Barnard Library Empirical Reasoning Lab: General Excel
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Formulas and Functions

X*Y
- Don't forget to label your data – write **X*Y** at the top of column C, in cell C1.
- Write the formula **=a2*b2** in cell C2. Always start formulas with a = sign.
- The **select** cursor is a large white plus sign and the **copy** cursor is a small black plus sign that only shows up at the bottom right corner of the cell. Copy the formula down the column.
- Excel will use **relative referencing** - i.e. in row 5 it calculates **A5*B5**, but in row 6 it calculates **A6*B6**.

50X
- Write **50X** in cell D1.
- To use **absolute referencing**, put in a **$** sign to tell Excel not to use relative referencing. The letter or number after the **$** refers absolutely to a particular row or column. If you put 50 in cell F1, in D2 you can use the formula **=a2*f$1**.
- If you want to multiply by a different number, just change it in F1, hit enter, and the results are updated.

Average
- Write **Average** in cell A22.
- Write **=average(** in cell A23 and select the X rows to be averaged. It's important to include the **(**.

Other Functions
- You can find functions by going to the **Formulas** tab, and then to **Insert Function**. Make sure you've selected a blank cell with the cursor. If your cursor is still on the Average function, then it will default to a dialogue box showing you how to calculate the average.
- The functions are organized categorically in the function library (just to the right of the **Insert Function** box).

Inserting and Editing a Line Graph

- Line charts are good for seeing changes with one variable that is continuous (along x-axis) and another that is categorical (different lines) because it implies changes between fixed points. For example, changes over time are often portrayed in a line chart.
- Select the data for the chart and go to **Insert – Line**. There are 6 options. The two in the left column (with & without dots) are the 2 you will always use! The other 4 will alter the data's appearance and should only be used if specifically instructed to do so.
- You can select non-adjacent cells by holding down CTRL while selecting with your mouse (or CMD on a Mac).
- In Excel 2013, the chart has 3 boxes to the right of it. The green plus sign allows you to edit particular elements of the chart. In earlier versions of Excel, use the **Chart Tools - Layout** tab.
- To change the labels of the x-axis, right click anywhere on the chart and go to **Select Data**. In the dialogue box, edit the **Horizontal (Category) Axis Labels**, or the right hand box, by clicking **Edit** button over the box. Select the cells with election years (A4:A13) with your mouse. The hit **Okay** and **Okay** again.
- To format the data series (meaning the series of dots, or markers, on the chart – not to be confused with data labels, the labels showing the values of the data), right click on a data marker and select **Format Data Series**. In Excel 2013, click on the paint box in the right hand box and select **Marker**. Change the color of the markers to green.
- To add a secondary vertical axis (for when you have lines that are extremely different, but want to view them simultaneously in the chart), right click on the data series that should have the secondary axis and go to **Format Data Series** and select **Secondary Axis**.

Inserting and Editing a Scatter Plot

- Scatter plots are good for seeing how related two variables are, typically we look at how linearly related they are, but you can also look for exponential, logarithmic, or polynomial relationships Select the data for the chart and go to **Insert – Scatter**.
- Typically, the independent variable goes along the x-axis. Make sure you data is in columns with the independent variable to the left of the dependent variable.
- In Excel 2013, the chart has 3 boxes to the right of it. The green plus sign allows you to edit particular elements of the chart. In earlier versions of Excel, use the **Chart Tools - Layout** tab.
- To format the axes, in Excel 2013, click on the green **+**. In earlier versions of Excel, select the X axis by clicking on a number on the axis, then right click and use **Format Axis - Axis Options**.
- Use **Axis Options** to change the numbering on the X axis to go from 0 to 1, instead of 0 to 1.2, and change the major units to 0.1.
- To insert or delete gridlines, in Excel 2013 you can click on gridlines to edit them, or you can click on the green **+**. In earlier versions of Excel, to add vertical gridlines, select the X axis, then right click and use **Format Axis - Add Major Gridlines**. Right clicking on the vertical axis allows you to add horizontal gridlines.
- To format the data series (meaning the series of dots, or markers, on the chart – not to be confused with data labels, the labels showing the values of the data), right click on a data marker and select **Format Data Series**. In Excel 2013, click on the paint box in the right hand box and select **Marker**. Change the color of the markers to green.

Inserting a Linear Trendline

- To add a trendline to the chart, in Excel 2013, click on the green **+**. In earlier versions of Excel, right click on a marker and then click on **Add Trendline**. To change its formatting, e.g. make it solid, right click on it and select **Format Trendline**. (In earlier versions of Excel, it's solid by default.)
- To display the equation for the trendline and the R-squared value for the data, right click on the trendline, select **Format Trendline**, and click on the graph icon in the format box. At the bottom of the box are three checkboxes - the bottom two should be checked. Move the equation and the R-squared value around on the chart so they can be read easily.

Shortcuts & Tips in Excel

- Sort data in the **Data** tab. You can sort by clicking the **AZ**Down_Arrow button for ascending order or the one below it for descending order. Click the **ZAAZ** table button and you can sort by more than one level.
- Format cells as financial, character, or general representations in the **Home** tab under **Number**. Change decimal places there too.
- Keyboard shortcuts:
  - Undo- CTRL Z (replace CTRL with CMD on Mac)
  - Cut- CTRL X
  - Copy- CTRL C
  - Paste- CTRL V
  - Move to bottom of data- CTRL Down Arrow
  - Move to top od data- CTRL Up Arrow
  - Select cells using Keyboard- SHIFT Down (or Up or Left or Right) Arrow
- Right click on a cell for **Insert, Delete,** or **Clear Contents** of cell

Pasting a Chart into a Word Document

- Right click on the frame of the chart and click on **Copy**. In Word you can paste it in as a picture by selecting **Paste Options – Picture**.
- There are other alternatives under **Paste Options** that will allow you to edit the chart in Word after pasting it.