3. EXCEL FORMULAS & TABLES

Fall 2016

Cell References

- **Relative reference** - refer to cell references in formulas in relation to the cell that contains the formula (such as "the cell two rows above this cell"). When you copy a formula containing relative references, the references adjust to the new location. e.g.=A2+1

- **Absolute reference** - refer to cells by their fixed position. Absolut references always refer to the same cell, regardless of where the formula is copied. e.g. =$A$2+1

- **Combination** - either the row is absolute and the column is relative or the row is relative and the column is absolute. e.g. =$A2+1 or =A$2+1

Example

- Excel adjusts cell references during the fill based on the reference type.

Combination Cell References

- How do $A1 and A$1 differ from $A$1?

	A	B	C	D	E
1	4	8	=A1/$A$3		
2	6	4	=A$1*$B4+B2		
3	=A1+A2	1			
4					
5					

- What formula would result in cell D1 if you copy the formula from cell C1 to D1?

- What formula would result in cell E5 if you copy the formula from C2 to E5?

Named Cell Reference

- What kind of cell reference is a named cell?
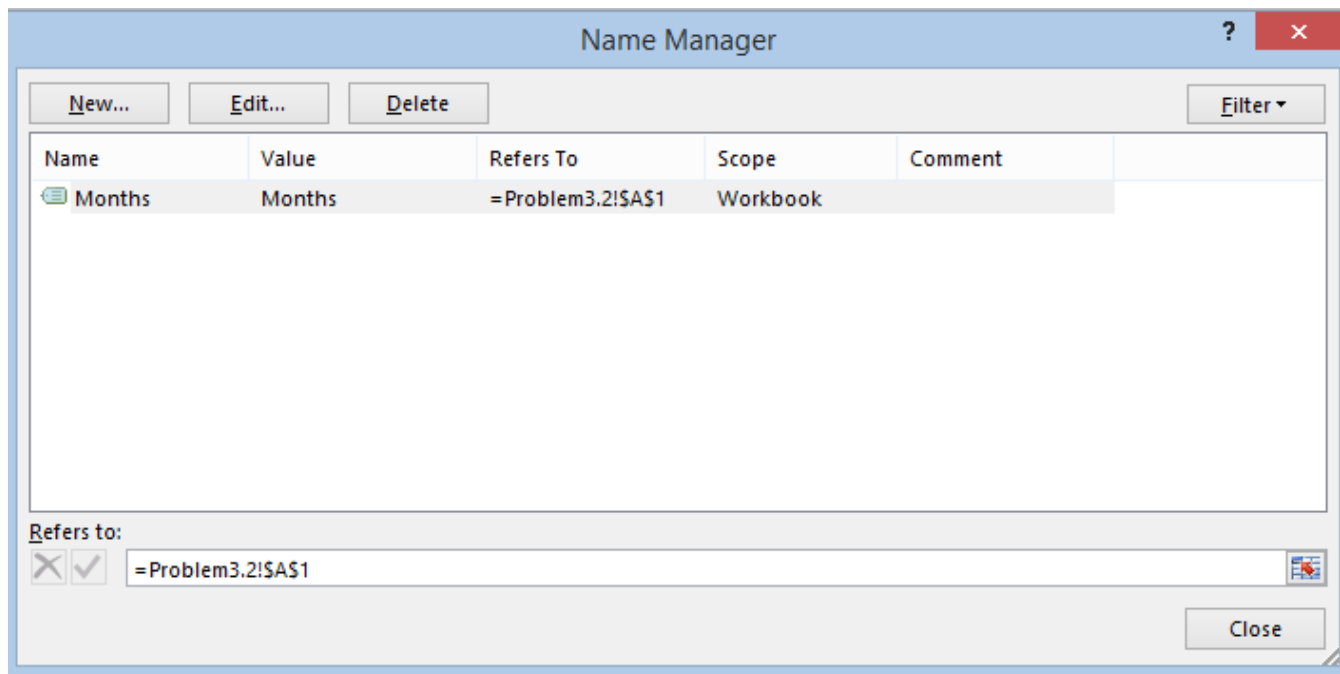
Problem 3.1

- An interesting Web site is www.worldometers.info

- Using the population of the world today and the present growth rate of 1.13% per year, design a worksheet that shows the population for each of the next 25 years.

- Let's design and then implement
  - Make sure that the population is stored as a number and that you show the 1000 separator (,)
  - Make sure that percentages are displayed as percentages

Problem 3.1 Continued

- What is the predicted world population in 2041 if the growth rate is 1.13%?

- What is the predicted world population if the growth rate is 1%?

What-If Analysis & Goal Seeking

• Using Excel to scrutinize the impact of changing values in cells that are referenced by a formula in another cell is called what-if analysis.
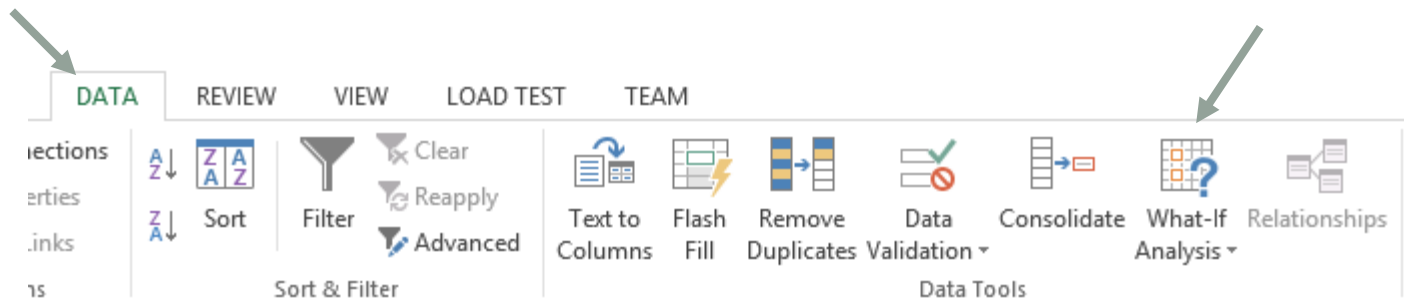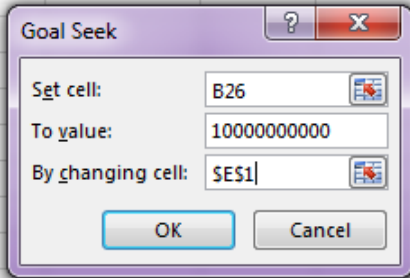
Goal Seek

- Located under Data->What-If Analysis->Goal Seek

- Goal seek allows you to see how one data item in a formula impacts another.

- Goal seek can be used to answer the question:
  - What growth rate will lead to the population reaching 10 Billion in 2041?

Goal Seek

Problem 3.2

- The university you are planning on attending has given you the following average expenses for a typical student.

	A	B	C	D	E
1	Category	Freshmen	Sophomore	Junior	Senior
2	Room and Board	$9,047.00			
3	Books and Supplies	$1,137.00			
4	Personal Expenses	$1,989.00			
5	Transportation	$1,073.00			

- Assuming a 3% increase in all expenses from year to year, finish the above worksheet showing expenses for each of your four years in college
- Write **one** formula in cell C1 and fill it down and right

Problem 3.2 Better Design

- How would we change the previous worksheet from 3% to 4%?

- Below is a better design:

	A	B	C	D	E	F	G	H
1	Category	Freshmen	Sophomore	Junior	Senior			
2	Room and Board	$9,047.00					Expense Increase	
3	Books and Supplies	$1,137.00					4%	
4	Personal Expenses	$1,989.00						
5	Transportation	$1,073.00						

Problem 3.3 Meteorology

- A meteorology class found the average weekly temperature for each week of each month for one year.
- The data is on the next slide. You are to find each of the following using an Excel worksheet:

  - The average monthly temperature for each month.

  - The highest and lowest monthly averages using two functions we have not discussed yet: maximum and minimum. See if you can use the help feature to figure this out.

Problem 3.3 Meteorology

- Let's import the data from the web
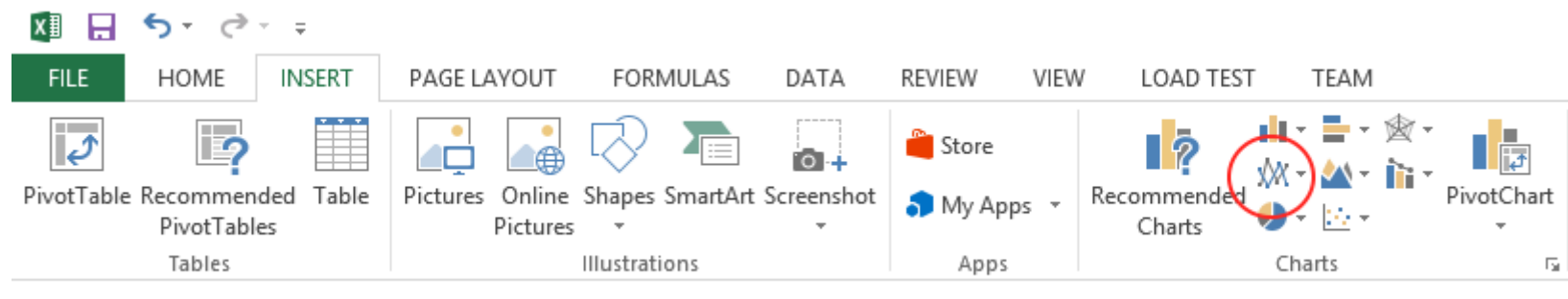
- Go to Data->From Web
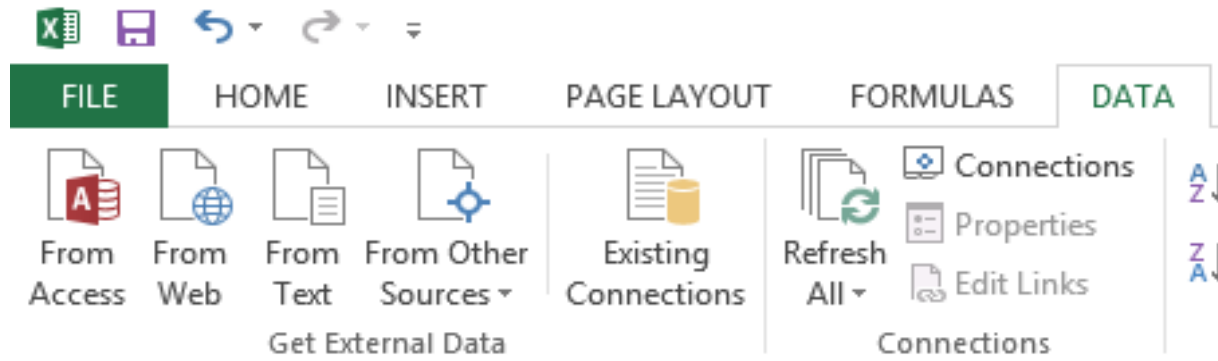
- Type in the following URL in the address box:
  - zeus.cs.pacificu.edu/shereen/cs130w16/WeatherTable.html
- Select the second yellow arrow and click Import
- Select OK

Importing from the Web

- What are the benefits of importing data from the web?

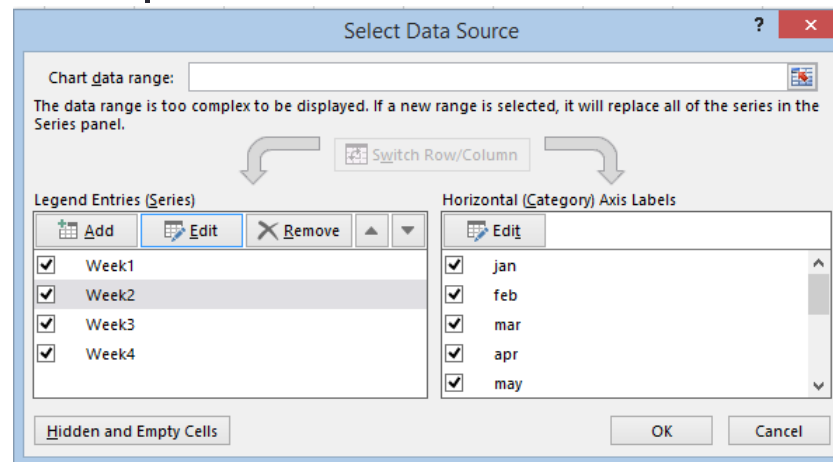- What are the downsides of importing data from the web?

Problem 3.3 Continued: Charting

- Select columns Month and Week 1
- Choose Insert | Recommended Charts | Line
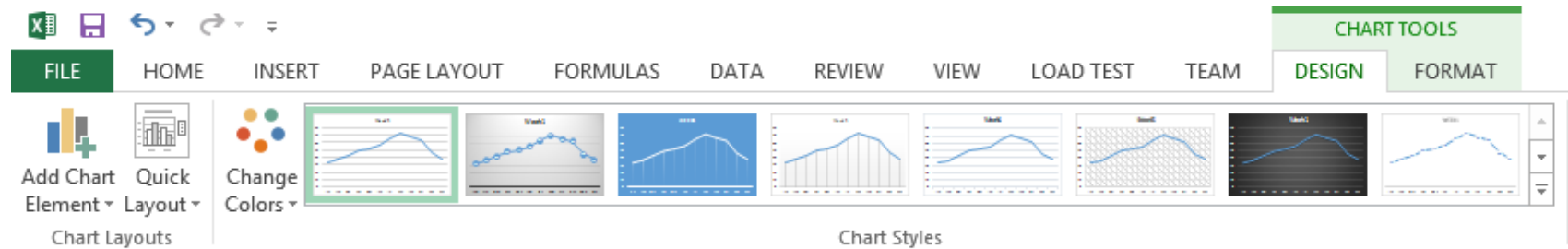 - OR select circled icon and the option in upper left of dropdown menu

Add a new Series

- To add other weeks
  - Right Click on the Chart | Select Data
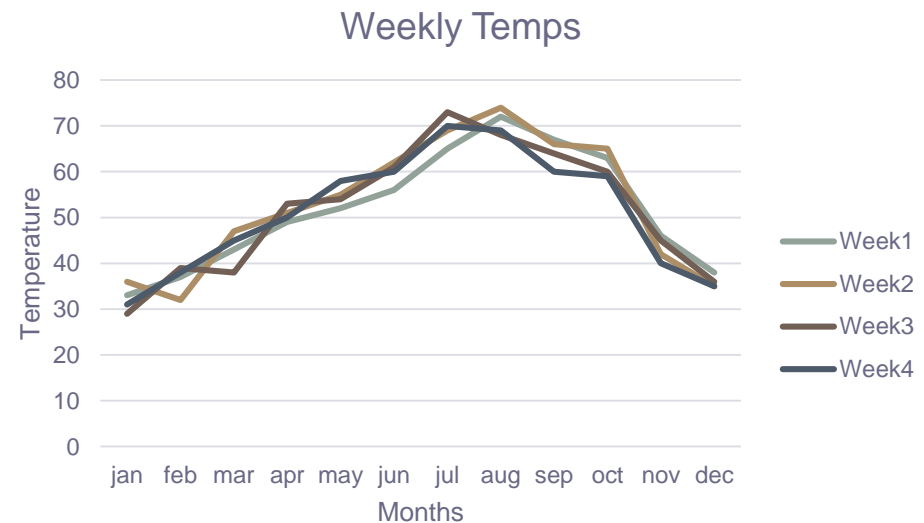- Add
- Series Name
- Series Values

- Edit Horizontal (Category) Axis Labels to show months.

Format the Chart

- Click on Chart -> Design | Add chart Element
  - Axis Titles
  - Chart Title
  - Legend | Right

Outside Practice

- Import the table from
  http://www.opensecrets.org/bigpicture/index.php?display=P

  - Format the data nicely

  - Add a row that calculates the average the columns containing monetary values.

  - Add a row to calculate the median of those same columns.

  - Add a column that shows how much more (in $) Democrats spent than Republicans each year. This number may be negative.

Outside Practice Continued

- Build a line chart that displays this data. The chart should have one line for Democrats and one line for Republicans.