tableau
SOFTWARE

Tableau Desktop 7 Core Certification
STUDY GUIDE

Note about version: The content described below, and the exam itself, are based on the feature set of Tableau 7.0. If you are currently using Tableau an earlier version of Tableau Desktop, upgrade or install a trial of Tableau 7.0 and understand the new capabilities prior to attempting the exam.

Recommended Preparation

Learn the functionality of Tableau Desktop.

The following resources are available (choose either method, or combine):

a. Attend Tableau Fundamentals and Advanced Training (best option) – See a list of available locations here: http://www.tableausoftware.com/learn/training/classroom.

b. Review all of the online training videos under the Intro and Advanced headings on the following page: http://www.tableausoftware.com/learn/training/ondemand. (Note, these videos do not cover all material on the exams, but can help you with your learning prior to reviewing the study guide.

Review and be able to complete all of the materials covered in the "Review and Practice" section of this study guide.

Review and Practice

All of the examples below use the 'Sample – Superstore Sales (Excel).xls' file. It is not recommend that you use the sample data source of the same name, rather make a new connection to the excel file. When trying to recreate these examples, your dates and resulting visualizations may differ from the examples.

I. Connecting to Data and the Data Window

Understand or be able to create/execute the following:

1.1 Know the different types of data connections Tableau supports natively

1.2 ODBC connectivity

1.3 Navigation of the Data Window, and understanding the visual cues

1.4 Understand and explain the difference between Dimensions and Measures. You can find a definition of dimensions versus measures here: http://onlinehelp.tableausoftware.com/v7.0 pro/online/en-us/datafields_typesandroles_dataroles_dimensionmeasure.html

    1.4.1 More simply, measures are the numeric values that you use to evaluate. Dimensions are the way that you "slice" your data. So in evaluating, your business, you might look at your sales measure. But you would want to "slice" or sub-divide the Measure sales by certain Dimensions: by Geography, by Product, by Sales Rep, etc.

1.5 Change a measure into a dimension

1.6 Hide unneeded fields

1.7 Understand Tableau Data Sources and how to create them http://onlinehelp.tableausoftware. com/v7.0/pro/online/en-us/export_connection.html

1.8 Know the difference between a live connection and an extract. http://onlinehelp. tableausoftware.com/v7.0/pro/online/en-us/getstarted_opendata.html

1.9 Understand how to create an extract, and the options available when creating them http:// onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/extracting_data.html

1.10 Be able to explain what a Cube (or Multidimensional) data source is and how it's different from a relational source. http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/ datafields_understanddatawindow_relational.html

2. Working with Data

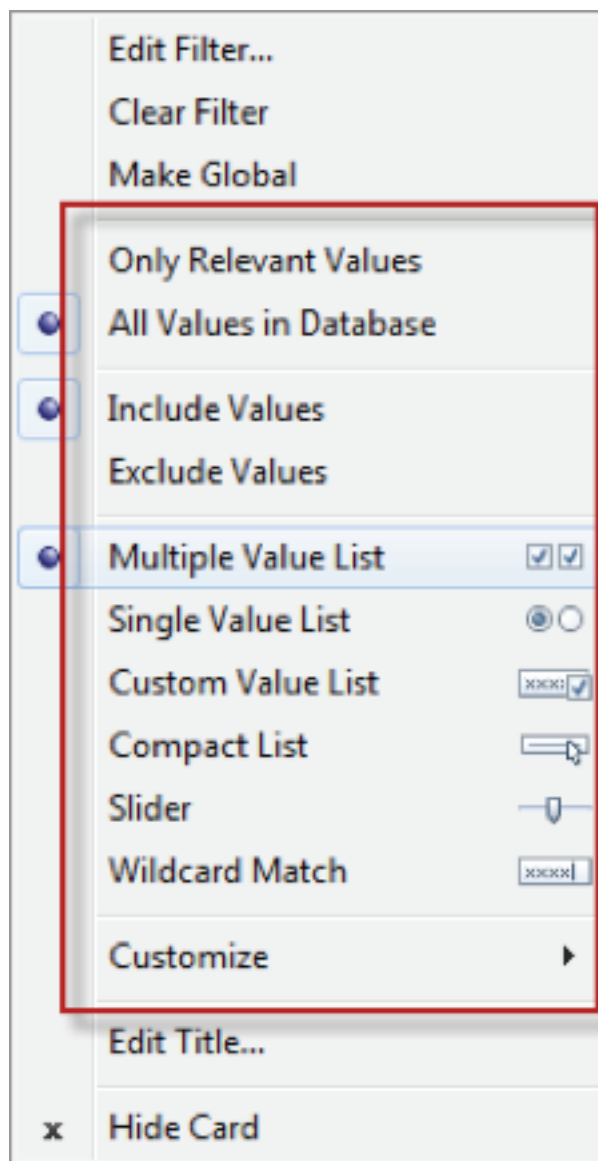Understand or be able to create/execute the following:

2.1   Understand how to create Filters with all types of data.

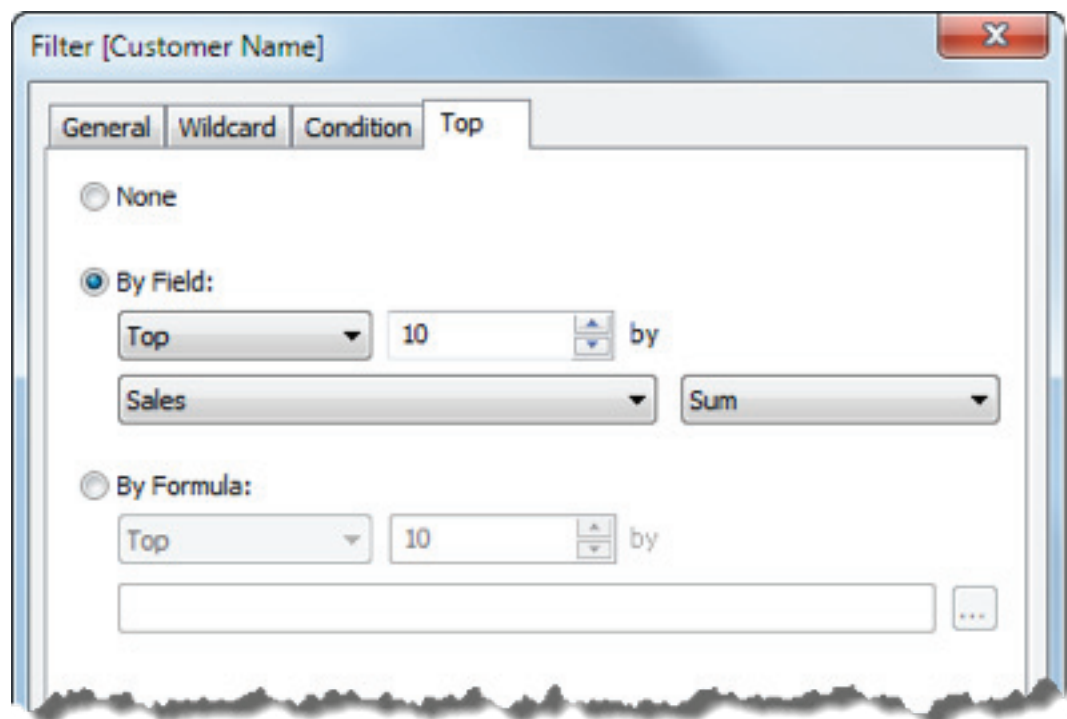2.1.1   Filtering numeric fields and controlling their aggregation:
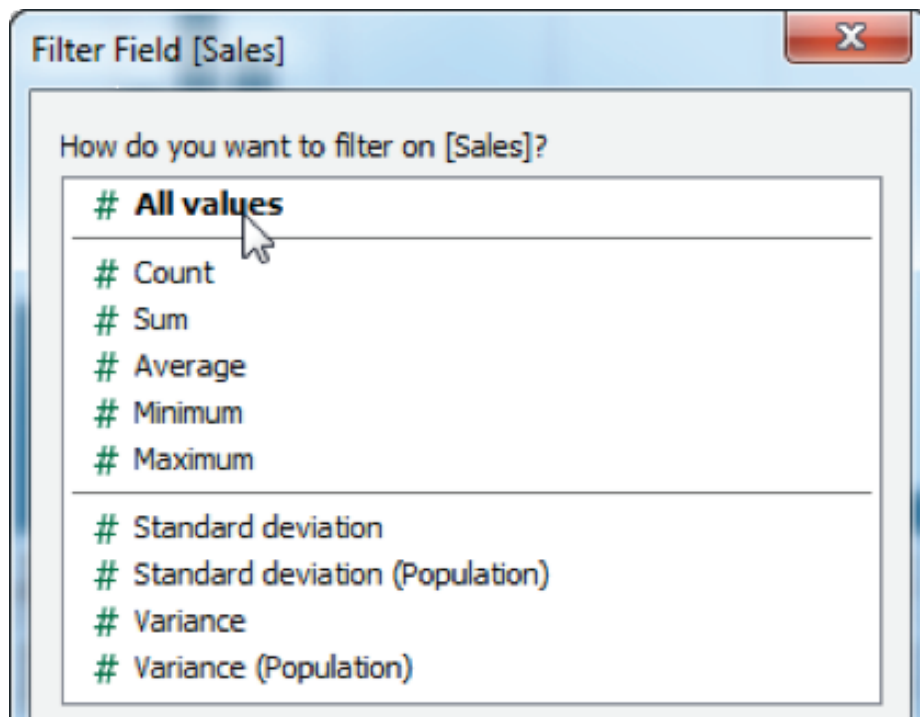
2.1.2   Know how to create a conditional filter which is based on another field.

2.1.3 Be able to Show Quick Filters and change Quick Filter modes

2.1.4   Filter a list to the Top 10

2.1.5 'Make Global' filters. Understand the difference between local and global filters. Most people understood that global filters apply across worksheets while local filters apply to only a single worksheet. Many miss the subtle distinction that global filters only apply to worksheets / visualizations utilizing the same data connection. Some implications:

- If you want a filter to apply to several, but not all worksheets, you can create a duplicate connection

- If you want to have a filter apply to visualizations from different sources in the same dashboard, parameters or filter actions can serve this purpose.

2.2 Understand how 'Context Filters' interact with Top n filters. Adding a filter to context implies that a "temp table" is created from the results of that filter. In some cases, this will be a temp table within the database itself. In other cases, a temporary Tableau Data Extract is created. The two most common applications of context filters are described in the following articles:
- http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/filtering_context.html
- http://www.tableausoftware.com/support/knowledge-base/using-context-filters-improve-performance

2.3 Create a hierarchy, and understand how it's used in a view.

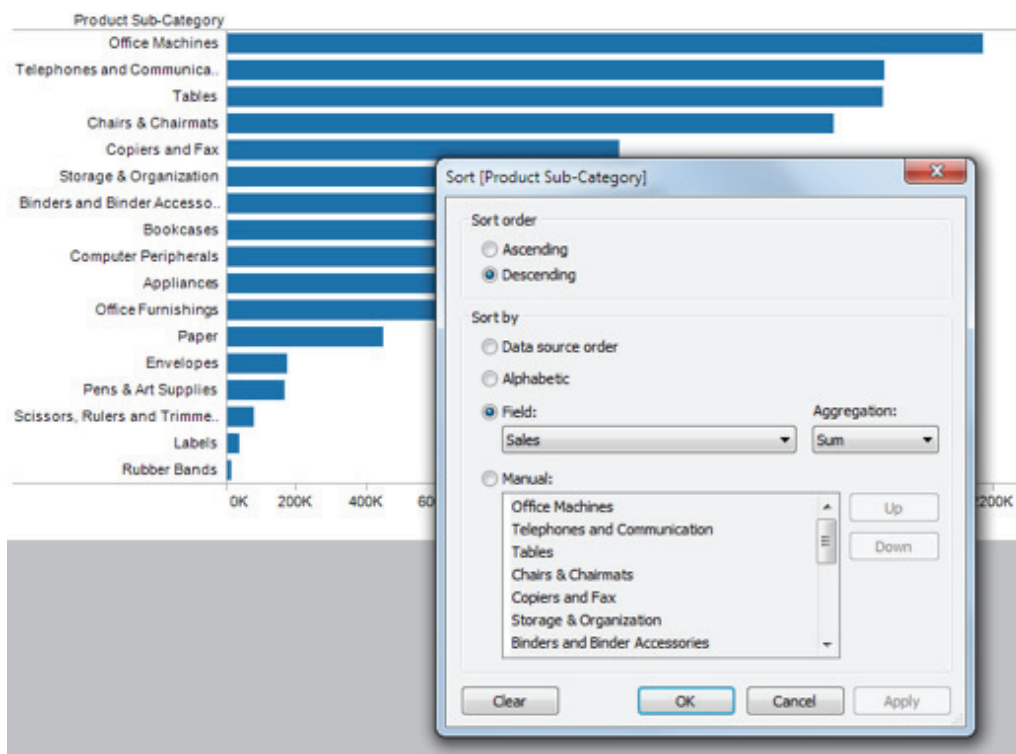2.4   Group two or more items on a view or legend.
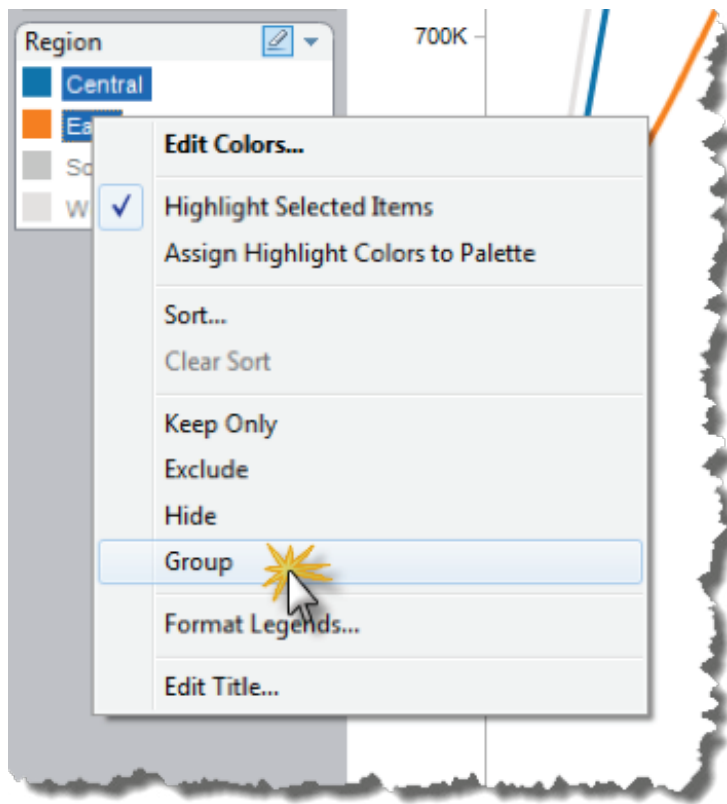
2.5   Understand all sorting options, including:

   2.5.1 One-Click Sort (toolbar method)

   2.5.2 Sorting from the Axis

2.5.3 Dynamic Sorting (as seen below)

2.6 Create Sets

    2.6.1 Using Sets: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/sortgroup_
        sets.html

    2.6.2 Use Parameters in Tableau

    2.6.3 For more information, see the help topic: http://onlinehelp.tableausoftware.com/v7.0/pro/
        online/en-us/parameters.html

    2.6.4 Understand using a parameter in a calculated field

    2.6.5 Know how to change bin sizes using parameters

    2.6.6 Be able to use parameters in reference bands

2.7 Change a field's formatting to display as currency or percentages

2.8 Understand how Tableau handles dates. For assistance, see the following:

    2.8.1 Video with information: http://www.tableausoftware.com/learn/tutorials/on-demand/
        advanced-training-dates-times

    2.8.2 See also online help: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-usdates.
        html

    2.8.3 Automatic Hierarchies associated with Dates

    2.8.4 Changing date levels

2.8.5 Filtering options unique to Dates, like "Relative Date" filtering: http://onlinehelp.
tableausoftware.com/v7.0/pro/online/en-us/filtering_add_dragfields_dates_relative.html
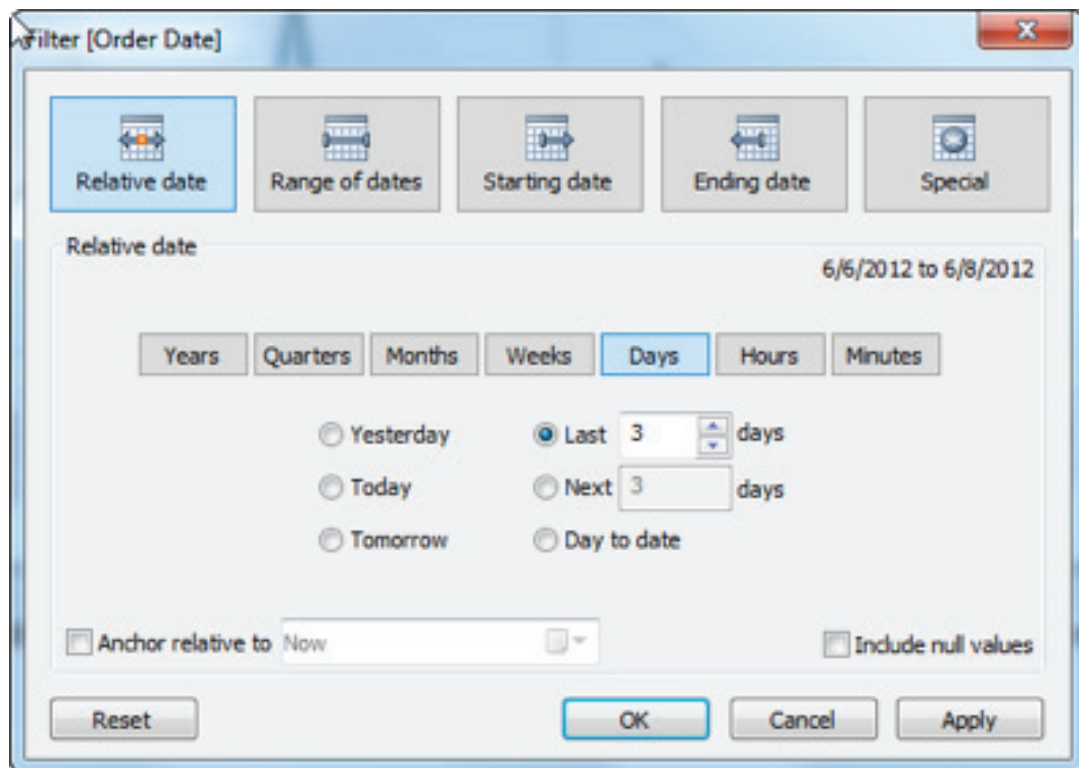

2.8.6 Assigning custom date levels

2.9 Understand the difference between 'Discrete' and 'Continuous' and understand how to work with Discrete and Continuous Dates.

For a general description of discrete vs. continuous, see help here: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/datafields_typesandroles_dataroles_continuousdiscrete.html

More information on continuous dates here: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/dates_continuous.html

2.10 Change the method of aggregation for a measure
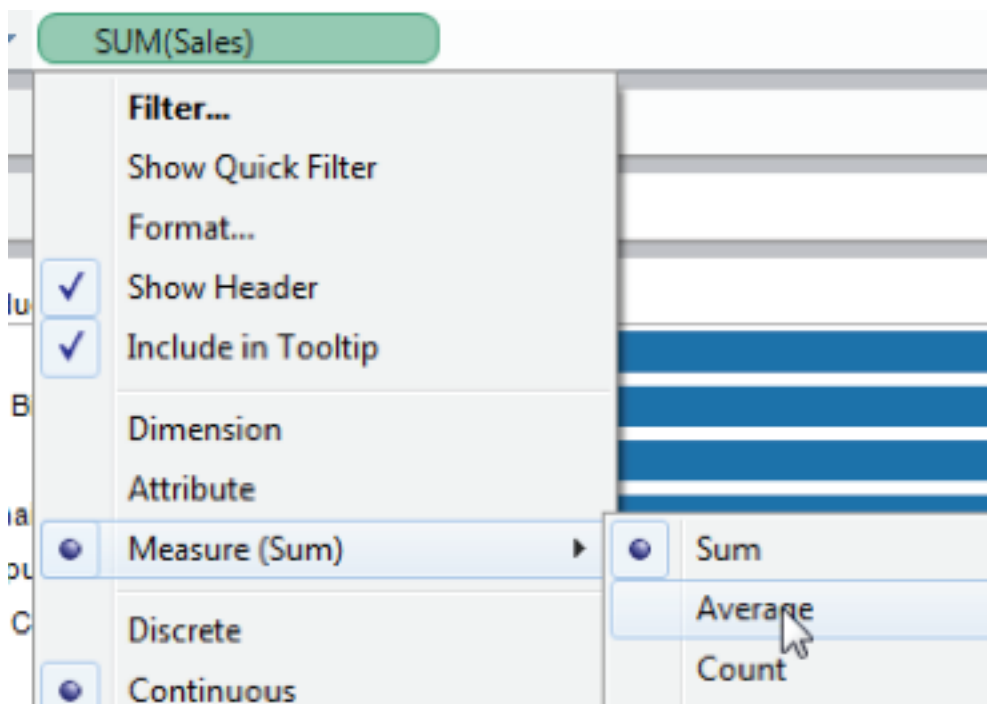
2.11 Understand Data Blending

2.11.1 Blend data from two or more data sources. For details on data blending in Tableau use online help: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/help.htm

2.11.2 Or this video: http://www.tableausoftware.com/videos/data-integration

3. Creating Visualizations

Understand or be able to create/execute the following:

3.1   Create Views by using the shelves for Columns and Rows, and adding information to Cards.

3.2   Be able to use Show Me! and understand how it selects visualization types that are probably relevant.

3.3   Use 'Measure Names' and 'Measure Values'

3.3.1 Measure Name and Measure Values come into play when you place more than one measure in the same place. They are a name-value pair. Measure Name contains the label for the measure ("Sales", Profit", etc). Measure Values contain the corresponding numerical values. The most common examples include:

- Creating a listing report with more than one measure – In this case, Measure Values will be placed on the text shelf. Measure Names will appear on the Column Shelf. Placing Measure Names on the column shelf provides a separate column with a header for each measure listed. Otherwise, the values will be written on top of each other in the same column. See the following article: http://www.tableausoftware. com/support/knowledge-base/measure-names-and-measure-values-explained

- Creating Cross Tabs (also known as Text Tables or Pivot Tables) with more than one measure in the intersection of measures. In this case, you would have one or more dimensions on the Row Shelf, another Dimension(s) on the Column Shelf. You would then place Measure Values on the Text Shelf, and Measure Names on either the Row or Column Shelf. This is to provide a separate column or row header for each measure displayed rather than having them over-write. See the following knowledgebase article: http://www.tableausoftware.com/support/knowledge-base/ quick-crosstab

- Combining more than one Measure on the same Axis. See the following Knowledge Base article: http://www.tableausoftware.com/support/knowledge-base/measure- names-and-measure-values-explained
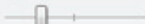
An example using Measure Names/Measure Values:

Pages	Columns				Measure Names				
	Rows				+ Product Sub-Categ..				

| Product Sub-Category	Order Quantity	Product Base Margin	Profit	Sales	Shipping Cost	Unit Price
Appliances	10,949	241	98,023	747,333	6,922	31,734
Binders and Binder Accesso..	23,120	345	307,174	1,024,522	6,682	52,933
Bookcases	4,836	122	-33,171	821,982	8,596	32,553
Chairs & Chairmats	9,385	238	149,938	1,744,145	15,281	69,876
Computer Peripherals	19,263	450	94,534	796,554	4,069	32,235
Copiers and Fax	2,128	36	167,361	1,130,361	2,447	64,899
Envelopes	6,618	93	48,711	176,298	1,715	6,524
Labels	7,320	109	13,689	39,042	290	1,592
Office Furnishings	20,273	405	96,878	665,912	8,225	25,154
Office Machines	7,879	151	276,590	2,171,343	7,248	190,883
Paper	31,006	461	45,987	449,496	7,949	17,749
Pens & Art Supplies	17,116	340	7,552	167,525	2,049	6,100
Rubber Bands	5,010	96	-78	15,240	227	544
Scissors, Rulers and Trimme..	3,931	92	-7,799	80,996	671	6,101
Storage & Organization	13,957	370	2,517	1,099,774	10,149	44,826
Tables	9,048	244	-61,271	1,887,215	20,619	79,569
Telephones and Communica..	22,969	513	316,952	1,889,314	4,842	86,844

NOTE: In all cases of using Measure Names and Measure Values, Measure Names are placed on the filter shelf to allow you to select which measures you want in play (active). A Measure Values card will also appear showing which measures are in play. Adding or removing Measures from this card is equivalent to changing the filter on Measure names from the filter shelf.

3.4 Format a cross-tab, including defining row banding:

Product Sub-Category	Region			
	Central	East	South	West
Appliances	188,779	151,835	187,920	218,800
Binders and Binder Accesso..	260,320	229,520	240,083	294,599
Bookcases	206,170	212,900	233,571	169,341
Chairs & Chairmats	398,892	416,734	469,663	458,855
Computer Peripherals	172,392	145,256	245,985	232,921
Copiers and Fax	344,372	263,329	311,800	210,861
Envelopes	47,499	28,159	60,689	39,951
Labels	9,088	10,983	8,795	10,176
Office Furnishings	151,713	131,677	164,327	218,195
Office Machines	445,251	449,344	734,106	542,643
Paper	110,890	102,716	117,956	117,934
Pens & Art Supplies	44,400	32,407	50,746	39,971
Rubber Bands	2,881	3,784	3,439	5,136
Scissors, Rulers and Trimme..	8,579	7,641	43,022	21,754
Storage & Organization	263,535	209,005	277,454	349,781
Tables	565,172	369,520	487,273	465,250
Telephones and Communica..	473,347	418,181	495,150	502,636

3.5 Put two or more measures on a single axis:

Order Date

Measure Names
- Profit
- Sales
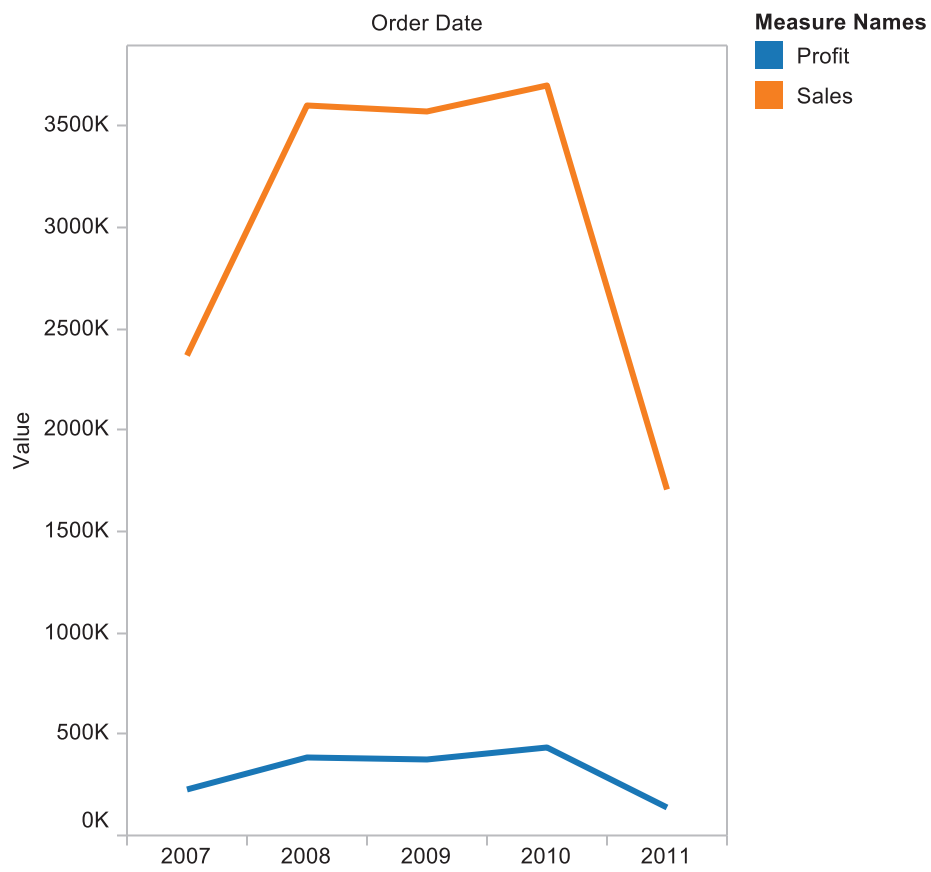
3.6 Change the label of an axis:
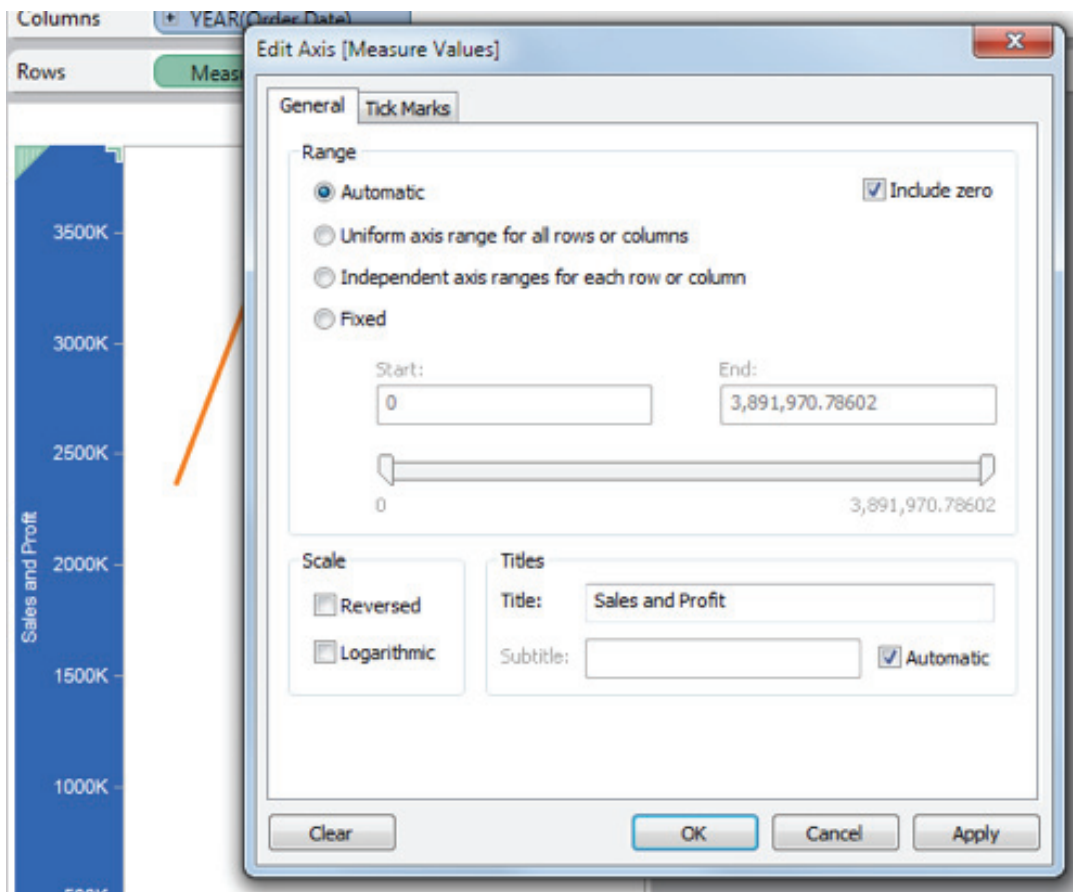
3.7 Adjust color legends by using a custom color:
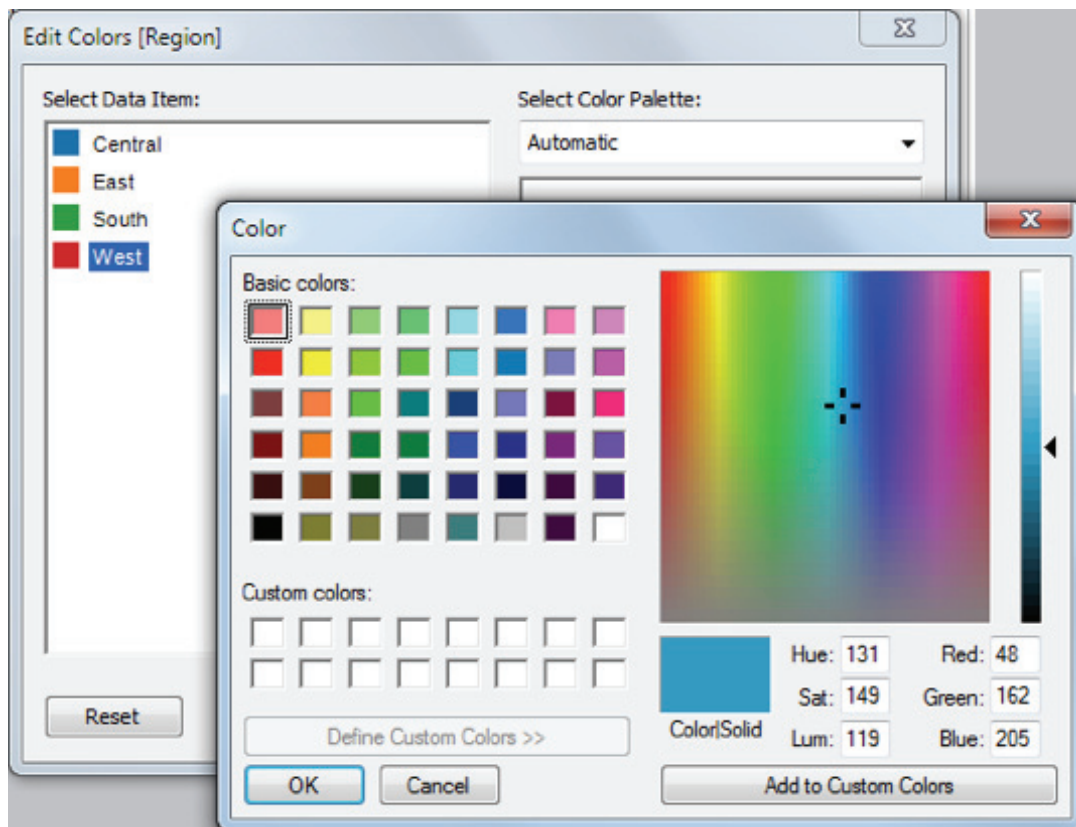
3.8 Change a Number Format

    3.8.1 From Field Properties: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/datafields_fieldproperties_formats.html

    3.8.2 From the View: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/formatting_specific_numbers.html

4. Building and Understanding Visualization Types

You should understand the common types of visualizations that we create with Tableau, when you would use each type, and how to create them. A review of common visualization types that you should be comfortable with is included below:
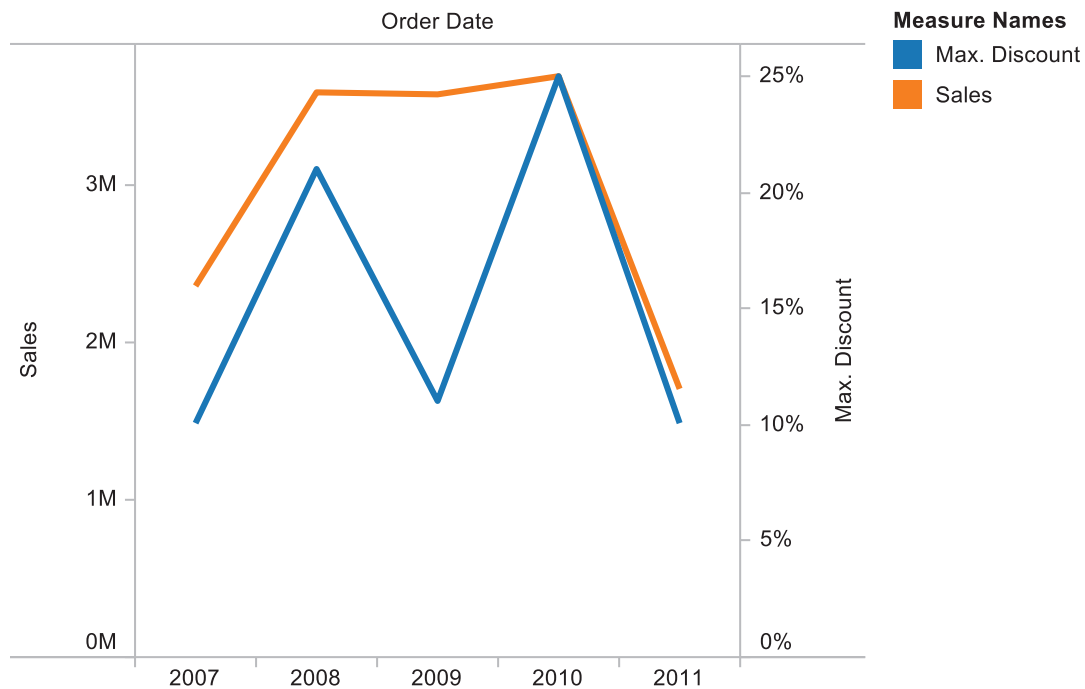
4.1   Histogram – a histogram is a bar chart showing the distribution of data. It is described in more detail in the following article: http://en.wikipedia.org/wiki/Histogram. Steps for creating a histogram in Tableau can be found here: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/calculations_bins.html.

4.2   Sparkline – Edward Tufte invented the Sparkline. What a Sparkline is and why you might use it, written by Tufte: http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0001OR. You can find a KnowledgeBase article on creating a Sparkline in Tableau here: http://www.tableausoftware.com/support/knowledge-base/sparklines-bullets.

4.3   Combo Chart – Combination Charts combine two different mark types in one chart. They require the use of multiple marks cards. You can find directions on creating these charts here: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/multiplemeasures_combocharts.html

4.3.1   For example:
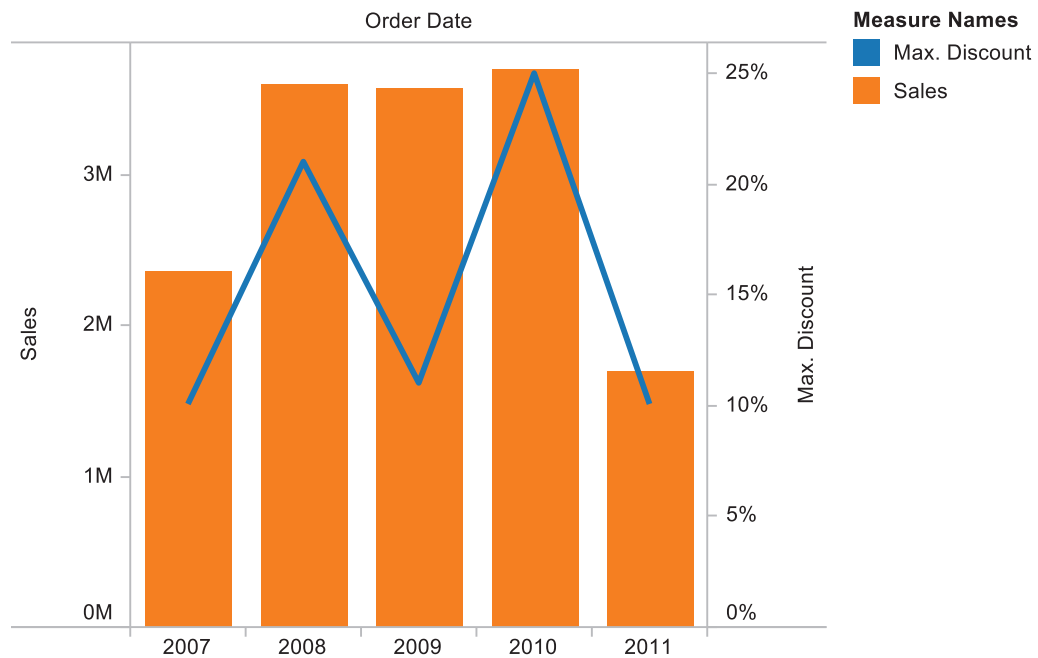
4.4   Dual Axes Chart – Dual Axes charts use two separate axes to show the data. This article
describes creating them: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/
multiplemeasures_dualaxes.html

Create a dual axis chart

Order Date

Sales — 3M, 2M, 1M, 0M

Max. Discount — 25%, 20%, 15%, 10%, 5%, 0%

2007 2008 2009 2010 2011

Measure Names
■ Max. Discount
■ Sales

4.5 Cross Tab – Cross Tabs are also often referred to as text tables, pivot tables, and a number of other names. It is simply having your report broken down with a Column Dimension(s), a Row Dimension(s) and a Measure(s) at the intersection of each row and column. If you want to have more than one measure at the intersection, Measure Names and Measure Values come into play. You can find more information here: http://onlinehelp.tableausoftware.com/v6.1/pro/online/en-us/help.htm by searching "Text Table" or in the KnowledgeBase http://www.tableausoftware.com/support/knowledge-base/quick-crosstab.

Create a cross-tab with % of Total Sales and Sales

Region	Sales	% of Total Sales
Central	3,693,281	24.78%
East	3,182,989	21.35%
South	4,131,981	27.72%
West	3,898,802	26.15%

4.6   Small Multiples – A small multiple is similar to the idea of a Cross Tab in that you have your information divided by a Row dimension and a Column dimension. However, instead of having a number at the intersection of the two dimensions, you have a visualization. Here is an article which describes small multiples: http://en.wikipedia.org/wiki/Small_multiple. Here is a link that describes creating small multiples in Tableau: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/getstarted_buildmanual_ex3nested.html

4.7   Bullet Chart – A bullet chart / bullet graph is a great way to display how an actual value compares to a target. It was invented by Stephen Few. You can find a good description of what a bullet graph is here: http://en.wikipedia.org/wiki/Bullet_graph.

4.7.1   This KnowledgeBase article describes the steps to create bullet charts in Tableau: http://www.tableausoftware.com/community/support/kb/bulletgraph.

Example of a Bullet Chart:

24
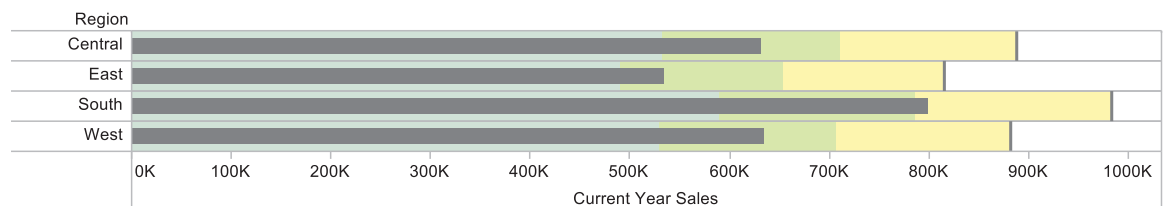
4.8 Scatter Plot – a scatter plot shows the distribution of values across two Measures. You can find more details here: http://en.wikipedia.org/wiki/Scatter_plot.

    4.8.1 For details on creating Scatter Plots in Tableau search Tableau help for "Scatter Plot" http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/buildexamples_scatter.html.

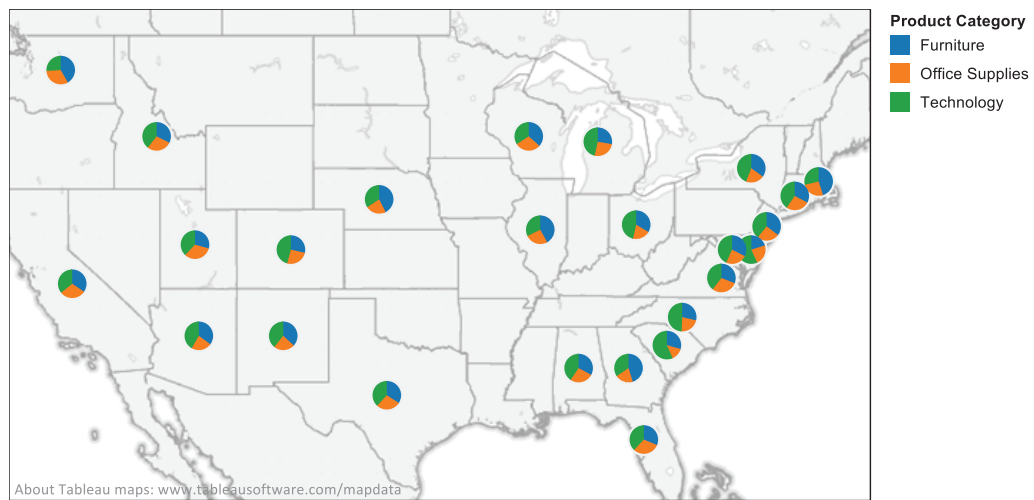   4.8.2 Be able to create a scatter plot and use the Marks card to encode data by color and shape
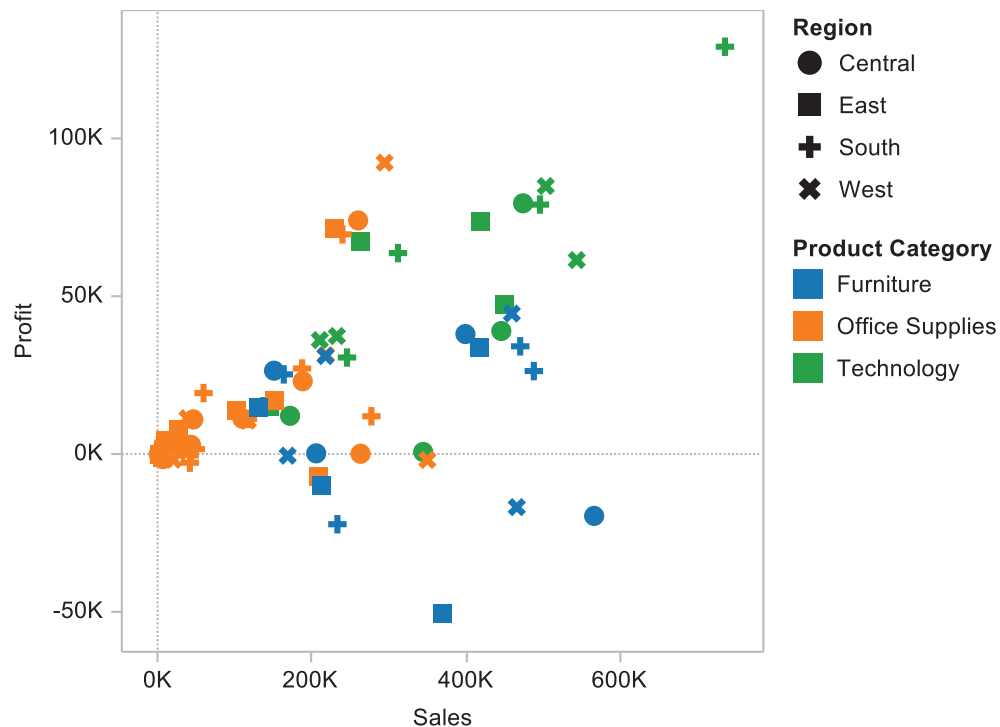
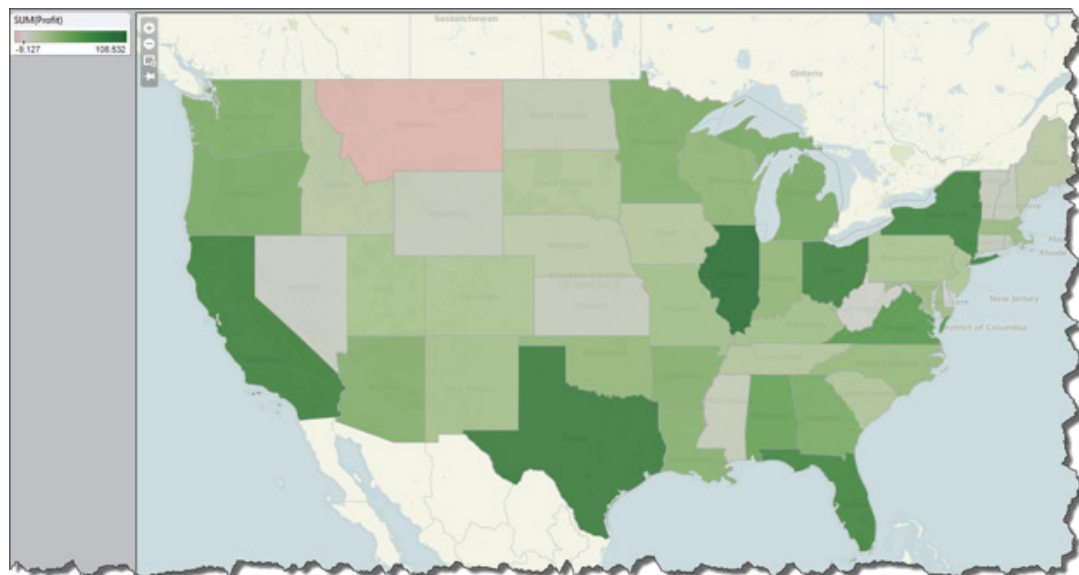4.9   Mapping - be familiar with Tableau's mapping functionality, including:
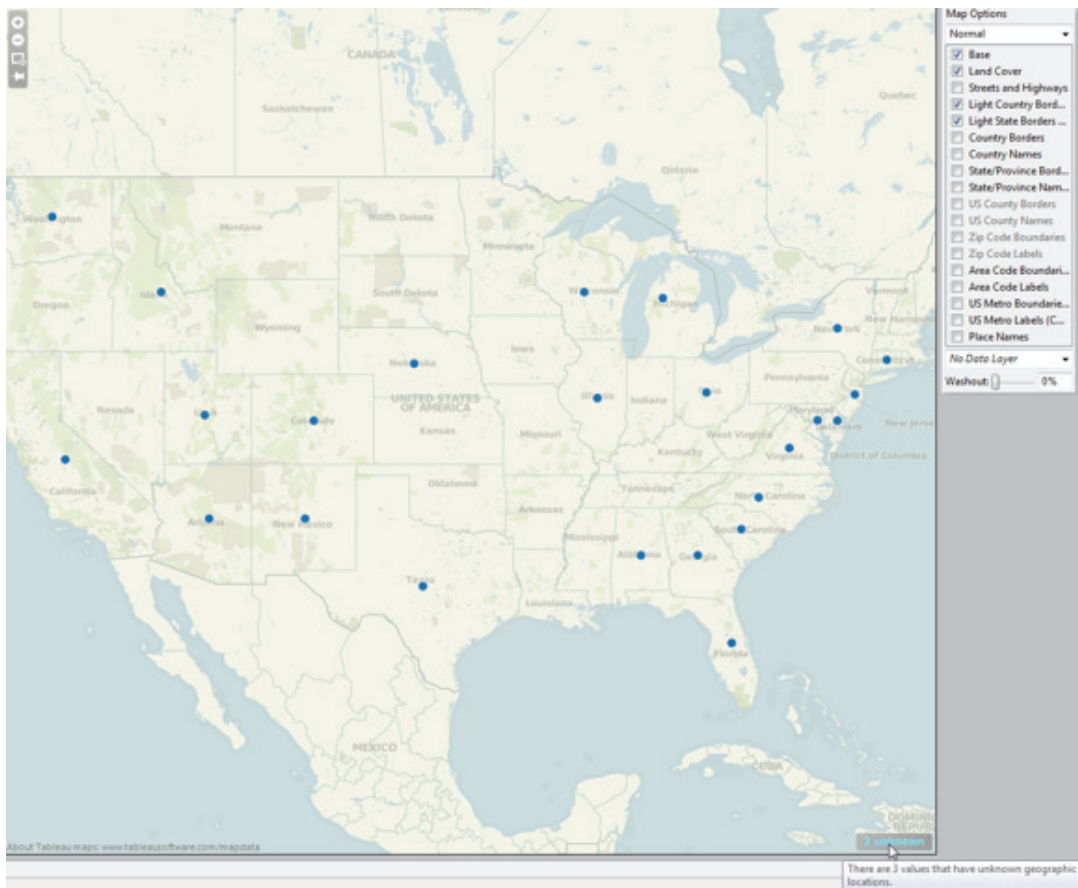
4.9.3 Encode data on a map using size and color

4.9.4 Use custom shapes on a map and scatter plot

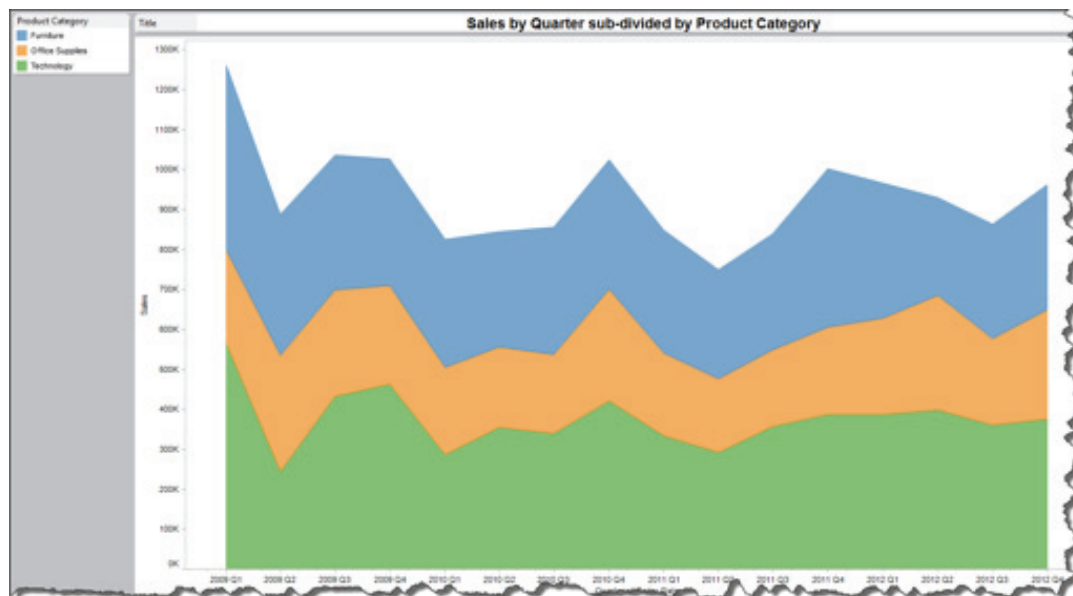### 4.9.5 Create a pie chart on a map

4.9.6 Create a Filled Map

4.9.7 Create a Filled Map

4.9.8 Use custom WMS Servers: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/
        maps mapsources_wms.html

4.9.9 Custom Geocoding: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/
        custom_geocoding.html

4.10 Create an Area Chart

4.11 Create a heat map

4.12 Understand how to add Motion to a visualization using the Pages shelf:
http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/buildmanual_shelves_pages.html

5. Analytics
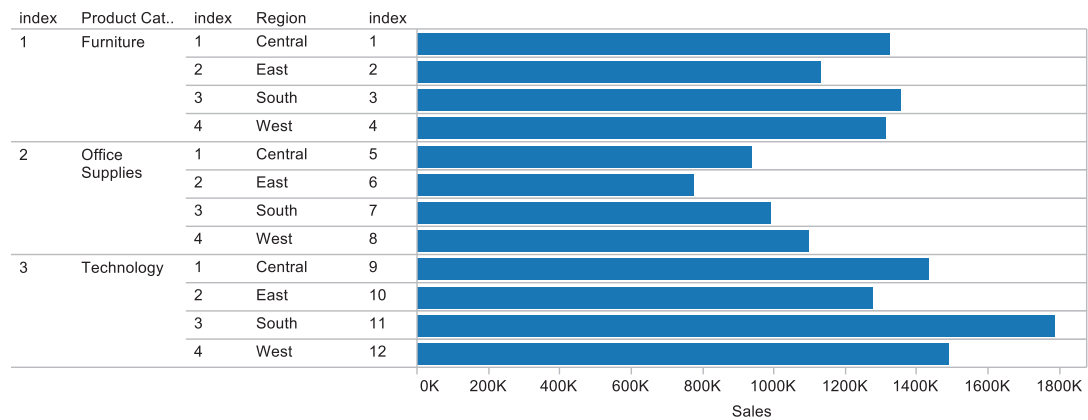
Be familiar with the Analytics functionality in Tableau, and be able to use the following features/ functions:

5.1   Create Calculated Fields: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/ calculations.html

    5.1.1   Be familiar with text manipulation and using Type Conversion functions

   5.1.2   Use date functions such as DATEDIFF() and DATETRUNC()

    5.1.3   Use the INDEX() function to create row numbers/ranking. See the following KnowledgeBase article for more information: http://kb.tableausoftware.com/articles/ knowledgebase/finding-top-n-within-category

index	Product Cat..	index	Region	index	
1	Furniture	1	Central	1	
		2	East	2	
		3	South	3	
		4	West	4	
2	Office Supplies	1	Central	5	
		2	East	6	
		3	South	7	
		4	West	8	
3	Technology	1	Central	9	
		2	East	10	
		3	South	11	
		4	West	12	

0K   200K   400K   600K   800K   1000K   1200K   1400K   1600K   1800K
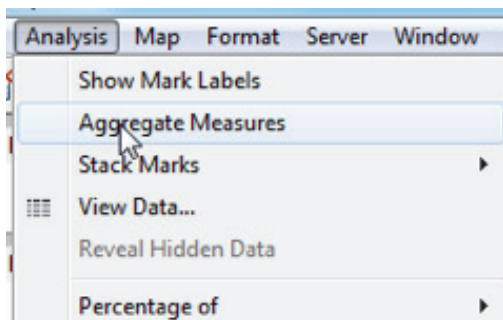
Sales

5.1.4 Use IF or CASE statements

5.1.5 Understand when and how to use aggregate calculations (custom aggregations)

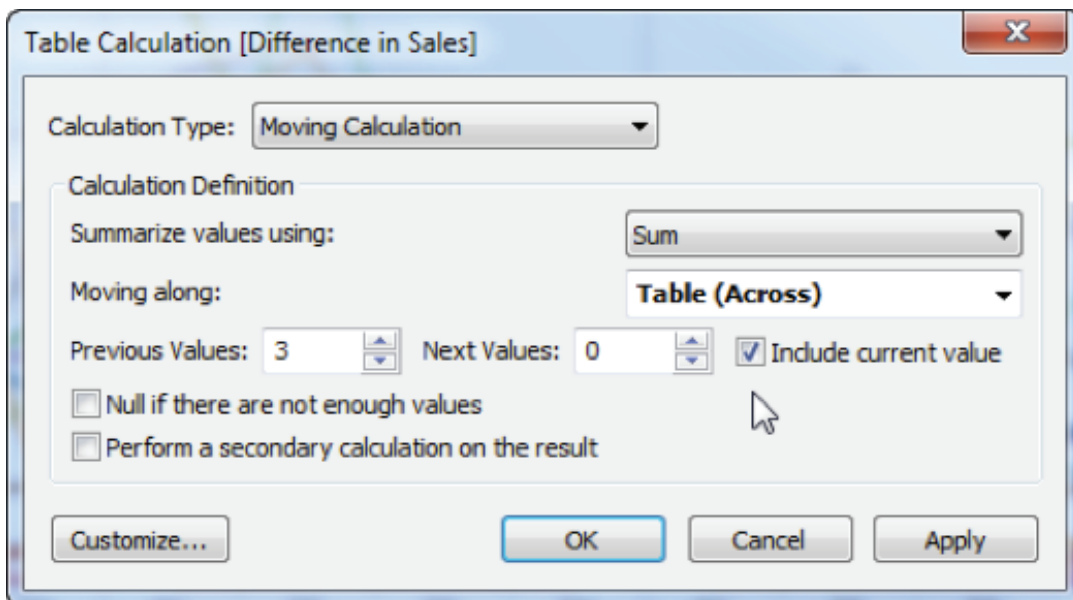5.1.6 Create and use a parameter to perform 'what if' analysis
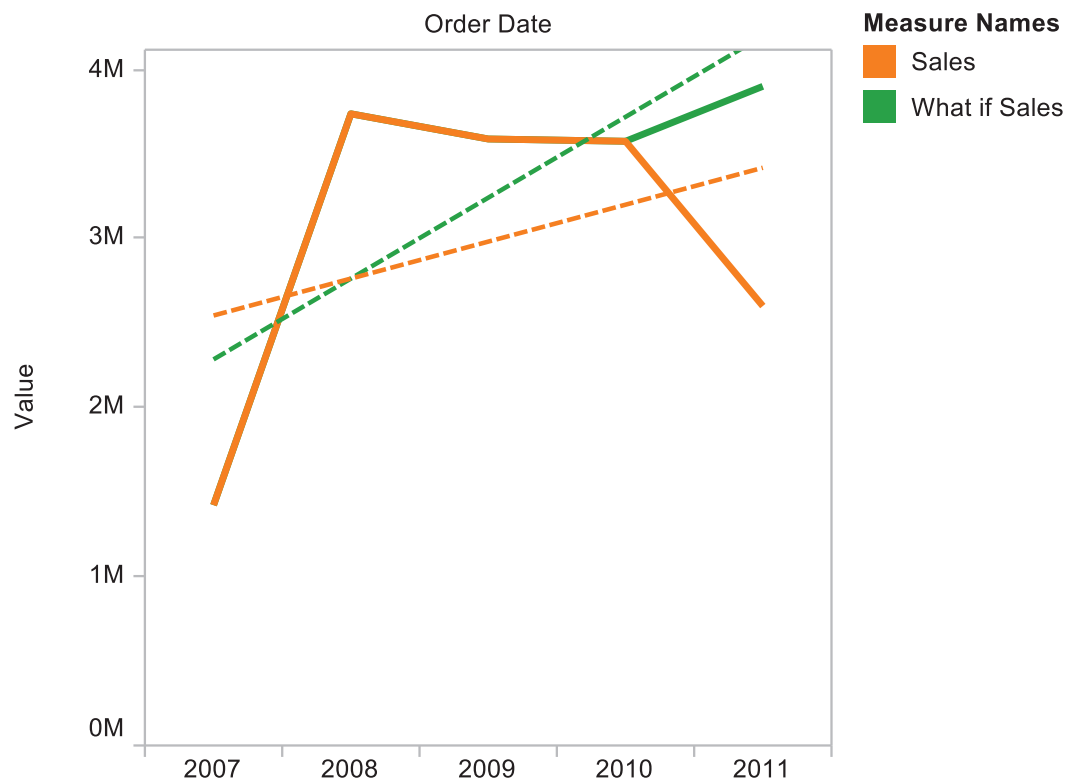
5.2   Work in 'dis-aggregated' mode

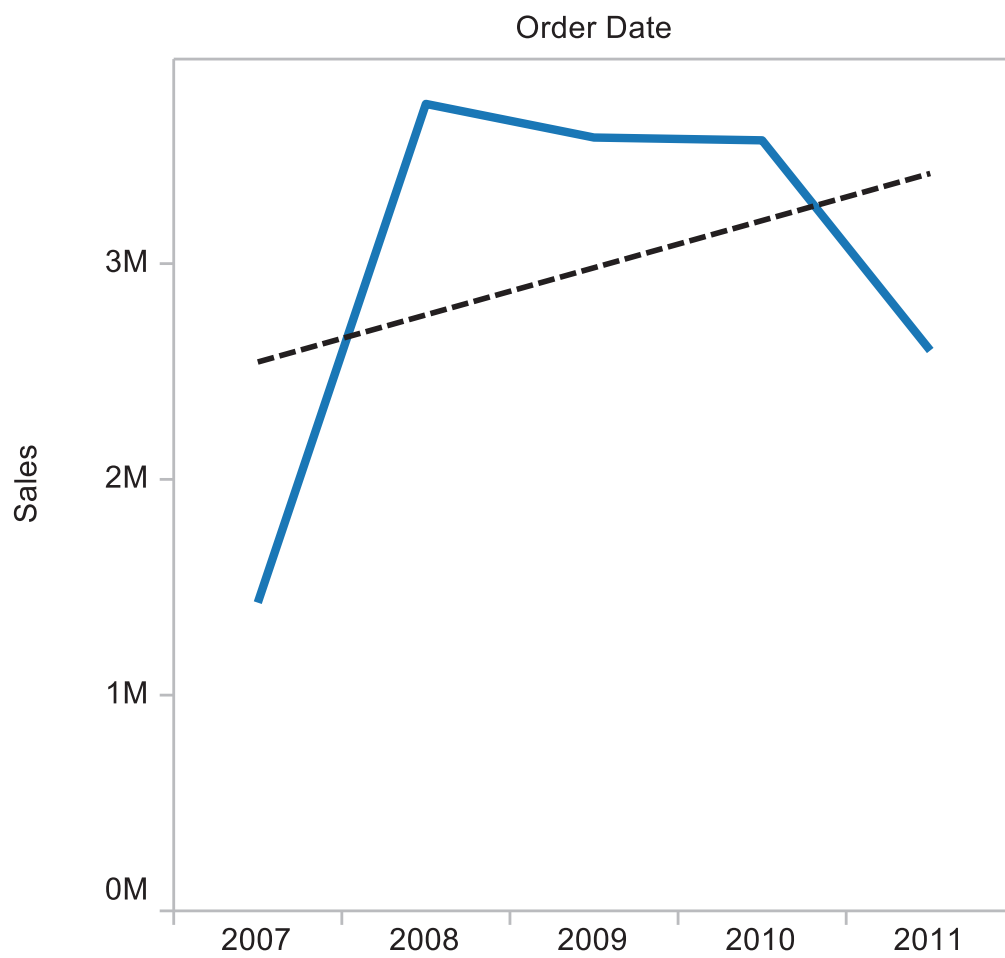## 5.3   Understand Table Calculations

5.3.1 Apply a 'Quick Table Calculation' (e.g. Year Over Year Growth, Percent of Total)

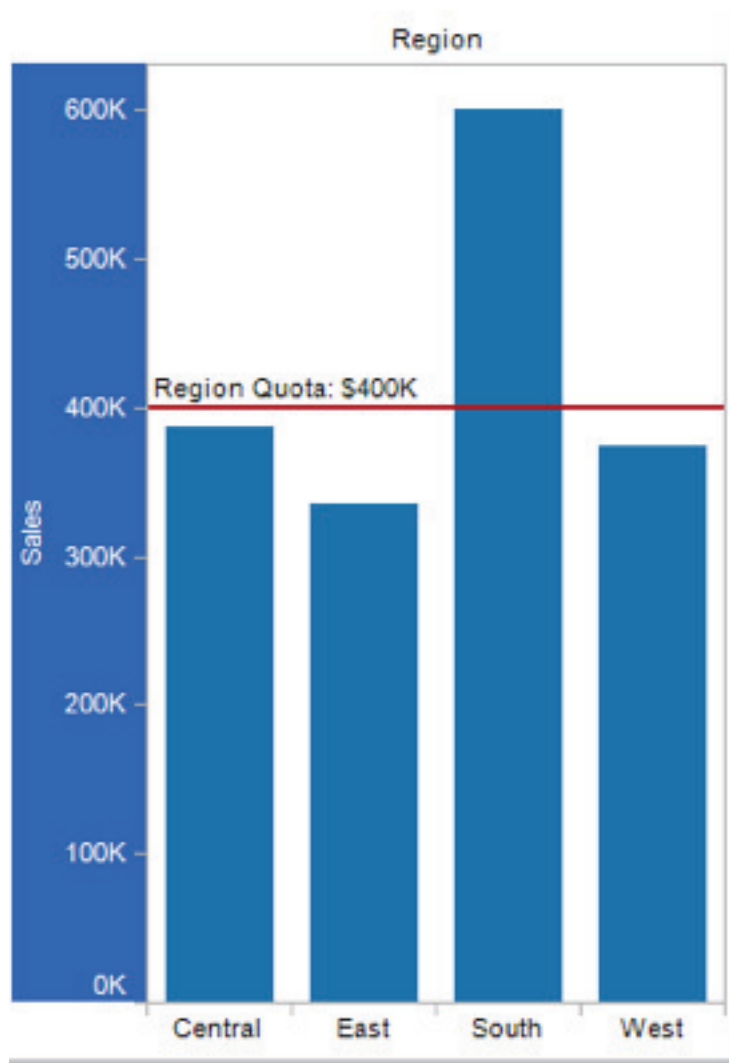### 5.3.2 Use advanced functionality with Table Calculations (i.e. Running Totals or Moving Averages)

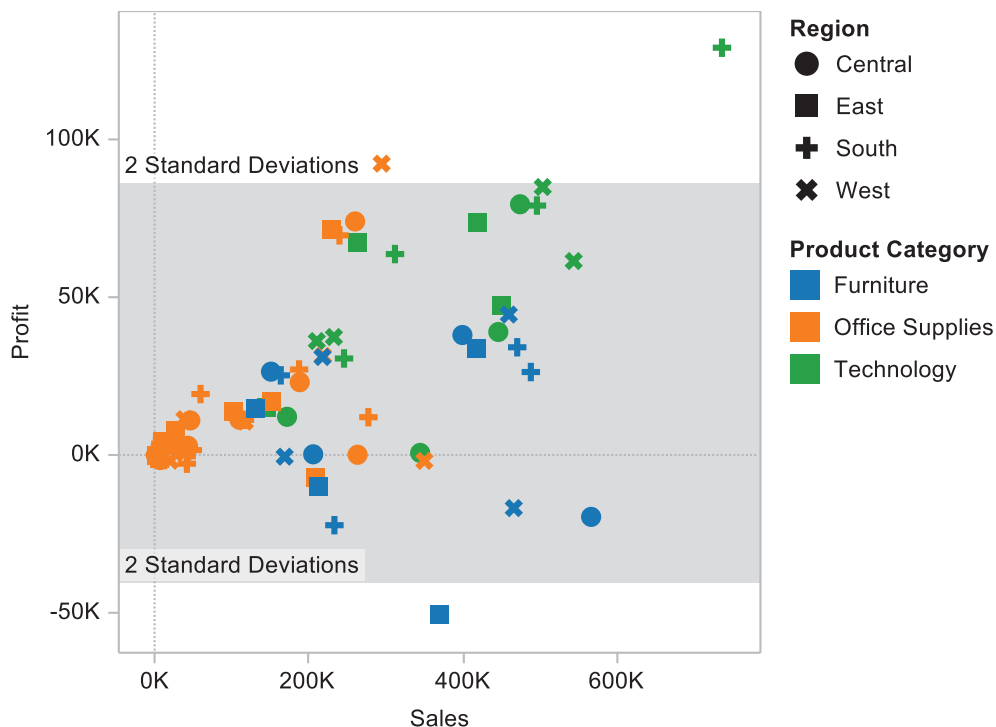5.4   Perform a linear regression (Turn on Trend Lines)

Order Date

5.5 Reference Lines and Bands

### 5.5.1 Create a reference line with a constant value and custom label

5.6   Create a reference band shading the area between +-2 standard deviations.

5.7   Create a reference band that uses shading to show Quartiles. For more information see: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/reflines_adddistributions_basic.html

5.8   Understand what the ANOVA table is, and how it can be displayed in Tableau. See the following resources for help: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/trendlines_model.html and also http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/trendlines_ex1trendlines.html

6. Dashboards

6.1   Add quick filters to dashboards

6.2   Organize dashboards by moving items

6.3   Use Horizontal and Vertical Layout Containers
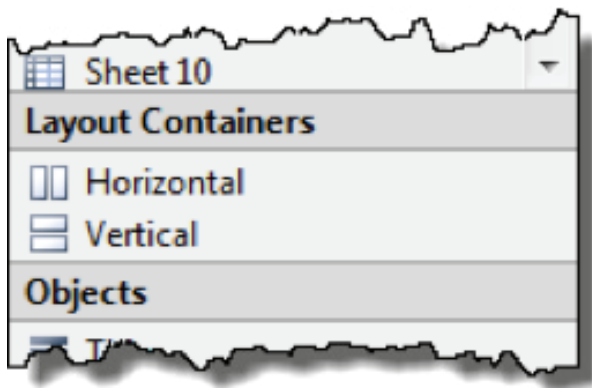
6.4   Use Dashboard Actions, including Filter Actions, Highlight Actions and URL Actions. Be familiar with how these can be used to control views on a dashboard. http://onlinehelp. tableausoftware.com/v7.0/pro/online/en-us/actions.html

7. Saving and Sharing in Tableau

7.1   Understand the difference between a Workbook (.twb) and a Packaged Workbook (.twbx) http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/getstarted_save.html

7.2   Save a packaged workbook

7.3　Be familiar with how to copy a worksheet from one workbook to another:　http://onlinehelp.
tableausoftware.com/v7.0/pro/online/en-us/save_savework_bookmarks.html

7.4　Understand Ways to Share your Tableau workbooks with others

　　7.4.1　Publish to a Tableau Server:　http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/
publish_server.html

　　7.4.2　Exporting as Data or as an Image:　http://onlinehelp.tableausoftware.com/v7.0/pro/online/
en-us/save_export.html

　　7.4.3　Using Tableau Public:　http://www.tableausoftware.com/public

　　7.4.4　Using Reader (http://www.tableausoftware.com/products/reader) with Packaged
Workbooks: http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/save_savework_
packagedworkbooks.html

　　7.4.5　Printing or creating a PDF:　http://onlinehelp.tableausoftware.com/v7.0/pro/online/en-us/
printing.html