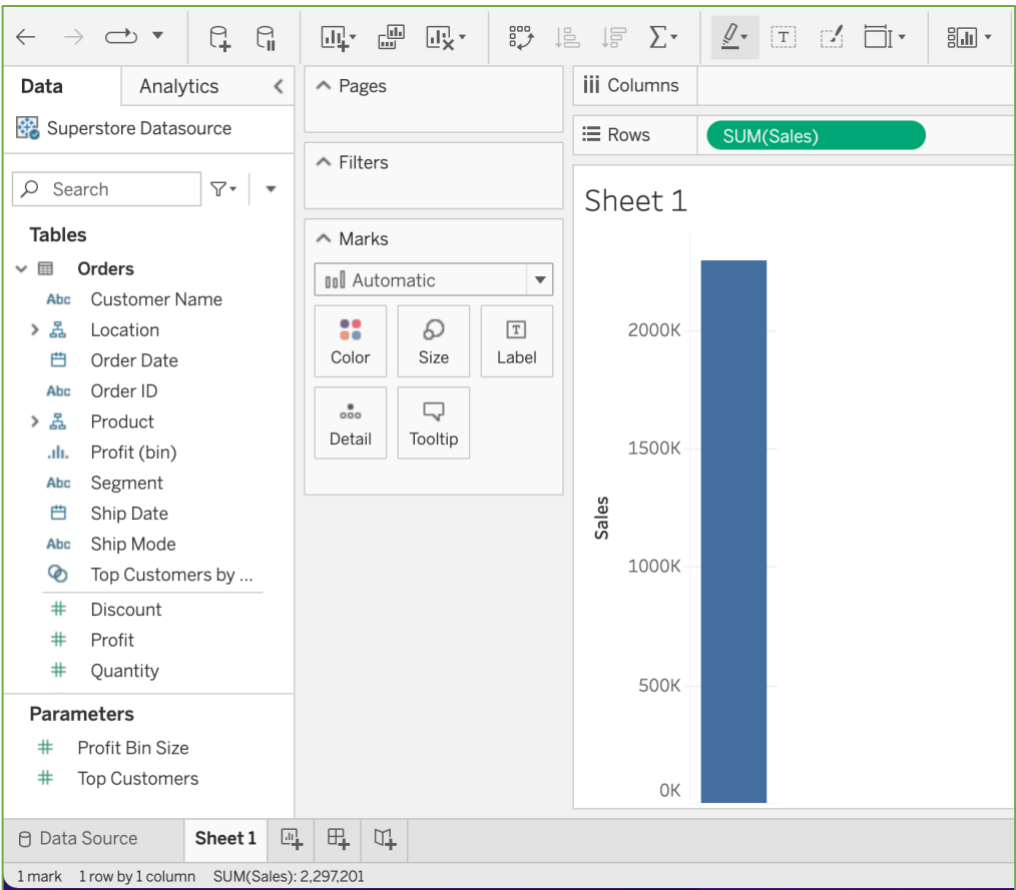
Back in the blank workspace, let’s bring some “pills” to the page. From the Data pane on the left, notice the various fields we have in this data set. In the interest of better understanding Tableau’s mechanics, in addition to exploring the performance of this “super” store, let’s double-click on the “Sales” field. Alternatively, you can drag the field onto the Rows shelf, up top.

Numeric data will be read into Tableau as a “Measure,” which are “things you aggregate.” As such, Tableau rolls the entirety of the Sales field into a single number, represented by the bar seen here. This data set has about \$2.3MM in sales.

Open the Product hierarchy and double-click on the “Category” Dimension

Open the Product hierarchy on the Data pane. Double-clicking on the field called “Category” will break this full aggregate into 3 buckets, respective of which product category each row of data represents. This is because “Category,” whose elements are strings (instead of numbers), is a Dimension. These group our aggregates into different buckets, based on the elements each Dimension represents.

Users have the ability to reassign fields to be Dimensions or Measures based on their properties, how the user might like to use them, and the possibility that Tableau misinterpreted their type assignment in the first place. As an example, your hypothetical field called “Completed At (Year)” may be misinterpreted as a numeric, aggregable field, when it really represents in which year something happened.

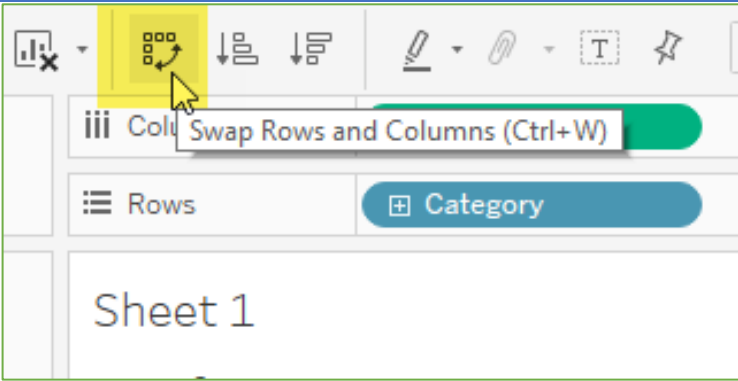


Swap your row and column axes using the toolbar button.

Tableau uses the colors Green and Blue to distinguish between Continuous and Discrete, respectively. While it is true that most Measures are continuous and most Dimensions are discrete, that is often not the case (think of a continuous date Dimension).

Notice how Tableau draws the bar chart based on this convention. Blue pills (we call them pills as they are pill-shaped in the UI) will yield a list of discrete, clickable elements – you can select the “Furniture” category by clicking on it. Green pills, on the other hand, yield a continuous axis – clicking anywhere on this axis will select the entire thing.

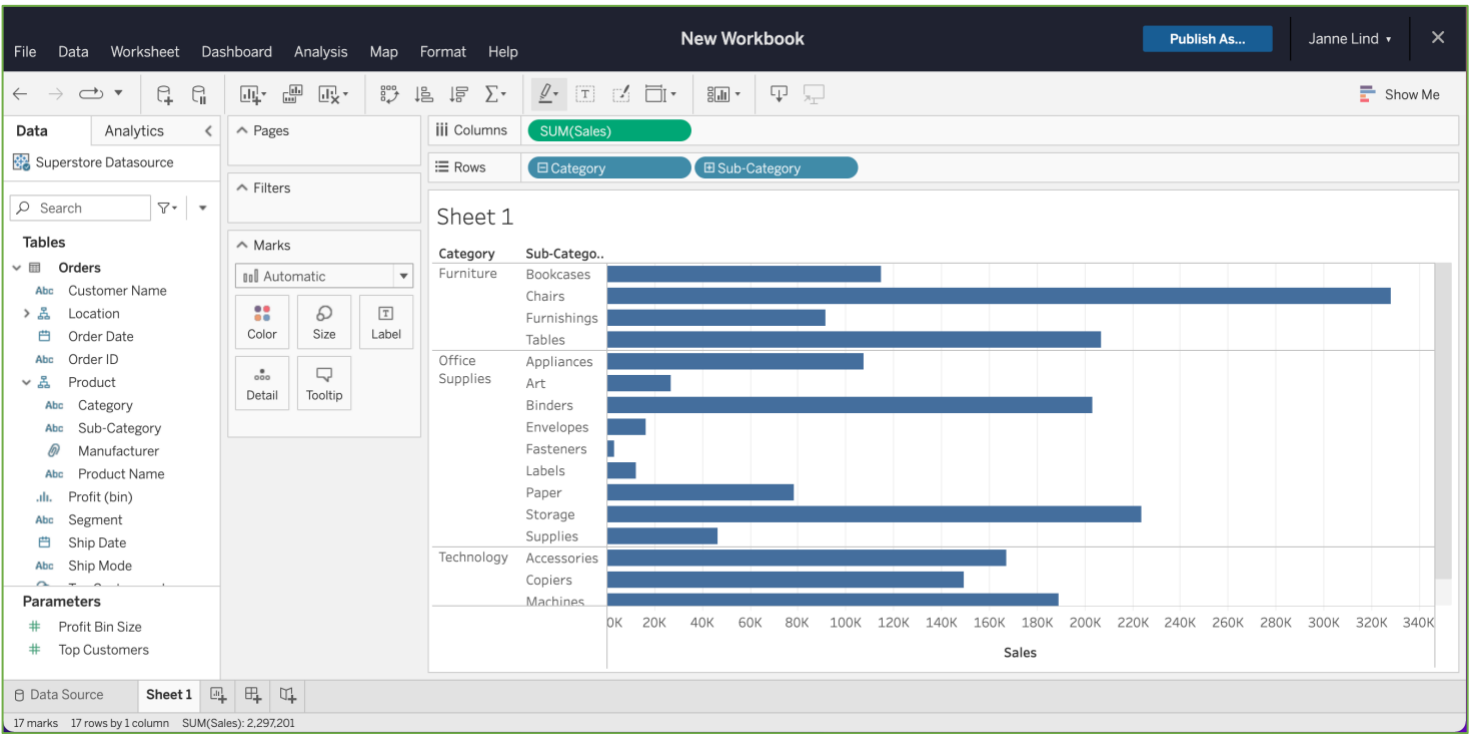
Swapping the axes is not so much required as a) an opportunity to discuss the aforementioned behavior and b) a suggested viz orientation under the guidelines of “visual best practices,” as consumers won’t have to turn their head on its side to read the listed elements, in addition to our eyes’ innate ability to perceive differences in horizontal bar lengths.



Drill down – click the ‘+’ on the **Category** pill to bring **Sub-Category** into the view

Hierarchies allow easy drill-down for end-users. While we sit in a space where we can access any element of the dataset, Tableau users can interact with the hierarchy to deepen their analysis.

To expose this behavior, see if you can find the ‘+’ that shows up if you hover over the view, instead of using the ‘+’ on the Category pill.

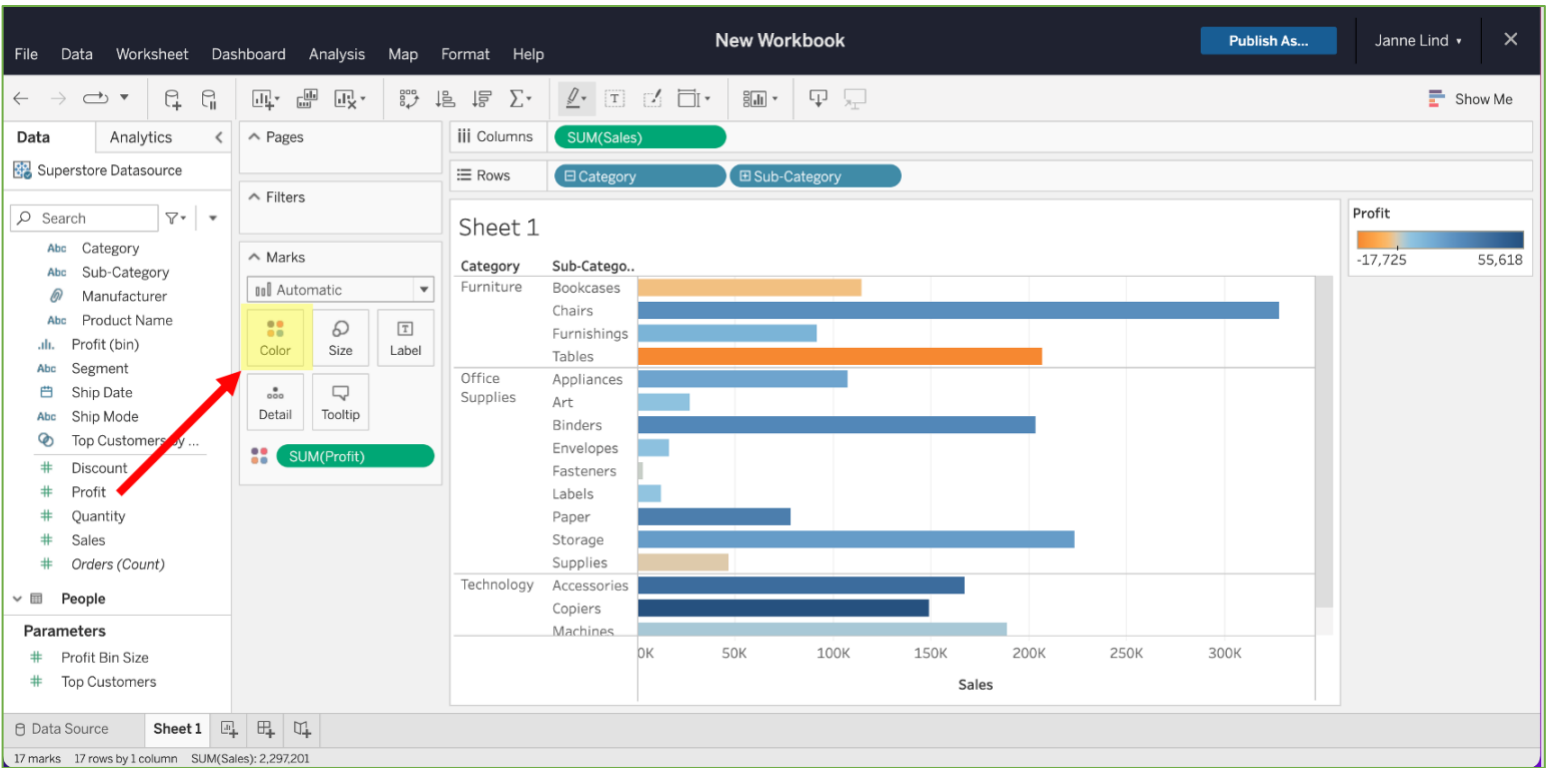


Drag **Profit** to Color

To further investigate the performance of Superstore, we can bring Profit into the view. This can happen in several ways. What happens if you double-clicked on Profit, instead? What if you drag the field to the center of the viz? Why might we not want to put Profit on Size or Label?

Tableau is designed with iteration in mind. You will find no step-by-step wizards, no workflows that involve a decision on what the final product needs to look like before getting there, and an endless amount of ways to dress up your data. The key is delivering your information in ways that make sense to your audience, help them more quickly understand the data, and communicate the message/story/narrative you want.

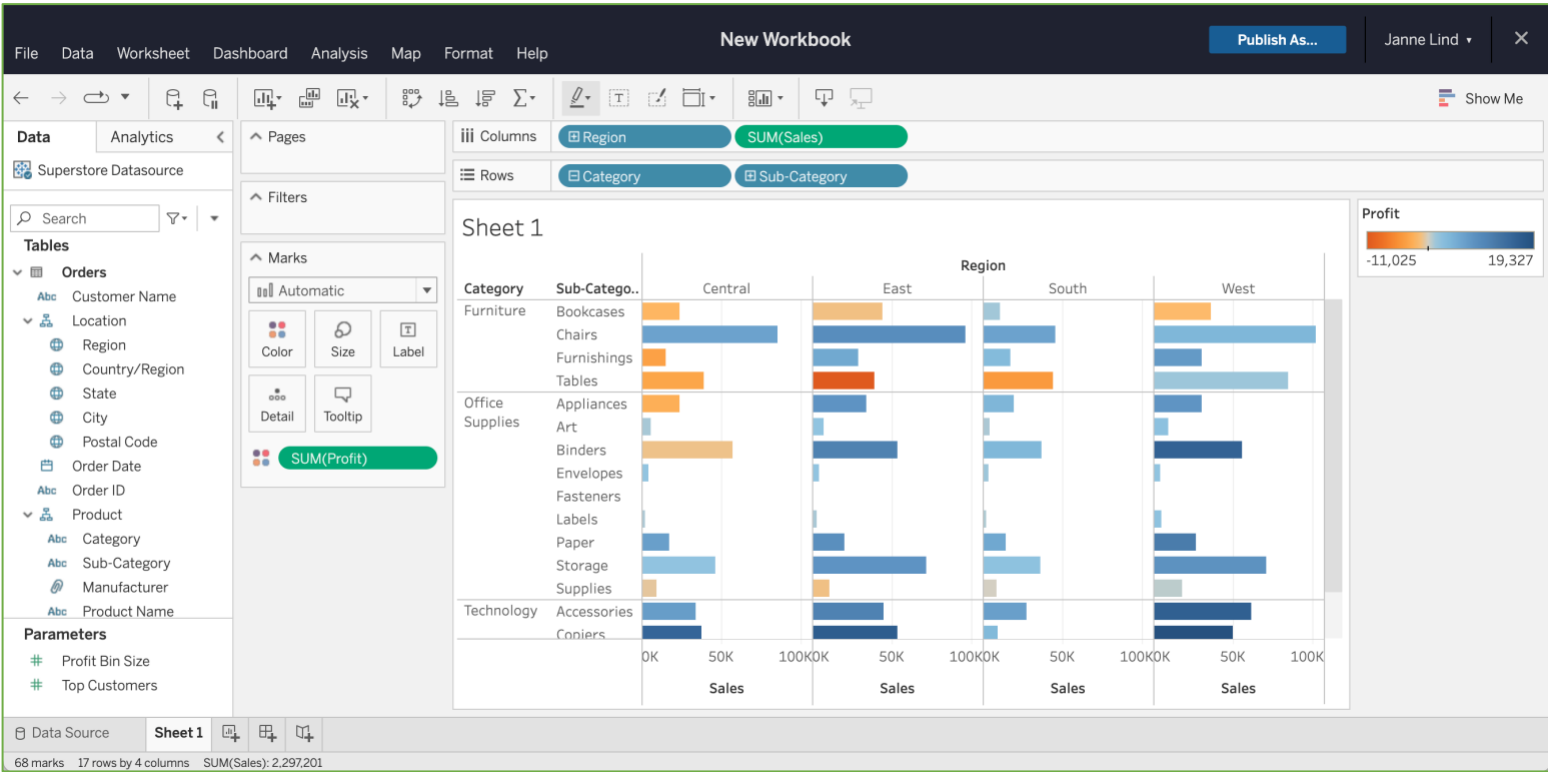
In this viz, we are quickly exposing the “Tables” issue – we are selling a lot of them, but not at an aggregate profit! Could this be a Regional issue only? Let’s drill down further.



Open the Location hierarchy, and drag **Region** to Columns

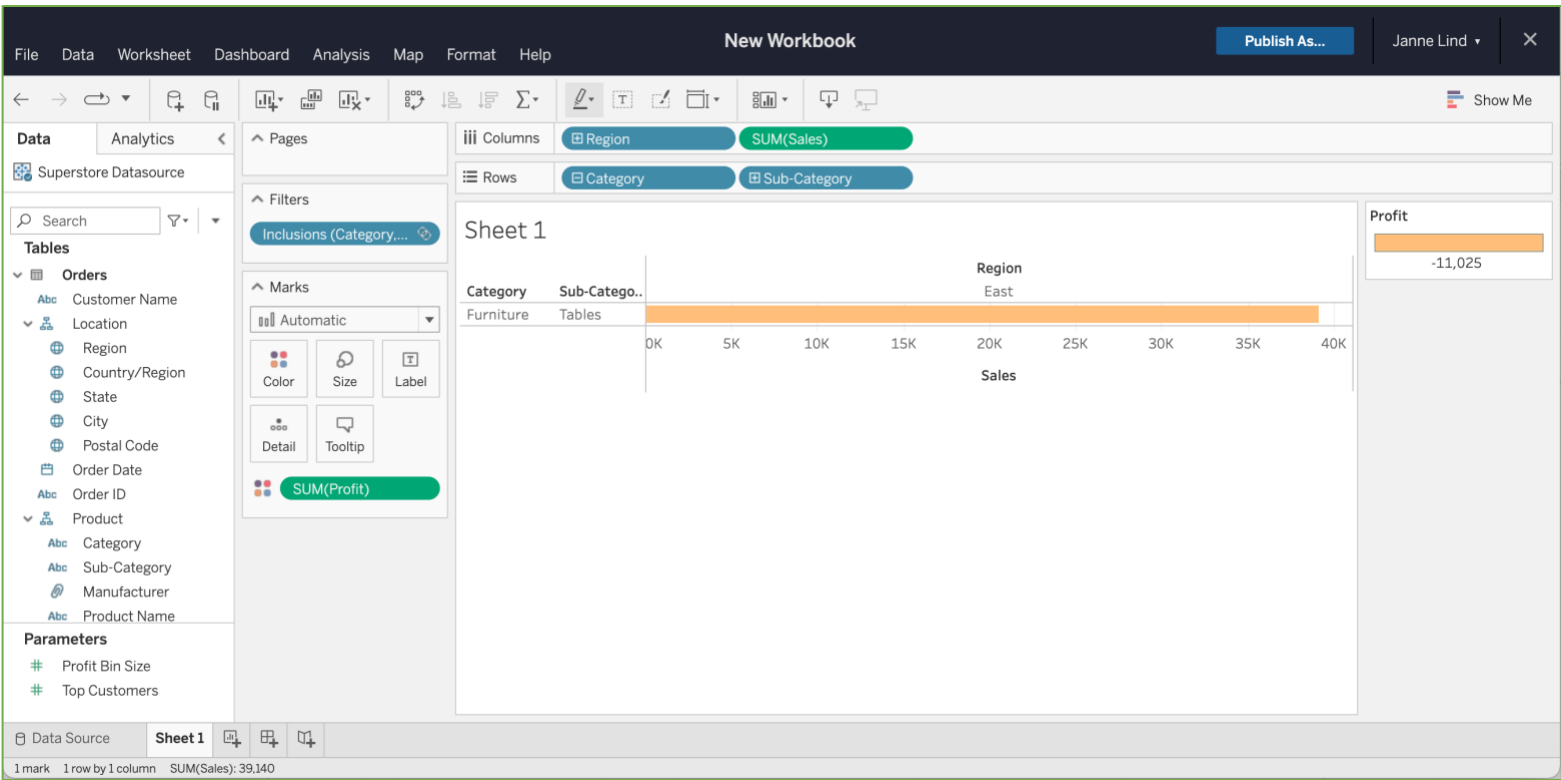
This “small multiples” chart is a great representation of data across several Dimensions. Notice how the use of color encourages the eye to find the ‘actionable’ or ‘troublesome’ cuts of data with only a quick glance.

While our Tables issue is not confined to a single Region, let’s dive into the worst situation in the East Region.



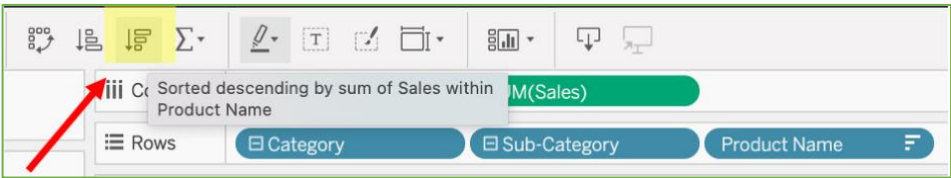
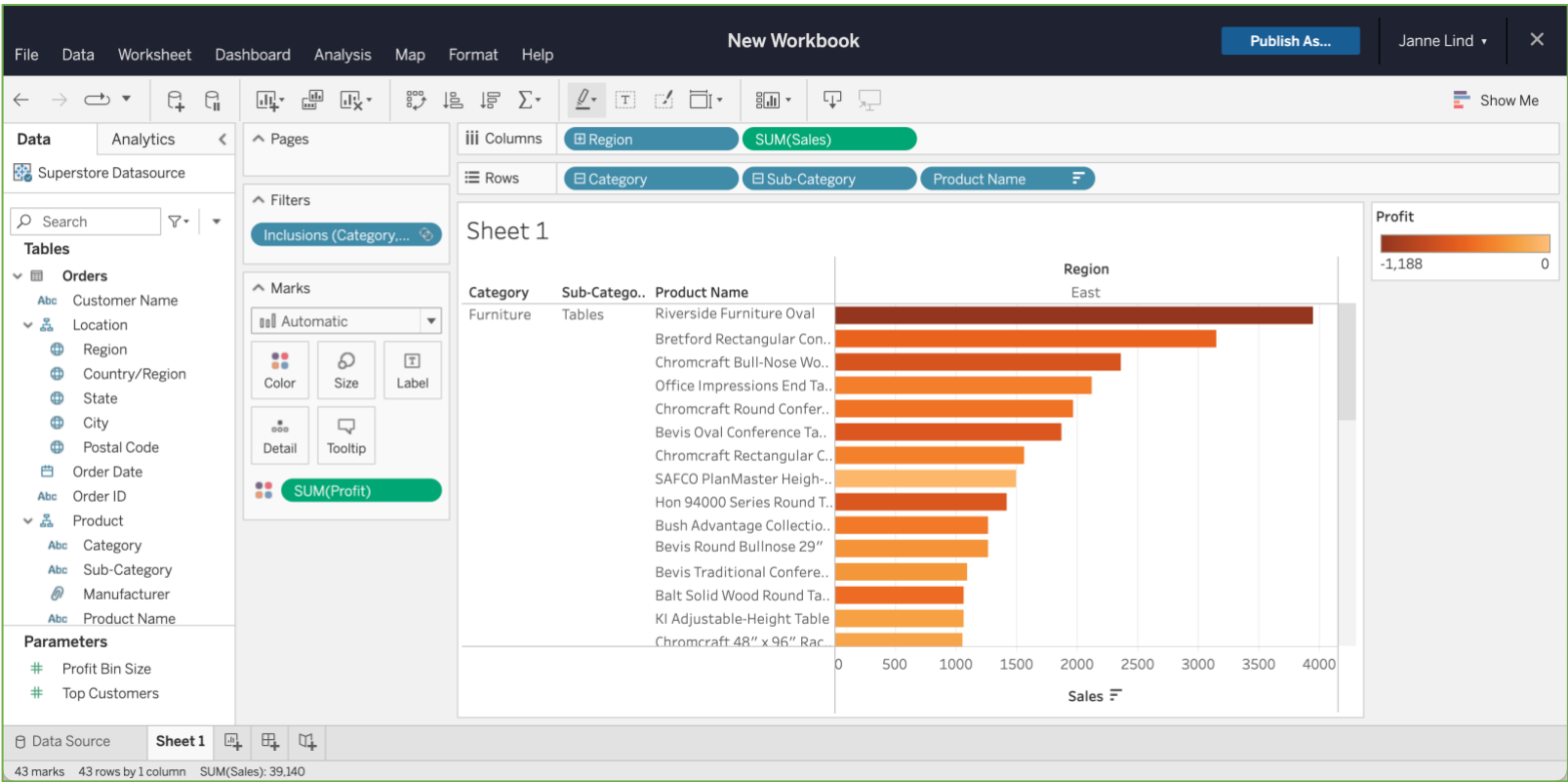
Click the **dark orange bar** at the intersection of Table Subcategory and East Region. Choose to **Keep Only** the East Region Tables.

Visual, Direct, and Intuitive are three major design principles of the Tableau suite. Many changes can be made by finding the thing you want to change and clicking or right-clicking on it.



Drill down to show the individual **Product Names** (no Manufacturer). Sort them in descending order by **Sales**, by clicking the sort icon on the toolbar.

The Product Hierarchy defined in this Data Source features the four levels: Category > Sub-Category > Manufacturer > Product Name. To accomplish this step, you can drag Product Name from the Data pane into the view (I'd put it on Rows), or by clicking on the '+' sign again to drill through the hierarchy. If you choose the latter, be sure to remove the Manufacturer from the view to allow for easier sorting.



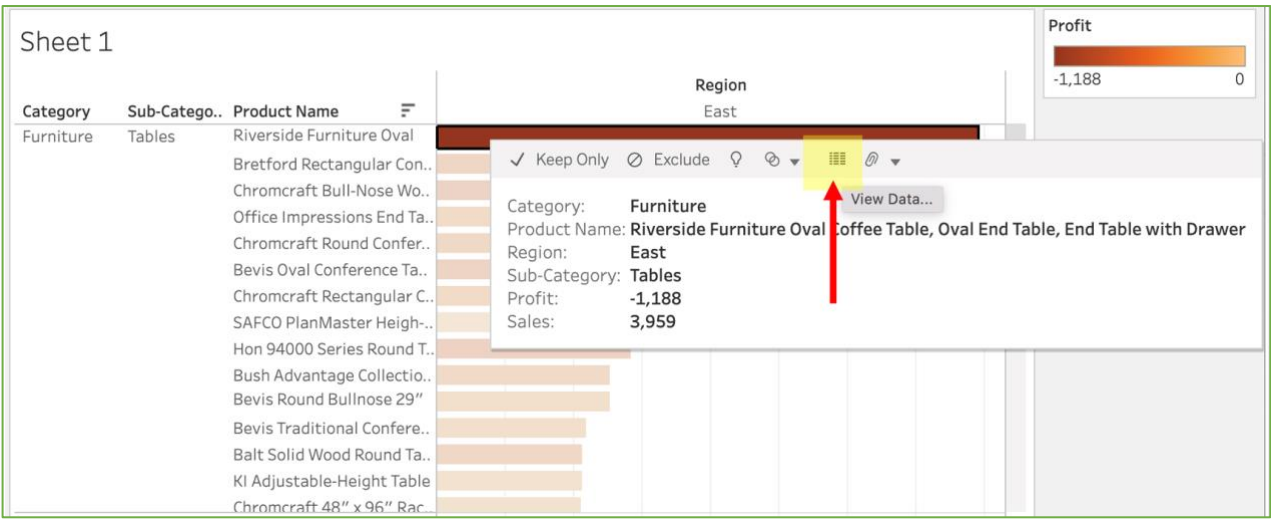
View underlying data for the top bar by clicking the top bar in the visualization and selecting the “**View Data**” toolbar icon from the dialog.

In the new dialog, choose the **Orders** tab and tick “**Show all columns**”.

Close the “**View data**” window.

At any point in Tableau, if a user “just wants the numbers,” one can get them with only a couple of clicks. This is more encouragement to use visual analytics as opposed to drawing up a bunch of crosstabs.

In this case, we learn there are three sales of this particular coffee table, all heavily discounted and unprofitable. This is actionable data!



View Data

dub01.online.tableau.com/vizql/t/tableaufinland/w/\$newWorkbook\$_8b0f5827-0969-4ab6-8e0f-f49922af755d/v/Sheet1/viewData/sessions/3943362755054D72B824645DC91E9D82-0:0/views...

Summary Orders

Showing first 3 rows. [Download all rows as a text file](#)

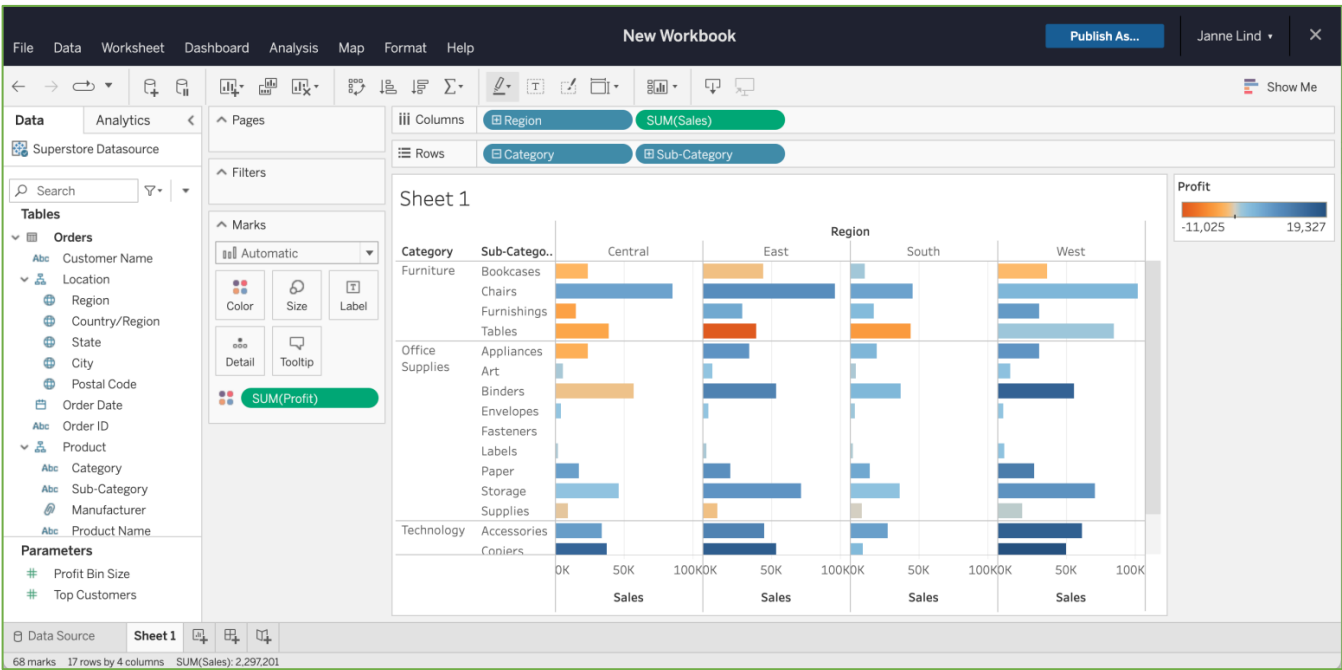
☒ Show all columns

Category	Sub-Category	Product Name	Region	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code	Profit (bin)	Segment	Ship Date	Ship Mode	State	Discount	Profit	Quantity	Sales
Furniture	Tables	Riverside Furniture Oval Coffee Table, Oval End Table, End Table with Drawer	East	Marion	United States	David Bremer	Riverside	12/27/2018	CA-2018-101889	43302	-600	Corporate	12/31/2018	Standard Class	Ohio	0.400000	-464.697	9	1,548.99
Furniture	Tables	Riverside Furniture Oval Coffee Table, Oval End Table, End Table with Drawer	East	New York City	United States	Lindsay Shagiari	Riverside	9/17/2018	US-2018-138919	10035	-200	Home Office	9/21/2018	Standard Class	New York	0.400000	-103.266	2	344.22
Furniture	Tables	Riverside Furniture Oval Coffee Table, Oval End Table, End Table with Drawer	East	Philadelphia	United States	Ross Baird	Riverside	11/28/2020	US-2020-110576	19120	-800	Home Office	12/2/2020	Standard Class	Pennsylvania	0.400000	-619.596	12	2,065.32

Showing first 3 rows. [Download all rows as a text file](#)

Click the back button under the File menu until you return to the “Region vs. Sub-Category” small multiples chart

Our most-used button – this can take us as far back as when we first opened the workbook! The product is meant to encourage exploration, oftentimes into the unfamiliar, unhelpful, or unsettling! It is easy to make a mess in Tableau, and there’s little reason not to do so once in a while, as it is even easier to return to familiar territory.



Right-click “Sheet 1” and “Duplicate as Crosstab.”

Probably not a bad idea to rename Sheet 1 something easier to understand. I’ll call mine “Products”

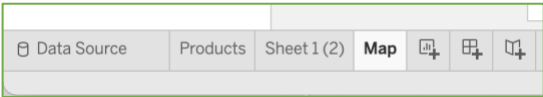
Let’s take a quick detour and compare the small multiples bar chart to its crosstab equivalent. This is the exact same information, except it takes me a while longer to understand my highs/lowes in sales and profit. Imagine scaling this across more than four Regions and a handful of Sub-Categories. This can really slow down a user’s workflow! Do you know people consuming data like this today? This is an opportunity.

Sheet 1 (2)

Category	Sub-Catego..		Region			
			Central	East	South	West
Furniture	Bookcases	Profit	-1,998	-1,168	1,339	-1,647
		Sales	24,157	43,819	10,899	36,004
	Chairs	Profit	6,593	9,358	6,612	4,028
		Sales	85,231	96,261	45,176	101,781
	Furnishings	Profit	-3,906	5,881	3,443	7,641
		Sales	15,254	29,071	17,307	30,073
Office Supplies	Tables	Profit	-3,560	-11,025	-4,623	1,483
		Sales	39,155	39,140	43,916	84,755
	Appliances	Profit	-2,639	8,391	4,124	8,261
		Sales	23,582	34,188	19,525	30,236
	Art	Profit	1,195	1,900	1,059	2,374
		Sales	5,765	7,486	4,656	9,212
	Binders	Profit	-1,044	11,268	3,901	16,097
		Sales	56,923	53,498	37,030	55,961
	Envelopes	Profit	1,778	1,812	1,465	1,909
		Sales	4,637	4,376	3,346	4,118
	Fasteners	Profit	237	264	174	275
		Sales	778	820	502	922

Create a new Worksheet by clicking the first of three small buttons to the right of your existing worksheets along the bottom toolbar. Name it “Map”

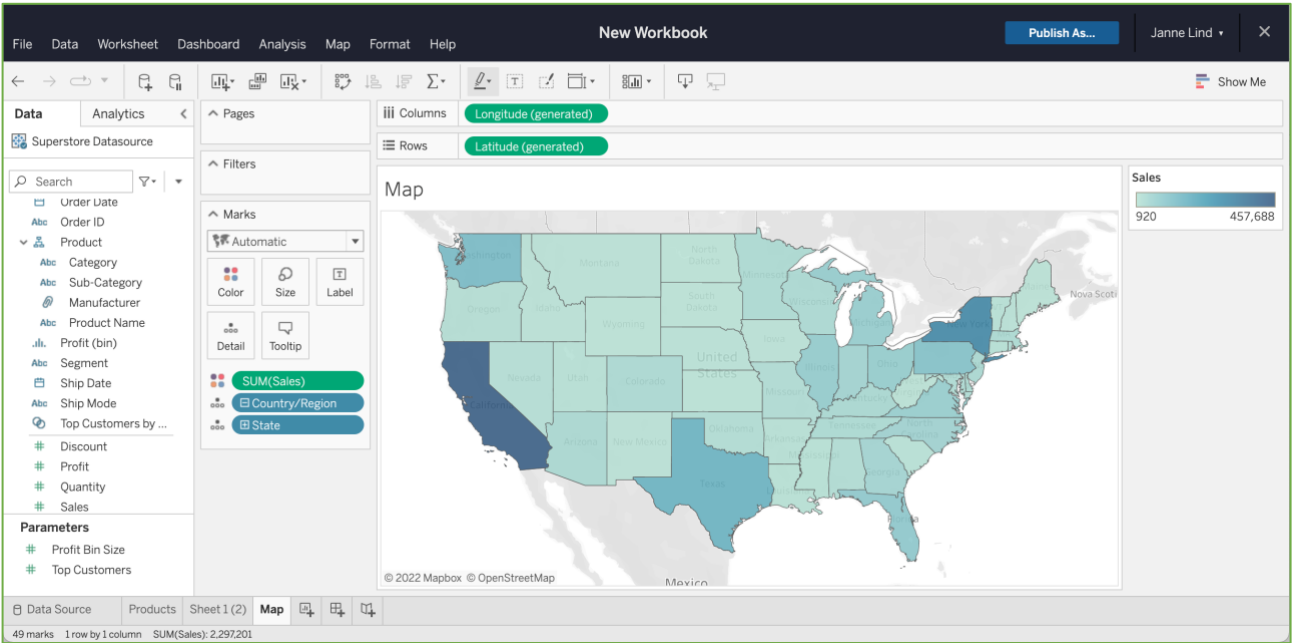
Whew, that was a lot of work for a single viz! The next one will surely come together more easily and quickly.



Make a map! Double-click on **State** in the Data pane.

Then drag **Sales** to **Color** on the marks card

The State Dimension lives in the Location hierarchy. Notice how the overall view is constructed when you double-click a geographical field: Tableau uses its native geocoding ability to create lat/long pairs for each Country/State/City. This capability extends to other plottables, like Airports and Zip Codes, among other things, but cannot plot a street address, for example. Mapping becomes even more powerful if you can feed in your own specific lat/long pairs, or if you have “spatial” data (in a file or db).

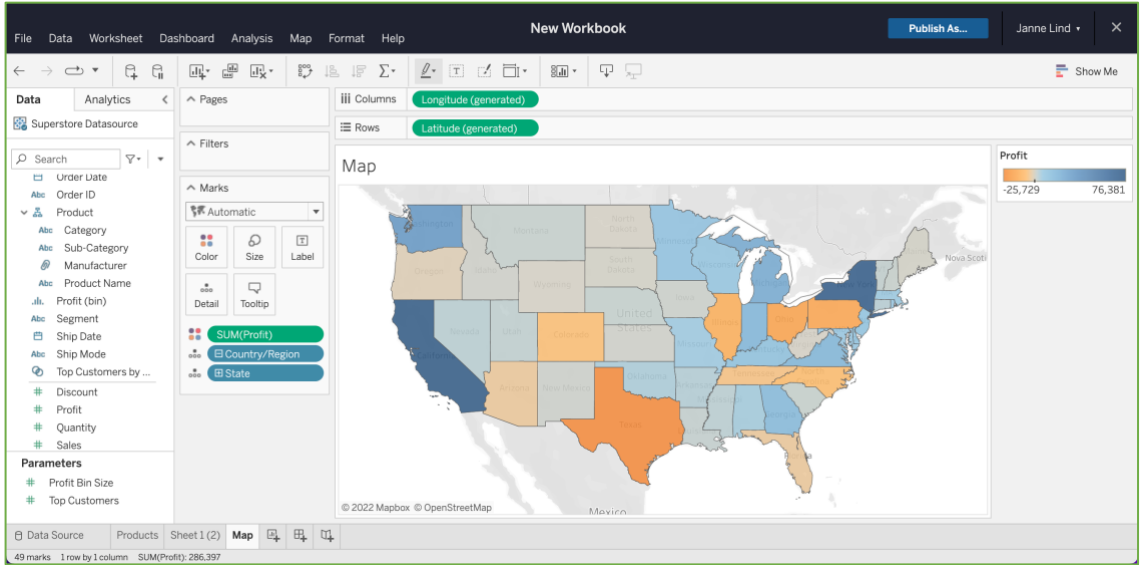


Replace **Sales** with **Profit**.

****Optional**** Show off a few other measures that can be visualized with the geocoded information.

You are never confined to a single representation of the data (or even a finite amount!) in your geocoded data. With a couple of quick moves we can redraw this map with different measures populating the same geographic data.

You can easily see how this ability to explore data quickly can help find insights.

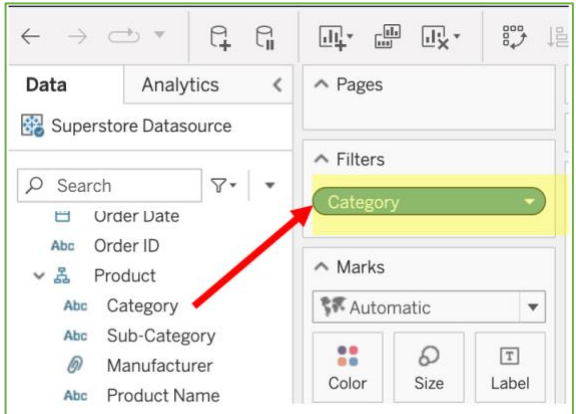


Drag **Category** from the Data pane to Filters card.

In the dialog, choose the value “**(All)**” in the list and click OK to close the dialog.

We want our visualization to be more dynamic, and filters are a great way to achieve greater re-usability of the data visualization, and this encourages visualization/dashboard users to explore the data.

We start creating a filter by dragging the desired data element to the filter card. In this example, we use Category.



Click this little arrow in the filter pill.

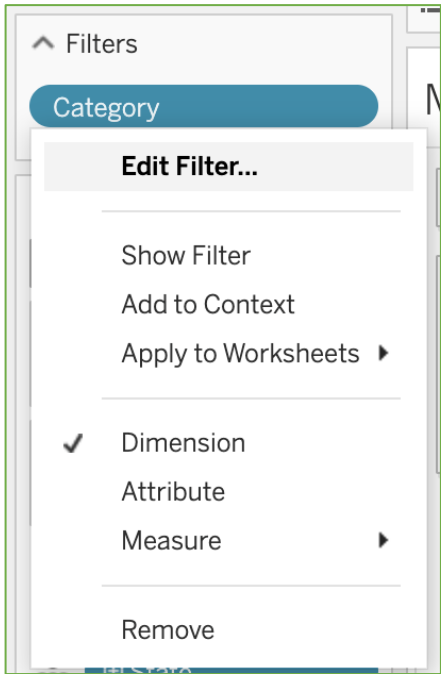


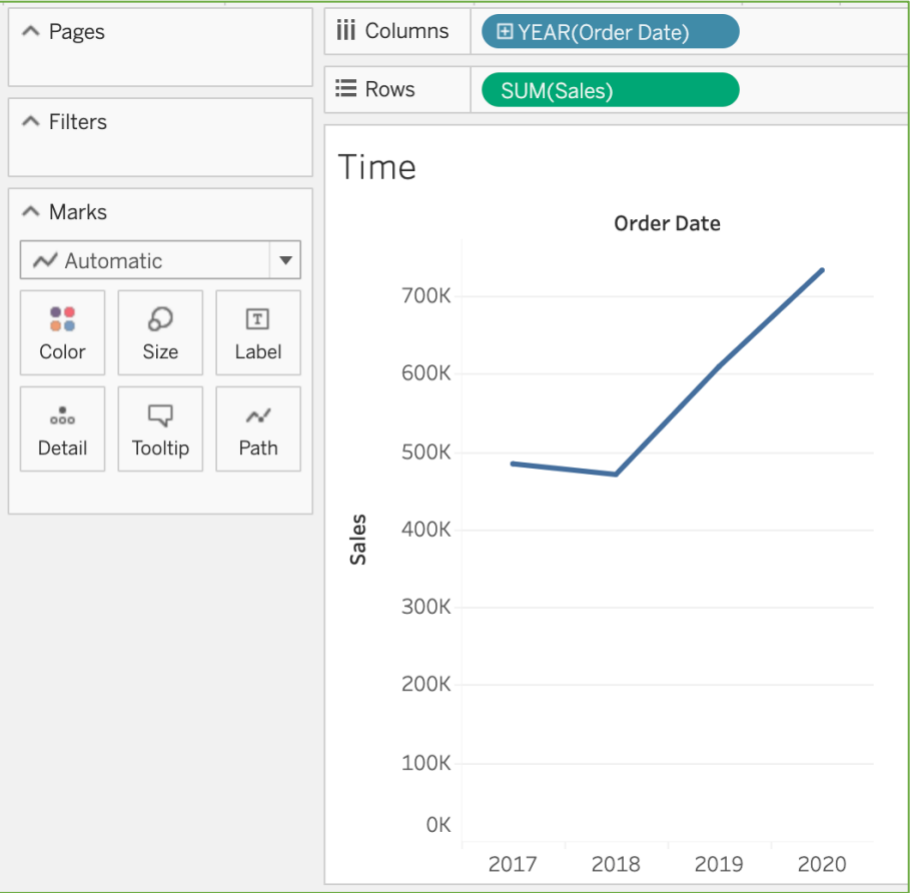
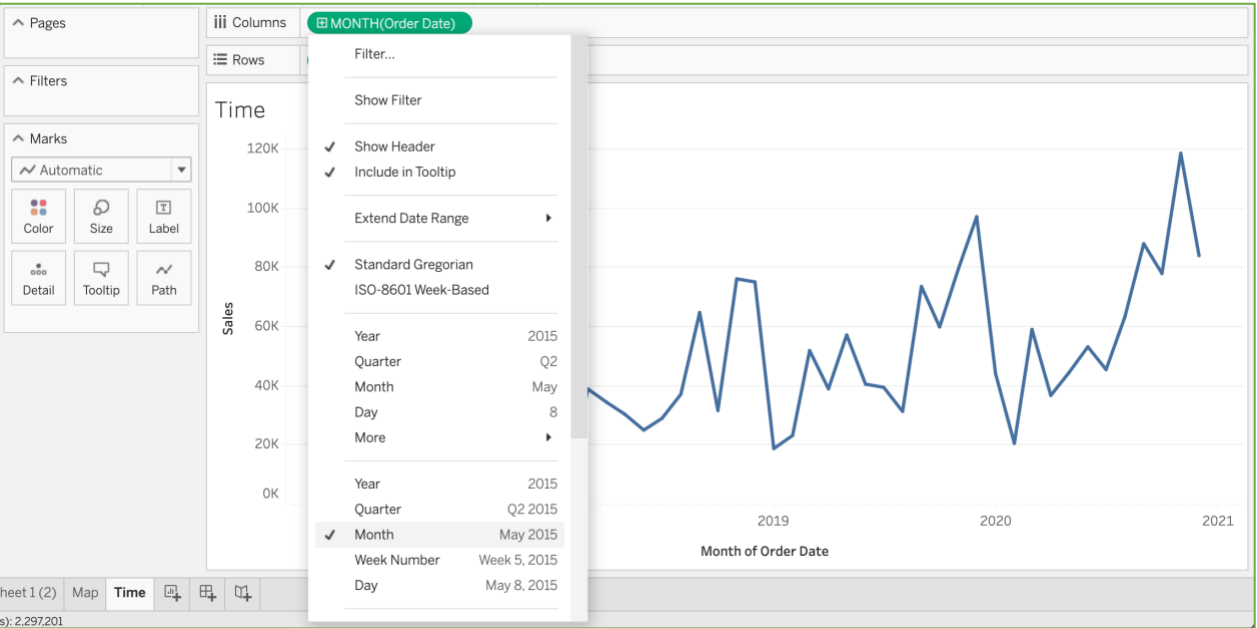
Choose **Show Filter**

We want this filter to be interactive, so we will show this filter to the end-users.

If you want to customize this filter, you can do this by clicking the dropdown arrow in the top-right of the box pictured on the right opens a menu for customizing the look and feel of this filter. Do you want single- or multi-select? Is it a list or a dropdown? Should it respond to other filters when presenting its options?

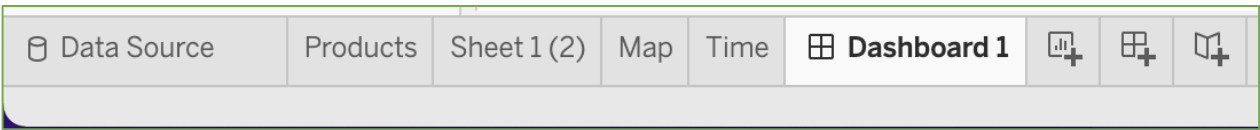
This should be a familiar way for most people to filter data. In a later step, we will show this is not the only way.



Create a new worksheet . Name it ' Time '	Let's create a view that looks at sales over time.	
Double-click on Sales Double-click on Order Date	<p>You will end up with a different viz (same data) if you do this in reverse order. Mostly a matter of Tableau having some default behavior that changes based on what is already in the view.</p> <p>That Order Date Dimension has that familiar '+' sign on it. While not involved in any defined hierarchies, dates have an inherent hierarchical nature and can be drilled through in the same manner.</p> <p>Right-clicking on the date pill will expose a LOT of different ways to draw things up. There are two sections of {Year, Month, Week, Day, ...}, which represent the 'datepart' and 'datetrunc' options, respectively. This is an important distinction, as the "month" datepart would allow you to roll up your sales values across all "Augusts" in the data set, as an example. The 'datetrunc' representation should be used to distinguish one August from the next.</p> <p>One particularly interesting mechanic is the Option-drag (Mac) or Alt-drag (Windows). If you remove your date pill from the view and instead Option-drag the field back onto the Columns shelf, you will expose this list of available options before the pill lands/the view renders. This works for non-dates, as well.</p>	
Right-click Order Date pill in Columns. Represent this as a continuous month using the second "Month" selection from the context menu.	<p>Recall, Green = Continuous. Tableau also will default to showing DATEPART as discrete and DATETRUNC as continuous, upon first selection, although these can be changed from that default.</p> <p>To get the exact view on the right, be sure to use the 'month' datetrunc, which is represented with the example "May 2015" in the context menu shown in the screenshot.</p>	

Create a new Dashboard by clicking the second of those three small buttons on the bottom toolbar, to the right of your Sheets.

We have built three very high-level visualizations so far. While we did some direct filtering to explore Tables in the East and while we used Quick Filters to show certain Categories on the map, the Dashboard is really the setting where you can apply powerful, layered filters to your analysis. Let’s bring in our three sheets and get them talking to each other.



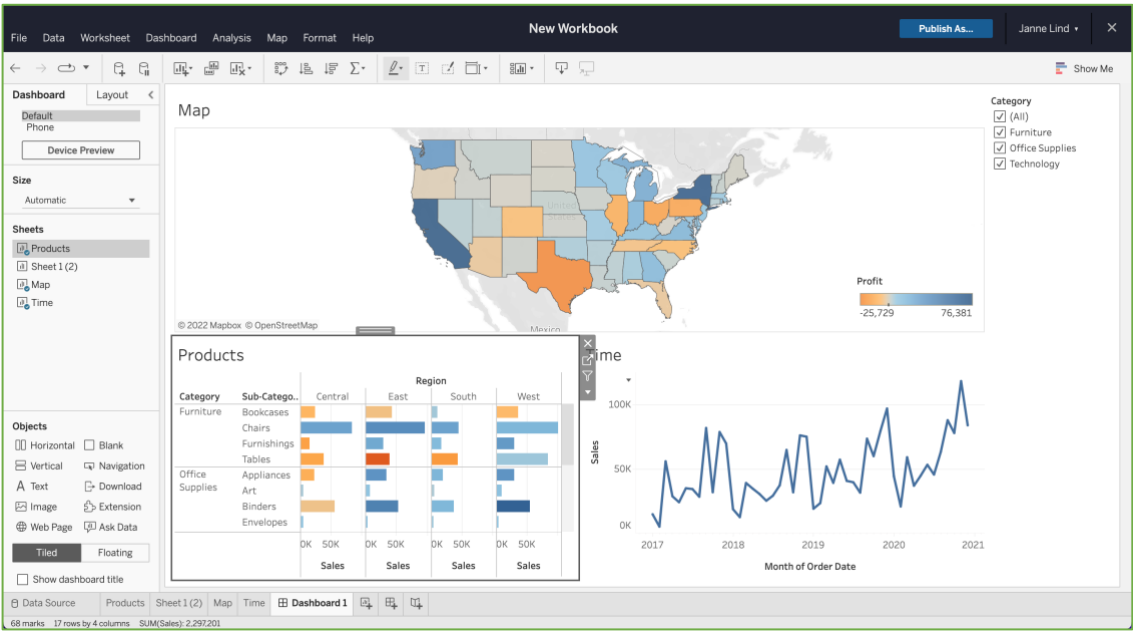
Double-click or drag your Sheets from the left-hand side into the Dashboard canvas.

Get a feel for the workspace – you can click into objects to ‘select’ them, exposing a grey box around the chosen item. There are context menu options from the dropdown arrow that appears on this grey frame.

Objects can be dragged in from the lower left to provide organization (horizontal/vertical containers) and functional/mechanical extensibility (Extensions, Web Browser, Navigation Buttons, ...). Feel free to reorganize your Dashboard elements to suit your preference.

Light formatting is included in the screenshot to the right:

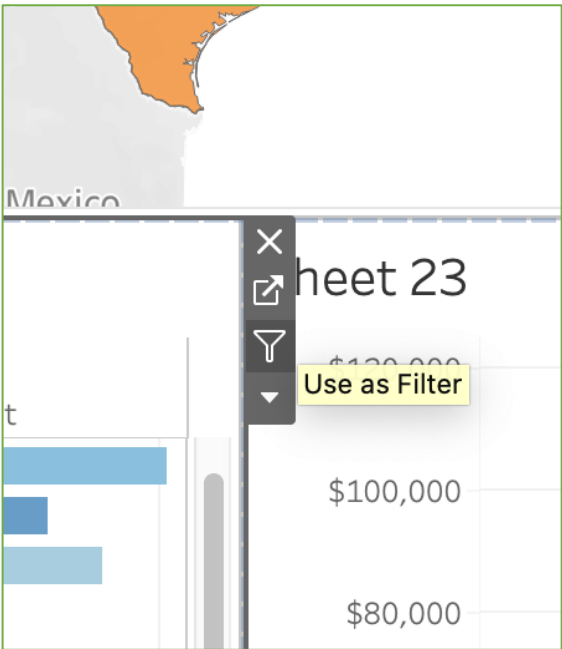
- Category Quick Filter is ‘multiple-values list’.
- Profit color legend moved to float over the map.
- Products bar chart adjusted to fit the “Fit Width”.
- Removed Size Legend.



Set up your filter behavior - apply Category filter to all sheets in play. You can click into the filter’s dropdown context menu, “Use as Filter” each viz.

First things first, we want that “Category” filter to apply to all sheets in play. You can click into the filter’s dropdown context menu to change this behavior. Notice you can filter across related Data Sources, although this doesn’t offer any increased functionality than “all using this Data Source” for today’s purposes.

Secondly, although more importantly, let’s get these sheets talking to each other! The icon above each object’s context menu dropdown arrow – something I refer to as the “world’s smallest funnel” – will allow you to use selections made in each sheet as filters for the others. We call these “Dashboard Actions” more broadly, and there are MANY ways to use these impactfully.

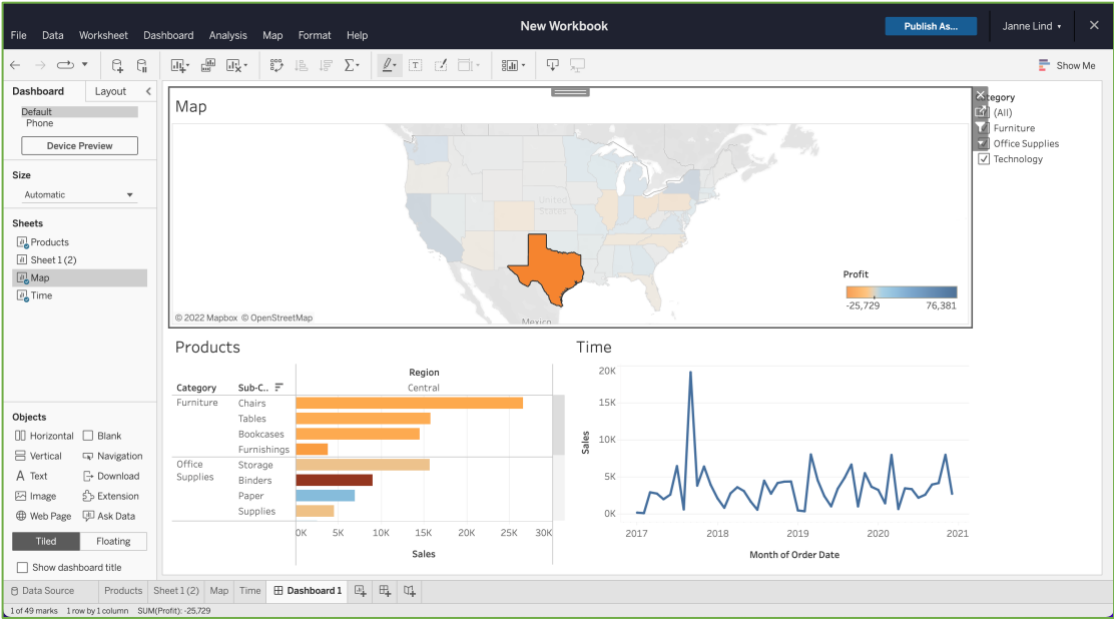


We dug into “**Tables in the East**” earlier in the workshop. What happens if we begin our analysis by digging into the profitability issues in **Texas**?

Who knew Binders were such an issue in Texas? We certainly could not identify this from the initial view, which suggests good Binder sales nationwide and only a slight dip into unprofitability across the aggregate Central region.

We call findings like these the “unknown unknowns.” This is one of the many reasons why Tableau is a better medium for analysis and data exploration than its competitors.

Can you dig further into this “Binders” issue to learn why this might have happened? How many transactions does this represent? Dig in!

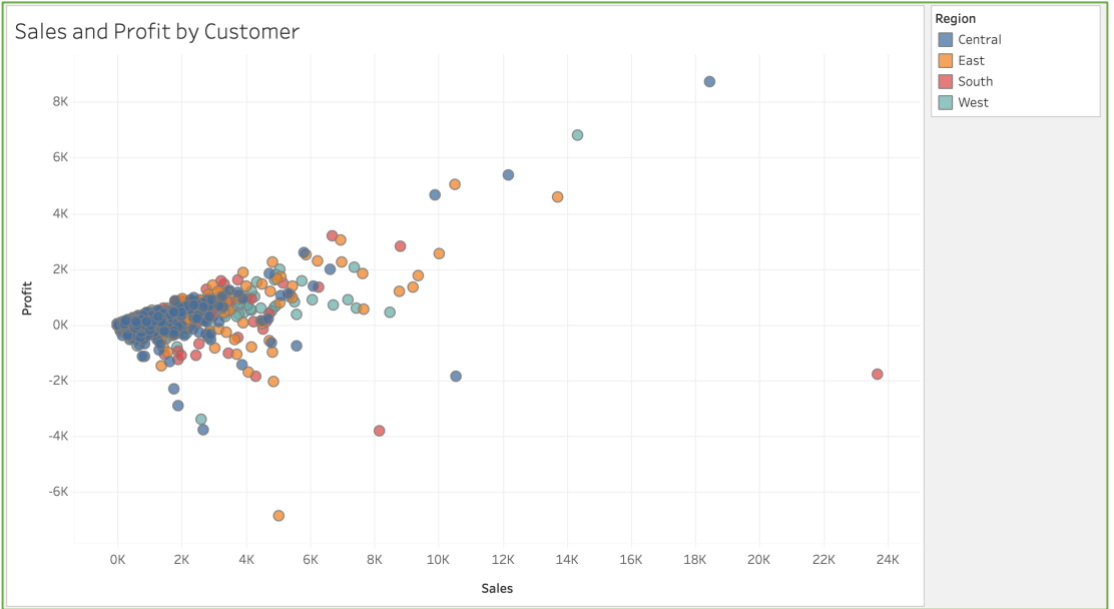


EXTRA CREDIT:

Let’s involve “Customers” in the Dashboard. Create a new viz that correlates Sales and Profit by Customer.

There isn’t only one correct answer, but I might suggest trying to build a scatter plot.

Compare what this should look like to what you know about how Tableau constructs a viz based on the Blue/Green (Discrete/Continuous) nature of the fields used. That map we made earlier is effectively a scatter plot over the top of a picture of the US.



Choose **Publish As** and use a unique name like “**Superstore Profit Analysis – YOURNAME**” and store the Workbook into **default** folder of Tableau Online site.

If publishing to **default** is prohibited choose **Personal Space** instead.

Now that we have data, and dashboard analysis in this workbook, let’s publish it up so you can share and collaborate with colleagues.

Surely nobody will be developing dashboards and analysis in a vacuum and only for themselves. Once we think that we have begun to answer questions, or get insights into a problem, it’s time to share and start a conversation.

The screenshot shows the 'Publish Workbook' dialog box. The 'Name' field is set to 'Superstore Profit Analysis - <YOURNAME>'. The 'Location' is set to 'Personal Space (Private to me)'. Under the 'Projects' section, 'default' is selected. There are checkboxes for 'Show sheets as tabs' and 'Embed password for data source'. The 'Publish' button is highlighted.

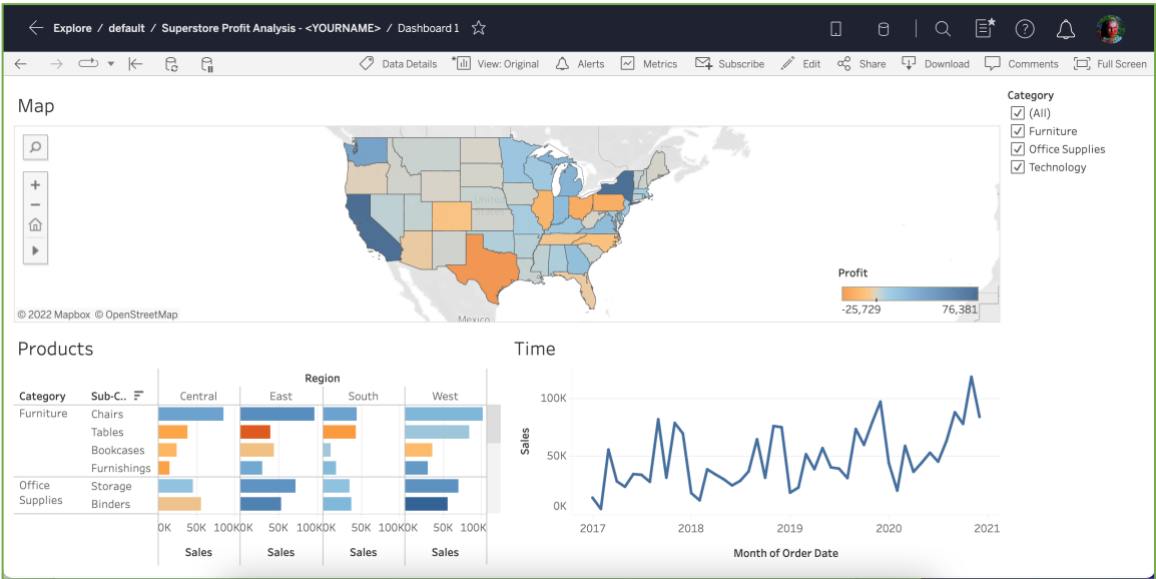
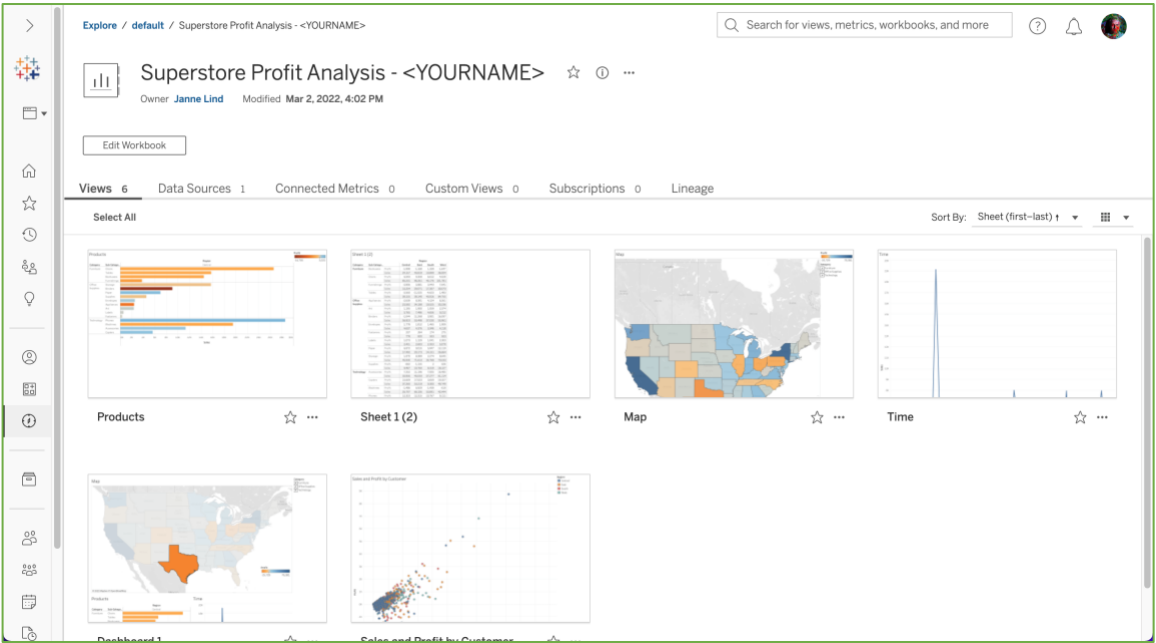
Once published. Close the Tableau web authoring experience from X on top right and locate the workbook in the folder you published it into.

Choose **Personal Space** or **Explore** from the toolbar on the right. With Explore open the default project folder.

Open the workbook you just published and open the dashboard or data visualization of your choice.

When you open the workbook from the Tableau Online portal, you will open it in end-user mode. In this consumption mode, you cannot edit dashboard, and most of the functionality of the authoring mode is hidden unless explicitly called using the toolbar edit button.

In consumption mode, end-users get lots of options to customize the view, collaborate, create metrics, set notifications, comment, etc. that are essential for making data-driven decisions.



THE END

All good things come to an end. I hope you enjoyed the workshop.