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## Course Reference Handout

# MICROSOFT EXCEL - ADVANCED

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# DAY 3

## Module 05

### Terms and References:

#### Named Ranges:

When inserting Names in a worksheet, you can literally assign a text name to a cell or a range of cells. After doing so, you can refer to the cell or range of cells for selection and reference purposes, such as when creating a formula or function in which you need to refer to the cell or cells.

To insert a Name into a worksheet, do the following:



- First select the cell or range of cells you want to assign a Name to.
- Select the Formulas command tab on the Ribbon and then click on Define Name.
- In the Define Name window, type in the name you want to refer to the cell or cells by.
- Click on OK when done to save the name.

#### Note:

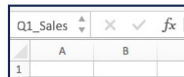


Names cannot contain certain characters, such as spaces or hyphens, among several others. You can use the underscore character, however, to create simulated spaces, such as QRT1\_Sales.

#### Navigating with Named Ranges:

To select a cell or range of cells for which you have inserted a Name, click the drop-down arrow to the right of the Name Box located to the left of the Formula Bar.

At any point in which you need to call up a list of inserted named ranges, such as when you want to refer to a range of cells in a formula or function, press the [F3] key on your keyboard to open the Paste Name window.



#### Functions:

Functions are predefined formulas that perform calculations by using specific values, called arguments, in a particular order, or structure. Functions can be used to perform simple or complex calculations or can perform tasks that meet certain criteria you've specified, such as retrieving data from another worksheet. The structure of a function consists of five things:

- All functions, like formulas, begin with the "=" sign.
- After the "=" sign is the actual Name of the function.
- Next is an open, or left, parenthesis.
- After the parenthesis the values and data that the function needs to perform the actual function will follow. These are known as the function's Argument. The Argument may be a simple reference to a range of cells or may consist of more complex references that require multiple sets of data.
- The final piece of the function is the closing, or right, parenthesis.

#### Example of a Simple Function:

##### =AVERAGE(B5:E10)

This function calculates an average of the values within the cell range starting in B5 and ending in E10. The argument consists of only a reference to a range of cells.

#### Example of a Complex Function:

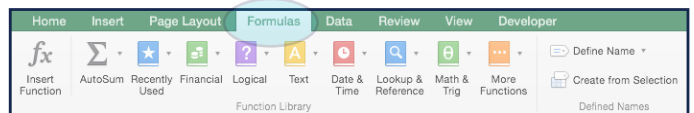
##### =IF(D5>=70, "PASS", "FAIL")

This function determines if the value in cell D5 is greater than or equal to 70. If it is, the function results in the word "PASS," and if it is not, the function results in the word "FAIL." The argument consists of more than just a reference to a range of cells.

#### The Formulas Ribbon:

In Excel 2016, the Formulas Ribbon is where you will now find all the commands related to Function design. To insert a function in a selected cell, select the Formulas Command Tab at the top of the Ribbon. From there, do the following:

- Click the Function button on the Formulas Ribbon or to the left of the Formula Bar:
- If you know the Category the function you wish to use is located in, select from the Function Categories located just to the right of the Function button.
- In the Insert Function window, select the Category of functions with which you wish to work and then click on the name of the function you want to use. Click OK to begin inserting your function's argument.
- Insert any data or references as required into the provided areas of the function's argument window. Click OK when finished.



#### Nesting Functions:

The term "nesting" is used to refer to two or more functions merged together. For example, let's say you needed to determine if an employee gets a yearly bonus. In order to qualify for the bonus, the employee's total annual sales must equal or exceed \$100,000 AND he or she must also have exceeded last year's total sales by 10 percent. For the purpose of this example, assume the employee's total sales are in cell E10 and the difference (in percentage) from last year's sales is in cell F10. Also assume that if the employee qualifies for the bonus, you want the function to return the word "BONUS." If the employee does not qualify for the bonus, you want the function to return the words "NO BONUS."

The nested function would look like this:

##### =IF(AND(E10>=100000,F10>10%) "BONUS", "NO BONUS")

The nested function is made up of an AND function with an IF function. If the statement in the AND function is TRUE or FALSE, it results in the IF function being TRUE or FALSE, respectively.

## Functions used in this Course:

**NAME:** IF

**CATEGORY:** LOGICAL

**PURPOSE:**

The IF function evaluates an expression and determines if the expression is TRUE or FALSE. The function will then return one result if the expression is TRUE and a different result if the expression is FALSE.

**NAME:** VLOOKUP

**CATEGORY:** LOOKUP AND REFERENCE

**PURPOSE:**

The VLOOKUP function will search the leftmost column of a list of records for a given criterion and then return another data value from a different column of the same record in which the criterion was found.

**NAME:** SUMIFS

**CATEGORY:** MATH AND TRIG

**PURPOSE:**

The SUMIFS function will search one or multiple columns within a list of records for data values that meet one or more criteria. Then it will return a summation from a different column of the same record that the criteria was found in.

**NAME:** IFERROR

**CATEGORY:** LOGICAL

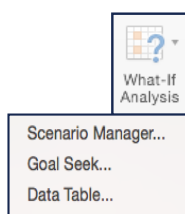
**PURPOSE:**

The IFERROR function can be used when you want a custom error message returned—as opposed to the standard Excel errors—if another function or calculation you perform will result in an error.

## Module 06

### Goal Seek:

This Excel feature allows you to select a cell that contains a formula or function and to have the result of the formula or function set to a specific value by changing one of the variables of the function.



### Consolidating Data:

Excel's Data Consolidation feature allows you to take data values from multiple worksheets or workbooks and consolidate the data into a single worksheet. To use Data Consolidation, select the Data Command Tab from the Ribbon and then click on the Consolidate button located in the Data Tools group of the Ribbon.

### To use the Goal Seek Feature:

- Select the Data Command Tab from the Ribbon and then click on the What-If Analysis button located in the Data Tools group of the Ribbon. Select Goal Seek.
- In the Set Cell area, select the cell that contains the formula or function you want to set to a specific value.
- In the To Value area, enter the specific value you want as the result of your formula or function.
- In the By Changing Cell area, select the cell that contains the variable of the formula or function you want Excel to manipulate to achieve your desired formula or function result.

### Data Tables:

Creating a data table allows you to plug in different data values into a formula or function and then see the various results all at the same time. There are two types of Data Tables: Single Variable and Multiple Variable. In a Single Variable Data Table, you can substitute one part of a formula or function with varying data values. In a Multiple Variable Data Table, you can substitute two parts of a formula or function with varying data values.

### Setting up Data Tables:

House Mortgage	
Mortgage Amount:	\$ 220,000
Interest Rate:	8%
Term in Months:	300
% Rate	\$1,698.00
7.25%	\$1,590.18
7.50%	\$1,625.78
7.75%	\$1,661.72
8.25%	\$1,734.59
8.50%	\$1,771.50
8.75%	\$1,808.72
9.00%	\$1,846.23

Single Variable Data Table

### Multiple Variable Data Table

Mortgage Amount:	\$ 220,000		
Interest Rate:	8%		
Term in Months:	300		
Alternate Rates:	Term in Months		
\$1,698.00	180	240	380
7.25%	\$2,008.30	\$1,738.83	\$1,479.11
7.50%	\$2,039.43	\$1,772.31	\$1,517.17
7.75%	\$2,070.81	\$1,806.09	\$1,555.57
8.25%	\$2,134.31	\$1,874.54	\$1,633.39
8.50%	\$2,166.43	\$1,909.21	\$1,672.77
8.75%	\$2,198.79	\$1,944.16	\$1,712.47
9.00%	\$2,231.39	\$1,979.40	\$1,752.45

- 1** Create (or copy) a formula or function for use in your Data Table. For a Single Variable Data Table, the formula or function should be in the upper-right corner of the Data Table Area (indicated above with the red border); for a Multiple Variable Data Table, the formula or function should be in the upper-left corner.  
  
Insert various values you want to substitute into the formula or function. For a Single Variable table, enter your values in a column. For a Multiple Variable table, enter various values in both a row and a column.
- 2** Select the Data Table Area and then activate the Data Table command by selecting the Data Command Tab from the Ribbon. Then, click on the What-If Analysis button located in the Data Tools group of the Ribbon and select Data Table.
- 3** The Row Input Cell is a reference to the cell that contains the value used in a formula or function you want to substitute for with the values in the top row of your Data Table.
- 4** The Column Input Cell is a reference to the cell that contains the value used in a formula or function you want to substitute for with the values in the left column of your Data Table.

## Scenario Manager:

With Scenario Manager, you can store different sets of data values that can be used to instantly replace existing data values. This way you will not have to manually enter data values to see the effects they have in the worksheet.

To access Scenario Manager, click on the Data Command Tab from the Ribbon and then click on the What-If Analysis button located in the Data Tools group of the Ribbon. Then select Scenario Manager.

## Terms and References:

### Macro:

A macro is an automated series of commands, or tasks, which can be performed in Excel with a single click of a button or keyboard shortcut. You can create a macro either by recording your own actions or by using a programming language known as VBA (Visual Basic for Applications).

### VBA (Visual Basic for Applications):

VBA is a programming language that allows program developers to customize Microsoft Office applications, among other programs, by working within the language in which Microsoft Office applications are written—Visual Basic (VB). When you record a macro in Excel, the commands that are actually recorded by the macro are written in VBA code.

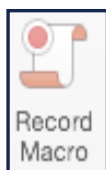
### Visual Basic Editor:

The VB Editor is an environment in which you work with VBA code. For example, because the macro is recorded in VBA code, the VB Editor opens when you edit a macro, so you can view and modify the macro's code.

## Recording a Macro:

To record a series of actions in a macro so that you can automatically perform those same actions later, do the following:

- When working with Macros, it is recommended that you activate the Developer Command Tab of your Ribbon, which contains all the commands needed to record and edit macros.
  - To activate this tab, click the File Tab and then select the Options button.
  - Select the Customize Ribbon option on the left.
  - Select the check box next to Developer to activate the Developer Tab of your Ribbon.
- To record a new Macro, select the Developer Tab of the Ribbon, and then click Record Macro.
- In the Record New Macro window, assign a name to your macro, create a keyboard shortcut and select where you want to store the macro.
- Click the OK button and the macro is now recording. When you have completed the last step you want the macro to record, click the Stop Recording button on the Developer Tab of the Ribbon.



### Note:



Macro names cannot contain characters, such as spaces or hyphens, among several others. You can use the underscore character, however, to create simulated spaces, such as "macro\_name."

## Storing a Macro:

When you record a new macro in Excel, there are three places where you can store, or save, your macro in:

- Personal Macro Workbook: Macros stored here can be accessed at any time and used within any workbook file.
- This Workbook: With this option the macro can be stored in the actual workbook file it was created in. You can only run the macro if the workbook file it is located in is open.
- New Workbook: The macro will be stored in a new workbook file created at the same time the macro begins recording.

## Running a Macro:

To run a macro and have it perform the actions the Macro recorded, do the following:

- Select the View Command Tab from the Ribbon and then click the top part of the Macro (Keyboard Shortcut: [ALT] + [F8]) button located at the far-right side of the Ribbon. Or select from the Developer Tab of the Ribbon. In the Macro window, double-click the macro you want to run or select the macro and click the Run button.