cs002 Lab 1
Microsoft Excel

Introduction

A program used in many academic fields as well as everyday life, Excel is comprised of grids of rows and columns that help its user to organize data. In this lab, we will introduce you to Excel's basic features and also invite you to explore its more complex capabilities.

To download Microsoft Excel on your personal computer, please use the following link:
https://www.brown.edu/information-technology/software/catalog/microsoft-office-365

Goals

- Link cells together across sheets of a workbook
- Set up calculations
- Format data to make it readable and aesthetically pleasing

Assignment

After reaching widespread fame and reverence for protecting the world from Syndrome's wrongdoings, The Incredibles are now employed by the government to use their superpowers to stop impending evil forces. Recently, however, they've grown suspicious that the government isn't rightfully compensating them for the amount of crises they've averted, and Mrs. Incredible has consequently decided to start keeping track of their finances. You'll be using Excel to create a weekly report to confirm (or disconfirm) their financial suspicions.

Getting Started

1) Open up a new Excel file by clicking on the Windows icon on the bottom left of your screen; *Excel 2016* should be under the *Productivity and Graphics* tab. Rename your first sheet "Earnings" by right-clicking on the *Sheet1* tab and selecting *Rename*.
2) We'll be helping Mrs. Incredible get on her feet for 4 weeks: September 19-25; September 26- October 2; October 3-9; and October 10-16. Add these weeks to the column titles of the spreadsheet.
3) Mrs. Incredible wants to keep track of the following data: Weekly Income, Weekly Income % Change ((this week's income - last week's income)/last week's income),

Number of Crises Averted, and Average Income per Crisis Averted (Weekly Income/Number of Crises Averted). Add these categories to the row titles of the spreadsheet.

4) Fill in the chart with the following values for Weekly Income and Number of Crises Averted. Your spreadsheet at this point should look something like this:

|	September 19-25	September 26-October 2	October 3-9	October 10-16
Weekly Income	$4,166	$5,057	$4,228	$5,251
Weekly Income % Change				
Number of Crises Averted	56	64	59	73
Average Income per Crisis Averted				

Formatting Cells

To change the appearance of cells, select the cells you'd like to format, right-click on them and choose *Format Cells*.
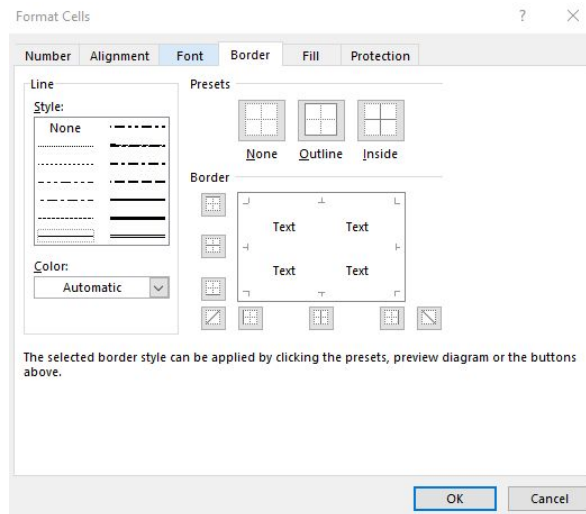
A pop-up window like this will appear. You can change a variety of things (text font, cell background color, type of information populating the cell, etc.), but arguably the most useful tool is one that lets you change the borders of your selected cells (under the *Borders* tab). It's a great way to make your data easier to read (and grade: hint, hint).
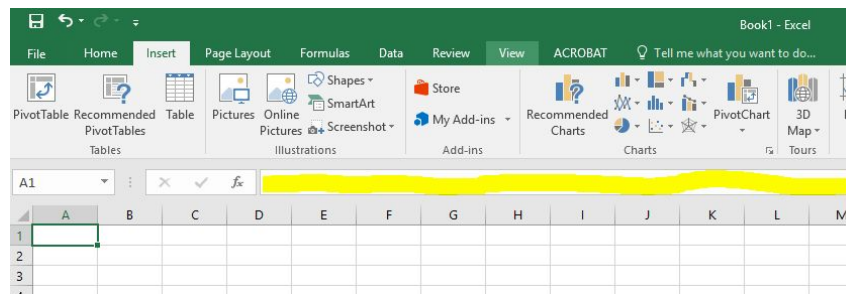
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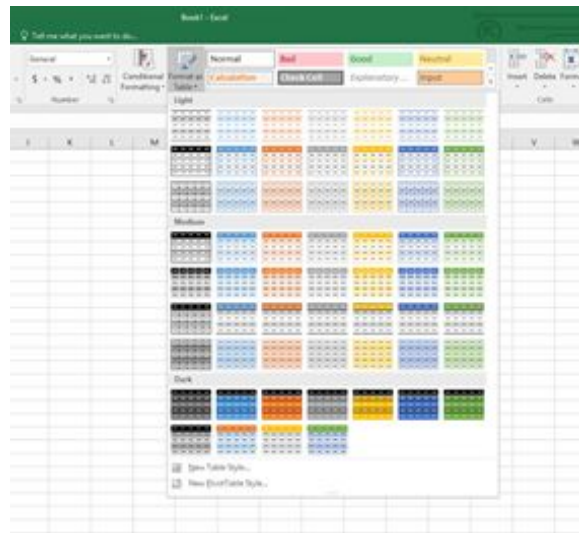
To format a group of cells in the same way, select the cells you want to include and go to *Format As Table* in the *Home* tab. A drop-down menu like this will appear. In the *Design* tab, you can further modify your table should you want to do so.

Task 1

Format the data in your Earnings sheet in a way that makes it easy to read and understand.

The Formula Bar

A cell may have just a number or some text, but it often contains a formula of some sort. The formula bar shows the calculations in a cell and is the white bar (highlighted in yellow in the picture above) located next to the *fx* symbol just above the row titles of the spreadsheet.

We say formulas are **dynamic** because the calculations within them can refer to certain values within certain cells rather than a constant numerical value. For example, "=2+2" is not a dynamic equation, but "=CellA+CellB" is. Typing an "=" in the formula bar tells Excel that you're about to type in a formula. If you omit "=", Excel will think you're just typing text.

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Cells are referred to by their column (a letter) and their row (a number); E12, F10, and C3 are all valid names of cells. To make dynamic equations that refer to cells, you can either type their names directly into the formula bar (eg. "=A10-B3") or you can click on the cells themselves as you type in the formula bar. This works the same way if you want to refer to a cell on another sheet (use the tabs to go to the other sheet and click on the cell).

The *fx* button next to the formula bar gives you access to a variety of mathematical operations that Excel can perform on your cells. Another feature you might find useful is AutoSum; it has its own button in the *Editing* section of the *Home* tab identified by a sigma (Σ) symbol. If you click this button, it will automatically add the values in nearby cells and output the result in the cell you originally selected.

Miscellaneous Excel Features

To copy information quickly over a bunch of cells, select the cell whose information you want to copy. Click and hold on the small square that appears in the lower right-hand corner of the cell, then drag towards the direction in which you want the information to be copied. If you use the same technique on two cells containing chronological data (such as *1* and *2*, *Monday* and *Tuesday*, or *June* and *July*), Excel will continue the chronology.
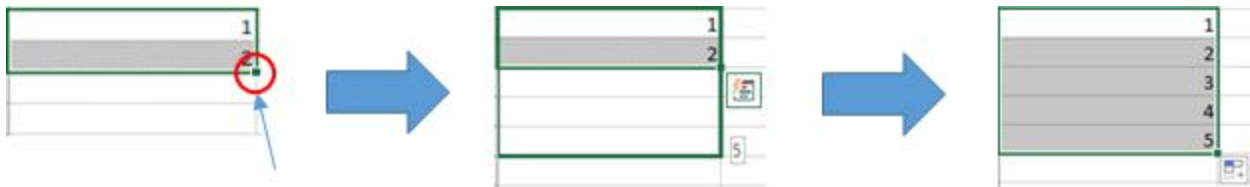
Copying Formulas

If you copy a cell with a formula, the formula will also be copied but slightly modified; this again speaks to the fact that formulas in Excel are **dynamic!** Let's say you have 3 rows of data in columns A and B, and you want the fourth row of each column to be the sum of the 3 respective rows above. You can manually type "=SUM(A1:A3)" in A4 and "=SUM(B1:B3)" in B4 to derive these sums, OR you could type this formula only in A4 then drag-copy the cell over to B4; Excel assumes the same formula function for each subsequent cell you drag-copy to while modifying the formula content on a case-by-case basis.

In the case that you do want to incorporate the same cell into a formula using the copying technique, add "$" in front of the cell's row and column indicators. Typing "=SUM(A1+A2+$A$3)" into A4 and dragging it over would give B4 the new formula of "=SUM(B1+B2+$A$3)."

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Task 2

1) Fill in the remaining cells of your chart for Weekly Income % Change ((this week's income - last week's income)/last week's income) and Average Income per Crisis Averted (Weekly Income/Number of Crises Averted). Each cell should be using a formula that computes new values based on already-existing ones.

2) The first week, September 19-25, is an exception – there is no Weekly Income % Change. To indicate the lack of data, type an apostrophe followed by a hyphen (-).

3) For the entire row indicating the Average Income per Crisis Averted, round the values to the nearest whole number by using just the respective cell in the September 19-25 column. Modify your function in the formula bar by using "=ROUND", an open parenthesis, your formula, a comma, "0", and a close parenthesis. For example, "=ROUND(SUM(A1+A2), 0)" would round the sum of cell A1 and A2 to the nearest whole number.

Task 3

Create a new sheet called "Summary" to report a summary of your findings. The cells in this sheet should automatically update their values when you change values on the Earnings sheet, so **you'll have to use dynamic equations to make this work**.

To reference cells from another sheet, you need to indicate the worksheet name as well as the cell itself and separate these two elements with an "!". To use the value of cell F5 from your Earnings sheet on your Summary sheet for example, you would need to type "=Earnings!F5". Anytime you change cell F5 on your Earnings sheet, it will be updated automatically on your Summary sheet as well.

The Summary sheet should include:

● The *sum* of the incomes from all four weeks

● The *average* weekly income % change

● The *maximum* number of crises in a given week

Every cell should reference data on the Earnings sheet and use a built-in Excel formula.

Making Charts

Most of the work here is in laying out the information correctly. To create a chart, select the information you want represented (including category labels!) and choose a chart under the *Insert* tab.

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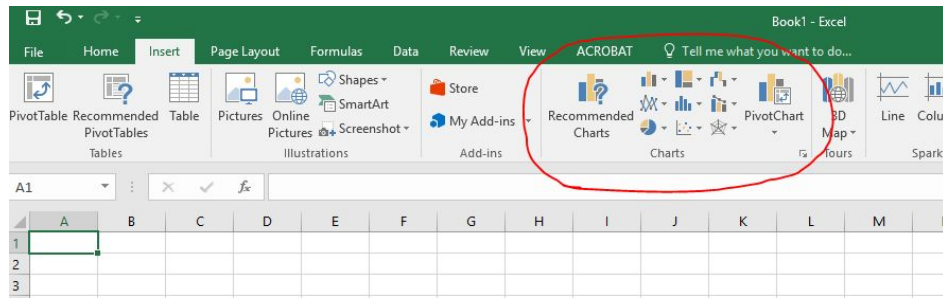
For a two-dimensional chart, make sure you select two sets of data that you want to compare; for a three-dimensional chart, three sets of data. The default is to make the first column (or row) of data the x axis of the graph and the second column (or row) of data the y-axis so position your data accordingly. There are many other chart functions available to you in Excel that won't be covered here; feel free to experiment with them!

Task 4

Create two different kinds of charts (bar, line, pie, surface, etc.) from your Earnings sheet. Each chart should contain data that would be logically represented by these kinds of charts. Add a title to each graph and play around with some of the other options (e.g. label the axes).

Check-off Requirements

1. Formatted Earnings sheet with correct values

2. Summary of Earnings on separate sheet using dynamic equations

3. Two different graphs from Earnings sheet

Submission

To submit this lab, please raise your hand so a TA can come check your work. Make sure you tell the TA to check you off their list, or else you will not receive credit. If you do not finish your lab in the allotted time, please either come to office hours or another lab section to finish. If you are unable to complete this lab due to sickness or injury, please contact BOTH Don and the cs002 TAs via email. Please contact the cs002 TAs if you have any further questions.

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