Tableau Cheatsheet

By Annie Nelson with the help of Maven Analytics Tableau courses- taught by Dustin Cabral
Linkedin: annie-nelson-analyst | Tik Tok: @anniesanalytics

Data Source Interface- Where connections begin

The data source interface is where you connect to files and do file level edits.

Filters: Adding a filter here does not impact your raw data, but will impact all data in all of your workbook.

Connection Type: *Live Connections* query the underlying database / flat file each time a field is used. *Extracts* pull data from the underlying source and into Tableau's Hyper Extract file format, allowing you to refresh data on regular basis.

Data interpreter: This cleans your Excel workbook (removes blank rows, etc) and the produces a new workbook which it works from. It does not alter your original data source.

Data Transformation: In the data source pane, you can clean and change your data for analysis. This does not alter your raw source. You can:

- **Rename** columns and **Hide** ones you don't need
- **Group** entries (rows) in fields (columns) and create a new column with your groups
- **Pivot** multiple columns into rows
- **Split** fields using automatic/custom delimters

Combining Data Sources

UNION 

Stacks/Appends rows from one table onto another

JOIN 

Combine data sources using keys

Data Blending happens at the *sheet level* and the datasources remain separate (does not impact the data source interface).

Saving Your Work

twb files are Tableau workbooks that can hold sheets, dashboards and stories, but not data.

twbx files contain everything included in a .twb file plus raw data, and are typically used when sharing Tableau files with other users.

Connecting Data

Joins and **Unions** are done in the data source pane. **Blending** is done at the sheet level.

Join: Select the table that you are connected with that you want, and drag it to the canvas. Next, grab the table that you want to join with, and drag it next to your table on the canvas. They should be connected with a line and arrow, while you are still holding the cursor down. Once you let go, a join menu will pop up. You need to select which kind of join you want (right, outer, etc.) and which unique field you are joining on.

Union: With the primary table in the canvas already, drag your selected sheet over to the canvas and hover it over the primary sheet. Instead of connecting with a line, a small box should pop out below your primary table- this indicates you are stacking the new table onto the primary table- a union.

Blending data 

To blend data, begin with an existing sheet and visualization. To add on a new field from a secondary source, go up to the data connections shelf in the top left and click the name of the secondary source you want to blend in. Next, find the field you want, and drag it into the view with your existing data. A "Show me" icon will pop up, and when you let go, it will be blended in.

Primary sources are the first field pulled, and they will have a blue checkmark. Dimensions and all primary table decisions will be made off of this source. 

Secondary sources have an orange check next to them. Any dimensions not in the primary source will not show up, even if they are in the secondary source. 

Show Me

For a quick start option, **Ctrl** + click the fields you want to create a visual with, then click "**Show Me**". This gives you suggestions and templates to choose from. Click it again to close it when you finish.

Sheet Interface

Quick Axis Toolbar: Provides single-click access to fundamental features (save, swap rows/ columns, etc.)

Pages Shelf: Displays data in a linear time-progression (controlled by the end user)

Filters Shelf: Shows which filters are applied and allows users to filter data

Marks Card: Allows you to customize your viz (color, size, labels, level of detail, tooltips, etc.)

View/Canvas: Visual representation of the fields in the Rows & Columns shelves – Your viz!

Lower Toolbar: Provides quick access to the current data source, existing sheets/dashboards, and options to add new sheets, dashboards, or stories

Tables Shelf (Formerly Dimensions and Measures)

DIMENSION	MEASURE
Qualitative/descriptive fields (i.e. City, Category, Date)	Quantitative/numerical fields - can be aggregated (Sales, Units, Profit…)

Dimensions are typically *discrete* values- contain a finite set of distinct values (Year, Category, Country, etc.)

Measures are typically *continuous* values – which can contain an infinite range of values (Age, Temperature, Profit, etc.)

 Knowing which type of measure you are and want to be working with is important for aggregation.

Toolbar Options

 Swap Rows and Columns- works like TRANSPOSE in excel, handy for flipping bars from horizontal to vertical

 Axis sorting options- sorts your sheet according to the field of your axis.

 Show/Hide Cards: Allows you to hide things such as title, filters, rows and column shelves, etc. Helpful as a central location for if something disappears and you don't know how to get it back.

The Pages Card

The **pages** card in the top left of the sheet interface allows for a dymamic viewing experience. You can show how your data moves over time, and track its path. It is best suited for dates.

To use this, make your visualization- such as a scatterplot, or line graph. Then, take your dynamic field- generally a MDY (date) field- and drop it into **pages**. Adjust the time period, it adds automatically as years but you may way quarters or months.

In the popup on the right you can adjust the **speed:** If you chose "**Show History**" and "**Both**" under show, then a trail will be left behind by each of your marks, which allows users to keep track of their movement throughout the course of the animation.

Grouping Options

Grouping allows you to combine fields that are somehow related to eachother such as pencils and pens (both writing utensils) or MA, and Mass – both abbreviations for the same state. It combines the data and shows it as one field.

Field Grouping- Right click on any dimension and click create > group to manually choose fields to group.

View Grouping- On your canvas, **ctrl**+click two or more dimensions and in the pop-up click the paperclip to group

Defining Heirarchies

A heirarchy is fields which are nested within eachother. Dates are automatically seen as a heirarchy- year > month > day. You can define your own, for example country > state > city. Or, Category > Subcategory.

To do this, put one of the pills into the columns or rows shelf. Next, grab the next level in the hierarchy you want, and drag it on top of the original pill. They will merge automatically and show you the highest level. To expand the view, click the blue plus sign that appears to the left of your field name.

Once created, you can click and drag fields and grouped fields in and out of your hierarchy in the sheets shelf on the lefthand side of the view.

Sets

Sets are custom fields that define a subset of data based on some conditions. dynamic using set actions. They are different from groups because you don't choose which fields are in or out of the group, instead you choose what conditions include or exclude fields from the set.

Constant Sets: Defined manually, not dynamic.

Computed Sets: Based on a rule or condition, changes dynamically with the data.

Set Actions: A way to dynamically interact with your sets from within the view.

You can create sets by right clicking on their **field name** in the left sheets shelf, or by selecting certain fields from the view and clicking the overlapping circles icon.

Set options- 

General: This is the only constant set option. You can also choose to exclude fields. **Condition:** Using either conditions from a certain field, or writing your own SQL type formula, you can define the conditions for this set. **Top:** By field or formula you can show only top values.

Filtering Between Sheets

Filters and parameters are or can be shared between sheets. This means that if you apply a filter to one sheet, it may affect the others in your workbook without you noticing it. Using filters between sheets allows you to have a clea experience when users want to drill down on data across sheets.

To change your filter application options, right click on your filter > "Apply to Worksheets". **Selected Worksheets** lets you pick which sheets, **All using this data source** will impact every sheet that uses the same underlying original data source, and **All using related data sources** will filter all sheets that have the same field- such as State.

Analytics Pane

This is located to the right of your data pane. It allows you to add statistical visualizations and benchmarks. This includes **constant lines, reference lines, trend lines**, etc. These can be layered on top of existing visualizations, and allow you to add these lines and add-ons without adding more data or creating calculated fields.

Sorting Options

Sorting allows you your user to easily scan your visualizations to notice trends, patterns, and gain insights that you are trying to convey.

Toolbar or **Axis** sorting are two quick options for adding an asc/desc sort to the data. You cannot get the original view back after using these. The toolbar sort is located up top in the quick toolboar, and the axis sort option will pop up when you hover over your axis.

Field sorting is a more customizable sorting option. If you go up to the shelf where your field is located (ex. Columns) and right click your field name, choose "sort".

Nested sort is a multi-step sort which allows you to sort first by one category, then a second.

Parameters

Parameters are dynamic values that you can use in filters, calculations, and reference lines. The most popular example is Top N Filters. Let's say you want to filter down a bar graph to Top 10 scores. But, you know that your end user might want to change that to Top 15 at some point. Your value (n = 10) needs to be *dynamic.*

To make this parameter, right click in the whitespace of your data pane > "Create" > "Parameter". Then, name your parameter (in this case, Top N Parameter), choose the data type (Integer), choose the current value (10), choose the display format (default is fine, but if you were using currency, you would change this), and then the simplest option for allowable values is just to choose "All". It will appear at the bottom of your data pane! To show this to end users, right click and click Show Parameter. It can now be used in filters, or calculations.

To apply this to a **dimension filter-** Choose the dimension you want to apply the filter to (ex. Name), and right click and "Filter". Choose the "Top" tab. Filter "By Field". Choose "Top" and then instead of choosing a value, click the dropdown and select "Top N Parameter". By – the numerical field (usually a measure) you are filtering by, and finally the aggregation method of this field. For example, "Top" "Top N Parameter" by "Score" "Sum". Now only your top 10 students, ranked by score, will show. The end user can change this to 5, 15, or anything!

Linkedin: annie-nelson-analyst | Tik Tok: @anniesanalytics

By Annie Nelson | with help from Maven Analytics

Filter Options

Tableau filters always follow the order of operations. ->

Extract Filters: Not commonly worked with. Apply these by clicking the "edit" next to "Extract" in the data source pane.

Data Source Filters: Apply to all sheets in your dashboard! Add these from the data source pane by clicking "Filters", or from the sheets view right clicking on the sheet name and clicking "Edit data source filters".

*The rest of the filters will be displayed on the filter shelf:

Context Filters: These are modifications of a dimension filter so that the filter works with the specific set of data you are working with. They allow you to say "I want to filter down to the top 5 appliances sold in NYC" and the filter won't limit your results to only the top 5 *overall* appliances which happen to be sold in NYC. A nested filter option which will supercede the dimension below it.

To filter your data in context, go to the category you want (filter shelf), right click, and select "Add to context".

Dimension Filters: These contain discrete categorical data that can be included or excluded using either manual selection or conditional logic. To apply them, right click on the name of the measure you want and select "Show Filter", or simply drag it over to the filter shelf. Right click and drag it over to choose the aggregation type for the filter.

Measure Filters: When you drag a quantitative field out to the filter shelf, you will need to choose the type of aggregation. This is a measure filter. You can change it by right clicking the name of the field in the filter shelf, scrolling to where it says Measure, and changing it.

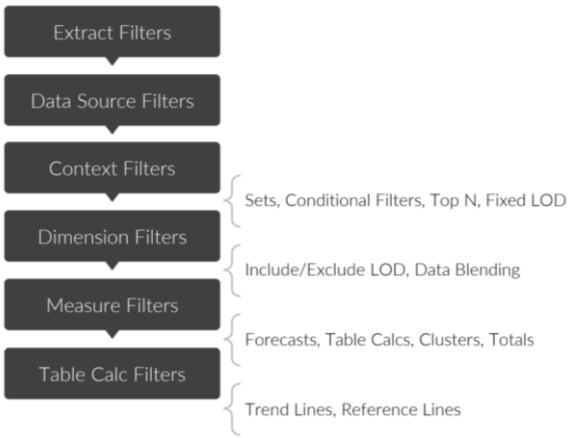
Table Calculation Filters: These are sheet specific calculated fields which you generate such as difference from or percent of total.

If you right click on a field in a filter, many options for editing it will come up. This includes **including** and **excluding** values, and showing the filter.

This includes the option to filter by **Only Relevant Values** or **All Values in Database**. The Only Relevant option allows you to save space and confusion by your end user by eliminating possibly filter options that are not applicable to your current view based on other filters.

Linkedin: annie-nelson-analyst | Tik Tok: @anniesanalytics

Tableau Order of Operations



Calculated Field Types

Calculated Fields allow users to create new data in columns. Three varities:

Basic Calculations: Most common calculations, and perform Excel-like calculations ex. aggregations, filtering.

```
SUM([Profit]) / SUM([Sales])
```

Level of Detail (LOD) Calculations: Support aggregations at dimensionalities other than the view level (advanced)- aka, you can control the level of detail in your aggregations so they are separate from the level of detail in your view.

```
{ FIXED [State]: SUM([Sales])}
```

Table Calculations: These calculations will be applied to values right in your view, rather than computing within the data source (as Tableau normally does).

```
RUNNING_AVG(SUM([Sales]))
```

Calculated Fields (Basics)

Create one by right clicking on a field > Create > Calculated Field. There are other places to create them, but this is the best option.

Drag or **Type** fields to bring them into your calculation.

Add operators by typing them where you would in a normal formula.

Alternatively, you can create from the **View** by double clicking in the rows/columns shelf, and typing your calculation.

Aggregate your calculation to the same level your view is at by wrapping your calculation in your aggregation. Tableau aggregates rows together automatically to bring them into a view, unlike Excel where you can view each row separately. If you want to know something like profit % in Excel, you would use ***Profit/Sales***. In Tableau, you need to aggregate your columns, because it will create one result. So, ***SUM(Profit) / SUM(Sales)***

You can **nest** calculations.

Once you create a calculated field and aggregate data within a field, when you drag it out to the view it will say **AGG** next to the field name- it will not then be able to create AVG or SUM like it normally will with fields.

Common Calculation Functions:

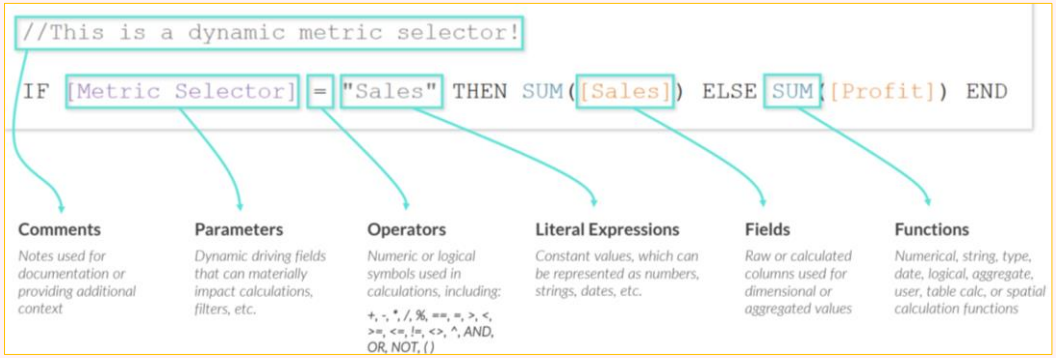
Aggregate: Change the level of granularity ex SUM, AVG.

String: Allows for manipulation of text based data (ex. CONTAINS, LEN, SPLIT, REGEX_MATCH)

Logical: T/F statements ex. IF, OR, ELSE, WHEN

Also, **Date,** and **Type Conversion** (ex. Float > string).

Calculation Syntax:



By Annie Nelson | with help from Maven Analytics

Marks

Marks are any visual element that you see that Tableau has created and include Charts, Labels, Legends, Sheets, Shapes, … etc.

You can find out how many marks are on a sheet by going to the bottom left corner of Tableau. It will tell you the number of marks, and the number of rows x columns. This is handy if you are checking to see how many records there are in a large bar chart.

Adding Visuals

Aside from **Show Me,** there are other options for adding visuals to your canvas.
Double Click on dimensions and measures, and this will add them to the canvas automatically in the way Tableau suggests.
Click and Drag dimensions and measures into the columns and rows cards if you know which axis you want the items on.

Editing Visuals

If you have two separate charts in the view and you want to **reverse their order**, just click and drag their pill on the columns/rows shelf.

If you have two (or more) charts that you want to combine into one, right click on the second pill and select "**Dual Axis**". You can also drag it to the right side of the first chart. You now have *TWO axes,* you have not combined the data on one axis.

This can look busy, so one way to differentiate is to go to to the Marks card and select only one of your fields and change the mark type. For example, on a bar chart (ex. Sales), add the second field as a line chart (ex. Profit).

To display them together using the same axis, you can go from this view and right click and click "**Synchronize Axis**".

Depending on the chart, you may also be able to click on the green triangle on the top left of the bottom axis, and drag it up to the top axis until you see a black square show up. They will then be two fields, on one axis. From the Measure Values card, you can choose to add more fields.

Marks Card

Tableau sets "automatic" as the default mark type, but you can change it.

Changes the color of the mark. You can also adjust border, halo, and opacity. This allows you to edit the mark, so you do not need to rely on the legend at the right side to change the color.

A slider to change the mark size. This includes changing the width of bars.

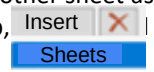
This is where you can change the label's text, alignment, and wrapping.

Detail is determined by the dimensions in the view. Add detail by adding dimensions.

Tooltips are a good way to level up your viz by customizing the text your users see when they hover over the mark. Change the shape of your marks. Includes custom!

To change the attribute of your mark without taking it off of the marks card, click the icon and a drop down menu will appear. For example, "Sales" is on the marks card for "color" but you want to switch it to "detail". Click on 

Marks Card Tips

❖In **Tooltips**, you can add the image of another sheet as part of the tooltip pop-up. Click on, Tooltip, 

, a menu will pop up. Select the sheet.

❖To customize **Color** to match anything that you can pull up on your screen (for ex. – the logo of the company you are working with). Pull up your desired item in a separate window, which you have resized to be small. While in the "choose custom color" menu, click on a blank custom color. Select the "Pick Screen Color" option. Then, you can click on the desired color, and Tableau will match it. Finally, Add to Custom Colors. Your exact logo color is now saved.

❖If you want to grab a field from one area in your sheet and add it to the marks card without removing it from the shelf (duplicate), click and hold **ctrl** the entire time you click and drag the pill.

Number Formatting

Numbers often need special formatting, such as adding a % sign, or converting to a $ with two decimal places. To access this, right click on the area you want to format > "Format". This will pull up your formatting pane on the lefthand side. On the far right you will see a "Fields" drop down > Select your desired numerical field.

Next to **Numbers**, it will say "automatic". Click the dropdown to select your number type. You also need to select either the "axis" or "pane" tab to get the number you want.

Stacking Marks

Stack Marks – Tableau automatically creates charts such as line charts with an area underneath them as stacked charts. This means that category A is stacked on B which is stacked on C. The total peak that you see is the combined value of A+B+C.

If you go to the "Analysis" menu up top, and deselect "Stack Marks", Tableau will unstack them and instead show them one on top of the other, with opacity to allow to see through to different layers.

If you want to **reorder** the stack order so a different field is "on top", go over to the color legend and drag to reorder the fields.

Getting the Visual You Want

If you are trying to create a certain type of chart or graph and Tableau is not letting you do what you want, there are some culprits you need to check.

Dates: make sure that they are in date form, and not string! Fix: Right click the name > "Change data type"

Continuous/Discrete: Are your dates continuous, or discrete? Do you want to use date to identify separate entries (discrete), or to show the flow from one date to the next and the change over time (continuous)?

Dimension/Measure: If you have a dimension and a measure in the same row, then Tableau will always place dimensions to the left of the measures. Fix: Change the field properties in order to switch their order.

Linkedin: annie-nelson-analyst | Tik Tok: @anniesanalytics

By Annie Nelson | with help from Maven Analytics

Dashboard Interface

Size: You can change the dimensions of your dashboard based on what goal and end user screen size you have in mind. Recommended to use Fixed Size and Device Designer for optimal dashboard design

Sheets: Select which sheets to use in your dashboard

Objects: Objects are like "containers" for your items. You can choose which to pull into your dashboard- be it a text box, or a specific size container that you are going to put a sheet into. You can select if it will be tiled or floating in the bottom of this menu before you pull it.

Layout: Allows you to easily edit containers in your dashboard by moving them sideways, changing their dimensions, and switching them to floating. This is also where you can change the *background and padding* of your tile.

Sheet Options

Remove sheet from dashboard

Go to Sheet

Use as filter- this will filter your whole dashboard based on this sheet and create an action filter

This menu allows you to do things on this sheet like:

- Add a title or caption
- Control which filters show up for each sheet on the dashboard
- Ignore filter options you apply elsewhere in the dashboard
- Change the container type (such as to floating)

Containers

Floating items can be moved around freely on the dashboard and resized at will. You can change how far to the front they are in the layout.

Tiled items are a set rectangle, and they fill a space. They are not as freely movable and resizable.

Experiment with tiled and floating dashboard items to get the layout that you want. Tiled items can be useful for holding a space and sectioning things out. Floating items can be helpful for customization.

Dashboard Objects

Containers help to organize and distribute objects within defined spaces

Text boxes can display flat text or parameters

Images can be embedded with tooltip and URL link options

Web Page objects embed websites into the dashboard

Extensions bring web application functionality to dashboards

Blank objects can create space and cover objects not to be selected

Navigation Buttons enable streamlined navigation between dashboard pages

Export Buttons enable export to image, pdf, and PowerPoint

Formatting

Workbook Level Formatting: Access this by going to "Workbook" > "Format". This is how you format things like fonts and borders for all tiles.

Worksheet Level Formatting: If you want to edit the fonts or lines of a specific worksheet right click the sheet you want and select "Format". On the left, in place of the data frame, your worksheet formatting options will appear.

Here you can edit things like axis lines, shading (this is how you make specific tiles **transparent** so you can layer and add color and images to your dashboard/story), borders, and alignment of each individual sheet. This menu can get confusing- make sure you pay attention to which tab you are in. You may be in "Lines", but are you in "All" or just "Rows"?

Stories

Creating stories in Tableau are similar to creating a powerpoint presentation. You can use **dashboards** and **sheets** in your story, as well as adding text and annotations to bring data to life.

Within a story, you can still interact with your sheets. This allows you to answer questions on the fly while presenting without having to re-analyze data.

Dashboard Filters

Dashboard filters allow your users to interact dynamically with the data, as opposed to a static image.

Filters that you have showing in a worksheet will automatically appear once you bring worksheets into your dashboard. It is a good idea to use **containers** to hold your filters if there are numerous.

Make sure that all of your sheets on your dashboard **filter together**, if that is what you want! Go back to your worksheets and make sure that if you right click on the filters in the filter shelf > "Apply to Worksheets" > and choose the option you want, such as "All Using this Data Source".

If a filter is not showing that you want, click the downwards carrot to bring up more options, select "Filter", and choose the one that you want to show.

Action Filters

This is another way to **dynamically filter** your dashboard. These can be tricky to interact with because users may think they "broke" the dashboard, so use well and with care.

To get started with an **action filter**, click the on the right-hand menu of your sheet. Now, when you click on a field in this sheet, the rest of the dashboard will filter down to just that field which you selected. Click it again, and it will release the filter.

To get your action menu, go up to the "Dashboard" tab > "Actions" and this brings the menu.

To edit your specific action, select it > "Edit". Here you can **Rename** it to be more specific, change the way the user activates the filter (**Select** is recommended, **hover** can freak users out). You can **Select Sheets** – maybe you do not want the action to impact *all* of your sheets. **Show all values** is recommended when the action **deselects**, so that your user can reset the dashboard to the original view.
Lastly, you want to decide which dimensions will push to all sheets by **selecting fields**. Sometimes you only want to filter by the one dimension which your user clicks on, and not apply all the other dimensions that are in the main sheet. Selecting down also speeds up dashboard performance

Linkedin: annie-nelson-analyst | Tik Tok: @anniesanalytics

By Annie Nelson | with help from Maven Analytics