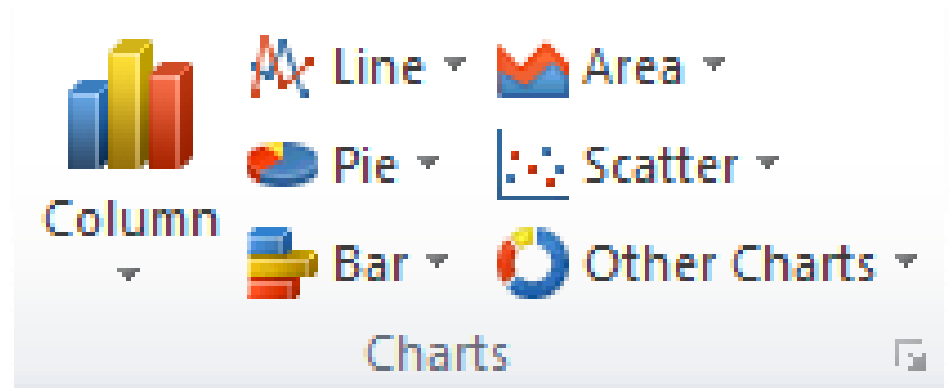


CS1100: Computer Science and Its Applications

Creating Graphs and Charts in Excel

Charts

- Data is often better explained through visualization as either a graph or a chart.
- Excel makes creating charts easy:
 - Column Charts
 - Pie Charts
 - Bar Graphs
 - Line Graphs
 - Area Graphs
 - Scatter Plots



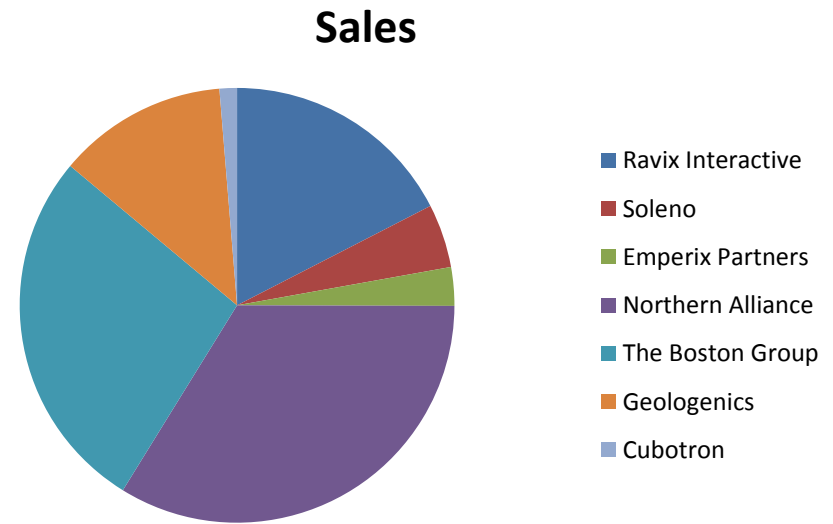
Sample Data

- Here's some sales data that we would like to visualize:

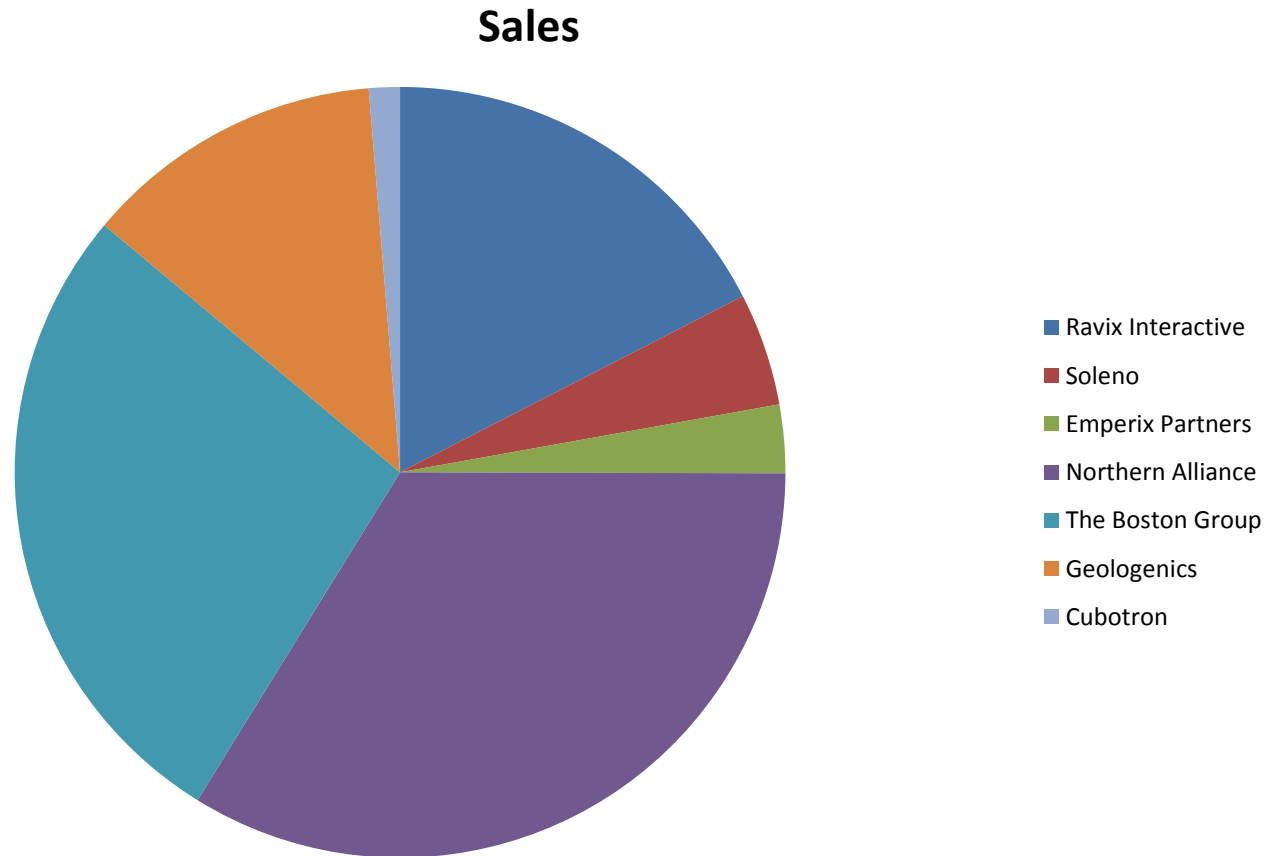
	A	B
1	Customer	Sales
2	Ravix Interactive	\$ 120,900
3	Soleno	\$ 32,800
4	Emperix Partners	\$ 19,870
5	Northern Alliance	\$ 234,000
6	The Boston Group	\$ 189,000
7	Geologenics	\$ 87,500
8	Cubotron	\$ 9,000

Pie Charts

- A pie chart is useful when you are trying to show proportions.
- How much of the sales revenue comes from each client?
- Who are our largest clients?



The Chart Layout



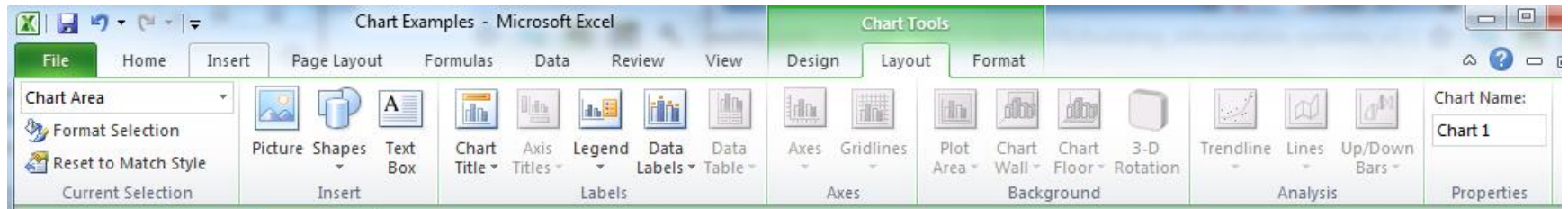
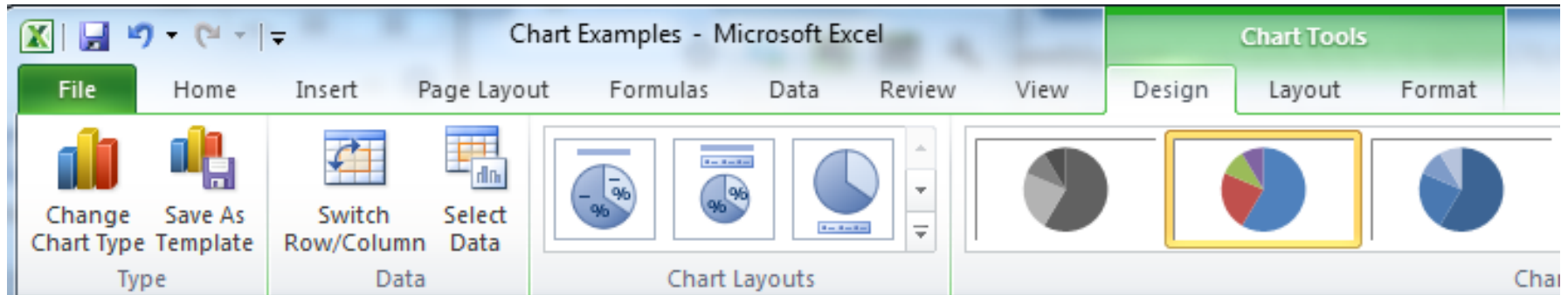
Creating a Pie Chart

- Highlight data and headers
- Go to Insert tab
- Within Charts section, click on Pie and select chart you would like

chart_sample_data.xlsx

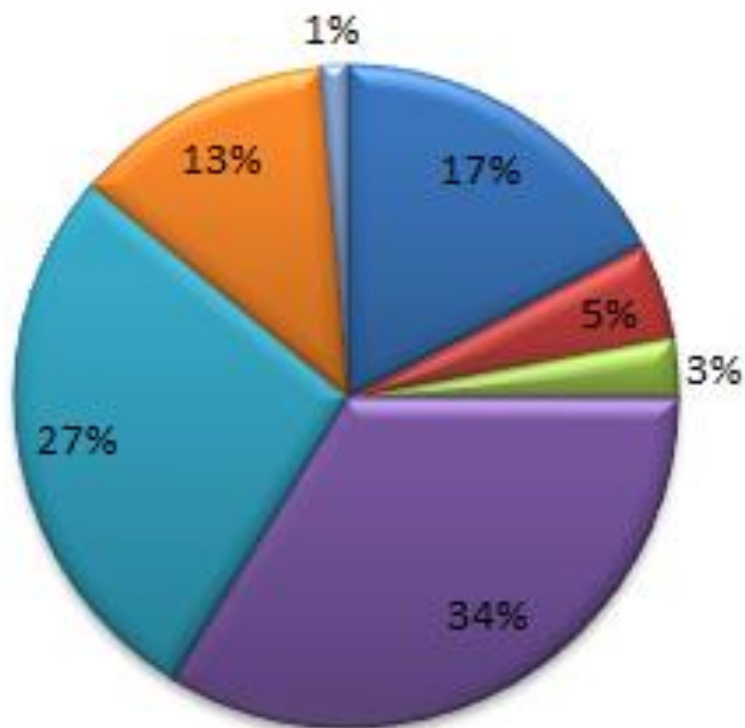
Sales by Customer

Customizing a Chart



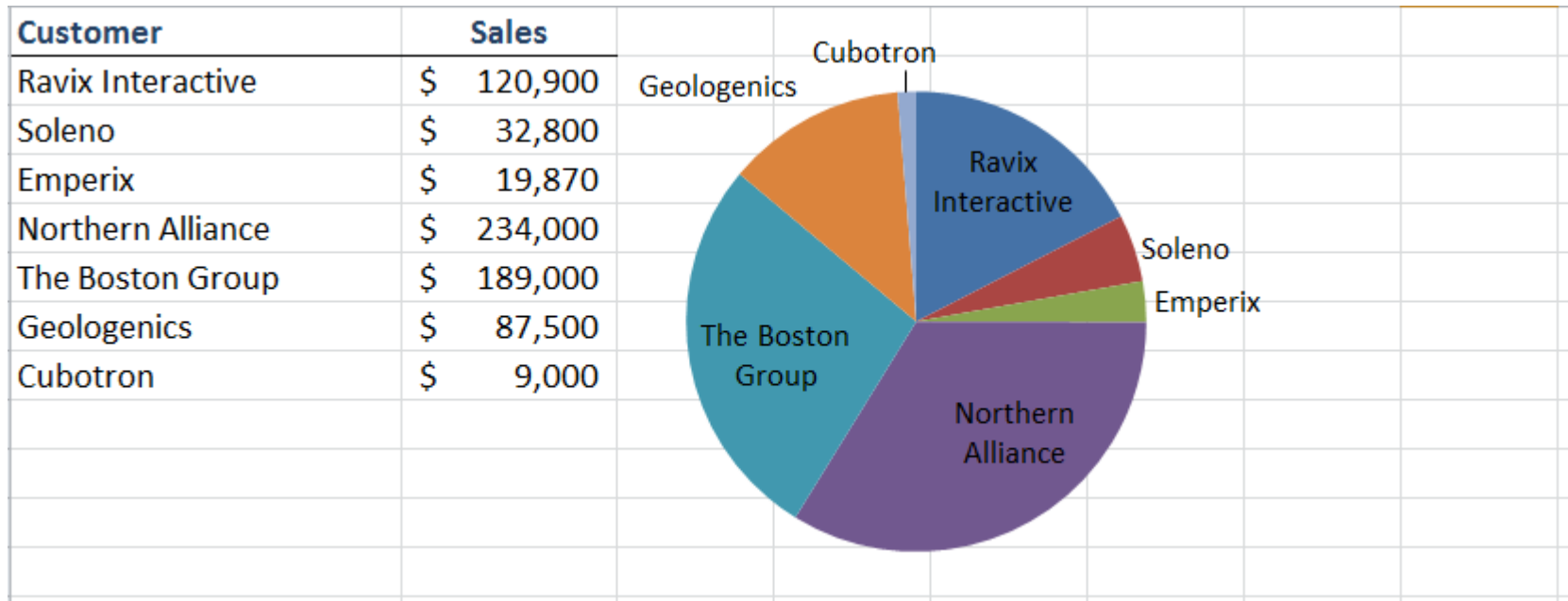
Sales

■ Ravix Interactive ■ Soleno ■ Emperix Partners ■ Northern Alliance
■ The Boston Group ■ Geologenics ■ Cubotron



Transparency to Create a Minimal Display

- Useful for creating a worksheet display that minimizes chart details and simply shows a small graphic to support a set of numbers



chart_sample_data.xlsx

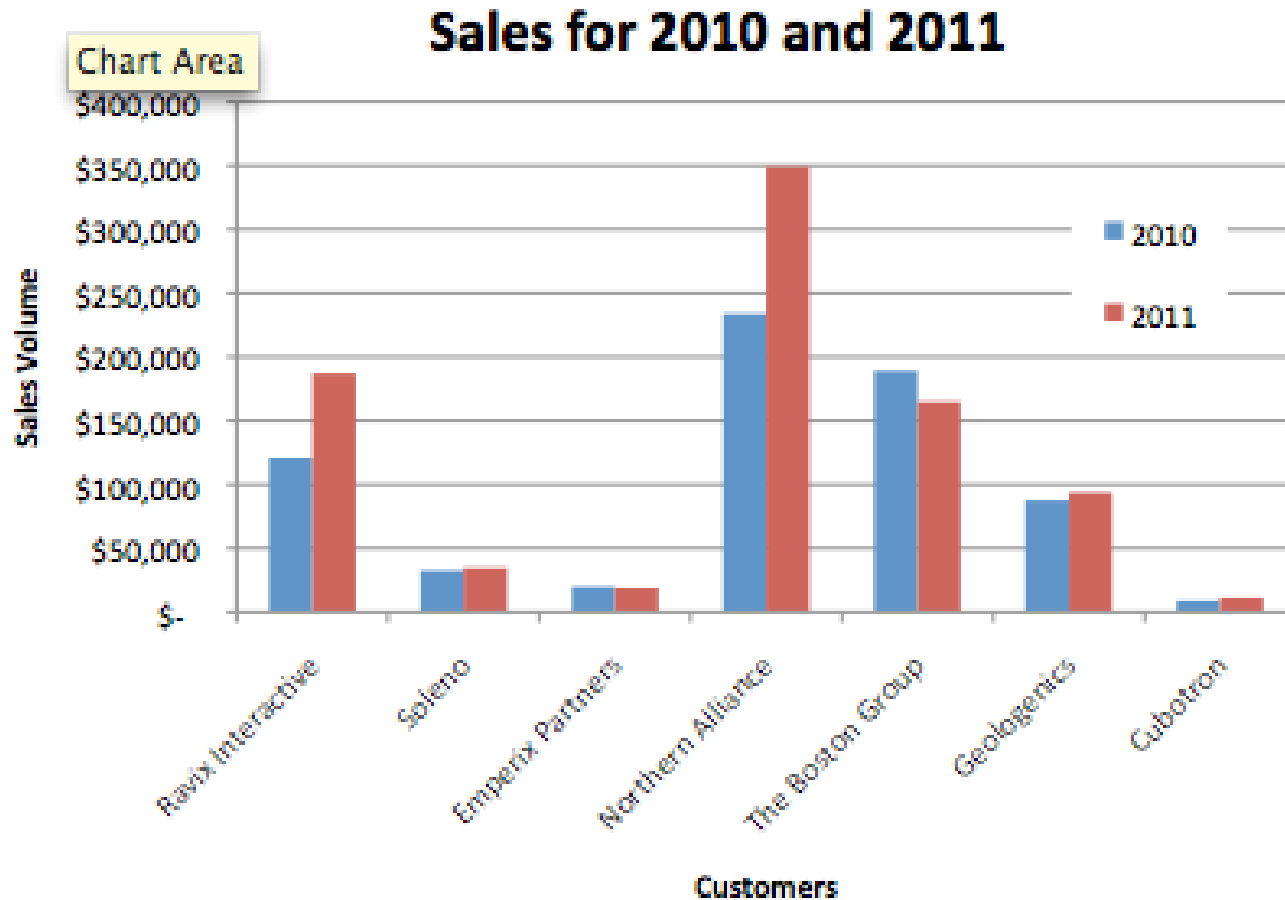
Sales by Customer

Chart Tools/Format/Shape Fill/No Fill

Column Chart

- Also known as a bar chart, with rectangular bars of lengths usually proportional to the magnitudes or frequencies of what they represent.
- The bars are vertically oriented in a column chart
- Useful for showing data changes over a period of time, or illustrating comparisons
- Categories organized on horizontal axis
- Values on vertical axis

Column chart



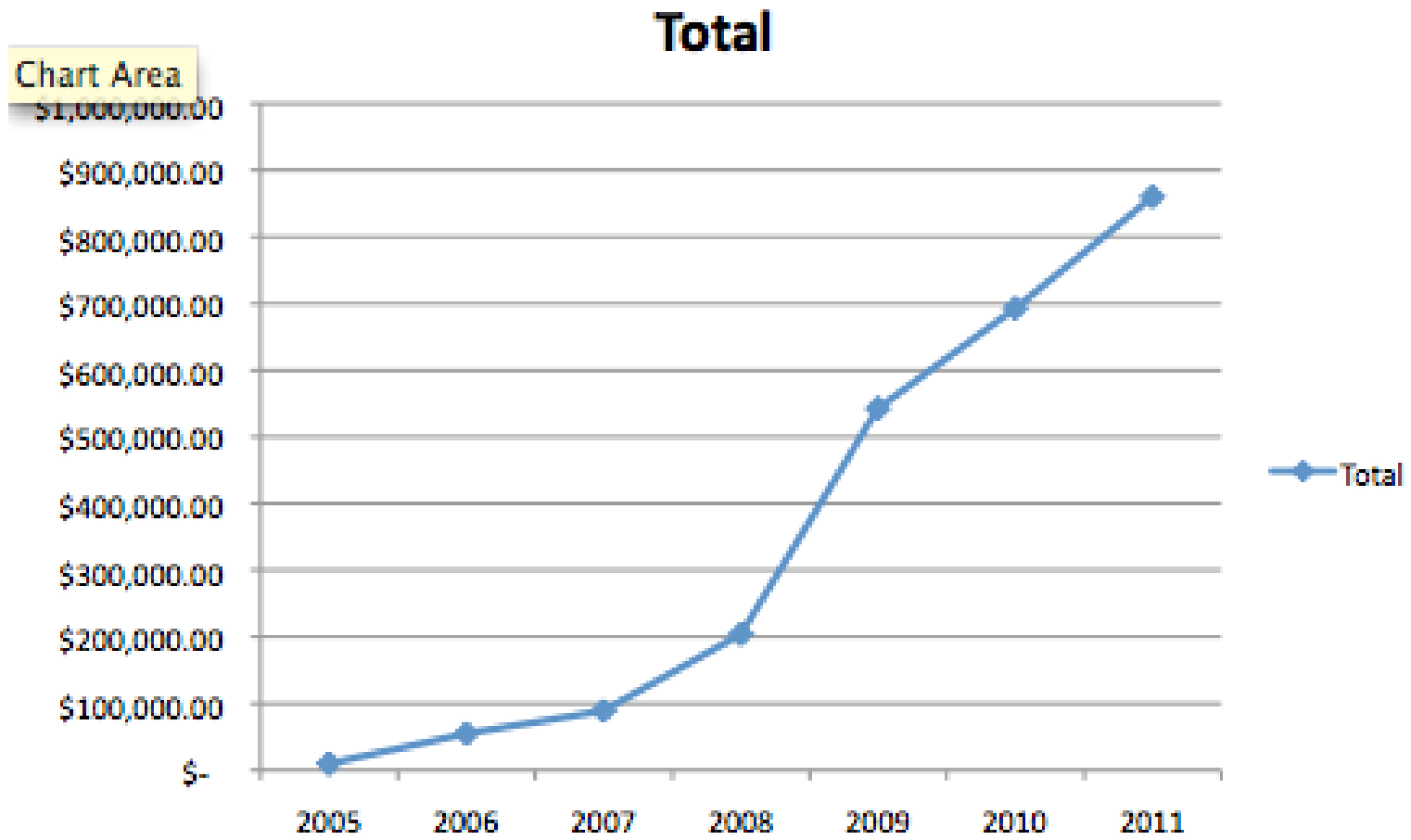
chart_sample_data.xlsx

Sales YoY

Line Graph

- Often used to plot changes in data over time such as weekly temperature changes or stock market prices
- If plotting changes over time:
 - Time is plotted along the horizontal or x-axis
 - Data is plotted as individual points along the vertical axis

Line Graph



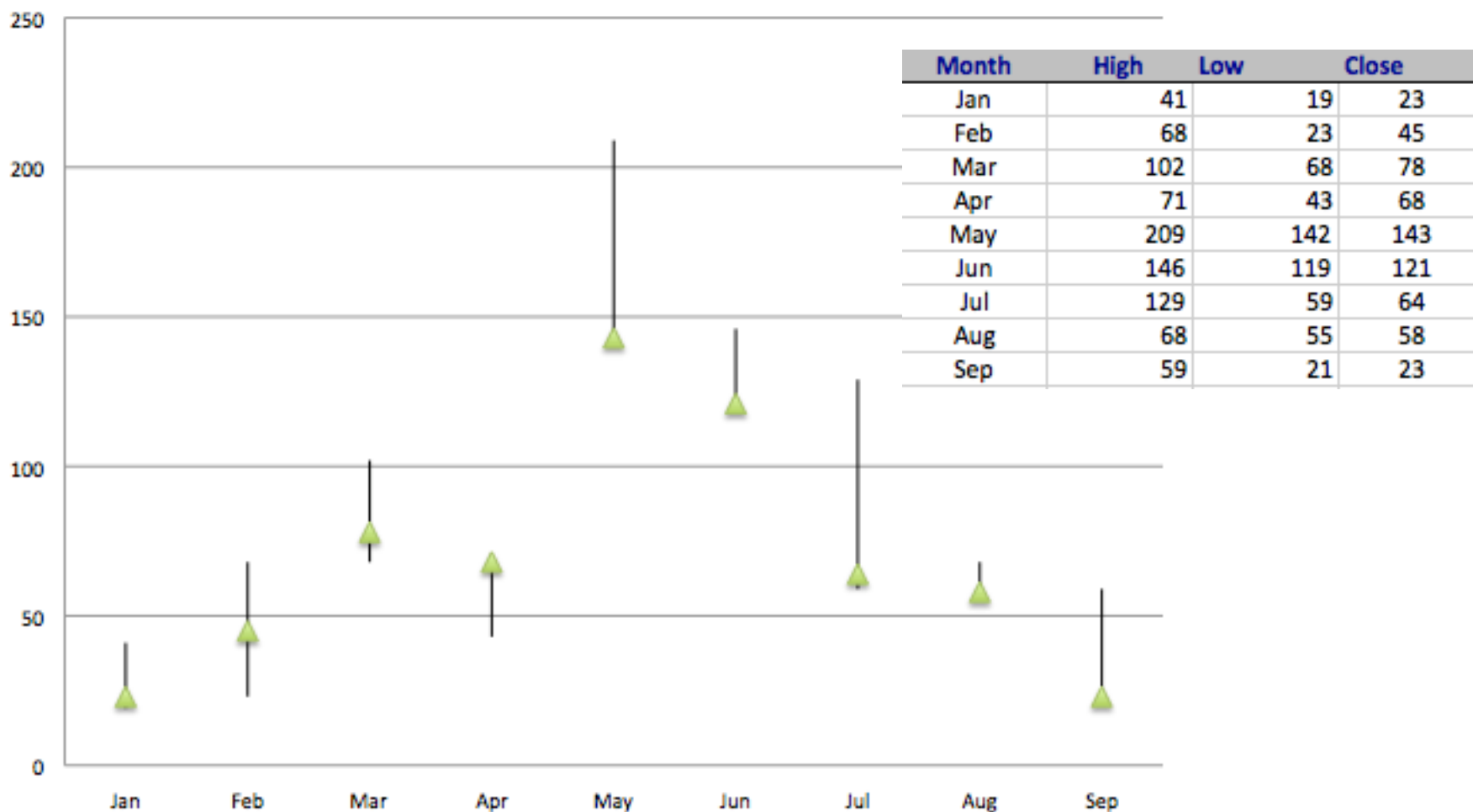
chart_sample_data.xlsx

Sales Trend

High Low Close Graph

- Used to illustrate the fluctuation of stock prices or for scientific data
- The data should be arranged with stock names as row headings, and High, Low and Close entered as column headings
- In “Stock” Charts in Excel

High Low Close



X/Y Scatter Plot

- Useful for determining how things relate to one another e.g. profits vs. expenditures, height vs. weight, etc.
- Each data point has more than one attribute
 - Person (height, weight)
 - Quarter (profit, expenditure)
- Each attribute on single axis

X/Y Scatter Plot

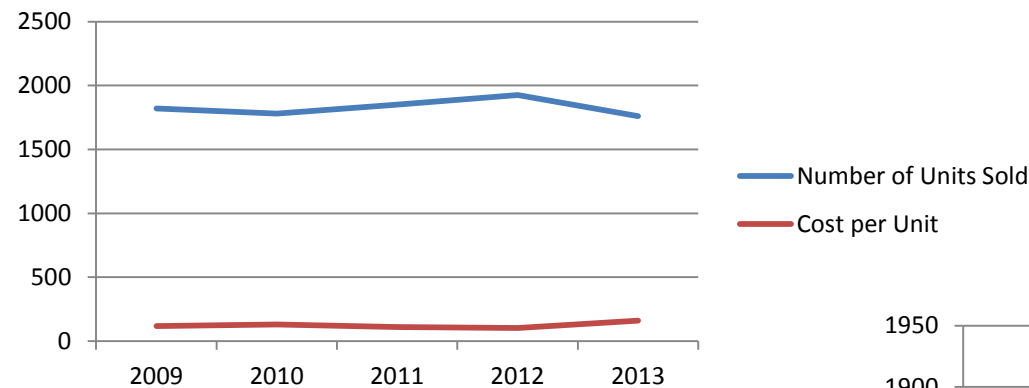


Assigning a Series to a Secondary Axis

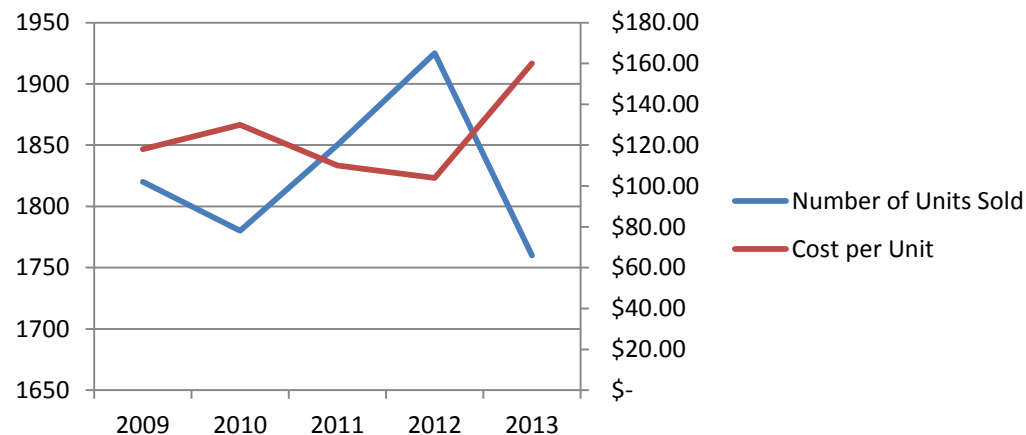
- A secondary value axis can make it easier to compare data series that have deviating ranges.
- Example: a series showing number of units sold per year has a range that is much higher than cost per unit per year that it's hard to see how they relate to each other. Putting one of the series on a secondary axis makes it possible to compare

Assigning a Series to a Secondary Axis

- The line graph on the left shows two data series with widely differing ranges, so it's hard to compare them.
- The graph on the right plots one series on a secondary axis making it much easier to compare.
- To move a series to a secondary axis, right-click on the series, click **Format Data Series**, select **Series Options** then select **Secondary Axis**.



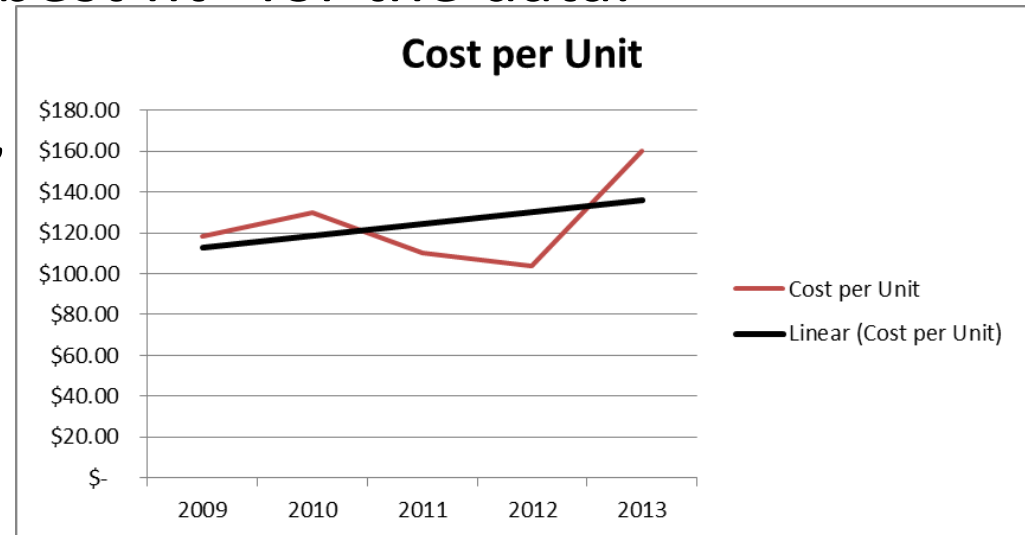
Column1	Number of Units Sold	Cost per Unit
2009	1820	\$ 118.00
2010	1780	\$ 130.00
2011	1850	\$ 110.00
2012	1925	\$ 104.00
2013	1760	\$ 160.00



Trendlines, Error Bars, etc.

Excel also provides statistical analysis tools via the Layout tab / Analysis section (Excel 2010) or Design tab / Add Chart Element icon (Excel 2013).

- Trendlines show the “best fit” for the data.
- Error bars show “confidence intervals” around data points.



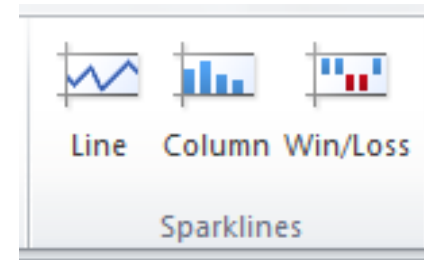
Sparklines

- New to Excel 2010, we can also create charts or graphs that live within one cell
- Their inventor, Edward Tufte, describes them as “intense, simple, word-sized graphics”
- Meant to be embedded into what they are describing
- Presents the general shape of variation in some measurement, in a simple and highly condensed way

	Current	1- Year
All Departments	\$159.6	
Women's Apparel	\$ 32.6	
Patio & Garden	\$ 16.2	
Toys	\$ 15.7	
Electronics	\$ 14.9	
Baby Apparel	\$ 14.2	
Men's Apparel	\$ 13.5	
Kid's Apparel	\$ 12.6	
Furniture	\$ 11.4	
Bed & Bath	\$ 11.1	
Kitchen	\$ 9.9	
Home	\$ 7.5	

To Create Sparklines:

- Select the cell where you want the Sparkline to appear
- Click the Insert tab and look for the Sparklines group
- Choose the data range and the location for the Sparkline.

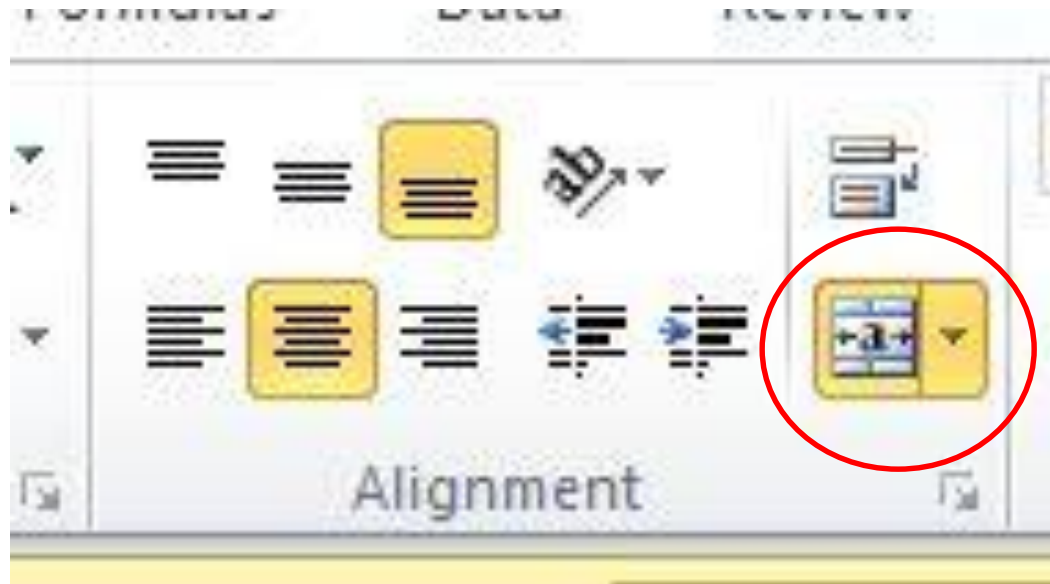


chart_sample_data.xlsx

Sparklines

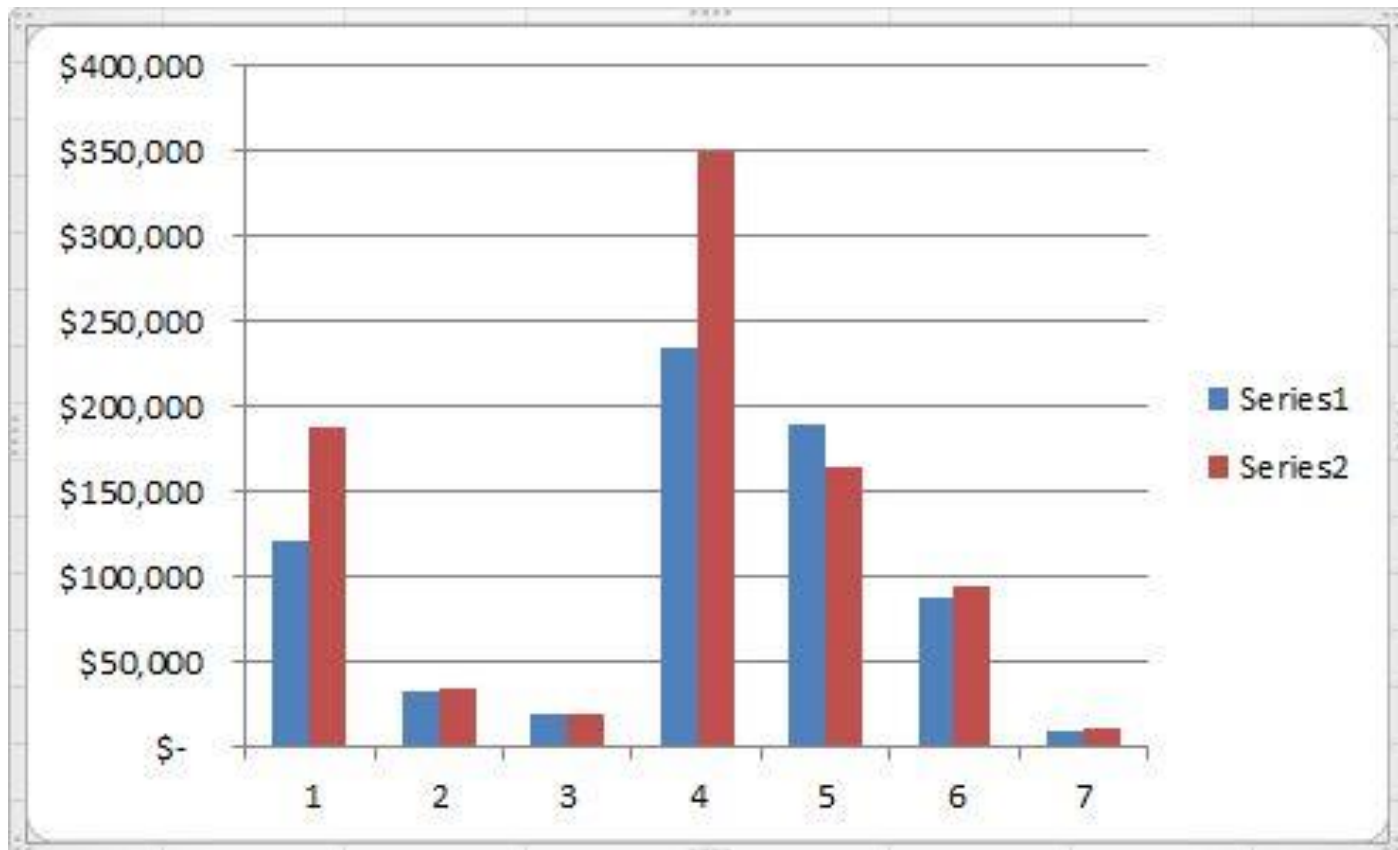
Merging Cells

- To make sparklines bigger, you can merge multiple cells into a single cell.
 - In the home tab:



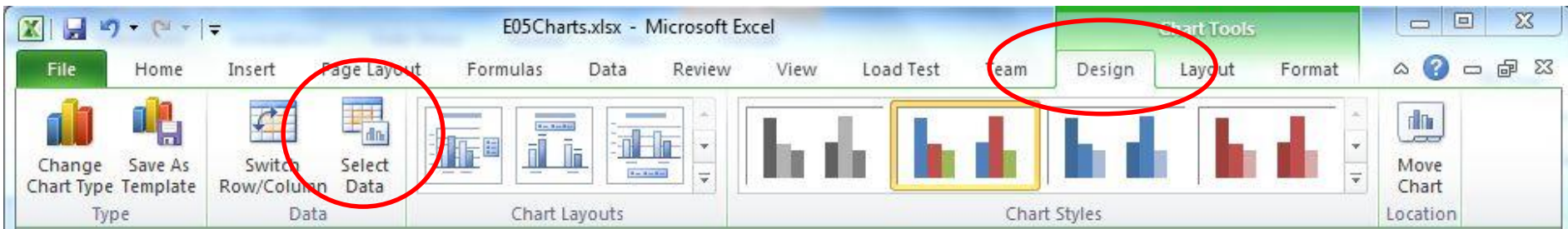
Common Issues: data labels

- Data labeled “Series1”



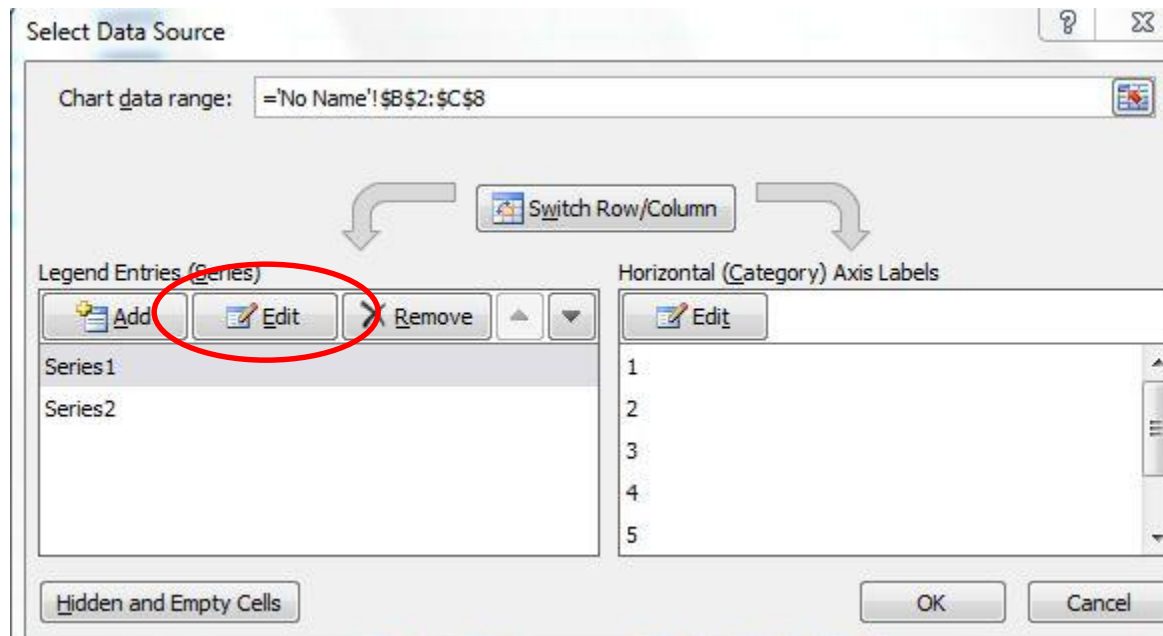
Common Issues: data labels

- Data labeled “Series1”
- To fix it: Select Data



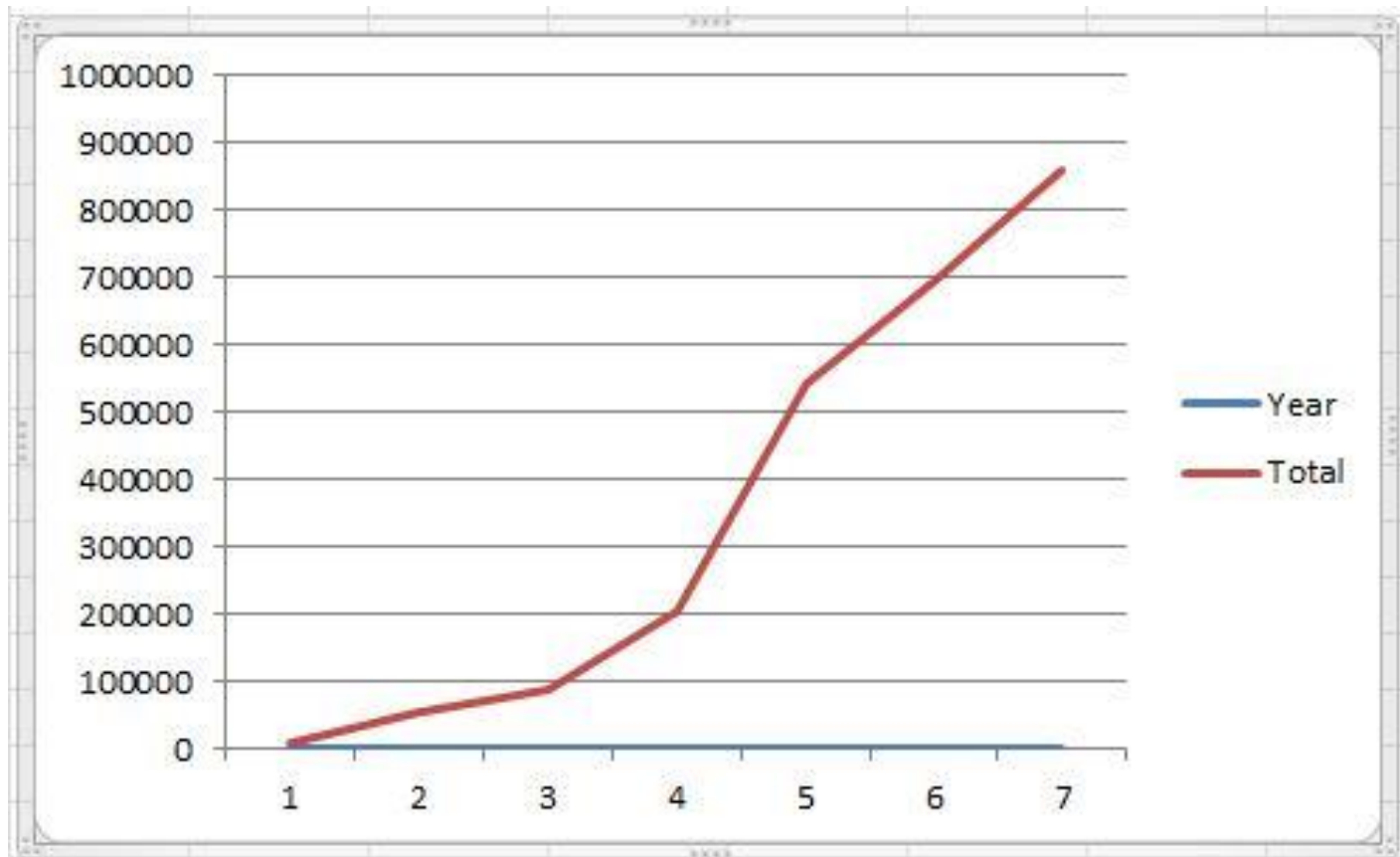
Common Issues: data labels

- Data labeled “Series1”
- To fix it: Select Data
 - Edit Series Name



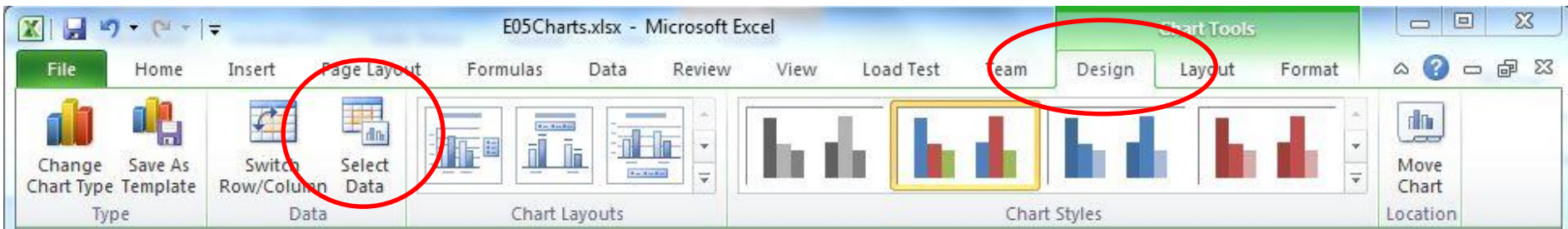
Common Issues: axis labels

- Axis labels plotted instead



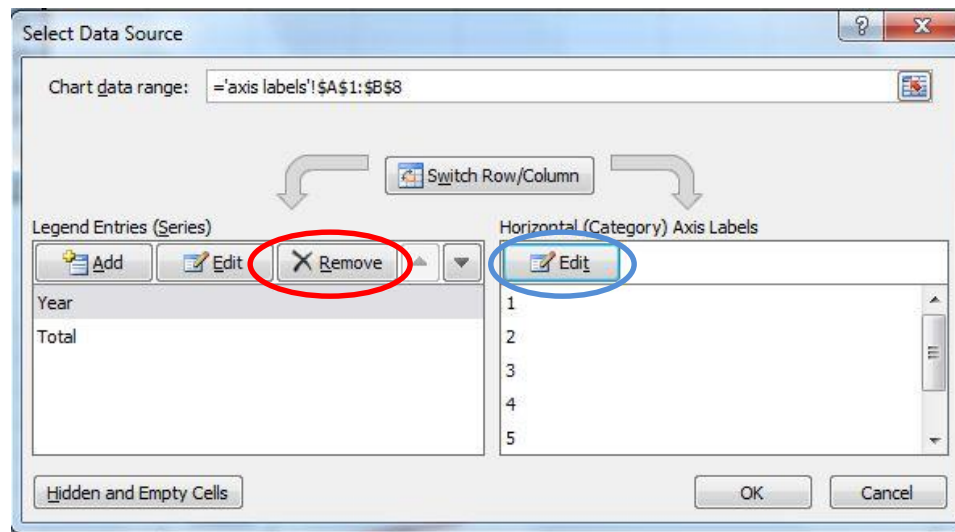
Common Issues: axis labels

- Axis labels plotted instead
- To fix it: Select Data



Common Issues: axis labels

- Axis labels plotted instead
- To fix it: Select Data
 1. Remove axis series
 2. Edit Axis Labels



Histograms

- Histograms are a specialized type of bar graph used to summarize groups of data.
- In some cases, you may collect a large number of data points for a single level of an independent variable.
 - That is, you take the same measurement over and over again. For example, when a lack of precision in measuring process does not give a good estimate of the true value with only a single measurement.

Binning

- How to summarize the results of these measurements?
- One way might be to simply calculate the average of all these measurements.
 - This would not, however, give you a good feel for how the data is *distributed*.
- A distribution graph, or **histogram**, allows you to see how many measurements fall within set ranges, or **bins**, of the dependent variable.
 - usually depicted as a bar chart, with one bar representing the count of how many measurements fall in a single bin.

Set up bins

- Set up bins based on how want data grouped together
- The bins may be similar to the groups of the lookup tables

Compute Frequencies

- Use the FREQUENCY array function to fill in the data column. **(Order of the steps is important)**
- **First:** select the range for the Frequency plus one extra cell (extra cell for values that are greater than the highest interval in the data_array.)
- **Second:** type in the frequency function, =FREQUENCY(data_array, bin_array)
- **Third:** press CTRL-SHIFT-ENTER for Windows, or CMD-ENTER on Mac

Bins	
600	0
650	0
700	0
750	0
800	0
850	0
900	0
950	3
1000	5
1050	3
1100	6

Compute Frequencies

Bins	
600	0
650	0
700	0
750	0
800	0
850	0
900	0
950	3
1000	5
1050	3
1100	6
1150	3
1200	8
1250	7
1300	3
1350	5
1400	3
1450	3
1500	2
1550	3
1600	0

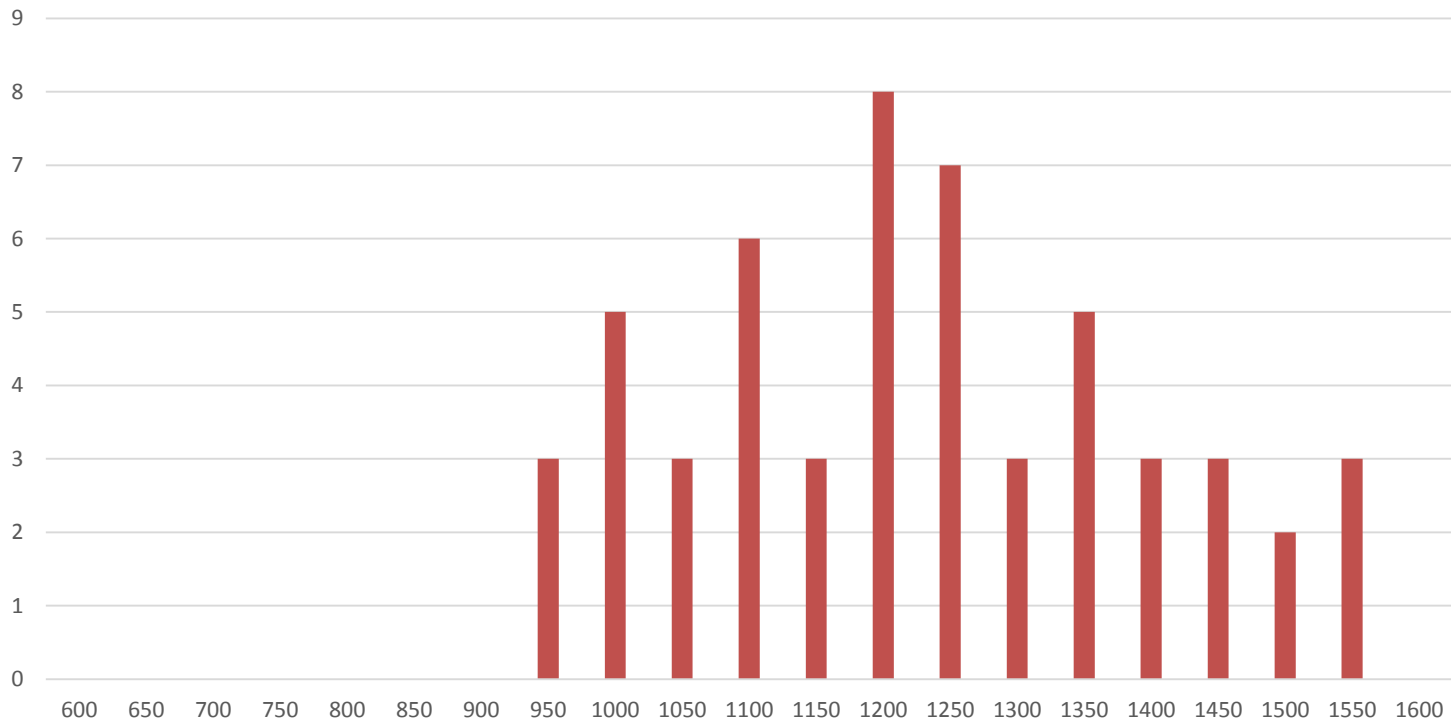
of values at ≤ 600

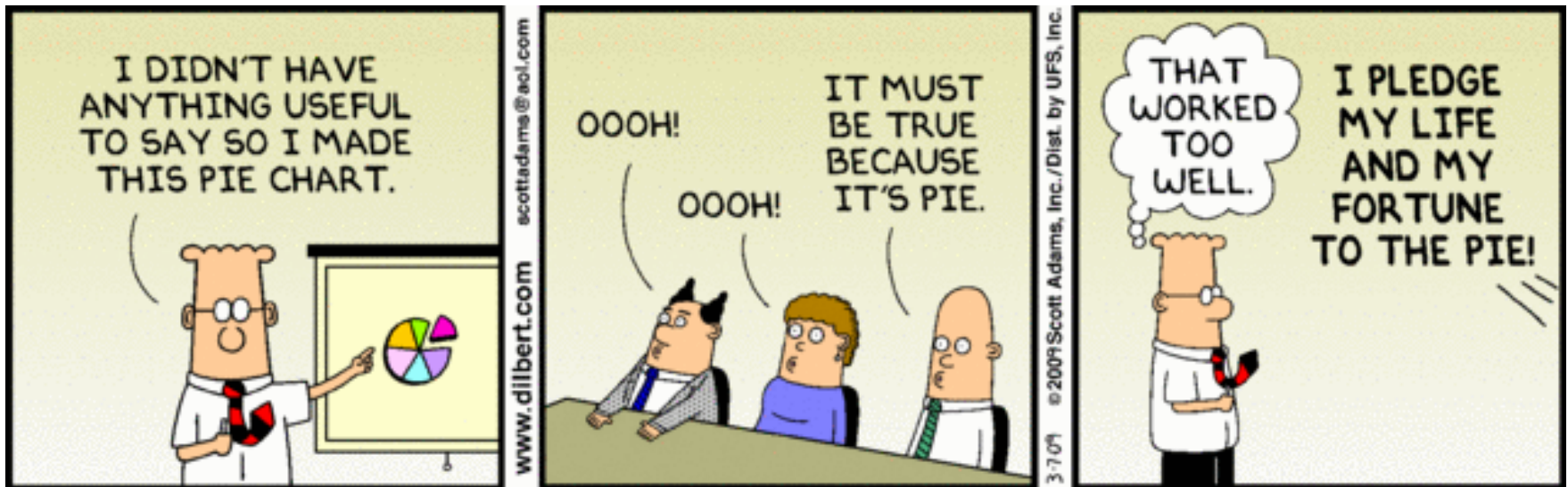
of values > 600 and ≤ 650

of values > 650 and ≤ 700

Plot Histogram - Frequency vs. Bin Data

- Highlight the bin array and frequency numbers.
Click on the icon for **Column Chart**.
Series: X values are bin values, Y is the frequency.
Add titles.





Any Question?