Tableau Basic Module

Topic 5: Basic Charts

This class demonstration provides an overview of several of commonly used charts available in Tableau Students are encouraged to follow along and/or take notes on the provided Student Handout. This topic uses **Global Superstore**.

## Bar Charts

We have already created some bar charts, but now let’s dive more deeply into this very simple but very powerful chart type.

Let’s Analyze **Sales** (double click) by **Category** (double click) and drill down to **Sub-Category** (drag to Columns, left of Category).

To make this easier to read let’s rotate it (click **Swap** in the toolbar) and sort it (click **Sort** icon).

This gives me a very nice look at Sales (in just a few seconds!). For example, Furniture (especially Chairs) seems to be selling well. But what about Profits?

Drag **Profit** out so you get the “show me” cursor. Drop it and Tableau will use it on the Color shelf. It’s clear that Tables are not profitable – and I’m selling lots of them! Not good. We can see that Tableau picked a red/green color scale because the numbers were positive and negative. However, since I remember what we learned about color blindness I will **switch to orange-blue** diverging. This probably has more pop anyway as a color scheme.

Reminder: the Show Me pane provides other possibilities for visualizing the data I have selected – we can click a couple to see other options, but then let’s use the Back button to return to our bar chart.

Notice that Office Supplies has a number of smaller categories that are just cluttering up my analysis. This is a common issue in a dataset, and I don’t want to remove these small categories because they may be significant in aggregate. Instead, let’s select them all (hold down CTRL and select the words) and clicking the paper clip to **Group** them. **Right-click** and **Edit Alias** to rename the group.

It’s important to understand that this does not change the underlying data – the original sub-categories are still there. What this HAS done is created a new object (point it out in the dimensions pane).

Now we see that there is a problem in Tables. **Right-click** Tables and select **Keep Only**.

Now that we’re just looking at Tables, let’s drill all the way down to the Product level. Drag out the **Product Name** to the viz and **Sort** descending.

Finally let’s look at the actual underlying data from our top selling product here. Click the first bar… **View Data**, **Underlying** tab. And now I have a nice list of transactions that I might want to investigate.

## Scatterplots

# Scatterplots are a very easy and powerful way to visualize the relationships between numeric variables (Measures). For example, I wonder if there is a relationship between **Discount** and **Profit** (seems like a reasonable possibility). Let’s take a look by selecting those two fields and clicking **Scatterplot** on the **Show Me** menu. Go to **Analysis**, **uncheck** Aggregate Measures.

**Swap** if needed to get Discount on the horizontal axis – looks like Profit tends to decrease as a larger Discount is given (confirms intuition).

Remember that with Tableau, unlike many other tools, we don’t need to stop here. It is very easy to keep adding data. For example, drag **Segment** to **Color**. This makes it easy to see what segment certain outliers belong to.

If we prefer to focus on just one segment (while leaving all the data displayed), we can click **Highlight Selected Values** in the Legend and select, for example, to focus our viz on the **Corporate** segment by highlighting it.

Go back to viewing all the data. Go to the **Analytics pane** and drag out a **trend line** (choose **linear**). If you have had a statistics course, you probably realize that this is a regression line. We are not covering regression in this course, but for students who need a refresher, I have posted a document on the course website for you.

[[Students should check the post for regression refresher [http://onlinestatbook.com/2/regression/intro.html](https://eventing.coursera.org/api/redirectStrict/55WXMVDO2QTfCLliav5ZsIvnxFIxqB44pLsqX0Lx22qnFp9R0m_jowyJIq2p1bT5qDOFz4Be5k0FPEMy3ikkyg.VJXqCH2o6muNFJlK90h3Cw.YLfi7wXs52pG4jRxhVANrQ3JQ2WifUp7-mioYTqLNk10Yo36lI3wGxkUj9b81DMo4G-pi_oKiacYtQMJ_2PqVp52NeK94Lm4rAT1P9up8YyPz_HluCLlo_PtrUHJ0y6d9RXe9kmkpdp7QjKFapgMeXSxyMPL43L41ZI6lTqQDgmwt18IBxtcJOgAhTJCbN7dZUdctfmZcO_P4V45x0lVOL7EH-tZ60pKqwircKcdHghcuA3Wq19tB9eJcURQGkvg67-vkQfktPMB0tdkSMKxf_cvfzPIsFDFLC0ffjTi6Vg90mzpxzV4z6sNJehlIRQRBAy__7XuxYOReNM3Vk_P4w) or a similar resource as needed]]

This trend line does not look very impressive, but take a look at the y-axis scale. We need to investigate more before dismissing this as a negligible relationship. **Hover** over the trend line. The **p-value** is very small, so in fact the relationship between these variables is statistically significant. And we can see by the negative **coefficient** that the relationship is negative. However, the **R-Squared** value is somewhat low, so our simple trend line has not explained very much of the relationship. **Drag the trendline out** of the viz to remove it. [[Instructors might want to digress more into interpretations here if desired]]

## Line Graphs

Like Scatterplots, line graphs are good for looking at the relationship between 2 variables (although a scatterplot is often better for this). Line graphs are often used for looking at how something changes over time. This is called time series analysis.

Let’s start by looking at sales over time. Double-click **Sales**, double-click **Order Date**. Tableau understands date fields and automatically breaks them down by Year, Quarter, etc.

I actually need more detail than yearly sales results, so let’s expand to Quarter and then Month. I don’t really care about Quarter, so **drag it out** of the viz.

Note that dual axis is very easy in Tableau – drag **Profit** to the **right axis**. Then **Undo** to get back to Sales only.

Remember that we can now drag things around and change the viz on the fly. We have discrete dates right now (we have already learned how, with discrete dates, each part of the date is treated separately). So for example we can drag **Year** to **Color** and see direct comparisons between the years. (Note that, if you liked the current format and just want each year to be a different color for clarity, you could CNTRL-drag Year to color).

Let’s all get back to a separate line chart for each year. If I want to look at a common calculation for time series data, like year over year growth, it is very easy: **Right-click** on the green **Sum(Sales)** pill. Select **Quick Table Calculation**… **Year over Year Growth**. Now I can see that there were months in which sales went down YOY. Click the **Back** button.

With Tableau it is also easy to add a Forecast. Go to the **Analytics pane** and drag out **Forecast** (interested students can learn about the specific forecasting algorithm in the Tableau documentation). Click the **Back** button.

Another useful feature to add to a line chart is a reference line, for example: drag the **Average Line** onto the viz…drop it onto the **Pane** icon.

I can also drill down, and this average will dynamically adjust: **select a few points** in the line graph and note the new average line.

Although we are talking about line graphs, I want to briefly point out how easy it is to explore other options: click the drop-down in the Marks card and select **Bar**, then **Circle**, and then finally leave it as **Area**.

## Histograms

Double click **Discount**. The default is a bar chart, and we can add more data to break out discount by segment, etc. But what if we are just interested in learning more about the various discounts that we offer?

Use **Show Me** to change to **Histogram**. **Right-click** the new **Discount(bin) dimension**, **Edit**, and change bins to 0.1. This is a very quick and easy way to get the view of the data that we want! Now we can see that most discounts are between 0 and 10%, and there are also a lot of discounts in the 10-20% range. We even have 300 instances in which the discount given was 70-80% (shown in the Tooltip). If we are suspicious about these, it just takes a couple clicks to get to the underlying data (**right-click** that bar and show the data).

Remember that, since this is Tableau, we can add more data if we want – for example, drag **Category** to **Color**, then **Undo** this change.

## Heat Maps

Let’s use heat maps to visualize the margin that we are making on Furniture items. Notice that margin is not in the data - let’s do a quick preview of Calculated Fields to create the margin field (we will cover calculations in detail in a later topic):

**Analysis**…**Create Calculated Field**. Name it **Margin**, formula is **SUM([Profit])/SUM([Sales])**

Drag **Category** and **Subcategory** to **Row**

Drag **Order Date** to **Columns**, and then change to **Month (discrete)**

Drag **Category** to **Filter** shelf, and select only **Furniture**

Finally, drag your new **Margin** field to the viz. We have a table of numbers. Not the most user-friendly…

Select **Heat Map** from Show Me, and then drag **AGG(Margin)** on the **Marks** card to **Color**. Change color to Orange-Blue Diverging. Drag edges if needed to make the viz larger. This is much better than the table of numbers! We immediately see some insights – e.g. maybe we are selling tables as a loss leader and making it up on chairs?

**The chart types covered above provide a core set of Tableau skills. There are also several other basic charts (e.g. tree maps and bullet graphs) that could be covered at this point in the course. Students can be referred to Tableau’s online resources for these charts:**

* Tree Maps:
  + [**http://onlinehelp.tableau.com/current/pro/online/mac/en-us/buildexamples\_treemap.html**](http://onlinehelp.tableau.com/current/pro/online/mac/en-us/buildexamples_treemap.html)
* Bullet Graphs
  + **http://onlinehelp.tableau.com/current/pro/online/mac/en-us/help.html#qs\_bullet\_graphs.html?Highlight=bullet**
  + Optional video by the inventor of the bullet graph (note: his demo uses an old version of Tableau):
    - [**http://www.tableau.com/videos/bullet-graphs**](http://www.tableau.com/videos/bullet-graphs)