



University of Regina

Microsoft Excel Level 2

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Chapter 1 Working with Excel Templates

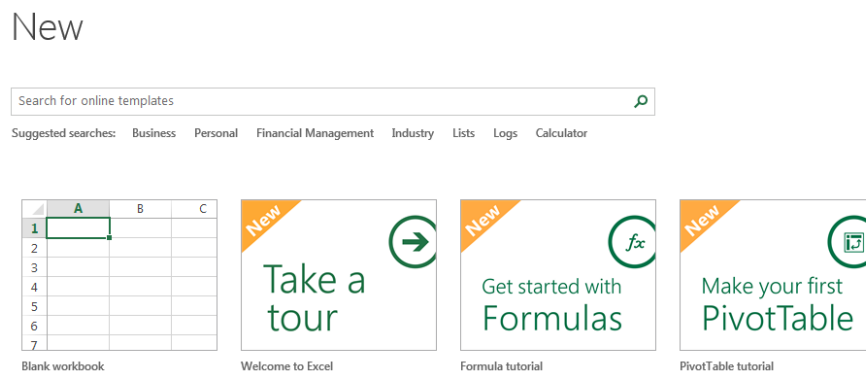
A. What is a Template?

A template is a workbook design or layout that can be saved and reused for any number of workbooks. A template can have formulas, fill effects, labels, borders, worksheet names, formats and a host of other Excel features that will be applied to each new workbook using the template.

I. Opening a Template

To open a workbook using a template:

1. Choose the New option from the Office menu.



2. Select a template category.
3. A list of templates relating to the category are available.
4. Double-click on a template icon. A workbook will open based on the selected template.

II. Using a Template

To use a template:

1. Click on the File menu and select New to find a template. The Personal tab will show all personal templates.
2. Once the workbook is open, the formatting and organization of data will all be in place based on the template.
3. Enter data into the spreadsheet as required

III. Creating a Template

To create a template:

1. Design the worksheet or workbook layout to meet any specifications required.
2. Layouts can be different for sheets in the workbook as a template can contain as many worksheets as needed.
3. Plan the layout, labels and formats to make the template.
4. Choose Save As from the Office menu to display the Save As dialogue box.
5. Enter a name for the template in the File Name text field.
6. Next, display the Save As Type drop list near the bottom of the dialogue box and select the Excel template option.
7. This will save the file as filename.xltx.
8. The new template will be automatically saved in the Excel Templates folder.
9. Once the template has been saved as a template in the Templates folder, it will be available under the Personal option in the New window.

Rather than create a template from scratch, download a template that is similar to the desired template and modify it in Excel. Once the template is complete, save it with a new name in the templates folder. Remember to save it as a template rather than a workbook.

Chapter 2 Working with Tables

A. What is a Table?

In Excel, a table is a specially designated range of numbers. This special range of numbers has added functionality that other cell ranges do not have. There can be more than one table in a workbook at a time and tables can be as large or small as the amount of data in them.

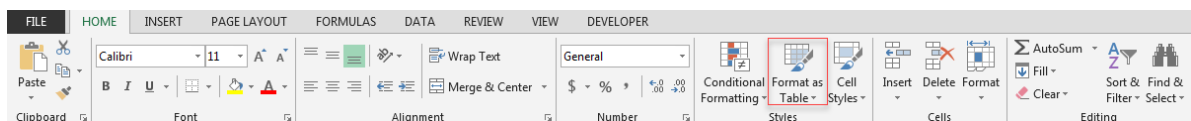
Normally, a table is made from adjacent columns of data, with a unique label or heading for each column. Each row in the table should have entries organized according to the column headings. Remember, that Excel has a lot more rows than columns. This design is well suited for data organized in long, adjacent, list-like columns. A table can be made with empty rows or columns, but this is not recommended. Data should be kept adjacent in a block to take advantage of all of Excel's table features.

| | A | B | C | D | E |
|----|----------|--------|----------|--------------|---|
| 1 | Name | Branch | Account | Balance | |
| 2 | Bob | 1st | 81112220 | \$10 000.00 | |
| 3 | Janet | 3rd | 81112221 | \$120 000.00 | |
| 4 | Mike | 3rd | 81112222 | \$2 000.00 | |
| 5 | Claire | 1st | 81112223 | \$18 000.00 | |
| 6 | Veronica | 2nd | 81112224 | \$65 000.00 | |
| 7 | Sandy | 3rd | 81112225 | \$15 670.00 | |
| 8 | Art | 1st | 81112226 | \$23 000.00 | |
| 9 | Reggie | 2nd | 81112227 | \$5 600.00 | |
| 10 | | | | | |

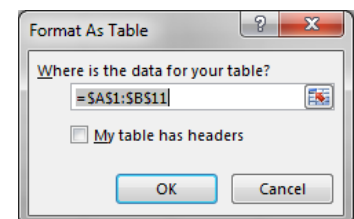
I. Creating Tables

To create a table from an existing range:

1. Select a range of data in adjacent columns.
2. Click on the Format as Table button in the Home Ribbon.



3. Select a table menu option and the selected range will be formatted as a table based on the style.
4. A Format as Table dialogue box appears.
5. Check the My table has headers checkbox if there are column headings in the first row of the range the table selected.
6. Make sure the cell range identified is the range for the table.
7. Press OK.



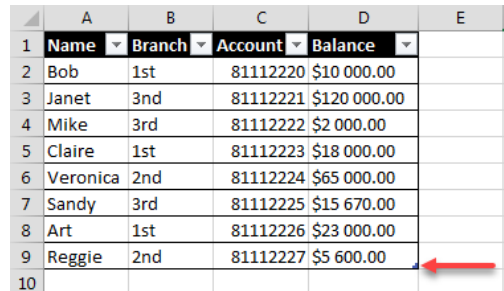
To create a table from scratch:

1. Enter column labels for the data across the top row.
2. A table can be created based on just the column labels by selecting the cells containing the labels and clicking the Format as Table button on the Home Ribbon.
3. Next, select a table style from the drop down menu and the Format as Table dialogue will appear.
4. When the Format as Table dialogue box appears, ensure that the row of labels has been selected properly. Check the My list has headers checkbox before clicking OK.
5. Enter data as usual into the cells of the table created.

II. Modifying Tables

To resize a table:

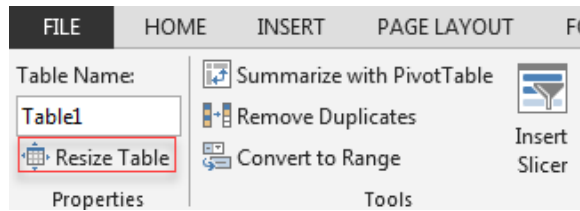
1. At the bottom right corner of the table, there is a small blue move handle.
2. Place the mouse pointer on the move handle. It will turn into a double headed arrow.
3. Hold down the left mouse button and drag the move handle to resize the list.
4. Drag downward to add more rows or drag to the right to add more columns to the table.



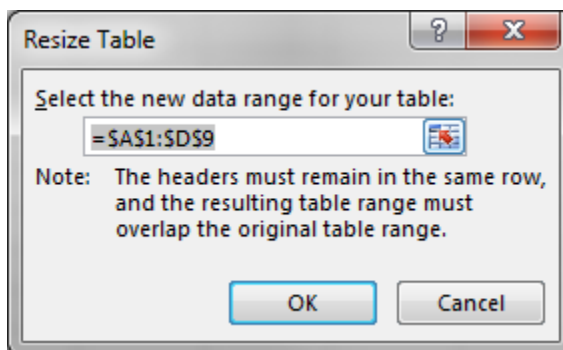
| | A | B | C | D | E |
|----|----------|--------|----------|--------------|---|
| 1 | Name | Branch | Account | Balance | |
| 2 | Bob | 1st | 81112220 | \$10 000.00 | |
| 3 | Janet | 3rd | 81112221 | \$120 000.00 | |
| 4 | Mike | 3rd | 81112222 | \$2 000.00 | |
| 5 | Claire | 1st | 81112223 | \$18 000.00 | |
| 6 | Veronica | 2nd | 81112224 | \$65 000.00 | |
| 7 | Sandy | 3rd | 81112225 | \$15 670.00 | |
| 8 | Art | 1st | 81112226 | \$23 000.00 | |
| 9 | Reggie | 2nd | 81112227 | \$5 600.00 | |
| 10 | | | | | |

Another way to resize a table:

1. Click on a cell in the table.
2. A Design tab will appear above the ribbon area of the screen.
3. Near the bottom of the Properties group. Click the Resize Table button.
4. The table will be enhanced by a dashed flashing border and the Resize Table dialogue box will appear.

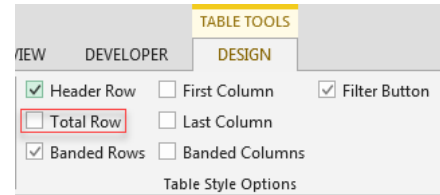


5. A new range can be entered directly into the range field of the resize table dialogue or select a range with the mouse and it will be entered automatically.

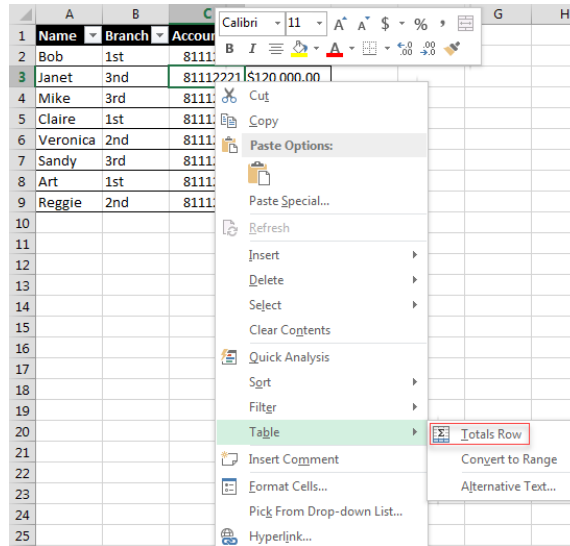


III. What is a Total Row

When working with a table in Excel, click on a table cell, to access the Design tab. In the Design Ribbon, there is a check box in the Table Style Options button group labeled Total Row.



Clicking on this checkbox will display another row at the bottom of the table with the word Total in the first cell. The Totals Row can also be shown by right clicking a cell in the table and choosing the Totals Row option from the Table sub menu.



When a cell in the total row is selected, an arrow will indicate a drop-down list.

| | | | |
|--------------|-----|----------|-------------|
| Art | 1st | 81112226 | \$23 000.00 |
| Reggie | 2nd | 81112227 | \$5 600.00 |
| Total | | | 8 |

The drop-down list has a number of options.

- None** Shows nothing in the total row for this column.
- Average** Shows the average of numerical values for the column.
- Count** Shows the number of items in the column.
- Max** Displays the maximum item for the column.
- Min** Displays the minimum item for the column.
- Sum** Displays the sum of numerical data in the column.
- StdDev** Shows the standard deviation for numerical column data.
- Var** Shows the variance of numerical data in the column.

Each cell in the total row can be selected and an option from the drop-down list can be applied to the selected cells.

In the following example, the total row shows a count of the Account numbers (8) and the average of the Balances (\$32408.75).

| | A | B | C | D |
|----|----------|----------|-----------|--------------|
| 1 | Name ▼ | Branch ▼ | Account ▼ | Balance ▼ |
| 2 | Bob | 1st | 81112220 | \$10,000.00 |
| 3 | Janet | 3rd | 81112221 | \$120,000.00 |
| 4 | Mike | 3rd | 81112222 | \$2,000.00 |
| 5 | Claire | 1st | 81112223 | \$18,000.00 |
| 6 | Veronica | 2nd | 81112224 | \$65,000.00 |
| 7 | Sandy | 3rd | 81112225 | \$15,670.00 |
| 8 | Art | 1st | 81112226 | \$23,000.00 |
| 9 | Reggie | 2nd | 81112227 | \$5,600.00 |
| 10 | Total | | 8 | \$ 32,408.75 |

To change what is displayed in the total row, click on any cell in the row and choose a different option from the drop list to design the total row. The total row can be hidden by clearing the Total Row checkbox on the Design Ribbon, or by right clicking a cell in the table and choosing Totals Row from the Tables sub menu.

IV. Moving and Copying Sheets

Sheets in a workbook can be rearranged by moving them. Sheets can also be moved onto another sheet. Copying sheets within a workbook or into another workbook is also possible. The Cut, Copy and Paste commands cannot be used to move or copy entire sheets.

To copy a sheet within a workbook:

1. Select the sheet to copy.
2. Press Ctrl then click and drag the sheet to the position to copy to.

Note: A new sheet is given a sub-number. For example when Sheet5 is copied the new sheet is Sheet 5 (2) or when January is copied the new sheet is January (2).

To move a sheet within a workbook:

1. Select the sheet to copy.
2. Click and drag the sheet to the new location.

Note: Multiple sheets can be copied/moved by selecting a group of sheets before executing the copy or move commands.

To copy a sheet into another workbook:

1. Open the files to copy the sheet(s) to and from.
2. Right-click the sheet(s) to copy.
3. Choose Move or Copy.
4. In the To Book box chose the Filename of the workbook for the sheet(s) to be copied to.
5. Select Create a copy at the bottom of the dialog box.
6. Press OK.

To move a sheet into another workbook:

1. Open the files to move the sheet(s) to and from.
2. Right-click the sheet(s) to move.
3. Choose Move or Copy.
4. In the To Book box chose the Filename of the workbook for the sheet(s) to be moved to.
5. Press OK.

B. What is a Pivot Table?

A Pivot Table is an interactive table used to quickly manipulate and summarize data. Using simple drag and drop actions, rows and columns can be rotated to create summaries of the source data, filter the source data and examine data in further detail.

I. Creating a Pivot Table

To create a Pivot Table, first ensure the source data is clean and organized. Columns and rows should be labeled and no blank rows or columns should be present in the selection.

| | A | B | C | D |
|----|------------|-----------|-----------|--------------|
| 1 | First Name | Last Name | ID | Amount Payed |
| 2 | Aaron | Karstens | 211374569 | \$350.00 |
| 3 | Abbey | Palmer | 211125458 | \$450.00 |
| 4 | Billi | Chaulk | 211457625 | \$100.00 |
| 5 | Billie | Tatom | 211124685 | \$150.00 |
| 6 | Devin | Ragula | 211789435 | \$300.00 |
| 7 | Devon | Macmillan | 211142068 | \$250.00 |
| 8 | Etsuko | Karty | 211047852 | \$300.00 |
| 9 | Etta | York | 211120420 | \$100.00 |
| 10 | Garth | Schwein | 211123456 | \$250.00 |
| 11 | Gary | Nesby | 211159951 | \$300.00 |

To create a Pivot Table:

1. From the Insert tab, under the Tables section, click the Pivot Table button to open the Pivot Table dialog window.
2. Select the table or range for the pivot table and its location in the worksheet.
3. Click OK to insert the pivot table.

Note: The pivot table tools tabs will now display on the ribbon. A pivot table graphic placeholder will appear on the sheet and the pivot table field list will display to the right of the screen. Selecting fields to add to the report will automatically change the Pivot Table placeholder graphic with the selected data.

4. In the field list, select the fields to include in the Pivot Table report.
5. Arrange the look of the report by dragging the corresponding fields, such as Team and Salary into the appropriate report categories.
6. The Pivot Table will automatically update.

Pivot Table Settings

PivotTable Fields [Close]

Choose fields to add to report: [Settings]

- First Name
- Last Name
- ID
- Amount Payed

MORE TABLES...

Drag fields between areas below:

FILTERS **COLUMNS**

ROWS **VALUES**

First Name Average of A...

Last Name

ID

Defer Layout Update **UPDATE**

Result of the Pivot Table

| 3 | Row Labels | Average of Amount Payed |
|----|--------------------|-------------------------|
| 4 | Aaron | 350 |
| 5 | Karstens | 350 |
| 6 | 211374569 | 350 |
| 7 | Abbey | 450 |
| 8 | Palmer | 450 |
| 9 | 211125458 | 450 |
| 10 | Billi | 100 |
| 11 | Chaulk | 100 |
| 12 | 211457625 | 100 |
| 13 | Billie | 150 |
| 14 | Tatom | 150 |
| 15 | 211124685 | 150 |
| 16 | Devin | 300 |
| 17 | Ragula | 300 |
| 18 | 211789435 | 300 |
| 19 | Devon | 250 |
| 20 | Macmillan | 250 |
| 21 | 211142068 | 250 |
| 22 | Etsuko | 300 |
| 23 | Karty | 300 |
| 24 | 211047852 | 300 |
| 25 | Etta | 100 |
| 26 | York | 100 |
| 27 | 211120420 | 100 |
| 28 | Garth | 250 |
| 29 | Schwein | 250 |
| 30 | 211123456 | 250 |
| 31 | Gary | 300 |
| 32 | Nesby | 300 |
| 33 | 211159951 | 300 |
| 34 | Grand Total | 255 |

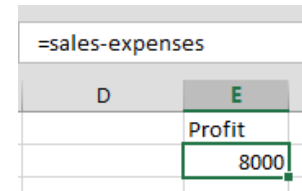
Chapter 3 Working with Names and Ranges

A. Naming Ranges

Cell references like D5:D22 or A33:C33 are somewhat abstract and don't really communicate anything about the data they contain. In Excel, cells or ranges can be given names for easy reference.

I. What are Range Names?

Range names are meaningful character strings that are assigned to individual cells or cell ranges. A range name can be used anywhere a cell or range is referenced. The advantage of using names comes from the fact that a name, like Employees, is more meaningful and less abstract than a reference like C2:C55. Also, named ranges are by default absolute. If a range is copied, it will maintain its original cell references.

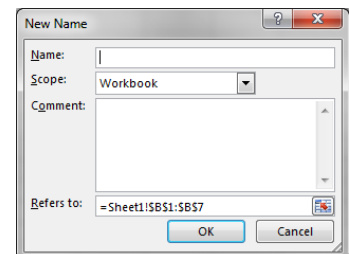


Range names make formulas more readable and make it easier to find and reference individual cells. Using range names in a worksheet improves clarity, improves organization and aids in the overall design.

II. Defining and Using Range Names

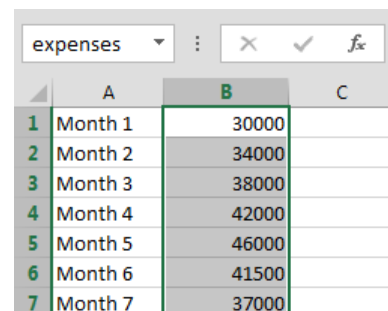
To define a range name:

1. Select either a cell or cell range and choose the Define Name button from the Formulas Ribbon.
2. This will display the New Name dialog box.
3. In the New Name box is the reference to the cell or range selected in the bottom text field.
4. Enter a name for the range in the top text field and click OK. (A comment to be associated with the new named range can also be added at this time.)
5. The Scope refers to the parts of the workbook where the named range will be valid.



Another way to name a cell or range is:

1. Select the range.
2. Enter the name in the name box on the formula bar and press Enter.
3. Press the down pointing arrow to the right of the name box to see a list of range names used in the spreadsheet.



Excel does not accept spaces between words in the names chosen. For example, “newrange” or “newRange” is acceptable, but “New Range” is not.

Once a name range has been defined, it can be used in formulas and functions just like a regular cell or range reference.

Using names for ranges and cells in this way makes formulas and functions much clearer. It is much easier to enter the name range into for a formula or function rather than the specified cell references.

III. Selecting Non-Adjacent Ranges

To select non adjacent ranges:

1. Press and hold the Ctrl button and select the first range.
2. Keep holding the Ctrl button and select each additional non adjacent range or cell with the mouse.
3. The normal rules of mouse dragging to select a range and clicking to select cells apply.

| | A | B | C | D |
|---|---------|----------|--------|--------|
| 1 | Month | Expenses | Sales | Profit |
| 2 | Month 1 | 30000 | 40000 | 10000 |
| 3 | Month 2 | 34000 | 42000 | 8000 |
| 4 | Month 3 | 38000 | 45000 | 7000 |
| 5 | Month 4 | 42000 | 50000 | 8000 |
| 6 | Month 5 | 46000 | 47000 | 1000 |
| 7 | Month 6 | 41500 | 40000 | -1500 |
| 8 | Month 7 | 37000 | 32000 | -5000 |
| 9 | Total | 268500 | 296000 | 27500 |

Format multiple selections all at once by clicking a formatting button on the Home Ribbon, or give them a defined name.

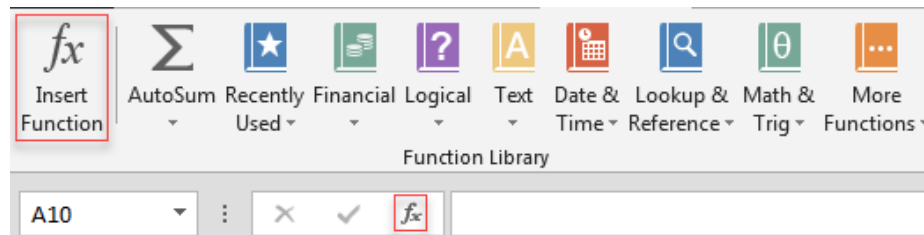
Chapter 4 Working with Functions and Formulas

A. Using Functions in Excel

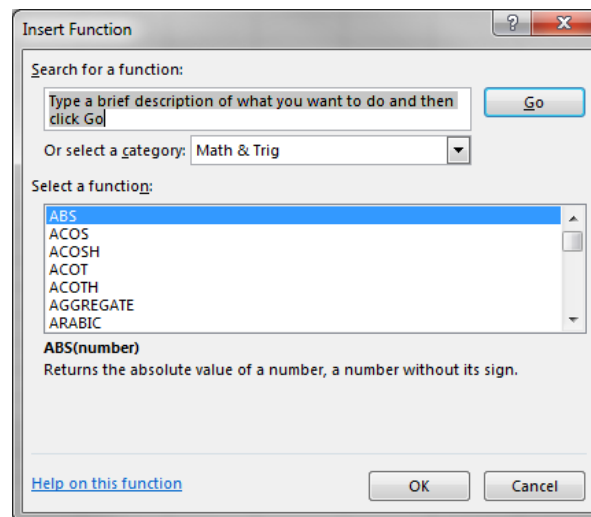
I. Inserting Functions

To insert a function:

1. Choose a cell to contain the function result.
2. Display the Insert Function dialogue box by clicking the fx button next to the formula bar or choose the Insert Function button from the Formulas Ribbon.

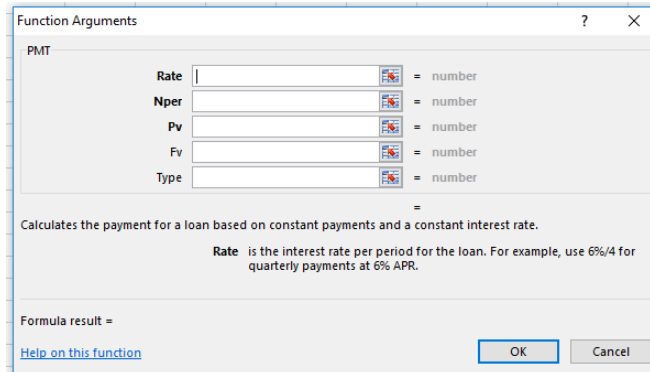


3. In the Insert Function dialogue box, select functions by category via a drop down list.



4. Once a function is chosen, click OK to move to the next step: the Function Arguments box.

For this example the PMT function has been selected from the financial category. The PMT function will calculate the payment amount for a loan based on the arguments provided.



- In the upper part of the box, there is a series of text fields, one for each possible argument to the function. Click on an argument field to see a brief description of the argument at the bottom of the dialogue box.
- The argument names are to the left of the argument fields.
- The ones in bold type (Rate, Nper, and Pv) are required arguments.
- For arguments without bold type names, Excel 2007 will enter a default value when required if the argument fields are left empty.

Raw data can be entered directly onto the argument fields or, if the data is stored in the worksheet, type the appropriate cell references. It is also possible to click on an argument field and then select the cell that contains the data to enter it without typing.

This process allows functions to be inserted into a worksheet without having to manually type them.

By using the Insert Function feature, parentheses and commas are not an issue. Also, the arguments descriptions is visible and how many arguments are required.

II. Using the IF Function

Excel's IF function can be very useful. This function can be used to branch to different values or actions depending on a specified condition. The structure of an If function is as follows: **IF (logical test, value if true, value if false)**

IF functions are called conditional functions because the value that the function returns will depend on whether or not a specific condition is satisfied. As an example, consider the following function: IF (A1=10, 5, 1)

This function states that if cell A1 has a value of 10 the cell that contains the function will have the value of 5. But if A1 doesn't have a value of 10, the cell that contains the function will have a value of 1. In other words, the function reads: if A1 equals 10 then return the number 5, else, return the number 1.

III. Working with Nested Functions

In Excel, functions can be placed (nested) within a function. Look at the following worksheet as an example.

| | A | B | C | D | E | F | G | H |
|---|---|--------|--------|--------|-----|---|---|---|
| 1 | | Type 1 | Type 2 | Type 3 | | | | |
| 2 | | 22 | 1 | 100 | | | | |
| 3 | | 45 | 45 | 4 | | | | |
| 4 | | 26 | 25 | 6 | | | | |
| 5 | | 28 | 8 | 2 | | | | |
| 6 | | 30 | 23 | 85 | | | | |
| 7 | | 151 | 102 | 197 | 150 | | | |

By looking in the formula bar, the average function for cell E7 contains three sum functions (the sums of the three type columns). This means that the value in E7 is the average of the sums of columns B, C and D.

This IF function has two additional IF functions nested inside.

```
=IF(A1<100, A1*1.5,IF(A1<200, A1*2,IF(A1<300, A1*2.5,A1*3)))
```

The first IF tests to see whether the value in cell A1 is less than 100. If it is, the result of this function will be the value of A1 multiplied by 1.5. If the value in A1 is equal to or greater than 100, the test condition will be false, and the second value will come into play. In this case, the second value is a nested IF function that tests whether the value in A1 is less than 200. If it is, the value in A1 is multiplied by 2 will be the result of the function. If the value in A1 is greater than or equal to 200 the third IF function will be used. This function tests whether the value in A1 is less than 300. The value in A1 will be multiplied by 2.5 if it is less than 300 or multiplied by 3 if it is greater than or equal to 300.

Remember, when nesting functions always make sure that there are as many closing parentheses as there are opening parentheses.

Note: Excel will permit up to 64 levels of nested functions. Previous versions of Excel only supported 7 levels of nested functions. Also, Excel will support 255 arguments to a function, where previous versions of Excel only supported a maximum of 30 function arguments.

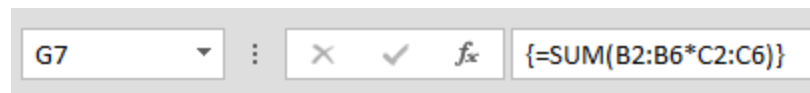
B. Working with Array Formulas

I. What Are Array Formulas?

An array is a grouping of two or more cells. If a selection of empty cells is made on a worksheet, type some text or a number in one of the cells and press Ctrl + Shift + Enter at the same time, the value just typed will appear in every cell in the selection. When Ctrl + Shift + Enter is pressed, Excel will treat the selection as a single entity or array. When a selection is defined as an array, operations are performed on every cell in the selection rather than on just a single cell. Operations involving corresponding cells in a number of ranges using array formulas. This is a powerful technique that can be used to enhance Excel formulas and functions.

If a formula involving selections of multiple cells is entered Ctrl + Shift + Enter is pressed, Excel will automatically place curly braces { } around the formula. This means that Excel will treat this formula as an array formula.

Note that curly braces cannot be typed manually to create array formulas: they must be created by pressing Ctrl + Shift + Enter. Some people even refer to array formulas as CSE (Control Shift Enter) formulas.



II. Using Basic Array Formulas

Using array formulas is fairly straightforward once the basic concepts are understood. The important thing to remember is that arrays of the same size should be selected to use in array formulas (same number of rows and columns). Array formulas that involve cell ranges (arrays) of different sizes will not work.

In the following example we have two columns of numbers, F2:F16 and G2:G16. Note that both columns of numbers are the same size. A third column can be selected of the same size, type the formula `=F2:F16*G2:G16`, and press Ctrl + Shift + Enter.

`{=F2:F10*G2:G10}`

| E | F | G | H | I |
|---|---------|----|---|-------|
| | Numbers | | | |
| | 110 | 44 | | 4840 |
| | 125 | 23 | | 2875 |
| | 512 | 54 | | 27648 |
| | 103 | 87 | | 8961 |
| | 85 | 45 | | 3825 |
| | 162 | 23 | | 3726 |
| | 215 | 65 | | 13975 |
| | 354 | 21 | | 7434 |
| | 84 | 89 | | 7476 |

Each cell in the first column will be multiplied by the corresponding cell in the second column, with the result being displayed in the third column.

Take note of the curly braces around the formula displayed in the formula bar. If Enter was pressed, the curly braces would not be added, and Excel would not recognize the ranges as arrays. As a result, only the value of the first two cells multiplied together, 4840, would be displayed in the cell G2.

When entering formulas into the formula bar, it is possible to select the ranges in the formula with the mouse rather than typing them directly.

III. Using Functions with Array Formulas

Suppose you want to take the average or sum of a large block of numbers after every number in the block has been multiplied by a constant. This can be done by combining functions and arrays to perform this kind of operation.

To combine functions and arrays:

1. Select a single cell for the result of the function (assuming the function will return a single result).
2. Enter the function and select the cell ranges needed.
3. Press Ctrl + Shift + Enter.

As an example, the worksheet on the following page calculates the average area of a circle based on a table of many cells, each containing a number representing the radius of a circle. The area of a circle can be calculated by multiplying the square of the radius by the mathematical constant PI. The formula reads: `{=AVERAGE(C2:F15^2*PI ())}`

In this formula, C2:F15 is the range of cells containing the data. The ^2 raises each cell value (radius) to the second power. The * PI () part multiplies the squared radius with the Excel PI function. The AVERAGE function calculates an average result. Finally, the curly braces { } enclose the entire function, letting Excel know that this formula involves an array, and that the mathematical operations are to be performed on each cell in the specified range.

The result of all this is that each and every number in the range C2:F10 will be squared and multiplied by PI and then averaged together for a final result.

| | A | B | C | D | E | F | G | H | I |
|----|---|---|-----|--------|----|----|---|----------|----------|
| 1 | | | | Radius | | | | Array | NonArray |
| 2 | | | 10 | 10 | 10 | 10 | | 3967.919 | #VALUE! |
| 3 | | | 10 | 10 | 10 | 43 | | | |
| 4 | | | 10 | 10 | 22 | 10 | | | |
| 5 | | | 10 | 10 | 2 | 10 | | | |
| 6 | | | 198 | 10 | 22 | 5 | | | |
| 7 | | | 12 | 10 | 3 | 10 | | | |
| 8 | | | 14 | 23 | 10 | 3 | | | |
| 9 | | | 10 | 10 | 6 | 10 | | | |
| 10 | | | 14 | 10 | 10 | 10 | | | |

The formula for cell H2 can be seen in the formula bar. The formula uses the AVERAGE function, a calculation involving a nested PI function [$^2*PI()$], and is enclosed in {}, making it an array formula. (Note: The parentheses are required after the text PI for Excel to recognize it as the PI function.)

Array formulas can perform mathematical or logical operations with corresponding cells in two or more ranges of the same size. Additionally, array formulas can perform mathematical or logical operations on every cell in a selected range. Array formulas and functions can be combined together to solve awkward problems. As a matter of fact, there are times when using array formulas may be the only solution for a tricky situation.

IV. Using the IF Function in Array Formulas

A very interesting and useful way of working with array formulas, is to combine them with Excel's IF function. Remember, the IF function works like this:

IF (test condition, value if test is true, value if test is false)

Now suppose we use ranges of cells (arrays) instead of individual cells.

=IF(B4:B14=C4:C14, B4:B14, 0)

If we make this an array formula (Ctrl + Shift +Enter), the IF function will return the value in the B4:B14 array whenever that value is equal to the corresponding value in the C4:C14 array. When the values are not equal, zero will be returned.

The next step is to combine this with a Sum function in the following way.

{=Sum(IF(B4:B14=C4:C14,B4:B14,0))}

If we make this an array formula, the function will basically step through both ranges (arrays) row by row, and sum the values that are returned from the IF function.

| | A | B | C | D | E |
|----|---------|---------|---|----------------------|---|
| 1 | Array 1 | Array 2 | | Sum of Common values | |
| 2 | 1 | 8 | | 25 | |
| 3 | 2 | 8 | | | |
| 4 | 3 | 8 | | | |
| 5 | 4 | 4 | | | |
| 6 | 5 | 5 | | | |
| 7 | 3 | 7 | | | |
| 8 | 4 | 6 | | | |
| 9 | 4 | 5 | | | |
| 10 | 4 | 4 | | | |
| 11 | 12 | 12 | | | |
| 12 | 11 | 13 | | | |

The values returned from the If function are 0, 0, 0, 4, 5, 0, 0, 0, 4, 12, 0, for a result of 25. (The array formula for the active cell can be seen in the formula bar).

As another example of what can be done with array formulas, suppose we have a worksheet like the following.

| | A | B | C |
|----|-------------|-------------------|----------------------|
| 1 | Name | Department | Hourse Worked |
| 2 | Stella | Social Work | 12 |
| 3 | Mike | Science | 10 |
| 4 | Janet | IS | 8 |
| 5 | Wally | RO | 9 |
| 6 | Kevin | IS | 10 |
| 7 | Stella | Social Work | 10 |
| 8 | Mike | Science | 12 |
| 9 | Janet | IS | 10 |
| 10 | Wally | RO | 10 |
| 11 | Kevin | IS | 8 |

To find out how many hours Janet worked, the following array formula could be created.

`{=SUM(IF(A2:A11="Janet",C2:C11,0))}`

This formula will step through the arrays A2:A11 and C2:C11, returning the value in C2:C11 every time the name in A2:A11 equals Janet, and zero otherwise. The returned values will be summed in cell F2 for a total of 18.

Note: When working with array formulas, keep in mind that operations on very large cell selections (arrays) might take longer than expected. Array formulas involving large arrays can increase the time it takes to recalculate the worksheet.

Chapter 5 File Formats

A. Files

I. Saving Files

For Excel, the basic file format extensions are:

| | |
|--------------|-------------------------------------|
| .xlsx | Signifies an Excel workbook. |
| .xltx | Signifies an Excel template. |
| .xlsb | Signifies an Excel binary workbook. |
| .xlam | Signifies an Excel add-in. |

Any of these file types will open fine in Excel. However, to open these file types with an earlier version of Excel (like Excel 2003 or Excel 2000), a problem occurs. Office uses a new file format that promotes interoperability between programs. However, the new file format may not be compatible with earlier versions of Microsoft Office software.

If the document is going to be opened in an earlier version of Excel, the file can be saved as an Excel 97-2003 workbook.

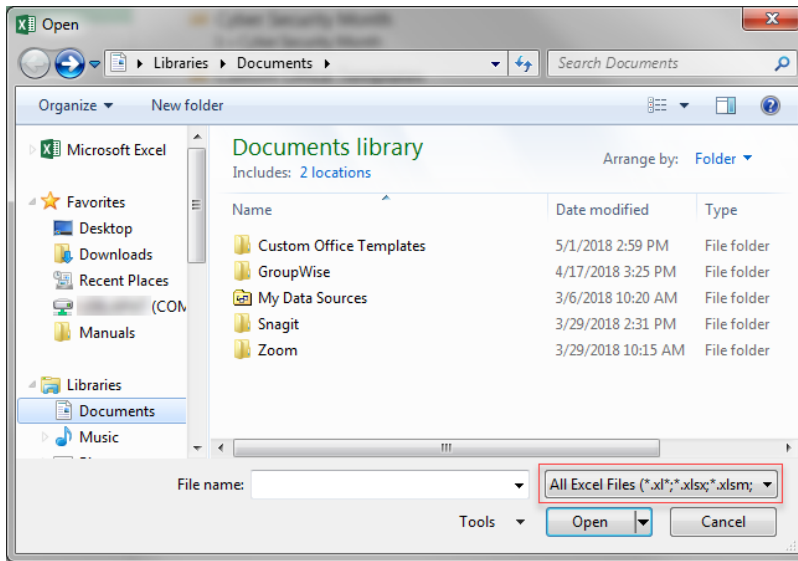
The save as dialogue:

1. In Excel, use the Save As dialogue to choose where to save the file and the file type.
2. Click Browse to browse to the location to save to, as well as the option of the file type.
3. The drop-down list labeled Save As Type allows for a format to be chosen for saving the file.

Understanding file formats is important when opening files as well.

The open dialogue:

1. Click Computer then Browse for more options.
2. There is a series of options in a drop list labeled Files of Type.



- The items that appear in the main viewing pane of the Open dialogue box will depend on the type of file that is specified in the Files of Type drop list.
- If the file is to publish to the web, choose the All Web Pages option. This will restrict the files in the viewing pane to those with types that are suitable for the World Wide Web.
- Use the All Files option to show all of the files in a given location.

II. Upgrading a Workbook

A book from an earlier version of Excel (Excel 97 to Excel 2003) can be converted to Excel 2013.

To upgrade a workbook:

1. Open Excel.
2. Use the Open option to open the earlier (file extension .xls) workbook file.
3. Click the File menu and choose Convert.
4. Excel will show a warning.
5. Press OK.



Although converting workbooks is recommended (as it allows for the use of new features of Excel), it is also recommended that a backup be created before doing the conversion.

III. File Properties

File properties are important for a number of reasons. The file properties can be used to get useful information about the file without having to open the file itself. Specific file properties can be entered to help maintain and manage files. Properties can be used as keywords when searching for a file. File properties can show the size of the file, the date the file was created, the date the file was last modified and what application is most appropriate for the file.

To view the properties of a file without opening it:

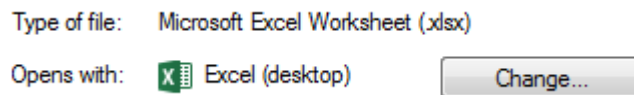
1. Right-click on the file icon in Windows Explorer.
2. Select Properties from the menu.
3. This will display the General tab of the Properties dialogue for the file.

In the Properties dialogue box:

- Edit the file name in the editable text field near the top. When Enter is pressed or OK is clicked, the file will assume whatever name is in the text field.

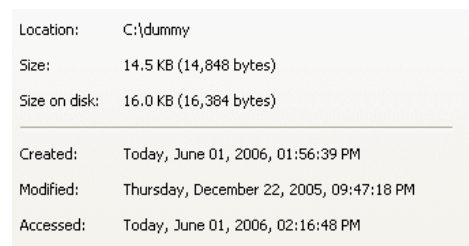


- A description of the file type and the program that is the default choice for opening the file.



- Click the Change button to select another program to open the file with. If another program is chosen to open the file and the file is double-clicked, the file will be opened with the new program.

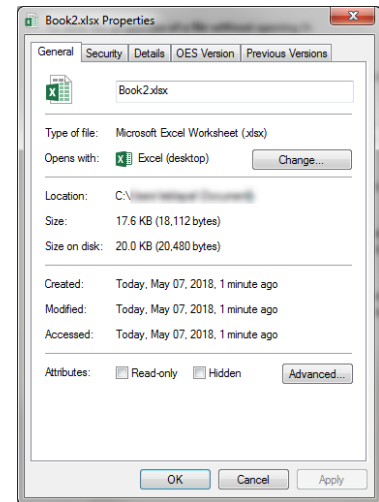
- Information of the location of the file, the size of the file, the creation date, when the file was last modified and when it was last accessed is available.



1. The two checkboxes at the bottom of the Properties box allow for the file to be Read-Only and Hidden.



2. If a check is placed in the Hidden checkbox, the file icon will not be available when looking at the contents of the folder that contains it unless the option is enabled in Windows.

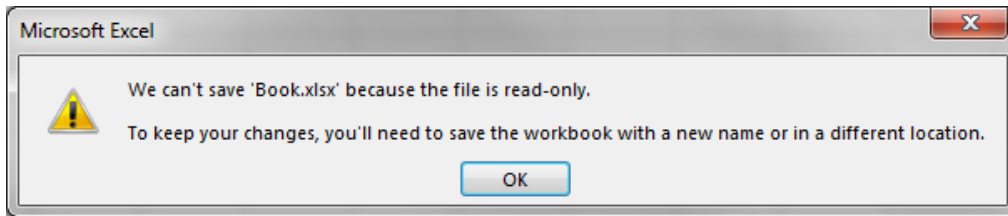


If a file is hidden:

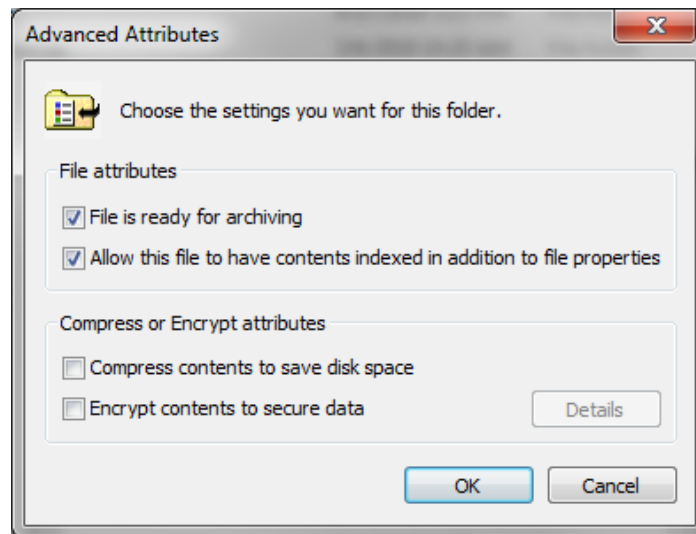
1. The file can be made visible by choosing the Tools menu in Windows Explorer
2. Choose Folder Options from the menu bar in the folder that contains the hidden file.
3. This will display the Folder Options dialogue.
4. Under the View tab, select the radio button labeled, "Show hidden files and folders."
This will make any hidden files visible.

If file is marked as Read-Only:

- The file can then only be read, not written to. This means that if the file is opened and changes to the data are made, the file will have to be saved under a new name.
- A message will appear if a Read-Only file is trying to be modified and saved.



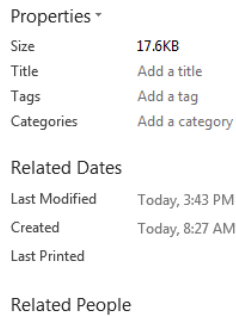
The Advanced button on the bottom of the General tab in the File Properties dialogue box, it will display an advanced attributes box:



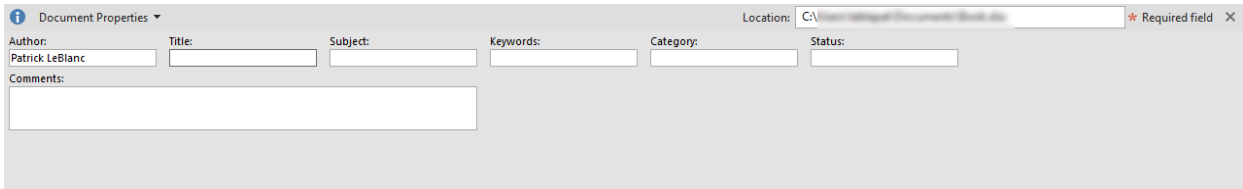
- In the advanced box, there are options to allow indexing of the file for better search performance, to compress the file to save disk space and to encrypt (encode) the file to help secure the data.

To edit/view file properties from within Excel:

1. Open a workbook, and display the Office menu.
2. Select the Info Tab.



3. The properties are on the right side.
4. Click the Properties text and select “Show Document Panel”
5. Enter properties for the document.



6. A small arrow labeled Document Properties will allow access to advanced options.