



Intermediate Excel

Fall 2013

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?

Problem 4.1

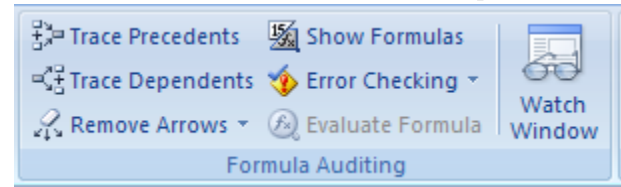
Import: <http://zeus.cs.pacificu.edu/chadd/cs130s13/Problem41.html>
Then format!

	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

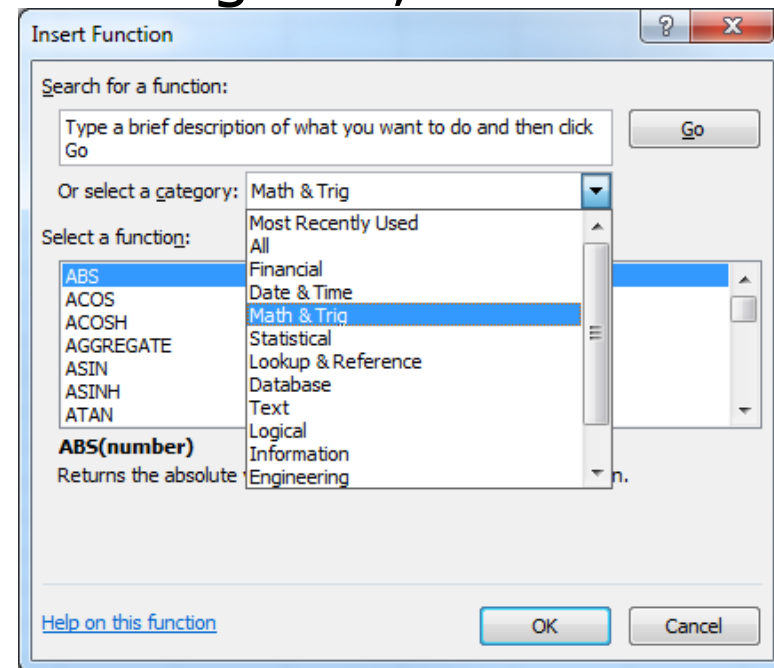
- The : between cell references indicates a range of values inclusive. So, A1:A5 means include cells A1, A2, A3, A4, A5.

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

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

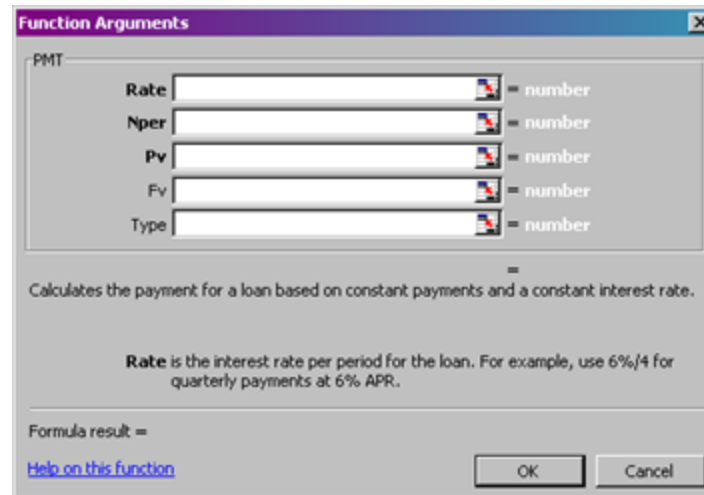
Variety of Functions

- 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
..

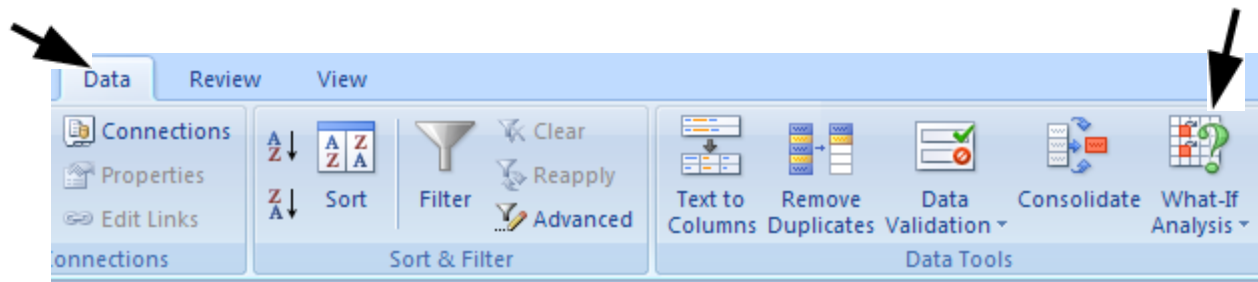
Problem 4.2 Continued

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

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

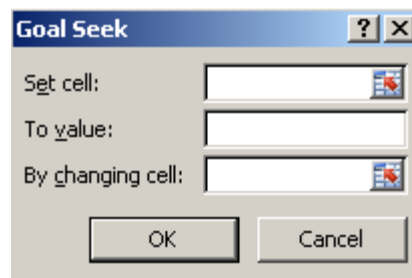
What-If Analysis & Goal Seeking

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

Keep the top row on the screen

The screenshot shows the Microsoft Excel ribbon with the 'View' tab selected. The 'Freeze Panes' dropdown menu is open, showing three options: 'Freeze Panes', 'Freeze Top Row', and 'Freeze First Column'. The 'Freeze Top Row' option is highlighted with a black arrow. Below the ribbon, a portion of an Excel spreadsheet is visible, showing columns H, I, and J, and rows 1 through 4. The data in the spreadsheet is as follows:

	H	I	J
eCa	AirlineID	Carrier	TailNum
	19393	WN	N232WN
	19393	WN	N316SW
	19393	WN	N278WN

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 your 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 to 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.