Hello everyone,

Our first topic today involves SORTING and FILTERS
I have a required 19 minute video for you to watch at http://youtu.be/zpgGdAQrv3U

In the interest of redundancy, here are the important skills.
When you have a spreadsheet of data like the US Presidents spreadsheet from Lesson 1

|	A	B	C	D	E
1	President	Years in office	Year first inaugurated	Age at inauguration	State elected from
2	Bill Clinton	8	1993	46	Arkansas
3	Herbert Hoover	4	1929	54	California
4	Ronald Reagan	8	1981	69	California
5	Jimmy Carter	4	1977	52	Georgia
6	Ulysses S. Grant	8	1869	46	Illinois
7	Barack Obama	n/a	2009	47	Illinois
8	Abraham Lincoln	4	1861	52	Illinois
9	Benjamin Harrison	4	1889	55	Indiana
10	Zachary Taylor	1	1849	64	Louisiana
11	John F. Kennedy	3	1961	43	Massachusetts
12	John Quincy Adams	4	1825	57	Massachusetts
13	John Adams	4	1797	61	Massachusetts
14	Franklin Pierce	4	1853	48	New Hampshire

there is a common and frequent need to SORT or ALPHABETIZE the data. When you go to the SORT menu under DATA you will see this screen that lets you add one or more levels of sorting into the mix.

Sort

Add levels to sort by: ☑ My list has headers

	Column	Sort On	Order	Color/Icon
Sort by	State elected from	Values	A to Z	
Then by	Age at inauguration	Values	Smallest to Largest	

[+] [−] [Copy]
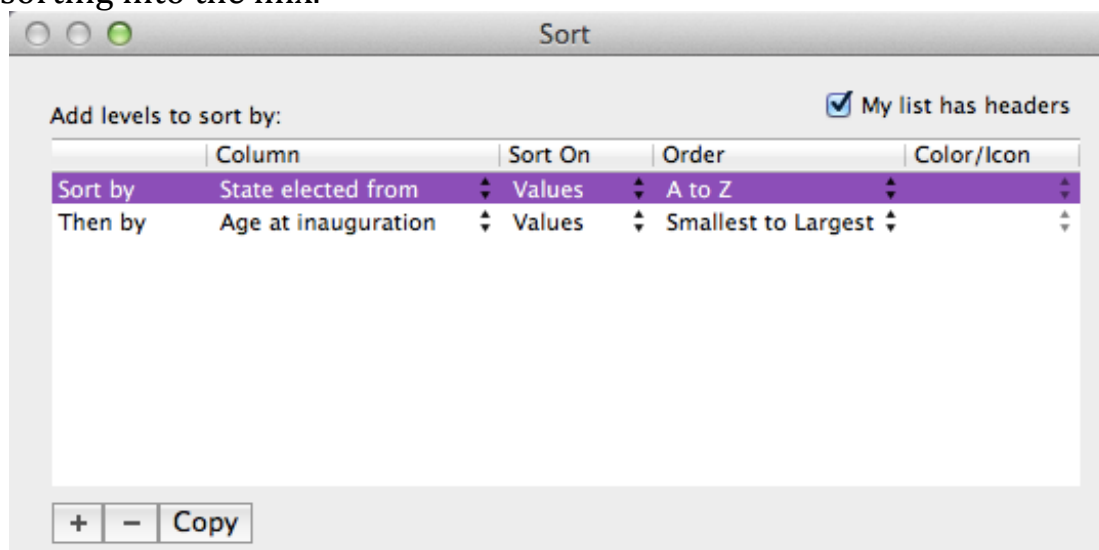
The + at bottom left means "add a level" and the - means "remove a level."
So let us click - twice and get rid of all the levels. We now have
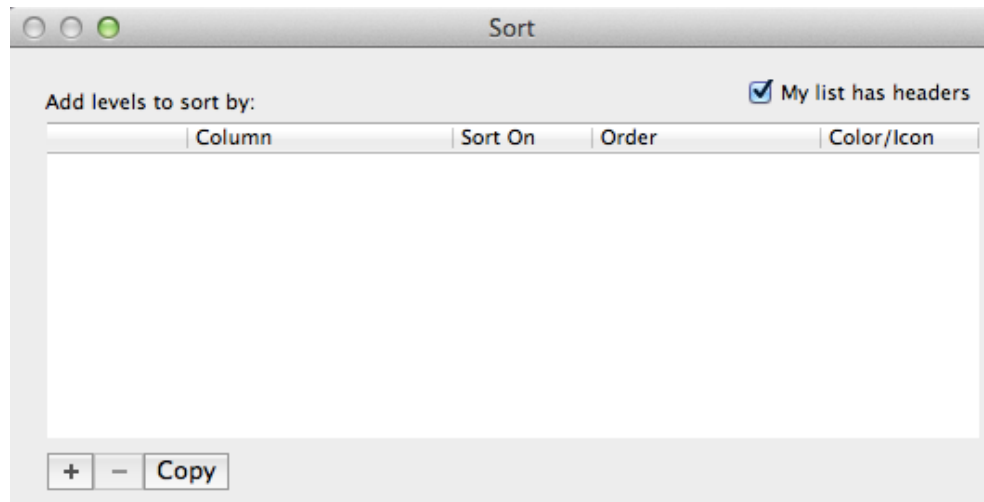
Notice at top right it says "MY LIST HAS HEADERS." This is very important for you to get into your repertoire. Does the data set have headers or not?

We click + and add a sorting level. Let us stay simple and just put the presidents in order by alphabetical order of first name of president.

If your spreadsheet has headers, you will see this
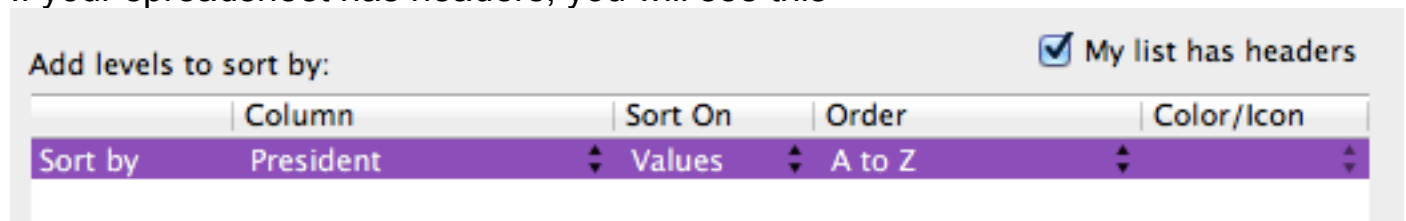
If your spreadsheet has no headers, you will see this
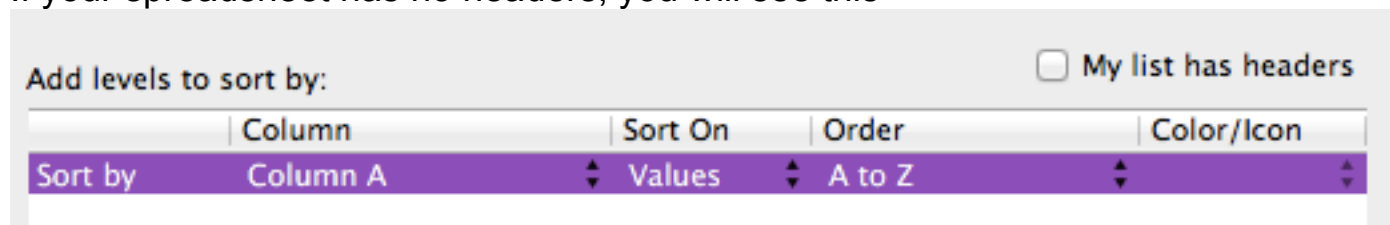
Remember that if your spreadsheet has headers and you set the checkbox incorrectly, you can all of a sudden see that your header has moved down into the body of the spreadsheet section like this:

22	John F. Kennedy	3	1961
23	John Quincy Adams	4	1825
24	Martin Van Buren	4	1837
25	*President*	Years in office	Year first inaugurated	ina
26	Richard M. Nixon	5	1969
27	Ronald Reagan	8	1981

I have made this mistake dozens of times in my life. Thank goodness for UNDO when this happens.

More often than not, with a spreadsheet, we need to deal with TWO levels of sorting, i.e. we want to group by STATE ELECTED FROM and then when there are ties, we want the second level to be AGE OF INAUGURATION.

So the recipe is this:

Add levels to sort by:				☑ My list has headers
	Column	Sort On	Order	Color/Icon
Sort by	State elected from	Values	A to Z	
Then by	Age at inauguration	Values	Smallest to Largest	

Notice that the ORDER column is either A to Z (if words) or SMALLEST TO LARGEST (if numbers). You can switch the order by using the double triangle.

Hope this helps along with the video (redundancy). Now for some exercises. Nothing needs to be turned in. You can check your own work using the answers below and I can then help you in our 30 minute session if you get stumped.

HW 2A Sort the US Presidents by Occupation with the presidents in alphabetical order by first name as the second level.

Here is what the top two inches will look like if you do it correctly:

President	Years in office	Year first inaugurated	Age at inauguration	State elected from	# of electoral votes	# of popular votes	National total votes	Total electoral votes	Rating points	Political Party	
Andrew Jackson	8	1829	61	Tennessee	178	642,553	1,148,018	261	632	Democrat	
Barack Obama	n/a	2009	47	Illinois	365	69,492,376	129,438,754	538		Democrat	
Bill Clinton	8	1993	46	Arkansas	370	44,909,326	104,425,014	538	539	Democrat	
Franklin Pierce	4	1853	48	New Hampshire	254	1,607,510	3,161,830	296	286	Democrat	
Franklin Roosevelt	12	1933	51	New York	472	22,825,016	39,749,382	531	876	Democrat	
Grover Cleveland	4	1893	55	New York	277	5,551,883	12,056,097	444	576	Democrat	
Grover Cleveland	4	1885	47	New York	219	4,874,621	10,049,754	401	576	Democrat	
James Buchanan	4	1857	65	Pennsylvania	174	1,836,072	4,054,647	296	259	Democrat	
James K. Polk	4	1845	49	Tennessee	170	1,339,494	2,703,659	275	632	Democrat	
Jimmy Carter	4	1977	52	Georgia	297	40,830,763	81,555,889	538	518	Democrat	
John F. Kennedy	3	1961	43	Massachusetts	303	34,221,344	68,828,960	537	704	Democrat	
Martin Van Buren	4	1837	54	New York	170	764,176	1,503,534	294	429	Democrat	
Woodrow Wilson	8	1913	56	New Jersey	435	6,293,152	15,040,963	531	723	Democrat	
James Madison	8	1809	57	Virginia	122 NA()		NA()	176	567	Democratic-Republican	
James Monroe	8	1817	58	Virginia	183 NA()		NA()	221	602	Democratic-Republican	
John Quincy Adams	4	1825	57	Massachusetts	84 NA()		NA()	261	564	Democratic-Republican	
Thomas Jefferson	8	1801	57	Virginia	73 NA()		NA()	137	711	Democratic-Republican	

HW 2B Sort the US Presidents by State with the presidents in alphabetical order by first name as the second level and last name as the third level (e.g. John Adams comes before John Kennedy).

HINT: you need to use the trick from Lesson 1 to change the names into two columns and manually deal in some fashion with the quirkiness of a few presidents with middle names or initials. To insert a column, you click on B at top and choose INSERT COLUMN.

Here is what the top two inches will look like if you do it correctly:

First name	Last Name	Years in office	Year first inaugurated	Age at inauguration	State elected from
Bill	Clinton	8	1993	46	Arkansas
Herbert	Hoover	4	1929	54	California
Ronald	Reagan	8	1981	69	California
Jimmy	Carter	4	1977	52	Georgia
Abraham	Lincoln	4	1861	52	Illinois
Barack	Obama	n/a	2009	47	Illinois
Ulysses	Grant	8	1869	46	Illinois
Benjamin	Harrison	4	1889	55	Indiana
Zachary	Taylor	1	1849	64	Louisiana
John	Adams	4	1797	61	Massachusetts
John	Kennedy	3	1961	43	Massachusetts
John	QuincyAdams	4	1825	57	Massachusetts
Franklin	Pierce	4	1853	48	New Hampshire

I have given you a second spreadsheet of data called L2_Countries of the World.xlsx

Here is what a portion of the spreadsheet looks like:

	A	B	C	D	E	F
1	Country	Region	Population	Area in sq mi	Pop. Density per sq. mi.	Coastline -- coast/area ratio
2	Afghanistan	ASIA (EX. NEAR EAST)	31,056,997.00	647,500.00	48.0	0.00
3	Albania	EASTERN EUROPE	3,581,655.00	28,748.00	124.6	1.26
4	Algeria	NORTHERN AFRICA	32,930,091.00	2,381,740.00	13.8	0.04
5	American Samoa	OCEANIA	57,794.00	199.00	290.4	58.29
6	Andorra	WESTERN EUROPE	71,201.00	468.00	152.1	0.00
7	Angola	SUB-SAHARAN AFRICA	12,127,071.00	1,246,700.00	9.7	0.13
8	Anguilla	LATIN AMER. & CARIB	13,477.00	102.00	132.1	59.80
9	Antigua & Barbuda	LATIN AMER. & CARIB	69,108.00	443.00	156.0	34.54
10	Argentina	LATIN AMER. & CARIB	39,921,833.00	2,766,890.00	14.4	0.18
11	Armenia	C.W. OF IND. STATES	2,976,372.00	29,800.00	99.9	0.00
12	Aruba	LATIN AMER. & CARIB	71,891.00	193.00	372.5	35.49
13	Australia	OCEANIA	20,264,082.00	7,686,850.00	2.6	0.34
14	Austria	WESTERN EUROPE	8,192,880.00	83,870.00	97.7	0.00
15	Azerbaijan	C.W. OF IND. STATES	7,961,619.00	86,600.00	91.9	0.00
16	Bahamas, The	LATIN AMER. & CARIB	303,770.00	13,940.00	21.8	25.41

Column F is interesting since 0.00 means the country does not touch an ocean. One such country is Afghanistan. So here is the next exercise.

HW 2C Sort the Countries of the World with from low to high with Coastline so that the 0.00 countries are at the top. Then your second level will be REGION and your third level will be alphabetical names of COUNTRIES.

Here is what the top two inches will look like if you do it correctly:

	A	B	C	D	E	F
1	Country	Region	Population	Area in sq mi	Pop. Density per sq. mi.	Coastline -- coast/area ratio
2	Afghanistan	ASIA (EX. NEAR EAST)	31,056,997.00	647,500.00	48.0	0.00
3	Bhutan	ASIA (EX. NEAR EAST)	2,279,723.00	47,000.00	48.5	0.00
4	Laos	ASIA (EX. NEAR EAST)	6,368,481.00	236,800.00	26.9	0.00
5	Mongolia	ASIA (EX. NEAR EAST)	2,832,224.00	1,564,116.00	1.8	0.00
6	Nepal	ASIA (EX. NEAR EAST)	28,287,147.00	147,181.00	192.2	0.00
7	Armenia	C.W. OF IND. STATES	2,976,372.00	29,800.00	99.9	0.00
8	Azerbaijan	C.W. OF IND. STATES	7,961,619.00	86,600.00	91.9	0.00
9	Belarus	C.W. OF IND. STATES	10,293,011.00	207,600.00	49.6	0.00
10	Kazakhstan	C.W. OF IND. STATES	15,233,244.00	2,717,300.00	5.6	0.00
11	Kyrgyzstan	C.W. OF IND. STATES	5,213,898.00	198,500.00	26.3	0.00
12	Moldova	C.W. OF IND. STATES	4,466,706.00	33,843.00	132.0	0.00
13	Tajikistan	C.W. OF IND. STATES	7,320,815.00	143,100.00	51.2	0.00
14	Turkmenistan	C.W. OF IND. STATES	5,042,920.00	488,100.00	10.3	0.00
15	Uzbekistan	C.W. OF IND. STATES	27,307,134.00	447,400.00	61.0	0.00
16	Czech Republic	EASTERN EUROPE	10,235,455.00	78,866.00	129.8	0.00
17	Hungary	EASTERN EUROPE	9,981,334.00	93,030.00	107.3	0.00
18	Macedonia	EASTERN EUROPE	2,050,554.00	25,333.00	80.9	0.00
19	Serbia	EASTERN EUROPE	9,396,411.00	88,361.00	106.3	0.00
20	Slovakia	EASTERN EUROPE	5,439,448.00	48,845.00	111.4	0.00

# Let us move on to the next topic in the video -- filters.

A filter may seem like sorting but it is not! When you filter your spreadsheet, you are saying "hey computer, please don't rearrange the rows, but just show me the rows that meet my criterion."

If we go back to the original data

	A	B
1	Country	Region
2	Afghanistan	ASIA (EX. NEAR EAST)
3	Albania	EASTERN EUROPE
4	Algeria	NORTHERN AFRICA
5	American Samoa	OCEANIA
6	Andorra	WESTERN EUROPE
7	Angola	SUB-SAHARAN AFRICA
8	Anguilla	LATIN AMER. & CARIB
9	Antigua & Barbuda	LATIN AMER. & CARIB
10	Argentina	LATIN AMER. & CARIB
11	Armenia	C.W. OF IND. STATES
12	Aruba	LATIN AMER. & CARIB
13	Australia	OCEANIA
14	Austria	WESTERN EUROPE
15	Azerbaijan	C.W. OF IND. STATES
16	Bahamas, The	LATIN AMER. & CARIB
17	Bahrain	NEAR EAST
18	Bangladesh	ASIA (EX. NEAR EAST)

we might say "can we filter the region to show me just the countries from ASIA?"

Notice that Afghanistan in row 2 and Bangladesh in row 18 are both from ASIA. So as the video shows you, you highlight column B then choose FILTER under DATA. This put a baby triangle in the same rectangle as REGION:

Region ▼
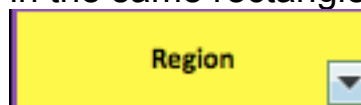
Now when you click the triangle you will see all the values and can UNCHECK select all and then check off ASIA so it looks like this:
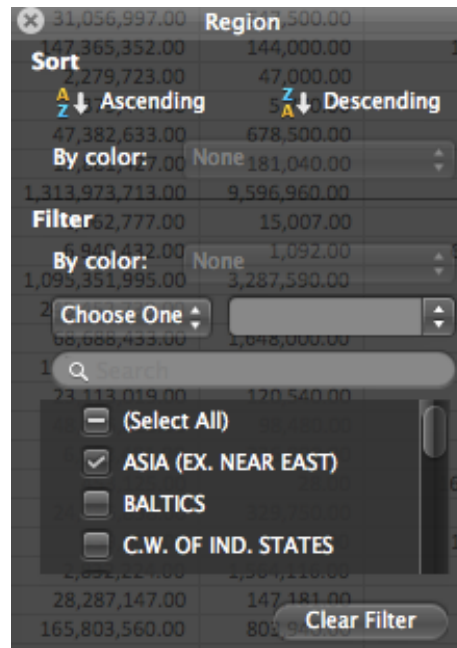
After you do this, your spreadsheet will look like this:

Notice that Afghanistan is still in row 2 and Bangladesh is still in row 18.

Also observe the FILTER icon changed its look in column B. To unfilter and get your data back, you click on this new icon and choose to CLEAR FILTER.

To get the filter icon completely off your spreadsheet, you just go back to the FILTER option under the DATA menu and choose it again. Or you can FILTER another column by clicking on it and choosing FILTER. You can also highlight multiple columns and then choose FILTER to get:

Finally, there is an icon in the toolbar that looks like ![filter icon] that is the same as the filter menu.

HW 2D Impose a filter on Countries of the World so we see the 5 countries from NORTHERN AMERICA. Please sort these countries in numerical order from high to low in terms of area of square miles.

Here is what the top two inches will look like if you do it correctly:

	A Country	B Region	C Population	D Area in sq mi
24	Canada	NORTHERN AMERICA	33,098,932.00	9,984,670.00
38	United States	NORTHERN AMERICA	298,444,215.00	9,631,420.00
82	Greenland	NORTHERN AMERICA	56,361.00	2,166,086.00
193	St Pierre & Miquelon	NORTHERN AMERICA	7,026.00	242.00
216	Bermuda	NORTHERN AMERICA	65,773.00	53.00
229				

HW 2E Impose a filter on US Presidents so we see just the presidents from Virginia who were from the Democratic-Republican political party. Please sort these presidents to be in alphabetical order.

Here is what the entire solution will look like if you do it correctly:

	A President	B Years in office	C Year first inaugurated	D Age at inauguration	E State elected from	F # of electoral votes	G # of popular votes	H National total votes	I Total electoral votes	J Rating points	K Political Party	
34	James Madison	8	1809	57	Virginia	122	NA()	NA()	176	567	Democratic-Republican	L
35	James Monroe	8	1817	58	Virginia	183	NA()	NA()	221	602	Democratic-Republican	L
36	Thomas Jefferson	8	1801	57	Virginia	73	NA()	NA()	137	711	Democratic-Republican	F

Now use the HIDE feature to make some of the columns disappear. This is a feature I have not taught you yet and it was NOT in the video. You click on any column then choose FORMAT then COLUMN then HIDE. Or you can use the SHIFT CLICK trick and highlight a bunch of columns and hide them all at once. Or you can use right mouse click (PC) or control click (Mac) and choose HIDE.

Another trick: to highlight non-contiguous columns, you hold down COMMAND on the Mac or CTRL on the PC. Then as you click columns A then C then E, it lights up just those not the inbetween ones.

What you will get will look like

Good luck!

Please note that in the video I have also taught you about SPLITTING windows and FREEZING ROWS and COLUMNS. I also taught you that you can click at the top left corner of the spreadsheet to SELECT ALL. You can also use CMD-A (Mac) or CTRL-A (PC) to SELECT ALL

HW 2F Create an interesting data set or find on the web an interesting data set that is more meaningful and personal to you in terms of what you teach or your current job. Make up a challenge that involves SORTING and FILTERS. Send it to me so I can see it and possibly use it in another assignment.

How to find EXCEL files on the web?

You can either use a keyword and xlsx in the search box like this:
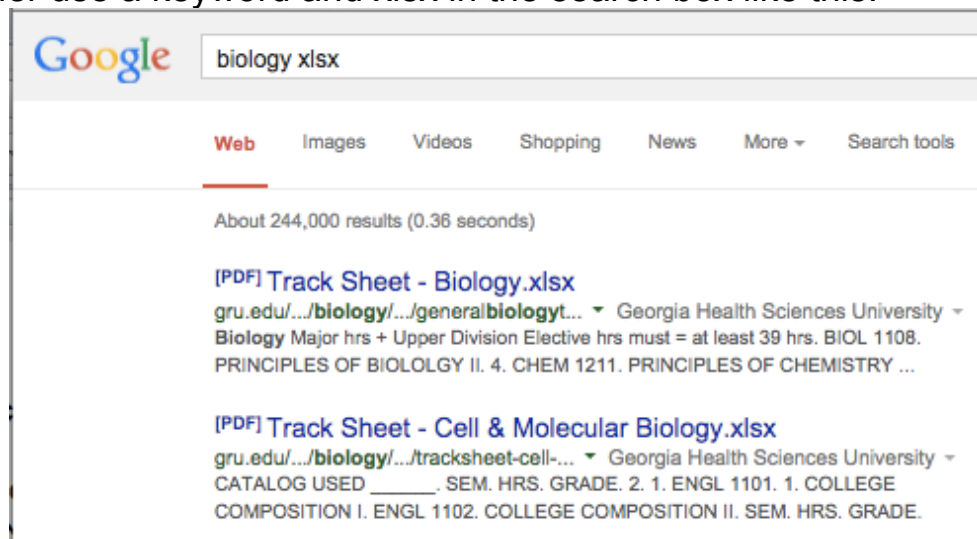
Or you can do an ADVANCED SEARCH and then change the FILE TYPE to be Excel

Advanced Search

Find pages with...

all these words:	biology
this exact word or phrase:	
any of these words:	
none of these words:	
numbers ranging from:	

Then narrow your results by...

language:	any language
region:	any region
last update:	anytime
site or domain:	
terms appearing:	anywhere in the page
SafeSearch:	Show most relevant results
reading level:	no reading level displayed
file type:	Microsoft Excel (.xls)

Next Topic: **The IF formula and CONDITIONAL FORMATTING**

The IF formula is one of the most powerful and useful Excel formulas as you move from being a JV to Varsity user. The basic structure is

<div align="center">=IF(condition,then,else)</div>

where CONDITION is usually an equation and THEN is either a number or word in quotes. The same with ELSE being either a number or word in quotes.

Example, we have a gradebook of students and want to flag in some way those students with an average below 75 so we can write letters to parents.

	A	B	C
1	STUDENTS	GRADE AVERAGE	
2	Larry	95	
3	Kevin	65	
4	Robert	72	
5	Georgia	91	
6	Mariah	61	

We will put an IF formula into C1 and the use the magic fill. We can either use numbers where 1 means pass and 0 means poor. Then our formula would be

<div align="center">=IF(B2<75,1,0)</div>

Please note with numbers you don't use quotes while with words, we would have

<div align="center">=IF(B2<75,"poor","good")</div>

Or we can identify the weak students and put nothing for the good students which we do via two quote symbols with nothing between them.

<div align="center">=IF(B2<75,"poor","")</div>

This IF formula is relatively easy to use and extremely powerful. I urge you to practice it and figure out how you can use it to your advantage. Here is the result after we use the MAGIC FILL with the =IF(B2<75,"poor","") formula.

	A	B	C
1	STUDENTS	GRADE AVERAGE	
2	Larry	95	
3	Kevin	65	poor
4	Robert	72	poor
5	Georgia	91	
6	Mariah	61	poor

In contrast, we have conditional formatting found under the FORMAT menu or found by clicking on the icon that looks like this:
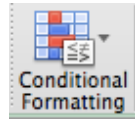
If we use the FORMAT menu method, we begin by highlighting the 5 cells from B2:B6 and choose CONDITIONAL FORMATTING under FORMAT, we see this screen which reminds of adding SORTING LEVELS.
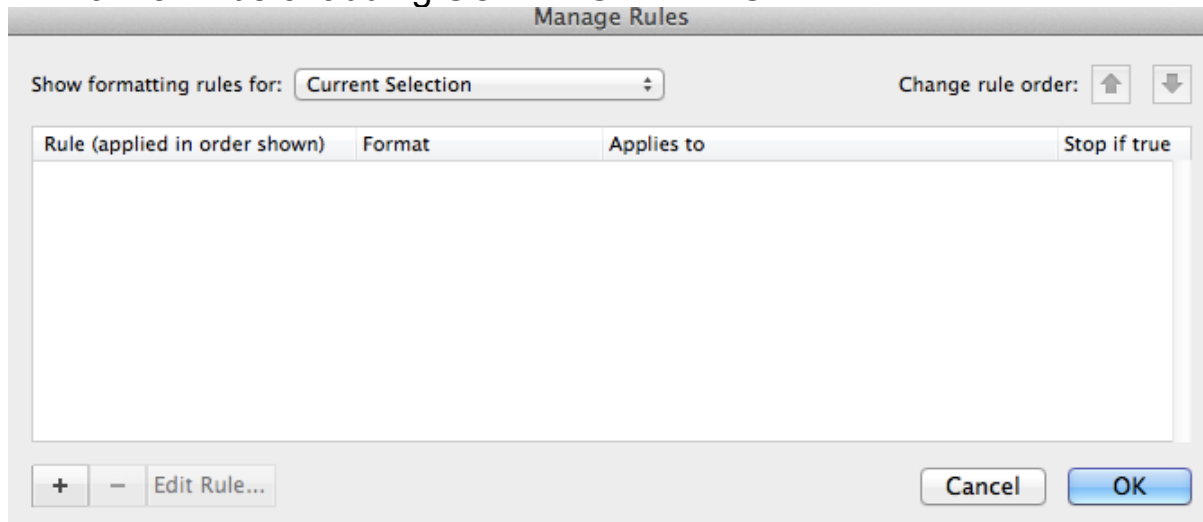
We choose + to add a formatting rule and will see
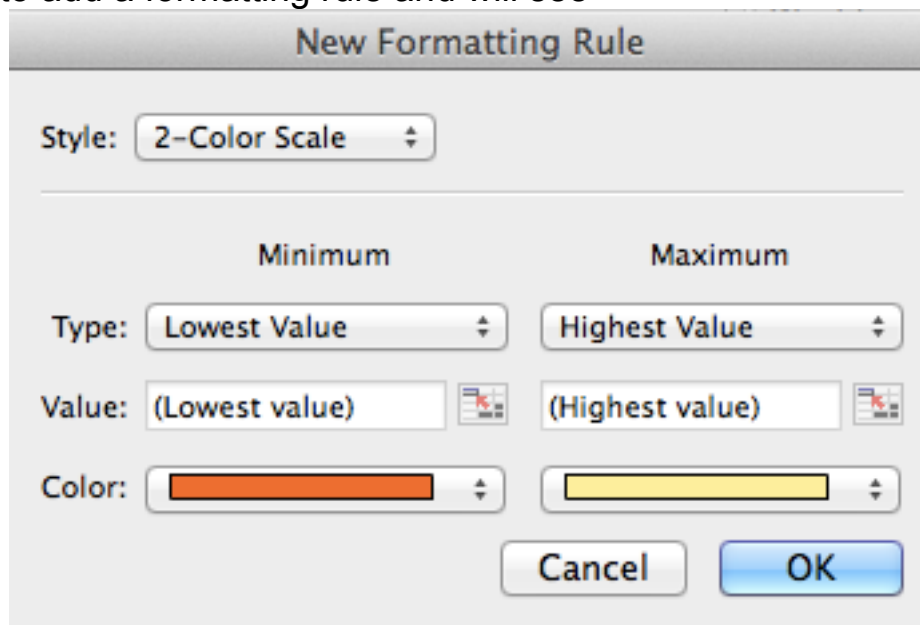
The double triangle under 2-Color Scale has 5 choices. We want the SIMPLEST one for now called Classic.

We will now have a CLASSIC RULE that looks like this
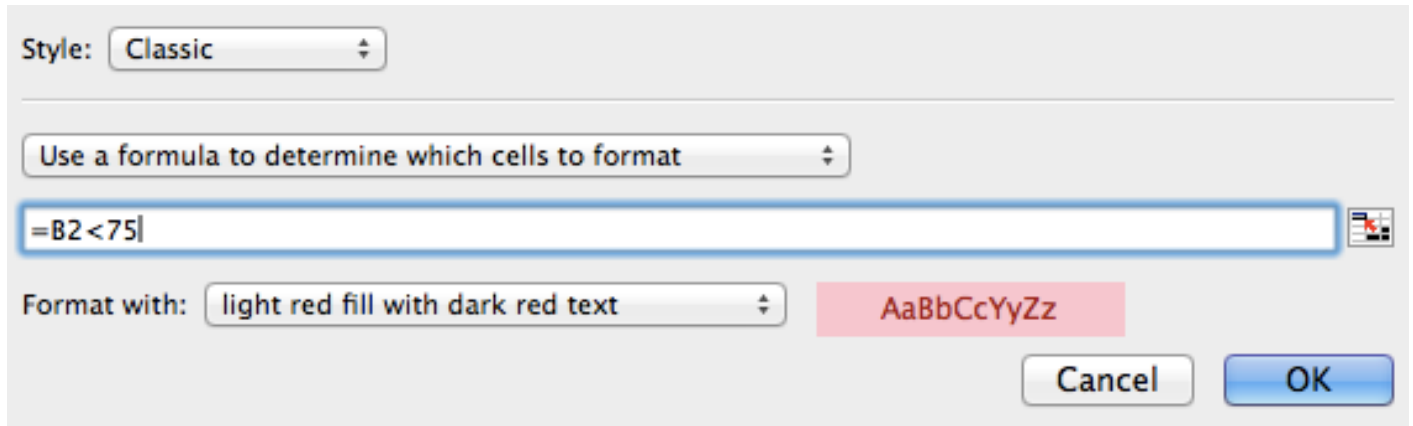
This is not so intuitive and not a lot of fun.

Alternatively if you use the icon instead, you still have to highlight the 5 cells from B2 to B6 and then click
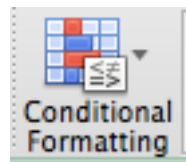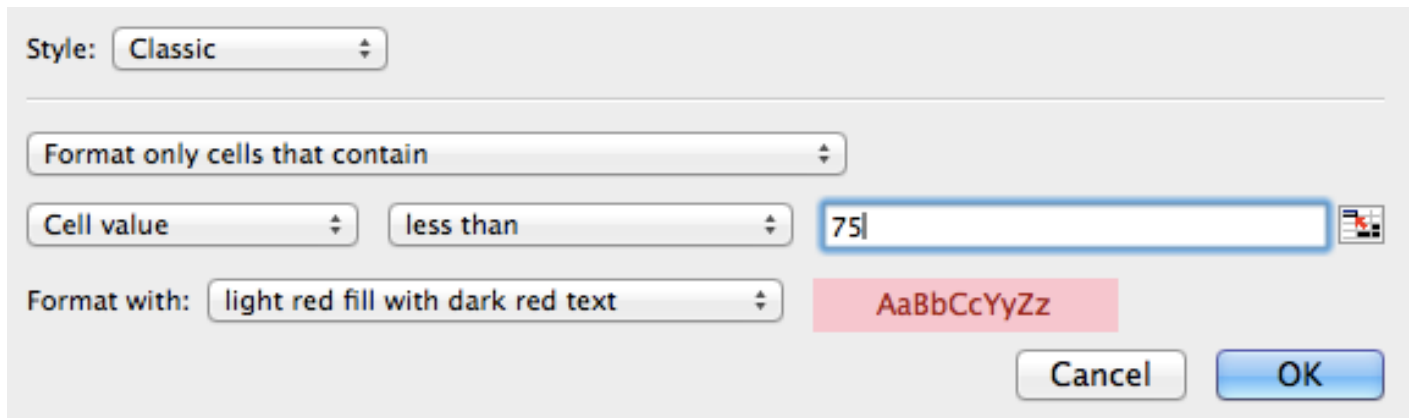
Now you get these options
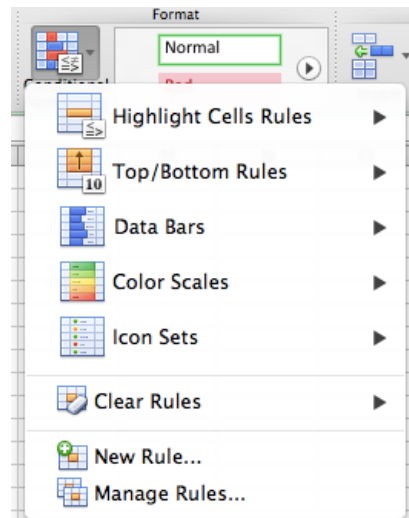
The easiest one is the top one that says HIGHLIGHT CELLS RULE which is the easiest and you get a simpler interface where you can specify to change the colors of the cells under 75.

Style: Classic

Format only cells that contain

Cell value | less than | 75

Format with: light red fill with dark red text | AaBbCcYyZz

Cancel | OK

The end result either way -- via MENU or ICON is

	A	B
1	STUDENTS	GRADE AVERAGE
2	Larry	95
3	Kevin	65
4	Robert	72
5	Georgia	91
6	Mariah	61

and we have success -- colorizing cells that meet a certain condition.

The fancier options you find that are fancier allow you to do very neat things with your data

FORMATTING MENU OPTION

ICON

✓ 2-Color Scale
3-Color Scale
Data Bar
Icon Sets
Classic

Highlight Cells Rules
Top/Bottom Rules
Data Bars
Color Scales
Icon Sets
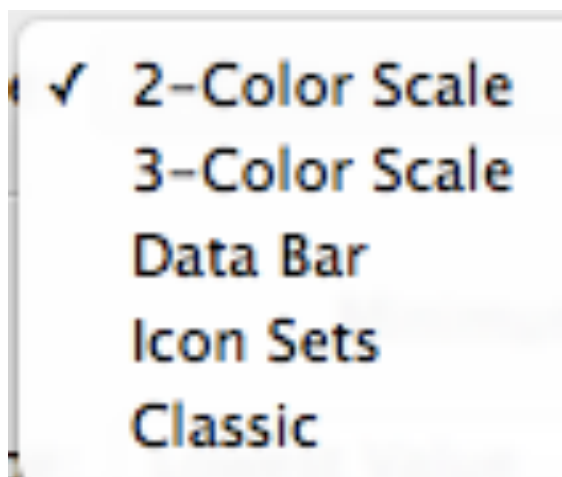
The 3-Color Scale for example gives you this with green for the high scores

STUDENTS	GRADE AVERAGE
Larry	95
Kevin	65
Robert	72
Georgia	91
Mariah	61

red for the bottom scores and yellow. Lots of fancy options for you to explore but it is important to make sure you catch onto the basics!

HW 2G Send me as an attached file one example of using conditional formatting. I would strongly prefer if you could send me some spreadsheet of your own that has value and meaning to you but if not, then do what I did with some artificial names and scores.
(please name your file **Larry Bird HW2G Jan 26.xlsx** using your name and current date of course)

HW 2H Continuation of 3 Vocab words or concepts per week on our Shared Doc. Please choose any THREE that have not been done and provide a definition or explanation on our shared doc.
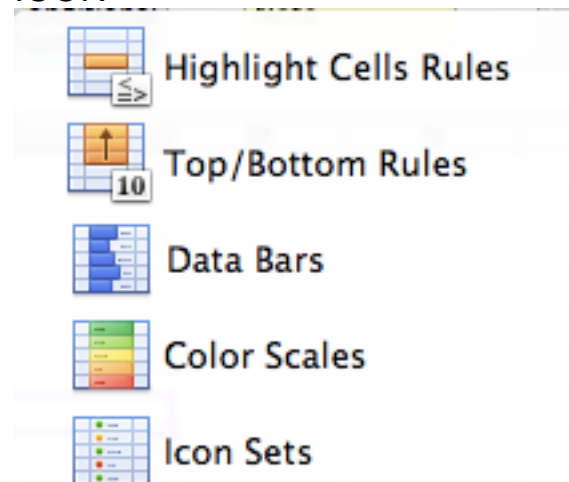
Final HW Assignment: Challenge Problem for this week
I am going to give you a challenge problem each week and a solution by video. This allows you to "take the challenge" with whatever comfort level you have of being puzzled. Some people like to drive themselves crazy figuring out the solution. Other people like to get some hints from the video and then pause and solve the rest. Other people like to watch the video thoroughly and then replicate the solution. Got it? Whatever you do, you must share comments in our collaborative document as part of your weekly homework!

HW 2I Produce a spreadsheet that shows all the temperatures from -100 degrees (freezing) to +100 degrees (boiling) and show the equivalents in Fahrenheit. Find the ONE temperature when Celsius = Fahrenheit. Speculate where in the world might this be?
The relationship is F=(9/5)*C+32 to review the basic Science relationship.
    So if C is 0 then F is 32
    And if C is 100 then F is 212
You can also use the formula F=1.8*C+32 since 9/5 is the same as 1.8.
Send me the solution via email once done.
(please name your file **Larry Bird HW3I Jan 26.xlsx** using your name and current date of course)

The top of your spreadsheet will look like

	A Celsius	B Fahrenheit	C Are they the same?
1	Celsius	Fahrenheit	Are they the same?
2	-100	-148	no
3	-99	-146.2	no
4	-98	-144.4	no
5	-97	-142.6	no
6	-96	-140.8	no
7	-95	-139	no
8	-94	-137.2	no
9	-93	-135.4	no
10	-92	-133.6	no
11	-91	-131.8	no
12	-90	-130	no
13	-89	-128.2	no
14	-88	-126.4	no
15	-87	-124.6	no
16	-86	-122.8	no
17	-85	-121	no
18	-84	-119.2	no
19	-83	-117.4	no

Here is the 13 minute instructional video: http://youtu.be/jBQFzFXPKmU

Reminder that you can watch none of it or just some of it before trying the challenge.

Have a good week. Please remember that I am here for you 15 hours a day (7am to 10pm NYC time) seven days a week and that unlike people who are arrested, you are NOT limited to one phone call. My job is to serve you and help you. If that means we talk two or three times a week, that is fine with me.

Steve
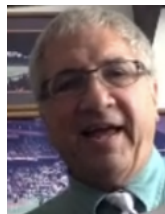
781-953-9699   skype name = stevebergen (no spaces) sbergen33@gmail.com

INDEX of HIGHLIGHTS can be found on the last page

☑ HW Watch the 19 min video on Sorting and Filter (page 1)

☑ HW 2A Sort the US Presidents by Occupation with the presidents in alphabetical order by first name as the second level (page 3)

☑ HW 2B Sort the US Presidents by State with the presidents in alphabetical order by first name as the second level and last name as the third level (page 4)

☑ Use the Spreadsheet L2_Countries of World (page 5)

☑ HW 2C Sort the Countries of the World with from low to high with Coastline so that the 0.00 countries are at the top (page 5)

☑ HW 2D Impose a filter on Countries of the World so we see the 5 countries from NORTHERN AMERICA (page 8)

☑ HW 2E Impose a filter on US Presidents so we see just the Presidents from Virginia who were Democratic-Republican. (page 8)

☑ HW 2F Create an interesting data set or find on the web an interesting data set that is more meaningful and personal to you in terms of what you teach or your current job. Make up a challenge that involves SORTING and FILTERS. Send it to me so I can see it and possibly use it in another assignment. (page 9)

☑ HW 2G Send me as an attached file one example of using conditional formatting. (page 15)

☑ HW 2H Continuation of 3 Vocab words or concepts per week on our Shared Doc. Please choose any THREE that have not been done and provide a definition or explanation on our shared doc. (page 15)

☑ HW 2I Produce a spreadsheet that shows all the temperatures from -100 degrees (freezing) to +100 degrees (boiling) and show the equivalents in Fahrenheit. Find the ONE temperature when Celsius = Fahrenheit. Speculate where in the world might this be? (page 15) Watch the video if you need hints or help (page 16).