Intermediate Excel

Winter 2014

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 4.1

Import: http://zeus.cs.pacificu.edu/shereen/cs130w14/Problem4.1.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.
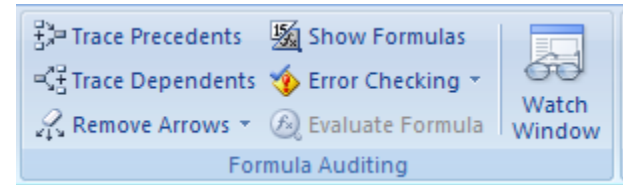
- Select cell B10 and use "Trace Dependents" to see which cells use B10.

- 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.
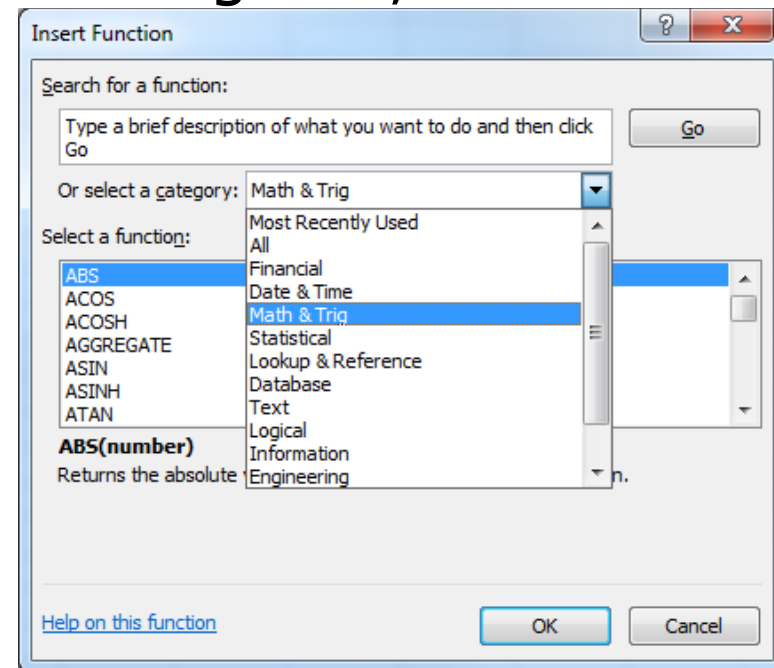
Financial Built-in Functions

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

- PMT Function
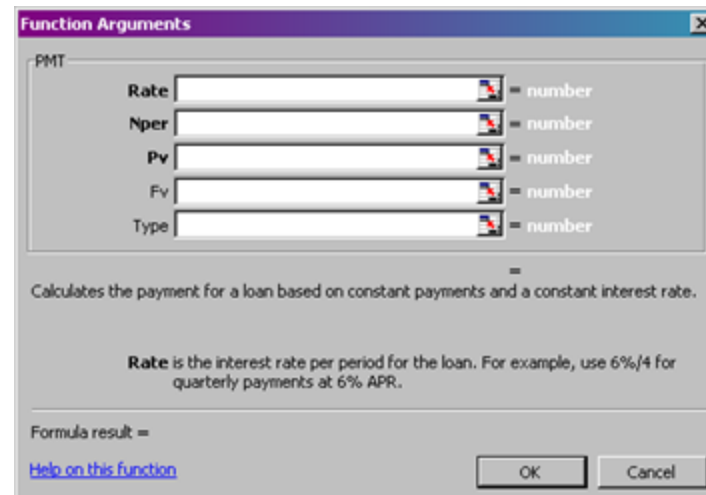
PMT Function

- 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 4.2

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 4.2 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 4.2 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 4.2 Continued

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

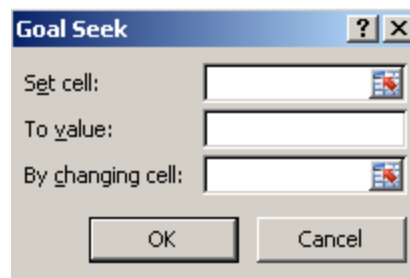Change the interest rate to 6%. Does your worksheet update correctly?

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.
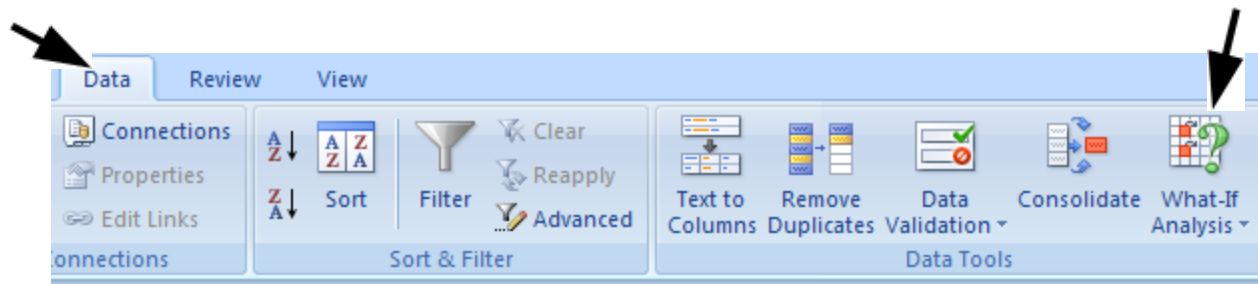
Goal Seek Question

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

Problem 4.3

- Go back to the worldometers.info page
- Check **New book titles**
- How many books have been published per day this 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
247	9/4/2013	1,483,456
248	9/5/2013	1,490,049

Books per day:	6,593

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

Keep the top row on the screen

Outside Practice

- You want to buy a car for $10,000. You have $2,000 for a down payment and can get a 5 year loan with a yearly interest rate of 5.6%

- Build a spreadsheet that will allow you to input the cost of the car, down payment, and interest rate.

- The spreadsheet should determine the monthly payment and the total amount of money paid for the car over the 5 years (including interest).

- Use Goal Seek to determine what your down payment needs to be for your monthly payment to be $150

Outside Practice

- You want to start funding you retirement account and hope to have saved $1,500,000 in 40 years.

- If you can achieve a 7% yearly interest rate with your retirement account, what does your monthly payment need to be reach your goal?

- What yearly interest rate would you need to reach your goal if you could only save $450 a month? Show your answer to two digits past the decimal point.