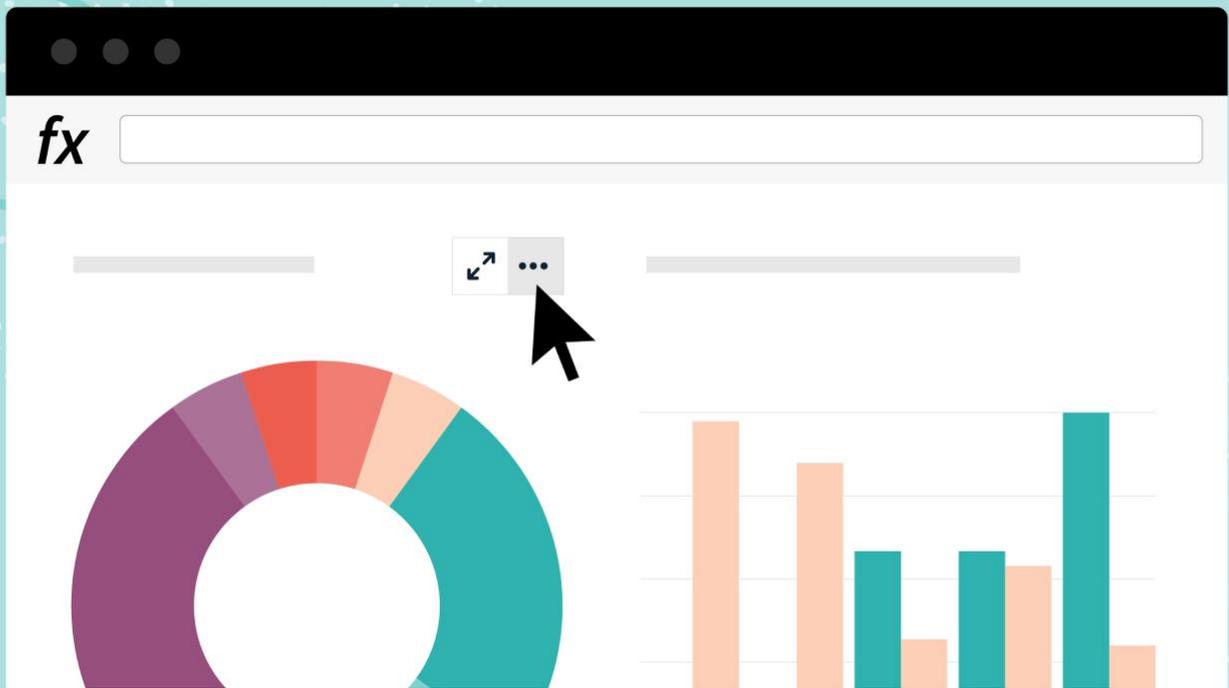


Sigma Hands-On Lab



For Free Trial Environment

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Lab Overview

This entry-level lab introduces you to the user interface and basic capabilities of Sigma, and is designed specifically for use with the Sigma free trial, 14-day environment with the default Administrator account type.

Target Audience

Anyone who will be creating, exploring, or visualizing content in Sigma. Includes technical roles like members of the Analytics & Business Intelligence team or an Operations team, to non-technical business users in the various lines of business. No SQL or technical skills are needed to do this lab.

What you'll learn

The exercises in this lab will walk you through the steps to:

- Get oriented with the Sigma UI
- Access helpful resources and Support
- Understanding different objects (Workbooks & Datasets)
- Workbooks
 - Formulas and Functions
 - Filtering
 - Groupings
 - Parameters
 - Totals
 - Visualizations/Tables/Pivot Tables
 - Building a data canvas and dashboard
- Explore
 - Include/Exclude
 - Show underlying Data
 - Drill Anywhere
 - Formulas
- Other
 - Share
 - Send Now, on Schedule, or when condition is met

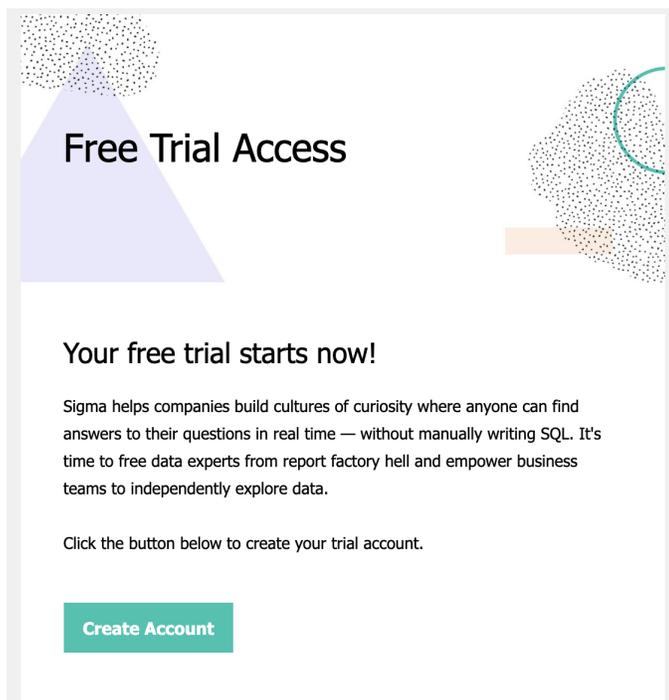
Prerequisites

- Access to a Sigma 14-day free trial environment with the default Administrator account type. Sign up for this at www.sigmacomputing.com/free-trial/
- Alternatively, an existing Sigma organization can work with this guide but it needs the connection to the “Sigma Sample Database” and lab participants need a minimum account type of “Creator” If these prerequisites are met, participants can log in and skip to Section 2.1

Module 1: Prepare Your Lab Environment

1.1 Steps to Prepare Your Lab Environment

- 1.1.1 Request access to a Sigma 14-day free trial environment at www.sigmacomputing.com/free-trial/
- 1.1.2 You will receive a “Welcome” email from Sigma to create your organization, or account. If you did not get this email, check your Spam/Junk folder.
- 1.1.3 In this email, click on the “Create Account” button and follow the steps.



- 1.1.4 On the following web page, enter in the required information and follow the steps. You are now able to proceed with the lab and should be in the Sigma user interface.

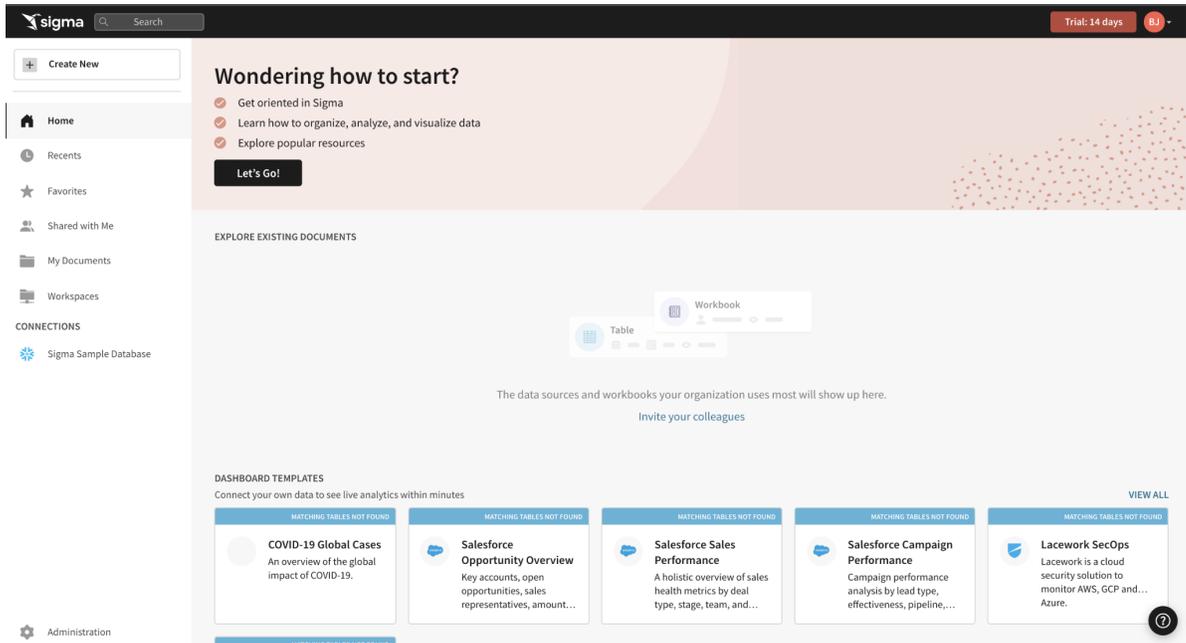
You will receive another email from Sigma with the URL needed to regain access to this free trial environment if need be.

- 1.1.5 If your monitor is large enough, it can be easier to follow this lab if you resize your browser window and PDF guide so that you can have both up at the same time.

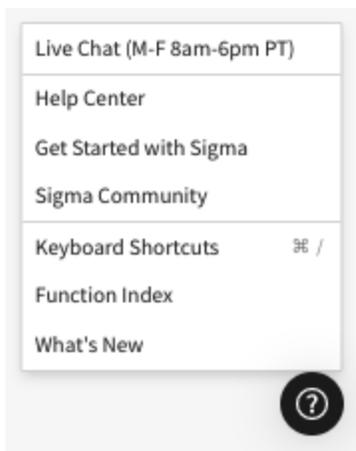
Module 2: The Sigma User Interface

2.1 Navigating the Sigma User Interface (UI)

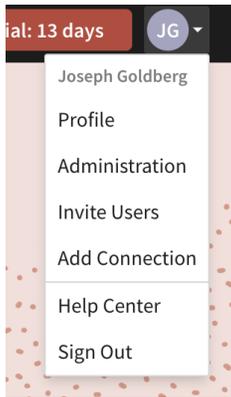
2.1.1 Per prior section, you should now be in the Sigma UI and seeing the home page below. The top section has some learning resources and below it are some pre-built dashboard templates. These are helpful for a new user or specific use case, but will not be used in the lab.



2.1.2 You can also always access Sigma live chat or get help by clicking on the question mark in the bottom right corner of every page within Sigma.



2.1.3 On the top right corner is a box with your username initial. Clicking on it reveals Profile where you can make changes to your preferences and sign out.



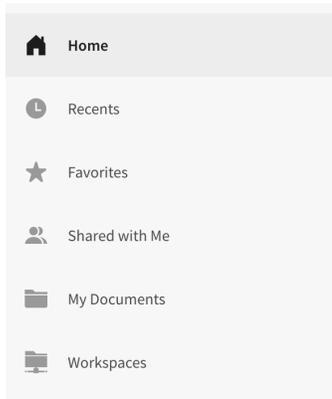
2.1.4 The main focus and mostly used section is the left side panel on your screen. This is where you will begin to access or create any content that lives inside of Sigma.



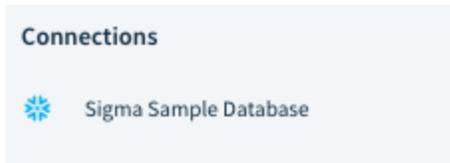
You can click on the Sigma icon at any point to get back to the home screen.
You can click in the search bar at any point to search for content within Sigma.

2.1.5 Below the search bar you have a number of tabs made available to you. These include:

- Home will bring back to home screen
- Recents will bring up items you have accessed recently
- Favorites will show a list of items that you have favorited or quicker access
- Shared with Me will show a list of items others have shared directly with you
- My Documents is a personal folder for you to save content you have created
- Workspaces are a way to organize and share content with specific members or teams within your organization. Items placed in workspaces can be accessed by anyone who has permission to that workspace.



2.1.6 Connections list the data warehouses you have connections to. Clicking on one of them shows the tables in that warehouse you can access. There can be many connections for a single Sigma account, each configured with different levels of access to the warehouse, to be shared with members or teams.



2.1.7 At the top left of the page, you can click the plus icon  in order to get a list of quick launch items.



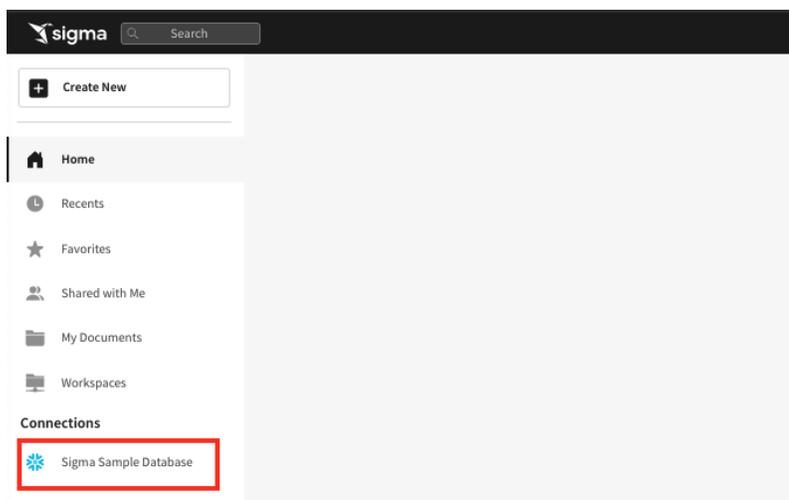
- Workbook will bring you to our Canvas where you can begin exploring your data via our spreadsheet-like user interface. Data exploration and analysis can then be turned into a wide range of elements including tables, charts, and visualizations. This in turn can power curated, or “view-only” dashboards.
- Dataset will enable the curation of data to then be shared with others
- Write SQL will allow you to write SQL to run against the data warehouse
- Upload CSV will allow you to upload a csv in order to perform analysis within a workbook

Module 3: Introduction to Sigma Workbooks

Throughout this lab we will be working with some common sales data from our fictitious company 'Plugs Electronics'. We will begin with looking at order transaction data, but throughout the course of the lab will incorporate more sources from associated store, product, and customer data. We will start by looking at some of our key store metrics around Profit, Cost, Profit Margin, and breaking down how our different product families are performing across our regions.

3.1 Explore/Create a Sigma Workbook

- 3.1.1 At the lower-left of the home page, under "Connections," click on "Sigma Sample Database", expand "EXAMPLES", expand "PLUGS_ELECTRONICS", then click on "PLUGS_ELECTRONICS_HANDS_ON_LAB_DATA". You are now connected to the Snowflake cloud data warehouse table used in the lab.



3.1.2 We now have a direct view into the database table “Plugs_Electronics_Hands_On_Lab_Data.” We see all the columns and tables in it. Note at the top right it is ~4.6 million rows and 18 columns.

The screenshot shows a data management interface with a table overview for 'PLUGS_ELECTRONICS_HANDS_ON_LAB_...'. The table has 18 columns and 4,584,628 rows. The 'PLUGS_ELECTRONICS_HANDS_ON_LAB_...' table is highlighted in the left-hand navigation pane.

123	Order Number	Date	abc	Sku Number	123	Quantity	123	Cost	123	Price	abc	Product
	83049	2016-04-01 14:46:01		HC5578098309		1		82.182692308		109.5		Arts & Entertai
	83419	2016-04-18 07:53:11		HC1023674913		3		212.278846154		283		Arts & Entertai
	83574	2019-04-13 05:59:26		HC7187893553		1		137.288461538		183		Arts & Entertai
	83929	2019-04-04 10:26:31		HC7384838026		3		42.766025641		57		Arts & Entertai
	83929	2019-04-04 10:26:31		HC9052289713		1		629.75		839.5		Arts & Entertai
	83931	2019-04-18 10:02:25		HC5578098309		3		82.147435897		109.5		Arts & Entertai
	83931	2019-04-18 10:02:25		HC3450869418		2		606.110576923		808		Arts & Entertai
	84026	2018-04-11 06:20:45		HC5226160252		3		82.147435897		109.5		Arts & Entertai
	84026	2018-04-11 06:20:45		HC5578098309		1		82.182692308		109.5		Arts & Entertai
	80122	2018-04-14 03:10:49		HC1473954319		5		651.496153846		868.5		Arts & Entertai
	81078	2017-04-14 11:22:11		HC4388140285		2		192.790865385		257		Arts & Entertai
	82818	2019-04-19 23:45:50		HC5578098309		3		41.073717949		54.75		Arts & Entertai
	78977	2016-04-08 23:32:09		HC7284838026		2		42.78353846		57		Arts & Entertai
	79030	2017-04-14 11:40:51		HC4022921832		2		298.903846154		398.5		Arts & Entertai
	79030	2017-04-14 11:40:51		HC9297875981		1		228.038461538		304		Arts & Entertai
	84481	2019-04-20 01:36:41		AU6124471627		1		153.461538462		225		Music
	84404	2019-04-11 23:45:56		CA4419013345		1		56.043956044		115		Photography
	84404	2019-04-11 23:45:56		CC6882788958		1		288.598901099		592.5		Photography
	84666	2018-04-21 23:40:44		CA8608690167		1		40.796703297		83.75		Photography
	81969	2018-04-06 22:05:33		HC6517560146		1		86.307692308		115		Arts & Entertai
	82188	2019-07-31 17:14:13		PR1224167440		1		32.803738318		99		Computers
	82188	2019-07-31 17:14:13		CT1692407873		1		57.14953271		172.5		Computers
	82249	2016-07-22 10:31:48		CT7638547239		3		95.451713396		288		Computers
	82249	2016-07-22 10:31:48		CT6845192561		1		90.327102804		272.5		Computers
	82299	2017-07-06 02:16:16		PR6329905813		3		38.115264798		115		Computers
	82302	2017-07-27 18:39:37		CT4737533741		1		38.130841121		115		Computers
	82524	2016-07-17 20:45:59		PR4658079167		3		119.797507788		361.5		Computers
	82875	2017-07-12 08:29:04		CT9776393587		2		18.901869159		57		Computers
	82133	2018-07-18 01:37:52		HC2336819470		3		83.853582555		115		Arts & Entertai
	82249	2016-07-22 10:31:48		HC2842945378		2		87.485981208		120		Arts & Entertai
	82249	2016-07-22 10:31:48		HC4474716304		1		79.878504673		109.5		Arts & Entertai

3.1.3 To begin our analysis we want to begin exploring this data. On the top right hand corner you can click the ‘Explore’ tab to open a Sigma Workbook and begin exploration.

NOTE - Just click on the “Explore” button and not the drop down option of “Create Dataset”.

The screenshot shows the Sigma interface with the 'Explore' button highlighted in a red box. Below it, a preview of the data table is shown with columns for Product Type, Product Family, Product Name, Store Name, and Store Key.

abc	Product Type	abc	Product Family	abc	Product Name	abc	Store Name	123	Store Key	abc
5	Arts & Entertainment		Hobbies & Creative Arts		1066-Football Autographed P		Black Swan Store #375		375	Wes
3	Arts & Entertainment		Hobbies & Creative Arts		1081-Hand Looms		Thoresby Store #819		819	Sou
3	Arts & Entertainment		Hobbies & Creative Arts		1027-Construction Paper		Thoresby Store #819		819	Sou

3.1.4 We often find ourselves conducting ad hoc analysis that is only needed in the current moment. So why clutter folders with one off documents never to be used again?

All workbooks are considered purely exploratory until you, as their creator, actively **save their first version**. This means you have one central location to start both your ad hoc analysis and reporting. Once you begin exploring your data, you can choose to leave the unsaved workbook behind, or you can save it and continue to build it out as a report.

Workbooks support data from multiple sources. This data can come either from tables in your Cloud Data Warehouse (CDW) or from your organization's [datasets](#).

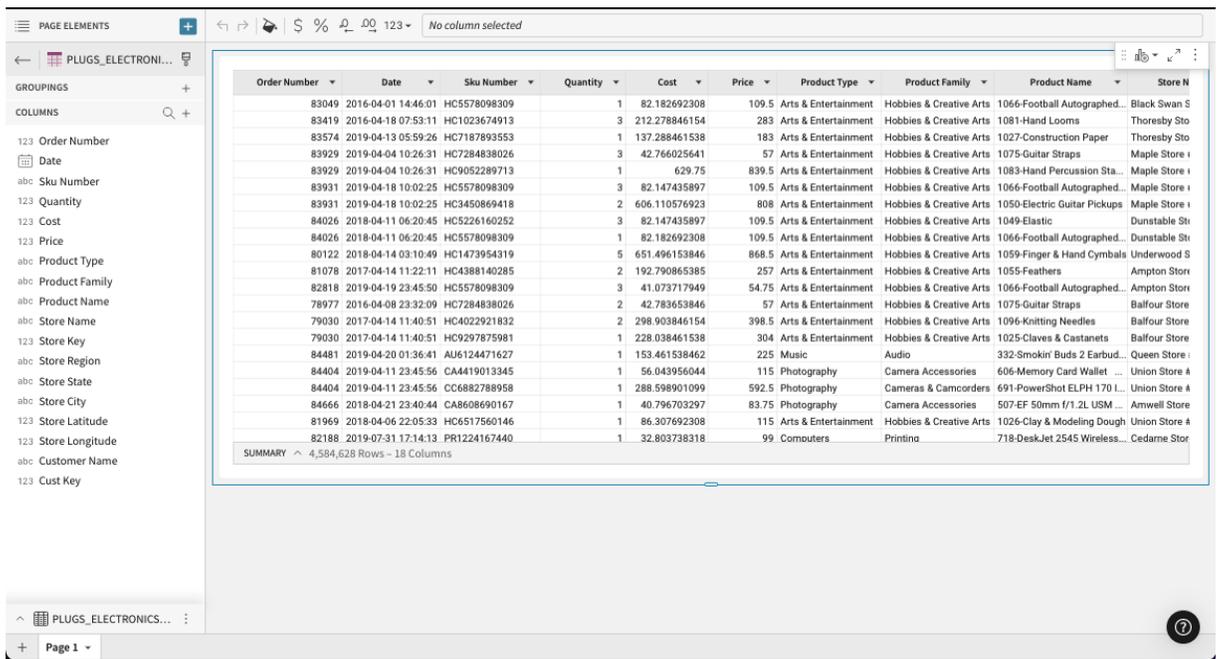
3.1.5 We are now inside a Sigma Workbook; a collaborative canvas for data driven decision makers. As you can see our table was added to the 'Canvas'. Each workbook can have one or more pages, and each page has its own canvas. The pages are shown on the tabs at the bottom of the user interface. Each canvas supports one or more visual elements (e.g. charts, tables, controls, images, etc).



Differentiator Alert!

Collaborative Canvas

At the heart of a Sigma Workbook is the collaboration canvas on each page that makes it easy to bring multiple data elements, including tables, charts, free-form text, and images, into a single page to make it easy to tell a data story, or narrative, with live data and collaborate with colleagues. Analysis and presentation are now seamlessly integrated in a spreadsheet-like experience. Run meetings, or your entire business, on Sigma.



Order Number	Date	Sku Number	Quantity	Cost	Price	Product Type	Product Family	Product Name	Store Name
83049	2016-04-01 14:46:01	HC5578098309	1	82.182692308	109.5	Arts & Entertainment	Hobbies & Creative Arts	1066-Football Autographed...	Black Swan S
83419	2016-04-18 07:53:11	HC1023674913	3	212.278846154	283	Arts & Entertainment	Hobbies & Creative Arts	1081-Hand Looms	Thoresby Sto
83574	2019-04-13 05:59:26	HC7187893553	1	137.288461538	183	Arts & Entertainment	Hobbies & Creative Arts	1027-Construction Paper	Thoresby Sto
83929	2019-04-04 10:26:31	HC7284838026	3	42.766025641	57	Arts & Entertainment	Hobbies & Creative Arts	1075-Guitar Straps	Maple Store i
83929	2019-04-04 10:26:31	HC9052289713	1	629.75	839.5	Arts & Entertainment	Hobbies & Creative Arts	1083-Hand Percussion Sta...	Maple Store i
83931	2019-04-18 10:02:25	HC5578098309	3	82.147435897	109.5	Arts & Entertainment	Hobbies & Creative Arts	1066-Football Autographed...	Maple Store i
83931	2019-04-18 10:02:25	HC3450869418	2	606.110576923	808	Arts & Entertainment	Hobbies & Creative Arts	1050-Electric Guitar Pickups	Maple Store i
84026	2018-04-11 06:20:45	HC5226160252	3	82.147435897	109.5	Arts & Entertainment	Hobbies & Creative Arts	1049-Elastic	Dunstable Str
84026	2018-04-11 06:20:45	HC5578098309	1	82.182692308	109.5	Arts & Entertainment	Hobbies & Creative Arts	1066-Football Autographed...	Dunstable Str
80122	2018-04-14 03:10:49	HC1473954319	5	651.496153846	868.5	Arts & Entertainment	Hobbies & Creative Arts	1059-Finger & Hand Cymbals	Underwood S
81078	2017-04-14 11:22:11	HC4388140285	2	192.790865385	257	Arts & Entertainment	Hobbies & Creative Arts	1055-Feathers	Ampton Stor
82818	2019-04-19 23:45:50	HC5578098309	3	41.073717949	54.75	Arts & Entertainment	Hobbies & Creative Arts	1066-Football Autographed...	Ampton Stor
78977	2016-04-08 23:32:09	HC7284838026	2	42.783653846	57	Arts & Entertainment	Hobbies & Creative Arts	1075-Guitar Straps	Balfour Store
79030	2017-04-14 11:40:51	HC4022921832	2	298.903846154	398.5	Arts & Entertainment	Hobbies & Creative Arts	1096-Knitting Needles	Balfour Store
79030	2017-04-14 11:40:51	AU6124471627	1	228.038461538	304	Arts & Entertainment	Hobbies & Creative Arts	1025-Claves & Castanets	Balfour Store
84481	2019-04-20 01:36:41	AU6124471627	1	153.461538462	225	Music	Audio	332-Smokin' Buds 2 Earbud...	Queen Store i
84404	2019-04-11 23:45:56	CA4419013345	1	56.043956044	115	Photography	Camera Accessories	606-Memory Card Wallet	Union Store #
84404	2019-04-11 23:45:56	CC6882788958	1	288.598901099	592.5	Photography	Cameras & Camcorders	691-PowerShot ELPH 170 L...	Union Store #
84666	2018-04-21 23:40:44	CA8608690167	1	40.796703297	83.75	Photography	Camera Accessories	507-EF 50mm f/1.2L USM	Amwell Store
81969	2018-04-06 22:05:33	HC6517560146	1	86.307692308	115	Arts & Entertainment	Hobbies & Creative Arts	1026-Clay & Modeling Dough	Union Store #
82188	2019-07-31 17:14:13	PR1224167440	1	32.803738318	99	Computers	Printing	718-DeskJet 2545 Wireless...	Cedarne Stor
SUMMARY ^ 4,584,628 Rows - 18 Columns									

As you can see, the table view within the workbook offers a familiar spreadsheet-like interface. Here we can get a quick overview of what data is contained in this table. It includes values like order and SKU number, date, quantity, cost, price, product name, and so on.

 **Differentiator Alert!**

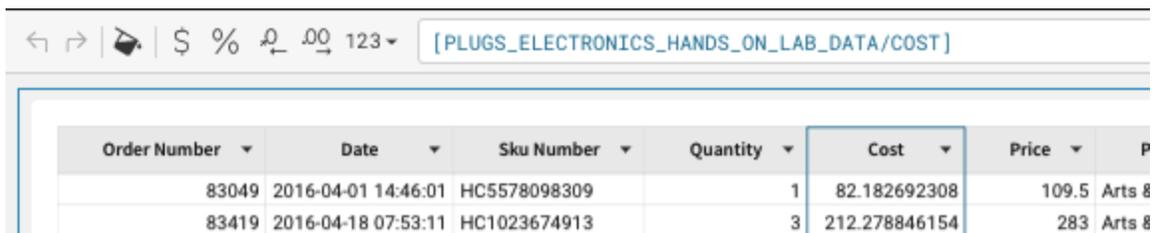
Spreadsheet-like, tabular Interface

Sigma is unique in empowering users to do analysis in an interface they already know and love: the spreadsheet. It also uses familiar functions found in spreadsheets. No need for SQL knowledge as the Sigma interface automatically, and behind the scenes, converts all user actions into optimized SQL. This spreadsheet-like interface helps speed up user adoption and success, especially with non-technical business users. This interface appears when working with tables or clicking into the underlying data powering a visualization.

3.1.6 The toolbar can be found directly under the workbook header. The toolbar's content changes depending on the element you have selected.

Selecting a column in a data element gives users with edit or explore permission access to view and edit the column's formula.

Buttons for undo, redo, and page theming can always be found in the toolbar as well.



The screenshot shows the Sigma interface. At the top, there is a toolbar with icons for navigation (back, forward), a search icon, and various data manipulation icons (currency, percentage, undo, redo). To the right of the toolbar is a text input field containing the formula `[PLUGS_ELECTRONICS_HANDS_ON_LAB_DATA/COST]`. Below the toolbar is a data table with the following columns: Order Number, Date, Sku Number, Quantity, Cost, Price, and Product Name (partially visible as 'Arts 8').

Order Number	Date	Sku Number	Quantity	Cost	Price	Product Name
83049	2016-04-01 14:46:01	HC5578098309	1	82.182692308	109.5	Arts 8
83419	2016-04-18 07:53:11	HC1023674913	3	212.278846154	283	Arts 8

3.1.7 Below the toolbar you will see our main table on the canvas with all of our columns and data going across. While the left hand pane shows a vertical view of all our column names and groupings.

The screenshot shows a data table interface. On the left, a pane titled 'GROUPINGS' and 'COLUMNS' lists various fields. The main table has the following columns: Order Number, Date, Sku Number, Quantity, Cost, Price, and Product Type. The data rows show various product entries with their respective values.

Order Number	Date	Sku Number	Quantity	Cost	Price	Product Type
83049	2016-04-01 14:46:01	HC5578098309	1	82.182692308	109.5	Arts & Entertainment
83419	2016-04-18 07:53:11	HC1023674913	3	212.278846154	283	Arts & Entertainment
83574	2019-04-13 05:59:26	HC7187893553	1	137.288461538	183	Arts & Entertainment
83929	2019-04-04 10:26:31	HC7284838026	3	42.766025641	57	Arts & Entertainment
83929	2019-04-04 10:26:31	HC9052289713	1	629.75	839.5	Arts & Entertainment
83931	2019-04-18 10:02:25	HC5578098309	3	82.147435897	109.5	Arts & Entertainment
83931	2019-04-18 10:02:25	HC3450869418	2	606.110576923	808	Arts & Entertainment
84026	2018-04-11 06:20:45	HC5226160252	3	82.147435897	109.5	Arts & Entertainment
84026	2018-04-11 06:20:45	HC5578098309	1	82.182692308	109.5	Arts & Entertainment
80122	2018-04-14 03:10:49	HC1473954319	5	651.496153846	868.5	Arts & Entertainment
81078	2017-04-14 11:22:11	HC4388140285	2	192.790865385	257	Arts & Entertainment
82818	2019-04-19 23:45:50	HC5578098309	3	41.073717949	54.75	Arts & Entertainment
78977	2016-04-08 23:32:09	HC7284838026	2	42.783653846	57	Arts & Entertainment
79030	2017-04-14 11:40:51	HC4022921832	2	298.903846154	398.5	Arts & Entertainment
79030	2017-04-14 11:40:51	HC9297875981	1	228.038461538	304	Arts & Entertainment
84481	2019-04-20 01:36:41	AU6124471627	1	153.461538462	225	Music
84404	2019-04-11 23:45:56	CA4419013345	1	56.043956044	115	Photography
84404	2019-04-11 23:45:56	CC6882788958	1	288.598901099	592.5	Photography
84666	2018-04-21 23:40:44	CA8608690167	1	40.796703297	83.75	Photography
81969	2018-04-06 22:05:33	HC6517560146	1	86.307692308	115	Arts & Entertainment
82188	2019-07-31 17:14:13	PR1224167440	1	32.803738318	99	Computers

3.1.8 At the top of each column, note the small downward-facing arrow. When clicked on, it reveals a column header dropdown that displays a variety of options including options to perform quick formatting, sorting, or aggregations of columns. At the top of the 'Cost' column, click the column dropdown and select 'Add New Column'

This image shows a close-up of the 'Cost' column header dropdown menu. The menu is open, displaying various options for column manipulation. The 'Add new column' option is highlighted with a red box.

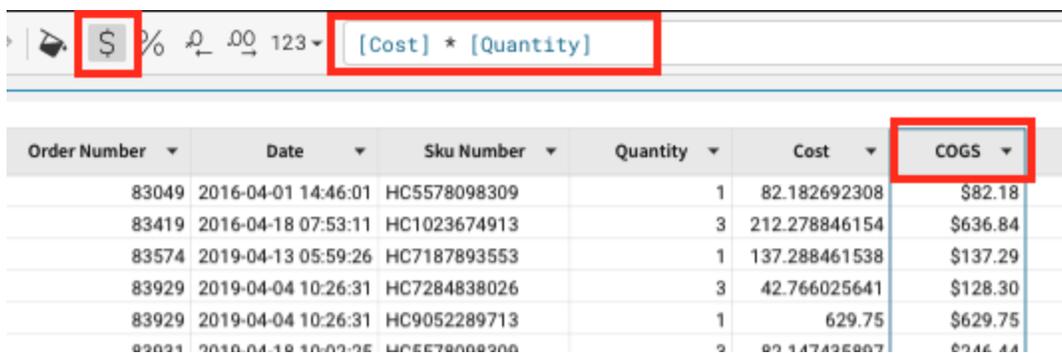
Date	Sku Number	Quantity	Cost	Price	Product Type
6-04-01 14:46:01	HC5578098309	1	82.182692		entertainment
6-04-18 07:53:11	HC1023674913	3	212.278846		entertainment
9-04-13 05:59:26	HC7187893553	1	137.288461		entertainment
9-04-04 10:26:31	HC7284838026	3	42.766025		entertainment
9-04-04 10:26:31	HC9052289713	1	62		entertainment
9-04-18 10:02:25	HC5578098309	3	82.147435		entertainment
9-04-18 10:02:25	HC3450869418	2	606.110576		entertainment
8-04-11 06:20:45	HC5226160252	3	82.147435		entertainment
8-04-11 06:20:45	HC5578098309	1	82.182692		entertainment
8-04-14 03:10:49	HC1473954319	5	651.496153		entertainment
7-04-14 11:22:11	HC4388140285	2	192.790865		entertainment
9-04-19 23:45:50	HC5578098309	3	41.073717		entertainment
6-04-08 23:32:09	HC7284838026	2	42.783653		entertainment
7-04-14 11:40:51	HC4022921832	2	298.903846		entertainment
7-04-14 11:40:51	HC9297875981	1	228.038461		entertainment
9-04-20 01:36:41	AU6124471627	1	153.461538		Aud
9-04-11 23:45:56	CA4419013345	1	56.043956		aphy
9-04-11 23:45:56	CC6882788958	1	288.598901		aphy
8-04-21 23:40:44	CA8608690167	1	40.796703		aphy

3.1.9 This will jump you to the function bar at the top of the screen. Here you can create functions to perform different calculations on the data in the table.

Let's enter the simple formula $[Cost] * [Quantity]$ to get the total cost of goods sold. Note how as you type, Sigma tries to save you time by automatically suggesting formulas or values you might want to use. If you click on one of these suggestions, it will show up in the formula bar properly bracketed.

Then click the Return key on your computer to run the calculation.

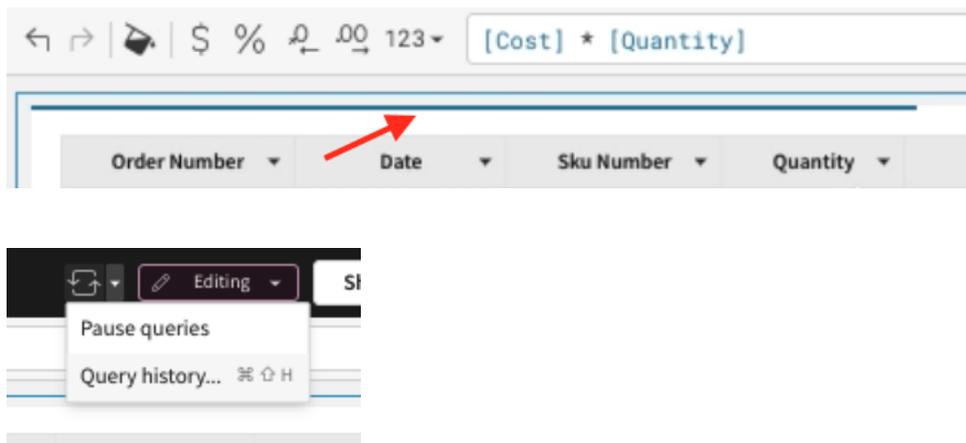
Next double click the New Column header and rename it to 'COGS' (cost of goods sold). We can then use the quick format button with the dollar sign to make this a currency.



The screenshot shows the Sigma interface. At the top, a formula bar contains the expression $[Cost] * [Quantity]$. Below it, a table displays data with a new column labeled 'COGS'. The 'COGS' column is highlighted with a red box, and the dollar sign format button in the toolbar above it is also highlighted with a red box.

Order Number	Date	Sku Number	Quantity	Cost	COGS
83049	2016-04-01 14:46:01	HC5578098309	1	82.182692308	\$82.18
83419	2016-04-18 07:53:11	HC1023674913	3	212.278846154	\$636.84
83574	2019-04-13 05:59:26	HC7187893553	1	137.288461538	\$137.29
83929	2019-04-04 10:26:31	HC7284838026	3	42.766025641	\$128.30
83929	2019-04-04 10:26:31	HC9052289713	1	629.75	\$629.75
83929	2019-04-18 10:00:00	HC5578098309	1	82.182692308	\$82.18

3.1.10 You may have noticed a blue line moving across the screen after inputting the calculating and hitting Enter. In Sigma, every action is transformed into SQL and sent to the data warehouse to be executed and to retrieve the results. This ensures your data in Sigma is always live and up to date with the latest results. At any time, you can click on the dropdown next to the refresh icon and select the query history to see exactly what is being run.



Action < All Queries

✓ Evaluate Query	Query Details ⚙️ Sigma Sample Database
✓ Count Rows	Action Evaluate Query
✓ Evaluate Query	Status ✓ Completed
✓ Data Source Preview	Run Time 2.0 s (12:10:26 PM - 12:10:28 PM) ⓘ
✓ Count Rows	Sigma Request Id 3090703067fb414d93b301a546a9e52a 📄

SQL Copy SQL

```
1 select
```



Differentiator Alert!

Direct Connection to the Cloud Data Warehouse

Sigma is unique versus many other BI products in that Sigma is fully-managed SaaS, offers a direct connection to the Cloud Data Warehouse (CDW), and pushes all queries to the CDW for execution. Benefits of this include:

- Data accessed by Sigma is always live and accurate
- Unlimited query speed and scale as Sigma leverages the compute resources of the CDW. Queries across hundreds of billions of rows are performant.
- Stronger security and governance as data never leaves the CDW and it is easy to control permissions via a single point of access.

With many other BI products, data is extracted out of the CDW to local desktops/servers for analysis which leads to stale data, limited scale and speed, and security issues with extracts scattered across many desktops and file shares.

3.1.11 Now, let's do a similar calculation to get our order price. Click the column dropdown from the 'Price' column and select 'Add New Column'. Enter the function $[Price] * [Quantity]$ to get the total Revenue of this transaction. Then click the Return key on your computer to run the calculation. Then double click the New Column header and rename it to 'Revenue'. Click the quick format dollar sign button to make this a currency.

← → | 📌 | \$ % ↕ .00 123 ▾ | $[Price] * [Quantity]$

	Sku Number ▾	Quantity ▾	Cost ▾	COGS ▾	Price ▾	Revenue ▾	
6	HC5226160252	5	39.549074074	\$197.75	54.75	\$273.75	Arts
4	HC1066817727	2	20.599537037	\$41.20	28.5	\$57.00	Arts
9	HC1045298145	2	102.208333333	\$204.42	141.5	\$283.00	Arts
6	ES3545123519	1	140.222222222	\$140.22	178	\$178.00	Ente

3.1.12 Now that we have our COGS and Revenue we should be able to calculate our profit. Click the dropdown from the 'Revenue' column and select 'Add New Column'. Enter the function $[Revenue] - [COGS]$ to get the profit made of this transaction. Then click the Return key on your computer to run the calculation. Then double click the New Column header and rename it to 'Profit'. Click the quick format dollar sign button to make this a currency if it is not already.

📌 | \$ % ↕ .00 123 ▾ | $[Revenue] - [COGS]$

umber ▾	Quantity ▾	Cost ▾	COGS ▾	Price ▾	Revenue ▾	Profit ▾	P
i0252	5	39.549074074	\$197.75	54.75	\$273.75	\$76.00	Arts 8
7727	2	20.599537037	\$41.20	28.5	\$57.00	\$15.80	Arts 8
8145	2	102.208333333	\$204.42	141.5	\$283.00	\$78.58	Arts 8
3519	1	140.222222222	\$140.22	178	\$178.00	\$37.78	Entert

3.1.13 Now that we know our profit made for each transaction, we may also be interested to know the profit margin percentage on each item. At the top of the 'Profit' column use the drop-down to add another new column and enter the calculation $[Profit] / [Revenue]$ to get the profit margin percentage. Then click the Return key on your computer to run the calculation.

Rename the column 'Profit Margin' In this case, change the formatting to a %.

ty	Cost	COGS	Price	Revenue	Profit	Profit Margin	Pr
5	39.549074074	\$197.75	54.75	\$273.75	\$76.00	27.76%	Arts &
2	20.599537037	\$41.20	28.5	\$57.00	\$15.80	27.72%	Arts &
2	102.208333333	\$204.42	141.5	\$283.00	\$78.58	27.77%	Arts &
1	140.222222222	\$140.22	178	\$178.00	\$37.78	21.22%	Enterte



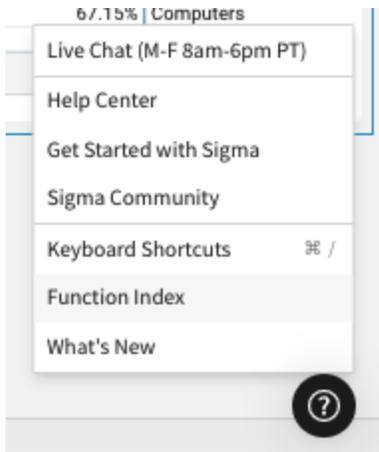
Differentiator Alert!

Browser Query

While Sigma does push queries to the CDW to take advantage of its scale and speed, Sigma is unique in that it first does an evaluation to see if the query or operation can be done in the end user's browser using the data in the browser cache. This functionality is called Browser Query and leads to near-instant results and a faster, better user experience.

Browser Query can perform operations like queries, filters, and sorts. And it is important to note that it is NOT a desktop data extract or summary as is the case with many other BI tools. Browser Query uses fresh data from the CDW and as soon as the browser is closed, the cache is flushed and the data does not persist, eliminating security or governance risk.

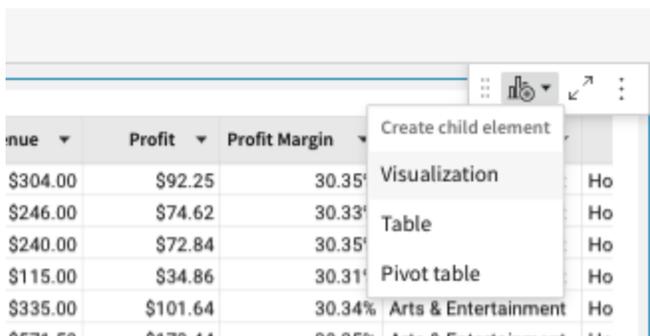
- 3.1.14** Some of these functions have been pretty easy, but note Sigma is capable of performing any function available in excel/google sheets or SQL. We will get into some more advanced functions later, but you can always check out the complete list by clicking the ‘Help’ button in the lower right hand corner and selecting ‘Function Index’.



3.2 Create Visual Elements

- 3.2.1** As mentioned above, the Canvas allows us to add any number of Elements to our exploration. Elements include visualizations, tables, pivot tables, filters, parameters, etc.
- 3.2.2** It is often easier to spot trends, outliers, or insights which lead to further questions when viewing data in a visualization. Sigma makes it easy to create visualizations of your data while also enabling you to dig into the data that makes up that visualization.

Start the creation of a visualization by hovering over the table and in the right hand corner clicking the chart icon dropdown and selecting ‘Visualization’.



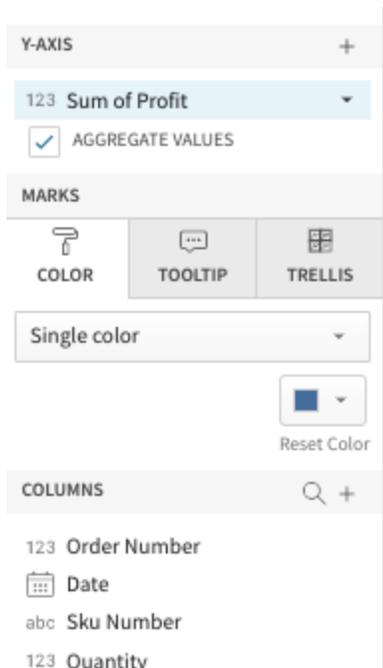
3.2.3 This will add a Visualization below our table. In the left-hand bar you will see a dropdown that lists all of the supported visualizations.

The screenshot shows a data visualization tool interface. On the left, there is a 'VISUALIZATION' panel with a dropdown menu showing various chart types: Bar, Line, Area, Scatter, Combo, Donut, Pie, and Single Value. Below this is a 'COLUMNS' panel with a search icon and a plus sign, listing '123 Order Number' and 'Date'. The main area displays a table with columns for Order Number, Date, Product Code, Quantity, Price, and Total. A 'SUMMARY' row is visible at the bottom of the table. To the right of the table, a visualization panel shows a small bar chart with three bars of increasing height.

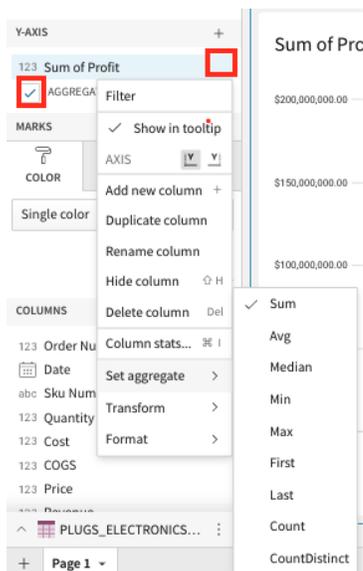
3.2.4 Select the bar chart. On the X-Axis click the plus button and let's add our [Store Region] column. Notice you can search here for the column you wish to add.

The screenshot shows the visualization tool interface with the 'X-AXIS' panel selected. A red box highlights a plus sign button next to the X-axis. A 'Select column' dialog box is open, showing a search bar with the text 'region' and a list of columns. The column 'Store Region' is highlighted in a red box. The 'Y-AXIS' panel has a checkmark next to 'AGGREGATE VALUES'. The 'MARKS' panel is visible at the bottom.

3.2.5 We can also drag values onto the Axis instead of using the add button. If we look at our columns on the bottom, find the [Profit] column and drag it under the Y-Axis.

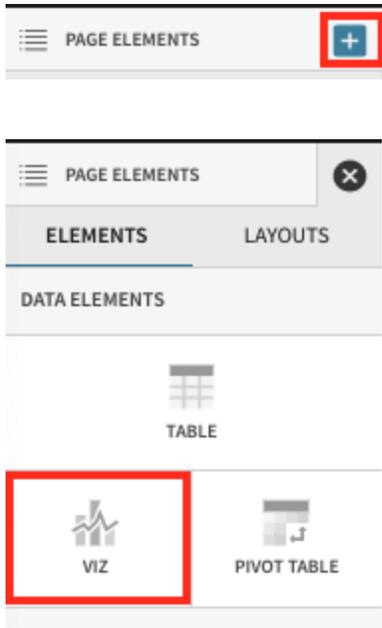


Notice that Sigma automatically summed the profit to create an aggregate. You can change the type of aggregate at any time using the dropdown, or if you do not wish to aggregate the values you can uncheck the 'Aggregate Values' checkbox.



3.2.6 Now let's look at our sales over time to get an understanding of how we are trending. Another way to create a new chart is by selecting the '+' icon on the top left panel next to the 'Page Elements' title.

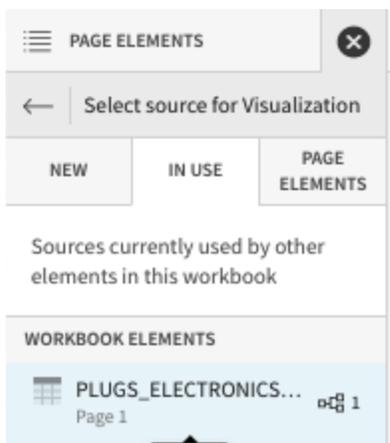
Click on the '+' icon to get a list of elements that we can add to our canvas and choose 'Viz'.



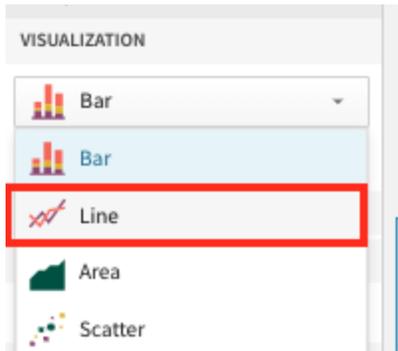
After selecting the 'Viz' icon, you will be prompted to select a source to use for that 'viz'. You can see tabs for selecting:

- **In Use:** sources that are currently being used by other elements in the workbook
- **New:** a new source that could be a table, dataset, sql, or uploaded csv
- **Page Elements:** Any data elements already in the workbook such as the bar chart we created or the table

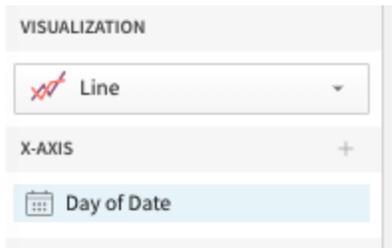
From the In Use tab select the Workbook Element 'Plugs_Electronics_Hands_On_Lab_Data'



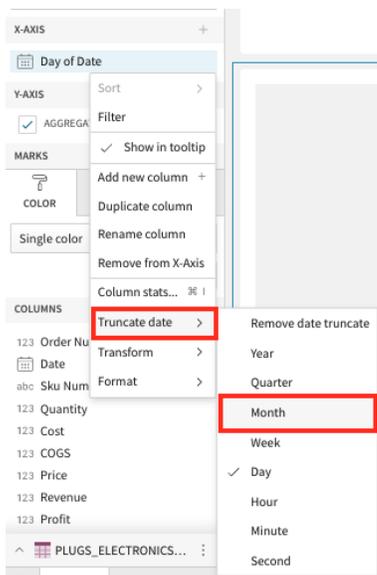
3.2.7 We now have a new chart below our bar chart. This time, using the Visualization dropdown, select a line chart.



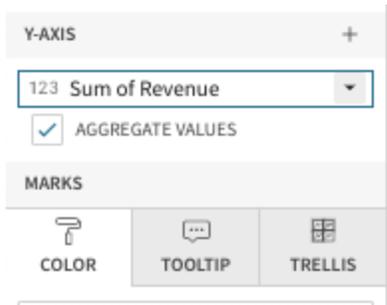
3.2.8 Next, let's drag the 'Date' column into the X-Axis. (optionally add it using the '+' icon next to the x-axis).



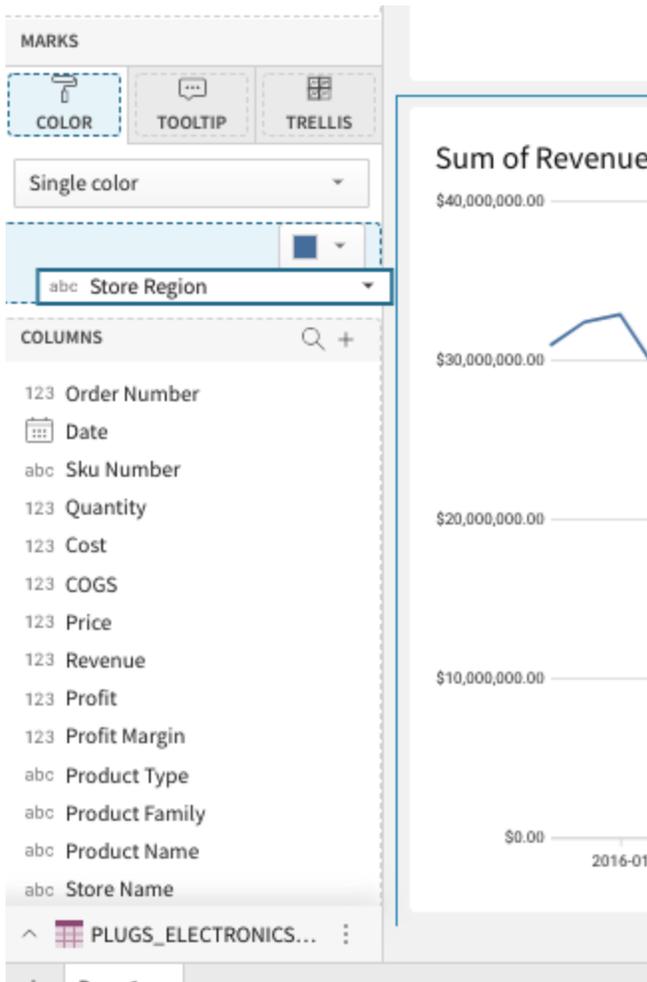
3.2.9 Notice that Sigma has defaulted to change the aggregation to 'Day' as the title now reads 'Day of Date'. We can change this aggregation at any time using the dropdown next to the field name. Let's change the aggregation level to be 'Month'.



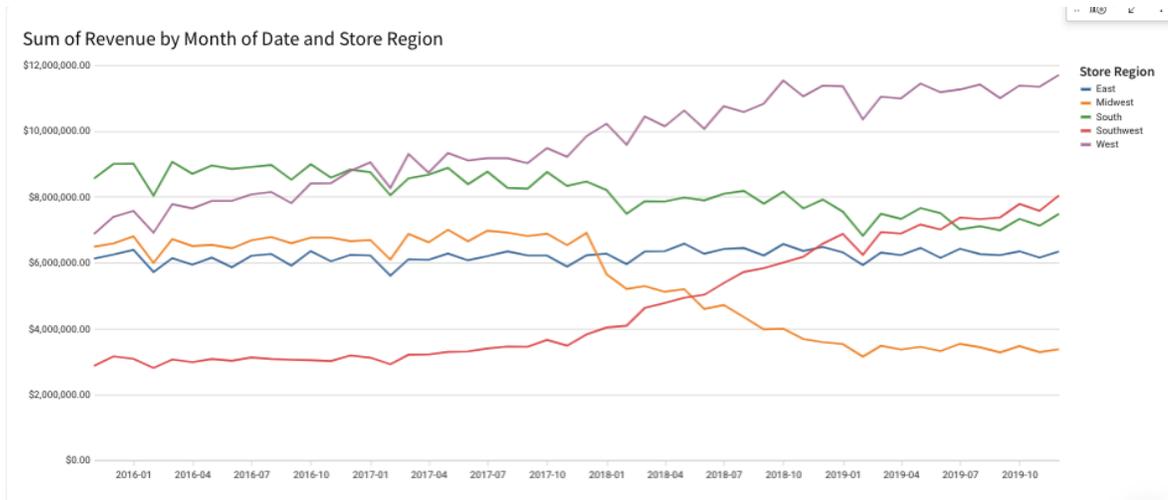
3.2.10 Next we can place our [Revenue] column on the Y-Axis to see our revenue of time. Again, Sigma has automatically summed the revenue to the monthly level.



3.2.11 Taking this one step further, we can compare our different regions by placing [Store Region] on color. You can do this by finding the store region column in the 'columns' tray and dragging it into the color tab.

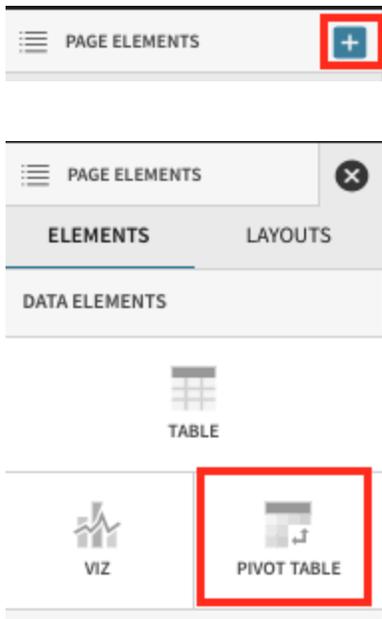


We now have a line chart showing our Revenue over time by store region.



3.2.12 Let's create one more chart. This time we want to create a Pivot Table.

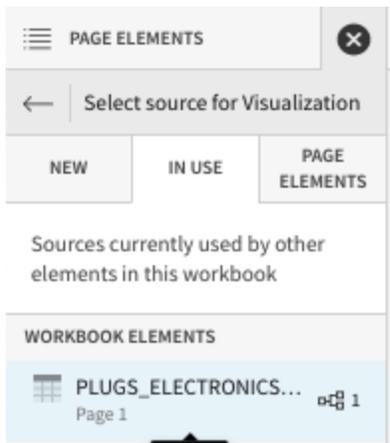
Click on the '+' icon to get a list of elements that we can add to our canvas and choose Pivot Table'.



After selecting the 'Viz' icon, you will be prompted to select a source to use for that 'viz'. You can see tabs for selecting:

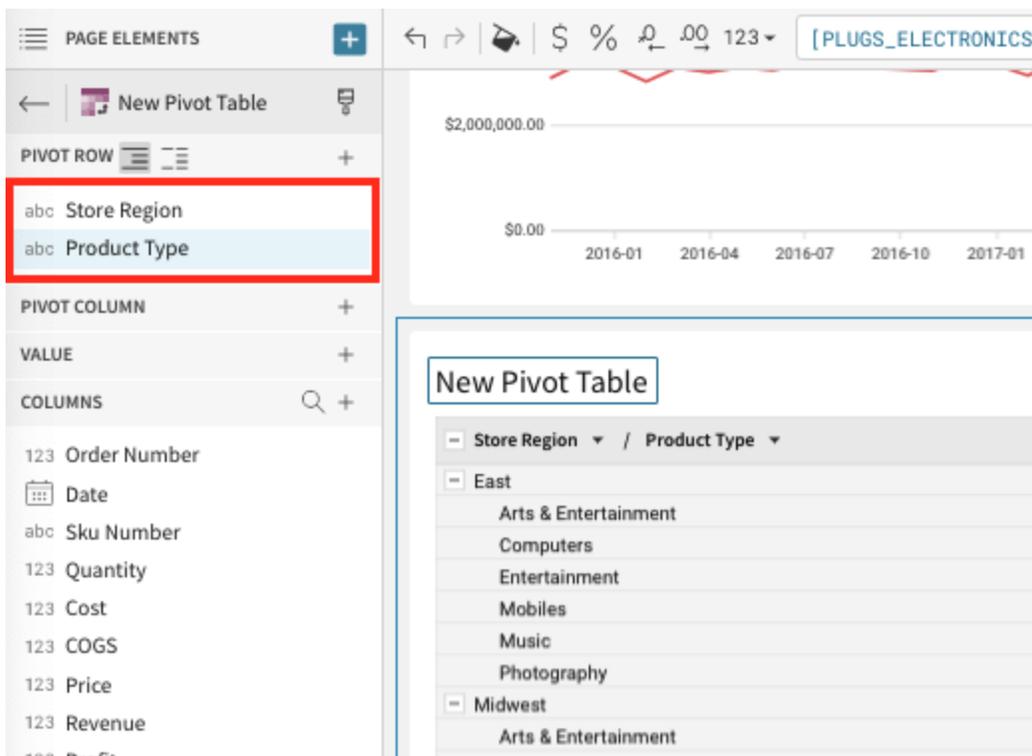
- **In Use:** sources that are currently being used by other elements in the workbook
- **New:** a new source that could be a table, dataset, sql, or uploaded csv
- **Page Elements:** Any data elements already in the workbook such as the bar chart we created or the table

From the In Use tab select the Workbook Element 'Plugs_Electronics_Hands_On_Lab_Data'

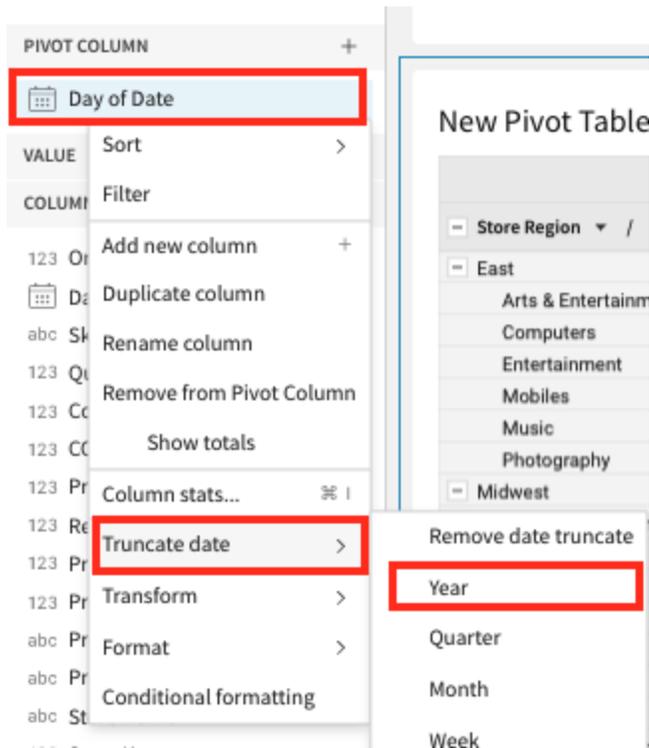


3.2.13 We can use Pivot Tables to slice and dice our data in a number of ways. In this scenario we want to look at Profit and Profit Margin by Regions and Product Type over time.

First we will want to drag [Store Region] and [Product Type] to our Pivot Row.



3.2.14 Next we will want to drag [Date] to the Pivot Column. We also want to truncate the date to Year.



3.2.15 Notice that Year 2015 appears first, lets change to sort order to have our most recent year at the far left. You can either do this from the Pivot Column panel using the dropdown next to the 'Year of Date' field, or we can do it directly in the Pivot Table itself by selecting the dropdown next to 'Year of Date' column header and clicking sort 'Year of Date'



3.2.16 Lastly, we will want to add our values which we want to look at. Drag the [Profit] and [Profit Margin] fields into the Value shelf.

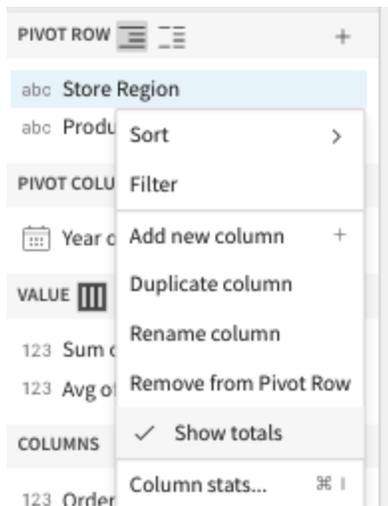
		Year of Date ▼	
		2019	
Store Region ▼ / Product Type ▼		Sum of Profit	Sum of Profit Margin
East			
Arts & Entertainment		\$4,798,634.29	926,359.27%
Computers		\$7,117,187.27	2,045,048.86%
Entertainment		\$2,197,789.73	605,697.07%
Mobiles		\$8,641,438.09	2,399,458.70%
Music		\$3,947,697.18	1,224,905.40%
Photography		\$6,594,195.37	1,755,854.29%

3.2.17 Our [Profit Margin] is a little off, so let's change it to be an Average instead of a Sum by clicking the dropdown menu next to 'Sum of Profit Margin' and selecting an aggregation of AVG.

3.2.18 We also have the option to show totals at higher grains of detail. If you select the dropdown next to [Product Type] in the Pivot Row shelf, you will get an option for 'Show Totals'. Selecting this will give the totals up to the Regional level.

		Year of Date ▼
		2019
Store Region ▼ / Product Type ▼		Sum of Profit
East		\$33,296,941.93
Arts & Entertainment		\$4,798,634.29

3.2.19 Let's do the same for [Store Region].

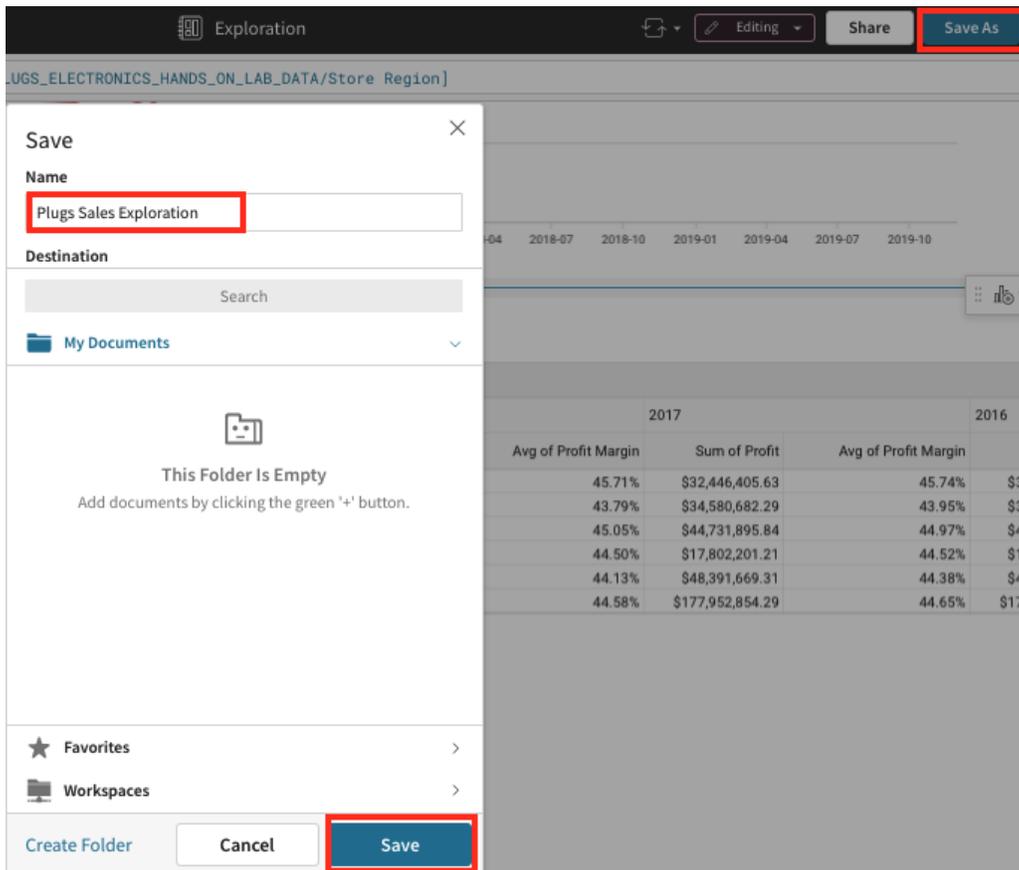


3.2.20 Now if we collapse all of our hierarchies by selecting the collapse icon next to Store Region in the Pivot Table, we can see the totals.

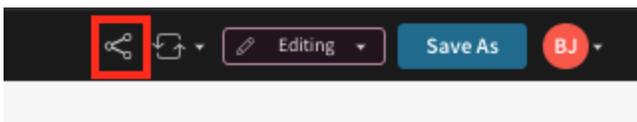
New Pivot Table

	Year of Date ▾	
	2019	
+ Store Region ▾ / Product Type ▾	Sum of Profit	Avg of Profit Margin
+ East	\$33,296,941.93	45.54%
+ Midwest	\$17,610,242.48	43.99%
+ South	\$38,324,929.16	44.93%
+ Southwest	\$38,126,324.25	44.35%
+ West	\$58,791,738.32	43.96%
Total	\$186,150,176.14	44.49%

3.2.21 At this point we might want to save some of this analysis. Remember, we have not actually saved anything, we have just been exploring. On the top right corner please select 'Save As' to save our workbook. Give it a name and click 'Save'.



3.2.22 Once you publish, click on the "Share" button at the top right of the screen. Note you now have the option to share your workbook with other team members within your organization or groups of people known as 'Teams' in Sigma. You can optionally check the 'Send an email notification' checkbox to notify them of this content via email.



Share Plugs Sales Exploration

Share Who has Access Link Sharing

Member or Team	Permission
<input type="text" value="Search for members or teams"/>	

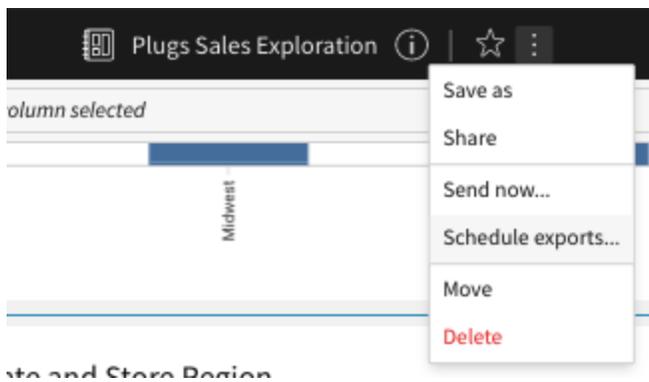
Add a Message

Send an email notification

Cancel Save

Click the “Cancel” button.

- 3.2.23** Optionally, you also have the option to send this to someone or schedule it to be delivered to you on any cadence.



Module 4: Creating a Dashboard

Dashboards are a great way to show and share a set of visualizations that are meant to be looked at together. This could be a high level executive summary down to a very specific set of visualizations to analyze a specific part of the business. In this module we will use the work from the previous module to assemble a dashboard.

In Sigma, an entire data canvas or just a subset of elements on the canvas, can be turned into a dashboard for others to view. You have full control on how end viewers can interact with the dashboard. In this lab the viewers can drill into the dashboard to explore the underlying data powering it, but optionally the dashboard could be “locked down” so end viewers cannot drill through the dashboard to underlying data.

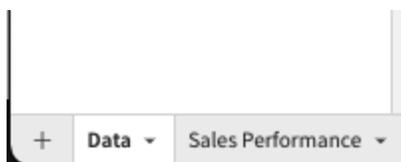
4.1 Create a Dashboard

4.1.1 We have created some calculations and great visualizations, but now we want to put them on a single canvas and organize them in a better way before sharing them with others.

To get started, scroll to the bar chart we created and hover over it until you see the menu icon appear in the upper right corner. Click on the ellipses and select ‘Move to Page’ -> ‘New Page’.



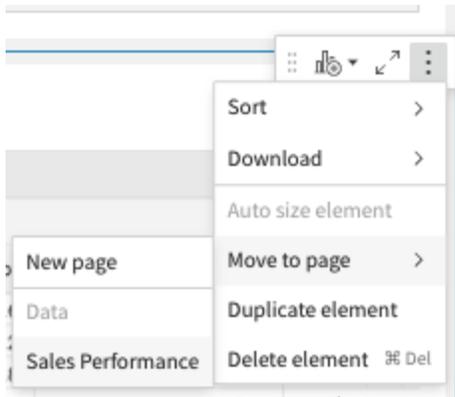
4.1.2 By doing this, we have created a new page where we can bring together all of our visualizations on a different canvas, separate from the data table we created. In the lower left hand corner, let's rename 'Page 2' to be 'Sales Performance' and 'Page 1' to be 'Data'.



4.1.3 Next, let's move our other charts to the 'Sales Performance' page. Click on the 'Data' page on the bottom left corner and navigate to the line chart.

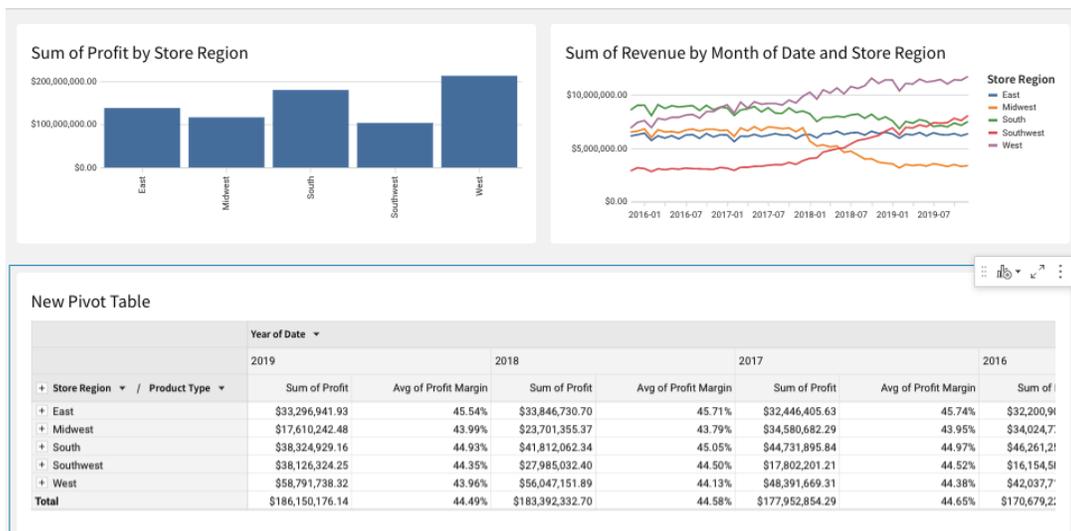
Again, hover over the chart until you see the menu icon appear in the upper right corner. Click on the ellipses and select 'Move to Page' -> 'Sales Performance'

Once more, navigate to the pivot table and hover over the chart until you see the menu icon appear in the upper right corner. Click on the ellipses and select 'Move to Page' -> 'Sales Performance'



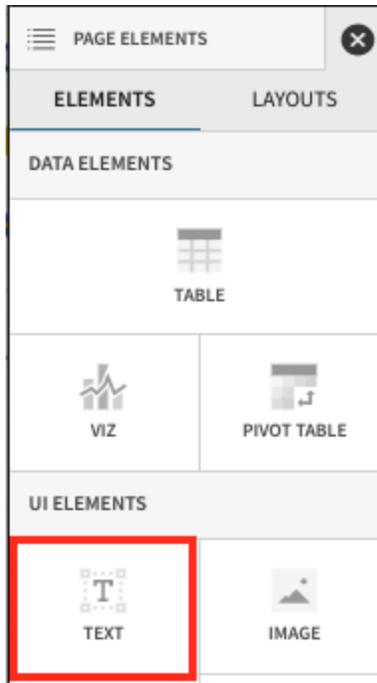
4.1.4 Next, click on the 'Sales Performance' page and notice all 3 charts have been moved here. Every Element that has been added to a canvas can easily be moved around and arranged in any manner you like.

Let's hover over the line chart until you see a hand icon appear. We can grab this chart and move it to the right hand side of our bar chart. You can also resize any of the charts to make them fit as you need.



4.1.5 Next, let's give this dashboard some context for our users. Using our text elements, we can give the page a title, as well as let users know what this dashboard is used for, giving them context.

Clicking the '+' icon on the upper left-hand pane next to 'Page Elements', select 'Text'. This will add a text box to the canvas.

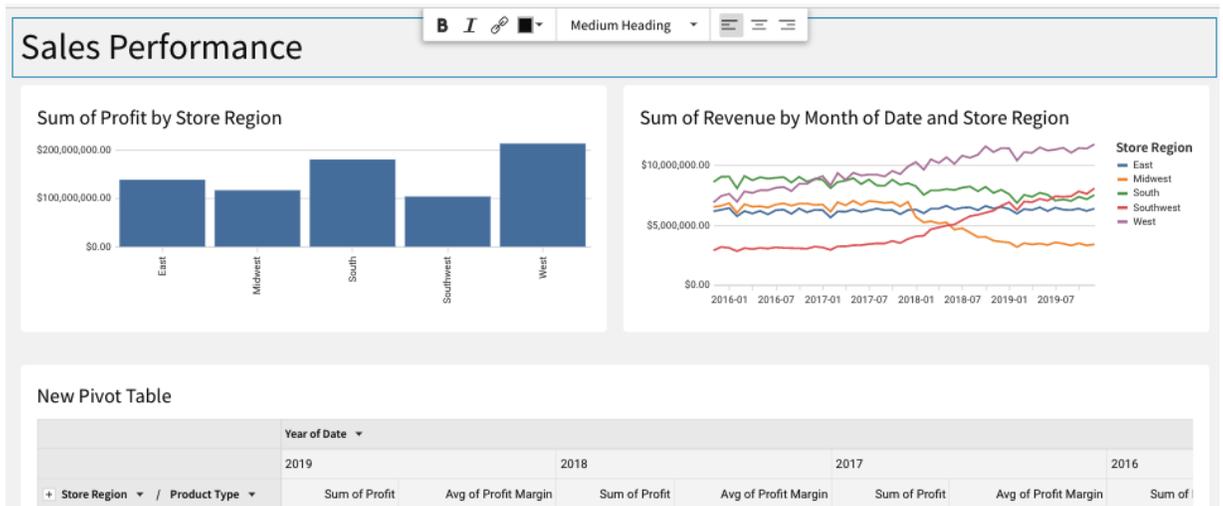


You will also notice other elements available to you here:

- Image: upload images or urls to show an image on the canvas
- Button: use buttons to navigate to other workbooks, websites, or download as a pdf
- Embed: embed other websites or applications into your workbook
- Spacer: used to add space between elements on the canvas
- Divider: used to create hard divisions between sections of the canvas

We will visit Control Elements in later steps.

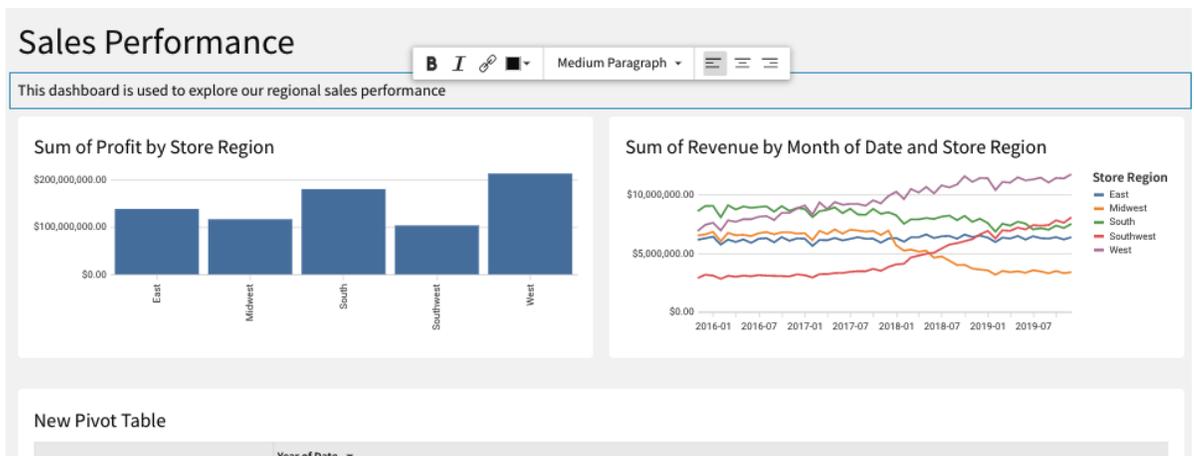
4.1.6 Drag the text box to the top of the canvas and give it the name 'Sales Performance'. Optionally you can adjust the font, color, sizing as you see fit.



4.1.7 Let's add one more text box and drag it below the title to give a description so that our end users know what this dashboard is used for.

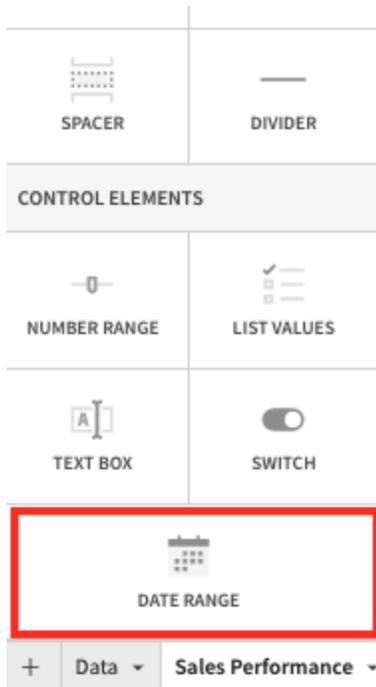
Clicking the '+' icon on the upper left hand pane next to 'Page Elements', select 'Text'. This will add a text box to the canvas.

Drag the text box to the top of the canvas and give it the description 'This dashboard is used to explore our regional sales performance'



4.1.8 Next let's add a control element to our canvas. Controls enable interactions with the chart such as filter the charts when in use.

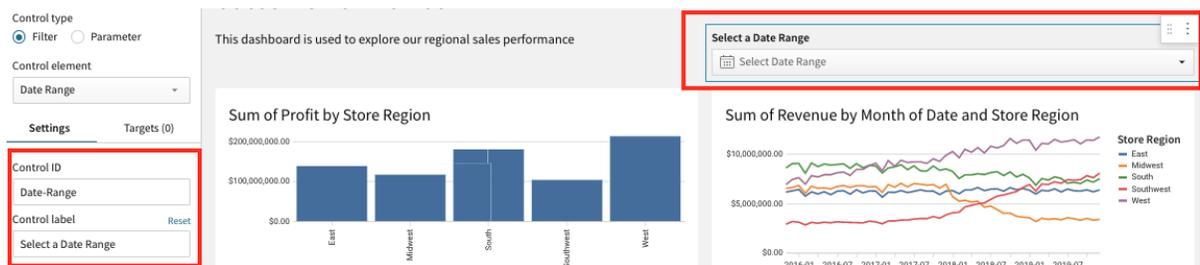
Clicking the '+' icon on the upper left hand pane next to 'Page Elements', select 'Date Range'. This will add a Date Range control to the canvas.



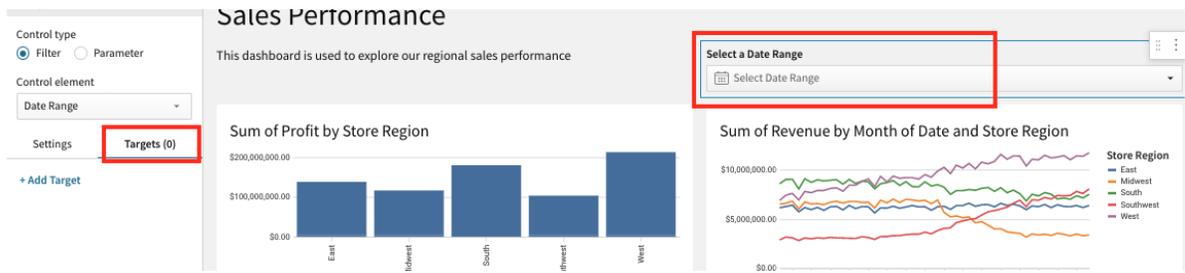
We will also see options for:

- Number Range: creating a range of values you wish to look at
- List Values: create a list of values for users to choose from
- Text Box: allow users to input free form text
- Switch: allow users to filter on Boolean (true/false) values

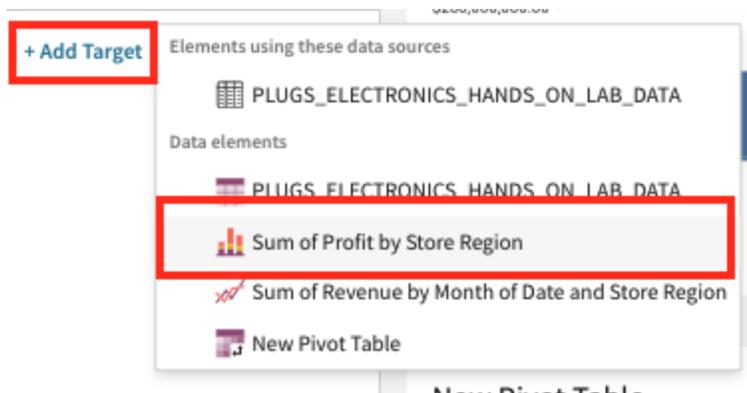
4.1.9 After adding the 'Date Range' control, let's drag it to the right of the description text box and update the control_id to say 'Date-Range' and update the control label to say 'Select a Date Range'



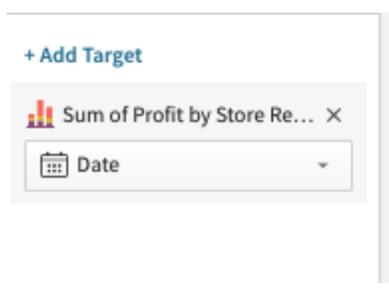
4.1.10 Next we need to tell the control which elements we want the control to apply to. Clicking on the filter control, we have some options in the left hand pane. Select 'Targets'. Then select 'Add Target'.



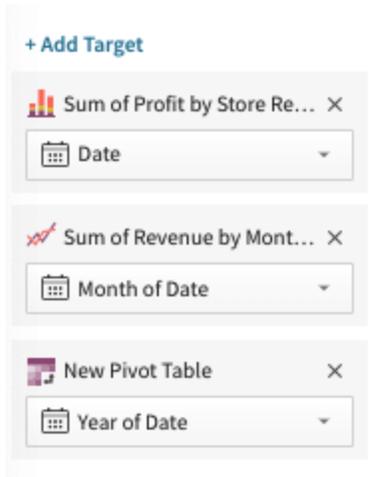
4.1.11 Next click on 'Add Target' and select our bar chart.



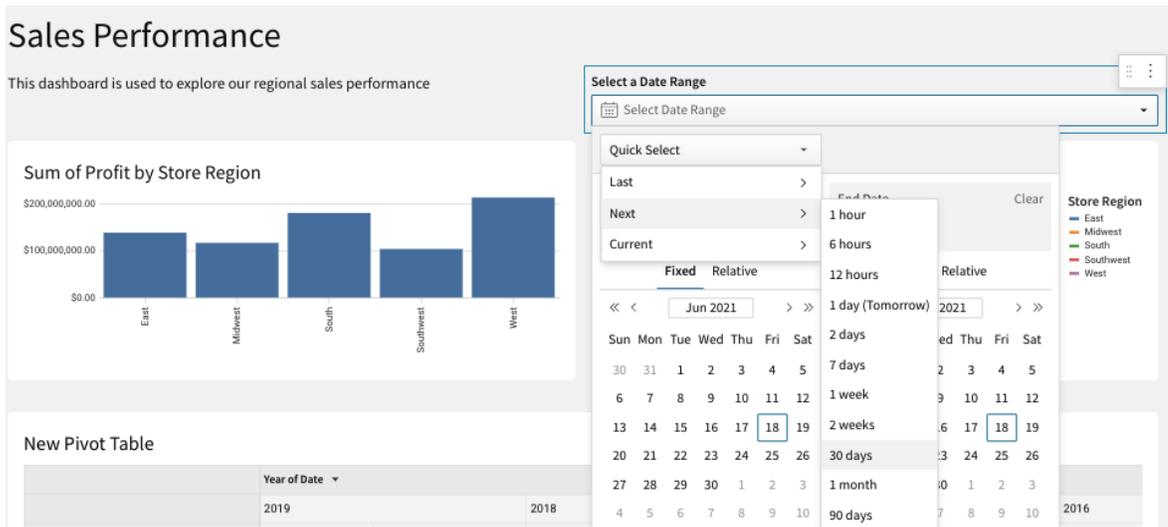
Notice it selected our date field by default, but you can always change it to any field that is appropriate.



4.1.12 Let's do this **two more times** adding both our line chart and pivot table. When done you should have 3 Targets all filter all the [date] fields. Notice that because some of our charts use 'Month of Date' or 'Year of Date' those fields were selected instead. Sigma intuitively selects what is appropriate, however, you could also change it to filter on the base date field if you desire.

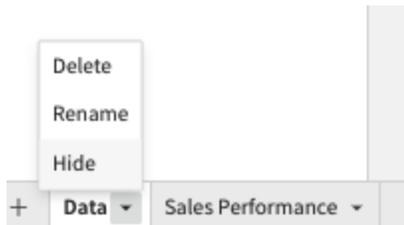


4.1.13 Now, users that are interacting with the canvas can use the date control to filter data as they see fit.

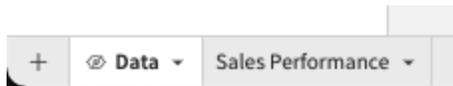


4.1.14 Lastly, before we share this with others, we may not want them to see the data tab from which we are pulling these charts from. If you click the dropdown in the bottom left hand corner on the 'Data' page, we can hide the 'Data' page from other users who may be viewing or exploring our dashboard.

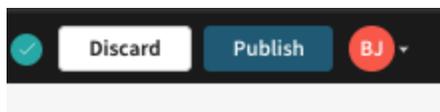
Click the dropdown and select 'Hide'.



Notice now it has a closed 'eye' to show it is hidden.



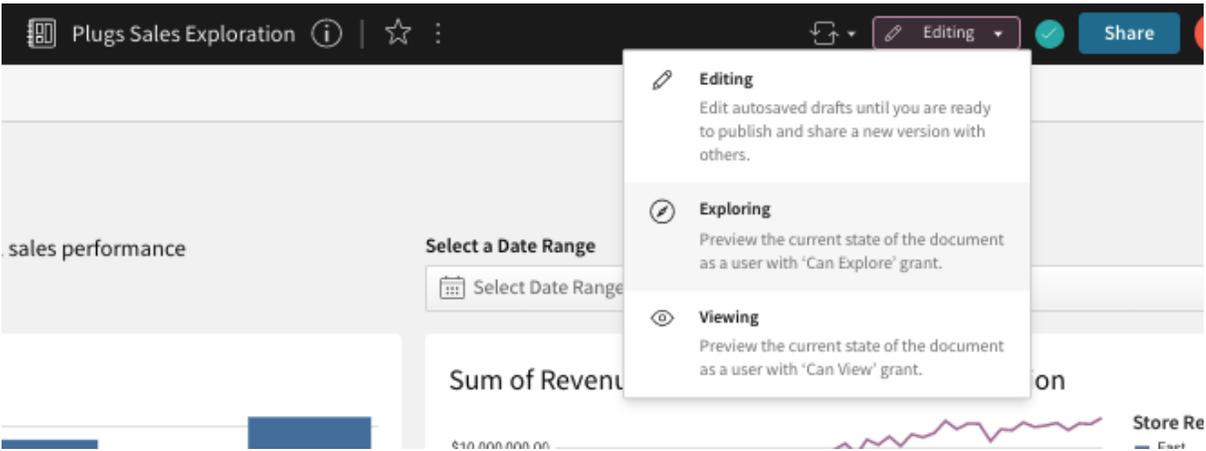
4.1.15 Lets publish this to save the current copy before moving on by clicking the 'Publish' button in the upper right hand corner.



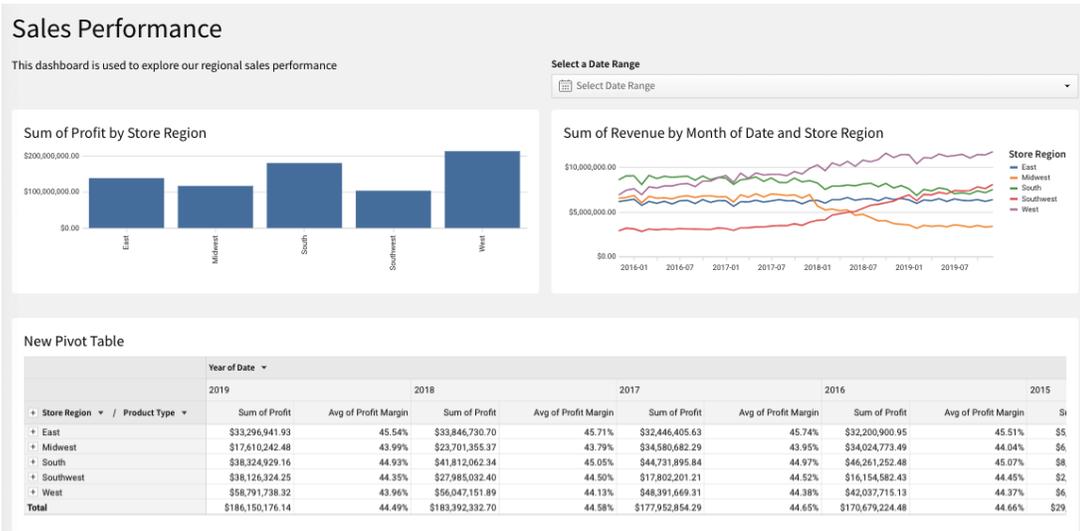
4.2 Exploring the Dashboard

4.2.1 Users in Sigma Workbooks have a great ability to explore a dashboard much beyond what has been given to them with a pre-built canned dashboard. In this section, we will highlight some of the great features allowed by end users to go beyond the charts provided to do their analysis.

Let's begin by clicking on the 'Sales Performance' page. On the top right corner you will notice we are currently in the 'Editing' mode. Let's switch this to the 'Exploring' mode to simulate how end users might interact with this dashboard.



4.2.2 This is what users with permission to 'Explore' this dashboard will see. Notice a lot of the editing features are not visible as well as the 'Data' tab that we hid.

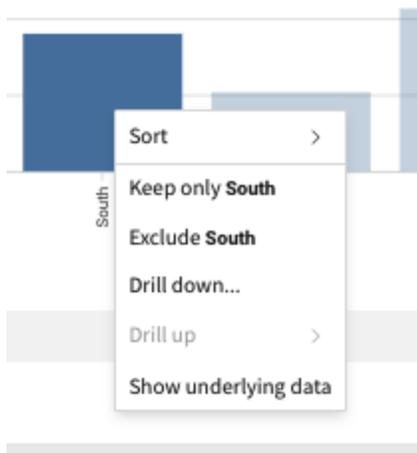


4.2.3 In this exploration, I'm going to take the role of a Merchandising Manager. I've been asked by our CEO to create a campaign to revive our loyalty program for our top customers. All I've been told is to pilot it in our Southern region and target customers purchasing computers. These are the first couple of points that give me direction, but from there, I'm not sure yet. I'm looking to get to transaction level data that my team can build an effective campaign around.

4.2.4 **Workbooks allow users to interact directly with a visualization to filter data, without the need to go to the underlying data or table, or have filters pre-defined for them. Right away, we're breaking the paradigm of users needing to go to their BI team for customizations.**

Every interaction a user takes from here will not make any changes to the underlying workbook, but it will save their 'explore' if they ever want to get back to it. Optionally, if they have permission, they can save their own copy.

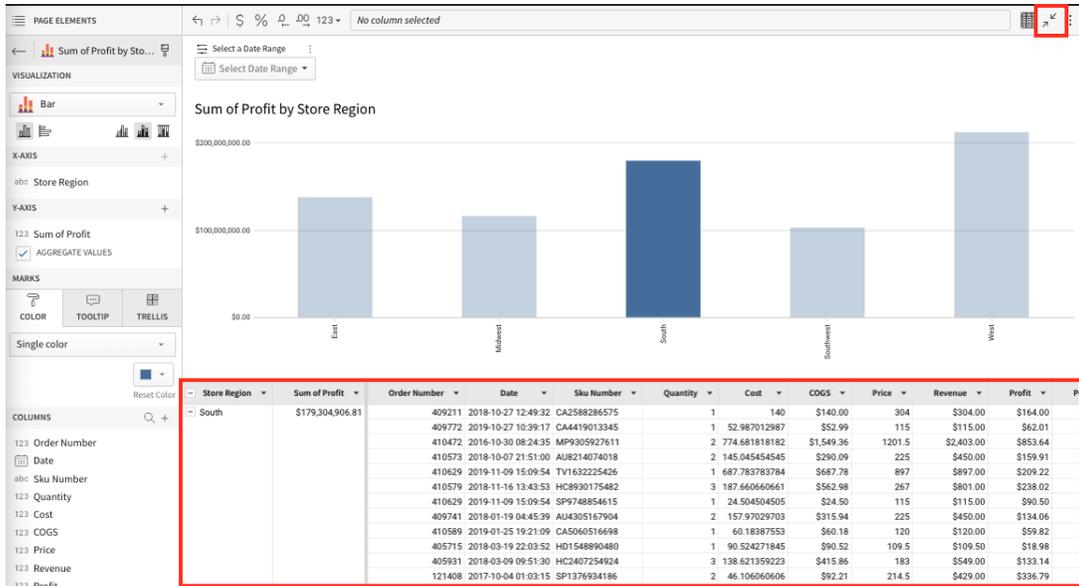
4.2.5 Looking at our bar chart, we want to look into the Southern region to find our target customers. By right clicking on the 'South' bar, you can see a few options:



- Sort: ability to sort by any of the metrics in the chart
- Keep only South: exclude all other values except the South
- Exclude South: Keep all values except the South
- Drill down...: ability to drill into this value by a different dimension
- Show underlying Data: Show the underlying data making up this chart

Let's click on 'Show underlying data'.

4.2.6 You will now notice we have jumped into 'Focus Mode' just for this chart and the data pane shows us exactly the data relating to the South bar. At any time we can close out of the focus mode by clicking the minimize button in the upper right corner and get back to the main canvas.



Differentiator Alert!

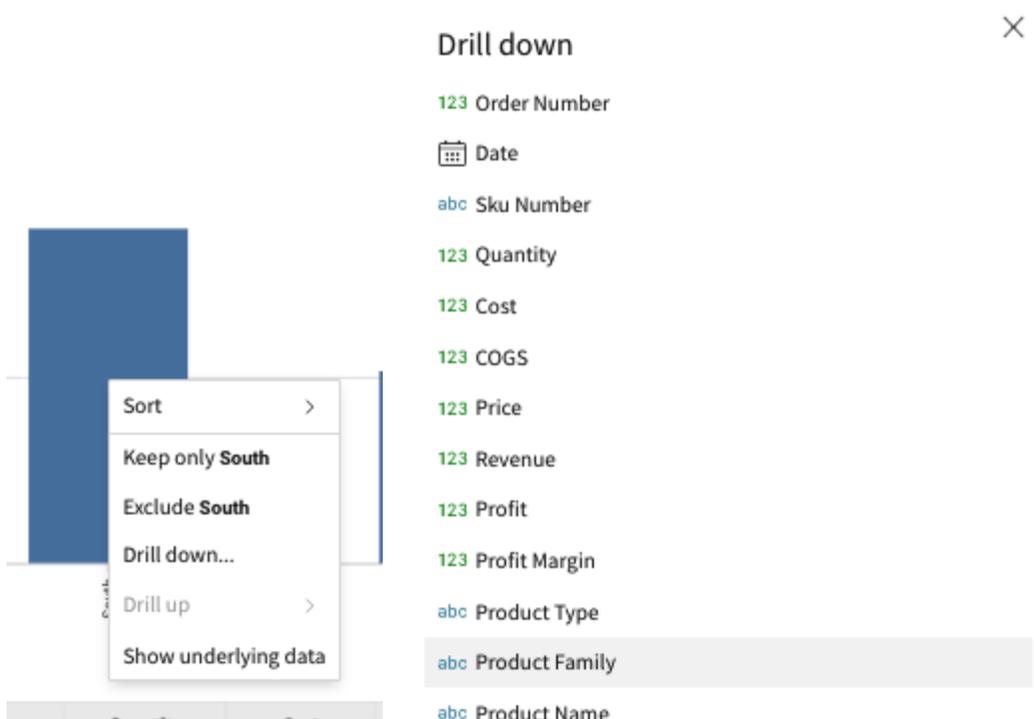
Go Beyond the Dashboard

Sigma is unique in that with a single click a user can go from a dashboard visualization down to a table view of the underlying data and lowest level of data that powers that visualization. This is critical because visualizations, when viewed, typically generate more questions, and it is key for users to be able to dive into the data in a self-service manner to quickly answer these new questions.

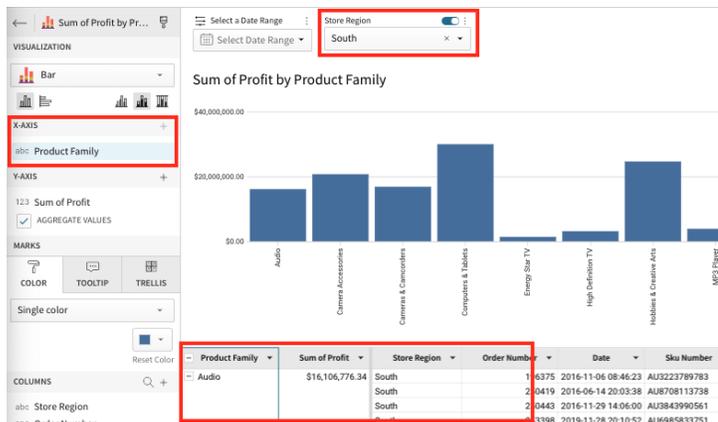
With many other BI tools, dashboards are static and end viewers cannot click into them to get to the underlying data. When the dashboards generate more questions for users, it can take hours or days, and involve BI tool administrators, to get answers.

4.2.7 We can now see the South Region rolled up value and every order that makes up those profits. Next we want to drill into the South and focus on our product family as we want to look into the customers purchasing computers.

Right click on the South and click ‘Drill Down... Select ‘Product Family’.

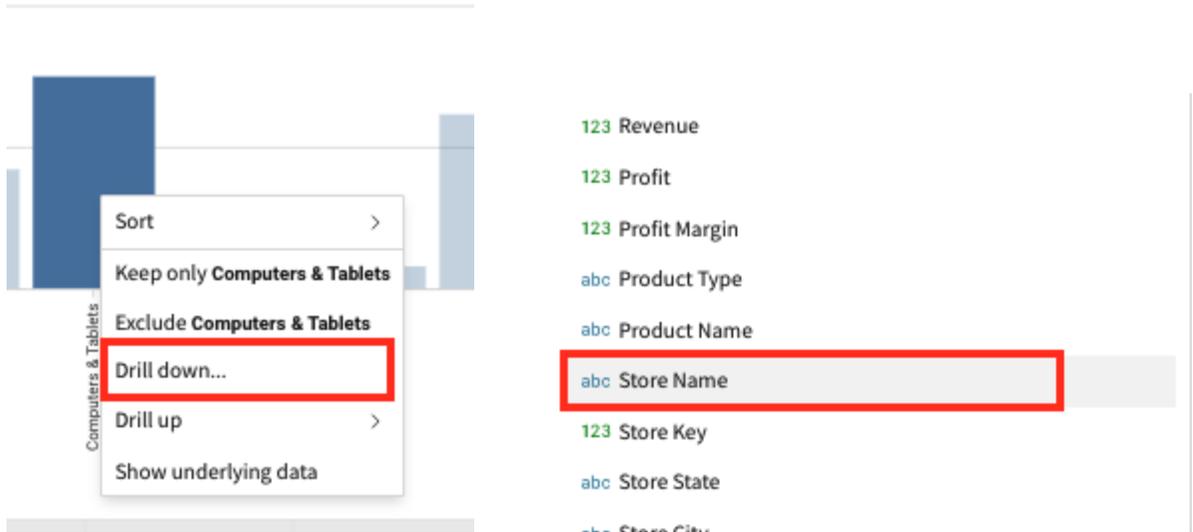


4.2.8 You will notice a couple things. One, the X-Axis has dynamically changed to now be on [Product Family]. Also, we have automatically added a filter to only include the South. The underlying data has also been recalculated to match with the visualization.

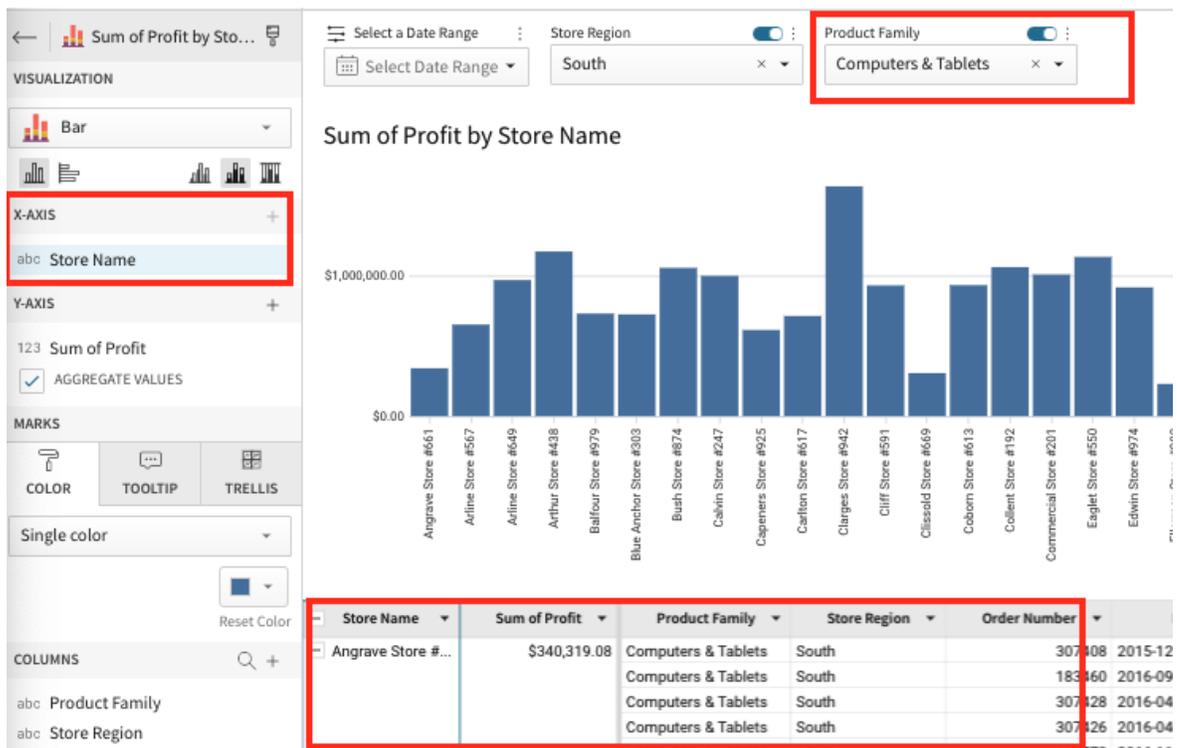


4.2.9 In order to take a closer look at our customers, we want to drill into our top performing stores in order to find our customers generating the profit. Lets again ‘Drill down...’ into our Computers and Tablets [Product Family] and look into our stores.

Right click on the ‘Computers and Tablets’ bar, Select ‘Drill down...’, and click on [Store Name].



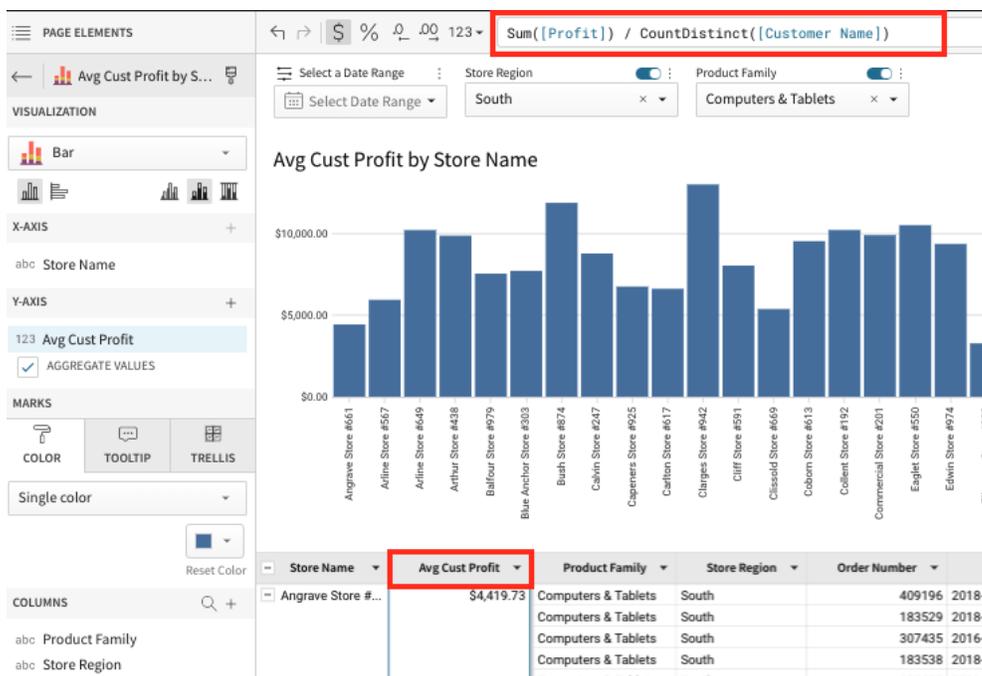
4.2.10 Again you will notice the X-Axis has been updated, another filter for ‘Computers and Tablets’ was added, and the underlying data has been reflected.



4.2.11 At this point, we've narrowed our data down using info already provided, but now we'll look to take ad hoc one step further. Our spreadsheet-like interface allows business users to easily augment their analysis. With Sigma, visualizations aren't limited to simple aggregations like sums or counts. We can easily chart any arbitrary function from margin percentage to some sort of complex If Statement. And we'll do that using our formula bar and familiar functions.

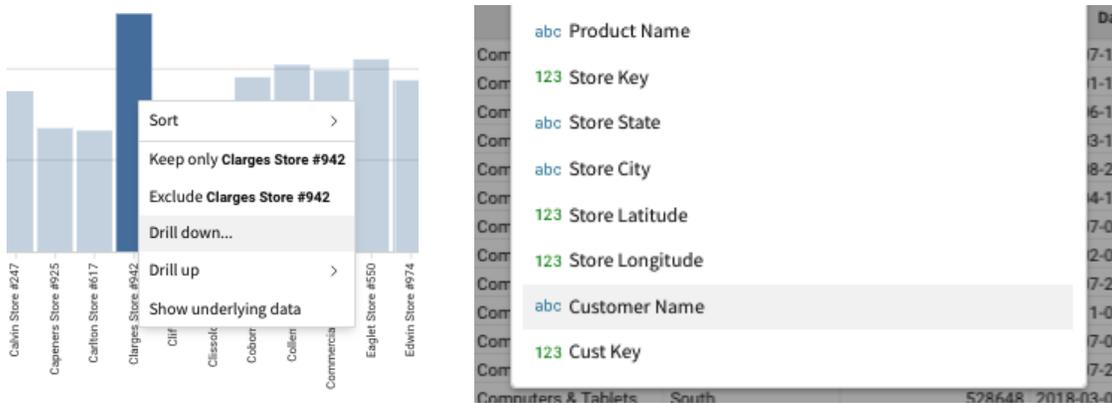
In our case, I'm interested in which stores have the most profitable customers, as this is probably where I'd like to focus on.

Click on the [Sum of Profit] column in the table, and update the function at the top of the screen to be `Sum([Profit]) / CountDistinct([Customer Name])`. Then double click the column header and rename it to [Avg Cust Profit].

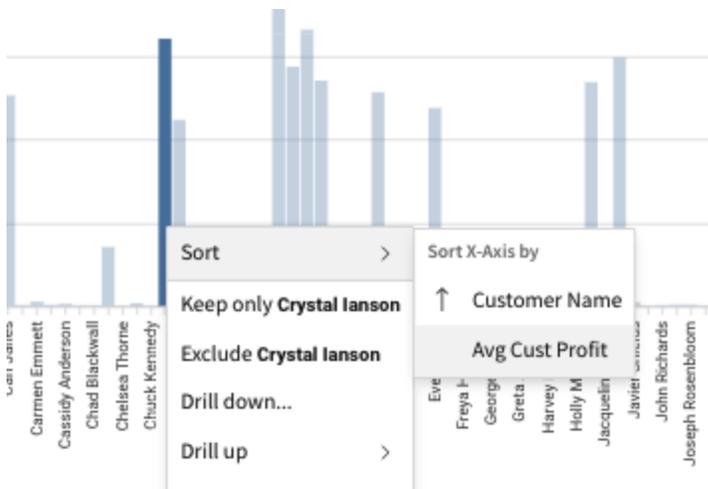


4.2.12 We'll use the additional metric we've added to quickly hone in on the actionable granular data that teams need to be effective. Keep in mind we will have gone from the highest level regional sales aggregate, to the finest grain records in just a few minutes with some UI clicks and a formula. This untethered exploration is what allows for true ad hoc analysis.

I want to drill into our highest performing store to see our strongest customers. Right click on Charges Store #942 (left of center) and 'Drill down...' into [Customer Name].



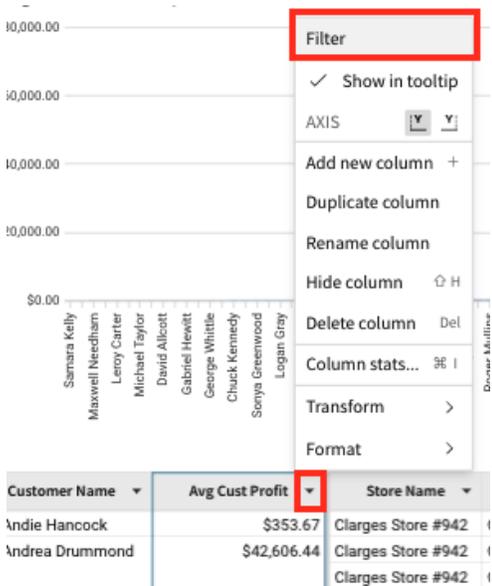
4.2.13 Next, Right-Click on any of the bars and Select 'Sort' by [Avg Cust Profit].



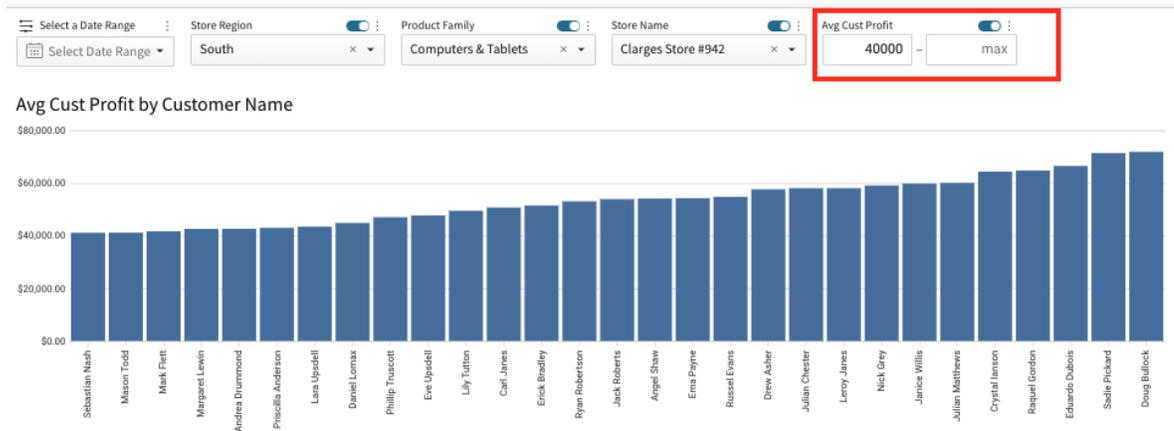
4.2.14 We now have our top performing customers grouped to the right. Here we can clearly see that we have a group of customers that generate over \$40k in profit before our drop. These are our most profitable customers.



4.2.15 Use the dropdown on the column header [Avg Cust Profit] and add it to the filter so we can focus on just the top group of customers.



4.2.16 On the upper right, we can see our filter was added. Lets put in a minimum profit of \$40,000. This will show us our most profitable customers.



Differentiator Alert!

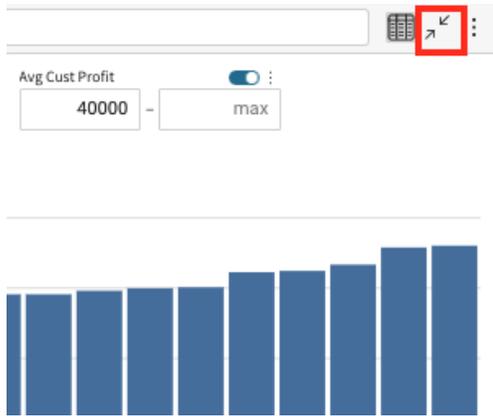
Lowest Level of Data

As you have seen from this section, Sigma is unique in that it allows users to easily get to the lowest level of data (a row) to explore and analyze their data at a very granular level. If a user needs to look up a single transaction or ledger entry, this is easy. Row data can also easily be aggregated or rolled up into cohorts and segments as needed.

With many other BI tools, the user is only presented with summary data, or getting to the lowest level of data is very difficult and requires many clicks.

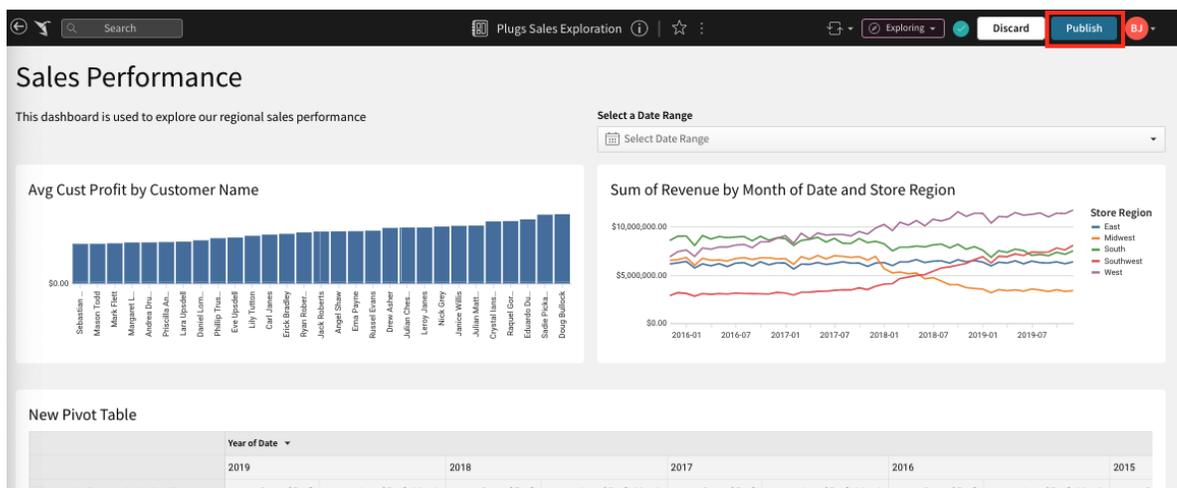
4.2.17 Now we have a list of our top performing customers in the South purchasing Computers or Tablets. I can now use this list to begin our campaign to target those loyalty customers.

Let's minimize this chart to get back to our dashboard. Click the minimize button in the upper right hand corner.



4.2.18 End users will now be able to Save this exploration, export the data from the chart, or share their findings with others.

Let's go ahead and 'Publish' this draft by clicking the Publish button in the upper right hand corner.

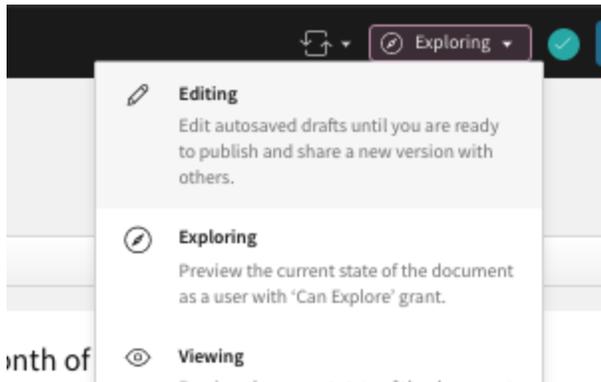


Module 5: Sigma Tables

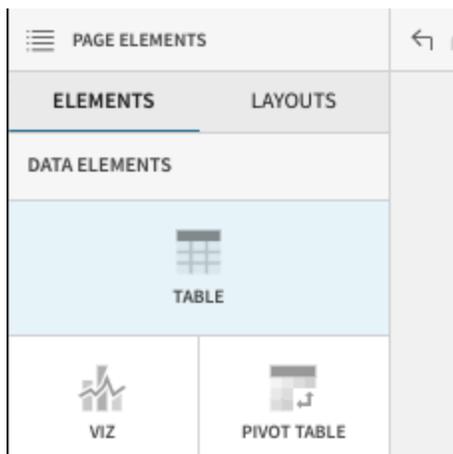
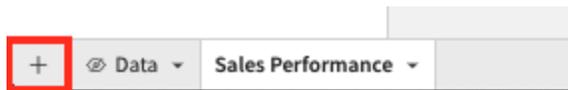
Tables in Sigma Workbooks are built to be flexible and operate like a typical spreadsheet. In this module, we will dig into more advanced topics relating to tables.

5.1 Sigma Tables - Advanced

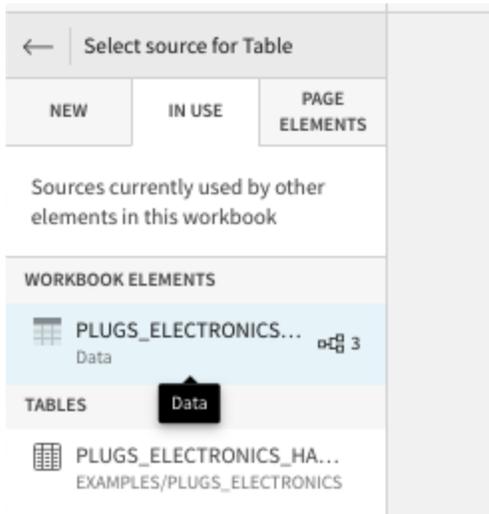
- 5.1.1** To begin, let's go back into 'Edit' mode so we can create a new table. You can do this by switching out of the 'Exploring' mode into the 'Editing' mode in the upper right hand corner.



- 5.1.2** Now that we are in Edit mode, let's create a new page. You can do this by clicking the '+' button in the bottom left hand corner and selecting 'Table'.

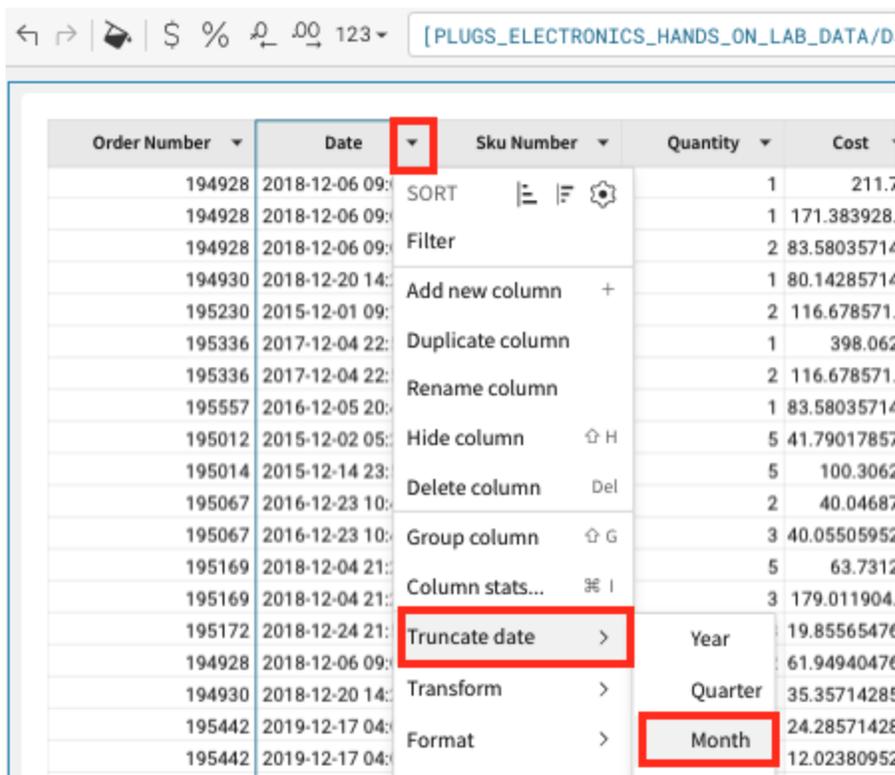


Then Select our Workbook Element 'Plugs_Electronics_Hands_On_Lab' from our 'Data' page.



5.1.3 We now have our table and can begin working just like a normal spreadsheet building off some of the calculations we did before.

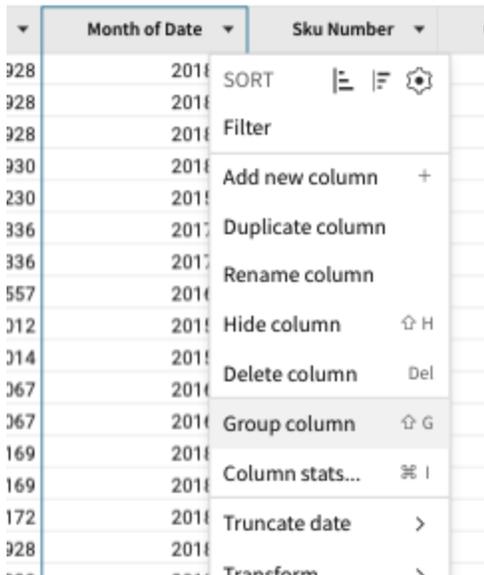
First, let's truncate our date to Month. You can do this by selecting the dropdown on the header column on [Date] and select 'Truncate date' and click 'Month'



Notice Sigma does not ever change the underlying data, we simply added a DateTrunc() function in the function bar.

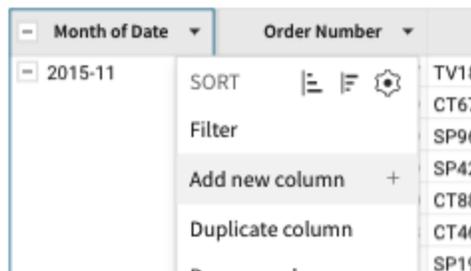
```
DateTrunc("month", [PLUGS_ELECTRONICS_HANDS_ON_LAB_DATA/Date])
```

5.1.4 Next we want to ‘Group’ on [Month of Date]. You can do this by selecting the dropdown on the header column on [Month of Date] and select ‘Group column’.

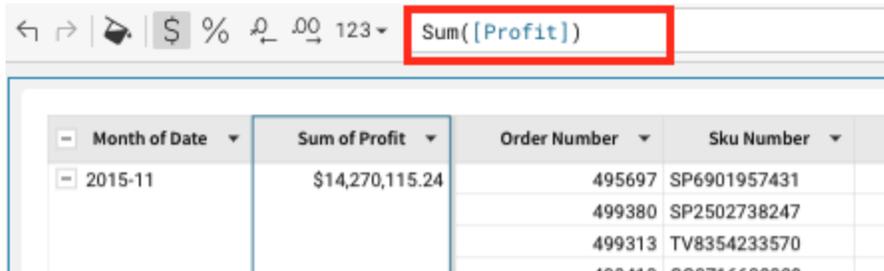


This creates a Group on the Month which allows us to perform calculations at his level of grouping.

5.1.5 Click the dropdown on [Month of Date] and click ‘Add New Column’

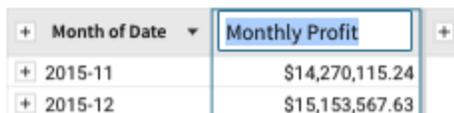


5.1.6 We can now put a calculation in the formula bar. Let's add the function Sum([Profit]) and hit enter (return).



The screenshot shows a spreadsheet interface. The formula bar at the top contains the text "Sum([Profit])" which is highlighted with a red rectangular box. Below the formula bar, a table is visible with the following columns: "Month of Date", "Sum of Profit", "Order Number", and "Sku Number". The first row of data shows "2015-11" in the "Month of Date" column and "\$14,270,115.24" in the "Sum of Profit" column. The "Order Number" and "Sku Number" columns contain values like "495697", "SP6901957431", "499380", "SP2502738247", and "499313", "TV8354233570".

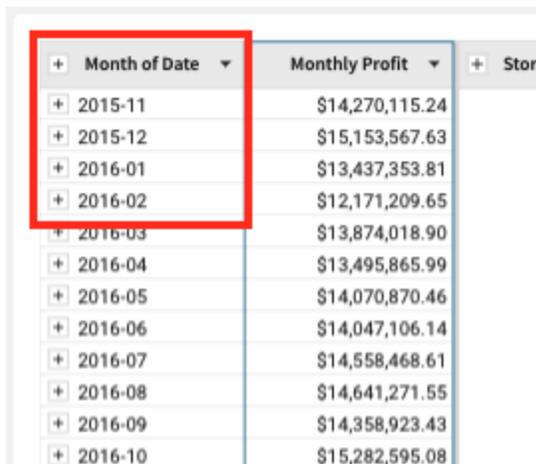
Double Click the column header [Sum of Profit] and rename it to [Monthly Profit].



The screenshot shows a spreadsheet table with two columns: "Month of Date" and "Monthly Profit". The "Monthly Profit" column header is highlighted with a blue selection box. The data rows show "2015-11" with a profit of "\$14,270,115.24" and "2015-12" with a profit of "\$15,153,567.63".

5.1.7 We now have the profit aggregate to the monthly level. You can at any point collapse a single month, or all the months, to hide the underlying orders. You can do this by clicking the minimize button next to the column header of [Month of Date] or any Monthly values.

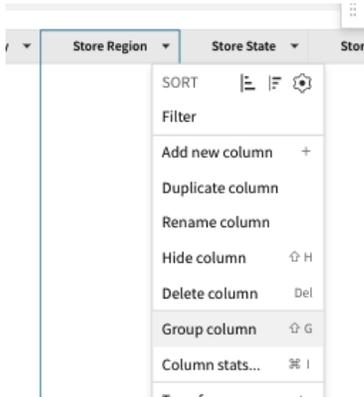
Click on the minimize button next to [Month of Date] to collapse all the Months.



The screenshot shows a spreadsheet table with two columns: "Month of Date" and "Monthly Profit". The "Month of Date" column header is highlighted with a red rectangular box. The table lists months from "2015-11" to "2016-10" with their respective profit values. The "2015-11" row is highlighted in blue.

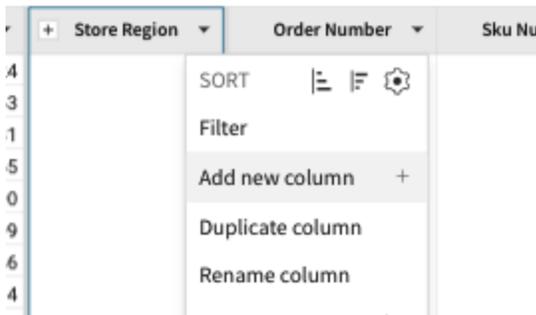
Month of Date	Monthly Profit
2015-11	\$14,270,115.24
2015-12	\$15,153,567.63
2016-01	\$13,437,353.81
2016-02	\$12,171,209.65
2016-03	\$13,874,018.90
2016-04	\$13,495,865.99
2016-05	\$14,070,870.46
2016-06	\$14,047,106.14
2016-07	\$14,558,468.61
2016-08	\$14,641,271.55
2016-09	\$14,358,923.43
2016-10	\$15,282,595.08

5.1.8 Scrolling to the right of the table, find the column [Store Region]. Using the dropdown, select 'Group column'.

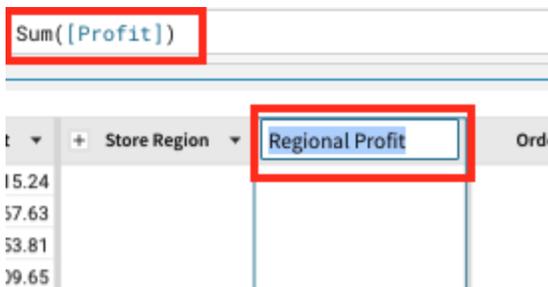


5.1.9 Scrolling back to the left, you see that we have created another grouping below the Month grouping. We can now perform calculations at this grouping level.

Let's add a new column next to [Store Region]. Clicking the dropdown next to [Store Region] select 'Add new column'.



5.1.10 Again, in the formula bar, enter the function Sum([Profit]) and hit enter. Next, Double Click on the column name and rename it to [Regional Profit]



5.1.11 Next, we can maximize [Month of Date] column to see the data for our months and regions. You can do this by clicking on the maximize button next to [Month of Date].

Month of Date	Monthly Profit	Store Region	Regional Profit	Order Number
2015-11	\$14,270,115.24	+	East	\$2,836,490.01
		+	Midwest	\$2,967,303.11
		+	South	\$3,964,958.50
		+	Southwest	\$1,327,546.48
		+	West	\$3,173,817.14
2015-12	\$15,153,567.63	+	East	\$2,933,378.46
		+	Midwest	\$3,040,574.47
		+	South	\$4,209,808.49
		+	Southwest	\$1,496,521.95
		+	West	\$3,473,284.25
2016-01	\$13,437,353.81	+	East	\$2,617,427.74
		+	Midwest	\$2,736,017.69
		+	South	\$3,718,401.89
		+	Southwest	\$1,294,858.54
		+	West	\$3,070,647.95
2016-02	\$12,171,209.65	+	East	\$2,351,373.88
		+	Midwest	\$2,446,263.86
		+	South	\$3,344,387.73
		+	Southwest	\$1,162,306.16
		+	West	\$2,866,878.02

We can now see all our months and regional profits for those months.

5.1.12 Taking this one step further we can also do formulas across the different grouping levels.

Clicking the dropdown next to [Regional Profit], select 'Add new column'.

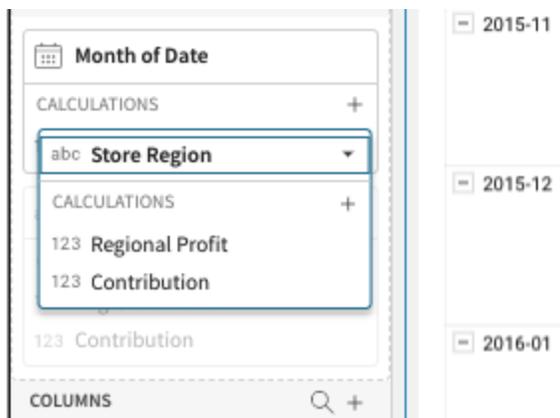
Monthly Profit	Store Region	Regional Profit	Order Number	Sk
,270,115.24	+	East	\$2,836,490	SORT Filter Add new column + Duplicate column Remove column
	+	Midwest	\$2,967,303	
	+	South	\$3,964,958	
	+	Southwest	\$1,327,546	
	+	West	\$3,173,817	
,153,567.63	+	East	\$2,933,378	
	+	Midwest	\$3,040,574	

5.1.13 Enter the formula [Regional Profit] / [Monthly Profit] and hit enter. We can rename this column to [Contribution] and format this as a percentage.

The screenshot shows the Sigma Workbook interface. The formula bar at the top contains the formula $[Regional Profit] / [Monthly Profit]$ and is formatted as a percentage. Below the formula bar is a table with the following data:

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution	
2015-11	\$14,270,115.24	+	East	\$2,836,490.01	19.88%
		+	Midwest	\$2,967,303.11	20.79%
		+	South	\$3,964,958.50	27.79%
		+	Southwest	\$1,327,546.48	9.30%
		+	West	\$3,173,817.14	22.24%
2015-12	\$15,153,567.63	+	East	\$2,933,378.46	19.36%

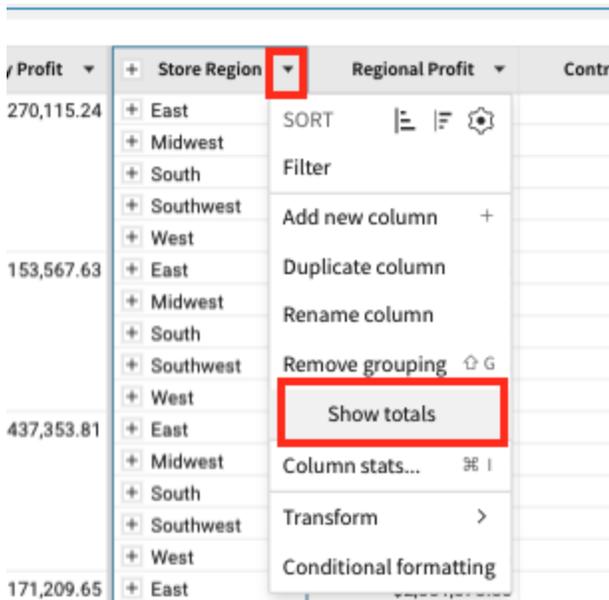
We can now see exactly how much each region is contributing to the monthly profit. There are no limitations in Sigma Workbooks Tables for how many groupings you can have. You can also at any time swap the order of the groupings in the left hand pane using a simple drag and drop method. We will leave the groupings alone for now.



5.2 Intro to Totals

5.2.1 Sigma Workbook Tables have many ways to get totals, sub-totals, and summary values. We will explore them now.

5.2.2 First, from the [Store Region] column header dropdown, select 'Show Totals'.



5.2.3 You can now see we have totals aggregated at the Regional levels.

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution
Total			\$747,598,270.48	
2015-11	\$14,270,115.24	Total	\$14,270,115.24	100.00%
		+ East	\$2,836,490.01	19.88%
		+ Midwest	\$2,967,303.11	20.79%
		+ South	\$3,964,958.50	27.79%
		+ Southwest	\$1,327,546.48	9.30%
		+ West	\$3,173,817.14	22.24%
2015-12	\$15,153,567.63	Total	\$15,153,567.63	100.00%
		+ East	\$2,933,378.46	19.36%

Taking this a step further we can do the same thing for our months. From the [Month of Date] column header dropdown, select 'Show Totals'. We now have totals at the Monthly level as well.

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution
Total	\$747,598,270.48		\$747,598,270.48	
2015-11	\$14,270,115.24	Total	\$14,270,115.24	100.00%
		+ East	\$2,836,490.01	19.88%
		+ Midwest	\$2,967,303.11	20.79%
		+ South	\$3,964,958.50	27.79%
		+ Southwest	\$1,327,546.48	9.30%
		+ West	\$3,173,817.14	22.24%
2015-12	\$15,153,567.63	Total	\$15,153,567.63	100.00%
		+ East	\$2,933,378.46	19.36%

5.2.4 Next let's add some conditional formatting to give some color to our table. Using the drop-down on the 'Regional Profit' select 'Conditional Formatting'.

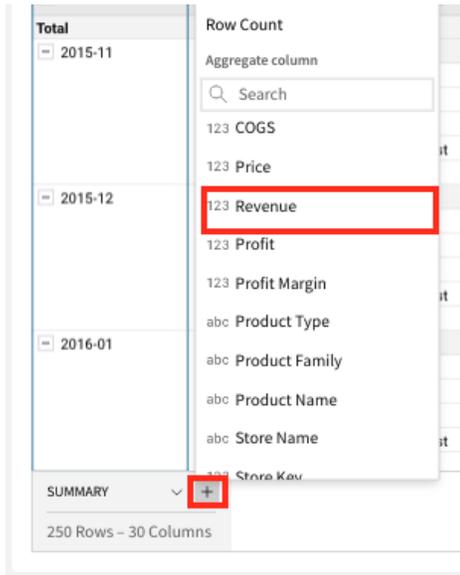
Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution
Total	\$747,598,270.48		\$747,598,270.48	
2015-11	\$14,270,115.24	Total	\$14,270,115.24	
		+ East	\$2,836,490.01	
		+ Midwest	\$2,967,303.11	
		+ South	\$3,964,958.50	
		+ Southwest	\$1,327,546.48	
		+ West	\$3,173,817.14	
2015-12	\$15,153,567.63	Total	\$15,153,567.63	
		+ East	\$2,933,378.46	
		+ Midwest	\$3,040,574.47	
		+ South	\$4,209,808.49	
		+ Southwest	\$1,496,521.95	
		+ West	\$3,473,284.25	
2016-01	\$13,437,353.81	Total	\$13,437,353.81	
		+ East	\$2,617,427.74	
		+ Midwest	\$2,736,017.69	
		+ South	\$3,718,401.89	
		+ Southwest	\$1,294,858.54	
		+ West	\$3,070,647.95	

In the left-hand pane, select 'Color Scale' We can now see which regions had the highest profits in specific months more clearly.

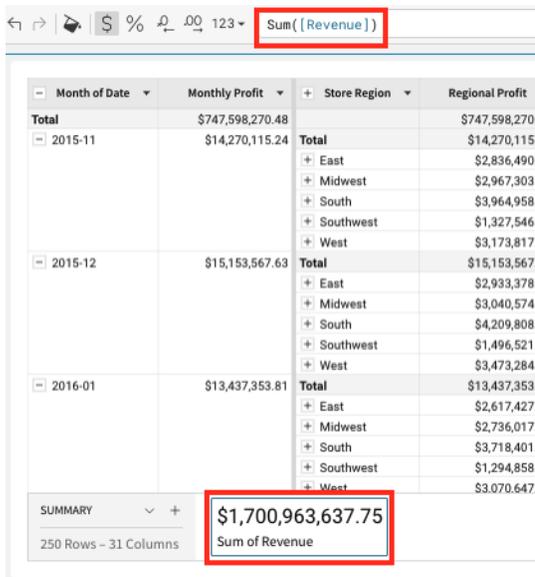
Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution
Total	\$747,598,270.48		\$747,598,270.48	
2015-11	\$14,270,115.24	Total	\$14,270,115.24	
		+ East	\$2,836,490.01	
		+ Midwest	\$2,967,303.11	
		+ South	\$3,964,958.50	
		+ Southwest	\$1,327,546.48	
		+ West	\$3,173,817.14	
2015-12	\$15,153,567.63	Total	\$15,153,567.63	
		+ East	\$2,933,378.46	
		+ Midwest	\$3,040,574.47	
		+ South	\$4,209,808.49	
		+ Southwest	\$1,496,521.95	
		+ West	\$3,473,284.25	
2016-01	\$13,437,353.81	Total	\$13,437,353.81	
		+ East	\$2,617,427.74	
		+ Midwest	\$2,736,017.69	
		+ South	\$3,718,401.89	
		+ Southwest	\$1,294,858.54	
		+ West	\$3,070,647.95	
2016-02	\$12,171,209.65	Total	\$12,171,209.65	

5.2.5 Sigma also has the ability to create Summary Values or KPIs across the entire Table. At the bottom of the table you will see a line that says 'Summary' which shows the number of rows as well as the number of columns.

Clicking on the carrot, you get a few options to create a Summary. Click on the carrot and select the '+ button'. Select [Revenue].

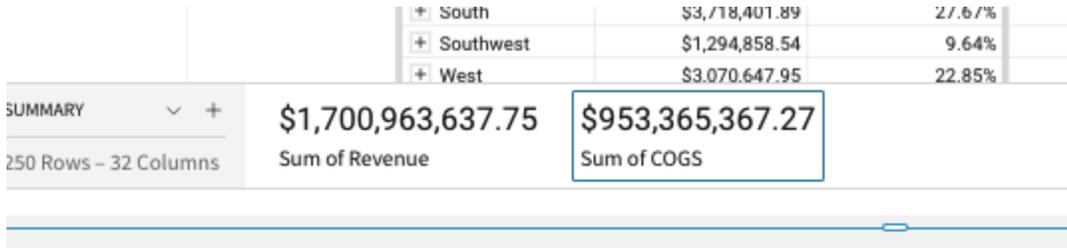


This will automatically create a summary value of our revenue. You can adjust this formula at any time from the formula bar to be anything you want.



These Summary Values can now be accessed in any formula anywhere in the Table and can also be leveraged with our KPI visualizations.

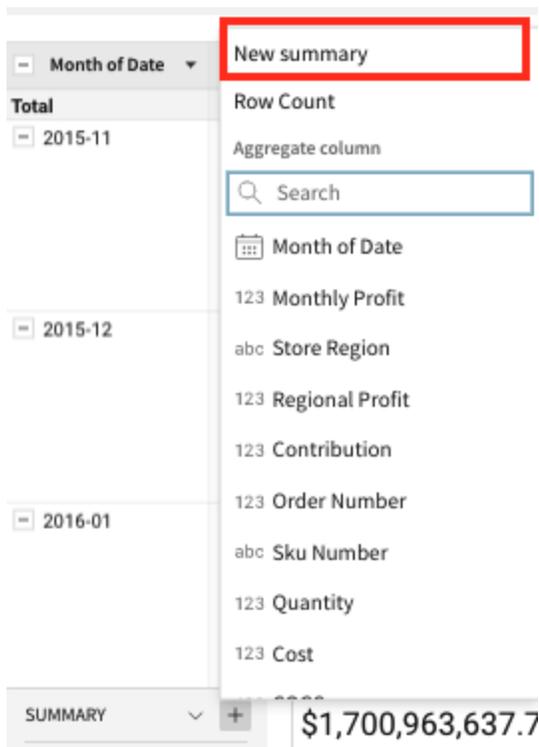
5.2.6 Let's add one more summary for our COGS. Click on the carrot and select the '+' button'. Select [COGS].



The screenshot shows a table with a summary row. The summary row has two columns: 'Sum of Revenue' with a value of \$1,700,963,637.75 and 'Sum of COGS' with a value of \$953,365,367.27. The 'Sum of COGS' value is highlighted with a blue box. Above the summary row, there are three rows of data for 'South', 'Southwest', and 'West' regions, each with a '+' button in the first column and numerical values in the other two columns.

Region	Revenue	COGS	Profit Margin
South	\$3,718,401.89		27.67%
Southwest	\$1,294,858.54		9.64%
West	\$3,070,647.95		22.85%
SUMMARY	\$1,700,963,637.75	\$953,365,367.27	

5.2.7 Lastly, let's create one more Summary value by clicking on the carrot, and selecting the '+' button'. This time Select 'New Summary'.



The screenshot shows a table with a summary row. The summary row has a value of \$1,700,963,637.7. A dropdown menu is open, showing options for adding a new summary. The 'New summary' option is highlighted with a red box. The dropdown menu also includes a search bar and a list of columns to aggregate, such as 'Row Count', 'Monthly Profit', 'Regional Profit', 'Contribution', 'Order Number', 'Quantity', and 'Cost'.

Month of Date	Summary
Total	\$1,700,963,637.7
2015-11	
2015-12	
2016-01	

This will give us a blank summary which we can write a function for.

5.2.8 In the function bar, enter the formula bar enter [Sum of Revenue] - [Sum of COGS] and hit enter. Also rename this Summary to [Total Profit].

The screenshot shows a data table with columns: Month of Date, Monthly Profit, Store Region, Regional Profit, Contribution, and Order Number. A formula bar at the top contains the formula `[Sum of Revenue] - [Sum of COGS]`. Below the table is a summary row with the following data:

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution	Order Number
Total	\$747,598,270.48		\$747,598,270.48		
2015-11	\$14,270,115.24	Total	\$14,270,115.24	100.00%	
		+ East	\$2,836,490.01	19.88%	
		+ Midwest	\$2,967,303.11	20.79%	
		+ South	\$3,964,958.50	27.79%	
		+ Southwest	\$1,327,546.48	9.30%	
		+ West	\$3,173,817.14	22.24%	
2015-12	\$15,153,567.63	Total	\$15,153,567.63	100.00%	
		+ East	\$2,933,378.46	19.36%	
		+ Midwest	\$3,040,574.47	20.07%	
		+ South	\$4,209,808.49	27.78%	
		+ Southwest	\$1,496,521.95	9.88%	
		+ West	\$3,473,284.25	22.92%	
2016-01	\$13,437,353.81	Total	\$13,437,353.81	100.00%	
		+ East	\$2,617,427.74	19.48%	
		+ Midwest	\$2,736,017.69	20.36%	
		+ South	\$3,718,401.89	27.67%	
		+ Southwest	\$1,294,858.54	9.64%	
		+ West	\$3,070,647.95	22.85%	
SUMMARY	\$1,700,963,637.75	\$953,365,367.27	\$747,598,270.48		
250 Rows - 33 Columns	Sum of Revenue	Sum of COGS	Total Profit		

5.3 Intro to Parameters

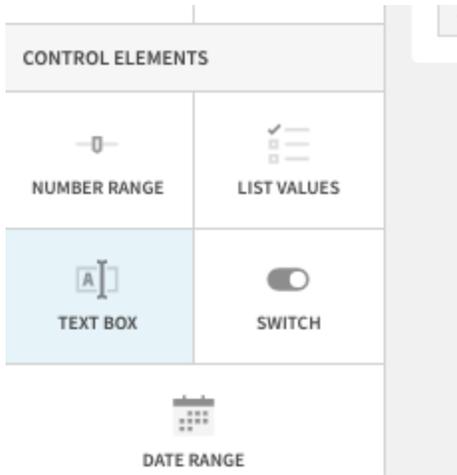
5.3.1 A parameter is a customizable field that can be added to a workbook and referenced in formulas. Creating parameters in your workbook, and referencing them in formula columns, allows you to dynamically replace values used in calculations across a workbook’s lineage. You can go on to use these variable calculations in table filters, pass them on to downstream visualizations and dashboards, or use them to manipulate data source queries.

Parameters can be huge assets for What-If Analysis and User Input Analysis. One common use case is implementing a parameter in place of a constant value. Using a parameter provides you the flexibility to change that value very quickly. For example, you may want to compare product sales growth by a variable 2%, 5%, and 10% percent. A parameter can be used to quickly track this variable value and inject it into formulas.

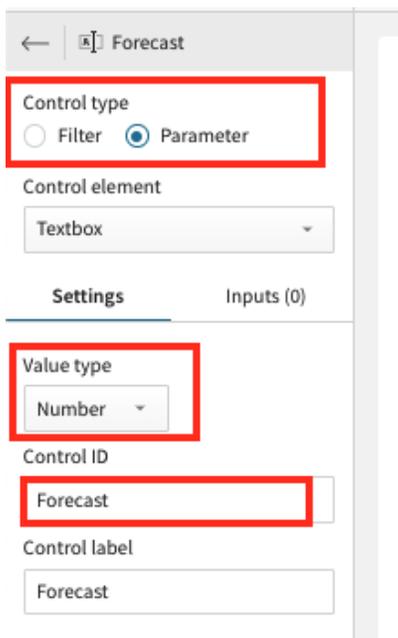
5.3.2 To create our first parameter, click the '+' icon in the left hand panel next to 'Page Elements'.



5.3.3 Next select 'Text Box' under Control Elements.



5.3.4 You will notice the radio button for 'Parameter' has been selected. Change the 'Value Type' to be 'Number' and let's rename this to be 'forecast'



5.3.5 We can now use this parameter in our formulas. In this scenario, let's see what would happen to our Profit if we increase our Revenue. We can easily modify our Summary value to accept a parameter as part of the calculation.

First, in our Forecast parameter, let's put a value of '1.1' so we can see what happens if we increase revenue by 10%.



5.3.6 Next, if we click on our [Sum of Revenue] summary value, we can edit our function in the formula bar. Let enter the formula $\text{Sum}(\text{Revenue}) * \text{Forecast}$.

Before hitting 'enter' take note of the [Sum of Revenue] and [Total Profit] Summary Values.

A screenshot of a spreadsheet showing the formula bar and a summary table. The formula bar contains the formula $\text{Sum}(\text{Revenue}) * \text{Forecast}$, which is highlighted with a red box. Below the formula bar is a table with columns: Month of Date, Monthly Profit, Store Region, Regional Profit, Contribution, and Order Number. The table shows data for 2015-11, 2015-12, and 2016-01, with sub-totals for each region (East, Midwest, South, Southwest, West). At the bottom of the table, there is a summary section with three values highlighted in red boxes: \$1,700,963,637.75 (Sum of Revenue), \$953,365,367.27 (Sum of COGS), and \$747,598,270.48 (Total Profit).

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution	Order Number
Total	\$747,598,270.48		\$747,598,270.48		
2015-11	\$14,270,115.24	Total	\$14,270,115.24	100.00%	
		+ East	\$2,836,490.01	19.88%	
		+ Midwest	\$2,967,303.11	20.79%	
		+ South	\$3,964,958.50	27.79%	
		+ Southwest	\$1,327,546.48	9.30%	
		+ West	\$3,173,817.14	22.24%	
2015-12	\$15,153,567.63	Total	\$15,153,567.63	100.00%	
		+ East	\$2,933,378.46	19.36%	
		+ Midwest	\$3,040,574.47	20.07%	
		+ South	\$4,209,808.49	27.78%	
		+ Southwest	\$1,496,521.95	9.88%	
		+ West	\$3,473,284.25	22.92%	
2016-01	\$13,437,353.81	Total	\$13,437,353.81	100.00%	
		+ East	\$2,617,427.74	19.48%	
		+ Midwest	\$2,736,017.69	20.36%	
		+ South	\$3,718,401.89	27.67%	
		+ Southwest	\$1,294,858.54	9.64%	
		+ West	\$3,070,647.95	22.85%	
SUMMARY					
250 Rows - 33 Columns					
		\$1,700,963,637.75	\$953,365,367.27	\$747,598,270.48	
		Sum of Revenue	Sum of COGS	Total Profit	

5.3.7 Hit Enter to finish the formula and notice how the values have updated.

Formula bar: $\text{Sum}([\text{Revenue}]) * [\text{Forecast}]$

Month of Date	Monthly Profit	Store Region	Regional Profit	Contribution	Order N
Total	\$747,598,270.48		\$747,598,270.48		
2015-11	\$14,270,115.24	Total	\$14,270,115.24	100.00%	
		+ East	\$2,836,490.01	19.88%	
		+ Midwest	\$2,967,303.11	20.79%	
		+ South	\$3,964,958.50	27.79%	
		+ Southwest	\$1,327,546.48	9.30%	
		+ West	\$3,173,817.14	22.24%	
2015-12	\$15,153,567.63	Total	\$15,153,567.63	100.00%	
		+ East	\$2,933,378.46	19.36%	
		+ Midwest	\$3,040,574.47	20.07%	
		+ South	\$4,209,808.49	27.78%	
		+ Southwest	\$1,496,521.95	9.88%	
		+ West	\$3,473,284.25	22.92%	
2016-01	\$13,437,353.81	Total	\$13,437,353.81	100.00%	
		+ East	\$2,617,427.74	19.48%	
		+ Midwest	\$2,736,017.69	20.36%	
		+ South	\$3,718,401.89	27.67%	
		+ Southwest	\$1,294,858.54	9.64%	
		+ West	\$3,070,647.95	22.95%	
SUMMARY					
250 Rows - 33 Columns					
	\$1,871,060,001.53	\$953,365,367.27	\$917,694,634.26		
	Calc	Sum of COGS	Total Profit		

5.3.8 Click Publish in the upper right hand corner to save your work.



Conclusion and Next Steps

Summary

This lab was designed to be an introduction in how to use Sigma to explore and analyze data, and turn results into visualizations. Through this lab we have walked through how a Sigma workbook enables us to quickly explore our data in a self-service manner using calculations, groupings, visualizations, the canvas, and dashboards. Because Sigma is SaaS and pushes all queries to your cloud data warehouse for execution, Sigma can combine its user interface and the unlimited power of the cloud data warehouse to give users the look and feel of a spreadsheet, but with no limit on the amount of data you wish to analyze. Unlock the value of all your data and users!

What's Next

Continue with this 14-day trial of Sigma, including connecting it to your own Cloud Data Warehouse or uploading your own CSV files. To extend your trial or to see a deeper demo, please contact Sales:

- If you are not a Sigma customer, please contact us at <https://www.sigmacomputing.com/contact-us>. We are happy to discuss a longer evaluation period, a deeper demo, a proof-of-concept, or how to purchase Sigma.
- Current Sigma customers can reach out to their sales rep or contact support@sigmacomputing.com

Still have questions

We're happy to help with whatever questions you have! Reach out to us using Sigma's live in-product chat or submit a request at the Support email above.

Other Resources

14-day trial: <http://www.sigmacomputing.com/free-trial/>

Help Center including Documentation: <https://help.sigmacomputing.com/hc/en-us>

Sigma Blog: <https://www.sigmacomputing.com/blog/>

Resources and Case Studies: <https://www.sigmacomputing.com/resources/>