Lec 3 - The Parts of a Function:

Each function has a specific order, called **syntax**, which must be strictly followed for the function to work correctly.

Syntax Order:

- 1. All functions begin with the = sign.
- 2. After the = sign define the **function name** (e.g., Sum).
- 3. Then there will be an **argument**. An argument is the cell range or cell references that are enclosed by parentheses. If there is more than one argument, separate each by a comma.

An example of a function with one argument that adds a range of cells, A3 through A9:



An example of a function with **more than one argument** that calculates the sum of two cell ranges:

=SL	JM (A3:A9, E	33:B5)
equal sign funct	tion name arç	Jument

Excel literally has hundreds of different **functions** to assist with your calculations. Building formulas can be difficult and time-consuming. Excel's functions can save you a lot of time and headaches.

Excel's Different Functions

There are many different functions in Excel 2007. Some of the more common functions include:

Statistical Functions:

- **SUM** summation adds a range of cells together.
- **AVERAGE** average calculates the average of a range of cells.
- **COUNT** counts the number of chosen data in a range of cells.
- MAX identifies the largest number in a range of cells.
- MIN identifies the smallest number in a range of cells.

Financial Functions:

- Interest Rates
- Loan Payments
- Depreciation Amounts

Date and Time functions:

- DATE Converts a serial number to a day of the month
- Day of Week
- DAYS360 Calculates the number of days between two dates based on a 360-day year
- TIME Returns the serial number of a particular time
- HOUR Converts a serial number to an hour
- MINUTE Converts a serial number to a minute
- TODAY Returns the serial number of today's date
- **MONTH** Converts a serial number to a month
- YEAR Converts a serial number to a year

You don't have to memorize the functions but should have an idea of what each can do for you.

To Calculate the Sum of a Range of Data Using AutoSum:

- Select the **Formulas** tab.
- Locate the Function Library group. From here, you can access all the available functions.
- Select the cell where you want the function to appear. In this example, select G42.
- Select the drop-down arrow next to the AutoSum command.
- Select **Sum**. A formula will appear in the selected cell, G42.
 - This formula, =**SUM(G2:G41)**, is called a **function**. AutoSum command automatically selects the range of cells from G2 to G41, based on where you inserted the function. You can alter the cell range, if necessary.

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36	\$	32	2.00				lb./case	2	\$	64.00	
37	\$	18	3.00				lb./case	6	\$	108.00	1
38	\$	75	5.00				lb./case	5	\$	375.00	
39	\$	50).45				lb./case	1	\$	50.45	1
40	\$	38	3.00			120	ct./case	2	\$	76.00	
41	\$	40	0.00			120	ct./case	4	\$	160.00	
42									=Sl	JM(G2:G	41)
43											

• Press the Enter key or Enter button on the formula bar. The total will appear.

To Edit a Function:

- Select the cell where the **function is defined**.
- Insert the cursor in the formula bar.
- Edit the range by deleting and changing necessary cell numbers.

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• Click the Enter icon.

To Calculate the Sum of Two Arguments:

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- Select the cell where you want the function to appear. In this example, G44.
- Click the **Insert Function** command on the Formulas tab. A dialog box appears.
- SUM is selected by default.

Insert Function	? 🔀
Search for a function:	
Type a brief description of what you want to do and then click Go	<u>Go</u>
Or select a category: Most Recently Used	
Select a function:	
SUM AVERAGE IF HYPERLINK COUNT MAX SIN SUM(number1,number2,) Adds all the pumbers in a proper of solls	
Help on this function	Cancel

- Click **OK** and the **Function Arguments** dialog box appears so that you can enter the range of cells for the function.
- Insert the cursor in the **Number 1** field.
- In the spreadsheet, select the **first range of cells**. In this example, G21 through G26. The argument appears in the Number 1 field.
 - To select the cells, **left-click cell G21** and **drag the cursor** to G26, and then release the mouse button.
- Insert the cursor in the **Number 2** field.

Function Arguments	? 🔀
SUM	
Number1	G21:G26 (43.55;92;178;285;54.2;68)
Number2	📷 = number
Number3	📷 = number
Adds all the numbers in a r	= 720.75 ange of cells. Number2: number1,number2, are 1 to 255 numbers to sum. Logical values and text
	are ignored in cells, included ir typed as arguments.
Formula result = \$	720.75
Help on this function	OK Cancel

- In the spreadsheet, select the **second range of cells**. In this example, G40 through G41. The argument appears in the Number 2 field.
- Notice that both arguments appear in the function in cell G44 and the formula bar when G44 is selected.

				_						
=SUM(G21:G26,G40:G41)										
E		F	G	i	H		- I			
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ct./case		Nur	nher 1	621-6	26		1	_		
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lb./case										

• Click **OK** in the dialog box and the **sum of the two ranges** is calculated.

To Calculate the Average of a Range of Data:

- Select the cell where you want the function to appear.
- Click the drop-down arrow next to the AutoSum command.

- Select Average.
- Click on the **first cell** (in this example, C8) to be included in the formula.
- Left-click and **drag** the mouse to define a cell range (C8 through cell C20, in this example).
- Click the Enter icon to calculate the average.

Accessing Excel 2007 Functions

To Access Other Functions in Excel:

- Using the point-click-drag method, select a cell range to be included in the formula.
- On the Formulas tab, click on the drop-down part of the **AutoSum** button.
- If you don't see the function you want to use (Sum, Average, Count, Max, Min), display additional functions by selecting **More Functions**.
- The Insert Function dialog box opens.
- There are three ways to locate a function in the **Insert Function** dialog box:
 - You can type a question in the Search for a function box and click GO, or
 - You can scroll through the alphabetical list of functions in the **Select a function** field, or
 - You can select a function category in the **Select a category** drop-down list and review the corresponding function names in the **Select a function** field.

Insert Function
Search for a function:
Type a brief description of what you want to do and then <u>Go</u>
Or select a category: Date & Time
Select a functio <u>n</u> :
DATE
DATEVALUE DAY DAY5360 Functions associated with the HOUR Date & Time category. MINUTE MONTH
DATE(year,month,day) Returns the number that represents the date in Microsoft Office Excel date-time code. Help on this function OK Cancel

• Select the function you want to use and then click the **OK** button.

What-if Analysis

Example

You need a loan to buy a new car. You know how much **money** you want to borrow, how long of a period you want to take to pay off the loan (**the term**), and what **payment** you can afford to make each month. But what you need to know is what interest rate you need to qualify for to make the payment \$400 a month. In the image below, you can see that if you didn't have interest and just divided this \$20,000 into 60 monthly payments, you would pay \$333.33 a month. The **What-If Analysis** tool will allow you to easily calculate the interest rate.

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2	Loan Amou	int		20000						
3	Term (mor	nths)		60						
4	Interest Ra	te 🗖			.					
5	Payment		(\$3	33.33)						
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Where Did the Formula Come From?

The **formula** that appears in **cell B5** in the example image is a **function**. It isn't part of the What-if Analysis tool, so you will need to understand functions thoroughly before you use What-if Analysis. For the example scenario described above, you need a formula that will calculate the monthly payment. Instead of writing the formula yourself, you can insert a function to do the calculation for you.

To Insert a Payment Function:

- Select the **Formula** tab.
- Click the Insert Function command. A dialog box appears.
- Select PMT.
- Click **OK**. A dialog box appears.
- Insert your cursor in the **first field**. A description about the needed information appears at the bottom of the dialog box.

Function Argur	ments	? 🛛
PMT		
	Rate	number
Explains what	Nper	= number
calculation	P٧	🐹 = number
the function	F٧	🔝 = number
penonns.	Туре	i number
Calculates the pay	ment for	a loan based on constant payments and a constant interest rate.
		Rate is the interest rate per period for the loan. For example, use 6%/4 for quarterly payments at 6% APR.
		Explains what information is
Formula result =		needed in the selected field.
Help on this function	20	OK Cancel

- Select the cell in the spreadsheet with the needed information.
- Insert your cursor in the **next field**. A description about the needed information appears at the bottom of the dialog box.
- Select the cell in the spreadsheet with the needed information.
- Repeat the last two steps until all the necessary information is entered in the dialog box.

• Click **OK**.

What-If Analysis Tools

There are **three** What-If analysis tools that you can use. To access these, select the **Data** tab, and locate the **What-If Analysis command**. If you click this command, a menu with three options appears.

Goal seek is useful if you know the needed **result**, but need to find the **input value** that will give you the desired result. In this example, we know the desired result (a \$400 monthly payment), and are seeking the input value (the interest rate).

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Goal Seek

To Use Goal Seek to Determine an Interest Rate:

- Select the **Data** tab.
- Locate the **Data Tools** group.
- Click the What-If Analysis command. A list of three options appears.

Text to Remove Columns Duplicates	Data Validation Consolidate What-If Analysis
Data	Scenario Manager
	Goal Seek
l J	Data <u>T</u> able

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- Select Goal Seek. A small dialog box appears.
- Select the **cell** that you what to set to a **specific value**. In this example, we want to set B5, the Payment cell.

	А	В	С		D	E	F
1	Loan Analysis			c	Carola		
2	Loan Amount	20000		Goal	Seek		
3	Term (months)	60		S <u>e</u> t o	ell:	35	E
4	Interest Rate			To <u>v</u> a	alue:		
5	Payment	(\$333.33)		By ch	anging cell:		
6				-, -,			
7					ОК	Car	ncel
8							

- Insert the cursor in the next field.
- Enter a **value** in the **value field**. In this example, type **-\$400**. Since we're making a payment that will be subtracted from our loan amount, we have to enter the payment as a negative number.

	А	В	С	D	E	F
1	Loan Analysis			-1.6		
2	Loan Amount	20000	Gu	al Seek		
3	Term (months)	60	S <u>e</u>	t cell:	B5	E
4	Interest Rate		То	<u>v</u> alue:	-400	
5	Payment	(\$333.33)	By	changing cell;		E
6			· · · ·			
7				ОК	Ca	ncel
8						
9						

- Insert the cursor in the next field.
- Select the **cell** that you want to change. This will be the cell that tries various **input values**. In this example, select cell B4, which is the interest rate.

	А	В	С	D		E	F		
1	Loan Analysis				Cl-				
2	Loan Amount	20000		Goa	Seek				
3	Term (months)	60		S <u>e</u> t cell:		B5			
4	Interest Rate			To va	alue:	-400			
5	Payment	(\$333.33)		– By ch	anging celly	¢re¢al	1		
6				079		PDPT			
7					OK	Ca	ncel		
8									
9									

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- Click **OK**.
- Then, click **OK** again. The interest rate appears in the cell. This indicates that a 7% interest rate will give us a \$400 a month payment on a \$20,000 loan that is paid off over 5 years, or 60 months.

	А	В	С		D	E	F	G				
1	Loan Analysis			Cos	Sook Stat	110	2					
2	Loan Amount	20000		dual seek status								
3	Term (months)	60		Goal	Seeking with	Step						
4	Interest Rate	7%		toun	id a solution.	Davisa						
5	Payment	(\$400.00)		Targ	jet value: -	400	Pause					
6				Curr	ent value: (\$400.00)						
7					[ОК	Cancel					
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