

# Tableau Handout

**Tableau** is used to generate interactive data visualizations and makes very common visualizations very easy. Our focus today is on creating simple visualizations using Tableau.

In this tutorial you will learn:

<b>Data</b>	Know how to import data
	View and describe data within Tableau
	Sort Data
	Select data types (Date, Number, String)
	Make Calculated Fields
	Change the # of rows displayed
	Create Groups
<b>Sheet</b>	Differentiate measure and dimensions
	Create simple visualization and change chart type
	Adjust encodings
	Adjust color
	Adjust aggregation methods (e.g. sum, average, count)
	Sort axis
<b>Organize Sheets</b>	Build dashboard
	Build stories
<b>Action</b>	Create annotations on the chart
	Create data filters
	Link sheets together with actions.
	Add analytics enhancements (e.g., constant line, regression)
	Edit legend and filter by legend.

## Section: Tableau Basics

Please make sure you have Tableau installed and running. You can get a copy at: <https://www.tableau.com/academic/students>

Make sure you can run Tableau. If you need more information on Tableau take a look at:

- Videos: <http://www.tableau.com/learn/training>
- Books:
  - <https://link.springer.com/book/10.1007/978-1-4842-1934-8>

**TERMS:**

**Workbook:** A workbook is the entire Tableau file containing your sheets and dashboards.

**Sheet:** A sheet is a singular chart/map in Tableau.

**Dashboard:** A dashboard is a canvas for displaying multiple sheets at a time and allowing them to interact with each other.

**Measure:** A variable from the dataset that is meant to be aggregated. (This means it should be a number that it makes sense to do math with: sum, average, and so on.) Measures are often continuous data. Examples include GPA, sales, quantity, quota, height, and salary.

**Dimension:** A categorical variable from the dataset that is used to slice and dice the data into different categories. Dimensions are often discrete data. Examples include country, gender, student ID, and name.

**Rows and Columns Shelves:** The Rows shelf and the Columns shelf is where you determine which variables will go on what axis. Put data you want displayed along the X-axis on the Columns shelf and data you want displayed on the Y-axis on the Rows shelf.

**Filter:** A filter is used to limit what data is being displayed on the sheet. Visible controls for a filter on a sheet or dashboard are called Quick Filters.

**Tooltip:** Tooltips are text boxes that appear when hovering over a mark on a sheet in order to give more information. The text and text formatting in them are easily edited through the Marks card.

**Marks card:** The Marks card is the tool used to create a sheet that controls most of the visual elements in a sheet. Using the Marks card, you can switch between different chart types (bar, line, symbol, filled map, and so), change colors and sizes, add labels, change the level of detail, and edit the tool tips.

## Section: The Movie Dataset

**Scenario:** you want to invest in the movie industry. However, you are not sure which director, which movie, or what movie genre that you want to invest your money in. In order to make a wise investment, you obtained some data about movies. You want to create visualizations to help you to make decisions.

### PART 1: Data set-up and manipulation

Download the movies dataset [here](#) with your Stanford credential, open the Tableau app, and load the data.

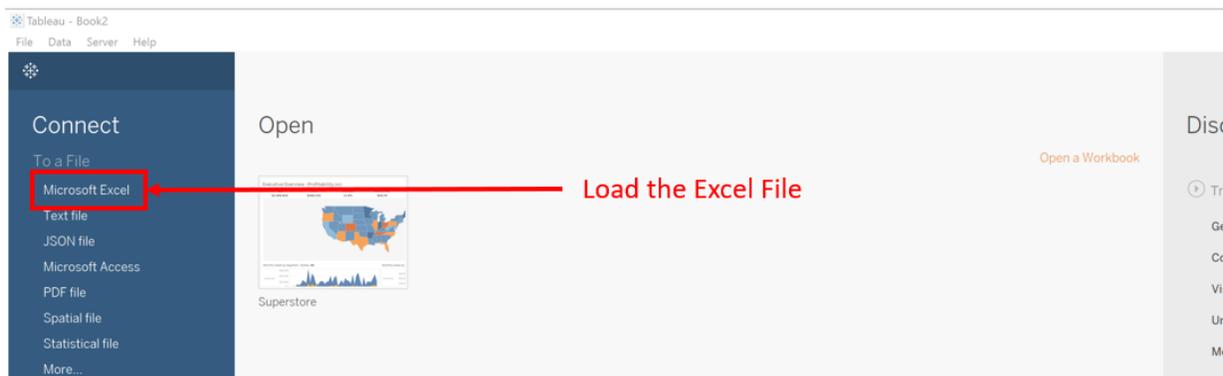


Figure 1

Once you load it, you will see something like this:

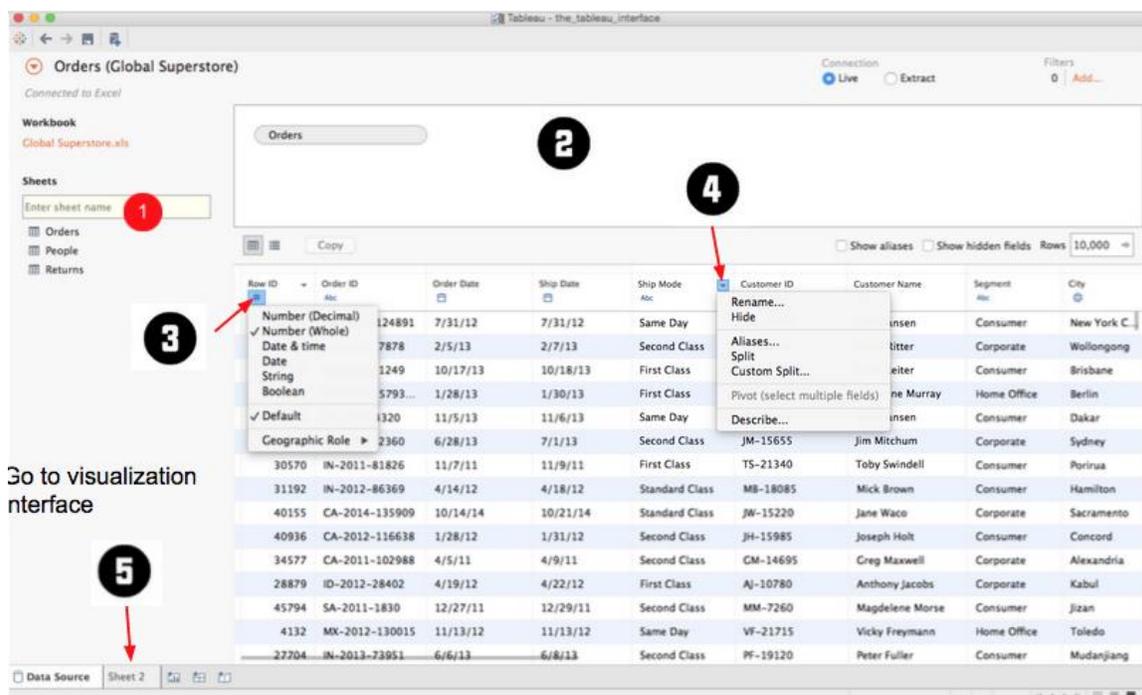


Figure 2

- You can view and edit the data under the “Data Source” Tab.
- Make sure that you are displaying all rows in the data, or your results might look a little different from ours. (Figure 2.1)

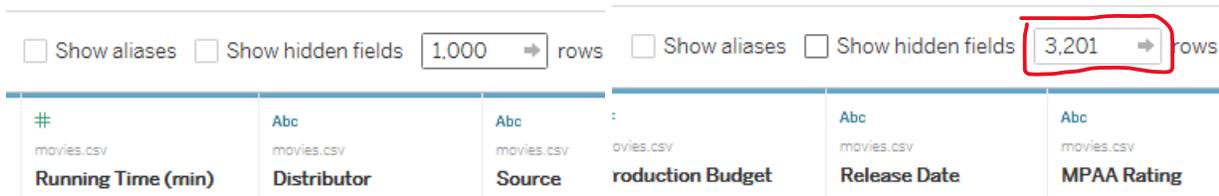


Figure 2. 1

***Question 1: Which movie has the highest production budget? Which movie has the lowest production budget?***

***Question 2: How do I sort the dataset by releasing date?***

***Question 3: Which is the most profitable movie?***

Hint:

1. Create a calculated field by clicking on the triangle next to “Worldwide Gross” -> select “Create Calculated Field”.
2. Revenue = Worldwide Gross-production budget, if we only care about movies that target the international market.

***Question 4: How many directors are included in the dataset?***

Hint: Click on the triangle next to “Director”-> select “Describe”.

***Question 5: How do I find all movies that contain specific strings in their names?***

Create a group of all movies that that contain the string “star” in their names.

Hint: Triangle Click-> create group-> enter search criteria-> “Find ALL”-> Group ->Change group name (optional) -> Include Others(optional) -> Change Field name(optional)

## PART 2: Creating Simple Visualizations with Tableau

After doing basic data manipulations, we are going to create some simple visualizations. Click on the “Sheet1” tab and you will see a layout like Figure 3.

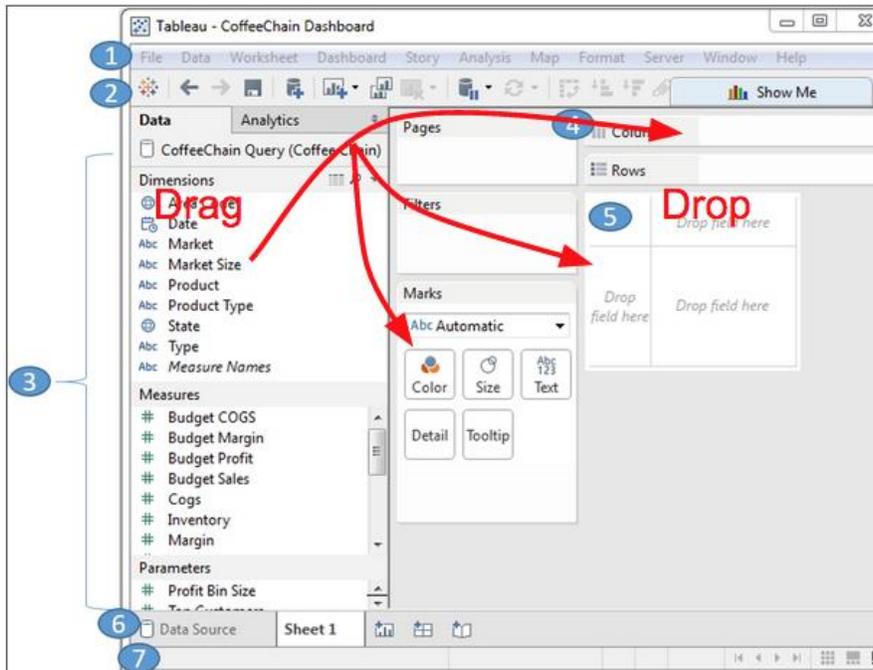


Figure 3

1. Menu
2. Toolbar
3. Sidebar for data and analytics
4. Shelves (e.g., pages, marks, rows)
5. Canvas to visualize data
6. Tabs of different data sheets
7. Status bar to navigate sheets

The side bar has two important blocks, **measures** and **dimensions**.

Dimensions are values that determine the **level of detail at which measures are aggregated**. Basically, you will have a “mark” for each dimension. You can think of them as slicing the measures or creating groups into which the measures fit. Measures are **values that are aggregated**.

### *Question 6: Who is the most successful director?*

6.1 Drag “Director” to the row, drag “Revenue” to the column. The “Show Me” menu let you create different types of charts.

6.2 Which director has the highest sum of revenue?

6.3 Filter Null Values in the “Director” field by right-clicking on the “Null” value.

6.4 Drag “Revenue” to column and convert it to the measure of average.

6.5 Add annotations via “Annotate”

6.6 Edit the color of the bar by clicking on the “Color” option in the “Mark” shelf.

6.7 Edit the Sheet1 title to be “Sum and Average of Revenue by Director”.

***Question 7: Are there any directors who have never directed a profitable movie?***

7.1 Create a new worksheet and name it as “Revenue as Dimension”.

7.2 Drag “Director” to the Rows. Drag “Revenue” to Columns, and convert it to Dimension

7.3 Add “Title” to the “Mark” shelf as tooltip so that each revenue mark is associated with the movie title.

7.4 Add a constant line to indicate movies that have negative revenue

Hint: Analytics -> Summarize -> Constant Line -> Value=0

7.5 Drag “Major Genre” to “Marks” shelf and encode it using color.

7.6 Are there directors who have never directed profitable movie? Who are they?

Hints:

1. you can use filters to complete this task.
2. never directed profitable movie =all movies directed have revenues less than zero

***Question 8: Can I get more information about a specific genre?***

8.1 Go back to the “Sum and Avg of Revenue” worksheet. Drag “Major Genre” to the “Filter” shelf and display only movies from the genre “Action”.

8.2 Find Directors who have the top 10 DVD sales by adjusting the director filter.

8.3 Which director has directed the most profitable Comedy movie?

Hint: change aggregation to “max”

***Question 9: When is the best time to release a movie?***

Create a visualization of revenue by quarters.

Hint: Click on the plus sign next to the YEAR

## **PART 3: Putting it all together**

### ***Question 10: How do I compare two visualizations in the same view?***

10.1 Create a dashboard to host both worksheets that we have created (e.g. “Sum and Avg of Rev” and “Rev as Dimension”).

10.2 Select “Action” from the legend so that only action movies are displayed in the (Revenue as Dimension visualization).

10.3 Add a highlight action: “Dashboard”-> “Action”-> “Add filter”. In the pop-up window, add a “Hover” action for the field of “Director”.

### ***Question 11: Is it better to invest in action movies or in comedy movies? Which director would you invest in?***

### ***Question 12: What’s the relationship between IMDB ratings and the revenue? Are highly-rated movies more profitable?***

### ***Question 13: I am going to invest in .....***

13.1 Make a story by clicking on the “add story” button.

13.2 Annotate the story and add new story points.

13.3 Who would you invest? Create some visualizations to justify your decision.

## **PART 4: Exporting your visualizations**

Interactive Tableau workbooks can only be uploaded to Tableau online, Tableau Server and Tableau servers. However, you can embed these visualizations to your own website: see the instruction here: [https://onlinehelp.tableau.com/current/api/js\\_api/en-us/JavaScriptAPI/js\\_api.htm](https://onlinehelp.tableau.com/current/api/js_api/en-us/JavaScriptAPI/js_api.htm)

You can export to image and pdf also.

For image export, you can only export worksheets: (figure 23)

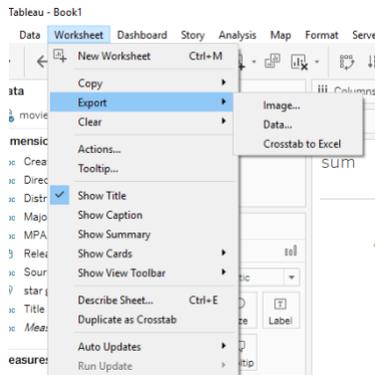


Figure 23: export by clicking worksheet-> export->image

For pdf export (which you can edit on editors such as illustrator), go to file-> print to pdf (figure 24)

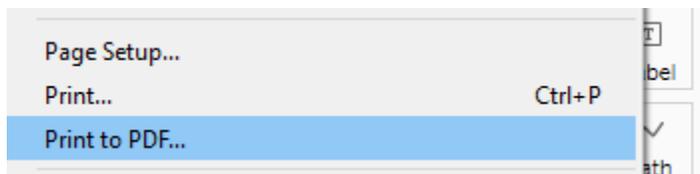


Figure 24

---

**NOTE:** Make sure that you check out the tableau public gallery <https://public.tableau.com/en-us/s/gallery>