Intermediate Excel

Fall 2012

Problem 4.1 Meteorlogy

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

- The average monthly temperature for each month. Show the output to 2 decimal places.

- 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.

http://zeus.cs.pacificu.edu/shereen/cs130f12/WeatherTable.html
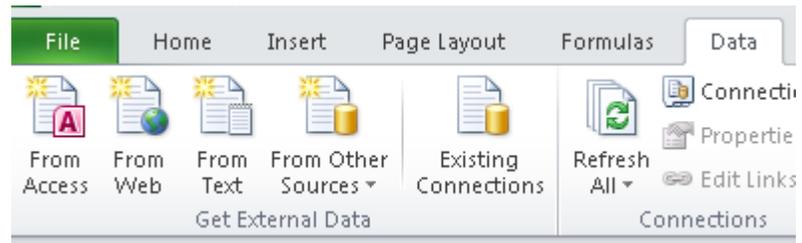
Let's import this data from a web page.

Month	Week1	Week2	Week3	Week4
jan	33	36	29	31
feb	37	32	39	38
mar	43	47	38	45
apr	49	51	53	50
may	52	55	54	58
jun	56	62	61	60
jul	65	69	73	70
aug	72	74	68	69
sep	67	66	64	60
oct	63	65	60	59
nov	46	42	45	40
dec	38	35	36	35

Let's add a Chart
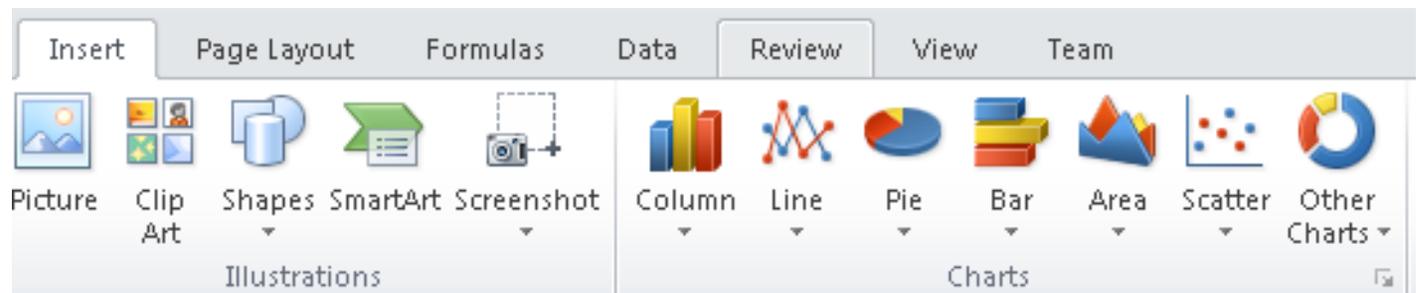
- Select columns Month and Week 1
- Choose Line
- Let's add the other weeks
- Right Click on the Chart | Select Data

Add a new Series

- Add
- Series Name
- Series Values
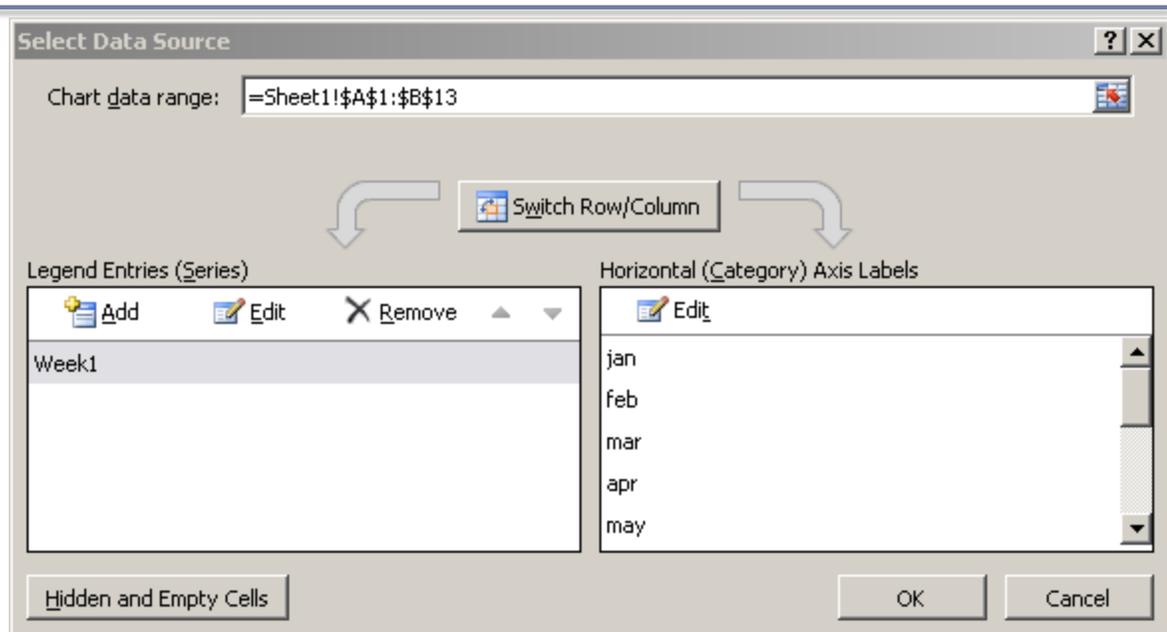
Format the Chart
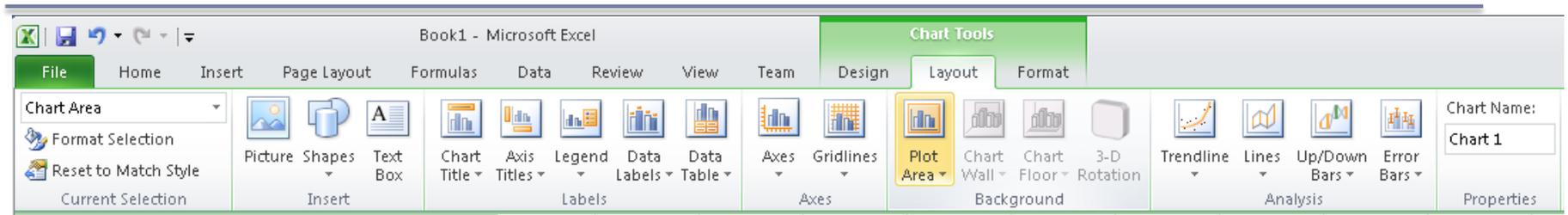
- Select the chart
- Chart Tools
  - Layout
  - Chart Title
  - Axis Titles
  - Axes

Fall 2012
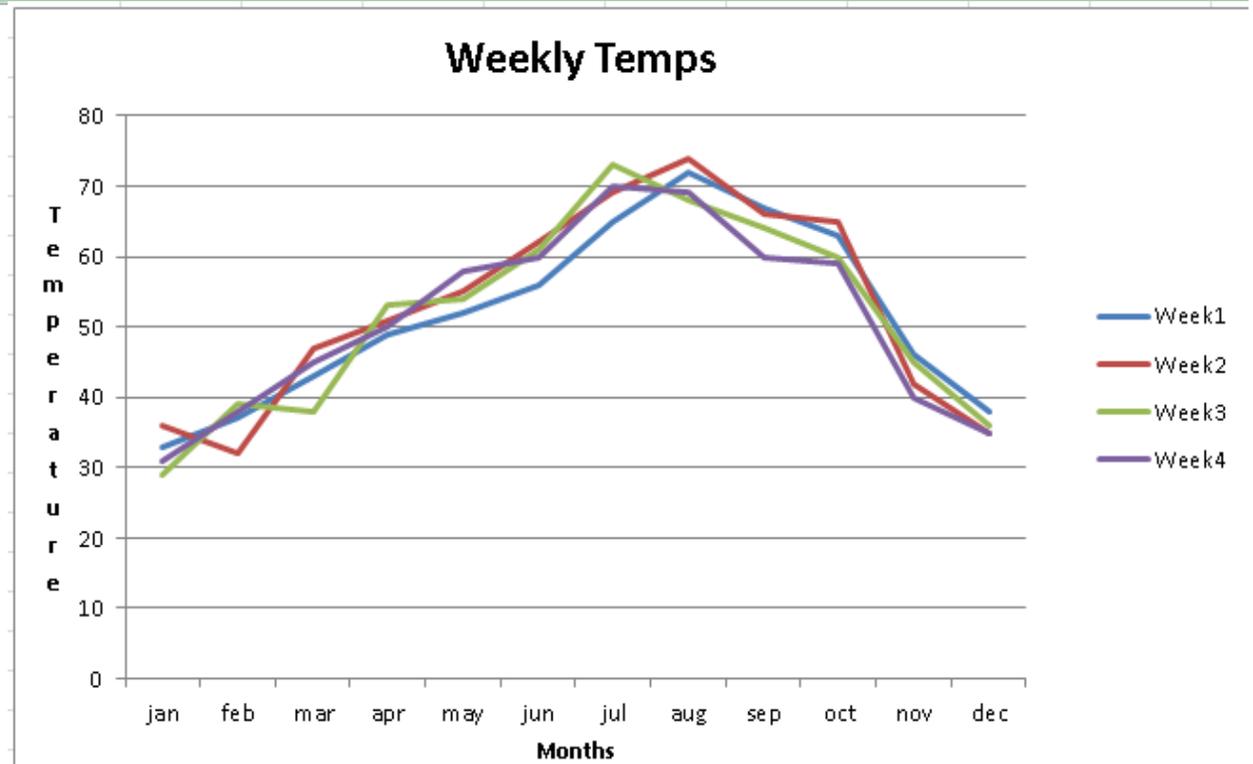
Problem 4.2: Cost of Elections

- Import the table from
  http://www.opensecrets.org/bigpicture/index.php
- Format the data nicely
- Add a row that calculates the average of each column. Add a row to calculate the mean.
- Add a column that determines how much more Democrats spent than Republicans each year
- Build a line chart that displays this data. The chart should have one line for Ds and one line for Rs.

Combination Cell References

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

	A	B	C	D	E
1	4	8	=A1/A3		
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?

Problem 4.3

Import: http://zeus.cs.pacificu.edu/shereen/cs130f12/Problem43.html
Then format!

	A	B	C	D	E
1	**Item #**	**Product**	**Price**	**After Discount A**	**After Discount B**
2	125A	Scooter	$59.99		
3	789A	Tricycle	$129.95		
4	78B	Soccer Ball	$12.35		
5	489A	Crybaby Doll	$21.99		
6	57B	Art Kit	$14.95		
7					
8	**Discounts**				
9	A	B			
10	10%	20%			

For the above worksheet, write a formula in the highlighted cell in such a way that you can fill down and then across to calculate the other prices.

Debug Your Worksheet

- Select cell D2 and use "Trace Precedents" in the Formulas Tab to see which cells are used by cell D2.
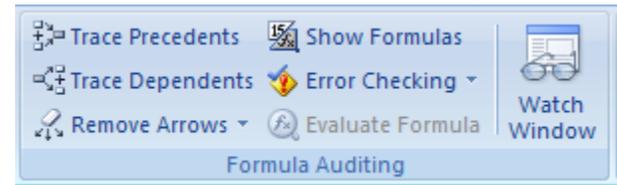
- Select cell B10 and use "Trace Dependents" to see which cells use B10.

- Click "Remove Arrows" to remove the tracing lines at any given time.

More Excel Functions

- In general, Excel functions take the form: name(arg1, arg2,…) where the number of arguments depends on the function being used.

Find a function in the Math & Trig library that uses two arguments. Show how the function works.

Range of Cell Values

- The : between cell references indicates a range of values inclusive. So, A1:A5 means include cells A1, A2, A3, A4, A5.

Any ideas how we might rewrite the formula =A1+A2+A3+A4+A5

- Excel is not case-sensitive. What does this mean?

Variety of Functions

- Excel has over 350 built-in functions divided into related categories.
- To invoke the "Paste Function" dialog box, click on the f_x icon on the tool bar.
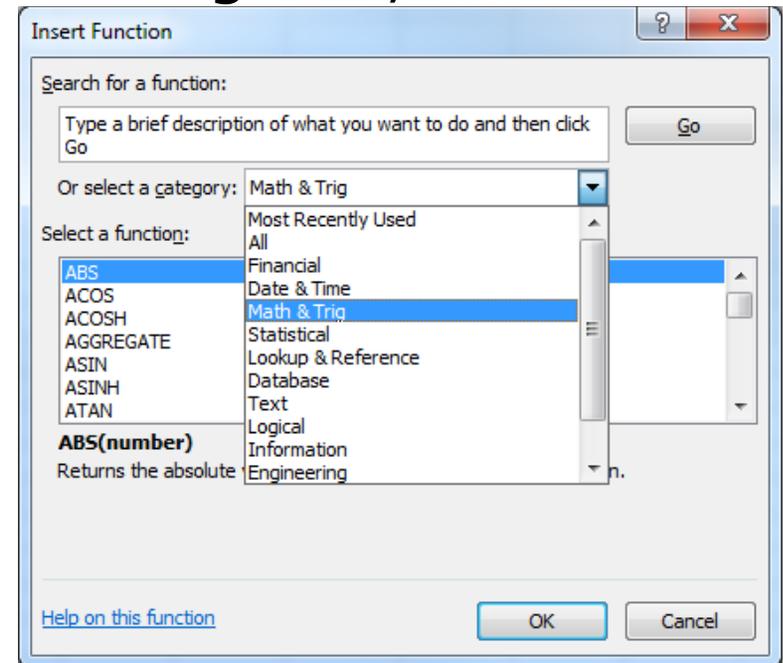
Financial Built-in Functions

- The financial functions can be isolated in Excel. Simply go to the Function Library on the Formulas tab and select Financial.

- PMT Function
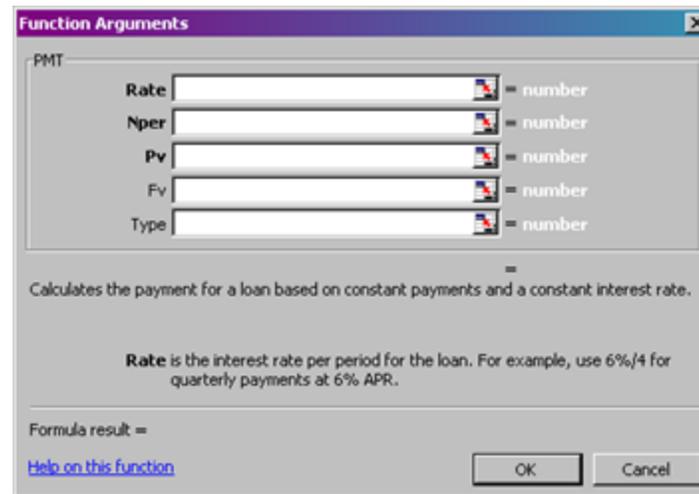
PMT Function

- The PMT function calculates the payment for a loan based on constant payments and a constant interest rate

- Syntax is **PMT(rate,nper,pv,fv,type)** where
  - **rate**   is the interest rate for the loan
  - **nper**   is the total number of payments for the loan
  - **pv**   is the present value (principal)
  - **fv**   is the future value (usually zero)
  - **type**   indicates when payments are due
    0 = end of month = default
    1 = beginning of month

PMT Function Continued

- Remarks
  - The payment returned by PMT includes principal and interest
  - Taxes & fees are not included

  - Units must be consistent between rate and nper
    - **Monthly** payments means
      rate = annual interest rate **/ 12**

PMT Function Continued

- Examples
  - The following formula returns the monthly payment on a $10,000 loan at an annual rate of 8 percent that you must pay off in 10 months:
    - ➢ =PMT(8%/12, 10, 10000) equals -$1,037.03

  - For the same loan, if payments are due at the beginning of the period, the payment is:
    - ➢ =PMT(8%/12, 10, 10000, 0, 1) equals -$1,030.16

Why?

PMT Function Continued

What do these mean?

=PMT(12%/12, 5, -5000)   = $1,030.20

=PMT(6%/12, 18*12, 0, 50000) = -$129.08

Problem 4.4

Now, let's imagine that you want to purchase a car worth $29,899. The car dealer is ready to grant you a 5-year loan at 6.5% annual interest rate, but you must put down 10% of the car price as down payment.

Design an Excel spreadsheet to allow the user the ability to input:

(a)The price of the car, (b)The yearly interest rate, (c)The length of the loan in years

Your spreadsheet should then compute and display:

(d)The amount of the down payment, (e) The amount of the loan , (f) The monthly payment of the loan

Be sure to **Name** each of the input cells appropriately.

Problem 4.4 Continued

	A	B	C
1	**Car Loan**		
2			
3	Enter Car Price		
4	Enter Yearly Interest Rate		
5	Enter Time in Years		
6			
7	**Down Payment Is**		
8	**Loan Amount Is**		
9	**Monthly Payment Is**		

Once you get the above worksheet working, add a row that shows the total interest paid.

Problem 4.4 Continued

Add a payment schedule to your current worksheet with columns: Payment #, Starting Balance, Monthly Payment, Monthly Interest, and Ending Balance.

Payment #	Starting Balance	Monthly Payment	Interest	Ending Balance
1	$26,909.10	$526.51	$145.76	$26,528.35
2	$26,528.35	$526.51	$143.70	$26,145.54
3	$26,145.54	$526.51	$141.62	$25,760.65
4	$25,760.65	$526.51	$139.54	$25,373.68
..	….	….	….	…..

Problem 4.4 Continued

How can you be sure that your payment schedule is correct?

Change the interest rate to 6%. Does your worksheet update correctly?

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.
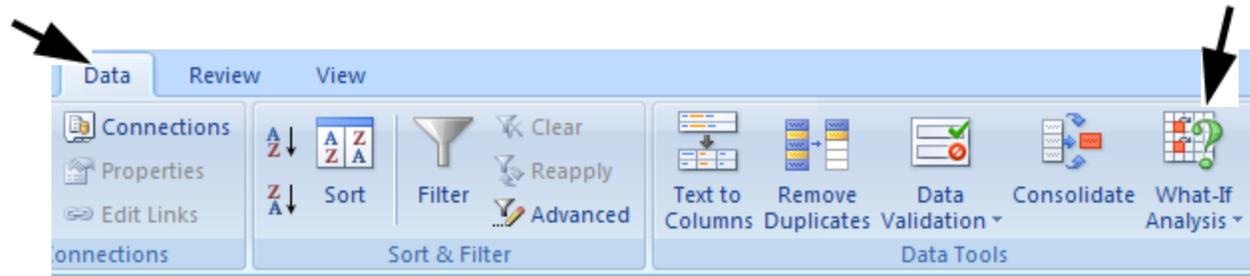
Goal Seek Question

How much car can I afford if I am willing to pay $600 a month under the initial scenario?
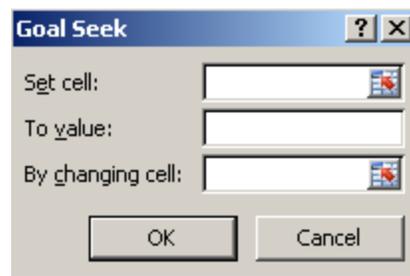
Problem 4.5

- Go back to the worldometers.info page
- Check **New book titles**
- How many books have been published per day this year?
    - Sep 5 is the 249th day of the year.
    - Sep 10 will be the 254th day of the year.
- Build a table showing the total number of books published for each day of this year (given the growth rate above)

Example

Day of Year	Date	Total Books
249	9/5/2012	251,686
250	9/6/2012	254,452

Books per day:	2,766

These numbers are made up and don't reflect the current values from Worldometers!

Keep the top row on the screen