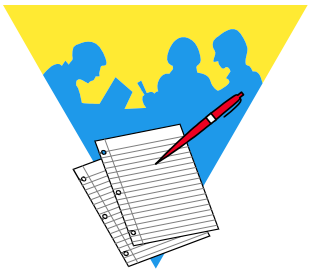
Excel 2019
Level 3

The Computer Workshop, Inc.

800-639-3535

www.tcworkshop.com
training@tcworkshop.com



Lesson Notes

Excel 2019

Level 3

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Developed by:
Brian Ireson
Suzanne Hixon
Thelma Tippie

Edited by:
Marissa Kain, Jeffrey DeRamus and Cheri Stevenson

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5200 Upper Metro Place, Suite 140
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for

The Computer Workshop, Inc.
5200 Upper Metro Place, Suite 140
Dublin, Ohio 43017
(614) 798-9505

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Using this Manual

Welcome to the *Excel 2019 Level 3* course. This manual and the data files are designed to be used for learning, review and reference after the class. The data files can be downloaded any time from *The Computer Workshop* website:

http:\\www.tcworkshop.com

There is no login or password required to access these files. You will also find handouts and supplementary materials on the website in the Download section.

To Download Data Files

Once on *The Computer Workshop* website, locate and click the *Student Resources* link in the top navigation bar. When on the *Student Resources* page, click the **Data Files** button.

1. ***Data Files*** page displays a list of general application types.
2. Click once on the ***Microsoft Office Courses*** link.
3. Click once on the software related to the course.
4. Click once on the version related to the course.
5. If there are multiple folders, click on the ***TCW*** folder.
6. Click on the course name to download the data files.

You can choose to open or save the zipped folders content to your computer.

While on the *Student Resources* page, you can also access handouts by clicking the **Handouts** button. Handouts are in PDF format and also available to you without login or password. Simply open the PDF and either print or save to your computer.

Conventions

Conventions Used in this Manual

The hands-on exercises (Actions) are written in a two-column format. The left column ("Instructions") gives numbered instructions, such as what to type, keys to press, commands to choose from menus, etc. The right column ("Results/ Comments"), contains comments describing results of, reasons for, quick keys, etc. for the instructions listed on the left.

- Key names and Functions are bold and enclosed in square brackets:

  [Enter], **[Tab]**, **[F5]**, **[F10]**

- Keys you press simultaneously are separated by a plus (+) sign, typed in bold and enclosed in square brackets. You do not press the plus.

  [Shift + F5]

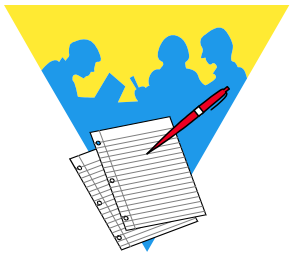
- Keys you press in sequence are separated by a space, bold and enclosed in square brackets.

  [Home] [Down Arrow]

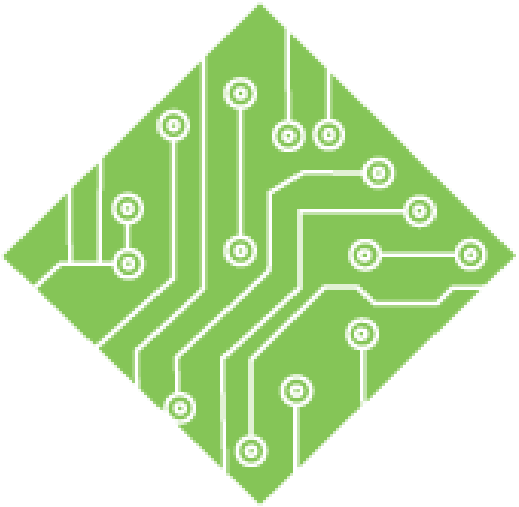
- Ribbon tab names are in bold and italic: Example: ***Home***
- Group names are in bold: Example: **Font**
- Dialog box names are in italic: Example: *Save As*
- Button names are bold and enclosed in square brackets: Example: **[Sort]**
- Information you are to type will be in bold. Example:

  This is the first day of the rest of your life.

- Information that you need to supply will be indicated with pointed brackets. Example: Type: < **your name** >.



Tips and Notes

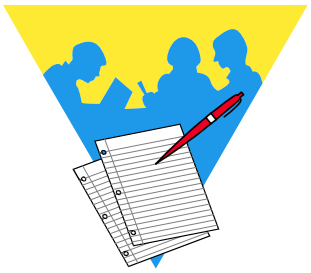


Lesson 1: Macros and VBA

Lesson Overview

You will cover the following concepts in this chapter:

- What is a Macro?
- Saving Files with Macros
- Developer Ribbon
- Macro Security
- Macro Naming
- Macro Referencing
- Recording a Macro
- Running a Macro
- Editing a Macro
- Recording a Macro in the Personal Workbook
- Running a Personal Macro Workbook Macro
- Editing Personal Macros
- Adding a Macro Button to the QAT
- Recording a Relative Reference Macro
- Removing A Personal Macro



Lesson Notes

What is a Macro?

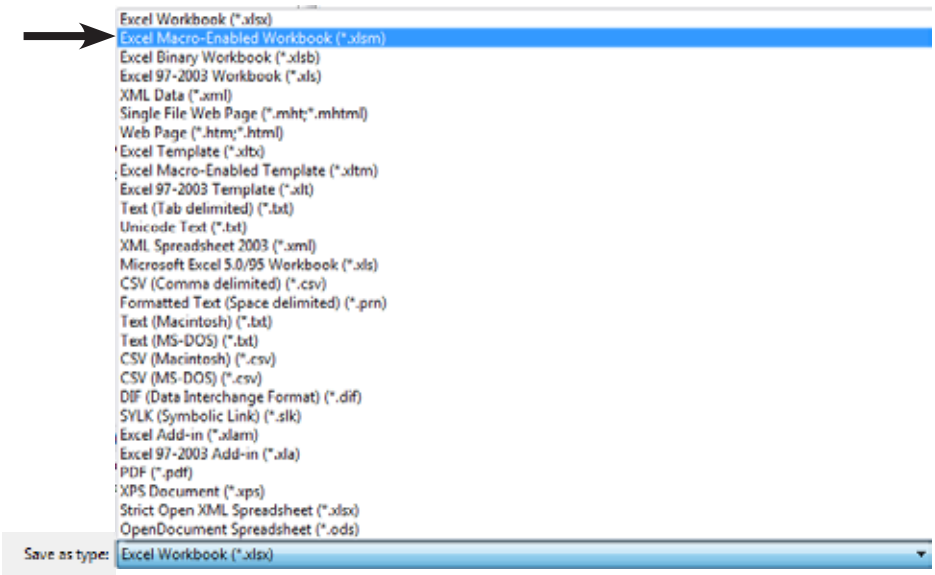
A **Macro** can be described as a tiny program that uses Visual Basic code to automate a sequence of actions or instructions. A **Macro** can be simple and consist of only a few tasks or commands, or be quite complex, involving lots of data manipulation and calculations. To create complex **Macros**, it is worthwhile to invest time in learning Visual Basic programming. But for simple **Macros**, you don't have to do any programming at all.

Simple **Macros** are great for any long sequence of keystrokes that you find yourself repeating often; or for combinations of basic *Excel* actions that would be convenient to automate for a particular workbook. **Macros** can be saved with the workbook in which they were created, or they can be saved in a separate personal **Macro** workbook where they are accessible all of the time.

As mentioned previously, *Excel* will record the actions you take when creating a **Macro** and convert them into Visual Basic code. This code contains all of the instructions that *Excel* needs to execute your **Macro**.

Saving Files with Macros

Once you plan on creating Macros in a workbook, it must be saved as a *macro-enabled workbook.* When performing a Save As choose the second option from the drop-down list within the *Save As Type* field. The saved *Excel* workbook will have an extension of .xlsm.

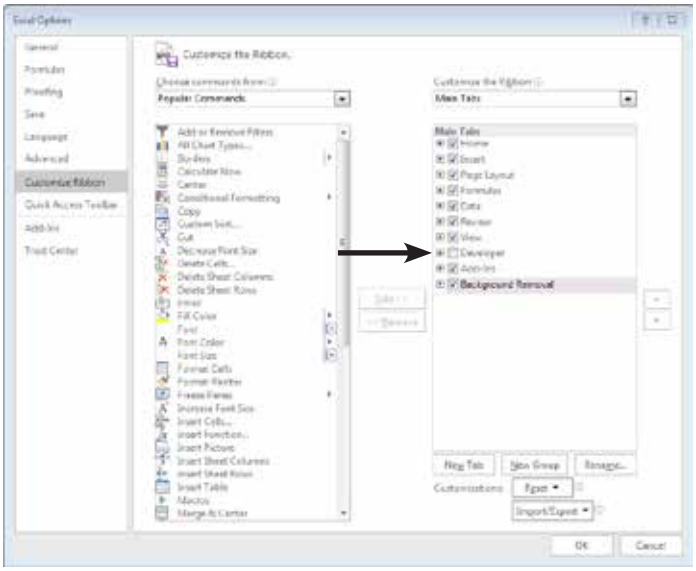


Developer Ribbon

Adding the Developer Tab

It is not difficult to create a **Macro** in *Excel*, but to make the controls easier to access, you should enable the ***Developer Tab***. This ***Developer Tab*** is your gateway to creating and editing **Macros** in *Excel 2019*. If the ***Developer Tab*** is *not* showing on the Ribbon, do the following:

- Select the ***File Tab***
- Click the **Options** in the index on the left.
- Click the ***Customize Ribbon*** category on the left of the *Excel Options* dialog.



- On the right in the ***Customize the Ribbon:*** list, click the checkbox before ***Developer***. A checkmark should be added to the checkbox.
- Click **[OK]** to close the *Excel Options* dialog. The ***Developer Tab*** now appears at the top of the *Excel* screen.
- Click the ***Developer Tab*** to activate it.

Macro Security

Macro Security

It is well known that VBA **Macros** can be a source or carrier of computer viruses created by unscrupulous programmers. Because of this, you should never use a **Macro** if you do not know where it came from, and you should never open a workbook that contains a **Macro** unless you trust the source of the workbook.

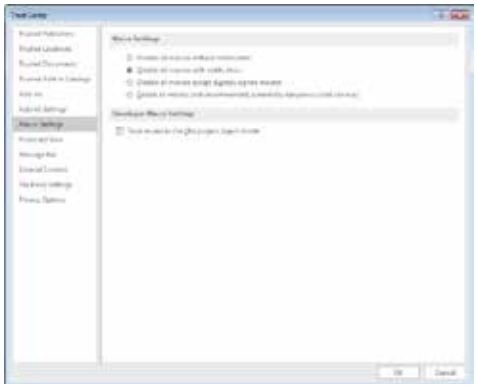
Setting the Macro Security Level

- Select the ***Developer Tab***.
- Click the **[Macro Security]** button.

- The *Excel Trust Center* dialog box will open.
- Click on ***Macro Settings*** on the left. Choose the option best for you and click **[OK]**.

- OR -

- Click on the ***File Tab***.
- Select **Options**.
- Choose ***Trust Center*** from the index on the left.
- Click on the **[Trust Center Settings]** button.
- The *Excel Trust Center* dialog box will open.



- Click on ***Macro Settings*** on the left. Choose the option best for you and click **[OK]**.

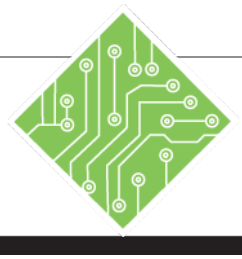
Macro Security, continued

Note

In *Excel*, **Macros** can clear all items from the undo list. Once a **Macro** has been run, the steps cannot be undone.

Option	Descriptions
Disable all **Macros** without notification	Only the **Macros** stored in workbooks in a trusted location are allowed to run. Security Alerts are also disabled.
Disable all **Macros** with notification	This is the default setting. Security Alerts are enabled. This allows you to choose which **Macro** to run.
Disable all **Macros** except digitally signed **Macros**	Only **Macros** that are digitally signed by a trusted publisher can run.
Enable all macros (not recommended; potentially dangerous code can run)	Enables all **Macros**. Makes the computer vulnerable to malicious code.
Trust Access to the VBA project object Model	This option is mostly for developers. Selecting this option enables **Macros** to access core VB objects, methods, and properties, potentially exposing your computer to viruses. If you find your **Macro** will not work with this option de-selected, move your file to a trusted location, or add the folder to your trusted locations. Otherwise, be sure to de-select this option upon closing your file.

Action 1.1 - Adding the Developer Tab



Instructions:	Results/ Comments:
1. Start *Excel*. Notice there is no ***Developer Tab***.	A blank spreadsheet is opened, if not then click the blank workbook option from the list of templates.
2. Click the ***File Tab*** and choose **Options** from the categories listed on the left side of the Backstage view.	The *Excel Options* dialog box opens.
3. Select ***Customize Ribbon*** from the categories on the left.	Options related to customizing the ribbon are displayed.
4. In the right list of Tabs, click the checkbox next to ***Developer*** and click the **[OK]** button.	The ***Developer Tab*** will now be added to the ribbon.
5. Activate the ***Developer Tab*** on the ribbon.	To view the ***Developer Ribbon***.
6. Locate the **Code Group**.	This group deals with creating and editing **Macros**.
7. Locate the **Controls Group**.	This group is used when creating Form Controls.
8. Click the ***View Tab***.	The ***View Tab*** is active.
9. Locate the **Macros Group.**	You can record and run **Macros** from this menu as well as the ***Developer Tab***.
10. Close the workbook without saving	**[Ctrl+W]**.

Macro Naming

To create a **Macro**, you can either write it from scratch using Visual Basic code, which can be considered programming, or you can have *Excel* record the actions you perform, which in turn creates the Visual Basic code for you. Recording is less efficient, but much easier.

Before recording your **Macro**, it is a good idea to plan the process you want to automate. Rehearsing the procedure will help eliminate recording mistakes in the **Macro**.

Macro Naming Rules

You must adhere to the following rules when creating your **Macros**:

- The **Macro** name must start with a letter.
- No spaces are allowed in the name. You may wish to use the underscore instead of spaces.
- You can use letters, number and the underscore character, but not other characters such as @, $, #, or ! .
- Make sure the name is unique and doesn't conflict with the name of other objects or built-in Names in your worksheet or workbook.

An error message will be given if these rules aren't followed, letting you know you have an invalid procedure.

Note

In newer versions of *Excel*, it is possible to record the formatting changes to a Chart as a **Macro** and then apply it to another Chart.

Note

There can be only one **Macro** named **Auto_Open**.

Auto-Run Macros

If you want your **Macro** to start as soon as you open your *Excel* program, simply save it with the name **Auto_Open**.

Macro Referencing

Understanding Macro Referencing

In earlier courses of *Excel*, you worked with cell referencing and the same concept applies when creating **Macros**.

Absolute Referencing will record actions using the absolute location of cells. This results in the **Macro** performing the actions in the same cell reference regardless of the position of the cell pointer.

For example, if you record a **Macro** to start in cell **A1** and move to cell **D1**, when running the **Macro**, if your active cell is **G15** it will go back to **A1** and move the selection to **D1**.

Relative Referencing will record actions *relative* to the active cell position. This results in the **Macro** measuring distance from the starting point vs. exact cell location.

There are benefits to both methods. You must decide what is best for your **Macro**. By default, *Excel* uses Absolute Referencing.

To Use Relative Referencing During Macro Recording

- Select the ***Developer Tab***.
- In the **Code Group**.
- Click the **[Use Relative References]** button.

- OR -

- Select the ***View Tab***.
- In the **Macros Group**, click the **[Macros]** button.
- Choose *Use Relative References.*

Note

The **[Use Relative References]** button is a toggle button, therefore selecting it turns it on and off.

Recording a Macro

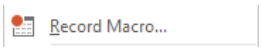
Once you have planned your **Macro**, recording a **Macro** is very easy using the steps outlined below, even if you don't have access to the ***Developer Tab***.

Creating a Macro Using the View Tab

Note

You can also access the *Record Macro* dialog box by clicking the **[Record Macro]** button located on left side of the **Status Ba***r*.

- Select the worksheet where you want to begin recording.
- If you want to use Relative Referencing, select the ***View Tab***, locate the Macros Group, click the **[Macros]** button, and choose *Use Relative References*. Make sure the icon is highlighted.
- To record, select the ***View Tab***. Locate the **Macros Group**. Click the **[Macros]** button and then select *Record Macro*.



- The *Record Macro* dialog box is displayed. Choose the following:

Note

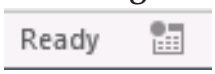
If you want your **Macro** to run automatically when the file is opened, use the name **Auto_Open**.

- In the **Macro name:** field, type a descriptive name - remember, no spaces.
- If you want to assign a shortcut key, type a letter or number that is not used for other shortcuts in the text box to the right of ***Ctrl+***.
- In the **Store macro in:** drop-down list, select one of the options *This Workbook, Personal Macro Book,* or *New Workbook.*

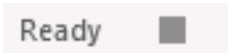
  A **Macro** that is stored in the *Personal Macro Workbook* can be run in any *Excel* workbook on the same computer. Therefore, use this option if you are creating a **Macro** that you think you would like to use in multiple workbooks.
- If desired, type in a description in the **Description:** field. This will show up in the dialog box when you view your **Macro** and is very useful if others are going to be using your **Macros**.

Recording a Macro, continued

- Click **[OK]** to begin recording. Notice the **[Record Macro]** button in the status bar changed to a **[Stop Recording]**.



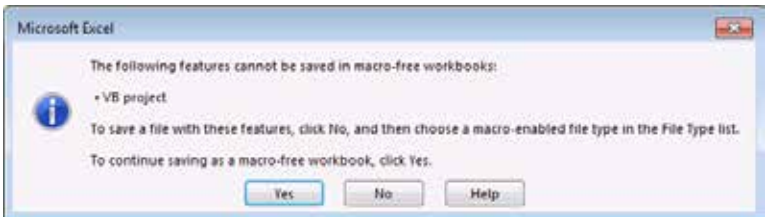
Record Macro



Stop Recording Macro

- Perform the tasks you want recorded. Be careful where you click and what you type. *Excel* will record each step. If you make a mistake, correct and keep going - you can edit the **Macro** once you are finished.
- Click the **[Stop Recording]** button on the **Status Bar** or select it from the **[Macros]** button drop-down on the ***View Tab***.

- Click on the ***File Tab***. Choose **Save-As** and save your workbook as an ***Excel Macro-Enabled Workbook (*.xlsm)*** file from the **Save as type:** field drop-down list.
- *Warning:* If you record a **Macro** in a regular workbook and then try to save it without changing the **Save as Type:** field, you will see an alert like the one below. If you click the **[Yes]** button, the **Macros** created and stored in this workbook will *not* be saved.

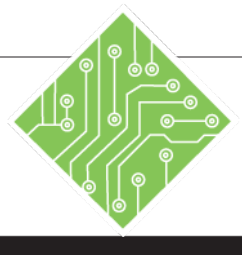


Creating a Macro Using the Developer Tab

- Select the worksheet where you want to begin recording.
- If you want to use Relative Referencing, select the ***Developer Tab***, locate the **Code Group**, click the **[Use Relative References]** button. Make sure the button is highlighted.
- To record, click the **[Record Macro]** button.
- The *Record Macro* dialog box is displayed. Follow the same steps as outlined in the previous section.

Action 1.2- Recording an Absolute Macro in File

Instructions:	Results/ Comments:
1. Create new workbook, on the ***Developer Tab*** check to make sure the **[Use Relative References]** button is **NOT** active.	The button is located in the **Code Group**, it should not be highlighted. This will be an Absolute Reference Macro.
2. Click the **[Record Macro]** button.	The *Record Macro* dialog opens.
3. In the **Macro Name:** field, type in; **NewInvoiceLayout**.	This will be the name of the macro.
4. In the **Shortcut key:** field, type in; **< Q >** while holding the **[Shift]** key.	This will be the keyboard shortcut to run the macro.
5. From the **Store macro in**: field drop-down, choose; *This Workbook*.	By choosing this option, this macro will only be available when working in this specific file.
6. In the **Description:** field type in; **< This adds logo with address block and inserts data structure with formulas. >**	The description should be clear and concise.
7. Click the **[OK]** button.	You are now recording, everything you do now is captured in the new macro.
8. Click the ***Insert Tab,*** in the **Illustrations Group** click the **[Pictures]** button.	The *Insert Picture* dialog opens.
9. Choose the *Logo.jpg* file from the lessons folder and click the Insert button.	The image is inserted to the worksheet but may need to be repositioned and sized.
10. Move the image to the upper left corner of the worksheet.	Drag the image to the location and use the corner handle to resize it.
11. Select cell **B8** and type in; **< Jan >** then use Autofill across to **G8**.	A list of the first six months is added to the worksheet.
12. Select cell **H8** and type in; **< Total >**	This will be the column where each region will be summed.



Instructions:	Results/ Comments:
13. Select cell **H4** and type in; < **Tax Rate** > .	This shows where a tax rate can be added later.
14. Select cell **H5** and apply a fill color.	
15. Select cell **A9** and type in; < **Region1** > then use Autofill down to cell **A14**.	This is the list of regions.
16. Select cell **H9** and type in the following formula; **=SUM(B9:G9).** Tap the **[Enter]** key**.**	This formula adds up each month for the region.
17. Use Autofill down to cell **H14**.	Each region will be calculated as values are added.
18. Select cell **G15** and type in; **< Subtotal >** .	
19. Select cell **H15** and type in the following formula; **=SUM(H9:H14)**. Tap the **[Enter]** key**.**	The subtotal of all the regions is calculated here.
20. Select cell **G16** and type in; < **Tax** > .	
21. Select cell **H16** and type in the following formula; **=H15*H5**. Tap the **[Enter]** key**.**	The amount of taxes owed is calculated here.
22. Select cell **G17** and type in; < **Grand Total** > .	
23. Select cell **H17** and type in the following formula; **=H15+H16**. Tap the **[Enter]** key**.**	The final total is calculated here.
24. Select cell **B9**.	This will be where you begin entering data into the worksheet.
25. Click the **Stop Recording** button in the **Macros Group** on the ***Developer Tab***.	The recording is stopped and the macro is ready for use.

Running a Macro

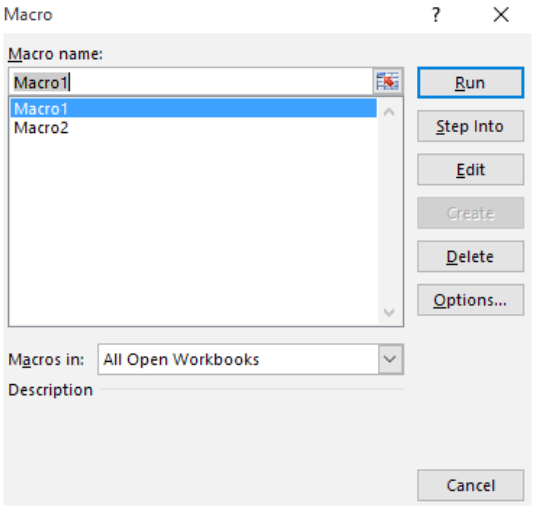
Once your **Macro** is created and saved, it will be available to run anytime it is needed.

Run a Macro Using the Macro Dialog Box

Note

You can also access the dialog box by going to the ***View Tab*** and selecting *View Macros* from the **[Macros]** drop down button.

- Select the worksheet where you want to apply the **Macro**.
- Select the ***Developer Tab***
- Click the **[Macros]** button.
- The *Macro* dialog box is displayed.



- Select which **Macros** you want to display by clicking on the down-arrow of the **Macros in:** field.
- If ***All Open Workbooks*** is in the **Macros in:** drop-down, you can see the **Macros** from any open workbook as well as from the personal **Macro** workbook.
- From the list of **Macros**, select the one you want to apply.
- Click **[Run]** or double-click the name. The *Macro* dialog box will disappear, and the sequence of instructions that was recorded will be performed on the current workbook.

Action 1.3- Run Macro in File

Instructions:	Results/ Comments:
1. Click the **[New Sheet]** button.	
2. Click the ***Developer Tab,*** in the **Code Group,** click the **[Macros]** button.	The *Macro* dialog opens, this window allows you to see, run, or edit.
3. Select the macro and click the **[Run]** button.	The sheet now has the logo, structure and formulas in place.
4. Click the **[New Sheet]** button.	Another sheet is added to the workbook.
5. Use the keyboard shortcut assigned to the macro; **[Ctrl+Shift+Q]**.	The sheet now has the logo, structure and formulas in place.
6. Save the file as **MyMacro.XLSM**. Remember to choose the *Excel Macro-Enabled Workbook* from the **Save As Type:** drop-down.	**[F12]** will open the *Save As* dialog. Save it in the Lessons folder as an **Excel Macro Enabled Workbook.**
7. Open a new file.	**[Ctrl+N].**
8. Click the ***Developer Tab, i***n the **Code Group,** click the **[Macros]** button.	The *Macros* dialog opens, you can see and use the Macro you just created. This is because the system is searching *All Open Workbooks* as the default within the **Macros in:**.
9. Close both files without saving any changes.	**[Ctrl+W]** for both files.
10. Open a new blank document.	**[Ctrl+N].**
11. Click the ***Developer Tab,*** in the **Code Group,** click the **[Macros]** button.	The *Macros* dialog opens, it has no macros listed since the macro was recorded and stored in *This Workbook.* Once the original file has been closed, it's macros are not available in new files.
12. Close the Macro window and close the file without saving.	**[Ctrl+W].**

Editing a Macro

There are several reasons to edit a **Macro** instead of rerecording:

- To correct mistakes made while recording
- To change recorded code
- To add complex tasks that cannot be recorded such as those involving user input or mathematical calculations.

Visual Basic for Applications

Macros use a programming language called *Visual Basic for Applications (VBA)*. As mentioned earlier in this chapter, when recording a **Macro**, *Excel* writes the VBA code for the keystrokes and commands you use.

Note

For additional instruction on using VBA, try the *Excel VBA Programming* course at The Computer Workshop.

Writing program code can be tricky even for seasoned programmers. If you don't catch on right away, don't be alarmed. Be patient, keep an open mind, and try to have fun exploring what you can do with VBA and *Excel*.

VBA Modules

Each **Macro** consists of a block of VBA code. A Module is used to store these **Macros**. Modules can contain one or more **Macros**. Workbooks and templates can contain one or more Modules. A set of Modules in a workbook is called a Project.

Visual Basic Editor

The Visual Basic Editor is one of many add-in applications available in *Excel*. It is used to load, view, and edit the VBA code in a **Macro**. It has its own interface, menu bar, and help system.

Editing a Macro, continued

Opening the Editor from Within Excel

- Click the *View Tab* in the **Macros Group**, click the **[View Macros]** button.

- OR -

- Click the ***Developer Tab*** and in the **Code Group**, click on the **[Macros]** button.
- Select a **Macro** that you want to work with from the *Macro* dialog box.
- Click **[Edit]**. The Visual Basic Editor opens in its own window.
- In the *Code* window, make the necessary changes.

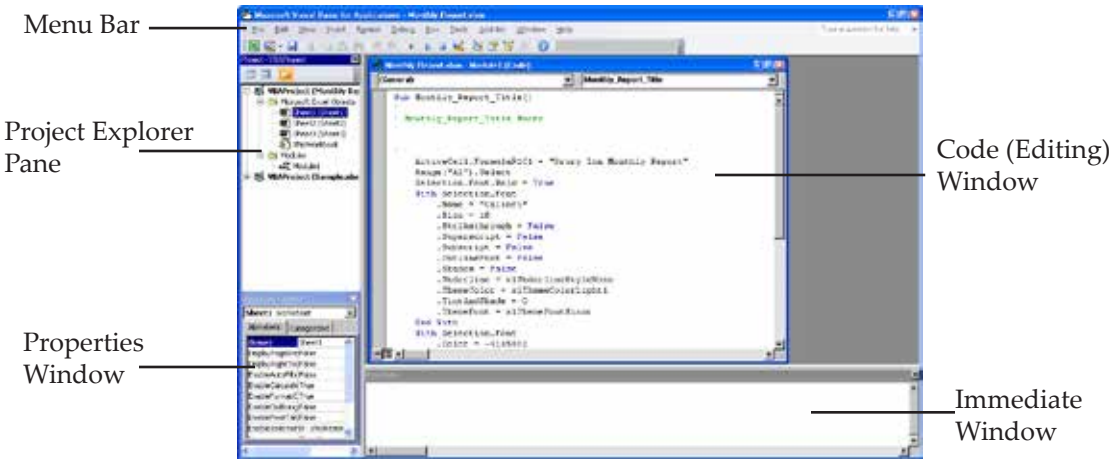
If you want to test the code first, type it in the *Immediate Window* and press **[Enter]** to run the code. If the *Immediate Window* is not showing, click ***View*** on the Menu Bar and select *Immediate Window*, or press **[Ctrl+G]**.

- Close the *Visual Basic* window to return to *Excel*.
- Run the **Macro** to test its functionality.
- Save your file.

Note

To toggle between the Visual Basic Editor and your spreadsheet, press **[Alt + F11]**.

Following is a description of the main components of the Visual Basic Editor. If your Editor doesn't display all of them, use the ***View*** menu to show them.



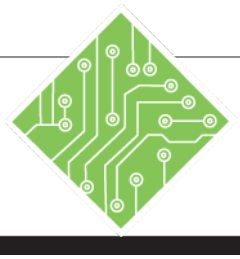
Editing a Macro, continued

Note

You can open several *Code* windows at the same time for different modules giving you great flexibility when modifying code. You can see, type, copy and paste code from one window to another.

Component	Description
Menu Bar	Contains menus for saving files, editing code, formatting, debugging code, running **Macros**, inserting objects, etc..
Tool Bar	Contains buttons for several menu items. At the far right is a field containing the line and column number of the insertion point in the *Visual Basic* editing window.
Project Explorer Panel  If you cannot see the Project Explorer panel, click the **[Project Explorer]** button on the toolbar.	A listing of VBA modules in all open workbooks and templates. Double-click on a Code Module to open it in the *Code (Editing)* window. Expand and collapse the view of the contents with the **(+)** and **(-)** buttons.
Properties Window	List of properties (characteristics) of the selected item in the Project Explorer.
Code (Editing) Window	Displays the VBA code that was recorded and/or written for the selected project. This is where you read, enter, and directly modify the VB code.
Immediate Window	Allows you to type or paste a line of code and press **[Enter]** to run it. You can then copy and paste into the *Code* window.

Action 1.4 - Edit a Macro



Instructions:	Results/ Comments:
1. Open the **MyMacro.XLSM** workbook.	This file should be in the Lesson Folder. If the **Security Warning** bar appears, click the **[Enable Content]** button.
2. Click the ***Developer Tab***, in the **Code Group,** click the **[Macros]** button.	The *Macros* dialog opens.
3. Select the macro and click the **[Edit]** button.	The *VBA Editor* opens.
4. In the *Project panel*, open the **Models** folder and double click the **Module1** icon. If necessary.	If the *Project Panel* is not visible, go the **View** option in the main menu and click the *Project Panel* to activate the panel. When you double click the **Module1** icon the code is displayed in the main panel to the right.
5. Set the cursor at the end to the line that says: **ActiveCell.FormulaR1C1 = "Total"**	You will be adding some code to make the headings bold.
6. Tap the **Enter** key and type in; < **Range("B8:H8").Select Selection.Font.Bold = True** >	This code will select the headings range and apply a bold format to the text. Tap the **[Enter]** key before typing the second line of code.
7. Click the **[Save]** icon in the toolbar and then the **[Excel]** icon.	The macro is updated and you are taken back into your *Excel* file.
8. Examine the headings on your sheet.	Nothing has been changed, the macro must be re-run in order for the change to take affect.
9. Add a new sheet to the workbook.	Click the **[New Worksheet]** button.
10. Click the ***Developer Tab***, in the **Code Group,** click the **[Macros]** button. Select the macro and click the **[Run]** button.	You can also use the keyboard shortcut you assigned to the macro to re-run it.
11. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

Recording a Macro in the Personal Workbook

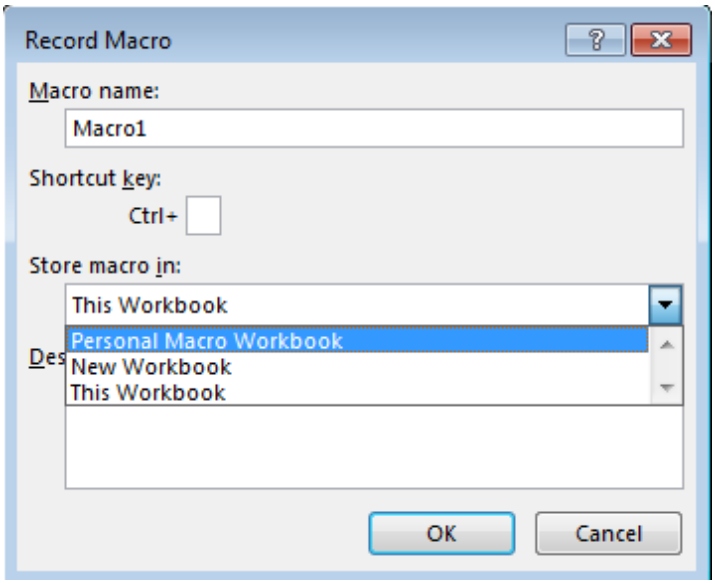
Personal Macro Workbooks

In the previous exercises you were recording the macro in the current file being worked on, this is a good standard practice since most of the time the macro will be relative to that file. The **Personal Macro Workbook** is where you can consider storing a macro or set of macros that are run often in new files. When you record to the **Personal Macro Workbook**, a hidden sheet is added to the Excel normal .xlst template. What this means is that any new workbook you create can access the macro and run it, making repetitive tasks much more manageable.

When creating new files and running the personal macro, the file can be saved as either a normal .xlsx or .xlsm file type. Choosing the Excel Workbook(.XLSX0) file format will disable the macro for future use in the file being saved. While saving the file as an Excel Macro Enabled Workbook(.XLSM) will maintain the functionality of the macro for future use in the file.

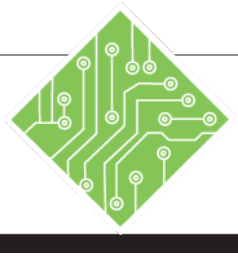
Saving a Macro in the Personal Macro Workbook

Recording a macro in the **Personal Macro Workbook** is done in the same manner as before except that you will choose *Personal Macro Workbook* in the **Store macro in:** field.



Action 1.5 - Record Macro in Personal Macro Workbook

Instructions:	Results/ Comments:
1. Create a new workbook, on the ***Developer Tab*** check to make sure the **[Use Relative References]** button is **NOT** active.	The button is located in the **Macros Group**, it should not be highlighted.
2. Click the **[Record Macro]** button in the **Code Group**.	The *Record Macro* dialog opens.
3. In the **Macro Name:** field type in; < **NewSheetLayout** >.	This will be the name of the macro.
4. Leave the **Shortcut key**: field blank.	There will be no need for a keyboard shortcut for this macro but you can assign one if you like.
5. From the **Store macro in**: field drop-down choose *Personal Macro Workbook*.	By choosing this option, this macro will be available in any new or existing file.
6. In the **Description**: field type in; < **This Adds Logo with address block and inserts data structure with formulas** >.	The description should be clear and concise.
7. Click the **[OK]** button.	You are now recording, everything you do now is captured in the new macro.
8. Click the ***Insert Tab,*** in the **Illustrations Group** click the **[Pictures]** button.	
9. Choose the *Logo.jpg* file from the lessons folder and click the **[Insert]** button.	
10. Move the image to the upper left corner of the worksheet.	
11. Select cell **B8** and type in; **< Jan >** then use Autofill across to **G8**.	A list of the first six months is added to the worksheet.
12. Select cell **H8** and type in; **< Total > .**	This will be the column where each region will be summed.



Instructions:	Results/ Comments:
13. Select cell **G1** and type in; **< Tax Rate > .**	This shows where a tax rate can be added later.
14. Select cell **H1** and apply a fill color.	This is the list of regions.
15. Select cell **A9** and type in; < **Region1** > then use Autofill down the cell **A15**.	This formula adds up each month for the region.
16. Select cell **H9** and type in the following formula; **=SUM(B9:G9).** Tap the **[Enter]** key.	Each region will be calculated as values are added.
17. Use Autofill down to cell **H15**.	
18. Select cell **G16** and type in; < **Subtotal** >.	The subtotal of all the regions is calculated here.
19. Select cell **H16** and type in the following formula; **=SUM(H9:H15).** Tap the **[Enter]** key.	
20. Select cell **G17** and type in; < **Tax** >.	The amount of taxes owed is calculated here.
21. Select cell **H17** and type in the following formula; **=H16*H1.** Tap the **[Enter]** key.	
22. Select cell **G18** and type in; < **Total** >.	The final total is calculated here.
23. Select cell **H18** and type in the following formula; **=SUM(H16:H17)**. Tap the **[Enter]** key.	This will be where you begin entering data into the worksheet.
24. Select cell **B9**.	

Instructions:	Results/ Comments:
25. Click the ***Developer Tab,*** in the **Macros Group,** click the **[Stop Recording]** button.	The recording is stopped and the macro is ready for use.
26. Save the file.	**F12**, **do not change anything**.
27. Close the file.	**[Ctrl+W]**.

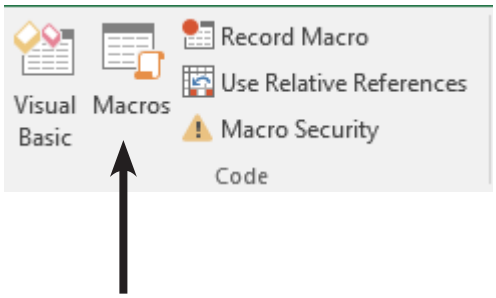
Running a Personal Macro Workbook Macro

Using a Personal Macro

Once the macro has been stored in the Personal Macro Workbook and recorded it can be used in any new files you create. It must be noted that personal macros are only available on the computer where they were recorded.

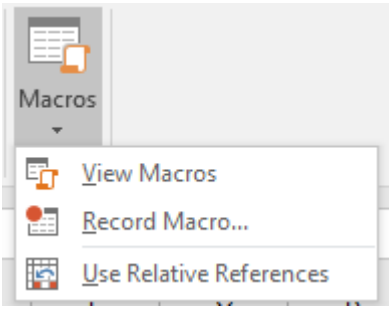
To access the Macro

- Use the **[Macros]** button in the Code Group on the *Developer Tab*.

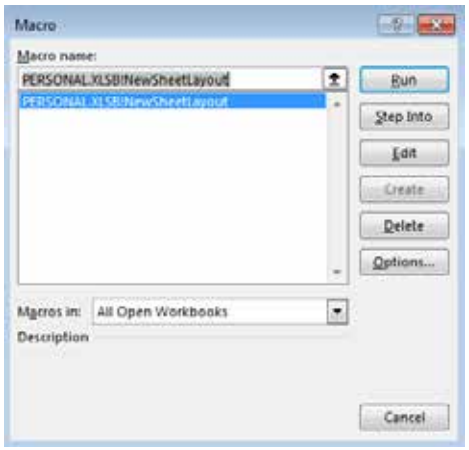


- OR -

- Use the **[Macros]** drop-down on the ***View Tab***.



- The *Macro* dialog opens, you should be able to see your personal macros listed.



Editing Personal Macros

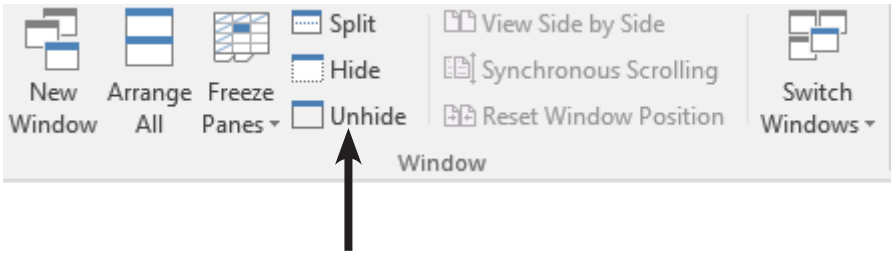
Accessing the Personal Macro Workbook

In order to access the macros stored in the **Personal Macro Workbook** is done by unhiding the personal macro worksheet, now stored in the blank workbook template.

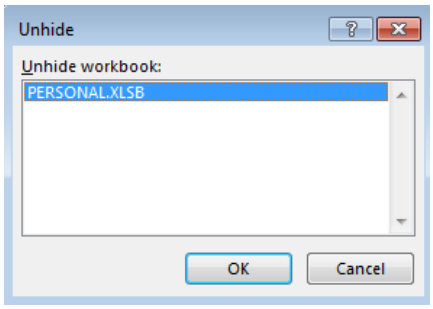
Note

The **[Unhide]** button is only active when there are macros stored in the **Personal Macro Workbook**.

- Click the *View Tab*.
- In the **Windows Group** click the **[Unhide]** button. (*This button will only be active in a new file if you have stored macros in the Personal Macro Workbook.*)



- The *Unhide* dialog opens.

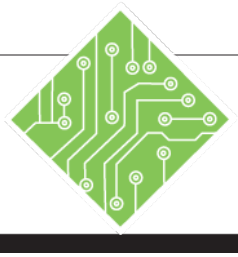


- The **PERSONAL.XLSB** is shown.
- Click the **[OK]** button.
- The **PERSONAL.XLSX** sheet opens in a new Excel window.

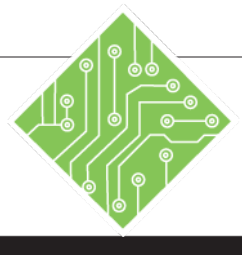
Editing the Personal Macro

- Click the ***Developer Tab.***
- Click the **[Macros]** button in the **Code Group**.
- Select the *Macro* and click the **[Edit]** button.
- The *VBA Editor* opens to the macro.

Action 1.6 - Running and Editing a Personal Macro



Instructions:	Results/ Comments:
1. Create a new blank file.	**CTRL N.**
2. Click the ***Developer Tab***, in the **Code Group,** click the **[Macros]** button.	The *Macro* dialog opens.
3. Choose the *PERSONAL.XLSB!NewSheetLayout* macro and click the **[Run]** button.	This should be the only macro in the list. Once the macro has been run the sheet now has the structure and formulas in place.
4. Click the **[New Sheet]** button.	A new sheet is added to the workbook.
5. Click the ***View Tab***, click the **[Macros]** button drop-down and choose *View Macros*.	
6. Choose the *PERSONAL.XLSB!NewSheetLayout* macro and click the **[Run]** button.	
7. Click the ***Developer Tab,*** in the **Code Group,** click the **[Macro]** button.	The *Macro* dialog opens.
8. Select the **PERSONAL.XLSB!NewSheetLayout** and click the **[Edit]** button.	The sheet now has the structure and formulas in place. The *Macro* dialog opens.
9. Click the ***View Tab***, in the **Window Group,** click the **[Unhide]** button.	A warning dialog box opens to let you know that the personal workbook must be unhidden before editing can be done.
10. Select the **PERSONAL.XLSB** workbook and click the **[OK]** button.	The *Unhide* dialog opens. By default a hidden workbook is opened in Excel as long as any Macros are saved in the Personal Macro Workbook.
11. Click the ***Developer Tab,*** in the **Macros Group,** click the **[Macro]** button.	The *Macro* dialog opens.
12. Select the **NewSheetLayout** and click the **[Edit]** button.	The *VBA Editor* opens without issue this time.



Instructions:	Results/ Comments:
13. Set the cursor at the end of the line that says: **ActiveCell.FormulaR1C1 = "Total"**	You will edit the code to make the headings bold again.
14. Tap the **]Enter]** key and type in; < **Range("B8:H8").Select** **Selection.Font.Bold = True** >.	Remember to tap the **[Enter]** key before typing the second line of code.
15. Click the **[Save]** icon in the toolbar and then the **[Excel]** icon.	The macro is updated and you are back in your *Excel* workbook.
16. Click the ***View Tab*** in the **Window Group** and click the **[Hide]** button.	The **PERSONAL.XLSB** sheet is hidden.
17. Create a new sheet.	Click the **[New Sheet]** button.
18. Click the ***Developer Tab,*** in the **Macros Group click** the **Macro** button.	The *Macro* dialog opens.
19. Select the **PERSONAL.XLSB!NewSheetLayout** and click the **Run** button.	The new sheet has its content and formulas added, with the formatting change applied.

Adding a Macro Button to the QAT

To make running a **Macro** easier, you can add a button to the Quick Access Toolbar for convenience. If the workbook containing the **Macro** is not open, the button will simply be grayed out. If you add the **Macro** to the Personal workbook when you create it, the **Macro** will always be available regardless of which workbook you have open.

To Add a Macro Button to the QAT

- Click on the **[More]** button at the end of the QAT.
- Select *More Commands...* from the drop-down list.
- Click on the drop-down arrow in the **Choose commands from:** list box.
- Select ***Macros***.
- In the list on the left, choose the **Macro** for which you would like to add the button.
- Click the **[Add]** button to add it to the list on the right.

- OR -

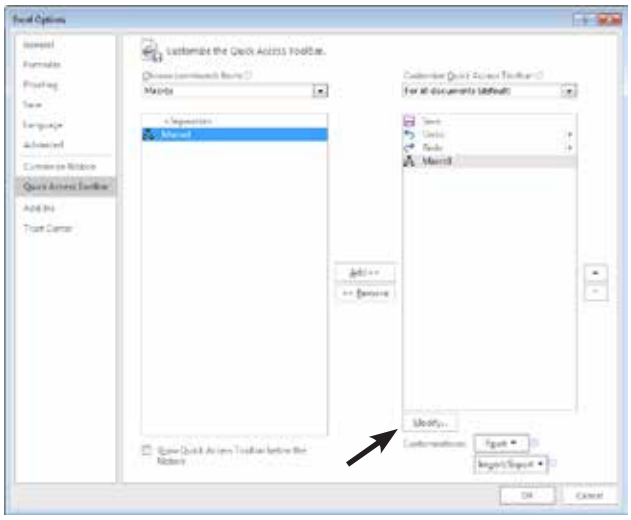
- Double-click on the **Macro** to add it to the list on the right.

Adding a Macro Button to the QAT,
continued

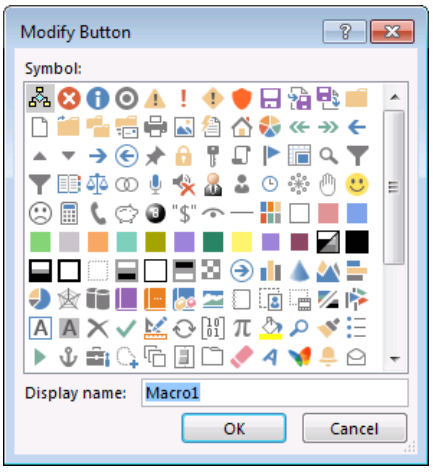
To Change the Appearance of the Button

You may want to change the button icon and the associated text so that your new **[Macro]** button can be distinguished from the other buttons in your QAT.

- Select the **Macro** from the list on the right of the *Excel Options* dialog box.



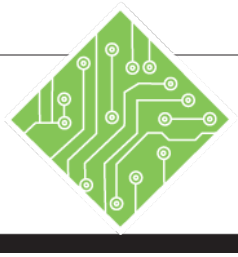
- Click on the **[Modify]** button at the bottom of the dialog box.
- Choose a different symbol to represent your **Macro**.



- Type a descriptive name in the **Display name:** field.
- Click **[OK]**.

You should now see the new button on the QAT.

Action 1.7 - Adding the macro to the QAT



Instructions:	Results/ Comments:
1. Click the drop-down arrow on the ***QAT*** and choose *More Commands*.	The *Options* dialog opens to the *Customize QAT* category.
2. From the **Choose Commands From**: drop-down choose *Macros*.	The left side panel displays any macros associated with this or personal workbooks.
3. Double click the *PERSONAL>XLSB!NewSheetLayout*.	Double clicking the macro adds it to the ***QAT*** list of commands in the right panel.
4. Select the macro from the list of commands on the QAT on the right side.	
5. Click the **[Modify]** button below the right side panel.	The *Modify Button* dialog opens.
6. Choose an ***Icon*** and click the **[OK]** button.	The icon is now used to represent the macro.
7. Click the **[OK]** button.	The *Options* dialog closes and the new button is visible on the ***QAT***.
8. Click the **[New Sheet]** button, then click the new button you just added to the ***QAT***.	The sheet now has the logo, structure and formulas in place.
9. Close your file without saving.	**[Ctrl+W]**.
10. Create a new blank workbook.	**[Ctrl+N]**.
11. Click the macro button on the ***QAT***.	The sheet now has the logo, structure and formulas in place.

Recording a Relative Reference Macro

Relative Reference Macros

All of the macros recorded up to this point have used absolute cell addressing. When looking at the VBA code generated while recording the macro, notice that the active cell is referred to by Row#Column# **(ActiveCell.FormulaR1C1)** and the selected cell or range lines of code refer to specific cells or ranges **(Range("B2:H2").Select)**. Allowing the macro to be run from any location and apply changes or additions in those specified cells in the **Range(##).Select** lines.

When recording a macro using Relative Cell Addressing, the cell addresses are replaced with offset parameters. The active cell location defines whatever cell is active at the time of recording and running of the macro. The code looks like this:

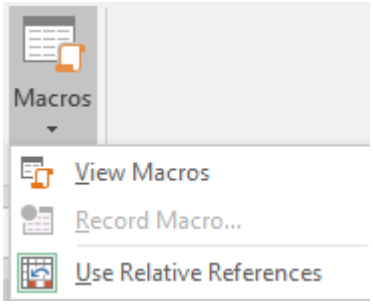
ActiveCell.Offset(1, -1)

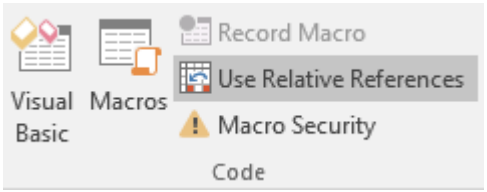
Move this many rows then columns from whatever the starting position

The first number represents the Rows while the second number represents the Columns. Positive values move down in Rows and right in Columns, negative values move the rows up and Columns left.

Turning on Use Relative References

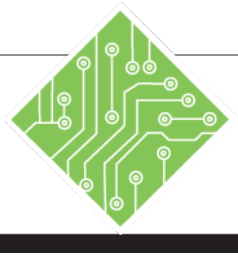
This can be done from either the **[Macros]** drop-down on the *View Tab* or the **[Use Relative References]** button in the **Code Group** on the *Developer Tab*.



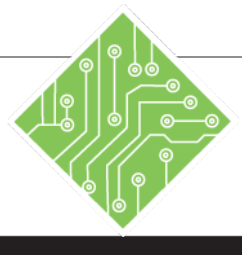


When this option is enabled it will be highlighted to show it is active. You then record the macro as before. It is a good idea to have the **A1** as the active cell before beginning to record the macro. With offsets in play it is possible to have the macro trying to move above row 1 or left of column A, both of which will cause debugging errors if the macro tries to select cells outside the normal sheet.

Action 1.8 - Relative Reference macro



Instructions:	Results/ Comments:
1. Add a new worksheet.	If necessary, create a new workbook.
2. Select cell **A1**.	
3. Click the ***Developer Tab,*** in the **Macros Group,** click the **[Use Relative References]** button.	By making this button active, you are able to run the macro based on offsets from whatever cell is active.
4. Click the **[Record Macro]** button.	The *New Macro* dialog opens.
5. In the **Macro Name:** field type; **NewDataBlock**.	
6. In the **Shortcut key**: field enter; **SHIFT W**.	
7. From the **Store macro in**: field drop-down choose; *This Workbook*.	
8. In the **Description**: field type in; < **This adds a new data block with formulas** >.	
9. Click the **[OK]** button.	The macro is now being recorded.
10. Select cell **A4** and type in; < **Jan** >.	This is the beginning of a list.
11. Use Autofill down to cell **A15**.	The list is populated.
12. Format the text to be *Bold*.	**[Ctrl+B]**.
13. Select cell **B3** and type in; < **Week 1** >.	This is the beginning of another list.
14. Use Autofill over to cell **F3**.	A numeric list of weeks is created.
15. Select cell **G3** and type in; < **Total** >.	



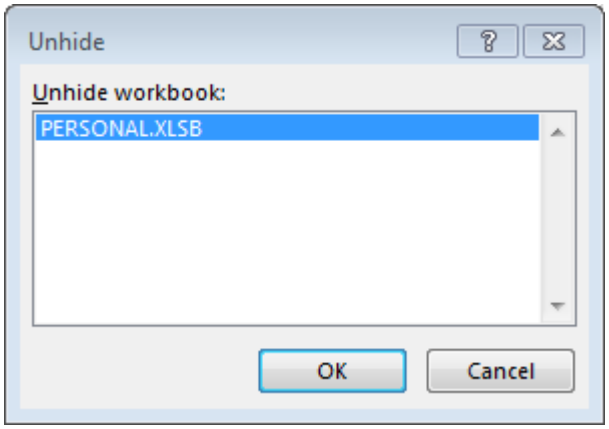
Instructions:	Results/ Comments:
16. Select cell **G4** and type in the following formula; **=SUM(B4:F4)**.	Each of the weeks in Jan are being totaled.
17. Use Autofill down to cell **G15**.	All the months of the year will now be calculated.
18. Select cell **B4**.	This will be an active cell when the macro has been run.
19. Click the ***Developer Tab,*** in the **Macros Group**, click the **[Stop Recording]** button.	The macro is completed and ready to be run.
20. Select cell **A20**.	This is where the next data block needs to be added.
21. Run the **NewDataBlock** macro.	Use the keyboard shortcut you assigned to the macro, **[Ctrl+Shift+W]**.

Removing A Personal Macro

Removing a Personal Macro Workbook Macro

When the macro stored in the **Personal Macro Workbook** is no longer necessary, you may want to delete it from the **Personal Macro Workbook**. You begin by accessing the **Personal Macro Workbook** by clicking the **[Unhide]** button in the **Window Group** on the ***View Tab***. (Refer back to page 23 for instructions on accessing the **Personal Macro Workbook**.)

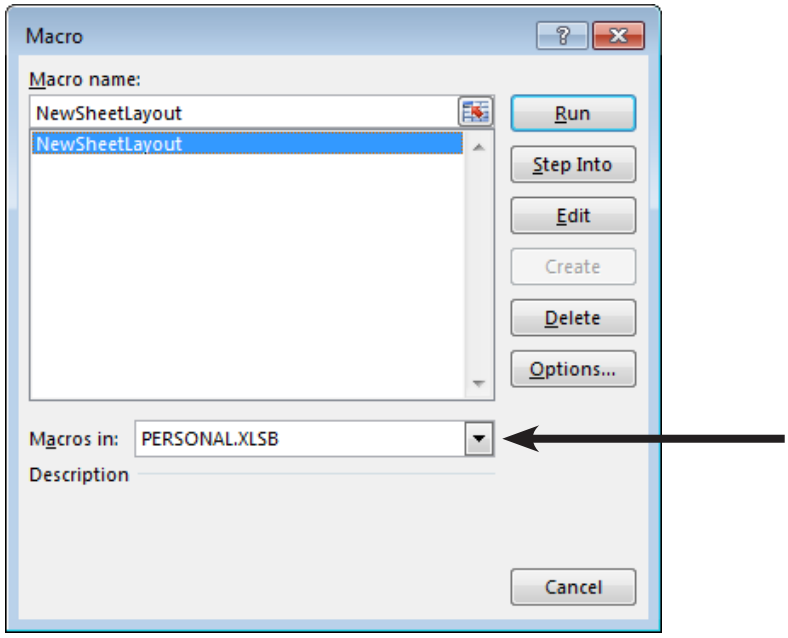
- Open a new blank file. **[Ctrl+N]**
- Activate the ***View Tab***.
- In the **Window Group**, click the **[Unhide]** button to open the *Unhide* dialog.



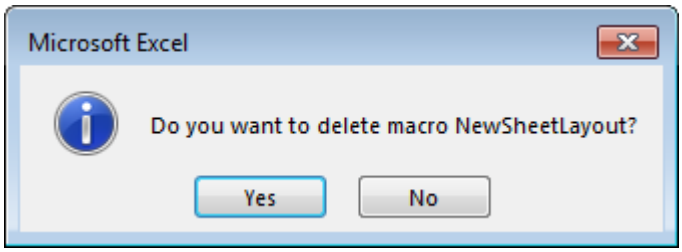
- Choose the *PERSONAL.XLSB* file and click the **[OK]** button.
- The **PERSONAL.XLSB** file opens.

  - It appears as a blank worksheet, look at the Title Bar to see that you are working in the **PERSONAL.XLSB** file.
- Activate the ***Developer Tab***.
- In the **Code Group**, click the **[Macros]** button.

- Choose the **PERSONAL.XLSB** from the **Macros in:** field drop-down menu.



- Select the unwanted macro and tap the **[Delete]** button.



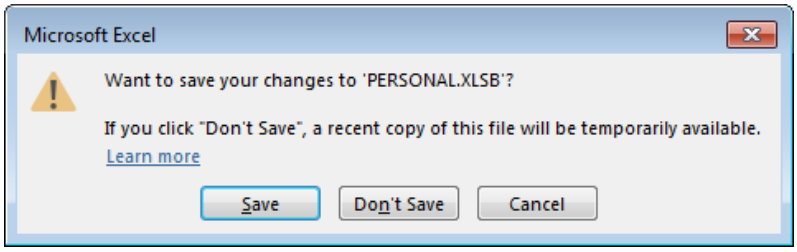
- The *Do you want to delete macro (Macro Name)* dialog appears, click the **[Yes]** button to remove the selected macro from the **PERSONAL.XLSB**.

If you simply save and close at this point the **PERSONAL.XLSB** will open every time you try to create a new workbook. This can quickly get out of hand as you try making more modifications and saving more variations, Excel will end up open several unwanted files each time the program is launched or a new file created. Be sure to follow the next steps to avoid these problems.

Resetting the Default Workbook

After deleting the unwanted macros from the **PERSONAL.XLSB** workbook, there are a few more steps to be taken to reset the default workbook.

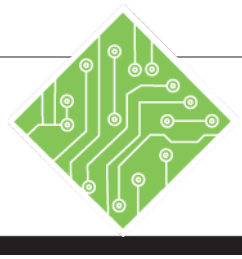
- Activate the ***View Tab***
- Click the **[Hide]** button.
  - The **PERSONAL.XLSB** is no longer active or displayed in the program titlebar.
  - There may be no worksheet in view.
- Close *Excel*.
- When the *Want to save your changes to 'PERSONAL.XLSB'?* dialog appears, click the **[Save]** button.



  - Saving the changes will keep the **PERSONAL.XLSB** workbook hidden in the future.
- Restart *Excel* and create a new workbook if necessary.

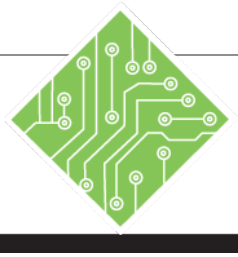
If the **PERSONAL.XLSB** reopens, repeat the steps to reset the default workbook.

Action 1.9 - Removing a Macro from the Personal Workbook

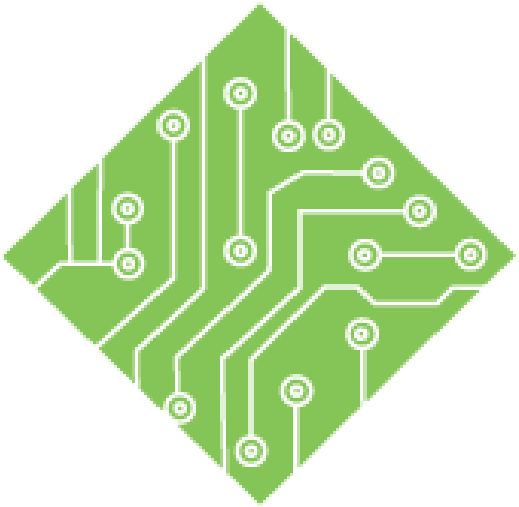


Instructions:	Results/ Comments:
1. Close any open files without saving.	**[Ctrl+W]**.
2. Create a new blank workbook.	**[Ctrl+N]**.
3. Click the ***View Tab***, in the **Window Group** click the **[Unhide]** button.	The *Unhide* dialog opens.
4. Select the **PERSONAL.XLSB** workbook and click the **[OK]** button.	The **PERSONAL.XLSB** workbook opens. Check the title in the titlebar to ensure that the correct workbook is active.
5. Click the ***Developer Tab***, in the **Code Group** click the **[Macros]** button.	The *Macros* dialog opens. You could also access the **[Macros]** button on the ***View Tab*** in the Macro Group.
6. In the **Macros in:** field drop-down, choose the *PERSONAL.XLSB* file.	This is to make sure that you are removing the macro from the **PERSONAL.XLSB** workbook and not any other.
7. Select the *NewSheetLayout* macro in the **Macro Name:** field.	All macros in the **PERSONAL.XLSB** are displayed in the **Macro Name:** field.
8. Click the **[Delete]** button.	To delete the specified macro.
9. When the *Warning* dialog opens click the **[Yes]** button.	The macro is removed from the personal workbook.

Action 1.9 - Resetting the Default Workbook



Instructions:	Results/ Comments:
1. Activate the ***View Tab***.	You will be closing the personal workbook next.
2. Click the **[Hide]** button in the **Window Group**.	The **PERSONAL.XLSB** closes. You may or may not see another workbook in *Excel*.
3. Close *Excel*.	Click the **[Close]** button or use the **[Alt+F4]** shortcut. Since you have made changes to the **PERSONAL.XLSB** file a *Save* prompt appears.
4. Click the **[Save]** button to commit the edits just made to the **PERSONAL.XLSB** file.	This includes the removal of the unwanted macro and set the view status of the **PERSONAL.XLSB** to a hidden state. *Excel* closes.
5. Restart *Excel* and open a new blank workbook.	Click the [**Blank Workbook]** button on the **Start Screen** if necessary. You should see the new workbook title be **Book1** in the program titlebar.

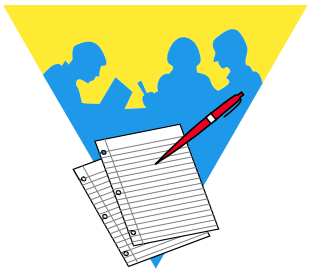


Lesson 2: Form Controls

Lesson Overview

You will cover the following concepts in this chapter:

- Form Controls
- Adding Form Controls
- Modifying Form Controls
- Adding a Combo Box
- Adding A Group Box
- Adding An Option Button
- Adding A Button
- Assigning a Macro to a Form Control



Lesson Notes

Form Controls

Another way to add functionality to your workbooks is to use *Excel's* **Form Controls**. By using **Form Controls**, you can provide a user friendly way to make choices and selections on a worksheet. You can arrange **Form Controls** to allow users to perform calculations and get results without having to interact directly with the source data. You can assign a **Macro** to a **Form Control**, and you can even use **Form Controls** to create a customized user interface for a workbook.

To create **Form Controls**, you must have the ***Developer Tab*** displayed on the ribbon. See Lesson 1 if you do not remember how to display the ***Developer Tab***.

When using **Form Controls**, you can place data lists, lookup tables, functions and formulas on a separate worksheet from the actual controls. This way, the user can access one sheet with all the controls they need, and the sheets with the actual data and formulas can be set up on a protected sheet to prevent deletion or modification.

Form Controls,
continued

What is a Form Control?

A **Form Control** is an interactive component that can be added to a worksheet. You can add a single Form Control to a worksheet, or a group of **Form Controls**. You can also combine **Form Controls** to create a simple user interface for the user to interact within a workbook.

Some of the **Form Controls** that you can choose from include:

- Check boxes
- Combo boxes
- Control buttons
- List boxes
- Option (radio) buttons
- Scroll bars

You can use Form Controls to design a workbook that encourages users to make certain choices and selections. Operations can then be performed based on the selections made. Form Controls can also be used to provide data options or choices for the user.

This allows you to manage what kind of data a user can enter or manipulate and what happens in the worksheet after a user has performed specific actions.

You can also use Active X form controls which offer a much more extensive properties that you can use to customize their appearance, behavior, fonts, and other characteristics. The draw back with these type of form controls is that the user of the file will require having Active X on the systems which means these form controls can be less accessible to people running older versions of *Excel*. In this book we will be focusing on the regular form controls.

Form Controls, continued

Form Controls in a worksheet make it easier for people to enter or edit data. A worksheet form contains controls, such as boxes or drop-down lists that can be used to make selections that trigger simple calculations, or to provide a basic interface that allows a user to interact with the workbook data.

When using **Form Controls** in your workbook, keep in mind that one type of **Form Control** may be better suited for a task than another.

The following is a list of the main **Form Controls** available in *Excel*.

The **Label Control** allows you to add a text label to a worksheet.

The **Button Control** allows you to add a button to a worksheet. (The button could be assigned to a **Macro** if you wish.)

The **Check Box Control** allows a user to make selections based on true or false values.

The **Option Button Control** can enable a single selection from mutually exclusive items in a set.

The **List Box Control** can display a list of values or choices. It is usually sized so that several rows are visible at all times. If there are more rows than can be displayed, a scroll bar appears. The user is limited to the existing values and *cannot* type a value into a list box.

The **Combo Box Control** can also display a list of choices. This list is hidden until you click the drop-down arrow. The user *can* type a value that is not in the list.

The **Scroll Bar Control** allows you to scroll through a selection of data.

The **Spin Button Control** allows you to increase or decrease a numeric value for input.

The **Group Box** button allows you to create a group box or a frame control to visually organize related items on a form.

Adding Form Controls

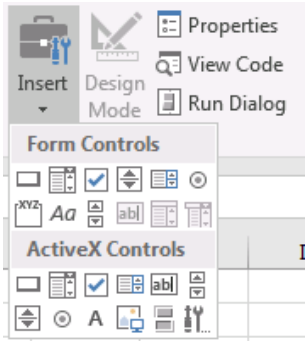
Note

In order to access the Form Controls, the ***Developer Tab*** needs to be active.

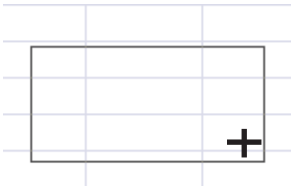
Adding a Form Control to a Worksheet

In *Excel*, it is fairly easy to add a **Form Control** to a worksheet.

- Make the ***Developer Tab*** active, if it is not visible use the methods described in the previous lesson to add it to the ribbon.
- In the **Form Controls Group**, you will see a panel of control icons like the ones described on the previous page. Mouse-over the buttons to see the screen tip that explains what they do.
- Select the **[Insert]** button drop-down to expand the list of From Controls.



- Click on the icon for the desired control. Your mouse pointer will turn into a crosshair as you move the mouse over the grid area of the worksheet.
- To create the control, click and drag the mouse pointer to draw the control on the worksheet.



- Each control will have properties that affect the behavior of the control. This course goes over a few of the controls available in *Excel*.

The process described here is basically the same for any of the **Form Controls**. The only differences are the control property modifications, and data source and link options which vary from control to control.

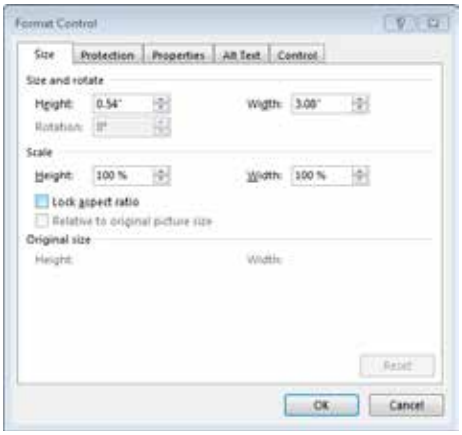
Action 2.1 - Adding a control

Instructions:	**Results/ Comments:**
1. Open a blank workbook.	**[Ctrl+N]**.
2. Activate the **Developer Tab**.	If the ***Developer Tab*** is not displayed on the ribbon, go to the *Excel* options, click the ***Customize Ribbon*** category on the left side of the *Options* dialog and then check the ***Developer Tab*** option in the right list of ribbon tabs.
3. Click the **[Insert]** button drop-down in the **Form Controls Group**.	The list of *Form Controls* are displayed.
4. Click the *List Box* control from the list of available controls.	It is the second option in the first row of options.
5. Set the cursor over cell **B6** click and drag over to cell **C10** and let go of the mouse button.	The cursor is a crosshair,which indicates you are ready to draw out the chosen form control. When you let go of the mouse the control is added to the worksheet.
6. Click into any cell to deselect the control.	The resizing handles disappear.
7. Right-click the control to re-select it.	This is the method to reselect a form control for editing or repositioning.
8. Examine the list of option in the contextual menu.	Depending on the control different options are available.

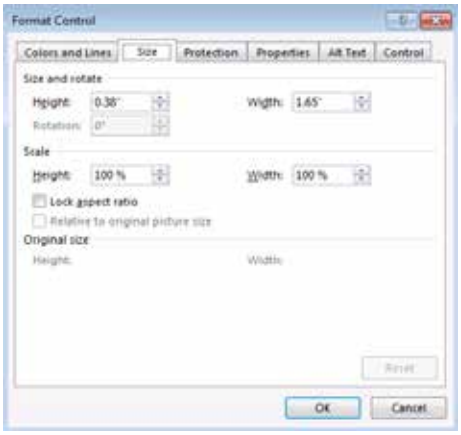
Modifying Form Controls

Modifying the Control

- Right-click the control to reselect it and display a contextual menu related to the control.
- When the resizing handles are displayed you can manually resize the control. To move the control, hover over it until the four sided arrow is displayed, then click and drag it into position.
- To access the *Form Control* dialog box, right-click the control and choose *Format Control* from the menu. The *Format Control* dialog box will be displayed.

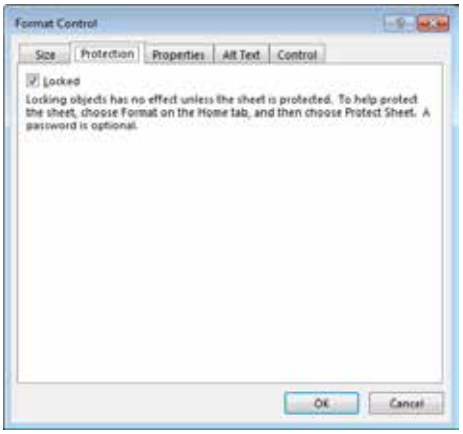


- The *Format Control* dialog offers several tabs to control the appearance and functionality of the form control.
  - On the ***Size Tab***, you will find options to modify the size of the control.

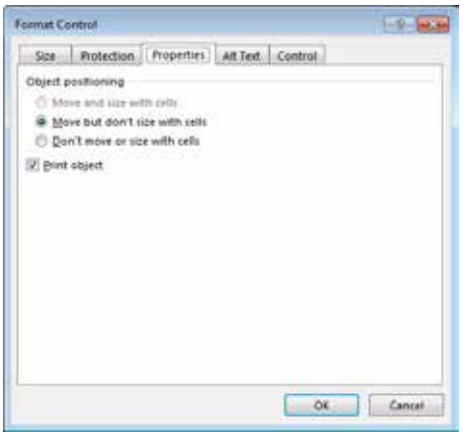


Modifying Form Controls,
continued

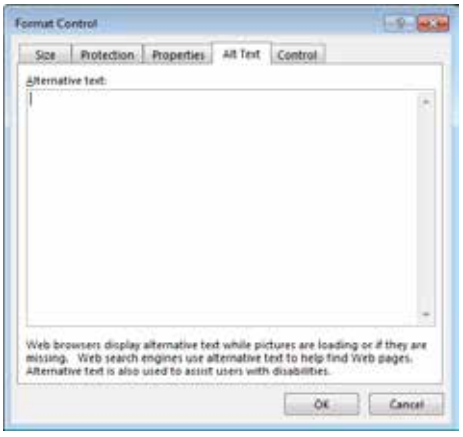
- On the ***Protection Tab***, you can choose to lock or unlock the control (used with protected worksheets).



- On the ***Properties Tab***, you can modify how the **Control** is positioned when cells are moved or resized. You can also specify whether or not you want the control to be printed with the worksheet.

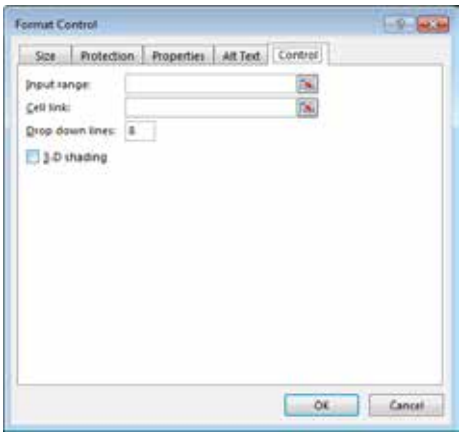


- The ***Alt Text Tab*** has options for displaying alternative text for the control.



Modifying Form Controls,
continued

- On the ***Control Tab***, you will find options specific to the type of control you have selected.



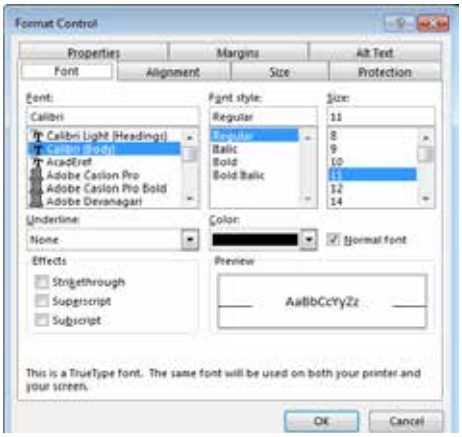
  - For a **List Box** or **Combo Box Control**, you may find options for specifying the input range, (a specific cell range containing the data that will appear in the list), and the cell link, which is the cell that will receive an index value corresponding to the item chosen from the list. When you make a selection from a list box, *Excel* will place the index value into the specified cell link.
  - For a **Checkbox** or **Option Button Control**, you may find options for the default selection, as well as the cell link and an option to apply 3-D effects to the box itself.
  - For a **Scroll Bar** or **Spin Box Control**, you will find options to set the default value, as well as the range of options and in what increments those options show. You can also specify the cell the data is linked to and whether or not the **Scroll Bar** or **Spin Box Control** should have a 3-D effect applied.


List Options


Combo Options

Modifying Form Controls,
continued

- The *Formatting Control* dialog offers other tabs allowing you to format the text and appearance of the button control.



Action 2.2 - Examining the Format Controls Dialog

Instructions:	Results/ Comments:
1. Click into cell **H1** and type in; **< Monday >.**	You are setting up the input range for the form control.
2. Use the Autofill handle to add the rest of the weekdays down to cell **H7**.	The rest of the weekdays are added to the worksheet.
3. Right-click the control you just added before and choose *Format Control* from the contextual menu.	The *Format Control* dialog opens.
4. Click the ***Size Tab*** in the dialog.	The size controls are now displayed in the dialog.
5. Set the **Height** to **2.5"** Set the **Width** to **2"**	The size of the control is now set.
6. Click the ***Protection Tab*** to see that the control is *locked*.	This tab offers the same type of object or cell protection as the ***Protection Tab*** in the *Format Cells* dialog.
7. Click the ***Properties Tab***.	Examine the options of how the control will react when changes are made in the worksheet.
8. Uncheck the **Print object** checkbox.	Now the control will not be included when the worksheet is printed.
9. Click the ***Alt Text Tab***, click in the **Alternative Text** field and type in; **< Click here to choose the day from the list. >.**	This tab allows you to enter text which will be read aloud for the visually impaired, this is part of ensuring that your document is ADA compliant. ***(ADA = American Disabilities Act)***
10. Click the ***Control Tab***.	From this tab you can add functionality to the control.
11. Click into the **Input range** field, then highlight cells **H1:H7**.	Here, you are connecting the cells that contain the values to be displayed in the drop-down.

Instructions:	Results/ Comments:
12. Click into the **Cell Link** field and click cell **A6**.	Here you are setting the location where the choice from the list will be displayed in the workbook.
13. Click the **[OK]** button.	The *Format Control* dialog is closed and all setting applied.
14. Deselect the control.	Click any cell on the worksheet.
15. Click the day to select from the list.	Use the Left mouse button to interact with the control. The list of weekdays has been added to the form control and when one is chosen the numeric position of the choice is displayed in cell **A6**.
16. Close the file without saving.	**[Ctrl+W]**.

Adding a Combo Box

The Combo Box Control

A Combo Box control combines a text box with a list box to create a drop-down list. Unlike a list box, the user is required to click the down arrow to display the list of items.

The Combo Box can use a range of existing cells to populate the drop-down list as well as return a value into another cell based on the choice made. The returned value is simply the numeric position of the choice within the list.

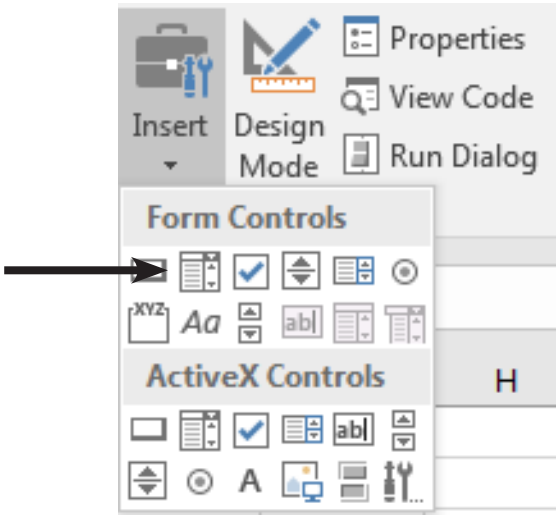
Choice	Return Value
January	1
February	2
March	3
April	4
May	5
June	6

This is a very useful control when the returned value is used in a **Vlookup**, **Hlookup**, **Match**, **Index**, or even an **If** formula.

Adding the control

Note: It is easiest to add the list of choices into a cell range somewhere within the current workbook before adding the control.

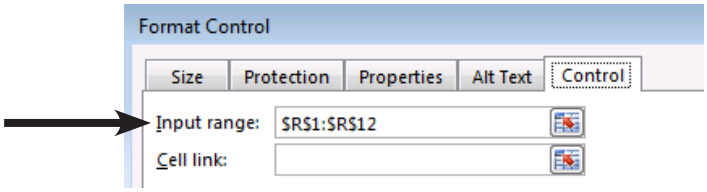
- Click the ***Developer Tab*** to activate it.
- Click the **[Insert]** button in the **Controls Grou**p and choose the *Combo Box* control.



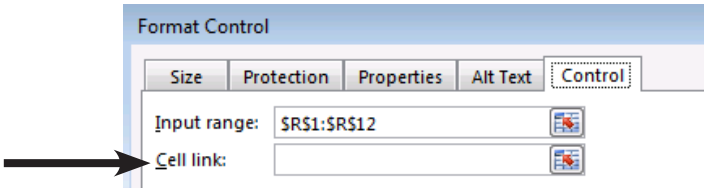
- Draw out the control where you want on the worksheet.
- Add functionality to the control by right-clicking it and choosing *Format Control* from the contextual menu.

Adding a Combo Box,
continued

- In the *Format Control* dialog, activate the Control tab.
  - In the **Input range:** field, select the cells containing the values to be used in the list.



  - In the **Cell link:** field, select the cell where the numeric value of the selection will be placed.



Action 2.3 - Adding a Combo Box Control

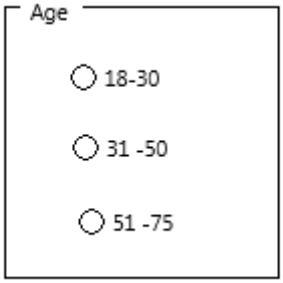
Instructions:	Results/ Comments:
1. Open the **MonthlyTotalsNew.xlms** file.	**[Ctrl+O]**, It is located in the course Data Files folder.
2. Click the **[Enable Content]** button and examine the structure of the file.	This file has all the worksheets needed already built.
3. Activate the ***Control Sheet***.	This worksheet has the list of months for the Combo Box drop-down list.
4. Double click cell **D9** and examine the formula in the cell.	This cell has a nested If formula designed to pull information from the appropriate worksheet depending on the month selected from the Combo Box list.
5. Tap the **[ESC]** key to exit editing the formula without changing anything.	
6. Activate the ***Main sheet*** and select cell **A16** and type in; < **Month** >.	
7. Click the ***Developer Tab***, in the **Controls Group** click the **[Insert]** button.	The list of controls are displayed.
8. Select the *Combo Box* control.	The second option in the top row.
9. Set the cursor over the upper left corner of cell **B16**, click and drag over to lower right corner of cell **C16**.	The Combo Box control has been added to the worksheet.
10. Right-click the control and choose *Format Control* from the contextual menu.	The *Format Control* dialog opens.
11. Click the ***Alt Text*** tab.	The ***Alt Text*** tab is now active.
12. Click into the **Alternative text:** field, and type in; < **Choose a month from the list** >.	You have added text that will be read by screen reading applications for the visually impaired.
13. Click the ***Control*** tab.	The ***Control*** tab is now active.

Instructions:	Results/ Comments:
14. Click into the **Input range:** field, then click the **[Collapse Dialog]** button and select the ***Contro***l sheet and select cells **B2:B7**. Click the **[Expand Dialog]** button to show the full dialog again.	The Collapse Dialog button is located at the right side of the input field. These cells contain the information to be added to the Combo Box drop-down.
15. Click into the **Cell Link:** field, then click the **[Collapse Dialog]** button and select the ***Control*** sheet and select cell **C9**. Click the **[Expand Dialog]** button to show the full dialog again.	When a choice is made from the list of options, the numeric value of that choice's position in the list will be entered into this cell.
16. Click the **[OK]** button.	The *Format Control* dialog is closed and the changes applied to the control.
17. Select cell **D16** and type in; **< =Control!D9 >.** and press the **[Enter]** key.	This is a 3D reference back to cell **D9** on the ***Control*** worksheet.
18. Click the Combo Box control and choose a month from the list to see the value in cell **D16** change.	As you make a selection from the list the value displayed in **D16** shows the amount of units sold in relation to the month chosen.
19. Save the file.	**[Ctrl+S]**.

Adding A Group Box

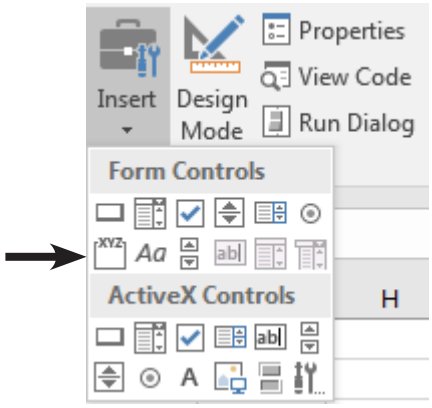
The Group Box Control

Group box controls used to group and label sets of related controls. Use a group box or a frame control to visually organize related items on a form. Think of a set of choices in response to a question like Age, where users are to choose from a series of options.



Adding the Group Box Control

- Click the **[Insert]** button in the **Controls Group** on the ***Developer Tab***.
- Choose the *Group Box* option, it is the first option in the second row of ***Form Controls***.



- Draw out the Group Box where you want it on the worksheet.
  - The Group Box will be named Group Box by default. As you create others, they will be numbered as well.
- Right-click the default text and chose *Edit Text* from the contextual menu.

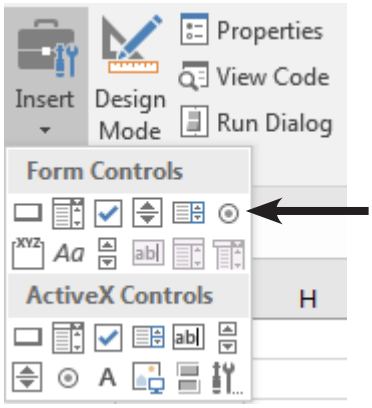
Adding An Option Button

Option Button Controls

Option Button controls look and function like Radio buttons and are good to use within Group Boxes. As the user selects an option the Cell Link will return the numeric value of the choice made. The values are set by the order of the button's creation.

Adding Option Button Controls

- Click the **[Insert]** button in the **Controls Group** on the ***Developer Tab***.
- Choose the *Option Button* option, it is the last option in the first row of ***Form Controls***.



- Click where you would like the Option Button placed to use the default size or draw out the Option Button to size where you want on the worksheet.
  - Continue adding Option Buttons for each choice you want to make available. (Remember not to deselect the completed Option Button before creating the next.)
- Right-click the default text and chose *Edit Text* from the contextual menu.

Note

Do not deselect the Option Button control before creating the next one. If you do the series of Option buttons will not be related. In essence you will create two separate lists of choices.

Note

When drawing the new Option buttons, do not let their edges touch the edge of the Group Box control or they will not be part of the options set in the Group Box.

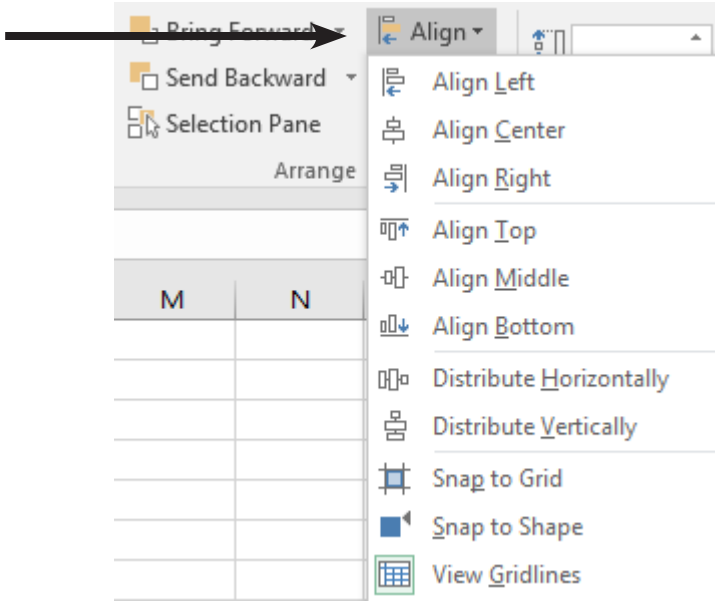
Selecting and Arranging a group of Option Buttons

Once all the Option Buttons have been created and named, you may want to align and distribute them so as to make them look well organized.

- To select a control: right-click the control.
- Hold the **[CTRL]** key and click each subsequent control.

Adding An Option Button, continued

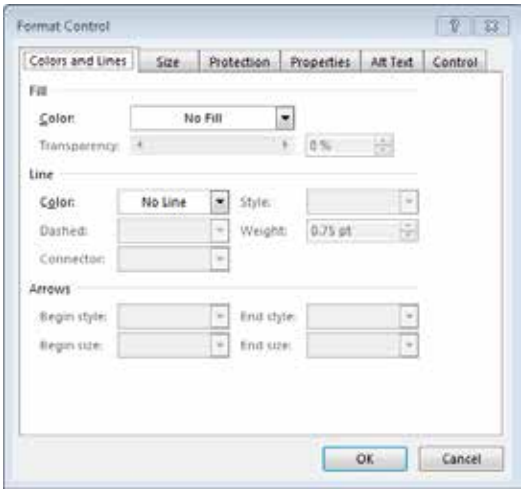
- Activate the ***Format Tab*** in the ribbon
- Click the **[Arrange]** button in the **Arrange Group** to access alignment options.



- Choose the appropriate option.

Adding Functionality to the Option Buttons

- Select all the related Option Buttons.
  - Use same method as described earlier.
- Right-click any of the selected buttons and choose *Format Object* from the contextual menu.
  - In the *Format Controls* dialog you will notice a new tab for formatting the appearance of the controls.



Adding An Option Button, continued

- Select the Control tab
  - Set the **Value** as *Unchecked*.
  - Set the **Cell link:** to where you want the value of the selected option to be returned.
  - Click the **[OK]** button to apply the changes to the Option Button set.

Action 2.4 - Adding a Radio Button Group

Instructions:	Results/ Comments:
1. The **MonthlyTotalsNew.xlms** file should still be open.	If not reopen the file.
2. Activate the ***Developer Tab***.	
3. Click the **[Insert]** button drop-down in the **Controls Group** and select the *Group Box* option.	This will be the first option in te second row.
4. Set the cursor over the top left corner of cell **B18** and drag down to lower right corner of cell **C30**.	You are defining the size and location of the Group Box.
5. Right-click the Group Box text and choose *Edit Text* from the contextual menu.	The text for the Group Box can now be modified to suit your needs.
6. Type in; < **Months** > and delete the other existing text.	
7. Do not deselect the control.	The control must remain selected in order for *Excel* to group the Group Box with the Option Buttons to be added.
8. Click the **[Insert]** button drop-down in the **Controls Group** and select the *Option Button* option.	If necessary, reactivate the Developer Tab to access this command.
9. Click over the middle of cell **B19**.	The Option Button is added, using the default size and text.
10. Right-click the Option Button control and choose *Edit Text* from the contextual menu.	The Option Button label is active and can be modified.
11. Type in; < **January**> and delete the other existing text.	This is the first radio button option of the list you are creating within the Group Box.
12. Do not deselect the control.	

Instructions:	Results/ Comments:
13. Repeat steps 8 through 12 for each of the remaining months to June.	When creating each Option Button, create them two cells below the one above.
14. Right-click the last control you edited and choose *Format Control* from the menu.	The *Format Controls* dialog opens, notice you now also have access to a Color and Lines Tab in the dialog.
15. Activate the ***Control Tab*** in the dialog.	
16. Leave the ***Value*** as *Unchecked*.	
17. Click into the **Cell link:** field and select cell **C9** on the ***Control*** worksheet.	This will populate the cell link with the numeric value of the Option Button selected.
18. Click the **[OK]** button.	The *Format Control* dialog closes.
19. Hold the **[CTRL]** key and click each of the Option Button controls in the Group Box.	By holding the **[CTRL]** key while clicking each Option Button, you are adding to the current selection.
20. Activate the ***Format Tab*** in the ribbon.	The formatting controls are available.
21. Click the **[Align]** drop-down button in the **Arrange Group** and select *Align Left*.	The selected objects are now all aligned.
22. Click the **[Align]** drop-down button in the **Arrange Group** and select *Distribute Vertically*.	The selected objects are now all evenly spaced apart.
23. Deselect the controls.	Click into any cell on the worksheet.
24. Test the radio buttons you just made.	As you click one Option Button the number of units sold that month are displayed.
25. Save the file.	**[Ctrl+S]**.

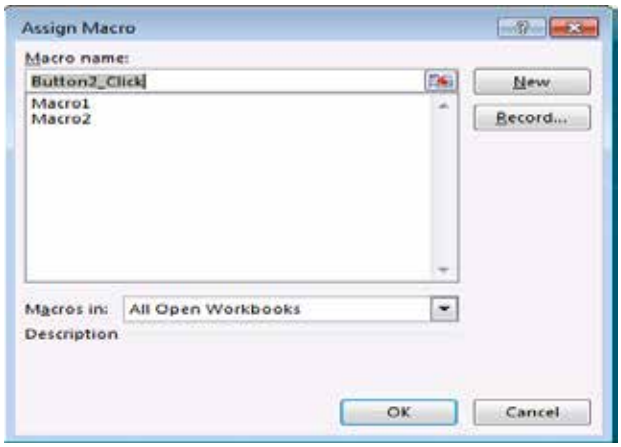
Adding A Button

The Button Form Control

- Select the *Developer Tab*.
- Click **[Insert]**.
- Select the **[Button]** control.
- Draw a button shape on the spreadsheet and the following dialog box will be displayed.

Note

If the file already has macros in it they are displayed in the list.

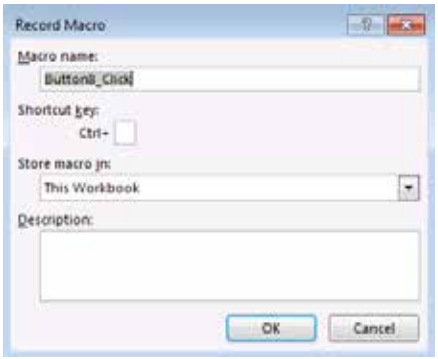


- Type in a **Macro Name** for your button.
- Click [**Record]**. The *Record Macro* dialog box is displayed.

Note

If you click **[New]** instead of **[Record]** you will be taken to the Visual Basic Editor to type in the commands.

- Type in the **Macro name:** and **Description:**. Click **[OK]**.



- Go through the steps needed for your button action. When finished, make sure you stop recording.
- To change the name on the button, right-click the button and choose *Edit Text*.

Assigning a Macro to a Form Control

Assigning a Macro to a Form Control

Before you assign a **Macro**, you should make sure that the purpose of the button is clear.

Changing the Name of the Form Control Button

- Right-click on the **Form Control**.
- Choose *Edit Text* from the shortcut menu.
- Select the default text and type a short, descriptive name.

If you select the *Format Control* option from the pop up menu, you can change the font type and size of the button's text as well as other attributes.

Assigning or Recording a Macro

- Right-click on the **Form Control**.
- From the shortcut menu, choose *Assign Macro.*. (The label control and the group box control do not have a **Macro** option available on the menu.)
- The *Assign Macro* dialog box is displayed. You can choose a **Macro** from the list to assign or you can record a new one.

- Click **[OK]**.
- If you choose to record a **Macro**, perform the steps you want attached to the **Form Control** and then stop the **Macro**.
- After you have assigned the **Macro**, you will be taken back to the spreadsheet. Click away from your new **Form Control** to deselect it. It is ready to use.

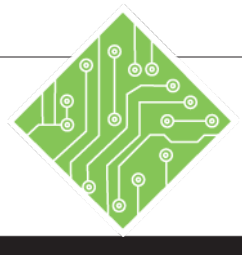
Action 2.5 - Adding a Button

Instructions:	Results/ Comments:
1. The **MonthlyTotalsNew.xlms** file should still be open.	If not, reopen the file.
2. Activate the ***Developer Tab***.	
3. Click the **[Insert]** button drop-down in the **Controls Group** and select the *Button* option.	The first button in the first row of options.
4. Set the cursor over the top left corner of cell **E9** and drag down to lower right corner of cell **F10**.	To define the size and location of the button.
5. In the *Assign Macro* dialog choose *CommandButton1_Click* and then click the **[OK]** button.	As soon as you finish drawing out a button control the *Assign Macro* dialog appears. You can choose to record a new macro or use an existing macro.
6. Right-click the new button and choose *Format Control* from the contextual menu.	The *Format Control* dialog opens, by default to the ***Font*** tab.
7. On the ***Font*** tab in the *Format Control* dialog, set the font to ***Trebuchet***, ***Bold***, and ***14pt***.	You are defining the appearance of the text on the button.
8. On the ***Alt Text*** tab; type in; **< Click here to print the selected month's detail page >.**	You are adding accessibility to the button in order to be ADA compliant.
9. Click the **[OK]** button.	The *Format Control* dialog closes.
10. Right-click the button again and choose *Edit Text* from the contextual menu.	
11. Replace the current text with < **PRINT**>.	The button is now renamed.
12. Go to the Print Preview screen.	**[Ctrl+P]**.
13. Click the **[Printer]** drop-down button and choose the *Adobe PDF Printer* from the list of available printers.	This will set the Adobe PDF Printer as the default printer. You may need to use the Microsoft XPS Document Writer.

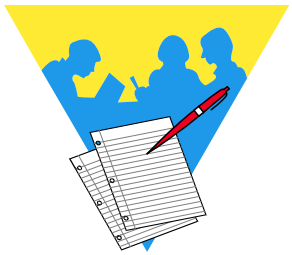
Instructions:	Results/ Comments:
14. Exit the Print Preview screen.	Tap the **[ESC]** key or click the **[Go Back Arrow]** button in the upper left of the screen.
15. Use the Option buttons or the Combo Box to select a month.	
16. Click the **[Print]** button.	The *Save PDF As* dialog opens.
17. Save the PDF to the desktop without changing the file name.	This way the PDF can be easily found later if necessary.
18. Preview the PDF and close *Acrobat*.	*Acrobat* opens the PDF, it should be a copy of the month worksheet for the month you choose.
19. Go back into the *Excel* file and try changing the month choice and running another print.	When the Save PDF As dialog opens, simply replace the existing file on the desktop.
20. Preview the PDF and close *Acrobat*.	*Acrobat* opens the PDF, it should be a copy of the month worksheet for the month you choose.
21. Save the file.	**[Ctrl+S]**.

Action 2. 6 - Examining the Print Macro

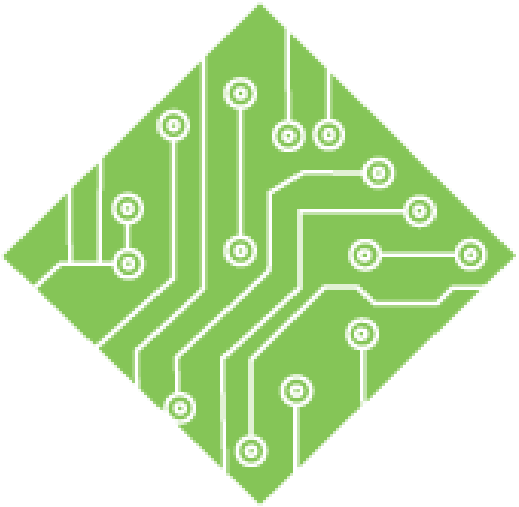
Instructions:	**Results/ Comments:**
1. Activate the ***Developer Tab*** and click the **[Macros]** button in the **Code Group**.	The *Macro* dialog opens.
2. Select the *CommandButton1_Click* macro and click the **[Edit]** button.	The selected macro is opened in the VBA editor.
Sub CommandButton1_Click()	Begins the macro and sets the trigger as _Click()
Select Case ThisWorkbook.Sheets("Control"). Range("D9")	This line defines where the macro will look to see the Case to print.
Case 1 *Call PrintJan* *Case 2* *Call PrintFeb* *Case 3* *Call PrintMar* *Case 4* *Call PrintApr* *Case 5* *Call PrintMay* *Case 6* *Call PrintJun*	If Control!$C$9 has the value of 1 in it then Case 1 will call the PrintJan macro. If Control!$C$9 has the value of 2 in it then Case 2 will call the PrintFeb macro. If Control!$C$9 has the value of 3 in it then Case 3 will call the PrintMar macro. If Control!$C$9 has the value of 4 in it then Case 4 will call the PrintApr macro. If Control!$C$9 has the value of 5 in it then Case 5 will call the PrintMay macro. If Control!$C$9 has the value of 6 in it then Case 6 will call the PrintJun macro.
End Select	
End Sub	Completes the macro.
3. Close the *VBA* editor without making any changes.	
4. Now to look at the Print(Month) macro.	The Print(Month) macros were each created as recorded macros.
5. Activate the ***Developer Tab*** and click the **Macros** button in the **Code Group**.	The *Macro* dialog opens.
6. Select the *PrintApr* macro and click the **Edit** button.	The selected macro is opened in the *VBA* editor.



Instructions:	**Results/ Comments:**
Sub PrintApr()	Definition of macro begins.
'	
' PrintApr Macro	Macro name, macro metadata.
'	
'Sheets("April").Select	Defines which worksheet is to be selected.
ActiveWindow.SelectedSheets.PrintOut Copies:=1, Collate:=True, _ IgnorePrintAreas:=False	Activates the print command and sets number of copies and other general print settings.
Sheets("Main").Select	Makes the Main worksheet as active.
End Sub	End of the macro.
7. Close the *VBA* editor without making any changes.	
8. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.



Tips and Notes

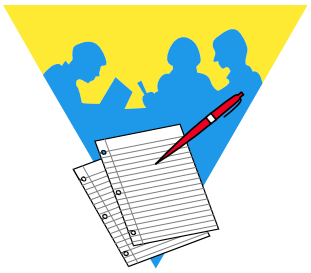


Lesson 3: Hyperlinks and Connecting to the Internet

Lesson Overview

You will cover the following concepts in this chapter:

- What is a Hyperlink
- Creating a Hyperlink
- Modifying Hyperlinks
- Querying Data from a Website
- Editing A Query



Lesson Notes

What is a Hyperlink

In this lesson, you will learn about hyperlinks and the Internet. You will learn how to insert hyperlinks into a worksheet, modify hyperlinks in a worksheet, and browse hyperlinks in *Excel*.

What is a Hyperlink?

A hyperlink is an object in a file that links to another location in the same file, or to another file altogether.

Some important points to remember:

- A hyperlink is used as an active link to another object.
- Hyperlinks usually appear in the form of an underlined word or phrase in a bright blue font. Hyperlinks can be created on a word, phrase, symbol, picture, or graphic.
- Each hyperlink to a web location has an address called a URL (uniform resource locator) associated with it. A URL is associated with a hyperlink to provide information on how to retrieve the linked object. A typical URL could look something like: **http://www.something.org**.
- You can create hyperlinks to locations within the same file, local or remote files, Web pages, media objects, and e-mail recipients.
- Hyperlinks should link to publicly available files or Web pages. For example, if Sue sends me a workbook with a hyperlink to a file on her computer, I am probably not going to be able to access that file (unless we are on the same network and that file or folder is shared).

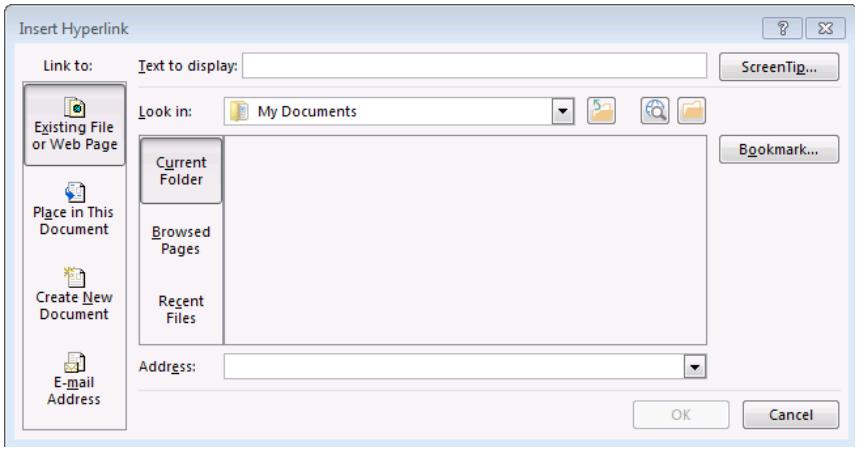
Creating a Hyperlink

Note

Another way to create a hyperlink in a worksheet is to select a cell, right-click on it, and choose the *Hyperlink* option from the shortcut menu. Or, press **[Ctrl+K]**.

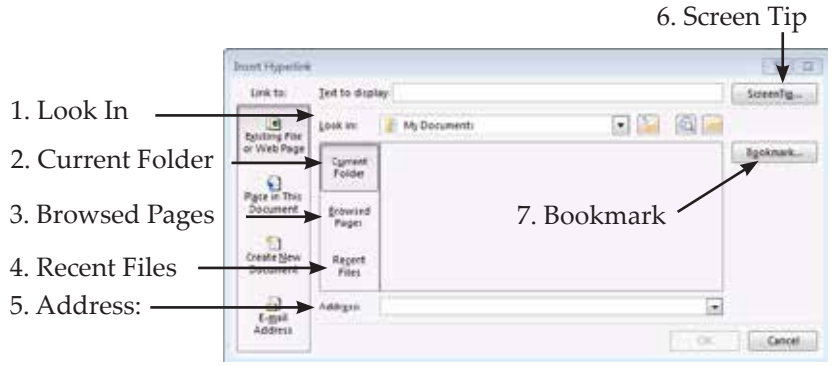
Inserting Hyperlinks

- Select the cell that will contain your hyperlink.
- Select the ***Insert Tab***.
- Click the **[Hyperlink]** button.
- The *Insert Hyperlink* dialog box will be displayed.
- Under the **Link to:** heading, choose what you want to link to. The information the dialog box will ask for depends on which of the following you choose.
  - Existing File or Web Page
  - Place in This Document
  - Create New Document
  - E-mail Address
- In the **Text to display:** field, located at the top of the dialog box, type the text for your hyperlink if there isn't already text in the cell. This text will appear as a blue underlined hyperlink in the cell that you have selected.
- When you are finished making your selections, click **[OK]**, You will be returned to your worksheet and the linked text will be underlined.



Creating a Hyperlink, continued

Link to Existing File or Web Page



Look in: Field

- **Current Folder** displays in the drop-down list the files and subfolders of the current folder.
- **Browsed Pages** displays a list of the URL's for Web pages you recently visited.
- **Recent Files** displays a list of recently accessed files.

Address: Field

- The file or object referred to in the address field will be the target of the hyperlink. Making a selection from any of these lists will enter the URL (or address) of the file into this field or type a URL for a Web page or remote file, or the path to a local file directly into the **Address:** field.

Screen Tip... Button

- Click this button to add a brief comment that will appear when the mouse pointer hovers over the hyperlink. The text will also be read by screen reading programs for the visually impaired.

Bookmark... Button

- Click to link to an existing bookmark in an **Excel** workbook. First, select the **Excel** file from the list, and then click the **[Bookmark]** button to specify the exact location within the selected workbook.

Note

To find the URL of a website, click on the **[Browse the Web]** button, navigate to the page in your browser and simply minimize the browser. The URL will appear in the **Address:** field.

Creating a Hyperlink, continued

Link to Place in this Document

This type of link can be useful when writing macros to navigate through the workbook.

Text to display: Field

- This is the text that will show in the cell. You can type it directly into this field or you can type it in the cell prior to clicking the **[Hyperlink]** button.

Type the cell reference: Field

- This will be the cell location on the sheet designated in the **Or select a place in this document:** list. It could be in the current sheet or on another sheet in this workbook.

Or select a place in this document: Field

- This shows a list of worksheets and range names in the current workbook to choose from.

Screen Tip... Button

- Click this button to add a brief comment that will appear when the mouse pointer hovers over the hyperlink.

Link to Create New Document

Text to display: Field

- This is the text that will show in the cell. You can type directly into this field or you can type it in the cell prior to clicking the **[Hyperlink]** button.

Name of new document: Field

- Type an appropriate name in the text box.

Full path Field

- Displays the current location and the name of the new workbook. Click **[Change]** to select a new location.

When to edit: Field

- If you choose to *Edit the new document now*, the new spreadsheet will be opened when the hyperlink is activated.

Screen Tip... Button

- Click this button to add a brief comment that will appear when the mouse pointer hovers over the hyperlink.

Creating a Hyperlink, continued

Link to E-mail Address

Text to display: Field

- This is the text that will show in the cell. You can type directly into this field or you can type it in the cell prior to clicking the **[Hyperlink]** button.

E-mail address: Field

- Type the e-mail address of the recipient of the automated E-mails.

Subject: Field

- Type a subject for your e-mail if you would like this automatically filled in.

Recently used e-mail addresses: Field

- A list of e-mail addresses you have already used.

Screen Tip... Button

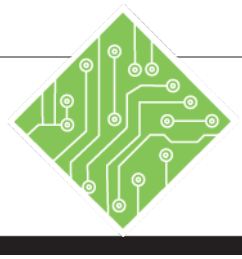
- Click this button to add a brief comment that will appear when the mouse pointer hovers over the hyperlink.

To Follow a Hyperlink in Excel

- Trace over the link until the mouse pointer turns into a pointing hand.
- Click on the hyperlink. You will be taken to the location of the link - even if it is in another application such as *Microsoft Word, Access,* or on the Web.

Action 3.1 - Creating Page Navigation Hyperlinks

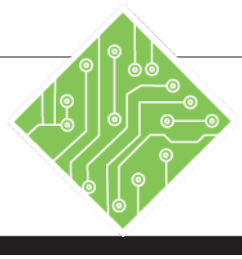
Instructions:	Results/ Comments:
1. Open the file named **SheetNavigation.xlsx**.	Located in your class data folder.
2. Save the file as **My Links**	**[F12]**.
3. On ***Main*** sheet select cell **C1**.	
4. Type: < **Jan** >.	This is a regular text label for a cell.
5. Select cell **C1** and use the autofill handle across to cell H1.	
6. Reselect cell C1.	
7. Click the ***Insert Tab*** and click the **[Hyperlink]** button.	**[Ctrl+K]**. The *Insert Hyperlink* dialog opens.
8. In the **Link to:** field, click **[Place in This Document]**.	A list of all the sheets in the workbook are displayed.
9. Select *Jan* from the list	***Jan*** is the sheet name.
10. Click the **[Screentip...]** button next to the **Text to display:** field.	The *Set Hyperlink ScreenTip* dialog opens.
11. In the **ScreenTip text:** field type in; < **Click here to go to the Jan sheet.** > and click the **[OK]** button.	This text will be displayed as the user hovers over the link, it will also be read aloud by screen reading applications. (ADA compliance)
12. Click the **[OK]** button.	The *Insert Hyperlink* dialog closes.
13. Click the link to verify that it works.	The ***Jan*** sheet should now be the active worksheet.
14. Reactivate the ***Main*** sheet.	Click on the ***Main*** sheet tab.
15. Repeat steps 7 through 10 to create links for **Feb** through **Jun** in cells **D1:H1** respectively.	Direct each link to the correct worksheet and adjust the ScreenTips accordingly.



Instructions:	Results/ Comments:
16. Select cells C1:H1 on the ***Main*** sheet tab and copy the cells.	**[Ctrl+C]** to copy or right-click and choose Copy from the menu.
17. Select the ***Jan*** through ***Jun*** sheets.	Click the ***Jan*** sheet tab, hold the **[Shift]** key and click the ***Jun*** sheet tab.
18. Click into cell **C1** and paste the copied cells.	**[Ctrl+V]** to paste or right-click and choose *Paste* from the menu. All the worksheets selected now have the sheet navigation links pasted.
19. Save the file and leave it open.	**[Ctrl + S]**.

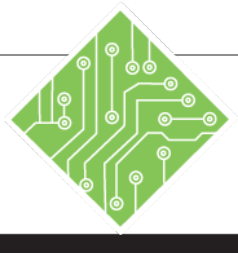
Action 3.2 - Adding a hyperlink to an Object

Instructions:	Results/ Comments:
1. **My Links** should still be open.	If not, reopen the file.
2. Activate the ***Jan*** sheet tab.	
3. Click the ***Insert Tab,*** in the **Illustrations Group,** click the **[Insert Shape]** button drop-down.	The list of available shapes are displayed in the drop-down.
4. Choose the *Rounded Rectangle*.	The sixth button in the top row of options.
5. Draw out the shape starting at the upper left corner of cell **A1** to **A2**.	To define the size and location of the shape.
6. Type in:; < **HOME** >.	The shape is a textbox by default so you are simply adding text to the textbox.
7. Right-click the shape and choose *Format Shape* from the menu.	The *Format Shape* pane opens on the right side of the screen.
8. In the *Format Shape* pane, click *Shape Options* then the **[Size & Properties]** button.	Options pertaining to shape size and properties are displayed in the pane.
9. Expand the ***Textbox*** set of controls and set the **Vertical alignment** to *Middle*.	The text is now vertically centered.
10. Expand the ***Properties*** set of controls and uncheck the ***Print Object*** checkbox.	If this sheet is printed, the button will not be included in the print.
11. Close the *Format Shape* pane.	Click the **[Close]** button in the *Format Shape* pane.
12. Click the ***Home Tab,*** in the **Alignment Group,** click the **[Center Align]** button.	The text is now also horizontally centered in the shape.
13. Select the shape if necessary.	
14. Click the ***Insert Tab,*** in the **Links Group,** click the **[Hyperlink]** button.	**[Ctrl+K]** or right-click the shape and choose Hyperlink from the menu.
15. In the **Link to:** field, click **[Place in This Document]**.	This will be another internal link.



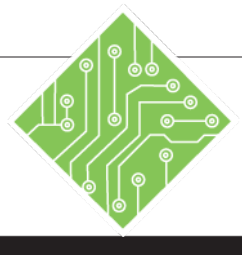
Instructions:	Results/ Comments:
16. Select *Main* from the list	To define what sheet will be active when the link is clicked.
17. Click the **[Screentip...]** button next to the **Text to display:** field.	The *Set Hyperlink ScreenTip* dialog opens.
18. In the **ScreenTip text:** field type in; **< Click here to go Back to the Main sheet. >** and click the **[OK]** button.	You are making this link ADA compliant. The *Set Hyperlink ScreenTip* dialog closes.
19. Click the **[OK]** button.	The Insert Hyperlink dialog closes.
20. Select and copy the shape.	**[Ctrl+C]** or right-click the shape and choose Copy from the menu.
21. Go to cell **A1** on each of the remaining month worksheets and paste the hyperlinked shape into place.	**[Ctrl+V]** or right-click the shape and choose Paste from the menu.
22. Test the links.	Using the links, you should be able to move back and forth through the worksheets.
23. Save the file and leave it open.	**[Ctrl+S]**.

Action 3.3 - Adding a Hyperlink to a Website



Instructions:	Results/ Comments:
1. **My Links** should still be open.	If not, reopen the file.
2. Activate the ***Main*** sheet tab.	
3. Select cell **A3** and type in; < **Home Page** >.	This will be a link to a website.
4. Deselect and reselect cell **A3**.	**[Ctrl + Enter]**.
5. Click the ***Insert Tab,*** in the **Links Group,** click the **[Hyperlink[** button drop-down.	**[Ctrl+K]** or right-click the cell and choose Hyperlink from the menu. The *Insert Hyperlink* dialog opens.
6. In the **Link to:** field, click **[Existing File or Web Page]**.	
7. Click into the **Address:** field and type in < **www.tcworkshop.com** >.	This is the URL where the link will direct your browser to open.
8. Click the **[ScreenTip]** button.	The *Set Hyperlink ScreenTip* dialog opens.
9. Add helpful screentip text and click the **[OK]** button.	You are making this link ADA compliant. Think about text that clearly lets the user know what to expect when clicking this link. The *Set Hyperlink ScreenTip* dialog closes.
10. Click the **[OK]** button.	The Insert Hyperlink dialog closes.
11. Test the link.	A browser window opens to the web page listed in the link.
12. Close the browser.	
13. Save the file and leave it open.	**[Ctrl+S]**.

Action 3.4 - Adding an E-mail Hyperlink



Instructions:	Results/ Comments:
1. **My Links** should still be open.	If not, reopen the file.
2. Activate the ***Main*** sheet tab.	
3. Select cell **A5** and type in; < **Contact Us** >.	This will be a link that opens a new E-mail message.
4. Deselect and reselect cell **A5**.	
5. Click the ***Insert Tab,*** in the **Links Group,** click the **Hyperlink** button drop-down.	**[Ctrl+K]** or right-click the cell and choose Hyperlink from the menu. The *Insert Hyperlink* dialog opens.
6. In the **Link to:** field, click **[E-mail Address]**.	The E-mail screen is active in the *Insert Hyperlink* dialog.
7. Click into the **E-mail address:** field and type in; < **training@tcworkshop.com**>.	This is who will receive any E-mails sent by clicking the link.
8. Click into the **Subject:** field and type in; < **More Info**>.	This will be the default subject line of any E-mails sent.
9. Click the **[ScreenTip]** button.	The *Set Hyperlink ScreenTip* dialog opens.
10. Add helpful screentip text and click the **[OK]** button.	You are making this link ADA compliant. The *Set Hyperlink ScreenTip* dialog closes.
11. Click the **[OK]** button.	The *Insert Hyperlink* dialog closes.
12. Test the link.	If there is an active E-mail program, a new message window opens with both the recipient and subject lines filled in. If there is no active E-mail program, *Outlook* will open to the point where you can begin to setup the program.
13. Do not configure an *Outlook* account.	Exit the setup screen or close the new email window.
14. Save the file.	**[Ctrl+S]**.

Modifying Hyperlinks

Modifying Hyperlinks

To change an existing hyperlink, do the following:

- If you are only changing the name of the link that appears in the cell, you can select the text in the Formula Bar and type the new name. If you need to change other items, right-click on the link to change and continue to the next step.
- Choose *Edit Hyperlink* from the shortcut menu.
- The *Edit Hyperlink* dialog box is displayed for the type of link you created.

Note

Remove Hyperlink and ***Open Hyperlink*** are also options on the drop-down menu, available when you right-click on a hyperlink.

You can now change the location for the hyperlink, the **ScreenTip**, or the **Text to display**. You can also remove the hyperlink from the worksheet by clicking the **[Remove Link]** button. When you are finished with your modifications, click **[OK]** to apply them.

Changing the Attributes of the Selected Hyperlink

Hyperlinks will generally appear in one color (bright blue by default) before they have been clicked, and in another color (purple by default), after they have been clicked.

- Right-click on the hyperlink
- Choose *Format Cells* from the drop-down menu.
- The *Format Cells* dialog box is displayed.

- Change the font color, size, border, shading, and alignment of the link as desired.
- Click **[OK]**.

Modifying Hyperlinks, continued

Changing the Attributes of All Hyperlinks

The method just described will allow you to modify individual hyperlinks, but what about modifying the default color and font size for all hyperlinks?

- Select the ***Home Tab***.
- Locate the **Style Group**.
- Click the **[Cell Styles]** button to display the pre-set cell styles or use the **[More]** button to expand the gallery if it is already displayed.
- Find the *Hyperlink* style.
- Right-click it and choose *Modify* from the menu that is displayed.
- This will display the *Style* dialog box.

- Make sure that the word ***Hyperlink*** appears in the **Style name:** field.
- Observe the checkmark next to the word ***Font***. This means that the style for hyperlinks currently includes only font settings.
- Click the **[Format]** button to display the *Format Cells* dialog box where you can make changes to the borders, shading, font size, font color, and alignment for all hyperlinks.
- When you are finished, click the **[OK]** button in the *Format Cells* dialog box to return to the *Style* dialog box.
- Notice the additional checkmarks and descriptions. Click the **[OK]** button.

The style changes are made to any current link that was not changed individually and will be the format for every new hyperlink you create.

Action 3.5 - Modifying a Hyperlink

Instructions:	Results/ Comments:
1. **My Links.xlsx** should still be open.	If not, reopen it.
2. Make sure you are on your ***Main*** worksheet.	If not, click the worksheet tab for ***Main***.
3. Right-click on the link in cell **A3** and select *Edit Hyperlink* from the shortcut menu.	The *Edit Hyperlink* dialog box is displayed.
4. Click in the Address: field, and change the address to < **www.google.com** >.	The link will now open Google when clicked.
5. Click **[OK]**.	To close the *Edit Hyperlinks* dialog box.
6. Test the link.	A browser window opens to the web page listed in the link.
7. Close the browser.	
8. Select cells **C1:H1**.	
9. Right-click on the selection and choose *Format Cells* from the shortcut menu.	The *Format Cells* dialog box is displayed.
10. On the ***Font Tab***, make the following changes: Font: *Courier New*, Style: *Bold*, Size: *12 pt*, Color: to *Red Accent 2 Darker 25%*	
11. On the ***Alignment Tab***, change the Text alignment *Horizontal* setting to *Center*.	
12. Click **[OK]**.	The dialog closes and the formatting changes are applied
13. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W].**

Querying Data from a Website

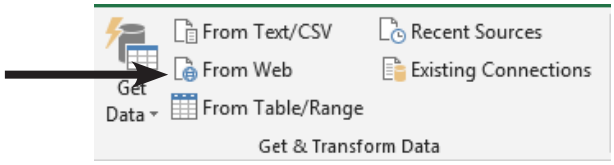
Excel offers new tools that allow querying data from external sources. These tools are found in the new **Get & Transform Group** on the ***Data Tab***. While the new ***Power Query*** and ***Power Pivot*** tools are outside the scope of this book, we will be examining how to use the ***New Query*** to gather information from websites.

Note

Website data must be stored as a table in order for *Excel* to be able to import the data.

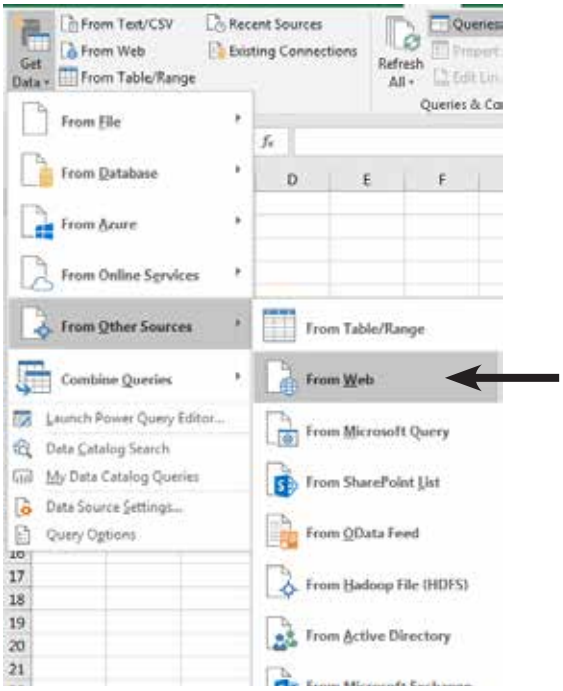
New Query from Web

- Click the **[From Web]** button in the **Get & transform Group**.



- OR -.

- Click the **[Get Data]** button drop-down and choose *From Other Sources* then *From Web*.



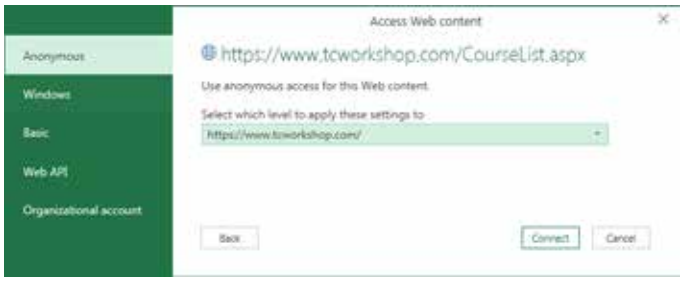
Using either method will open the *From Web* dialog

Querying Data from a Website, continued

- The *From Web* dialog opens.

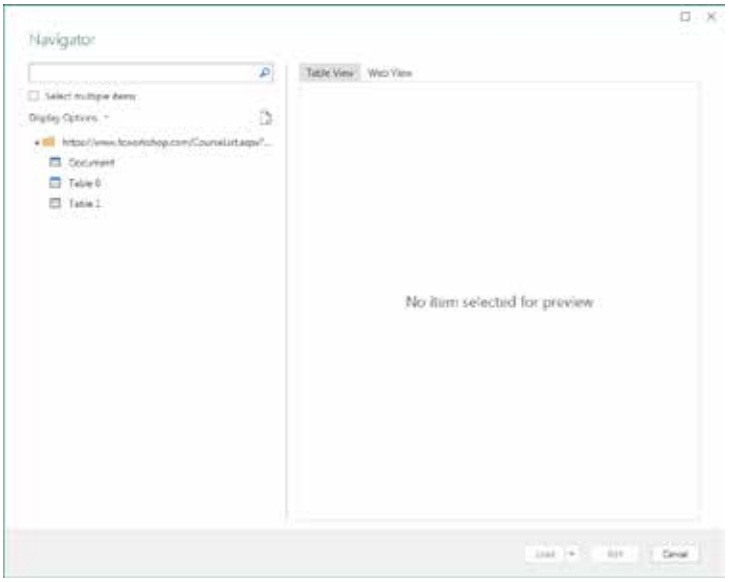
  - Enter the web address into the **URL** field and click the **[OK]** button.

- The *Web Access Content* dialog opens.



  - Should the website require signing in, you are able to enter any information used to sign into the site in this dialog.
  - If the site does not require signing in then leave the default settings and click the **[Connect]** button.

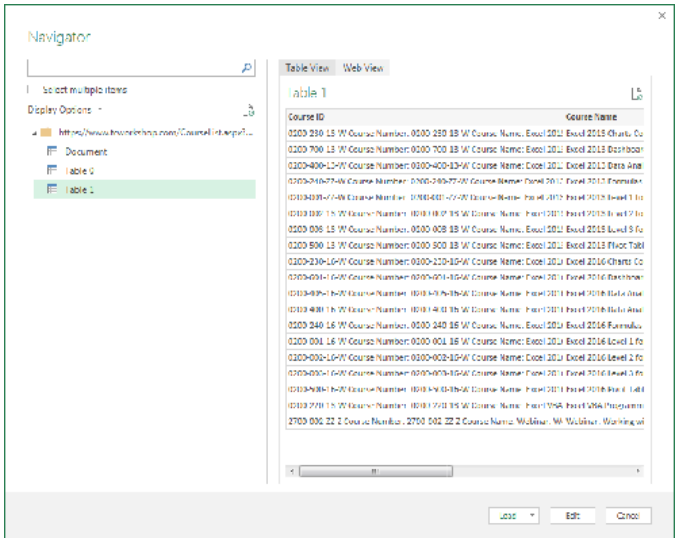
- The *Navigator* dialog opens.



Querying Data from a Website, continued

- In the Display Options area, a list of all the different tables on the web page are displayed.
- These may or may not be named, depending on how the site is using HTML labels to define the tables.
- You are able to choose a single table or by checking the ***Select Multiple Items*** checkbox select more than one table to connect to.

- When choosing a single table, a preview is displayed on the right side of the dialog.



- The selected table from this web page will be connected to and imported.
- There are two options for the preview at the top of this section of the *Navigation* dialog, either as ***Table*** or ***Web*** view.
- The ***Table View*** shows the data as an unformatted table.
- The ***Web View*** shows the table as it appears on the web page.
- When selecting more than one table the preview area displays the highlighted table in the Display Options area.

- Once the tables are selected, click the **[Load]** button to load the data into a new worksheet

Action 3.6 - Gathering Data from a Website

Instructions:	Results/ Comments:
1. Open the new blank *Excel* file.	The file is in the lessons folder.
2. In the data files folder, open the **ClassTable.html** file in a browser window. Copy the url in the address bar.	This will act as an active web site for the exercise. To copy the url, **[Ctrl+C]** or right-click and choose *Copy* from the menu.
3. Click into cell **A1** of the blank *Excel* file and paste the url.	**[Ctrl+V].**
4. Save the file as **WebClassList.xlsx**.	**[F12]**.
5. Select cell **A1**, and copy it.	**[Ctrl+C]** or right-click and choose *Copy* from the menu.
6. Click the ***Data Tab,*** in the **Get & Transform Group,** click the **[From Web]** button.	The *From Web* dialog opens.
7. Click into the **URL** field and paste the copied link.	**[Ctrl+V]** or right-click and choose *Paste* from the menu.
8. Click the **[OK]** button.	The *Web Access Conent* dialog opens.
9. Leave the setting as they are and click the **[Connect]** button.	Take a few moments to explore this dialog. when you click the [Connect} button the *Navigation* dialog opens.
10. From the ***Display Options*** area, select the *Table* from the list of tables.	A preview of the data in that table is displayed on the right side of the *Navigation* dialog.
11. Click the ***Web View*** tab.	The preview now shows what the table looks like on the site.
12. Click the back to the ***Table View*** tab.	The preview shows simple table view.
13. Click the **[Load]** button.	The data from the selected table is added in cell **A1** of a new worksheet.
14. Save the file and leave it open.	**[Ctrl+S]**.

Editing A Query

Removing Unnecessary Data from a Query

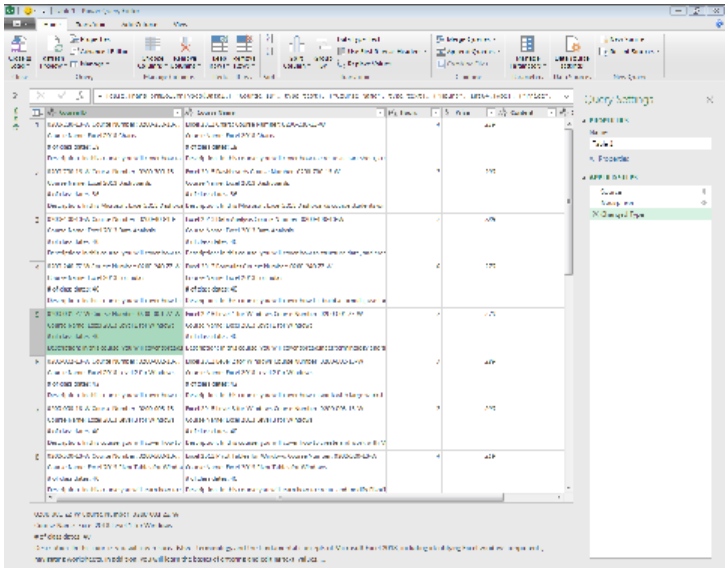
Once the data connection is established and the data added on a worksheet in the workbook, you may realize there is unnecessary data in the table. When the data table is selected, or any cell within the table the ***Query Tab*** is displayed on the ribbon.

Note

This tab is a contextual tab and is only displayed when the table or a cell within the table is actively selected.

Editing the Table

- Click the **[Edit]** button in the **Edit Group** on the ***Query Tab***.
- The *(Table Name) Power Query Editor* window opens.



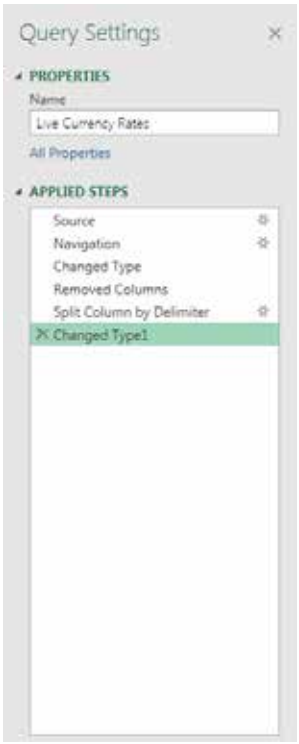
- Columns that need to be edited are selected by clicking the column header.
- Once a particular column is actively selected, it can be split or removed from the data set.
- You can also choose specific rows of data to keep from the table by using the **[Reduce Rows]** button drop-down.
- The data may also be filtered, to import only required information.

Note

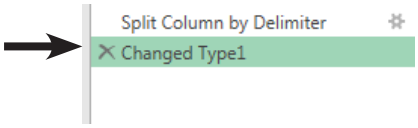
Editing the query can also be done when connecting to the source data. From within the *Navigator* dialog, after selecting the table to be imported, click the **[Edit]** button to access the *Power Query Editor* window.

Editing A Query, continued

- As changes are made, they are listed in the **Applied Steps** of the ***Query Setting*** pane of the editor.



- To Undo any change: select the change and click the **[X]** button to remove the specific change.

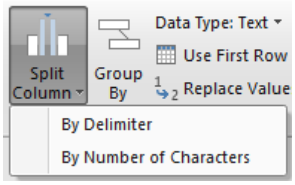


- To see how the changes will affect the table click the **[Refresh Preview]** button in the **Query Group** on the ***Home Tab*** of the *Query Editor* dialog.
- When all changes are completed, click the **[Close & Load]** button in the **Close Group** on the ***Home Tab*** of the *Query Editor* dialog.

Editing A Query, continued

Splitting a Column

- Select the column to split into multiple columns.
- Click the **[Split Columns]** button drop-down, two options are available:



  - ***Delimiter***- choose this option if there is a common character that can be used as a marker of where the data can be split. (This is the choice for the example used here.)
  - ***By Number of Characters***- choose this option if there is a common prefix that can be used as a marker to define where the data is to be split.
- If the *Delimit* option is chosen, the *Split Column by Delimiter* dialog opens.

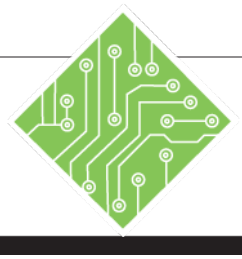
  - The **Select or enter delimiter** field drop-down offers a variety of common characters to choose from, including *Custom*.
  - Choosing *Custom* from the list of delimiters adds a field where you can enter the character to use as the delimiter.
  - Click the ***Advanced Options*** drop-down to expand more options on how the data will be split.
- Click the **[OK]** button when done to apply the changes.
- Click the **[Close & Load]** button to finish editing the query.

Refreshing the Data

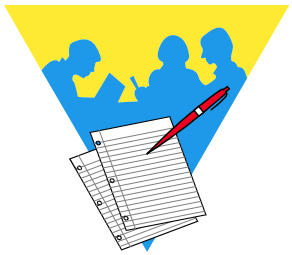
Click the **[Refresh]** button in the **Load Group** on the ***Query Tab***.

Action 3.7 - Editing the Query

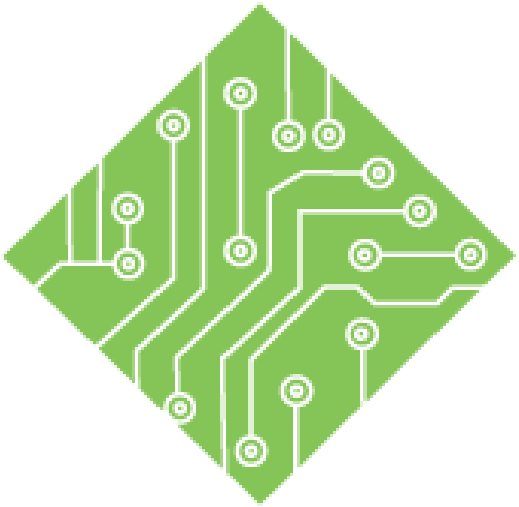
Instructions:	Results/ Comments:
1. **The WebClassList.xlsx** file should still be open.	If not, then re-open the file.
2. Click any cell in the data table that was just added to the workbook.	To make the data table active and display the ***Query Tab*** in the ribbon.
3. Activate the ***Query Tab*** in the ribbon.	
4. In the **Edit Group,** click the **[Edit]** button.	The *Power Query Editor* window opens.
5. Select the third column header (**Course_ ID**) in the preview.	The column is highlighted.This column will be split into three separate columns.
6. In the **Transform Group**, click the **[Split Column]** button drop-down and choose *By Delimiter*.	The *Split Column by Delimiter* dialog opens.
7. Choose *Space* from the **Select or enter delimiter** field, Then select the *Right-most delimiter* radio button and click the **[OK]** button.	Each part of the date field has been put into it's own column.
8. Right-click the first column header (**Course_ID.1**) in the preview and choose *Rename*, name the column as **Course_ID**.	The column has been given a name in-line with the data it contains.
9. Rename the **Course_ID.2** column as **Program**.	Repeat step 8.
10. Select the last column header (**client_id**) in the preview.	
11. In the **Manage Columns Group**, click the **[Remove Columns]** button.	The column is removed from the preview.
12. Select the second column header (**Class_ Reference**) in the preview.	



Instructions:	Results/ Comments:
13. In the **Manage Columns Group**, click the **[Remove Columns]** button.	The second unnecessary column of data is removed from the preview.
14. In the **Applied Step** field of the ***Query Settings*** pane, try selecting different steps taken in shaping the data.	The preview of the data reverts back to how the data was shaped at that stage of the edit.
15. On the ***Home Tab***, click the **[Close & Load]** button.	The data is returned to the worksheet in the way it has been shaped.
16. Click the **[Refresh]** button in the **Load Group** on the ***Query Tab***.	The data in the table is updated based on the information from the website.
17. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.



Tips and Notes

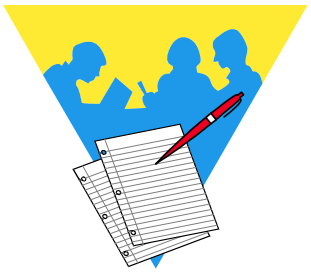


Lesson 4: Outlining, Subtotals, and Consolidation

Lesson Overview

You will cover the following concepts in this chapter:

- Outlining
- Automatic Outlining
- Exploring Outlined Data
- Grouping Data Manually
- Creating Subtotals

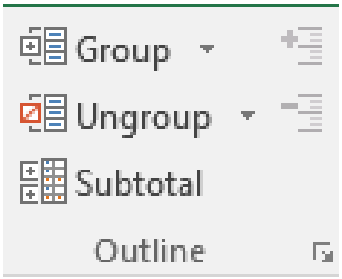


Lesson Notes

Outlining

Sometimes, a worksheet can become so large and contain so much data that it becomes unwieldy. Totals and subtotals that summarize the data are lost on screen after screen of numbers. **Excel** has an excellent feature to help with this kind of problem.

Excel's **Grouping** and **Outlining** features will allow you to collapse a large worksheet to show or print summary data, and to expand the same worksheet to show or modify the details. You will find these features in the **Outline Group** on the ***Data Tab***. The **Automatic Outlining** feature makes outlining a worksheet



fairly straightforward. It works best with numerical data organized into groups and sub groups by formulas or functions. The following worksheet, for example, contains monthly financial data for a business, organized into quarterly and yearly totals using formulas and the **SUM** function.

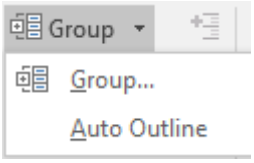
	A	B	C	D	E	F	G
1		Sales	Supplies	Wages	Rent	Total Expenses	Profit
2	January	$ 25,000.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 13,961.00
3	February	$ 25,170.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,131.00
4	March	$ 25,346.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,307.00
5	**Quarterly totals**	**$ 75,519.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 42,402.00**
6	April	$ 25,519.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,480.00
7	May	$ 25,692.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,653.00
8	June	$ 25,865.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,826.00
9	**Quarterly totals**	**$ 77,076.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 43,959.00**
10	July	$ 26,038.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,999.00
11	August	$ 26,211.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,172.00
12	September	$ 26,384.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,345.00
13	**Quarterly totals**	**$ 78,633.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 45,516.00**
14	October	$ 26,557.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,518.00
15	November	$ 26,730.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,691.00
16	December	$ 26,903.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,864.00
17	**Quarterly totals**	**$ 80,190.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 47,073.00**
18	**Yearly Totals**	**$ 311,418.00**	**$ 59,280.00**	**$ 60,000.00**	**$ 13,188.00**	**$ 132,468.00**	**$ 178,950.00**
19	January	$ 27,076.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,037.00
20	February	$ 27,249.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,210.00
21	March	$ 27,422.00	$ 4,840.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,383.00
22	**Quarterly totals**	**$ 81,747.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 48,630.00**
23	April	$ 27,595.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,496.00
24	May	$ 27,768.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,669.00
25	June	$ 27,941.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,842.00
26	**Quarterly totals**	**$ 83,304.00**	**$ 15,000.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,297.00**	**$ 50,007.00**

It can be difficult to discern quarterly and yearly totals at a glance because these figures are lost among the other data.

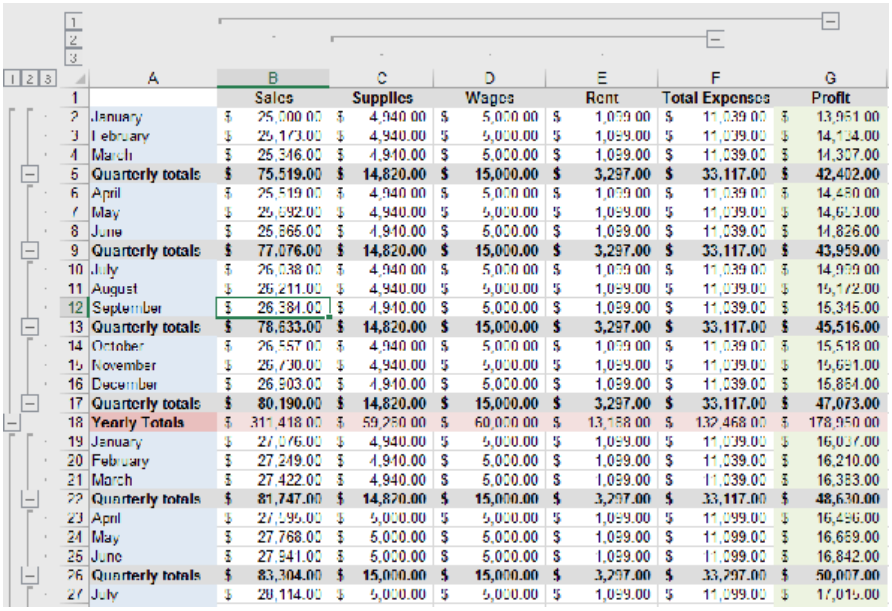
Automatic Outlining

Using an Automatic Outline

- Select the *Data Tab* and locate the **Outline Group**.
- Click the down arrow under the **[Group]** button.



- From the drop-down menu, choose ***Auto Outline.***
- The spreadsheet is automatically outlined based on Total Rows in the spreadsheet.



	A	B	C	D	E	F	G
1		Sales	Supplies	Wages	Rent	Total Expenses	Profit
2	January	$ 25,300.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 13,961.00
3	February	$ 25,173.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,134.00
4	March	$ 25,346.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,307.00
5	**Quarterly totals**	**$ 75,819.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 42,402.00**
6	April	$ 25,519.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,480.00
7	May	$ 25,692.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,653.00
8	June	$ 25,865.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,826.00
9	**Quarterly totals**	**$ 77,076.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 43,959.00**
10	July	$ 26,038.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 14,999.00
11	August	$ 26,211.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,172.00
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13	**Quarterly totals**	**$ 78,633.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 45,516.00**
14	October	$ 26,557.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,518.00
15	November	$ 26,730.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 15,691.00
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17	**Quarterly totals**	**$ 80,190.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 47,073.00**
18	**Yearly Totals**	**$ 311,418.00**	**$ 59,280.00**	**$ 60,000.00**	**$ 13,188.00**	**$ 132,468.00**	**$ 178,950.00**
19	January	$ 27,076.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,037.00
20	February	$ 27,249.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,210.00
21	March	$ 27,422.00	$ 4,940.00	$ 5,000.00	$ 1,099.00	$ 11,039.00	$ 16,383.00
22	**Quarterly totals**	**$ 81,747.00**	**$ 14,820.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,117.00**	**$ 48,630.00**
23	April	$ 27,595.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,099.00	$ 16,496.00
24	May	$ 27,768.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,099.00	$ 16,669.00
25	June	$ 27,941.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,099.00	$ 16,842.00
26	**Quarterly totals**	**$ 83,304.00**	**$ 15,000.00**	**$ 15,000.00**	**$ 3,297.00**	**$ 33,297.00**	**$ 50,007.00**
27	July	$ 28,114.00	$ 5,000.00	$ 5,000.00	$ 1,099.00	$ 11,099.00	$ 17,015.00

- All of the original data is shown, as well as **Outline Group**ing indicators and collapse buttons marked with a (-). In this example, the quarters are grouped together to be summarized by Quarterly Totals, and each year has been grouped to be summarized by Yearly Totals.

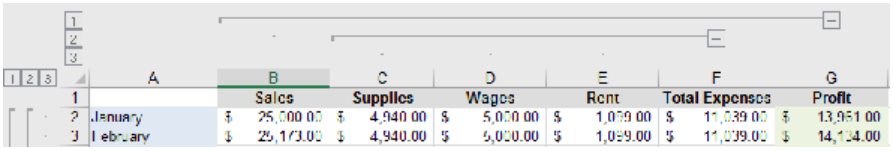
  Notice also that the columns **Supplies**, **Wages**, and **Rent** have been grouped under **Total Expenses**, and that there is an over arching group of all columns under **Profit**.

Note

The worksheet must have formulas in place in order to use the Auto Outline feature.

Exploring Outlined Data

One of the benefits of outlining is that is eliminates detail information and only shows Totals. In the figure below, you can see the summary results of *Excel's* **Automatic Outline**. The original information is still available in all of its detail, but it is now presented in a summary view, showing only the yearly profit totals.



	A	B	C	D	E	F	G
1		Sales	Supplies	Wages	Rent	Total Expenses	Profit
2	January	$ 25,000.00	$ 4,940.00	$ 5,000.00	$ 1,059.00	$ 10,999.00	$ 14,001.00
3	February	$ 25,173.00	$ 4,940.00	$ 5,000.00	$ 1,059.00	$ 11,039.00	$ 14,134.00

Note

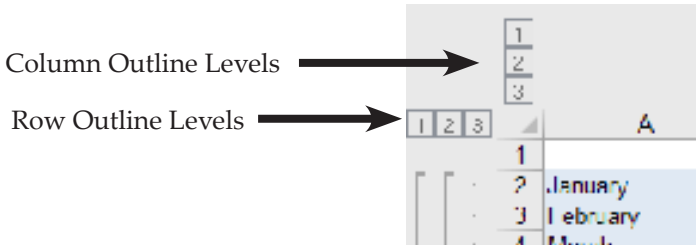
If an **Outline** is collapsed, only the data that is visible on your screen will be printed.

Showing or Hiding Outlined Data

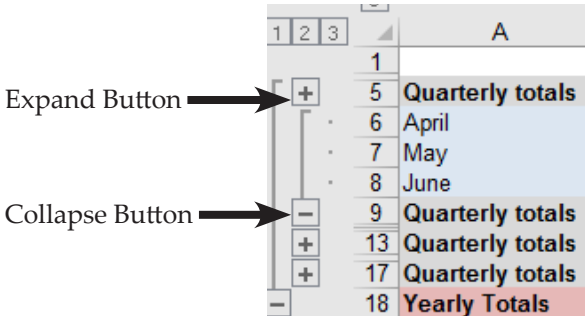
After the spreadsheet is outlined, you will see outline symbols above and to the left of your spreadsheet.

Do one or more of the following to Expand or Collapse the detail data in the Outline:

- To display or hide the entire outline to a specific level, click the number of the level you want.



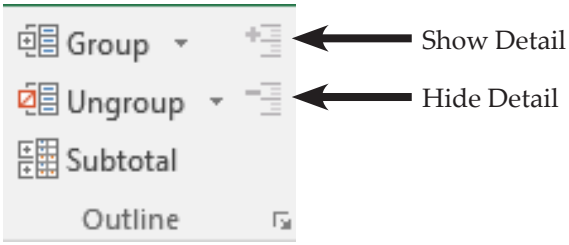
- To display detail data within a group, click the expand button marked with a [+] sign.
- To hide the detail data for a group, click the collapse [-] button.



- OR -

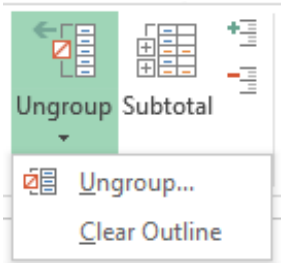
Exploring Outlined Data, continued

- Select a cell within a level group and click the desired button to show or hide the detail of group



Removing an Automatic Outline

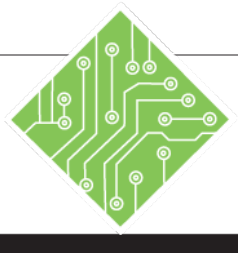
- Select the ***Data Tab*** and locate the **Outline Group**.
- Click the down arrow under the **[Ungroup]** button.



- From the drop-down menu, choose the ***Clear Outline*** option.

Action 4.1 - Using Auto Outline

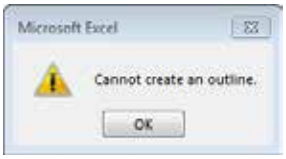
Instructions:	Results/ Comments:
1. Open the file **Outline.xlsx** in your exercise files folder.	This worksheet contains monthly, quarterly, and yearly sales data. It is numerical data that uses formulas and functions to calculate column totals. This kind of worksheet is an ideal example for *Automatic Outlining*.
2. Save the file as **MyOutline**	**[F12]**.
3. Click the ***Data Tab and click*** the **[Group]** button on and choose *Auto Outline.*	The data in the worksheet is now Outlined.
4. Examine the data.	The outlining is based on how the formulas break the data down.
5. Click both the number **[1]** buttons in the upper left area of the worksheet.	The data in the worksheet is collapsed down to the point where we only see the profit totals for each year. Since the Yearly Totals formulas are summing the quarters, these are the top level formulas in the files and are the Level 1 breakpoints.
6. Click the number **[2]** button of the horizontal row of numbered buttons in the upper left area of the worksheet.	Now the quarterly totals of all the years are now also displayed. The individual **[Expand]** and **[Collapse]** buttons are displayed within the second column on the left side of the worksheet. The Level 2 formula are gathering the summing the data in order to provide the values used by the Level 1 formulas.
7. Click the number **[2]** button of the vertical column of numbered buttons in the upper left area of the worksheet.	Now the Sales and Expenses columns are displayed, along with the individual **[Expand**] and **[Collapse**] buttons above the worksheet.
8. Click the **[Plus]** buttons to expand each of the Quarter in the first year.	Each of the four quarters in the first year are expanded so you can see the detailed data. The **[Plus]** buttons change to **[Minus]** button when the group is expanded.



Instructions:	Results/ Comments:
9. Click the **[Minus]** buttons of the first two quarters to collapse the groups.	Those two quarters detailed view is collapsed and the **[Minus]** are replaced with **[Plus]** buttons.
10. Clicking the number **[3]** buttons will expand to show the data used by the formulas in the data set.	The highest number value buttons will displays all the source data used by the formulas within the data set.
11. Click the ***Data Tab***, in the **Outline Group,** click the **[Ungroup]** button drop-down and choose *Clear Outline*.	The Outlining features are removed and you are working with a normal large data set on the worksheet.
12. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

Grouping Data Manually

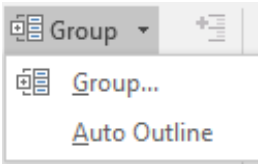
Automatic Outlining may not be possible for worksheets with non-numerical values or with no distinctive totals (from formulas or functions). When **Automatic Outlining** does not, or cannot, organize your data in the way you want, **Excel** displays the following alert**.**



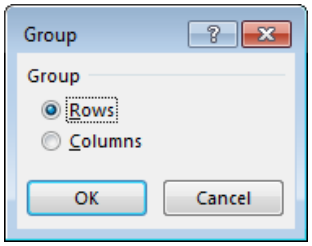
Although, you can manually group your data as required.

To Manually Outline Data

- Select the rows or columns that you want to group. Select the ***Data Tab*** and locate the **Outline Group**. Click the drop-down arrow on the **[Group]** button and choose *Group.*



- If you select cells and not rows, a dialog box will be displayed asking if you want to group by **Rows** or **Columns**.

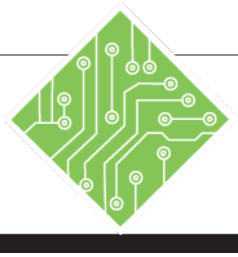


Excel will provide an outline indicator and a **[collapse/expand]** button for the new grouping.
You will see numbered level buttons in the top left corner. These buttons work like the ones in automatic outlines.

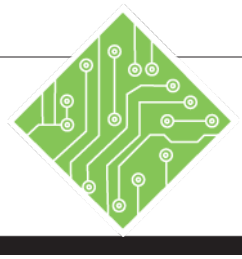
To Remove Manual Groupings

- Select the rows or columns corresponding to the grouping you wish to remove.
- Click the drop-down arrow on the **[Ungroup]** button and choose *Ungroup* or if the dialog box was displayed, choose *Row* or *Column* and click **[OK]**.

Action 4.2 - Grouping Manually to Create Outlines



Instructions:	Results/ Comments:
Open the **Grouping.xlsx** file.	The file is in the lessons folder.
1. Save the file as **MyGrouping**.	**[F12]**.
2. Click the ***Data Tab,*** in the **Outline Group,** click the **[Group]** button drop-down and choose *Auto Outline*.	Since this file has no formulas, *Excel* is unable to determine how the data should be outlined and now displays the *Cannot create an outline* screen.
3. Close the *Notification* screen.	
4. Select columns **B:D.**	
5. Click the ***Data Tab,*** in the **Outline Group,** click the **[Group]** button drop-down and choose *Group*.	Columns B:D are now grouped. The outlining controls are added above the column headers.
6. Click the **[Minus]** button above the column headers.	Columns **B:D** are collapsed out of view.
7. Click the **[Plus]** button above the column headers.	The columns are re-displayed.
8. Select cells **A5:A20**.	
9. Click the ***Data Tab,*** in the **Outline Group, click** the **[Group]** button drop-down and choose *Group*.	You can also simply click the **[Group]** button itself. Since only cell were actively selected when click the **[Group]** button *Excel* requires more direction on how to group the data and opens the *Group* dialog.
10. Choose *Rows* in the *Group* dialog and click the **[OK]** button.	Rows **5:20** are now grouped and the outlining controls are added to the left of the row headers.
11. Click the **[Minus**] button to the left of the row headers.	Rows **5:20** are collapsed out of view.
12. Select rows **30:200**.	



Instructions:	Results/ Comments:
13. Click the ***Data Tab,*** in the **Outline Group,** click the **[Group]** button.	A new group of rows is created.
14. Click the number **[1]** button on the horizontal number buttons.	All the row groups are collapsed.
15. Click the number **[2]** button on the horizontal number buttons.	All the groups are expanded, showing all the data.
16. Click any cell within a group.	
17. Click the ***Data Tab,*** in the **Outline Group**, click the [Ungroup] button drop-down.	The group related to the selected cell is removed.
18. Click any cell outside of an existing group.	
19. Click the ***Data Tab,*** in the **Outline Group,** click the **[Ungroup]** button drop-down and choose *Clear Outline*.	Since there wasn't a cell within a group selected all group and outlining was removed.
20. Save the file and leave it open.	**[Ctrl+S]**.

Creating Subtotals

Another kind of outlining or grouping technique available in *Excel* is the **Subtotals** feature. If you have numeric data organized with clear column and row headings, you can use *Excel* to create automatic **Subtotals** and **Grand Total**s for the data.

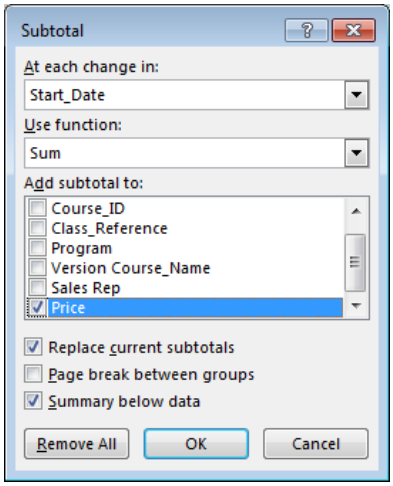
Ensure your dataset does not include blank columns and rows so that *Excel* includes all of the data and include the headings.

Note

To use the **Subtotal** feature, your data should be sorted, to break the data into an organized structure.

Using the Subtotal Feature

- Click into the dataset you want to apply **Subtotals** to.
- Select the ***Data Tab*** and in the **Outline Group**, click the **[Subtotal]** button. The *Subtotal* dialog box is displayed.
- Select the drop-down for **At each change in:** to choose options for the number of rows that will be totaled. Totals will be applied every time the values under the chosen column label changes.



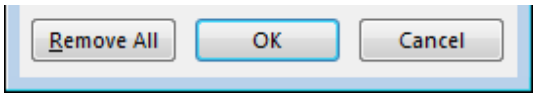
- Select the drop-down for **Use function:** to choose a function (**SUM**, **AVERAGE**, **COUNT**, **PRODUCT**, and **STDEV**) to apply to your data. The function you choose will be used to calculate the totals.
- In the **Add subtotal to:** list, select which columns to apply the totals. You can apply totals to a single column or to multiple columns in the selected range.

Creating Subtotals, continued

- Put a checkmark in the options to:
  - *Replace current subtotals*
  - *Page break between groups*
  - *Summary below data*

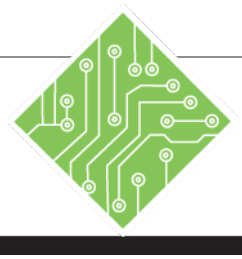
Removing Subtotals

- Select a cell in the range of data.
- Click on the **[Subtotal]** button in the **Outline Group** on the ***Data Tab*** to reveal the *Subtotal* dialog box.
- In the *Subtotal* dialog box, click the **[Remove All]** button.



Action 4.3 - Subtotaling

Instructions:	Results/ Comments:
1. The **MyGrouping.xlsx** file should still be open.	If not, then reopen the file.
2. Click into any cell in the Sales Rep column.	This will be the data used to organize the data set.
3. Click the ***Data Tab,*** in the **Sort & Filter Group,** click the **[Sort A to Z]** button.	The data is now organized by the sales reps.
4. Click the **[Subtotal]** button in the **Outline Group** on the ***Data Tab***.	The *Subtotal* dialog opens.
5. In the *Subtotal* dialog, click the drop-down for the **At each change in:** field and choose *Sales Rep*.	Subtotals will be added for each sales rep within the Sales Rep column.
6. Leave the **Use function:** field as Sum.	This is the function that will be used by the subtotaling feature.
7. Check the *Price* checkbox in the **Add subtotal to:** field.	Totals will be added to this column of data.
8. Click the **[OK]** button.	The subtotals are added to the data set along with the Outlining tools.
9. Examine the data.	You can now see the total sales by each rep in the Price column as well as the grand total of all sales.
10. Click the ***Data Tab,*** in the **Outline Group,** click the **[Subtotal]** button.	You will now add more information to the data set that did not exist before. The Subtotal dialog opens.
11. Click the drop-down for the **At each change in:** field and choose *Sales Rep*.	Subtotals will be added for each sales rep within the Sales Rep column.
12. Set the **Use function:** field to *Count*.	This function will count the number of sales each rep has made.
13. Check the ***Price*** checkbox in the **Add subtotal to:** field.	The count of sales will be added to this column of data.



Instructions:	Results/ Comments:
14. Uncheck the ***Replace current subtotals*** checkbox.	If this checked remains checked, the counts will replace the existing subtotals.
15. Click the **[OK]** button.	The counts are added to the data set.
16. Examine the data.	You can now see the sales counts by each rep in the Price column as well as the total count of all sales.
17. Click the number **[1]** button in the horizontal outlining buttons.	Only the grand totals are displayed.
18. Try the other outline number buttons to see how the data set is grouped.	Groups of data are displayed depenent on the numbered level chosen.
19. Click the number **[4]** button in the horizontal outlining buttons.	All the data is displayed.
20. Click the ***Data Tab,*** in the **Outline Group,** click the **[Subtotal]** button.	The Subtotal dialog opens.
21. Click the **[Remove All]** button and then click **[OK]**.	All subtotals and outlining are removed from the data set.
22. Click into any cell in the Course Name column.	This will now be the column used to break the data on with the subtotaling tool.
23. Click the ***Data Tab,*** in the **Sort & Filter Group,** click the **[Sort A to Z]** button.	The data is resorted.
24. Click the ***Data Tab*** in the **Outline Group,** click the **[Subtotal]** button.	The *Subtotal* dialog opens.
25. In the *Subtotal* dialog, click the drop-down for the **At each change in:** field and choose *Course Name*.	Subtotals will be added for each course name within the Course Name column.
26. Leave the **Use function:** field as Sum.	This is the function that will be used by the subtotaling feature.
27. Check the *Price* checkbox in the **Add subtotal to:** field.	Totals will be added to this column of data.

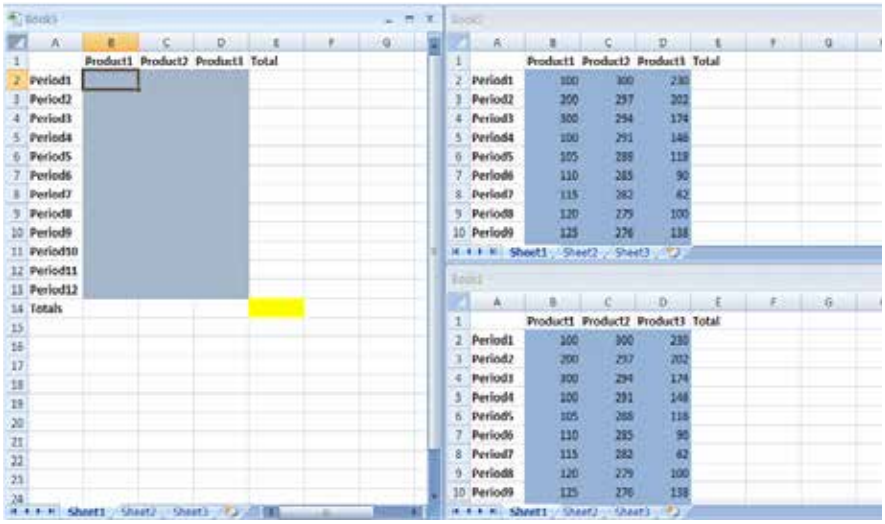
Instructions:	Results/ Comments:
28. Click the **[OK]** button.	The subtotals are added to the data set along with the Outlining tools.
29. Examine the data.	
30. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

Consolidating Workbooks

When you consolidate workbooks, you are combining, condensing, and summarizing data from multiple sources into one destination. For example, a large company may have sales or profit data broken down into several different geographical locations. Each workbook may have the same layout and structure (template) but contain different data. With *Excel*, you can consolidate the different workbooks, summarizing and totaling the data in one place to get a combined view of your information.

To consolidate workbooks in *Excel*, open the relevant workbooks and choose a destination workbook where the data will be consolidated. It is a good idea to set up the destination worksheet to have the same layout as the worksheets that will supply the data. This means having the same labels and using the same number of columns and rows and cell locations for the same types of data. This is not mandatory, but it can make the consolidation process a lot easier.

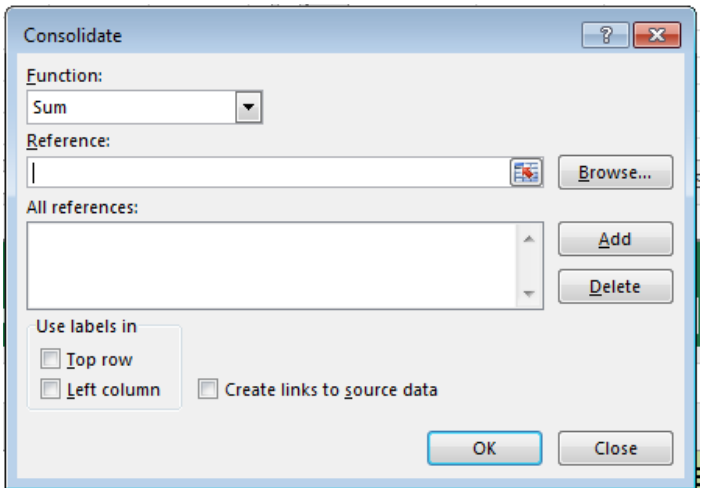
This *Excel* screen shows three open workbooks, **Book1**, **Book2**, and **Book3**. **Book1** and **Book2** need to be consolidated into **Book3**.



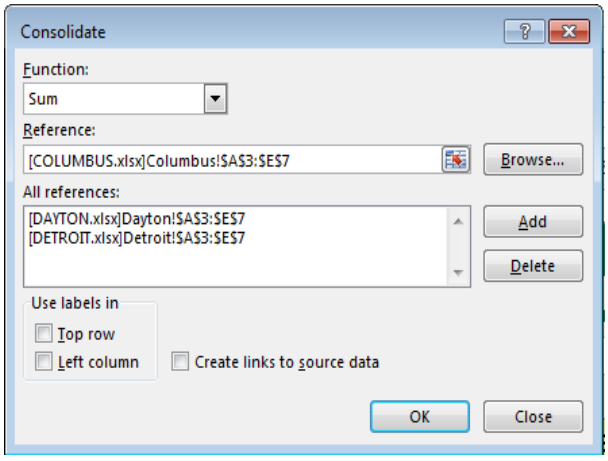
Consolidating Workbooks, continued

To Consolidate Workbooks

- Select cell **B2** in **Book3** (the book with the empty cells) and click the **[Consolidate]** button on the ***Data Tab***. This will display the *Consolidate* dialog.



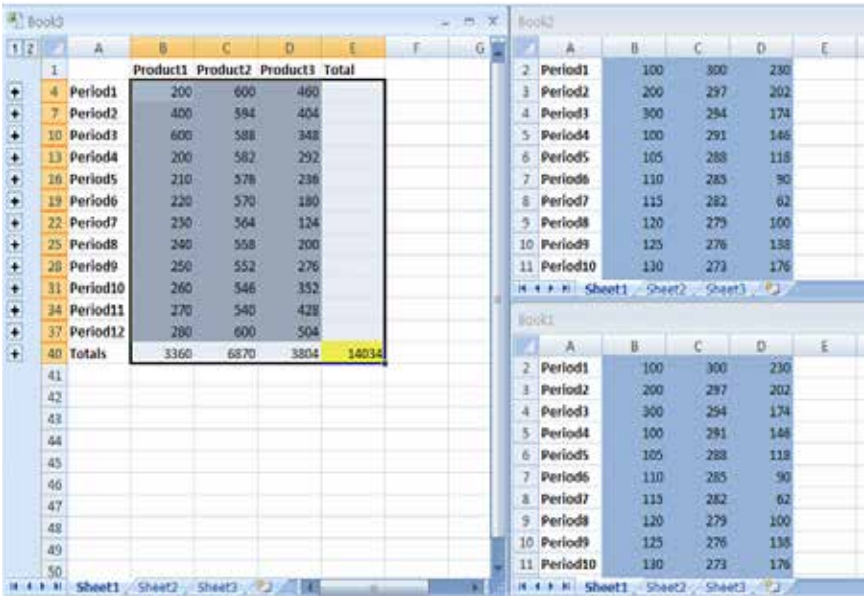
- In the **Function:** field, there is a drop-down list containing many functions you can use to combine the data. In this example the default ***Sum*** is used.
- Under the **Reference:** field, enter the ranges of data to be consolidated. The simplest most accurate way to do this is by selecting them from the different workbooks with your mouse or keyboard. When a range is entered, click the **[Add]** button to add it to the **All References:** field.

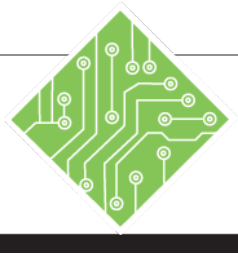


Consolidating Workbooks, continued

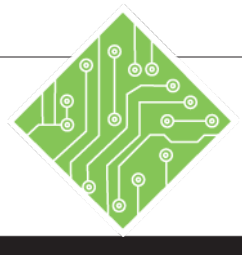
- Check the ***Use labels in*** boxes to consolidate sheets based on row labels or column labels. This means, the data in columns or rows that have the same labels will be consolidated even if the labels are under different column letters or row numbers in the source workbooks. You may find consolidation is easier when all the worksheets involved have the same labels and layout.
- Check the *Create links to source data* check box. When checked, the information in the destination work book will be updated if the cell content in the source workbooks is changed.
- Once all options are set, make sure the workbooks and cell ranges to be consolidated are correct, and click **[OK]**.

The workbooks will be consolidated and combined into the destination workbook (**Book3** in this example). Since these files are now also linked the data is set up in an Subtotals style.

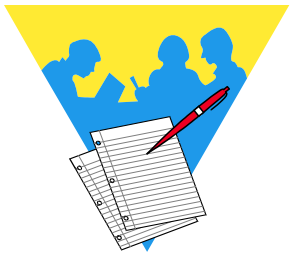




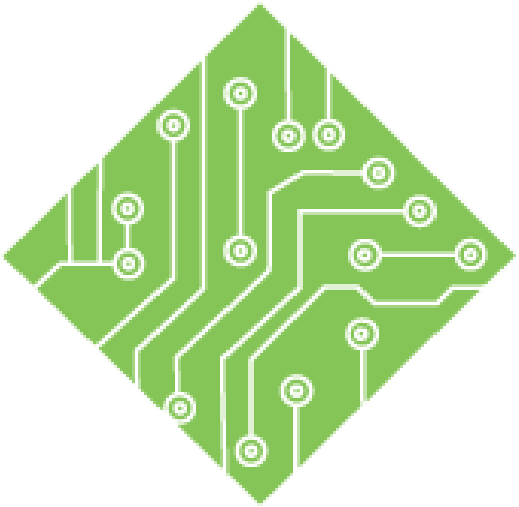
Instructions:	Results/ Comments:
1. Double click any tab in the ribbon.	This will hide the ribbon.
2. Open the following files from the lessons folder: **Report.xlsx** **Columbus.xlsx** **Dayton.xlsx** **Detroit.xlsx**	You will be consolidating each city file into one regional summary.
3. Save **Report.xlsx** as **MyReport**.	**[F12]**.
4. Click the ***View Tab,*** in the **Window Group,** click the **[Arrange All]**. button.	The *Arrange Windows* dialog opens.
5. Make sure the ***Windows of active workbook*** checkbox is not checked, and click **[OK]**.	This tiles the workbooks so that you can see them all at the same time.
6. Activate the ***Regional Summary*** sheet in the **Report** file and click into cell **A1**.	This will be where the consolidated data will be placed.
7. Click the ***Data Tab,*** in the **Data Tools Group,** click the **[Consolidate]** button.	The *Consolidate* dialog opens.
8. In the *Consolidate* dialog, click into the **Reference:** text box.	
9. Select **A3:E7** in the **Dayton** file.	
10. Click **[Add]**.	The referenced cell range is added in the **All references:** field.
11. With the Reference: field active click the **Columbus** file and select cells **A3:E7**.	
12. Click **[Add]**.	
13. Repeat the steps above to add the same range from the **Detroit.xlsx** workbook.	



Instructions:	Results/ Comments:
14. Click the checkboxes for ***Use labels in*** *Top row* and *Left column*.	The first row and columns of the selected reference ranges will be treated as labels.
15. Click the checkbox to ***Create links to source data***.	This will dynamically connect the source files to the consolidated data.
16. Click **[OK]**.	Notice that when the data is consolidated outlining tools are automatically added.
17. Click the **[Expand]** button to the left of **Week1** to show the detail for the summary data.	Widen the columns if necessary to see all the data source information.
18. Save and close the files.	**[Ctrl+S]** and **[Ctrl+W]**.



Tips and Notes

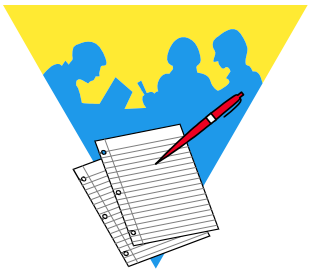


Lesson 5: Analytical Tools

Lesson Overview

You will cover the following concepts in this chapter:

- Goal Seek
- Data Tables
- Scenarios
- Solver
- Forecasting



Lesson Notes

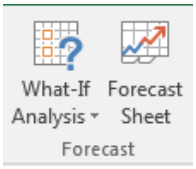
Goal Seek

Goal Seek is a useful analysis tool provided by *Excel*. With **Goal Seek**, *Excel* will find a value for a specified cell that makes a given worksheet formula equal to a value that you define. In other words, you can set a formula to a value (goal) that you would like to attain, and then specify one of the cells that the formula references as a cell that *Excel* can adjust in order to reach the goal.

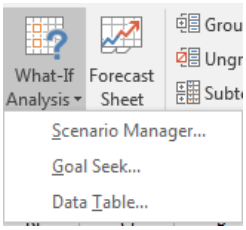
This is a great tool for financial calculations where you want to meet a specific goal.

To use Goal Seek

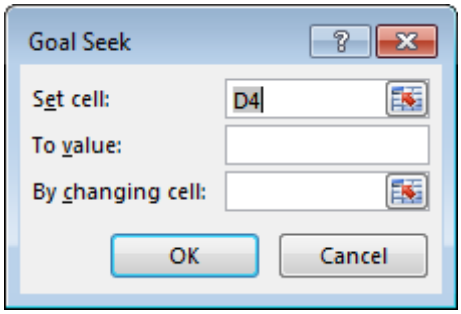
- Select the cell containing a formula whose result you want to define.
- Select the ***Data Tab***.
- Click the **[What-If Analysis]** button drop-down in the Forecast Group.



- From the menu choose *Goal Seek*.

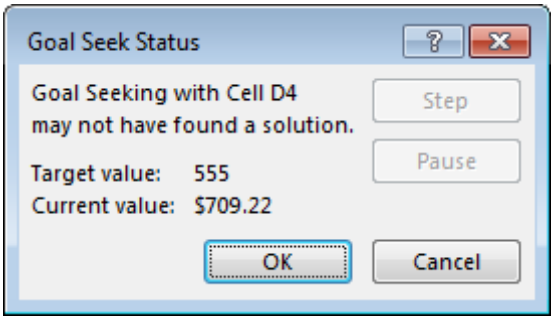


- The *Goal Seek* dialog is displayed.



Goal Seek,
continued

- The active cell shows in the **Set cell:** field.
  - *If that isn't the cell where the goal will be displayed, change it.*
- In the **To Value:** field, type the goal you want to get to.
- In the *By changing cell:* field, type the cell reference that needs to change in order to calculate the answer.
- Click **[OK]**.
- The *Goal Seek Status* dialog is displayed and reports that a solution has been found. The cells in the spreadsheet have changed to solve the problem.



  - Clicking the **[Cancel]** button restores the original worksheet values.
  - Clicking the **[OK]** button will enter the Goal Seek solution values into the worksheet.

Action 5.1 - Using The Goal Seek

Instructions:	Results/ Comments:
1. Open the **LoanSchedule.xlsx** file.	The file is in the lessons folder.
2. Save the file as **MyLoanSchedule.xlsx**.	**[F12]**.
3. Select cell **D4** on the Loan Seek worksheet and examine the formula in the Formula Bar.	This cell contains a payment function formula that uses cell **B5** for the interest rate divided by 12 (this value must be divided by 12 since this calculates monthly payments); cell **B4** defines the number of payments (if this value was in year then the value would have to be multiplied by 12); the -**B3** is a negative value since this is money which is owed.
4. On the ***Data Tab,*** in the **Forecast Group,** click the **[What-If Analysis]** drop-down button.	The What-If analysis options are displayed.
5. Choose *Goal Seek* for the options in the menu.	The *Goal Seek* dialog opens.
6. In the *Goal Seek* dialog, the **Set cell:** field make sure the cell reference is **D4**. If it is not then click into the **Set cell:** field and click cell **D4**.	This cell must contain the formula which a specific return is desired.
7. In the **To value:** field type in; **<500>**.	This is the desired value.
8. Click into the **By change cell:** field and select cell **B4**.	This is the part of the formula which can be modified to return the desired value.
9. Click the **[OK]** button.	The *Goal Seek Status* dialog opens, offering the choice of keeping the new or original value.
10. Click the **[Cancel]** button.	The original values are restored to cell **D4**.
11. Reselect cell **D4**.	If necessary.

Instructions:	Results/ Comments:
12. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If Analysis]** drop-down button.	You will run the Goal Seek feature again to calculate how many months it will take to pay off the loan.
13. Choose *Goal Seek* for the options in the menu.	The *Goal Seek* dialog opens.
14. In the *Goal Seek* dialog, in the **Set cell:** field, make sure the cell reference is **D4**.	
15. In the **To value:** field type in; **<550>**.	
16. Click into the **By change cell:** field and select cell **B4**.	
17. Click the **[OK]** button.	The *Goal Seek Status* dialog opens.
18. Click the **[OK]** button.	The value in the cell **B4** is updated to reflect the results of the Goal Seek.
19. Save the file and leave it open.	**[Ctrl+S]**.

Data Tables

While the Goal Seek is good for looking at a single variation the Data Table is a more useful tool for seeing a wider set of variables in relation to a PMT function. Data Tables are a range of cells showing the results of substituted values of a formula. They are used in situations where you want to perform "what-if" analysis to see how changing certain values in your formulas effects the results of the formulas. By using Data Tables you can calculate all of the variations in one operation which will save many hours of work.

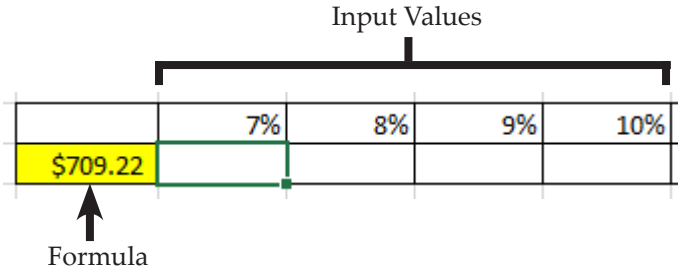
Excel offers two types of data tables: **one-input** tables and **two-input** tables.

Note

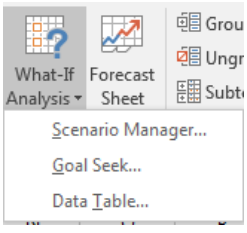
The function should use cell addresses instead of static values.

Creating a One-Input Data Table:

- You will need to set up a worksheet with i*nput values* that will be substituted in for the value in the *input cell*.
- You will need an input cell.
- You will need the formula that refers to the input cell in the row above the first input value and one cell to the right of the column of input values.

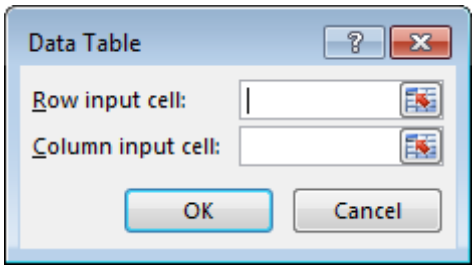


- Select the range beginning with the cell above the input values through the cell to the right of the last input value.
- Select the ***Data Tab***.
- In the **Forecast Group, c**lick on the **[What-If Analysis]** button drop-down.
- Select **Data Table** from the menu.



Data Tables,
continued

- The *Data Table* dialog opens.



- Depending on the structure of the table being built enter the variable cell in the formula into either the **Row** or **Column input Cell:** field.
  - Use the **Row input cell:** field if the data table is set up to run across multiple columns.

	7%	8%	9%	10%	
$709.22					

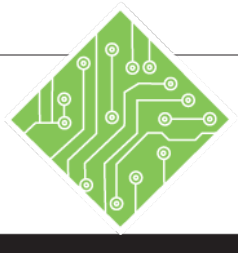
  - Use the **Column input cell:** field if the data table is set up to run down a series of rows.

	$709.22
6	
12	
18	
24	
30	
36	

- Click **[OK]**. *Excel* substitutes the value in the input cell with the values in the input value column and places the table formula in the column below the beginning formula.

Action 5.2 - Adding One Input Data Tables

Instructions:	Results/ Comments:
1. The **MyLoanSchedule.xlsx**. file should still be open.	If not, reopen the file.
2. Make the ***Loan Tables*** worksheet active.	Click the ***Loan Tables*** worksheet tab.
3. Select cells **B11:K12**.	This cell range is where you will create a row one input data table.
4. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If analysis]** drop-down button**.**	
5. Choose *Data Table* from the menu.	The *Data Table* dialog opens.
6. Click in the **Row input cell:** field and the click in cell **B5**.	Since the selected cell range has a range of variable interest rates running across one row, you will use the **Row input cell**: field in this example.
7. Click the **[OK]** button.	The monthly payments are calculated according to the variable interest rates in cells **C11:K11**.
8. Select cell **B15:C31**.	This cell range is where you will create a column one input data table.
9. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If analysis]** drop-down button**.**	
10. Choose *Data Table* from the menu.	The *Data Table* dialog opens.
11. Click in the **Column input cell:** field and the click in cell **B4**.	Since the selected cell range has a range of variable interest rates running down one column, you will use the **Column input cell:** field in this example.
12. Click the **[OK]** button.	The monthly payments are calculated according to the variable number of months in cells **B16:B31**.



Instructions:	Results/ Comments:
13. Save the file.	**[Ctrl+S]**.
14. Make the ***SimpleMathTable*** worksheet active.	This worksheet will be used to convert one currency into another using a simple formula with cell references.
15. Select cell **C5**.	
16. Examine the formula in **C5**.	This cell has simple formula to convert the current amount to another amount based on currency conversion values.
17. Select cells **C4:I5**.	This is where the data table will be created.
18. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If analysis]** drop-down button**.**.	
19. Choose *Data Table* from the menu.	The *Data Table* dialog opens.
20. Click in the **Row input cell:** field and the click in cell **C2**.	This cell represents the exchange rates in cells **D4:I4**.
21. Click the **[OK]** button.	The conversion rates are calculated according to the variable interest rates in cells **D4:I4**.
22. Save the file.	**[Ctrl+S]**.

Data Tables,
continued

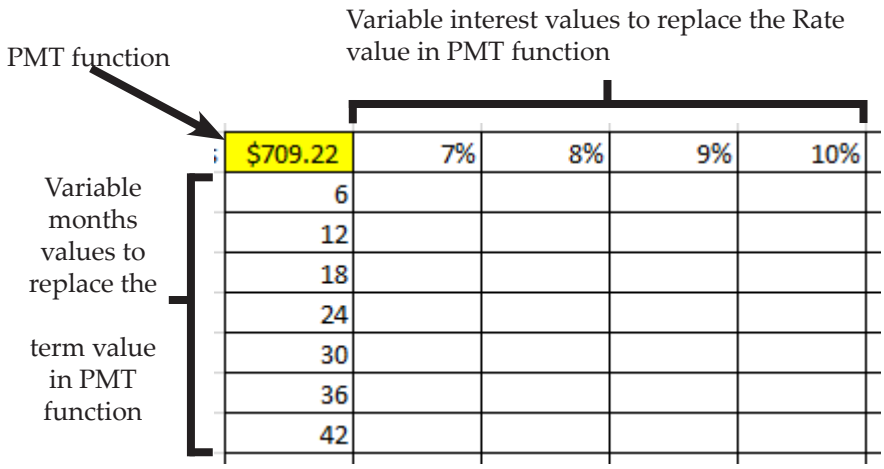
Two-Input Data Table

The two-input data table is used to see how changes in two variables affect one formula. The process works the same as the one-input tables except you will have both a column input cell and a row input cell.

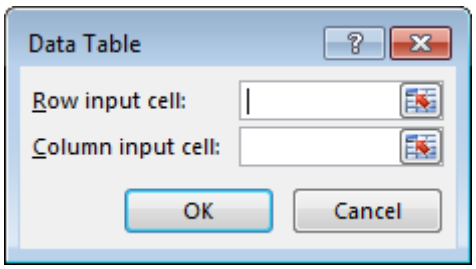
Note: The function should use cell addresses instead of static values.

Creating a Two-Input Data Table:

- You will need to set up a worksheet with input values that will be substituted in for the value in the input cells. In this example, you will see how your monthly payment changes based on both the interest rate and the term of the loan.



- The formula needs to be placed right above and to the left of the input values.
- Select the table range beginning with the formula and ending with the last input value intersection.
- Select the ***Data Tab***.
- Click on the **[What-If Analysis]** button drop-down in the **Forecast Group**.
- Select *Data Table* from the menu.
- The *Data Table* dialog box opens.



Data Tables, continued

- The **Row input cell:** field will be the Rate cell reference in the **PMT** formula.
- The **Column input cell:** field should be the Term cell reference in the **PMT** formula.
- Click **[OK].**

Action 5.3 - Adding s Two Input Data Table

Instructions:	Results/ Comments:
1. The **MyLoanSchedule.xlsx**. file should still be open.	If not, reopen the file.
2. Make the ***Loan Tables*** worksheet active.	
3. Select cells **G15:P31**.	These cells will be used to create the two input data table showing how changes in the interest rate and length of the loan will affect the monthly payments.
4. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If analysis]** drop-down button**.**	
5. Choose *Data Table* from the menu.	The *Data Table* dialog opens.
6. Click in the **Row input cell:** field and the click in cell **B5**.	This will define the interest rate variables.
7. Click in the **Column input cell:** field and the click in cell **B4**.	This will define the number of months to repay the loan.
8. Click the **[OK]** button.	The data table is created.
9. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

Scenarios

When there is a worksheet detailing a current situation and you need to see how certain changes will affect the calculations the Scenario feature in *Excel* offers the ability to see those changes within the same worksheet, instead of creating multiple worksheets or workbooks to see how results change. This feature allows you define what cells will change and set the values of those changes manually, as each set of changes are made you can save each Scenario. You can then switch between the Scenarios to display the saved Scenario set of variables.

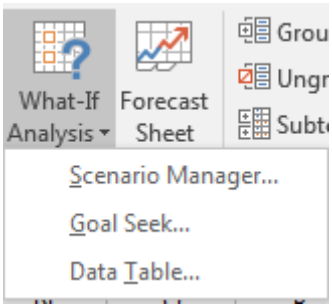
Note

It is a good idea to create the first Scenario based on the current set of values, so you can always return to it if needed.

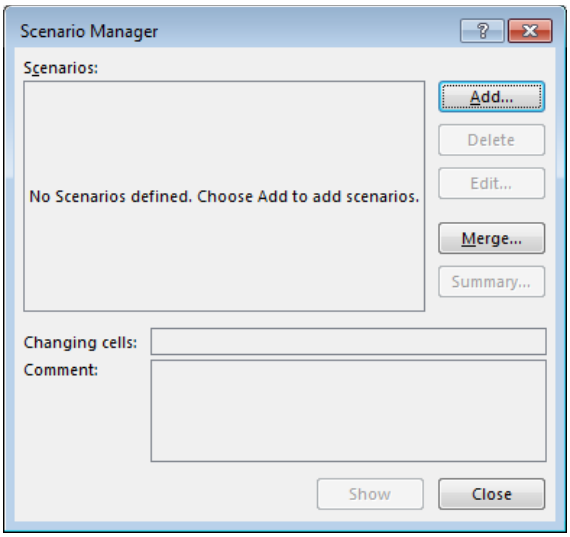
Adding Scenario's

In this example, you will be showing three locations rental costs.

- Click the ***Data Tab***.
- Click the **[What-If analysis]** button drop-down in the **Forecast Group**.

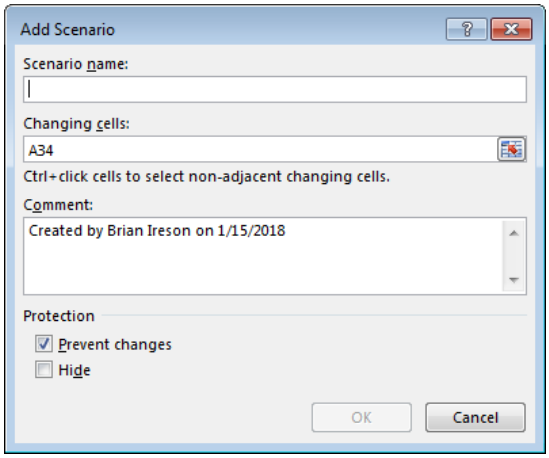


- Choose *Scenario Manager* from the menu.
- The *Scenario Manager* dialog opens.

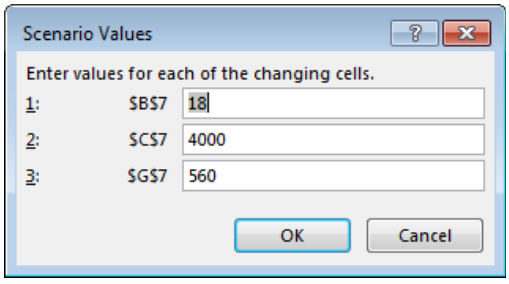


Scenarios, continued

- There will be no existing Scenarios when beginning this process
- Click the **[Add]** button
- The *Add Scenario* dialog opens.



  - The **Scenario Name:** field allows you to name the Scenario.
  - The **Change cells:** field allows you to define what cells values can be modified.
  - The **Comment:** field allows you to add a brief description of what the Scenario represents.
- After applying a name and defining the cells to be changed click the **[OK]** button.
- The *Scenario Values* dialog opens.
- Change the values to coincide with the new data points for the variable cells defined in the **Change cells:** field.



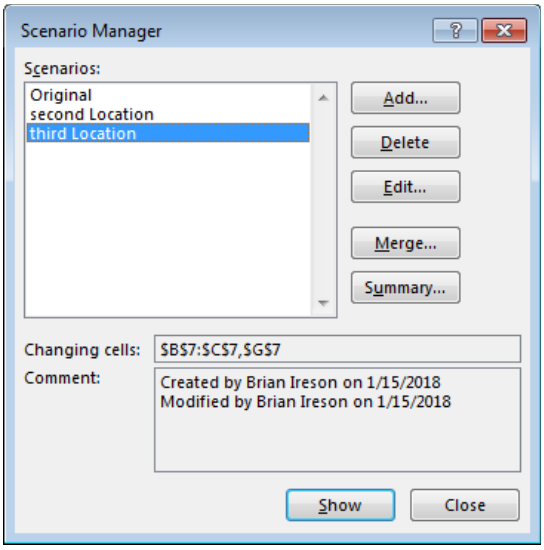
  - For the first Scenario, leave the original values in place.
- Click the **[OK]** button to return to the *Scenario Manager* dialog.

Scenarios,
continued

- Repeat these steps to create a second Scenario when the values are modified in the *Scenario Values* dialog.
- Add as many Scenarios as needed to avoid having multiple worksheets with slight variations.

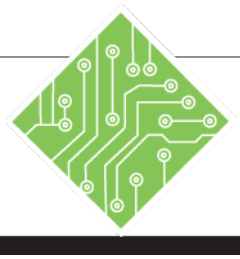
Showing Scenarios

- Click the ***Data Tab***.
- Click the **[What-If analysis]** button drop-down in the **Forecast Group**.
- Choose *Scenario Manager* from the menu.
- The Scenario Manager dialog opens, any existing Scenarios are displayed in the **Scenarios:** field.

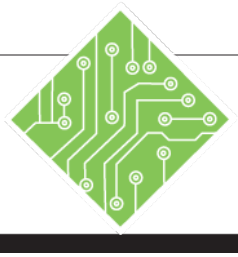


- Select the desired Scenario and click the **[Show]** button to display that Scenario's set of values.

Action 5.4 - Creating Scenarios



Instructions:	Results/ Comments:
1. Open the **RentCalculation.xlsx** file.	It is located in the lessons folder.
2. Save the file as **NewRentCalculations. xlsx**.	**[F12]**.
3. Activate the ***Manual Scenario*** worksheet.	Click the ***Manual Scenario*** worksheet tab if necessary.
4. On the ***Data Tab,*** in the **Forecast Group, c**lick the **[What-If analysis]** drop-down button**.**	
5. Select *Scenario Manager* from the menu.	The *Scenario Manager* dialog opens. This file has no scenarios yet so none are listed.
6. Click the **[Add]** button.	To create the first scenario. The *Add Scenario* dialog opens.
7. Click into the **Scenario name:** field and type in; **<Original>**.	This will be the name of the scenario when complete.
8. Click into the **Changing cells:** field and then select cells **B7:C7** hold the **[Ctrl]** key and click cell **G7**.	This are the cells that can be altered in this and other scenarios to allow changes.
9. In the **Comment:** field type in; **<These are the current figures>.**"	This is not required but never hurts to see the comments to know which scenario you will choose to show later on.
10. Click the **[OK]** button.	The *Edit Scenario* dialog opens, showing the cells that can be changed along with the values in those cells.
11. Leave the values as they are and click the **[OK]** button.	Since this is the original scenario, no changes should be made. The *Scenario Manger* dialog is re-displayed.
12. Click the **[Add]** button.	The *Add Scenario* dialog opens again.



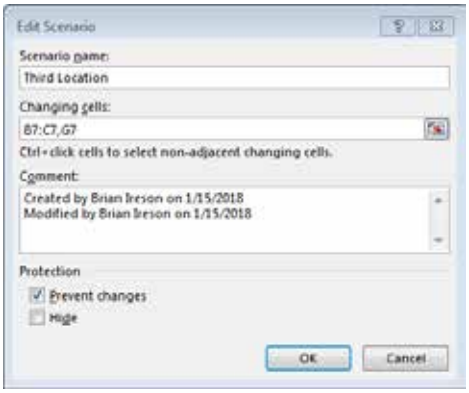
Instructions:	Results/ Comments:
13. Click into the **Scenario name:** field and type in; "**Second Location**"	This will be the name of the second set of variables in the scenario.
14. In the Comment field type in; "**These are the figures at second location**"	
15. Click the **[OK]** button.	The Edit Scenario dialog opens again.
16. Enter the following values; 1: "**15**" 2: "**7500**" 3: "**500**" Click the **[OK]** button.	The values represent the changes in cost per square foot, footage, and the Maintenance Fees. Click into the first field and use the **TAB** key to move to the next field after entering the new values. The Scenario Manager dialog is re-displayed.
17. Try adding another Scenario choosing your own values.	Name this Scenario '**Third Location**".
18. Close the *Scenario Manager* dialog.	
19. On the ***Data Tab***, in the **Forecast Group,** click the **[What-If analysis]** button drop-down.	
20. Select *Scenario Manager* from the menu.	The *Scenario Manager* is displayed, showing the saved Scenarios.
21. Choose the *Second Location* scenario and click the **[Show]** button.	The values change in accordance to the Scenario being shown.
22. Save the file and leave it open.	**[Ctrl+S]**.

Scenarios,
continued

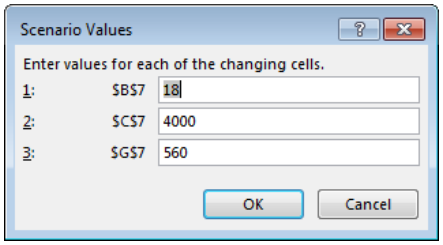
Editing a Scenario

When the set of variables changes you may need to update the scenario to reflect those changes. Any Scenario can be edited from within the Scenario Manage dialog.

- Open the *Scenario Manager* from the **[What-If analysis]** button drop-down.
- Select the Scenario that needs to be updated.
- Click the **[Edit]** button to open the *Edit Scenario* dialog.



- Click the **[OK]** button to open the *Scenario Values* dialog.

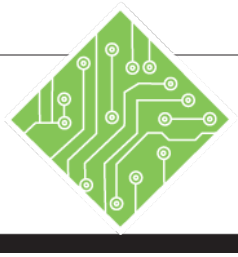


- Change the values as needed and click the**[OK]** button.
- Click the **[Close]** button to close the Scenario Manager dialog.

Removing Scenarios

- Open the *Scenario Manager* dialog.
- Select the unwanted Scenario.
- Click the **[Delete]** button
- Click the **[Close]** button to close the *Scenario Manager* dialog.

Action 5.5 - Editing and Deleting a Scenario



Instructions:	Results/ Comments:
1. The **NewRentCalculations.xlsx**. file should still be open.	If not, reopen the file.
2. On the ***Data Tab***, in the **Forecast Group,** click the **[What-If analysis]** button drop-down**.**	
3. Select *Scenario Manager* from the menu.	The *Scenario Manager* dialog opens.
4. Select the *Third Location* Scenario and click the **[Edit]** button.	The *Edit Scenario* dialog opens.
5. Click the **[OK]** button.	The *Scenario Values* dialog opens.
6. Change the values in the *Scenario Values* dialog.	
7. Click the **[OK]** button.	The *Scenario Manager* dialog is re-displayed.
8. Select the *Third Location* Scenario and click the **[Show]** button.	The *Third Location* Scenario values are shown in the worksheet.
9. On the ***Data Tab***, in the **Forecast Group,** click the **[What-If analysis]** button drop-down**.**	
10. Select *Scenario Manager* from the menu.	The *Scenario Manager* dialog opens.
11. Select the *Third Location* Scenario and click the **[Delete]** button.	The *Third Location* Scenario is removed from the list of available Scenarios.
12. Click the **[Close] b**utton.	The *Scenario Manager* dialog closes.
13. Save the file and leave it open.	**[Ctrl+S]**.

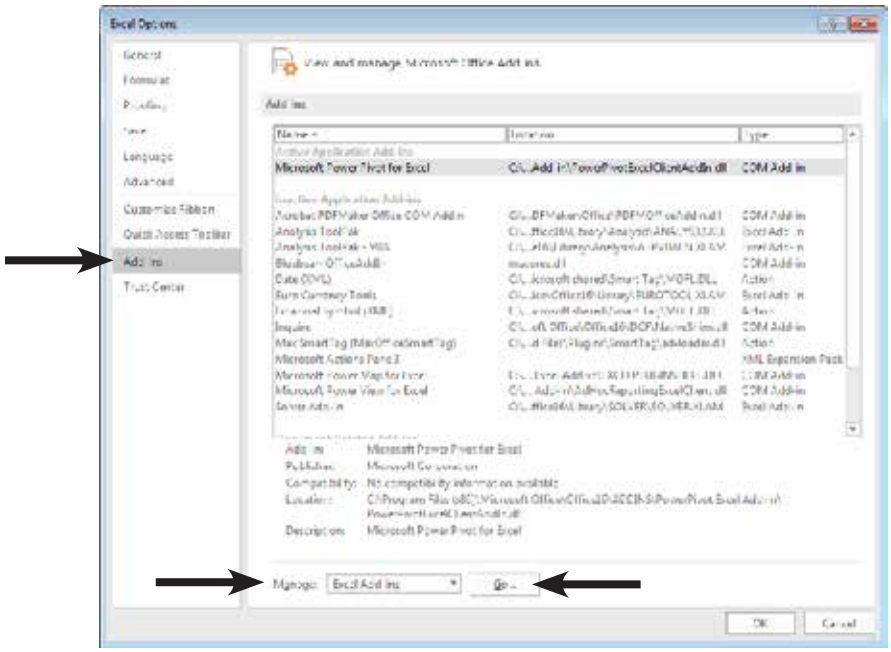
Solver

The Solver is an *Excel* add-in program, used for what-if analysis. When you need to calculate to an optimal (maximum or minimum) value for a formula in one cell use the Solver to find the desired value. This is similar to the Goal Seek but offers new levels of control by allowing you to set constraints to the variables used to determine the desired value. Solver adjusts the values in the variable cells in accordance with the limits defined by constraints in order to meet the desired result.

The Solver must be enabled from the *Excel* Add-ins before you can access it.

Installing the Solver Add-in

- Display the ***File Menu*** and click the *Excel* **Options** button on the left side of the Backstage view.
- The *Excel* **Options** dialog is displayed,
- Choose the **Add-Ins** category from the left side of the window.
- From the drop list at the bottom specify *Excel* **Add-ins** (if not already designated).
- Click **[Go]** to display the *Excel* **Add-ins** dialog.

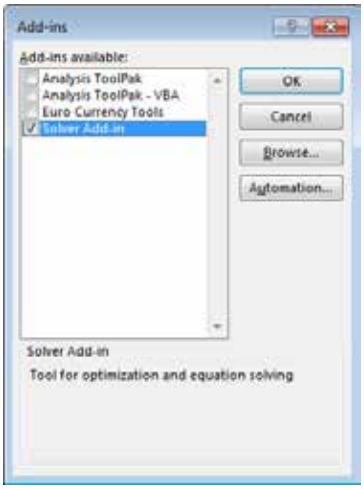


Note

If the Solver does not install properly, check to see if the ActiveX settings have been set to *Prompt me*. To access the ActiveX setting; go to the ***File Tab***, choose *Excel Options*, choose *Trust Center*, click the **[Trust Center Settings]** button, choose *ActiveX Settings*, click the *Prompt me* radio button and click the **[OK]** buttons to exit all options windows. You may need to restart *Excel* for all changes to take effect.

Solver, continued

- The Add-ins dialog opens.



- Put a check next to the *Solver Add-in* option in the available add-ins list.
- Click **[OK]**.
- When *Excel* finishes installing the **Solver**, an Analysis Group is added at the right side of the ***Data Tab,*** with the **[Solver]** button.

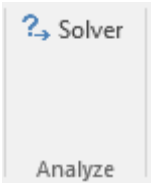
Solver,
continued

Using Solver

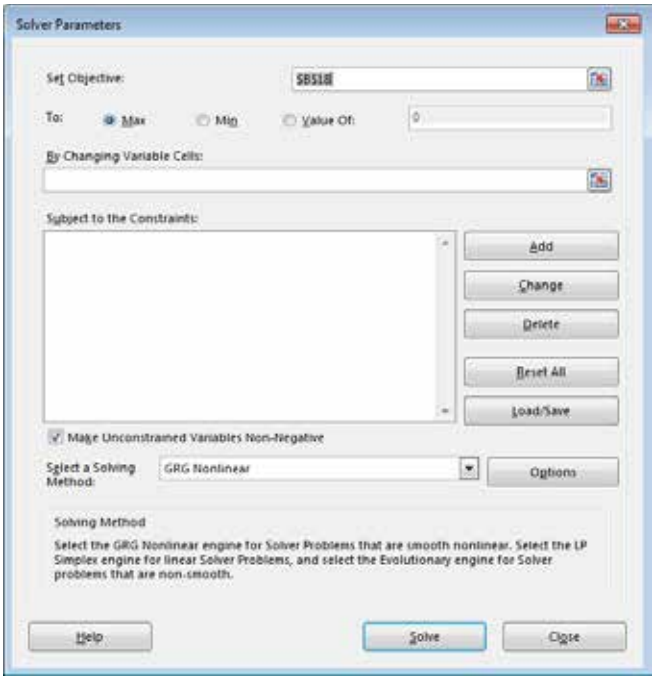
If the worksheet you are using has formulas that are feeding into an overall value, then the solver can be used to help reach an objective by adjusting the cell values used by those formulas. It is also possible to add cells to define parameters to be considered in the Solver's recalculations, although it is not necessary.

In the example being used here, we will be trying to find the best options in order to reduce rental costs while working within q set of constraints.

- Once the spreadsheet is set up,
- click the **[Solver]** button in **Analysis Group** on the ***Data Tab***.

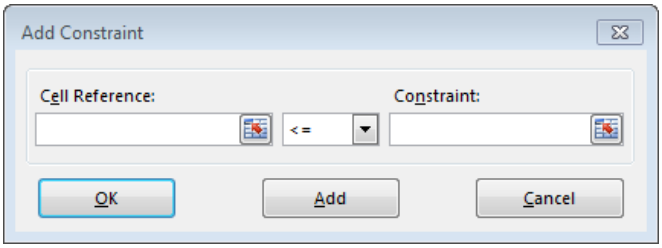


- The *Solver Parameters* dialog is displayed.



Solver, continued

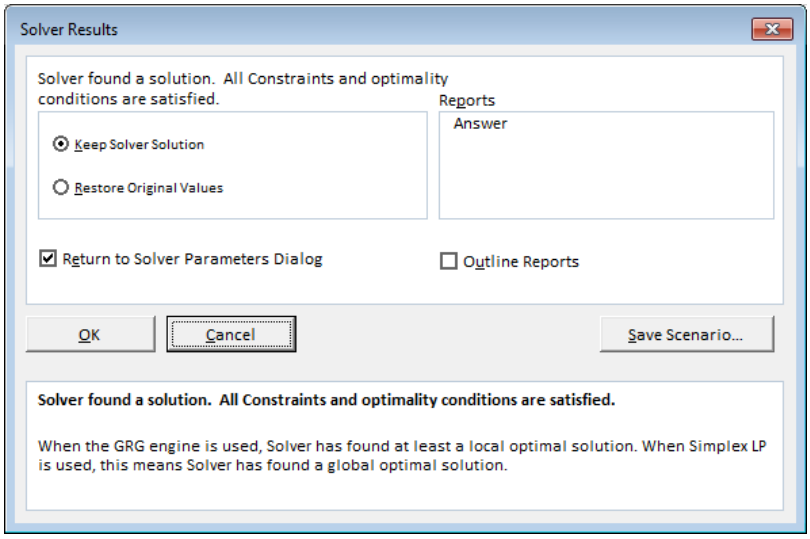
- Click into the **Set objective:** field and select the cell containing the final output formula.
- Set the **To:** radio buttons to the desired objective**.**
  - ***Max-*** will return the highest value
  - ***Min-*** will return the lowest value
  - ***Value of-*** allows you to define a specific value.
- The By **Changing Variable Cells:** field, allows you to select which cells can be modified in order to return the desired value.
- The **Subject to the Constraints:** field is empty at first. When there are limits or constraints you need to add to the Solver click the **[Add]** button.
- The *Add Constraint* dialog opens.



  - The **Cell Reference:** field is where you choose the cell that can be modified.
  - The **Operator** drop-down allows you to select from a set of options: ***Less than or equal to, Greater than or equal to, equal to, Integer, Bin,*** or ***Dif.***
  - The **Constraint:** field allows you to either choose a cell or enter a specific value.
  - Click the **[Add]** to continue adding other constraints.
  - Click the **[OK]** button when all the constraints have been added.

Solver, continued

- Click the **[Solve]** button. The Solver runs the calculations and the *Solver Results* dialog opens.

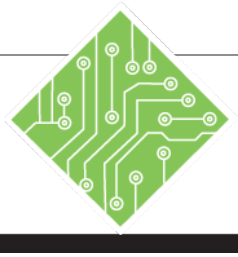


- In this dialog you can choose to:
  - Keep Solver Solution.
  - Restore Original Values.
  - Return to Solver Parameters Dialog.
  - You are also able to Save the Solver results as a new Scenario.
- Select the options you wish to use and click the [OK] button.

Note

If you checked the ***Return to Solver Parameters Dialog*** checkbox the *Solver* dialog reopens.

Action 5.6 - Adding the Solver to Excel

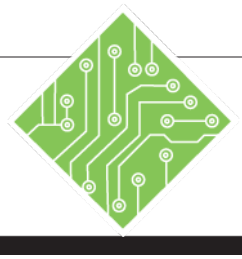


Instructions:	Results/ Comments:
1. Click the ***File Tab.***	The *Backstage* view is displayed.
2. Select *Options* from the right side of the *Backstage* view.	The *Options* dialog opens. You could also use the **ALT F T** sequential keyboard short cut.
3. On the left side of the window click the *Add-ins* category.	The Add-ins set of options are displayed in the main screen area.
4. In the **Manage:** drop-down make sure that *Excel Add-ins* is selected and click the **[Go]** button.	This should be the default selection, if not then use the drop-down and select it. The *Add-ins* dialog opens.
5. In the *Add-ins* dialog check the *Solver Add-in* checkbox	This is the specific ***Add-in*** you are adding to *Excel*.
6. Click the **[OK]** button.	*Excel* adds the Solver.
7. Make the ***Data Tab*** active.	
8. Notice the new **Analysis Group** on the right side of the ***Data Tab***.	The **Analysis Group** gives access to the Solver tool.

Action 5.7 - Using the Solver

Instructions:	Results/ Comments:
1. **NewRentCalculations.xlsx** file should still be open.	If not, reopen it.
2. Make the ***Solver Scenario*** worksheet active.	Click the ***Solver Scenario*** worksheet tab.
3. On the ***Data Tab***, in the **Forecast Group,** click the **[What-If analysis]** button drop-down**.**	
4. Select *Scenario Manager* from the menu.	The *Scenario Manager* dialog opens.
5. Click the **[Add]** button.	To create the first scenario. The *Add Scenario* dialog opens.
6. Click into the **Scenario name:** field and type in; **<Original>**	This will be the name of the scenario when complete.
7. Click into the **Changing cells:** field and then select cells **B7:C7** hold the **[Ctrl]** key and click on cells **E7** and **G7**.	This are the cells that can be altered in this and other scenarios to allow changes.
8. Click the **[OK]** button.	The Set Values dialog opens.
9. Leave the values as they are and click the **[OK]** button.	The *Scenario Manager* dialog is re-displayed.
10. Click the **[Close]** button.	The *Scenario Manager* dialog closes.
11. On the ***Data Tab***, click the **[Solver]** button drop-down in the **Analysis Group.**	The *Solver Parameters* dialog opens.
12. Click into the **Set objective:** field and then select cell **B1**.	This cell contains the formula used to return the monthly rental of an office space.
13. Click the **Value of:** radio button and enter < **7000** > in the Value field.	This represents the desired target value, by choosing a target value the solver acts very much like the Goal Seek.

Instructions:	Results/ Comments:
14. Click into the **By Changing Variable Cells:** field and select cells **B7:C7, E7,G7**.	These cells are used in the calculations to determine the value in cell **B1**. Setting these as variable cells will allow Solver to modify their values in order to return the desired value in **B1**.
15. Click the **[Add]** button in the **Subject to the Constraints:** area of the dialog.	The *Add Constraint* dialog opens, where limits to the modifications Solver can make in the variable cells.
16. In the **Cell Reference:** field enter **B7**, Set the **Operator** to <=, in the **Constraint:** field enter **B16**, then click the **[Add]** button.	This will define the top amount to be paid per square foot. Clicking the **[Add]** button will add the constraint and clear the field so you can add the next constraint.
17. In the **Cell Reference:** field enter **B7**, Set the **Operator** to >=, in the **Constraint:** field enter **B17**, then click the **[Add]** button.	This defines the lowest amount to be paid per square foot.
18. In the **Cell Reference:** field enter **C7**, Set the **Operator** to <=, in the **Constraint:** field enter **B11**, then click the **[Add]** button.	This defines the largest size of the space.
19. In the **Cell Reference:** field enter **C7**, Set the **Operator** to =>, in the **Constraint:** field enter **B12**, then click the **[Add]** button.	This defines the smallest size of the space.
20. In the **Cell Reference:** field enter **E7**, Set the **Operator** to <=, in the **Constraint:** field enter **B13**, then click the **[Add]** button.	This sets the maximum number of rooms the space should have.
21. In the **Cell Reference:** field enter **E7**, Set the **Operator** to >=, in the **Constraint:** field enter **B14**, then click the **[Add]** button.	This sets the minimum number of rooms the space should have.



Instructions:	Results/ Comments:
22. In the **Cell Reference:** field enter **E7**, Set the **Operator** to *int*, then click the **[Add]** button.	This defines the value in cell **E7** must be a whole number.
23. In the **Cell Reference:** field enter **G7**, Set the **Operator** to =, in the **Constraint:** field enter **<500>**, then click the **[OK]** button.	This sets an exact amount for the maintenance fees. Since you are done adding all the constraints, clicking the **[OK]** button returns you to the *Solver Parameters* dialog.
24. Examine the constraints now listed in the **Subject to the Constraints:** field.	
25. Click the **[Solve]** button.	The *Solver Results* dialog opens.
26. In the *Solver Results* dialog check the ***Return to Solver Parameters Dialog*** checkbox and click the **[Save Scenario]** button.	The *Save Scenario* dialog opens.
27. In the *Save Scenario* dialog, click into the **Scenario Name:** field and enter "**7000 target**" and click the **[OK]** button.	The Scenario is named and saved, the *Solver Results* dialog is re-displayed.
28. Click the *Restore Original Values* radio button and then click the **[OK]** button.	By choosing this radio button option the original values are put back into place and the *Solver Parameters* dialog is re-displayed.
29. Select the *$G$7=500* constraint and click the **[Change]** button.	The *Change Constraint* dialog opens.
30. Change the value in the **Constraint:** field from **500** to **400** and click the **[OK]** button.	The constraint has been edited and the *Solver Parameters* dialog is re-displayed.
31. Click the **[Solve]** button.	The *Solver Results* dialog is displayed.
32. Click the **[Save Scenario]** button.	The *Save Scenario* dialog opens.
33. In the *Save Scenario* dialog, click into the **Scenario Name:** field and enter < **7000 target 2** > and click the **[OK]** button.	A third scenario is saved and the *Solver Results* dialog is re-displayed.

Instructions:	Results/ Comments:
34. Click the *Restore Original Values* radio button and then click the **[OK]** button.	The original values are put back into place and the *Solver Parameters* dialog is re-displayed.
35. Click the **[Close]** button.	The *Solver Parameters* dialog is closed.
36. On the ***Data Tab***, click the **[What-If analysis]** button drop-down in the **Forecast Group.**	
37. Select *Scenario Manager* from the menu.	The *Scenario Manager* dialog opens, showing the three scenarios created.
38. Select the *7000 target 2* Scenario and click the **[Show]** button.	The values for this scenario are displayed on the worksheet.
39. Try changing which scenario is being shown and the click the **[Close]** button.	Depending on the scenario being shown, the values change.
40. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

Forecasting

Note

The timeline requires consistent intervals between its data points.

When the data you are working with has historical time-based data, *Excel* can be used to create forecasts without having to generate a chart. Creating a forecast will add a new worksheet containing a table of the existing data and predicted values along with a chart of the table data. Forecasts help predict future trends based on the existing data.

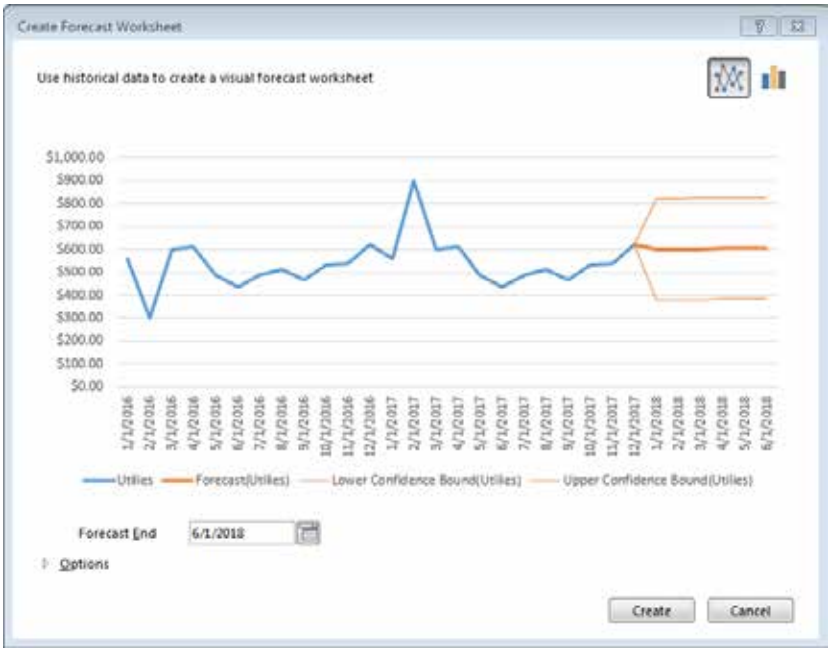
The structure of the data can be either vertically or horizontally laid out when using the Forecast feature. As long as one column or row has time based data, you are able to create and forecast the data as far into the future as needed. When creating the Forecast you can choose from either a Line or Bar chart.

Create a Simple Forecast

- Click any cell within the data set. (If you choose a single cell, *Excel* will automatically expand the selection to include all the connected data when using the Forecast feature.)

- OR -

- Select both data series to be forecasted. (Include the timeline date in the selection.)
- On the ***Data tab***, in the **Forecast Group**, click the **[Forecast Sheet]** button.

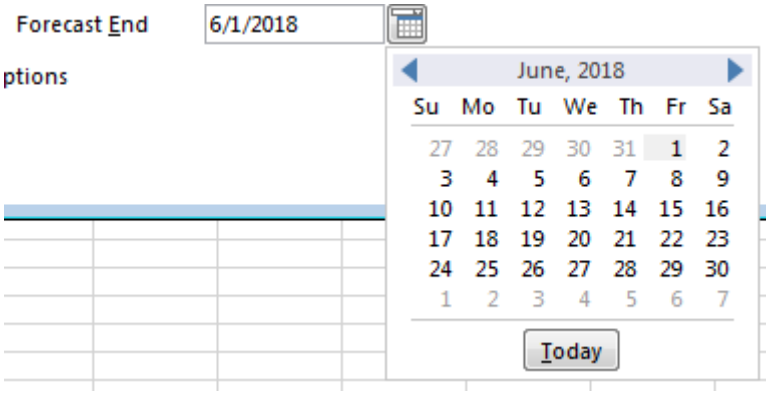


- The *Create Forecast Worksheet* dialog opens.

Forecasting,
continued

- Choose either a line or column chart in the upper right corner of the *Create Forecast Worksheet* dialog as the visual representation.

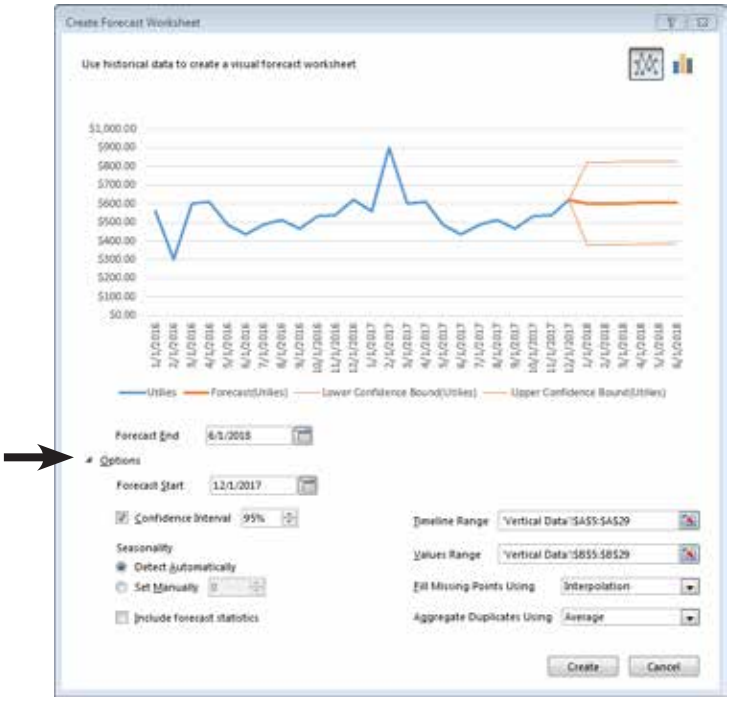
- Click into the **Forecast End:** field use the ***Date Picker*** to set the end date of the forecast.



- Click the **[Create]** button to generate the new worksheet with the forecast table and chart..

Customizing the Forecast

- While in the *Create Forecast Worksheet* dialog, click the *Option* drop-down to expand the options available with forecasting.



Forecasting,
continued

Note

If your data is seasonal, then starting a forecast before the last historical point is recommended.

- The **Forecast Start:** field allows you to set the date when the forecast is to begin. If you set the date prior to the end of the historical data only data prior to the start date in the prediction is calculated.
- The **Confidence Interval c**heckbox shows or hides the confidence interval. The forecasted values should be within the range set in the **Confidence Interval:** field. Note: The default value is 95%

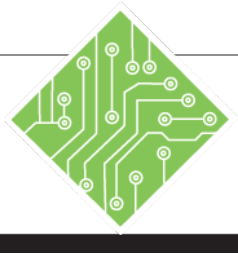
- ***Seasonality*** allows you to set the length (number of points) for a seasonal pattern. Detect *Automatically* is the default but you can select *Manually* to set the pattern to suit your needs.
- The **Timeline Range:** field allows you to define the cells containing the date or time data in the data set.
- The **Values Range:** field allows you to choose which cells contain the values used to create the forecast. This should match the ***Timeline Range*** in scope.
- The **Fill Missing Points Using:** drop-down uses interpolation by default but allows you to choose Zeros or:
  - ***Interpolation*** means that any missing point will be calculated as a weighted average of the neighboring points.
  - ***Zeros*** will place a zero value for any missing points.

Forecasting, continued

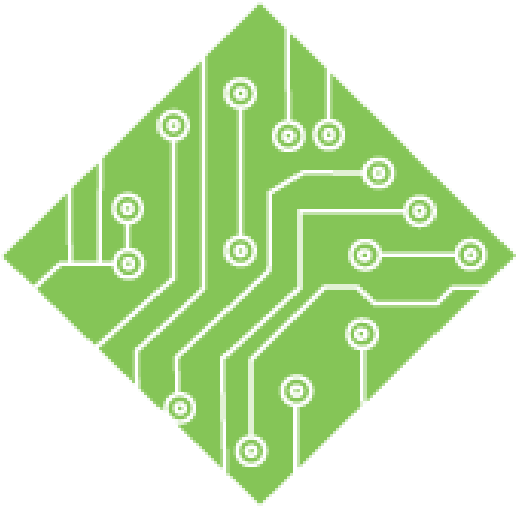
- The **Duplicate Aggregates Using:** field drop-down allows you to determine how *Excel* will handle multiple values with the same timestamp. The default is *Average* but you can choose other methods from the list.
- The ***Include Forecast Statistics:*** checkbox can add a table of statistics to the new worksheet. The table will contain measures, such as the smoothing coefficients (**Alpha**, **Beta**, **Gamma**), and error metrics (**MASE**, **SMAPE**, **MAE**, **RMSE**).

Action 5.8 - Adding a Forecast Worksheet

Instructions:	Results/ Comments:
1. Open the **Forecasting.xlsx** file.	It is located in the lessons folder.
2. Save the file as **MyForecasting.xlsx**.	**[F12]**.
3. Activate the ***Vertical Data*** worksheet.	Click the ***Vertical Data*** worksheet tab if necessary.
4. Click any cell containing a value.	*Excel* will automatically expand the selection when the **[Forecast Worksheet]** button is clicked.
5. On the ***Data Tab,*** in the **Forecast Group,** click the **[Forecast Worksheet]** button**.**	The the *Create Forecast Worksheet* dialog opens.
6. Click the date picker for the **Forecast End:** field and set the date to **December 1, 2018.**	The preview shows the forecast going forward to June 1, 2018. As the **Forecast End** is redefined the preview adapts to show the changes.
7. Click the **[Create]** button.	A new worksheet is added to the file with a table and chart.
8. Select the new sheet and examine it.	The table shows the total column of the source data was used to generate the forecast. It also shows the existing historical data and then forecasted data in the Forecast column, also added are columns showing the forecasted lower and higher values.
9. Delete the new worksheet.	Right-click the new worksheet tab and choose *Delete* from the menu.
10. Save the file and leave it open.	**[Ctrl+S]**.
11. Activate the ***Horizontal Data*** worksheet.	Click the ***Horizontal Data*** worksheet tab.
12. Click any cell containing a value.	
13. On the ***Data Tab,*** in the **Forecast Group,** click the **[Forecast Worksheet]** button**.**	



Instructions:	Results/ Comments:
14. Click the **[Create a column chart]** button in the upper right corner of the *Create Forecast Worksheet* dialog.	*Excel* will create a ***Column Chart*** instead of a ***Line Chart***.
15. Click the **[Create]** button.	The new worksheet with forecasting is added to the workbook.
16. Examine the new worksheet and the delete it.	This time the utilities row was used as the data for the forecast and the chart is a column chart.
17. Activate the ***Vertical Data*** worksheet.	Click the ***Vertical Data*** worksheet tab if necessary.
18. Click any cell containing a value.	
19. On the ***Data Tab,*** in the **Forecast Group,** click the **[Forecast Worksheet]** button**.**	The *Create Forecast Worksheet* dialog opens.
20. Click the ***Options*** arrow**.**	The ***Options*** are expanded.
21. Set the **Forecast Start:** field to **June 1, 2017**.	The forecasting will start from an overlapped position.
22. Change the **Confidence Interval** to *50%*.	The ***Confidence Interval*** lines in the preview are brought closer together.
23. Set the **Value Range:** field to; **Vertical Data'!$B$5:$B$29**.	Instead of forecasting the totals column of data you will now be forecasting the utilities column of data.
24. Click the **[Create]** button.	The new worksheet is added to the workbook.
25. Examine the new worksheet.	
26. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.

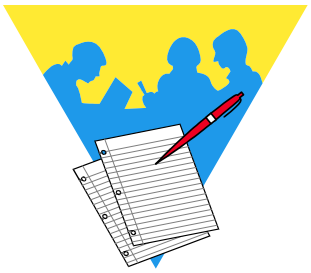


Appendix A: The Default Workbook and Theme

Lesson Overview

You will cover the following concepts in this chapter:

- The Default Workbook
- Excel Styles



Lesson Notes

The Default Workbook

In addition to Themes, there are other formatting options that are stored in their individual style galleries, which are all stored in the default workbook. The default workbook is the template that is used for all new workbooks.

Settings That Can Be Saved in a Template

- Cell and sheet formats.
- Page formats and print area settings for each sheet.
- Cell styles.
- The number of sheets in a workbook.
- Protected and hidden areas of the workbook.
- Standard text you want in every workbook, such as page headers and row and column labels.
- Data, graphics, formulas, charts, and other information.
- Data validation settings.
- Macros, hyperlinks, and ActiveX controls on forms.
- Workbook calculation options and window view options.

Note

Check with your administrator for permission to alter the default workbook. Not all installations or login credentials allow access to the default workbook folder.

If you want to make the styles that you create in or copy into a workbook available in all future workbooks, you can save them in the default workbook.

Saving Cell Styles to the Default Workbook

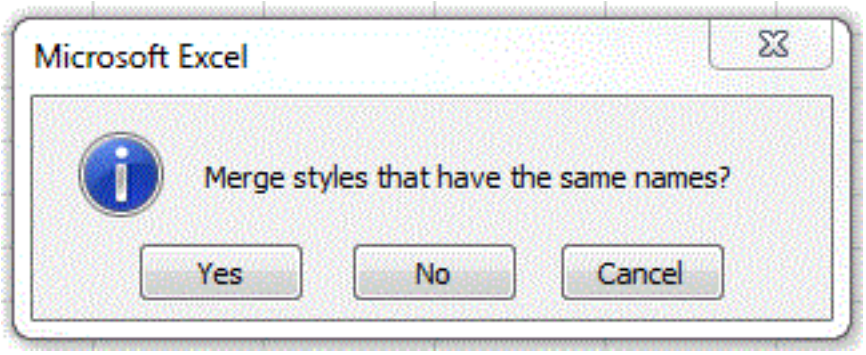
- Open the workbook that contains the styles that you want to make available.
- Open a new, blank workbook.
- In the blank workbook, click **[Cell Styles]** in the **Styles Group** of the ***Home Tab***.
- Click **Merge Styles...** at the bottom of the gallery.
- In the *Merge Styles* dialog box, double-click the workbook that contains the styles that you want to make available, and then click **[OK]**.

The Default Workbook, continued

If the two workbooks contain styles with the same names, you will see a message asking whether you want to merge these styles.

To replace the styles in the active workbook with the copied styles, click **[Yes]**.

To keep the styles in the active workbook, click **[No]**.



You receive this message only once, regardless of the number of conflicting style names.

- On the ***File Tab***, click **Save As**.
- In the **File name:** field, type **book**.
- In the **Save as type:** list, select *Excel Template (*.xltx)*.
- Using the folder list and address bar, navigate to the **XLStart** folder.

The **XLStart** folder can be located in the **Microsoft Office** folder:

C:\Program Files\Microsoft Office 14\root\office14

- OR -

If you do not have permission to save to the **Program Files** folder, you can save it to you **Users** folder.

For example, if your name is Ann:

C:\Users\Ann\AppData\Roaming\Microsoft\Excel\XLStart

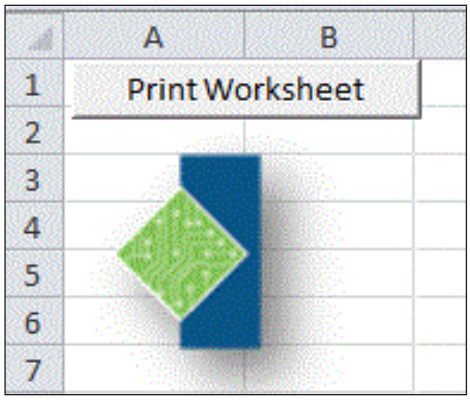
- Click **Save**.
- Close and re-open *Excel* to see the styles added to the default Style Gallery.

Note

You may also use the **Windows Search** function to find the **XLStart** folder.

Action A.1 - Customizing the Default Workbook

Instructions:	**Results/ Comments:**
1. Open a new *Excel* workbook.	
2. Click on the Windows **[Start]** button in the lower left-hand corner of your screen.	
3. In the **Search** field, type: **XLStart**.	
4. Where is it located? Write it on the line in the **Results** section.	_____
5. Rename ***Sheet1*** to **Dashboard.**	Double-click on the sheet tab and type **Dashboard**.
6. From the ***Insert Tab***, select **[Picture]**.	
7. Browse to the student exercises file folder and click on the **TCW logo** file.	
8. Click **[OK]**.	
9. Move the logo so that it rests in cells **A3:A6**.	There is no need to resize the logo.
10. Insert a hyperlink to The Computer Workshop on the TCW logo.	Right-click on the graphic and select *Hyperlink....* Then in the **Address:** field, type: **www.tcworkshop.com**
11. On the ***Format Picture Tools Tab***, apply the *Drop Shadow Rectangle* style from the ***Picture Styles*** gallery.	Fourth from the left in the top row of the gallery.
12. Using the ***Developer Tab***, insert a **Macro Button Form Control** to print the worksheet. Name the macro and the button **Print Worksheet**.	Click on the **[Insert]** button on the ***Developer Tab***. Select the **Button** tool and draw a button in cells **A1** and **B1**. When the *Macro* dialog box opens, type **PrintWorksheet** in the **Name:** field and click the **[Record]** button. Select the ***File Tab***, **Print**, and click **[Print].** Click the **[Stop Recording]** button on the ***Developer Tab***.

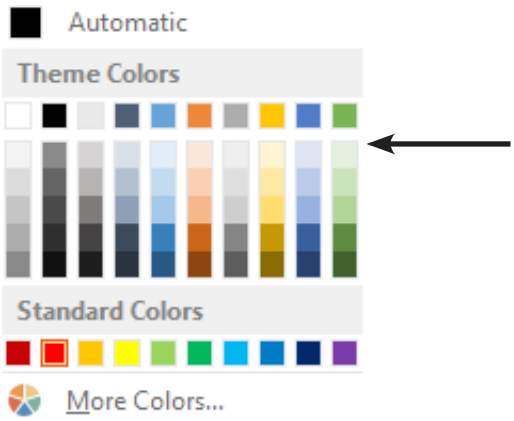
Instructions:	Results/ Comments:
13. In the header of the worksheet, insert and center **The Computer Workshop**.	
14. In the left section of the footer, insert **Created by: <your name>** .	
15. Rename ***Sheet2*** to ***Company***	
16. Delete ***Sheet3***.	
17. Click on the ***File Tab***.	
18. Select **Save As**.	
19. Change the **Save as type:** to *Excel Template (.xltx)*.	Be sure to complete this step before changing the file type. When the file type is changed to *Excel Template (.xltx),* the **Save As** location will default to the **Templates** folder.
20. Change the **File name:** to **book**.	Making the filename **Book** and the **Save As type:** *Template* should create a new default workbook template.
21. Click **[Save]**.	
22. Close your file.	
23. Create a new workbook.	Observe that the new workbook has the button and logo you created.
24. Click on the ***File Tab*** and select **Print**.	Notice the header and footer in the **Print Preview**.

Excel Styles

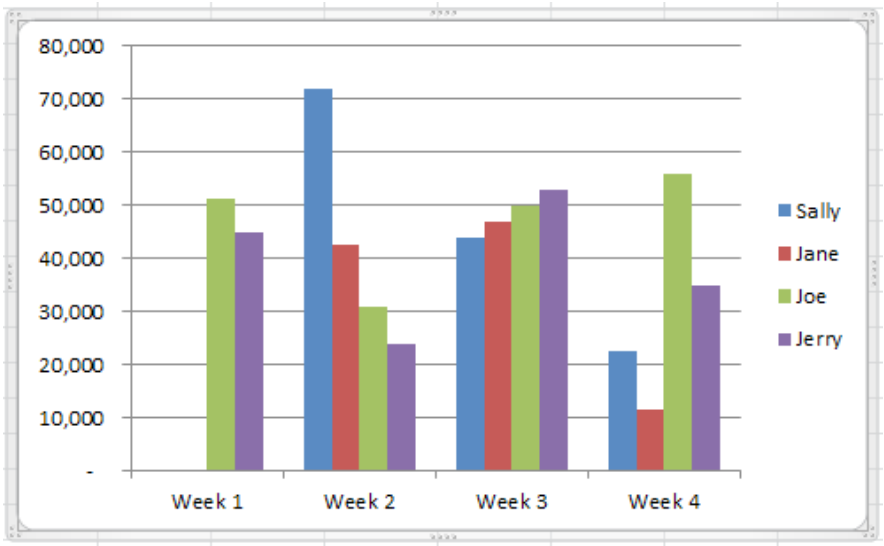
With the advent of *Excel 2007*, a new standard of formatting was developed involving styles. All of the *Office* products now incorporate Themes in formatting documents, workbooks and presentations. A Theme is a combination of fonts, styles and colors used in the active workbook.

When you select colors from a color palette, there is a row of theme colors at the top of the palette. Those colors are determined by the default workbook and can be changed in individual workbooks or saved to the default.

The default *Office* Theme includes the colors you see in the current font and fill drop-down galleries.



These are also the colors that appear in the series representation when you create a chart.



Excel Styles, continued

By using the ***Page Layout Tab***, you can see which colors will be applied, when you can view or change the current color palette, and also view or change the **Theme.**

Changing the Theme of a Workbook

- On the ***Page Layout Tab***, click the **[Themes]** button.
- Select from the drop-down gallery

  - OR -

  Select *Save Current Theme* to save a custom theme.

Changing the Colors in a Workbook Theme

- On the ***Page Layout Tab***, click the **[Themes]** button.
- Select from the drop-down gallery

  - OR -

  Select *Create New Theme Colors* to save a custom set of colors.

Notice you can change different elements which affect the bars in a column chart, or the pieces in a pie chart.

Changing the Font in a Workbook Theme

- On the ***Page Layout Tab***, click the **[Fonts]** button.
- Select from the drop-down gallery

  - OR -

  Select *Create New Theme Fonts* to save a custom set of colors.

Excel Styles,
continued

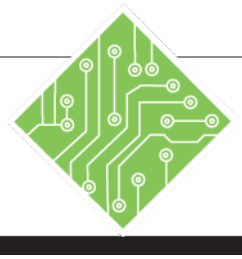
Saving a Custom Theme

- On the ***Page Layout Tab***, select the **[Themes]** button drop-down arrow.
- Select *Save current theme...* from the list.
- In the *Save Current Theme* dialog box, type a name for your theme in the **File name:** field.
- Click the **[Save]** button.

Your new theme will appear in the **Custom** section of the **[Themes]** gallery.

Action A.2 - Changing the Workbook Theme

Instructions:	**Results/ Comments:**
1. Open the **Styles.xlsx** workbook.	Notice the colors and font style applied to the worksheet.
2. Save the file as **My Styles**	
3. Click on the **[Colors]** button in the **Themes Group** of the ***Page Layout Tab***.	
4. Select the *Marquee* color palette.	Notice the colors changed on the Chart, PivotTable, Slicer, and the Table.
5. Click on the **[Fonts]** button in the **Themes Group** of the ***Page Layout Tab***.	
6. Choose the *Georgia* font group.	
7. Click into cell **E1**.	
8. Type: **Ohio Book Sales**.	
9. On the ***Home Tab***, in the **Styles Group**, select *Title* from the ***Cell Styles Gallery***,	
10. Click on the **[Colors]** button in the **Themes Group** of the ***Page Layout Tab***.	We will use custom colors not found on the palette.
11. Select Customize Colors.	
12. In the *Create New Theme Colors* dialog box, in the **Name:** field, type: **TCW**.	
13. Select the drop-down arrow next to ***Accent 1***.	
14. Click on the *More Colors...* option at the bottom of the menu.	
15. On the ***Custom*** tab, type: R= **0**, G= 83, and B= 134.	



Instructions:

16. Click **[OK]**.

17. Repeat steps 12 thru 15 for Accent 2, Accent 3 and Accent 4, with the following attributes:

	Red:	**Green:**	**Blue:**
Accent 2	**133**	**197**	**87**
Accent 3	**165**	**165**	**165**
Accent 4	**149**	**79**	**114**

18. Click **[Save]**.

19. Click on the **[Colors]** button in the **Themes Group** of the ***Page Layout Tab***.

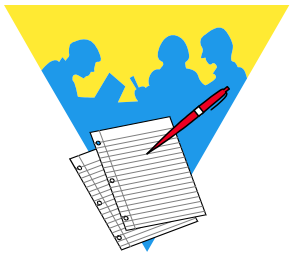
20. Select *TCW* from the ***Custom*** section of the list.

21. Save and close the file.

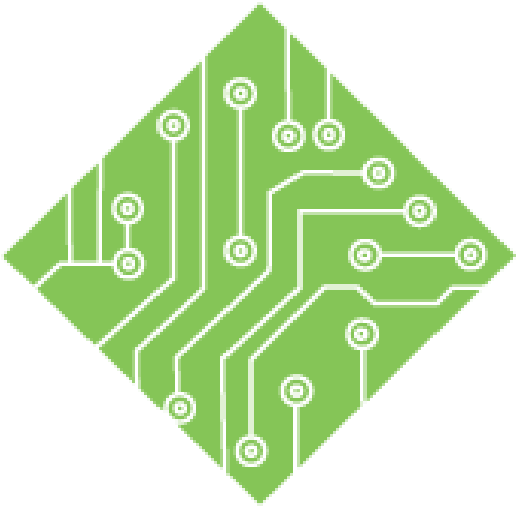
Results/ Comments:

Now we will test the new colors

The PivotTable and PivotChart should now be formatted with the custom TCW colors.



Tips and Notes

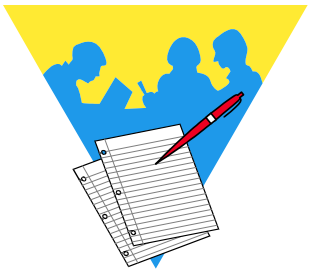


Appendix B: Querying a Website with Excel 2016

Lesson Overview

You will cover the following concepts in this chapter:

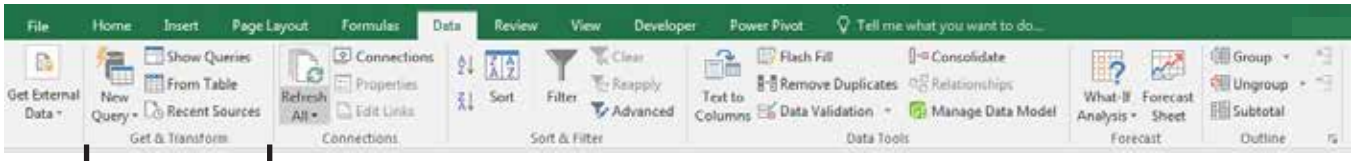
- Querying Data from a Web Site
- Editing A Query



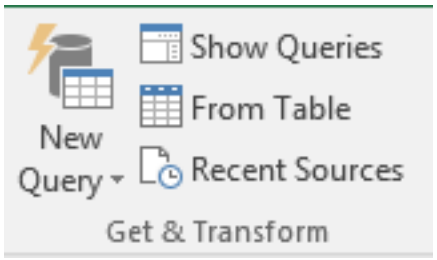
Lesson Notes

Querying Data from a Web Site

Excel *2016* offers a set of querying tools in the new **Get & Transform Group** on the ***Data Tab***. While the new ***Power Query*** and ***Power Pivot*** tools are outside the scope of this book, we will be examining how to use the ***New Query*** to gather information from websites.



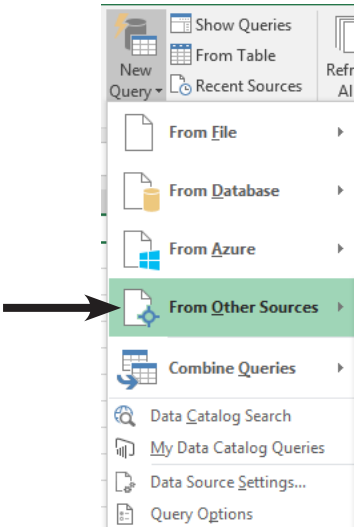
New Group



New Query from Web

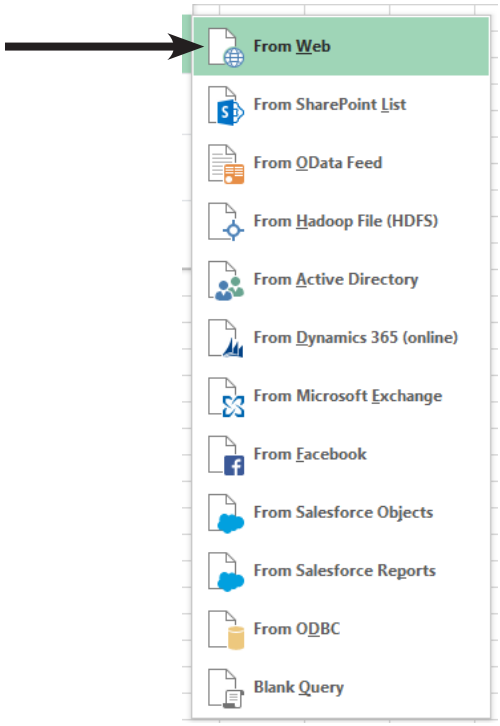
When you want to pull information from a web page into *Excel* using the New Query feature, the web page must have the data you are looking for in a tabular format.

- Click the **[New Query]** button drop-down in the **Get & Transform Group** on the ***Data Tab***.
- Scroll down to the ***From Other Sources*** option.
- From the ***Other Sources*** menu choose *From Web*.



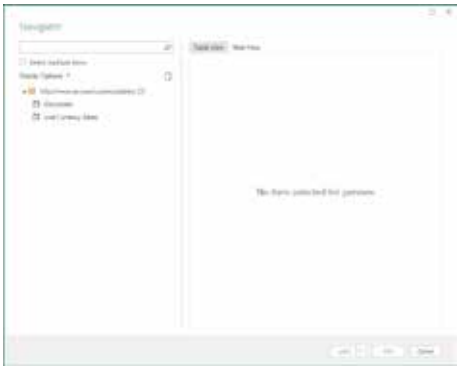
Querying Data from a Web Site, continued

- The *From Web* dialog opens.



- Enter the web address into the URL field and click the **[OK]** button.

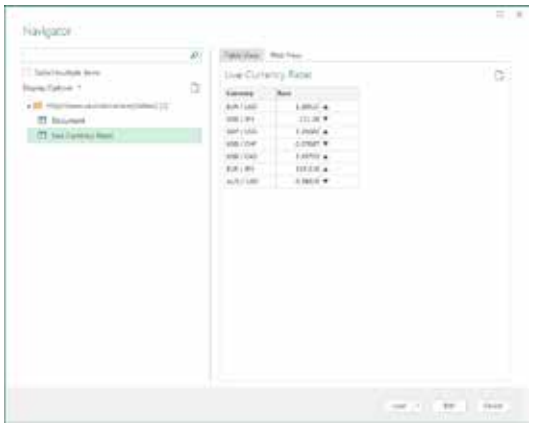
- The *Navigator* dialog opens.
  - In the Display Options area, a list of all the different tables on the web page are displayed.



Querying Data from a Web Site, continued

- These may or may not be named, depending on how the site is using HTML labels to define the tables.
- You are able to choose a single table or by checking the ***Select Multiple Items*** checkbox select more than one table to connect to.

- When choosing a single table, a preview is displayed on the right side of the dialog.
  - There are two options for the preview at the top of this section of the *Navigation* dialog, either as ***Table*** or ***Web*** view.



  - The ***Table View*** shows the data as an unformatted table.
  - The ***Web View*** shows the table as it appears on the web page.
  - When selecting more than one table the preview area displays the highlighted table in the Display Options area.
- Once the tables are decided on, click the **[Load]** button to load the data into a new worksheet.

Action B.1 - Gathering Data from a Web Site

Instructions:	Results/ Comments:
1. Open the **LinkToSite2.xlsx** file.	The file is in the lessons folder.
2. Save the file as **CurrencyExchange.xlsx**.	**[F12]**.
3. Select cell **A1**, and copy it.	**[Ctrl+C]** or right click and choose *Copy* from the menu.
4. Click the ***Data Tab,*** in the **Get & Transform Group,** click the **[New Query]** drop-down button.	The list of Queries are displayed.
5. In the **[New Query]** drop-down, choose *From Web* from the ***Other Sources*** submenu.	The *From Web* dialog opens.
6. Click into the **URL** field and paste the copied link.	**[Ctrl+V]** or right click and choose *Paste* from the menu.
7. Click the **[OK]** button.	The *Navigation* dialog opens.
8. From the ***Display Options*** area select the *Live Currency* table.	To select the table from this web page to connect to. A preview of the data in that table is displayed on the right side of the *Navigation* dialog.
9. Click the ***Web View*** tab.	The preview now shows what the table looks like on the site.
10. Click the back to the ***Table View*** tab.	The preview shows s simple table view.
11. Click the **[Load]** button.	The data from the selected table is added in cell **A1** of a new worksheet.
12. Save the file and leave it open.	**[Ctrl+S]**.

Editing A Query

Removing Unnecessary Data from a Query

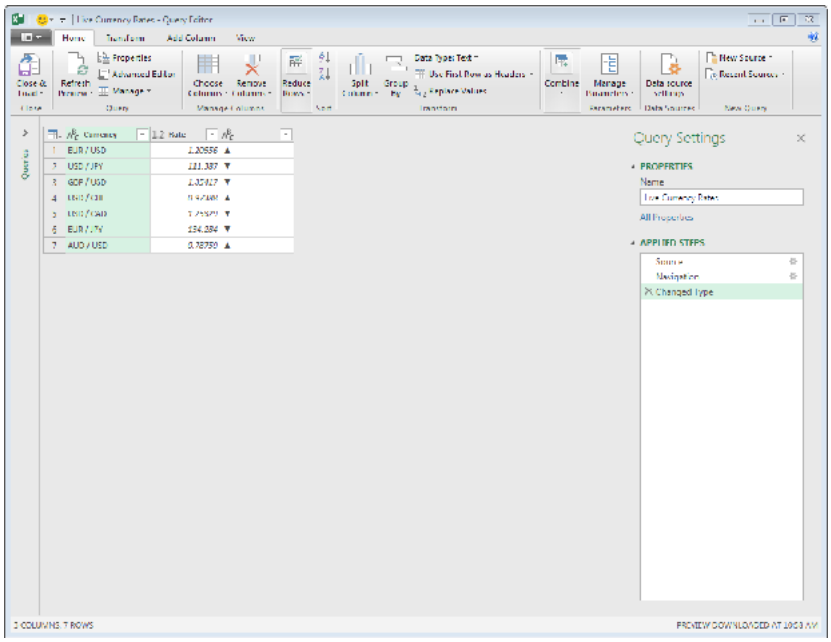
Once the data connection is established and the data added on a worksheet in the workbook, you may realize there is unnecessary data in the table. When the data table is selected, or any cell within the table the ***Query Tab*** is displayed on the ribbon.

Note

This tab is a contextual tab and is only displayed when the table or a cell within the table is actively selected.

Editing the Table

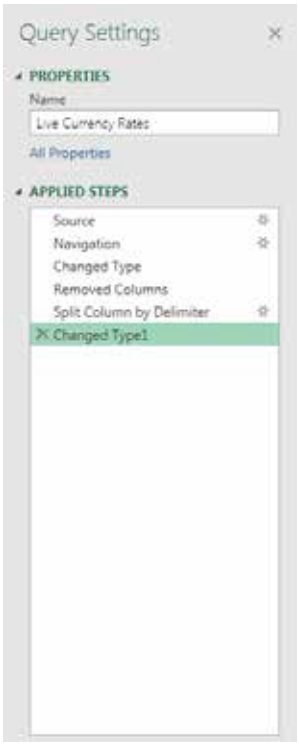
- Click the **[Edit]** button in the **Edit Group** on the ***Query Tab***.
- The *(Table Name) Edit Query* dialog opens.



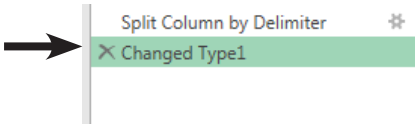
- Select any column that is not needed by clicking the column header.
- Click the **[Remove Columns]** button in the **Manage Columns Group** on the ***Home Tab*** in the *Query Editor* dialog.
  - You can also choose specific rows of data to keep from the table by using the [Reduce Rows] button drop-down.

Editing A Query, continued

- As changes are made a list of those change are displayed in the ***Query Setting*** pane of the editor.



  - To Undo any change: select the change and click the **[X]** button to remove the specific change.

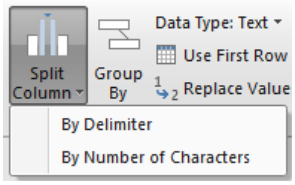


- To see how the changes will affect the table click the **[Refresh Preview]** button in the **Query Group** on the ***Home Tab*** of the *Query Editor* dialog.
- When all changes are completed, click the **[Close & Load]** button in the **Close Group** on the ***Home Tab*** of the *Query Editor* dialog.

Editing A Query, continued

Splitting a Column

- Select the column to split into multiple columns.
- Click the **[Split Columns]** button drop-down, two options are available: .



  - ***Delimiter***- choose this option if there is a common character that can be used as a marker of where the data can be split. (This is the choice for the example used here.)
  - ***By Number of Characters***- choose this option if there is a common prefix that can be used as a marker to define where the data is to be split.
- If the *Delimit* option is chosen, the *Split Column by Delimiter* dialog opens.

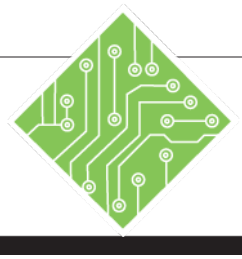
  - The **Select or enter delimiter** field drop-down offers a variety of common characters to choose from, including *Custom*.
  - Choosing *Custom* from the list of delimiters adds a field where you can enter the character to use as the delimiter.
  - Click the ***Advanced Options*** drop-down to expand more options on how the data will be split.
- Click the **[OK]** button when done to apply the changes.
- Click the **[Close & Load]** button to finish editing the query.

Refreshing the Data

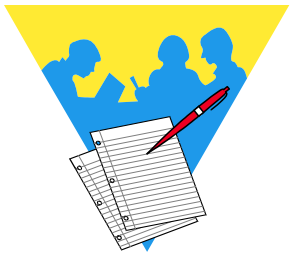
Click the **[Refresh]** button in the **Load Group** on the ***Query Tab***.

Action B.2 - Editing the Query

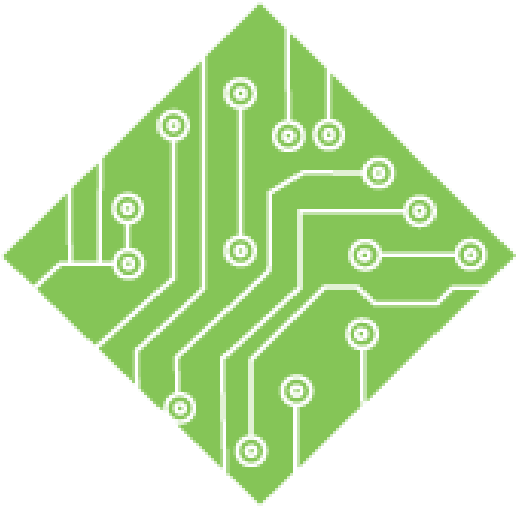
Instructions:	Results/ Comments:
1. The **CurrencyExchange.xlsx** file should still be open.	If not, then re-open the file.
2. Click any cell in the data table that was just added to the workbook.	To make the data table active and display the ***Query Tab*** in the ribbon.
3. Activate the ***Query Tab*** in the ribbon.	
4. In the **Edit Group,** click the **[Edit Query]** button.	The *Query Editor* dialog opens.
5. Select the third column header in the preview.	The column is highlighted.
6. In the **Manage Columns Group**, click the **[Remove Columns]** button.	The column is removed.
7. Click the first column header in the preview.	This column will be split into two separate columns.
8. In the **Transform Group**, click the **[Split Columns]** button drop-down and choose the *By Delimiter* option.	The *Split Column by Delimiter* dialog opens.
9. Choose *Custom* from the **Select or enter delimiter** field drop-down.	A new blank field is added below the **Select or enter delimiter** filed.
10. Click into the new field and type in: </>.	This character is used to divide the two currencies in the column and will now be used as the marker for spliting the column into two.
11. Click the **Advanced options** arrow.	New options relating to how the columns can be split are displayed.
12. Examine the available options.	
13. Click the **Advanced options** arrow.	The advanced options are collapsed.
14. In the **Applied Step** field of the ***Query Settings*** pane, select the *Split Columns by Delimiter* step and click the **[X]** button.	The ***Split Columns*** action is undone and the column is recombined. You may need to remove the *Changed Type 1* step before the *Split Columns by Delimiter*.



Instructions:	Results/ Comments:
15. On the ***Home Tab***, click the **[Close & Load]** button.	The *Query Editor* dialog is closed and the data table updated.
16. Click the **[Refresh]** button in the **Load Group** on the ***Query Tab***.	The data in the table is updated based on the information from the web site.
17. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W]**.



Tips and Notes

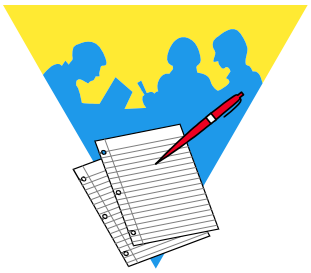


Appendix C: 2016-Sharing and Linking Workbooks

Lesson Overview

You will cover the following concepts in this chapter:

- Creating and Using Shared Workbooks
- Sharing a Workbook
- Tracking Changes
- Protecting a Shared Workbook
- Resolving Conflicts in a Shared Workbook
- Consolidating Workbooks



Lesson Notes

Shared Workbooks

Excel's shared workbook feature allows multiple users to edit a single workbook at the same time. Moreover, the users that are modifying the shared workbook can be at separate remote locations. This is a great way for coworkers to overcome location or scheduling barriers that prevent them from meeting. All of the users can collaborate on the worksheet from their own desks at the same time or at different times, and the changes made can be reviewed and merged when required.

In this lesson, you will learn how to share an *Excel* workbook, how to track changes to the workbook, how to resolve conflicts in a shared workbook, and how to revise a shared workbook.

Sharing a Workbook

Sharing Limitations

There are some *Excel* features and objects that cannot be modified once a workbook is shared. It is usually a good idea to set up these features as needed before you share the workbook.

The following features and objects can be viewed but not modified in a shared workbook.

- Drawing objects
- Data validation
- Charts
- Conditional formatting
- Hyperlinks
- Merged cells
- Groupings and outlines
- Array formulas
- Pictures

The following features and objects can be viewed, but cannot be created or modified in a shared workbook.

- Data tables
- PivotTable reports
- Sparklines
- Slicers
- *Excel* tables
- Data forms

In addition, passwords, scenarios, and lists cannot be viewed or created in a shared workbook.

You can run existing macros and you can record shared workbook operations into a macro stored in another unshared workbook. However, you cannot, write, record, change, view or assign macros.

Also, you cannot sort or filter by formatting, use the **Text to Columns** command, work with XML data, or delete worksheets or blocks of cells in a shared workbook.

Sharing a Workbook, continued

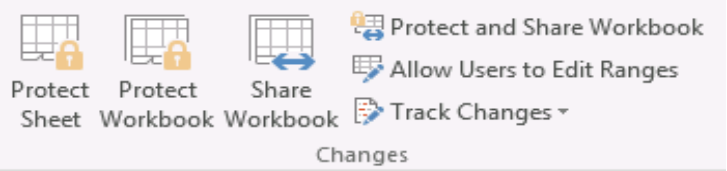
How to Share a Workbook

Once you have created your workbook, the most efficient way to share it is to save the workbook to a shared network folder or location.

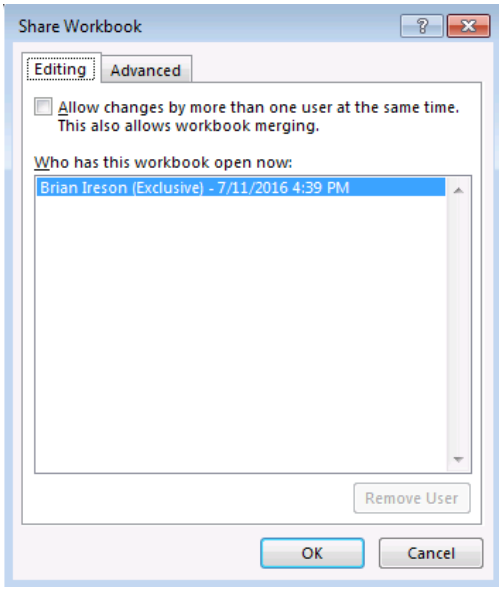
- Use the *Save As* dialog to browse to the shared folder on your network and click the **[Save]** button in the dialog to save the workbook.

For this example, the workbook will be saved as **SharedWorkbook2**.

- Click the **[Share Workbook]** button in the **Changes Group** on the ***Review Tab***.



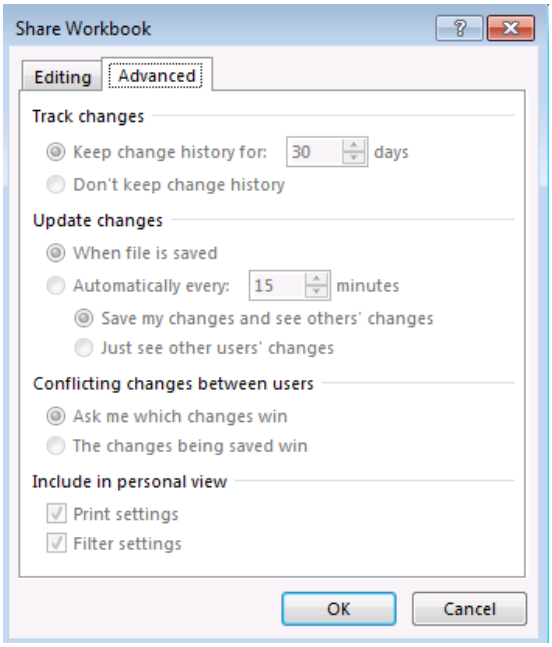
- This will display the following *Share Workbook* dialog.



- Put a checkmark in the checkbox on the ***Editing Tab*** to allow more than one user to make changes to the workbook simultaneously.

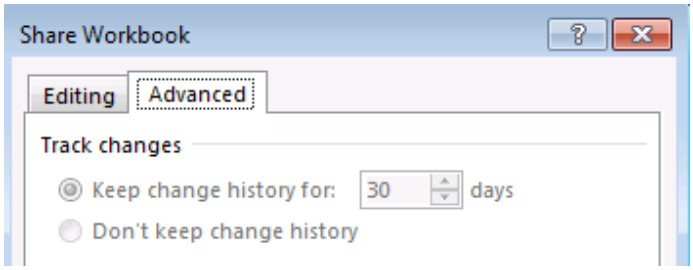
Sharing a Workbook, continued

- Click the ***Advanced Tab*** in the *Share Workbook* dialog to show you more options for configuring your shared workbook.



On this tab, you can specify how many days to keep track of changes to the workbook, when to update changes, and how to resolve conflicts.

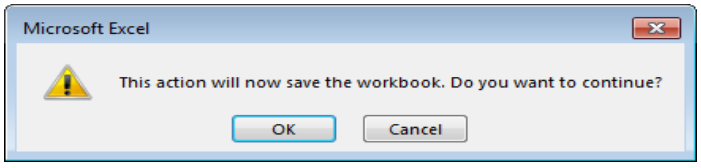
- Under the ***Track Changes*** heading, you will see an option button labeled *Keep change history for*. Selecting this button will allow you to review the changes made to the shared workbook by the users involved. You should keep in mind that if you specify a long period of time to keep the change history, the file size can grow quite large if there are frequent changes.



Sharing a Workbook, continued

- Under the ***Update Changes***, heading you can choose to have changes to the file updated when the file is saved, or automatically, based on a time period that you specify. If changes are updated automatically, your shared workbook will be updated for you even while you have it open. If you select the *When file is saved* option, saving the shared workbook will update all of the changes made since the last time you saved it.
- When a workbook is shared, it is possible for more than one user to modify the workbook at the same time. If two people try to save a shared workbook after making changes to the same cells, a conflict can occur. You can use the ***Conflicting changes between users*** section to moderate how to resolve this issue.
- Click the **[OK]** button in the *Share Workbook* dialog to save the shared workbook to a shared network folder if you have not already done so.

If you have saved the workbook to a shared network folder *before* making it a shared workbook (as is the case in this example), you will see the following alert when you click **[OK]** in the *Share Workbook* dialog.



If you click **[OK]**, the workbook will be saved as a shared workbook. The shared workbook can now be edited by users just like a standard workbook (keeping in mind the exceptions listed previously).

Opening and Editing a Shared Workbook

To edit a shared workbook, users should navigate to the network folder where the shared workbook is stored and open it just as you would a regular *Excel* workbook.

Action C.1 – Sharing a Workbook and Tracking Changes

Instructions:	Results/ Comments:
1. Open the **Production Totals.xlsx** file.	It is located in the lessons folder.
2. Save the file as **MyProductionTotals.xlsx.**	**[F12]**.
3. On the ***Review Tab,*** in the **Changes Group,** click on **[Share Workbook]** button.	The *Share Workbook* dialog opens.
4. Check the checkbox to ***Allow changes by more than one user at the same time***.	If this remains un-checked the file will not be shared.
5. Click on the ***Advanced Tab***	If the ***Allow changes by more than one user at the same time*** is un-checked, all options are greyed out.
6. In the **Keep change history for:** field change the number of days to **45**.	The default number of days the history is kept is 30.
7. Under ***Update changes,*** click on the *Automatically every radio button.*	Fifteen minutes is the default.
8. Leave the remaining defaults and click **[OK]**.	
9. Click **[OK]** in the *Alert* dialog to save the workbook.	The file is saved as a shared workbook.
10. Activate the ***Insert Tab***.	Since the file has been saved as a shared workbook most of the options on the tab are greyed out.

Tracking Changes

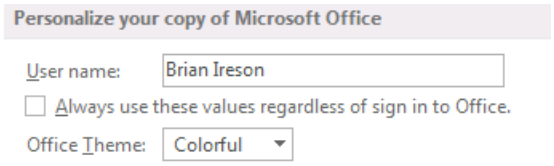
Tracking Changes

The ***Track changes*** option will allow you to see any changes that have been made to the shared workbook by the individual users sharing it. Even more importantly, it will allow you to accept or reject any of the changes that have been made to the workbook over a period that you can specify.

User Credentials for Tracking Changes

Users should ensure they have a **User name** entered on their *Excel* application, so the changes they make will be identified with their user. These credentials usually appear in the file properties of workbooks the user has created.

- Click the **[Excel Options]** button on the ***File Tab*** to display the *Excel Options* dialog.



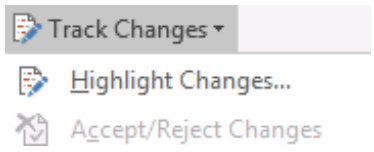
Note

Changing the **User name** in *Excel* will also change it for the other *Office* Applications (*Word, PowerPoint, Access*, etc.) you have installed.

- In the *Excel Options* dialog, choose the ***General*** heading from the panel on the left, and then enter your user name in the **User name:** field near the bottom.
- Click the **[OK]** button to close the *Excel Options* dialog.

Highlighting Changes

- Click on the ***Review Tab***.
- Select the **[Track Changes]** button drop-down.

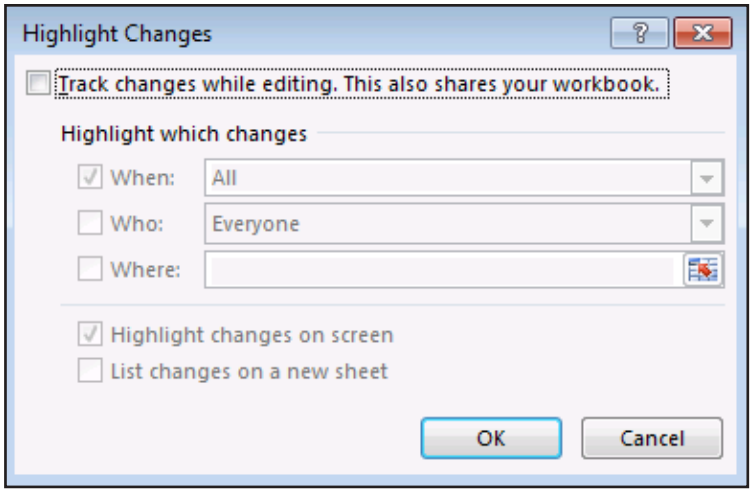


- Select *Highlight Changes...* from the drop-down menu. This opens the *Highlight Changes* dialog.
- Click on the *Track changes while editing* checkbox. This will activate the options for you to highlight which changes specifically you would like to see highlighted.

Tracking Changes, continued

When you first set up a workbook for sharing, you will see an option for keeping the change history for the workbook under the ***Advanced Tab*** in the *Share Workbook* dialog.

This option is selected by default. If you select *Don't keep changes,* you will not be able to track the changes to the shared workbook.



In the *Highlight Changes* dialog you can choose:

- **When:** which refers to what date you want as the reference point for tracking the changes.
- **Who**: which refers to the user or users whose changes you want to track.
- **Where**: which refers to the specific cell or range that you want to track changes in.
- At the bottom of the box, you can choose to ***highlight changes on screen*** or ***list changes on a new sheet***, or both.

Checking the ***Highlight Changes on Screen*** option will highlight any cells that have been changed with a blue border and a blue comment triangle in the upper left.

The comment shows information about the changes to the cell. It includes the person who modified the cell, when it was modified, and the previous and current values. To see a comment, just let your mouse pointer hover over an highlighted cell and the comment will automatically expand.

Tracking Changes, continued

Note

The History worksheet is available until the file is saved, or the Accept/Reject Changes is used.

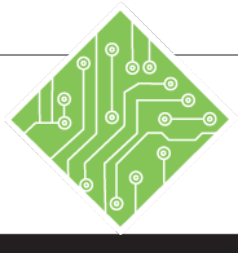
The History worksheet

The ***List Changes on a New Sheet*** option will generate a new temporary worksheet labeled ***History*** that details the changes made to the workbook. The ***History*** sheet is displayed while working in the shared workbook, when ***Track Changes*** is active. This sheet is only available while working in the file currently, it is removed when you use the Accept/Reject Change tool, or save the file. To view the History worksheet again, you must open the *Highlight Changes* dialog and checking the ***List changes on a new sheet*** check box.

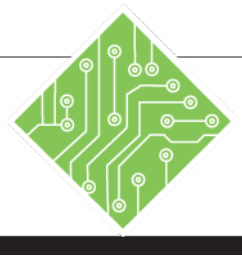
In the ***History*** worksheet, you can sort the changes or apply filters from the **AutoFilter** drop lists associated with each column heading. The last two columns, **Action Type** and **Losing Action**, apply to conflict resolution for workbooks that are shared from a shared network folder. You can always use the ***History*** worksheet or the highlighted changes on screen as a reference if you want to re-enter some of the older values and undo changes.

Adding the History Worksheet

- Choose *Highlight Changes* from the menu of the **[Track Changes]** drop-down button.
- In the Track Changes dialog:
  - Check the **When:** field checkbox and choose *All* from the field drop-down.
  - Leave the **Who:** and **Where:** checkboxes unchecked.
  - Check the ***List changes on a new sheet*** checkbox.
  - Click the **[OK]** button



Instructions:	Results/ Comments:
1. The **MyProductionTotals** file should still be open.	If not, reopen it.
2. On the ***Review Tab,*** in the **Change Group,** click the **[Track Changes]** button drop-down.	
3. Choose *Highlight Changes* from the list.	The *Highlight Changes* dialog opens.
4. Check the **Track Changes while editing** checkbox.	If the workbook has not already been shared, checking this checkbox automatically shares the workbook.
5. Check the **When:** checkbox and leave the field as ***Since I last saved***.	Any change made since you last saved the file will be highlighted.
6. Check the **Who:** checkbox and leave the field as ***Everyone***.	Changes made by any user of the file will be highlighted.
7. Check the **Highlight changes on screen** checkbox.	As changes are made they are highlighted with a blue border and triangle in the upper left corner of the cell.
8. Click the **[OK]** button.	The *Highlight Changes* dialog is closed and *Tracking* is turned on.
9. Select cell **B3** and change the value to: **<26562>**.	The cell is highlighted.
10. Select cell **C3** and change the value to: **<45254>**.	The cell is highlighted.
11. Hover over cell **B3**.	The *Change Comment* is displayed.
12. Save the file.	**[Ctrl+S]**.
13. On the ***Review Tab,*** in the **Change Group,** click the **[Track Changes]** button drop-down.	
14. Choose *Highlight Changes* from the list.	The *Highlight Changes* dialog opens.



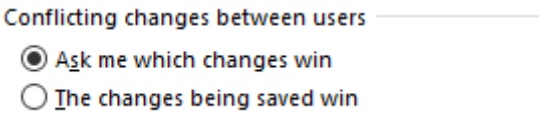
Instructions:	Results/ Comments:
15. Check the **When:** checkbox and select ***All*** from the field drop-down.	This will show all changes made to the file since the ***Track Changes*** was turned on. This is subject to the time defined in the **Keep Change History** field on the ***Advanced Tab*** in the *Share Workbook* dialog.
16. Check the ***List changes on a new sheet*** checkbox.	This will add a new worksheet to the file, detailing the change history.
17. Click the **[OK]** button.	The *Track Changes* dialog closes and a ***History*** worksheet is added to the file.
18. Activate the ***History*** worksheet.	Click the ***History*** tab.
19. Examine the ***History*** sheet.	Information about the changes to the file are listed. The last two columns are blank since no review of the changes has been done yet.
20. Save and close the file.	**[Ctrl+S]** and **[Ctrl+W].**
21. Reopen the **MyProductionTotals.xlsx** file.	**[Ctrl+O]**. Notice that the changes are not highlighted and the ***History*** sheet is no longer part of the workbook.
22. On the ***Review Tab,*** in the **Change Group,** click the **[Track Changes]** button drop-down.	You will turn Track Changes back on.
23. Choose *Highlight Changes* from the list.	The Tack Changes dialog opens.
24. Check the **When:** checkbox and select ***All*** from the field drop-down.	This will show all changes again.
25. Check the ***List changes on a new sheet*** checkbox.	This will add the History worksheet to the files again.
26. Click the **[OK]** button.	The *Track Changes* dialog closes. All changes are highlighted and the History worksheet is added to the file.

Resolving Conflicts

Resolving Conflicts a Shared Workbook

As mentioned previously, it is possible for two or more users to save a shared workbook after making changes to the same cells. The problem with this is that *Excel* can only keep one set of values in the cells of a given worksheet at a given time.

On the ***Advanced Tab*** of the *Shared Workbook* dialog, you can specify a method for conflict resolution for situations like the one just described. Under the ***Conflicting changes between users*** heading, *Excel* provides two options for resolving a cell value conflict.

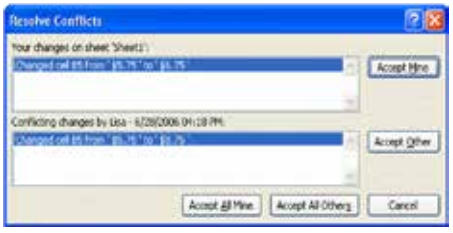


If you select the ***Ask me which changes win*** option, you will see a *Resolve Conflicts* dialog when you try to save a shared file that has a conflict. In the *Resolve Conflicts* dialog, you can choose what version of the conflicting cells to keep. When a conflict of this kind occurs, the last user to save the shared workbook will see the *Resolve Conflicts* dialog and have the choice of what to keep.

If you select the ***Changes being saved win*** option button, the changes made by the user that saves last will be implemented.

In the following example, the ***Ask me which changes win*** option is used for the shared workbook. Imagine that a user named Lisa makes changes to a particular cell in the shared workbook. She then clicks the **[Save]** button to save her version of the shared workbook. Next, without knowledge of Lisa's actions, you make changes to the same cell or cells in the shared workbook, and then try to save your version.

When you try to save the changes you made, the following dialog will appear.



Resolving Conflicts,
continued

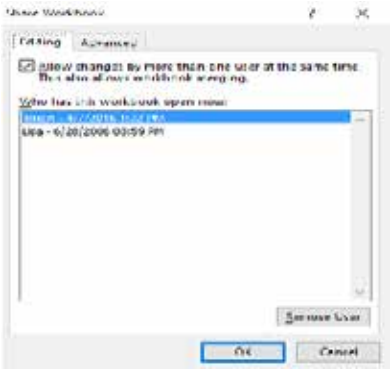
Here you can see the conflict in terms of the change that you made and the change that Lisa made. You can click the **[Accept Mine]** button, to implement the change that you made, or you can click the **[Accept Other]** button, to implement the change made by the other user. If you wish, you can resolve all conflicting changes by clicking the **[Accept All Mine]** or the **[Accept all Others]** button. **[Accept All Mine]** will resolve the conflicts by implementing your cell values. **[Accept All Others]** will resolve the conflicts by implementing the data entries made by other users.

Remember, the last person to save the shared workbook gets to resolve any conflicts that occur with regard to the changes that they have made.

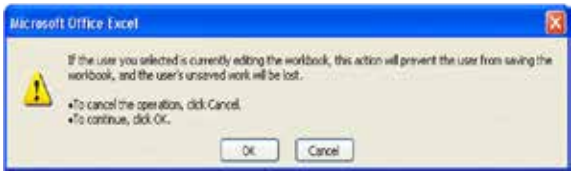
Note

You will only see the *Resolve Conflicts* dialog if you are trying to save a shared file at the same time as someone else.

If you click the **[Share Workbook]** button on the ***Review Tab*** when you are editing a shared workbook, you will see all of the other users that are working on the same shared workbook at the same time.



Here you can see that a user named Brian and a user named Lisa are currently working on the shared workbook.
If you click the **[Remove User]** button, you will see the following alert.



When you click **[OK]**, the user that you selected will be removed (disconnected) from the shared workbook. Any unsaved work that they have done will be lost.

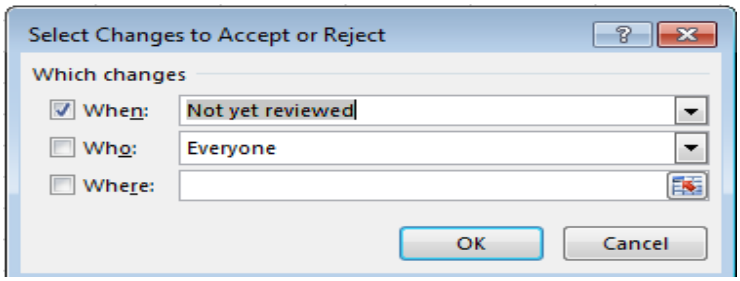
Accepting and Rejecting Changes

Note

Once changes are accepted or rejected and the highlight changes are reapplied, only changes that were accepted are displayed

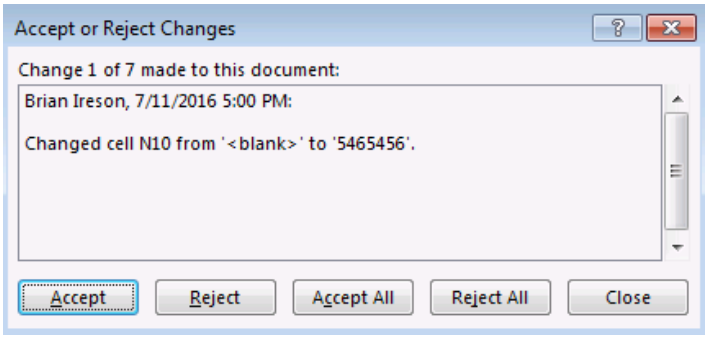
Accepting and Rejecting Changes

- Click the *Accept/Reject Changes* option from the **[Track Changes]** button menu, to see the following dialog and select which changes you wish to keep and which you would like to discard.
- This will open the *Select Changes to Accept or Reject* dialog, where you can specify one or more of three checkboxes to restrict which changes you wish to view.



Not Yet Reviewed means that all changes that have not yet been accepted or rejected will be subject for review.

- Click **[OK]**.
- The *Accept or Reject Change* dialog opens.

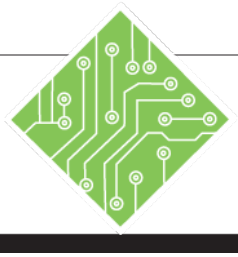


- Now you can step through each change to the workbook and choose to accept or reject it.

Clicking the **[Accept]** or the **[Reject]** button will implement your choice and load the next change into view.

Action C.3 – Accepting /Rejecting changes

Instructions:	Results/ Comments:
1. Open the **Production Totals Shared.xlsx** file.	It is located in the lessons folder.
2. Activate the Review Tab.	
3. On the ***Review Tab,*** in the **Change Group,** click the **[Track Changes]** button drop-down.	
4. Choose *Highlight Changes...* from the menu.	The *Highlight Changes* dialog opens.
5. Set the **When:** field to *All* from the menu.	This will display all changes made to the file since ***Track Changes*** was turned on.
6. Click **[OK]**.	This *Tack Changes* dialog is closed and previous changes are highlighted.
7. Click on the **[Track Changes]** button in the **Changes Group**.	
8. Choose *Accept/Reject Changes* from the menu.	The *Select Changes to Accept or Reject* dialog opens.
9. Set the **When:** field to *Not yet reviewed* and click **[OK].**	The *Accept or Reject Changes* dialog opens showing the first change information.
10. Select the middle option from the list and click the **[Accept]** button.	Since this cell has had several changes made to it, there is a list of changes in the Select a value for cell **B3**: field. The first change is accepted and the next change is displayed in the *Accept or Reject Changes* dialog
11. Click the **[Reject]** button to reject the change.	The original values are re-entered into the cell and the next change is displayed.
12. Click **[Accept All]** button.	All the other changes to the file are accepted at once and the *Accept or Reject Changes* dialog closes.

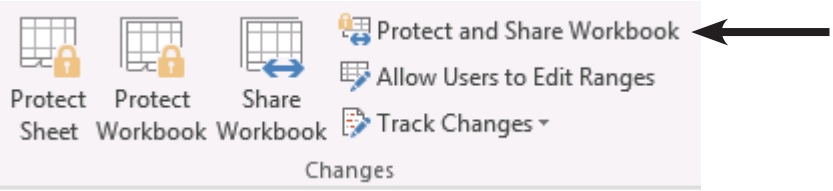


Instructions:	Results/ Comments:
13. Click the **[Track Changes]** button on the ***Review Tab*** again and choose *Highlight Changes* form the menu.	The *Highlight Changes* dialog opens.
14. Set the **When:** field to *All* and uncheck the **Who:** and **Where:** checkboxes.	
15. Click the checkbox to ***List changes on a new sheet***.	
16. Click **[OK]**.	The *Highlight Changes* dialog closes and the ***History*** sheet is added to the workbook.
17. View the ***History*** sheet.	The new worksheet lists all changes and their status.
18. Activate the Input worksheet.	Notice that only accepted changes are highlighted on the worksheet.
19. Close the file without saving any changes.	**[Ctrl + W]**.

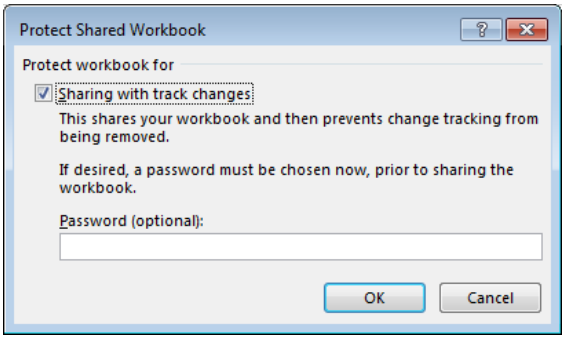
Protecting Shared Workbooks

Protecting a Shared Workbook

Before you share a workbook, you will see a **[Protect and Share Workbook]** button on the ***Review Tab***. Clicking on this button will let you simultaneously share and protect the workbook against deletion of the change history.



After you share a workbook, this button changes to a **[Protect Shared Workbook]** button. At this point, you can still protect the workbook against deletion of the change history, but you no longer have the ability to add a password.

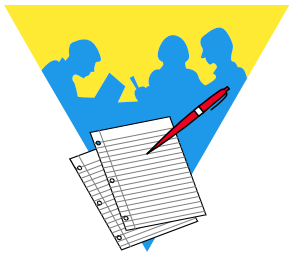


Passwords can change history, but you no longer have the ability to add a password. Passwords can only be added if the workbook is unshared.

Action C.4 – Protecting a Shared Workbook

Instructions:	Results/ Comments:
1. Open a new blank file.	[Ctrl+N].
2. Activate the ***Review Tab***.	
3. Click on the **[Protect and Share Workbook]** button in the **Changes Group**.	The Protect Shared Workbook dialog opens. The **Password:** field is active.
4. Check the **Sharing with track changes** checkbox to turn on ***Sharing with track changes***.	
5. Click into the **Password:** field and type in: "**Password**".	
6. Click the **[OK] button**.	The *Confirm Password* dialog opens.
7. Click into the **Reenter password to proceed:** field and type in: **<Password>**.	
8. Click the **[OK]** button.	The *Save As* dialog opens.
9. Name the file **Protected.xlsx** and click the **[Save]** button.	The file is saved as a shared workbook.
10. Click the **[Add new Worksheet]** button.	The new worksheet is added to the file.
11. Right click the sheet tab.	You are not able to delete the worksheet since the file is shared.
12. Activate the ***Insert Tab***.	Most of the buttons are greyed out because the file is shared.
13. Activate the **Review Tab**.	
14. Click on the **[Unprotect Shared Workbook]** button in the **Changes Group**.	The *Unprotect Sharing* dialog opens.

Instructions:	Results/ Comments:
15. Enter the password to turn off the Sharing and protection. 16. Click the **[OK]** button. 17. Save and close the workbook.	You have to know the password to turn off sharing and protection. The *Unprotect Sharing* dialog closes. **[Ctrl+S]** and **[Ctrl+W]**.



Tips and Notes

TCW BOOK CODES

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis with PowerPivot	PPT

MICROSOFT OFFICE EXCEL ASSOCIATE EXAM MO-200

Import data into workbooks	
Import data from .txt file	DA
Import data from .csv files	DA

Navigate within workbooks	
Search for data within a workbook	L-1
Navigate to named cells, ranges, or workbook elements	L-2
Insert and remove hyperlinks	L-3

Format worksheets and workbooks	
Modify page setup	L-1
Adjust row height and column width	L-1
Customize headers and footers	L-1

Customize options and views	
Customize the Quick Access toolbar	L-1
Display and modify workbook content in different views	L-2
Freeze worksheet rows and columns	L-2
Change window views	L-2
Modify basic workbook properties	L-2
Display formulas	L-1

Configure content for collaboration	
Set a print area	L-1
Save workbooks in alternative file formats	L-1
Configure print settings	L-1
Inspect workbooks for issues	L-1

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Excel Charts	CH
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Excel Data Analysis with PowerPivot	PPT

Manipulate data in worksheets	
Paste data by using special paste options	L-1
Fill cells by using Auto Fill	L-1
Insert and delete multiple columns or rows	L-1
Insert and delete cells	L-1

Format cells and ranges	
Merge and unmerge cells	L-1
Modify cell alignment, orientation, and indentation	L-1
Format cells by using Format Painter	L-1
Wrap text within cells	L-1
Apply number formats	L-1
Apply cell formats from the Format Cells dialog box	L-1
Apply cell styles	L-1
Clear cell formatting	L-1

Define and reference named ranges	
Define a named range	L-2 / FM
Name a table	DA

Summarize data visually	
Insert Sparklines	L-2
Apply built-in conditional formatting	L-2
Remove conditional formatting	L-2

Create and format tables	
Create Excel tables from cell ranges	L-2
Apply table styles	L-2
Convert tables to cell ranges	L-2

Modify tables	
Add or remove table rows and columns	L-2
Configure table style options	L-2
Insert and configure total rows	L-2

TCW BOOK CODES

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Excel Data Analysis	DA
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Filter and sort table data	
Filter records	L-2
Sort data by multiple columns	L-2

Insert references	
Insert relative, absolute, and mixed references	L-1
Reference named ranges and named tables in formulas	L-2

Calculate and transform datas	
Perform calculations by using the AVERAGE(), MAX(), MIN(), and SUM() functions	L-1
Count cells by using the COUNT(), COUNTA(), and COUNTBLANK() functions	DA
Perform conditional operations by using the IF() function	FM

Format and modify text	
Format text by using RIGHT(), LEFT(), and MID() functions	DA
Format text by using UPPER(), LOWER(), and LEN() functions	DA
Format text by using the CONCAT() and TEXTJOIN() functions	DA

Create charts	
Create charts	L-2 / CH
Create chart sheets	L-2 / CH

Modify charts	
Add data series to charts	L-2 / CH
Switch between rows and columns in source data	L-2 / CH
Add and modify chart elements	L-2 / CH

TCW BOOK CODES

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis with PowerPivot	PPT

MICROSOFT OFFICE EXCEL EXPERT EXAM MO-201

Manage workbooks	
Copy macros between workbooks	L-3
Reference data in other workbooks	L-3
Enable macros in a workbook	L-3
Manage workbook versions	L-2

Prepare workbooks for collaboration	
Restrict editing	L-2
Protect worksheets and cell ranges	L-2
Protect workbook structure	L-2
Configure formula calculation options	FM
Manage comments	L-2

Use and configure language options	
Configure editing and display languages	L-1
Use language-specific features	L-1

Fill cells based on existing data	
Fill cells by using Flash Fill	L-1
Fill cells by using advanced Fill Series options	L-2

Format and validate data	
Create custom number formats	L-1
Configure data validation	L-3 / FM
Group and ungroup data	L-3
Calculate data by inserting subtotals and totals	L-3
Remove duplicate records	DA

TCW BOOK CODES

Excel Level 1	L-1
Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis with PowerPivot	PPT

Apply advanced conditional formatting and filtering	
Create custom conditional formatting rules	L-2
Create conditional formatting rules that use formulas	L-2
Manage conditional formatting rules	L-2

Perform logical operations in formulas	
Perform logical operations by using nested functions including the IF(), IFS(), SWITCH(),	FM
SUMIF(), AVERAGEIF(), COUNTIF(), SUMIFS(), AVERAGEIFS(), COUNTIFS(), MAXIFS(),	FM
MINIFS(), AND(), OR(), and NOT() functions	FM

Look up data by using functions	
Look up data by using the VLOOKUP(), HLOOKUP(), MATCH(), and INDEX() functions	FM

Use advanced date and time functions	
Reference date and time by using the NOW() and TODAY() functions	FM
Calculate dates by using the WEEKDAY() and WORKDAY() functions	FM

Perform data analysis	
Summarize data from multiple ranges by using the Consolidate feature	L-3
Perform what-if analysis by using Goal Seek and Scenario Manager	L-3
Forecast data by using the AND(), IF(), and NPER() functions	FM
Calculate financial data by using the PMT() function	FM

TCW BOOK CODES

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Excel Level 2	L-2
Excel Level 3	L-3
Excel Formulas	FM
Excel Data Analysis	DA
Excel Charts	CH
Excel PivotTables	PT
Excel Data Analysis with PowerPivot	PPT

Troubleshoot formulas	
Trace precedence and dependence	FM
Monitor cells and formulas by using the Watch Window	FM
Validate formulas by using error checking rules	FM
Evaluate formulas	FM

Create and modify simple macros	
Record simple macros	L-3
Name simple macros	L-3
Edit simple macros	L-3

Create and modify advanced charts	
Create and modify dual axis charts	CH
Create and modify charts including Box & Whisker, Combo, Funnel, Histogram, Map, Sunburst, and Waterfall charts	CH

Create and modify PivotTables	
Create PivotTables	PT
Modify field selections and options	PT
Create slicers	PT
Group PivotTable data	PT
Add calculated fields	PT
Format data	PT

Create and modify PivotCharts	
Create PivotCharts	PT
Manipulate options in existing PivotCharts	PT
Apply styles to PivotCharts	PT
Drill down into PivotChart details	PPT