MICROSOFT EXCEL 2023

THE COMPREHENSIVE GUIDE

THE ULTIMATE GUIDE TO MASTER EXCEL FEATURES & FORMULAS. BECOME A PRO FROM SCRATCH IN JUST 7 DAYS WITH STEP-BY-STEP INSTRUCTIONS, CLEAR ILLUSTRATION, AND PRACTICAL EXAMPLES

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The ultimate guide to master Excel features & formulas. Become a pro from scratch in just 7 days with step-by-step instructions, clear illustration, and practical examples

BY

MIKE SHEPARD

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INTRODUCTION

Microsoft Excel is a data analysis and representation application for fabricating a large number of data, expenditure and income, predictions, and many accounting-related activities. The application can be used in areas such as accounting, finance, and calculation operations. Excel comes with an interesting User Interface; graphics and it is also widely popular.

Microsoft Excel 2022 also comes with interesting features and new options that make data entry, analysis, representation, and visualization easy and comprehensive. With charts, shapes, icons, and various formatting options made available, Excel can be used to customize your data to whichever format is desired and suitable for your use.

Understanding a program like Excel is essential to every professional, worker, student, and anyone who seeks some sort of order, from the simplest to the most complex operations.

In the following chapters, we will develop a series of information based on concepts, methodologies, functions, and formulas that will help both a beginner and an expert understand the benefits of this spreadsheet born from the hand of Dr. Charles Simonyi in 1985.

There are dozens of spreadsheet applications and software similar to Microsoft Excel on the market. However, these alternatives do not seem to be at the same level as this program since it has become clear that Excel has calculation graphic design using tables and pivot tables.

Microsoft's popular spreadsheet program, Excel, has long been at the forefront of this technology and is expected to maintain its dominance for the foreseeable future. That is precisely what this book is about.

It is a program that allows you to optimize data processing time, improving the effectiveness and efficiency of anyone. It simply saves the investment of time in pencil calculations and facilitates programming directly on a spreadsheet on a computer.

Therefore, those who consider themselves inexperienced should start working on it right away, and this is precisely what the information compiled in the following 16 chapters is all about.

16 chapters, and that will possibly turn you into an expert

Chapter 1: Excel history on Microsoft

Multiplan was the first spreadsheet program marketed by Microsoft back in 1982. It was originally designed and incorporated in CP/M systems, but its popularity was much lower on MS-DOS systems compared to its rival: Lotus 1–2–3.

For this reason, Microsoft was forced to create Excel for Mac and publish it for the first time in 1985. For Windows, the first version was released in November 1987 and numbered 2–05 in line with the Mac, which had a Windows environment runtime package.

The official origin of Excel is the Microsoft Office application, put on the market on August 1, 1989. It was originally conceived as a tool for Apple Macintosh computers and could later see the light of day on the Windows operating system.

This was how Microsoft could be the standard-bearer among the leading developers of computer spreadsheet software because Lotus was slow to bring 1–2–3 for Windows, an area in which it was also far superior to another rival of the time: Quattro Pro from Borland.

By 1993, the lawsuits of others represented a huge challenge for Microsoft. On this occasion, the axis of the judicial conflict was a company that replicated its software and marketed it under the same name of "Excel."

The use of the tool for the financial sector was such that it was very profitable to market the licenses. This lawsuit resulted in the Excel designed by Microsoft should be named "Microsoft Excel" in all press releases and legal documents. Over time, Microsoft has not fully complied with this legal provision, and the same company expressed its intention to acquire the other trademark to eliminate any difficulty or confusion.

Subsequently, the same organization proposed the use of the letters "XL" as the abbreviation for the program, in addition to a more stylized redesign of the program's icon.

Excel Developer

Although Excel is a software patented and marketed by Microsoft, the initiative would never have prospered if it had not been for the idea of Dr. Charles Simonyi, the original creator. Simonyi, in 1985, decided to sell the rights to this idea of Word and Excel and thus was born as the company's original product.

At the time, Excel was a gold mine for developers and the corporation in general as it was the first spreadsheet with which the user could set the appearance of fonts, character attributes, and boxes. The inclusion of special features such as intelligent recomputing of boxes, updating data, and working in separate cells with automatic formulas made it a unique tool.

Why Excel Is Different

Interface

The interface that Microsoft developed for the Excel user is unique and has been replicated by multiple competitors over the years. It has become a worldwide reference in terms of spreadsheet features, maintaining the essence of certain structures such as the boxes organized in rows and columns called cells (intersection of rows and columns), and in each of the cells, you can manage data or formulas with relative, absolute and mixed references.

Visual Basic

Visual Basic (VBA) applications have been incorporated in Excel since 1993. It is a programming language with the ability to automate Excel tasks and process user-defined functions in worksheets. VBA is the application that allows the creation of forms and keeps the controls in the worksheet communicating with the user.

Formats

The default format of the Microsoft Excel application is .xls. Some variations in the formats according to the version of the program can be:

- Files are saved in .xls format for versions earlier than or equal to Excel 2003.
- The workbooks are saved in .xlsx format for versions older than or equal to Excel 2007.
- Macro-prepared workbooks are saved under the .xlsm extension for versions greater than or equal to Excel 2007.
- Binary Excel workbooks are saved under the .xlsb format for versions later than or equal to Excel 2007.

Calculation Control

This VBA function provided by VBA caused many problems for the corporate area. The problem was that it made Excel a target for macro viruses. As the risk was great, Microsoft took measures and incorporated the option to disable or automatically execute macros when opening an Excel file. Subsequently, the problem was solved with the rise of the antivirus market, which allowed immediate detection.

Customization

At the time, Excel was the first spreadsheet application to include functions for customizing the appearance and modification of cells independently so that they could be updated immediately

after modification. A great novelty for the time.

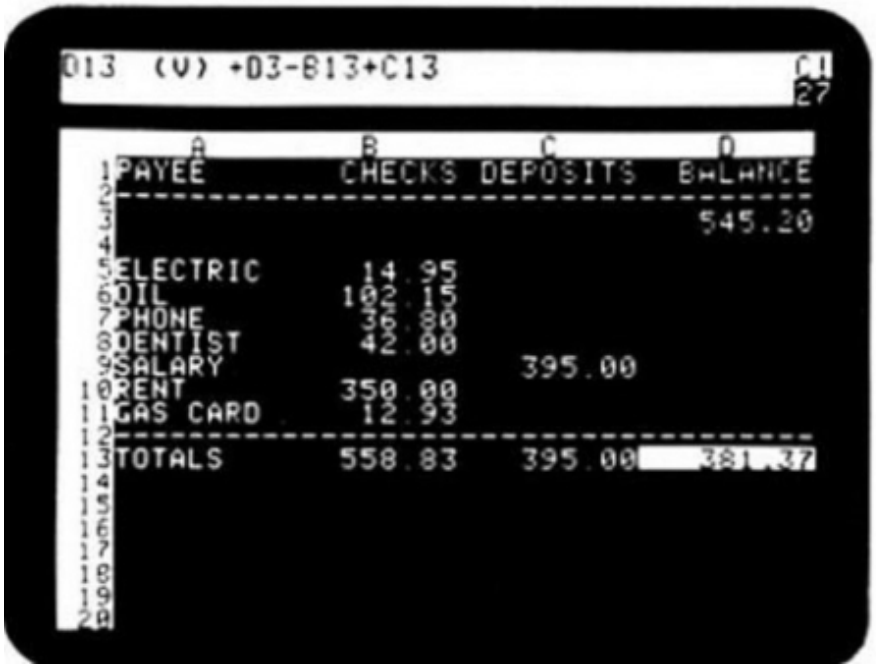
In addition to that typical interface of its type that maintained the premises of VisiCalc, it also organized cells with data or formulas with relative, absolute, or mixed references and distributed them to other cells.

Versions of Excel

Microsoft Excel became so popular because, before its release, no other computer software could offer both simple and advanced functions. Spreadsheet work became easier, leading the way in data management and accounting technology.

The technological giant's constant strategy in program updates made it possible to perfect every action. Nowadays, years go by, and it is still possible to discover different uses and applications of Excel in several fields. That is why, when talking about Excel versions that precede the most current one, it is worth mentioning:

First Attempts

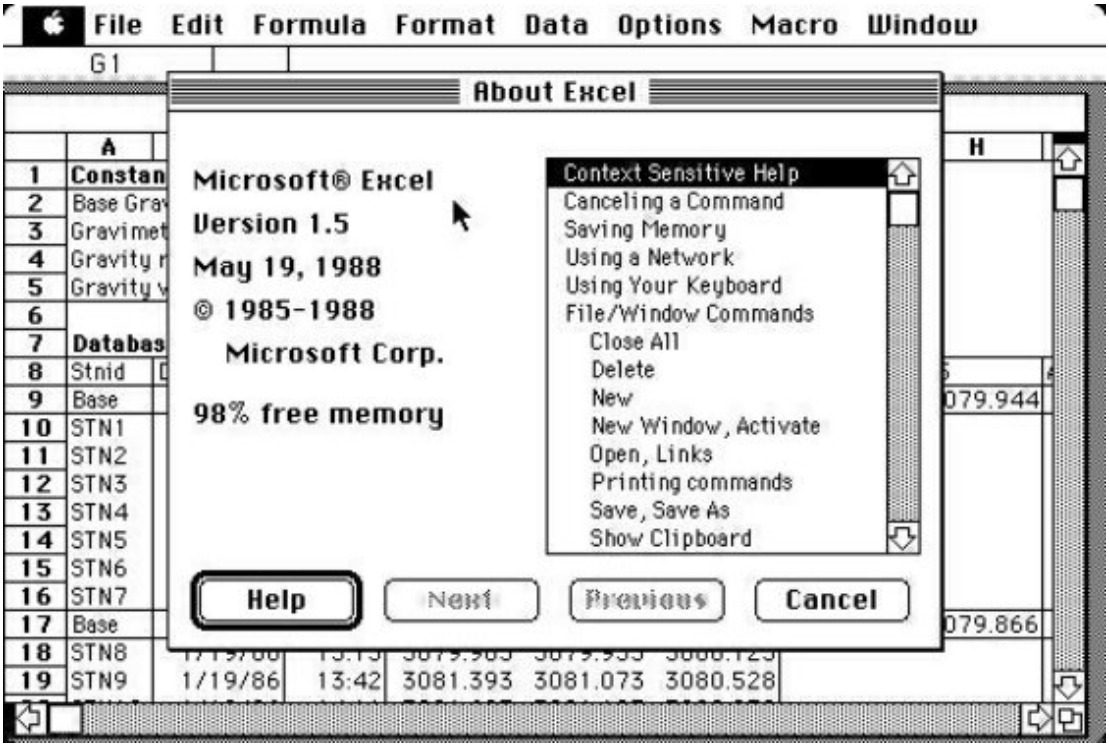


VisiCalc and Lotus 1–2–3 are the "pillar" programs of the Excel that is known today. VisiCalc earned a reputation as the first functional spreadsheet program, so useful that it eliminated the need for other spreadsheet applications on computers.

While Lotus 1–2–3 led the spreadsheet market in the 1980s, a decade in which it recorded huge sales for IBM computers and gave it market dominance for a long time.

Excel 1

The graphical user interface and the mouse were two unique elements available in this operating system. To avoid direct competition with Lotus 1–2–3, the market leader at the time, Microsoft released the first version of Excel for Macintosh systems in 1985.



Excel 2 and 3

After the success of Excel 1, Excel 2 was officially released in 1987 along with its Windows operating system. For this, the developers had the advantage of a previous version, and for this newer edition, they took the same functionalities and features of the Macintosh interface, such as drop-down menus and point-and-click mouse interaction, and achieved a truly graphically optimized version.

Excel 4 and 5

With these two versions, Excel officially became part of the Microsoft Office suite in 1992. The software appeared together with Windows 3.1, a range of new features for users that made it irremediably displace its competition and become the market leader. In 1993 an improved version, called Excel 5, was launched, with other enhanced options.

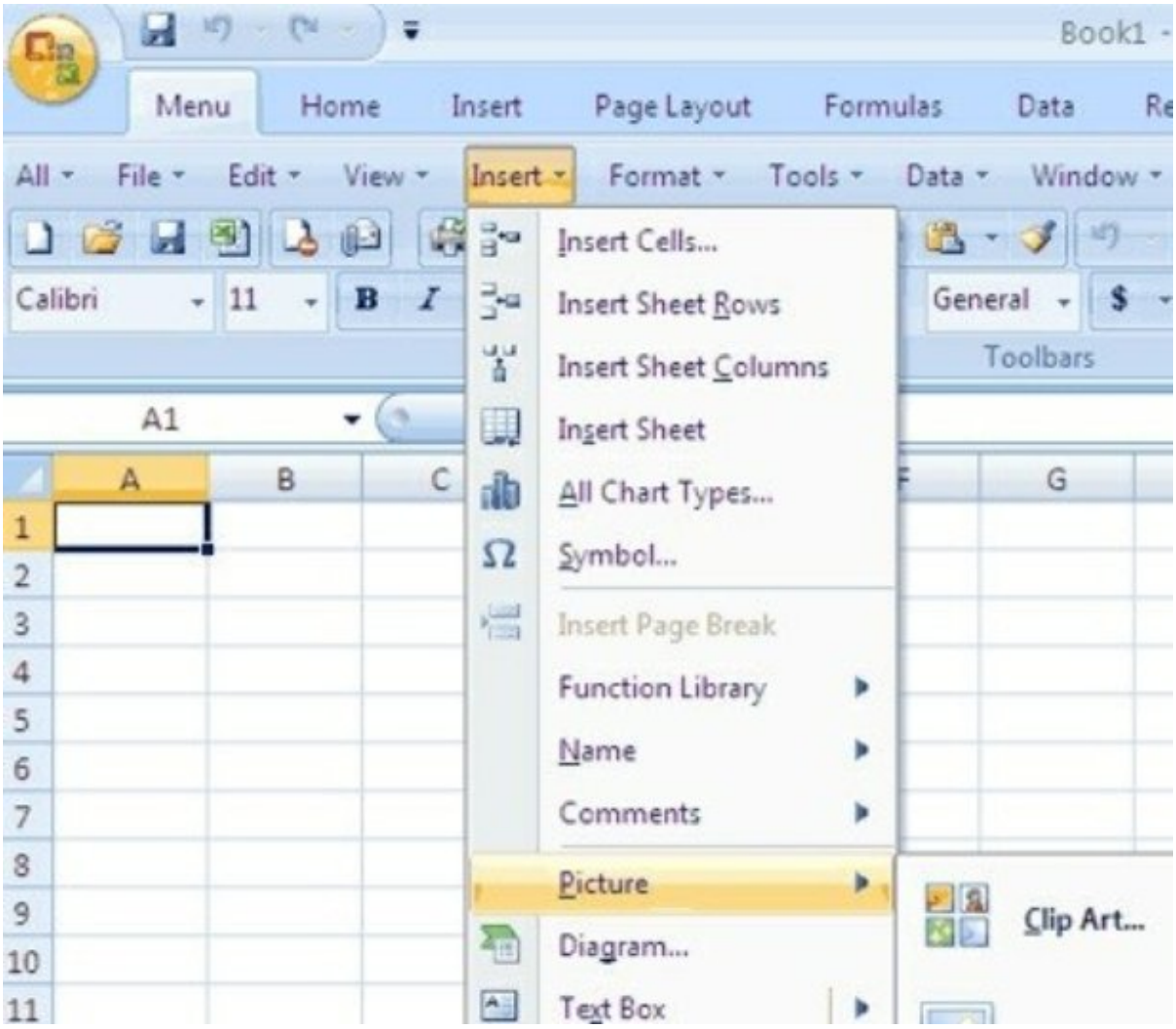
Excel 95–2003

The great redesign of the Microsoft operating system was Windows 95 in 1995. On that occasion, as in the previous edition, improved functions were advanced for all the Office platform programs, including a version known as Excel 95.

It was followed by versions of the program that continued improving and giving recognition to the line of Office applications, such as Excel 97, Excel 2000, Excel 2002, and Excel 2003, all of them keeping the original design with which Excel 95 had positive results.

Excel 2007

Excel 2007 was one of the last versions to present important changes in the interface, where ribbons and tabs replaced the traditional drop-down menu; and in functionality. It was launched together with the Windows Vista operating system and included many of its visual elements.


Book1 -
Menu
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All Chart Types...
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Insert Page Break
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Name
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Text Box
Clip Art...

CHAPTER 2 - WELCOME TO MICROSOFT EXCEL

LEARNING HOW TO USE EXCEL'S FEATURES

Microsoft Excel particularly finds application in accounting, finance, and calculation operations. The majority of companies tailor and fabricate a large number of their expenditure and income, predictions, and all accounting-related activities on Excel worksheets.

Although Excel is said to be a management house for data, however, the type of data most usually and frequently controlled in Excel is financial data. Other numerous software applications exist that can also perform basic and financial operations as Excel. An advantage Microsoft Excel has over its rivalries is its interesting User Interface, graphics, and yes, its popularity.

Additional functions and applications of Excel are:

- Data entry
- Management of data
- Accounting
- Financial analysis
- Design of charts and graphs
- Programming
- Designing time management schemes
- Designing task management schedules
- Financial documentation

Microsoft Excel can be used on any form of data that needs to be processed and organized.

RECENT UPGRADES IN MICROSOFT EXCEL 2022 Joint Spreadsheet Editing

Multiple employees can work on a worksheet or spreadsheet simultaneously. This feature is known as Co-authoring. The coauthoring process makes joint editing easy and quick.

The co-authoring feature also comes with the recognition of who works with you and effects changes in a worksheet.

Easy Navigation

Excel introduces XLOOKUP which facilitates easy navigation through rows, columns, and tables.

The LET Function

This function allows the assignment of names of results from calculations. It helps to save values and defines formulas in calculations.

Excel also introduces the feature of having a resulting array from the input of a formula. This feature is called Dynamic Array.

Quick Search

Excel 2022 helps make searching and getting a quick result of a particular data-position easier. With the XMATCH feature, including this in formulas help users find exact positions of searched data.

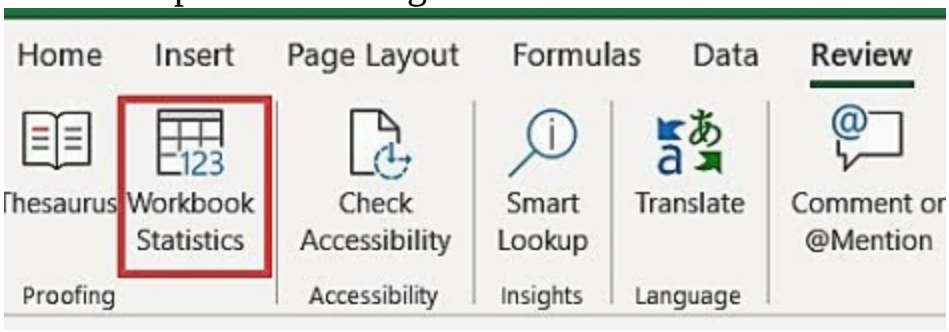
Customized Viewing of Worksheets

Microsoft Excel now allows you to determine how worksheets are

viewed.

Enhanced Performance

Operation speed is now improved with the introduction of functions such as SUMIF, COUNTIF, and AVERAGEIF. You can also now unhide and hide multiple sheets at a go.



Workbook Summary

In cases of big data, Excel 2022 provides a tab called **Workbook Statistics** which provides a summary of the entire data contained in the workbook.

Excel files can also now be saved to OneDrive or SharePoint Online as changes are being made to your data.

IMPROVING YOUR KNOWLEDGE OF WORKSHEETS AND WORKBOOKS

Worksheets in Excel are single pages of sheets or work areas contained in a file known as workbooks. Workbooks however are made up of a combination of multiple worksheets. Launching Microsoft Excel opens a workbook that contains a minimum of three worksheets.

Worksheets in Excel comprise of 1,048,576 rows, 16,384 columns and 17,179,869,184 cells.

WORKSHEET NAVIGATION AND USING THE EXCEL RIBBON

Navigating a Worksheet Using a Keyboard

- **Ctrl + W** can be used to exit a workbook
- **Ctrl + O** is used to open an existing workbook
- **Alt + H** is for navigating to the Home tab
- Use **Ctrl + S** when saving a workbook
- Use **Ctrl + C** to copy data in cell(s)
- **Ctrl + V** can be used to paste copied data
- Use **Ctrl + Z** to undo actions
- Pressing the **Delete** key cleans up the data in a cell
- Use keys **Alt + H** to select a color to fill the desired cell

- **Ctrl + X** keys cut data snippets

- **Alt + N** keys are used to navigate to the tab for inserting additional features

- Use **Ctrl + B** keys to write text or numbers on bold fonts

- Pressing keys **Alt + A,** then **Alt + C** edit input to be placed centrally in cells

- Keys **Alt + P** are used to navigate to the layout option for pages
- Pressing keys **Alt + A** takes you to the Data pane
- **Alt + W** keys open the View pane
- Use keys **Alt + H,** then **Alt + B** to include borders in your cells
- Use key combination **Alt + H + D + C** when deleting columns
- **Alt + M** keys navigate to the Formula section
- Use **Ctrl + 9** keys to hide a set of highlighted rows
- Use **Ctrl + 0** keys to hide a set of highlighted columns
- Use **Ctrl + Tab** keys to navigate around current Excel workbooks.

- Use **Ctrl + Page Down** keys to navigate to subsequent worksheets in a workbook.
- Use **Ctrl + Page Up** keys to navigate to preceding worksheets in a workbook.
- The **Ctrl + Arrow Keys** can be used to control the cursor in all possible directions
- The **Ctrl + Home** keys are for moving to the topmost cell on the left of the worksheet.
- The **Ctrl + End** keys are for moving to the last cell used in the worksheet.
- Keys **Alt + Page Down** helps navigate a full view in the right direction of the worksheet.
- Keys **Alt + Page Up** helps navigate a full view in the left direction of the worksheet.

Using a Mouse to Navigate a Worksheet

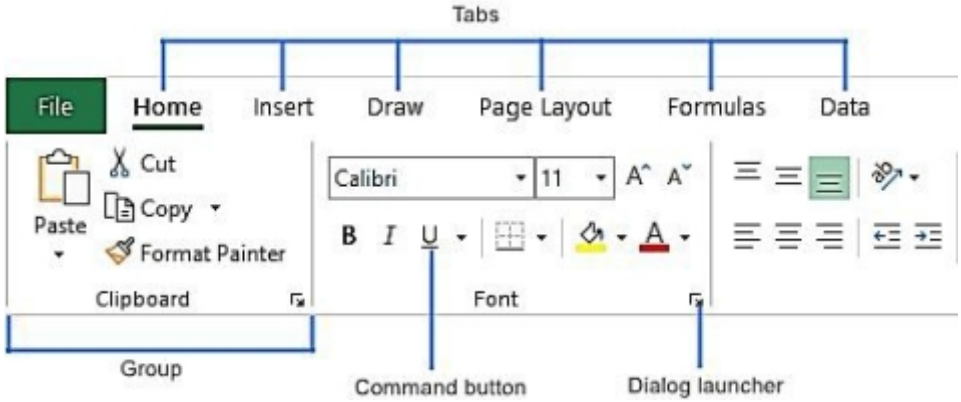
The mouse can easily be used to highlight and move through cells as desired. Every pane on the Ribbon can also be accessed with a simple click of the mouse. The scrollbar can also be moved in all directions either by clicking on the arrows present at the edges or by simply dragging the scroll box itself.

MAKING USE OF THE RIBBON PANE

The ribbon pane in Microsoft Excel is an array of accessible menus and icons that can be found on top of the Excel screen. It makes it easier to locate, comprehend and make use of simple functions to perform simple operations.

The Ribbon pane in Microsoft Excel is in four categories:

- **The Ribbon Tabs:** These are made up of numerous functions that are further divided into groups known as the Ribbon groups.
- **The Ribbon Group:** This is made up of similarly related functions that are implemented when carrying out bigger operations.
- **The Dialog Launcher:** This is a little arrow icon present at the right-hand edge of the ribbon group. This arrow icon opens additional related functions.
- **The Command Button:** This is the button to be clicked when carrying out specific operations.



Contents of the Ribbon Pane

- **File:** The file tab makes it easy to access a menu that shows necessary functions and options that can be used to manipulate files and workbooks.
- **Home:** This tab house commands that are most commonly implemented. Some of these commands include Copy, Paste, Sort, Filter, Format, etc.
- **Insert:** Use the insert tab to include various images and objects in your worksheet. These objects can be charts, equations, tables, links, symbols, headers, footers, etc.
- **Draw:** The draw tab offers drawing tools that enable you to insert self-drawn characters in your worksheet. The options in the draw tab are however is dependent on the type of device being used.
- **Page Layout:** This menu helps you customize how your worksheet looks when onscreen and in hardcopy. It also allows you to configure settings such as themes, gridlines, margins, object alignment, etc.
- **Formulas:** The formula tab makes it possible to input formulas, specify names and decide how calculations are to be carried out.
- **Data:** This menu contains functions used for configuring worksheet data and also for the inclusion of data from external sources.

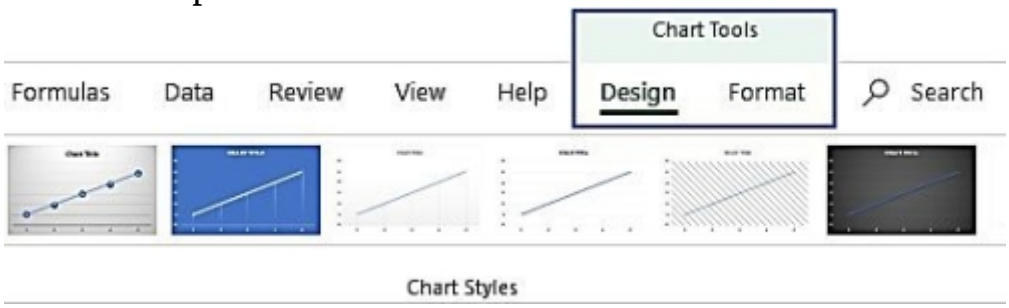
- **Review:** This menu makes it possible to cross-check spellings, keep track of edits, include comments, and also safeguard

worksheets and files.

- **View:** This menu offers options for navigating around views in worksheets, locking panes, and also helps determine how multiple worksheets are displayed and arranged.
- **Help:** The help tab is a quick menu that provides you with easy access to the Microsoft support page. It enables you to quickly report errors and acquire needed tutorial videos.
- **Developer:** The developer tab first needs to be enabled by a user as it is not visible by design in Microsoft Excel. This menu allows you to implement the advanced programming language in Excel, which is the VBA (Visual Basic for Applications) macros, the ActiveX, Form configurations, and also XML functions.
- **Add-ins:** This menu is only visible when an older workbook is opened, or an add-in that changes the view of the toolbars or menus is loaded.

The Contextual Menu

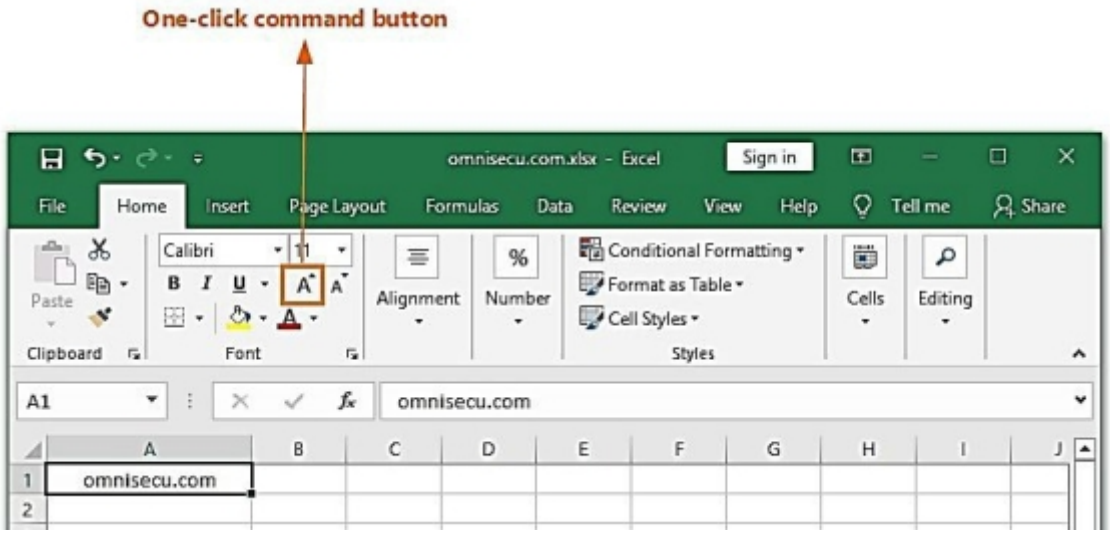
The Contextual menu, also called the Tool Tabs, can only be made visible and accessible when particular objects are selected. Example of items that brings up the contextual menu includes tables, charts, shapes, and picture. For instance, clicking on a chart automatically brings up Design and Format options under a menu called Chart Tools.



COMMAND TYPES PRESENT ON THE RIBBON MENU

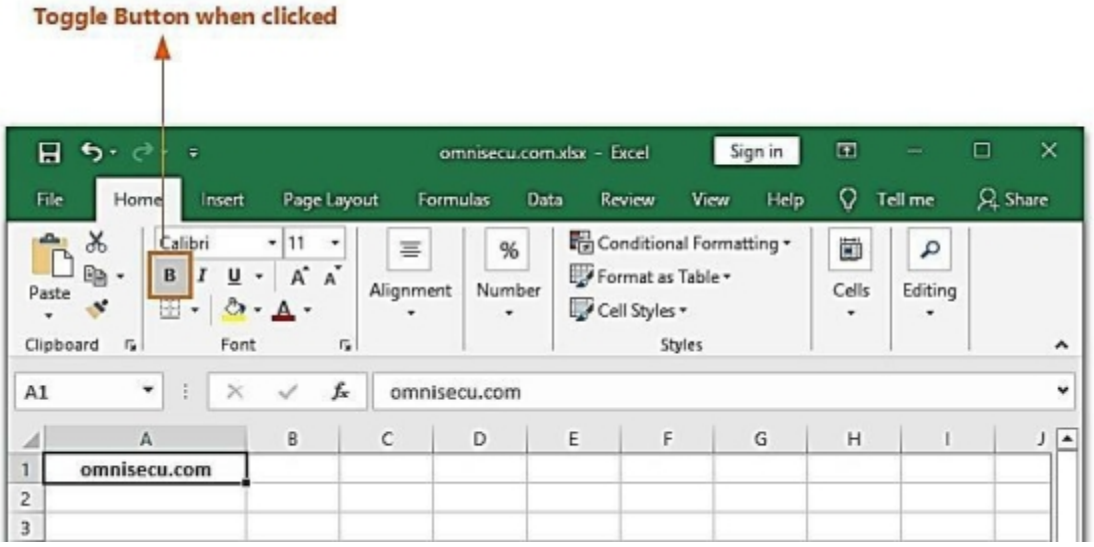
- **Commands that Executes in a Click**

This command is a very common one in the Excel Ribbon. Clicking on these commands initiates a corresponding action immediately after they are clicked. For example, the **Increase Font Size** command immediately initiates a font increase when clicked on.



- **The Toggle Commands**

The toggle commands in Excel Ribbon exist in dual states. The command is developed such that a click on the Toggle command changes the icon color to indicate that the command is currently turned on. Another click on the command turns it off and removes its effect. A good example is a **Bold** command.



- **The Split Commands**

The split commands are those buttons having a drop-down option in the Excel Ribbon. Buttons with the split command feature are found to possess a little down-arrow at their ends. A click on these buttons themselves

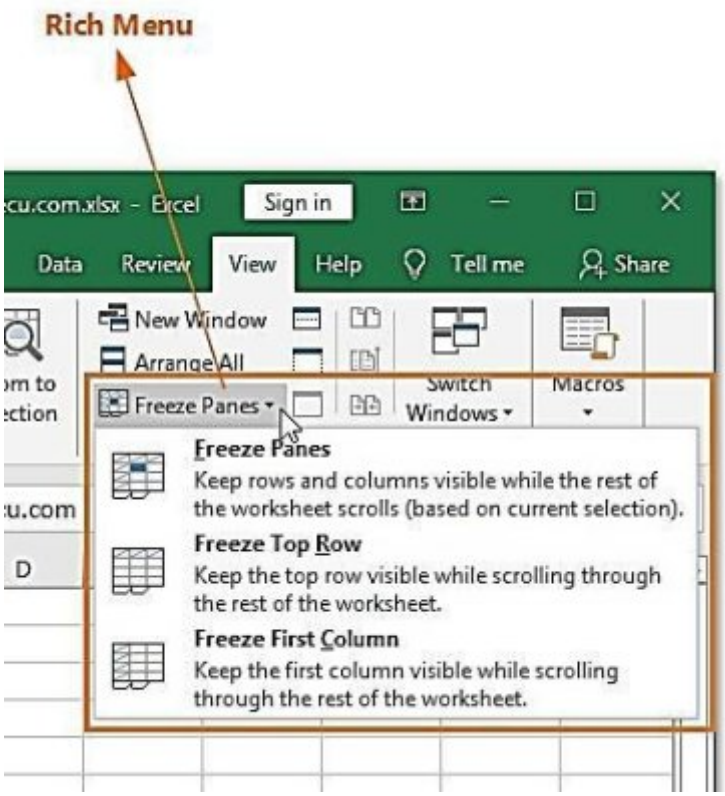
initiates default or previously selected commands, while a click on the down-arrow displays additional options on the drop- down menu. An example is the **Underline** command.

- **The Drop-down Commands**

These commands are those buttons having a drop-down arrow in the Excel Ribbon. A click on the present down-arrow displays additional options on the drop-down menu. An example is the **Conditional Formatting** option.

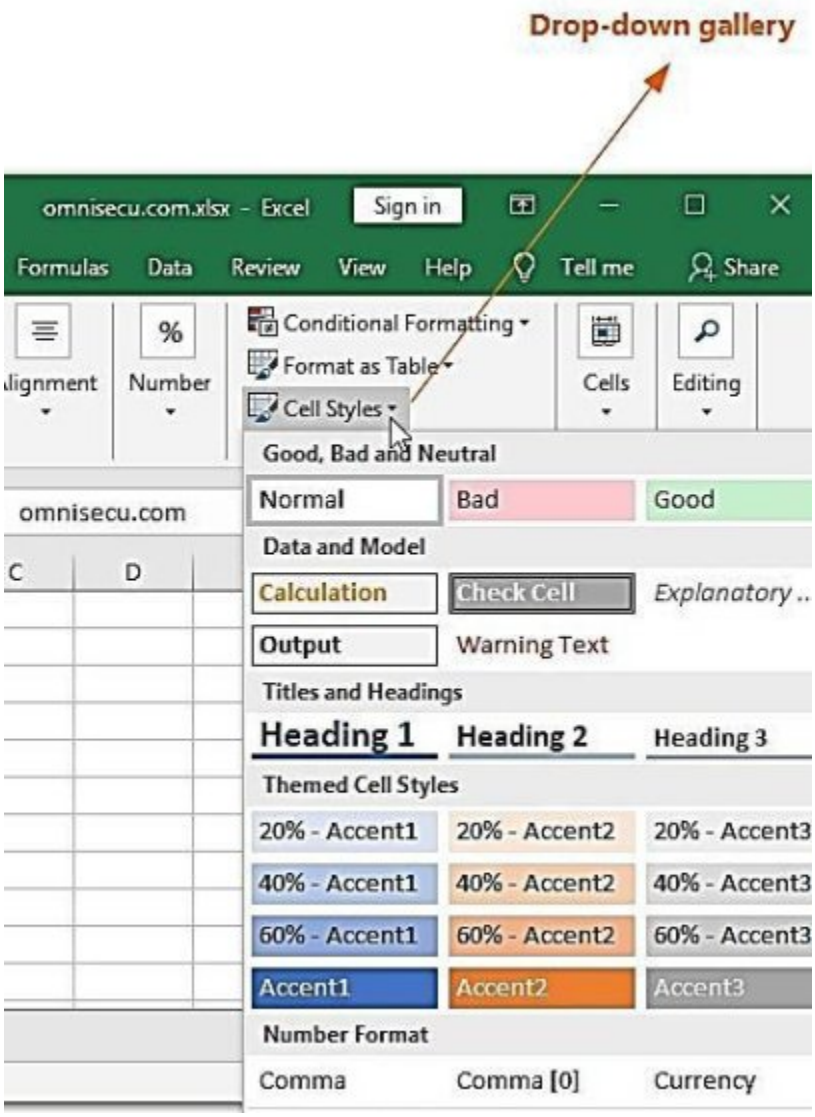
- **The Rich Menu Commands**

These commands are also like the drop-down commands in Excel Ribbon, but they give additional details concerning a menu or an item. Further information helps to know better how these menus or item operates. An example is the **Freeze Panes** option.



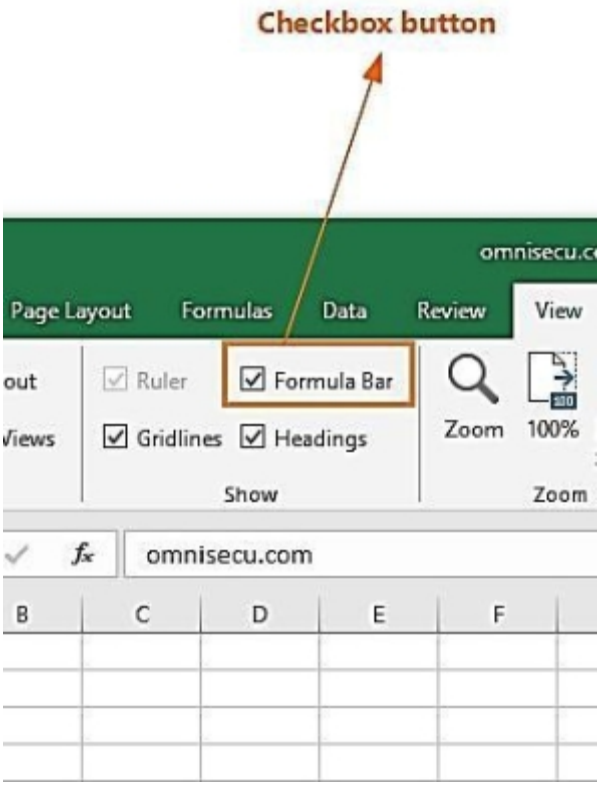
- **The Gallery Drop-down Commands**

In Excel Ribbon, these commands display more available functions than the usual drop-down menus. Objects in a gallery drop-down previews how the selection of one of the items would affect the available data. Hovering your cursor over an option in the gallery drop-down applies it on your open Worksheet without necessarily selecting it. An example is the **Cell Styles** option.

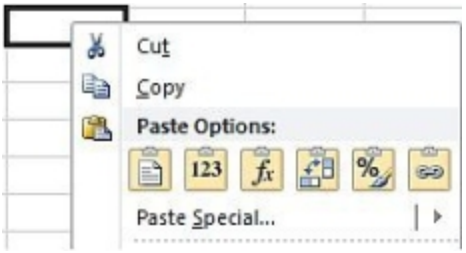


- **The Check Box Commands**

The check box commands in Excel ribbons also exist in dual states like the toggle commands. These commands are implemented for configurations that are only available in either “ON” or “OFF” options. An example is the **Formula Bar** option.



IMPLEMENTING



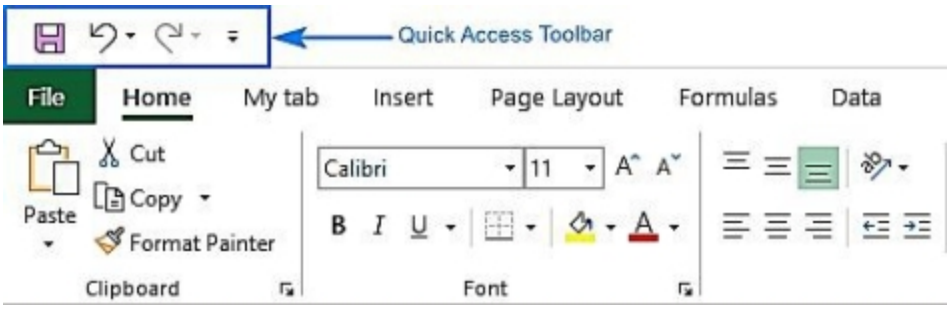
SHORTCUT MENUS IN EXCEL

Shortcut panes display commands and settings that are mostly used when working with a particular item in a worksheet. Note however that these options depend on context, i.e. the object being configured. The shortcut options that are displayed in these contexts are also determined by the position of the cursor.

Shortcut options are not the total list of options or commands available for items in Excel; therefore, some needed functions may not be seen among the displayed options.

Shortcut menus can be accessed by right-clicking on your mouse while the cursor is placed at specific positions. Keyboard keys **Shift**

+ F10 can also be used to bring the menu on display.

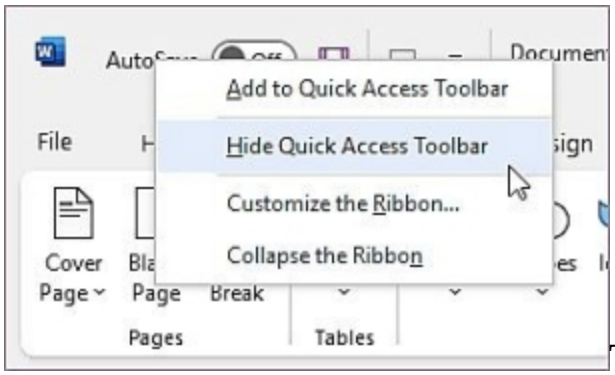


CONFIGURING THE QUICK ACCESS TOOLBAR

The Microsoft Excel Quick Access Toolbar is a configurable tab housing a combination of settings that stand apart from the menus on the ribbon. The position of the Quick Access Toolbar can be changed; even buttons and commands can be added and removed.

To display or hide the Quick Access Toolbar:

- In the top left corner atop the ribbon, make a right-click to select to either display or hide the toolbar.

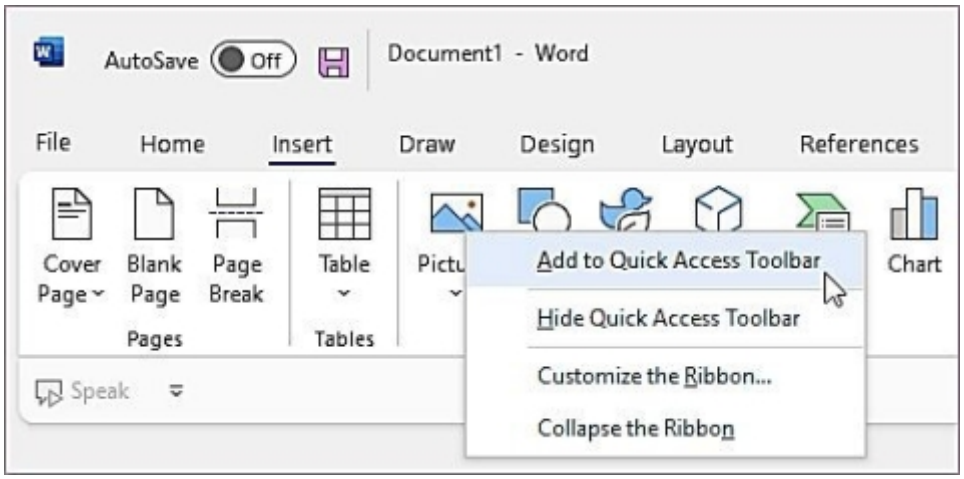


To adjust the positioning of the Quick Access Toolbar:

- Click on the option to configure the Quick Access Toolbar after clicking on the related icon.
- From the subsequent menu, click on the tab to either display the toolbar at the bottom or the top of the Ribbon.

To add commands to the Quick Access Toolbar:

- Select a desired command from the ribbon and make a right-click on it to display an additional menu. Select the option to include the command in the quick access toolbar.



• Also, if the desired command that you want to add to the quick access toolbar is not available on the ribbon, select the option to configure the Quick Access Toolbar after clicking on the related icon.

• Click on the option to access more commands.

• Select the tab to choose commands not present on the ribbon from the Choose commands from option

• Click on Add after locating the desired command.

To delete commands from the Quick Access Toolbar:

• Highlight the command to be deleted and make a rightclick on it. Select the option to remove it from the toolbar from the pop-up menu.

• To rearrange how commands are displayed on the Quick Access Toolbar:

• Select the option to configure the Quick Access Toolbar after clicking on the related icon.

• Highlight commands to be moved and choose either to move them up or down.

To Revert the Quick Access Toolbar to default:

• Select the tab to reset to default and then click on the option to only reset the toolbar.

USING DIALOGUE BOXES IN EXCEL There are two types of dialogue boxes available in Excel, these are:

• **Typical Dialogue Boxes:** these dialogue boxes discontinue further activities and actions on the worksheet unless the dialogue box is dismissed.

- **Modeless Dialogue Boxes**: users can continue their activities on worksheets when these dialogue boxes are open. An example of this is the Find and Replace dialogue box.

Navigating through Dialog Boxes

Moving through dialogue boxes is as easy as it comes. Simply click on necessary and desired commands to configure as you wish.

Implementing Tabbed Dialogue Boxes

Tabbed dialogue boxes are those which consist of multiple possible setups grouped in tabs. Simultaneous editing of various aspects of an item is made possible with tabbed dialogue boxes. Clicking on the OK button after all configurations affects immediate changes.

WORKING WITH TASK PANES

Making use of some commands or inserting particular items in a worksheet immediately launches a task pane for the specific command. Working with pictures or images for example launches the task pane to immediately format the picture. Clicking on the close button on task panes after using them removes them from the display.

BUILDING YOUR WORKBOOKS IN MICROSOFT EXCEL

Acquiring your first workbook in Microsoft Excel is a very easy task; you only need to follow these steps:

- Double click on the **Excel icon** on your computer to launch the application

- Click on the option to create a blank workbook or press **Ctrl + N**

keys

To use a workbook from a predefined template:

- Click on **File**
- Click on **New**
- Select a template from available options

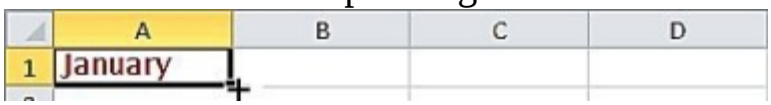
USING YOUR WORKSHEET

Entering Months of the Year in your Worksheet Using Autofill

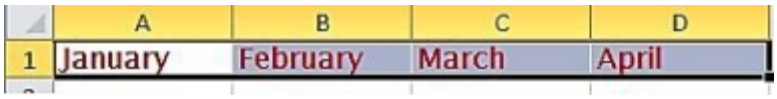
- Either on rows or columns, enter the first-month value:

January

- Place your cursor at the right-hand of the bottom of the cell you entered the previous value.
- Drag down or sideways to the desired cell when the Autofill icon becomes visible while pressing down the left button of your mouse.



- Let go of the mouse button to see the Autofill result

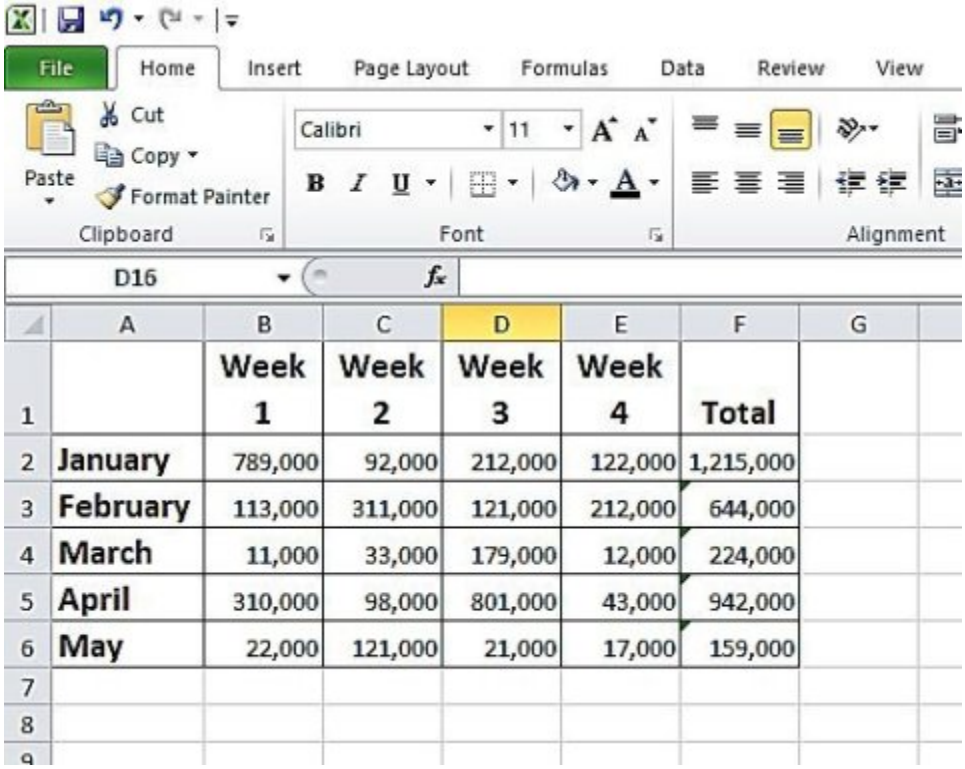


- To enter months in intervals, enter the preceding two months in the desired sequence to enable Excel to compute the interval

- Repeat drag process

Inputting Sales Data

• First, put your sales data in a comprehensive format and enter it in your worksheet as shown below:



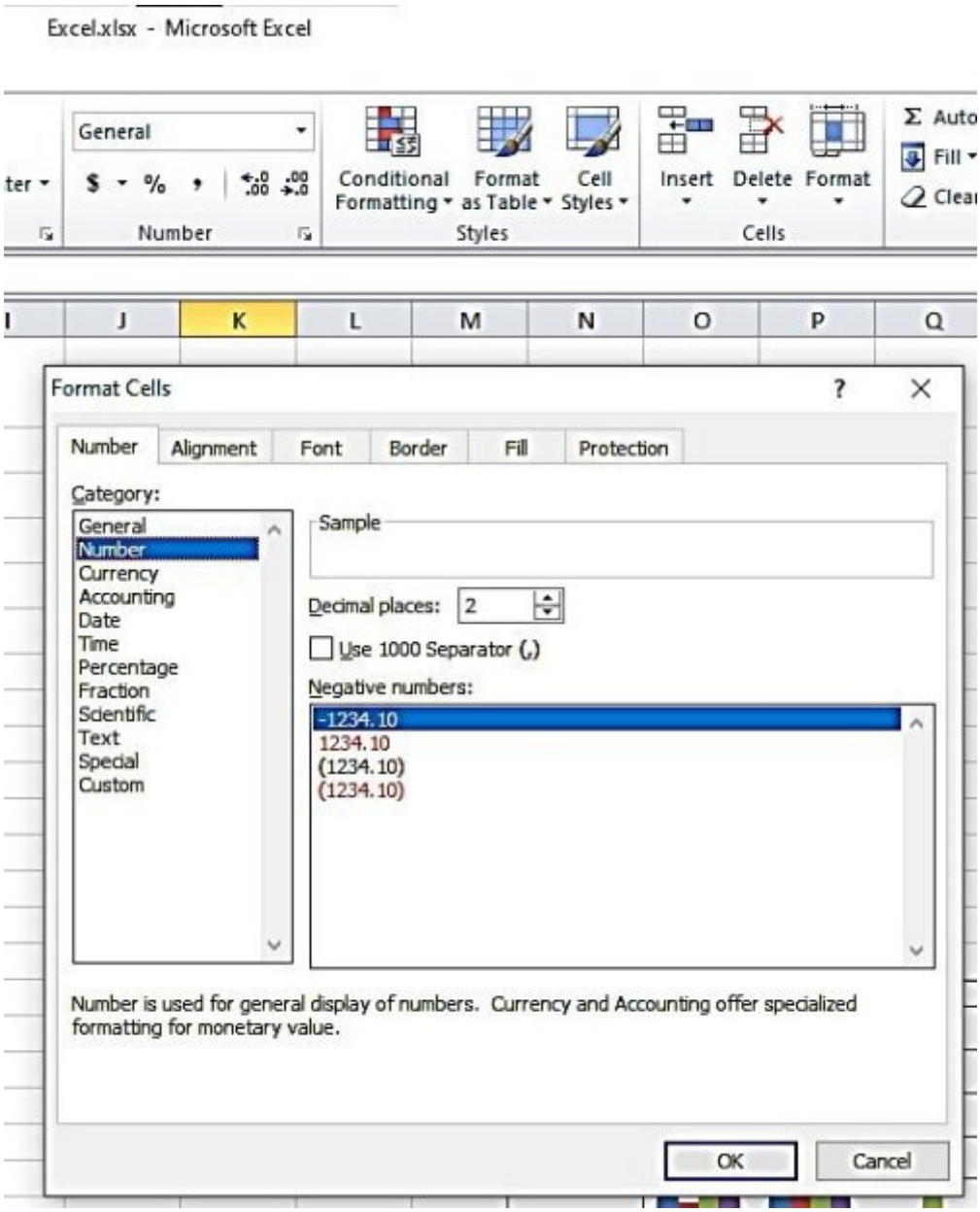
	A	B	C	D	E	F	G
1		Week 1	Week 2	Week 3	Week 4	Total	
2	January	789,000	92,000	212,000	122,000	1,215,000	
3	February	113,000	311,000	121,000	212,000	644,000	
4	March	11,000	33,000	179,000	12,000	224,000	
5	April	310,000	98,000	801,000	43,000	942,000	
6	May	22,000	121,000	21,000	17,000	159,000	
7							
8							

• This data shows weekly sales entries for four months along with the total sales.

Editing Number Formats

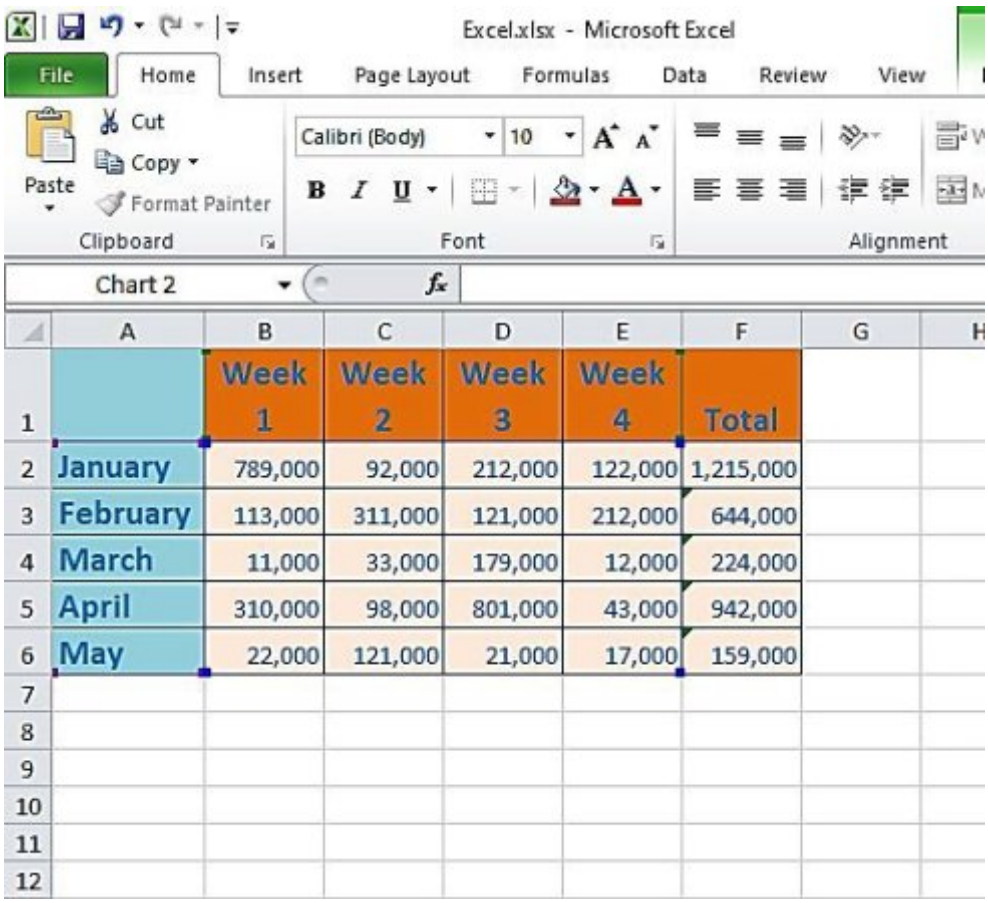
• Navigate to the **Home** tab

• Click on **Numbers** and select the **Number Format** option. Pick the desired number format.



Customizing Data Entry in a Worksheet

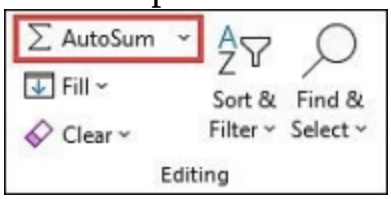
This process gives color and pops to your worksheet to make it attractive to viewers. Simply highlight desired columns or rows and colors and borders from the ribbon menu.



	A	B	C	D	E	F	G	H
1		Week 1	Week 2	Week 3	Week 4	Total		
2	January	789,000	92,000	212,000	122,000	1,215,000		
3	February	113,000	311,000	121,000	212,000	644,000		
4	March	11,000	33,000	179,000	12,000	224,000		
5	April	310,000	98,000	801,000	43,000	942,000		
6	May	22,000	121,000	21,000	17,000	159,000		
7								
8								
9								
10								
11								
12								

Performing Addition Operations on the Sales Data

Using the AutoSum command is the easiest and simplest procedure to carry out summing operations in Excel. Simply highlight the rows or columns containing the numbers to be summed up, and then click on **AutoSum** present on the **Home** tab.



Simple formulas can also be used. All you have to do is to note the ID for the row or column where the data to be summed up is contained, e.g. cells B3 - B6. Then in the formula bar enter the expression:

=SUM(B3:B6)

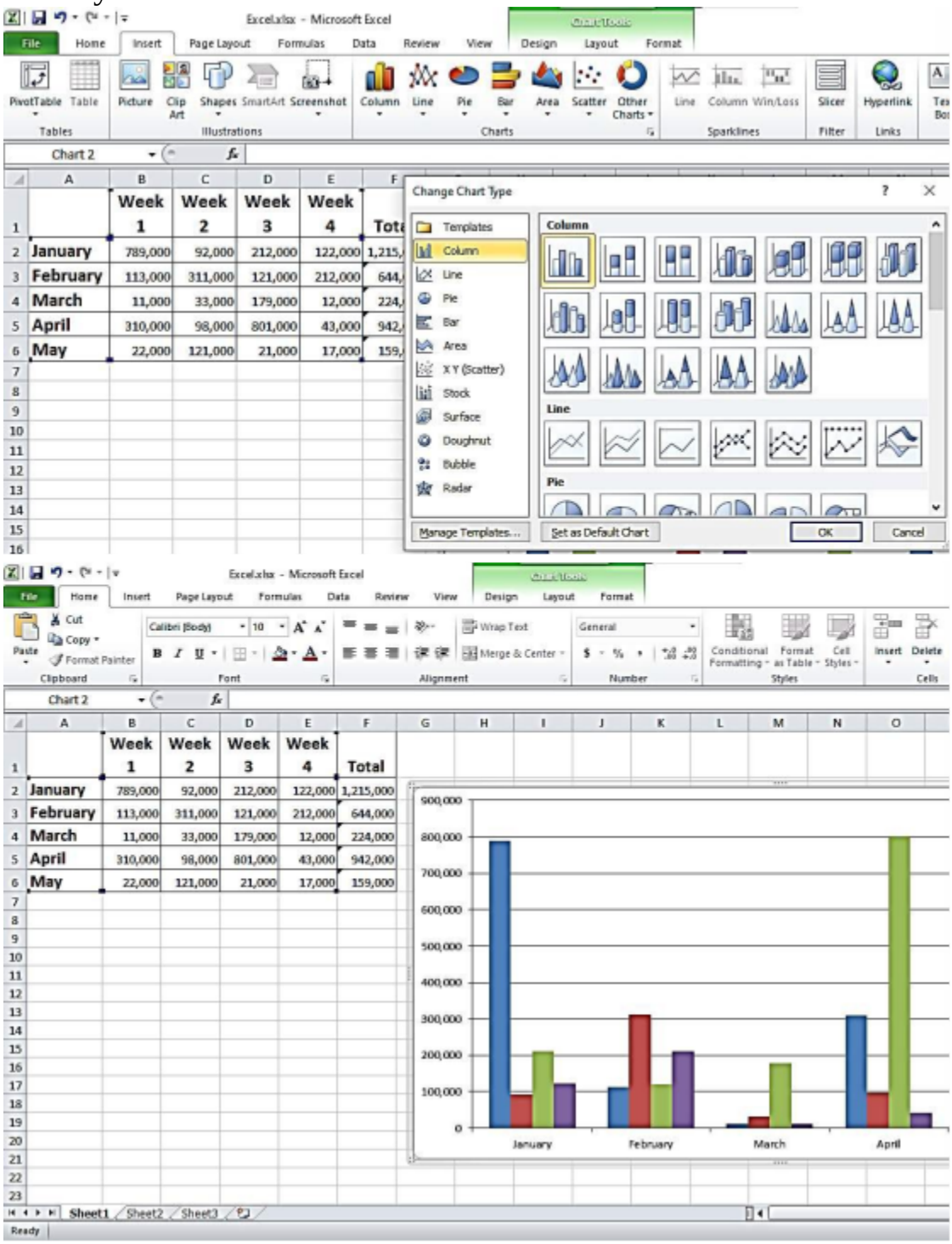
Place the cursor on the desired cell where you want the result to be displayed.

Creating a Chart for the Sale Data

- Select all cells containing data on your worksheet

- Select the **Insert** option on the ribbon menu

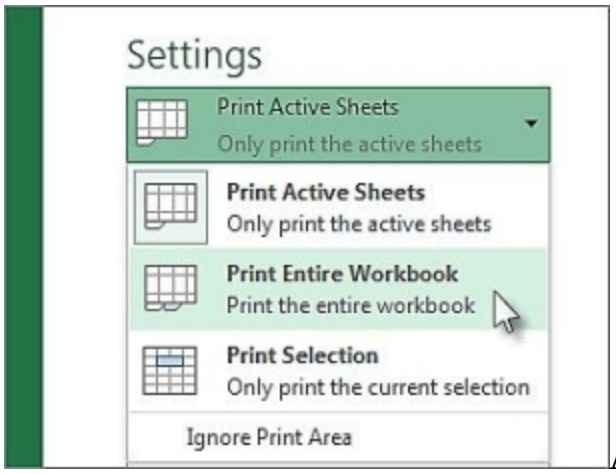
• Click on **Charts** and select the option to input a clustered column chart in your worksheet



Publishing or Printing the Worksheet

The fastest way to print your worksheet is to use the keyboard shortcut keys of **Ctrl + P** keys. This action launches the Print configuration tab.

Here, you can decide what to print, either the complete workbook or just the selected worksheet.



An alternative procedure to this is to click on File and select the Print option in the available menu.

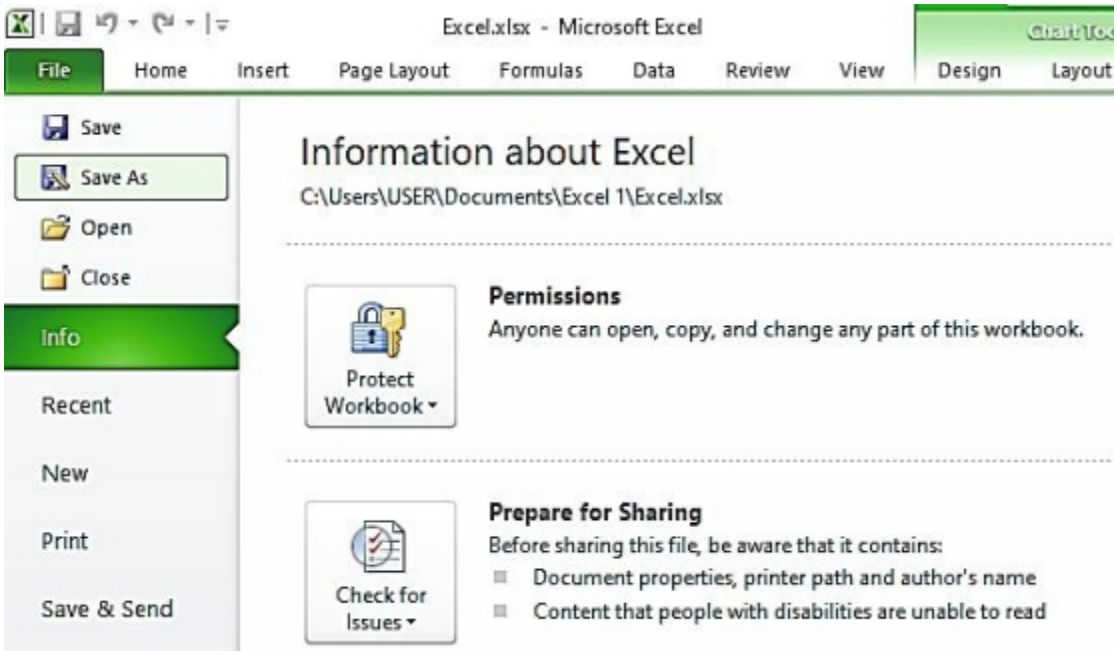
Saving your Workbook

- Use keyboard keys **Ctrl + S** to save your workbook.

- Type in a suitable name for the workbook to facilitate easy access in the pop-up dialogue box.

- Select the Save button.

You can also navigate to **File** and then select the **Save** or **Save As option.**

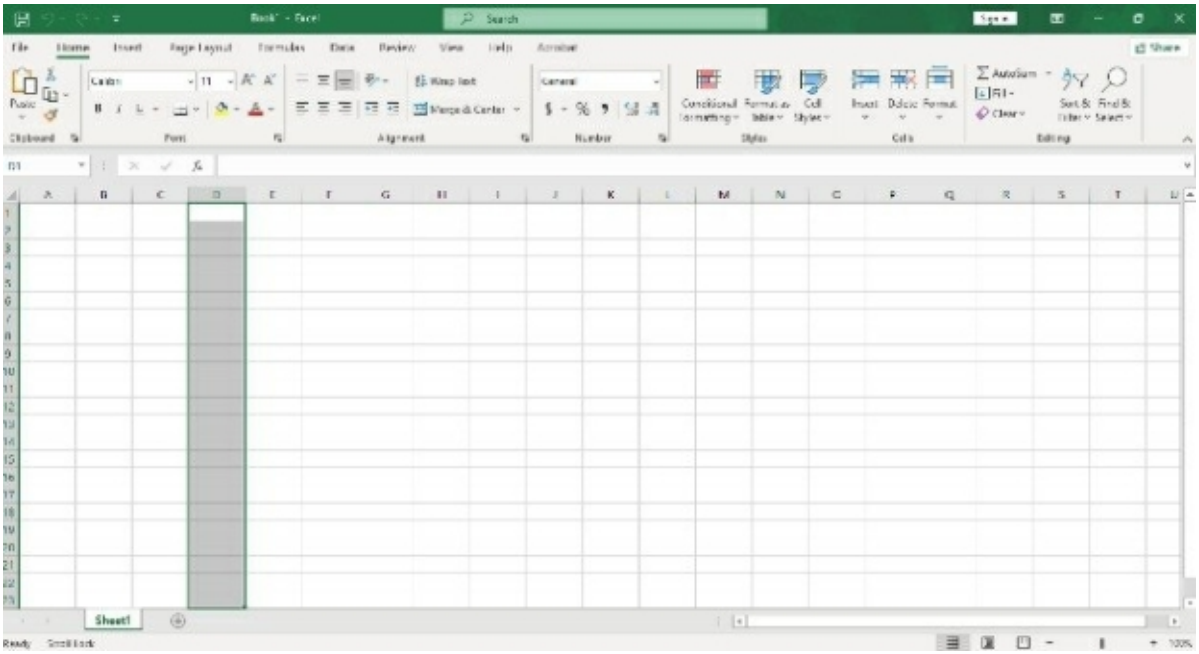


Summary

This chapter provided a step-by-step procedure on how you can easily create your first workbook with adequate functionalities after first introducing Microsoft Excel and explained the purpose and application areas of the software. The new features in Excel 2022 were discussed along with workbooks, worksheets, and how users can navigate through them using either a mouse or a keyboard. The

essence of the Ribbon menu and its commands with available shortcut menus, the Quick Access Toolbar, and how it can be configured were also examined.

Chapter 3: Understanding the Spreadsheet



The well-known spreadsheet is a very useful tool for people to work with numbers and perform operations with them. This spreadsheet allows anyone to work with a large amount of data and numbers, and it has a wide range of functions that integrate it and with which you can perform mathematical, statistical, technical, and financial calculations.

To talk about the importance of the Excel spreadsheet, it is necessary to highlight some aspects of the computer tool that currently has a huge field of application.

Another point to rescue to highlight its importance is the multitude of professionals who benefit from this tool. It can be assured that this program is a great ally for administrators, inventory managers, accountants, scientists, students, enterprising communicators, and thus, a diversity of professions that have no relation to mathematics take advantage of this tool and its ability to automate tasks.

This software is completely versatile and adaptable to different needs, relevant for decision making, as it allows to see the effect that changes in the variables cause in the desired result.

Know the Structure of the Spreadsheet

As you can see, the function of the spreadsheet is to organize and store data and information in a work area in the form of a matrix, similar to a sheet of graph paper.

When you open a document in the program, you can see that it is made up of a certain number of rows and columns, which in turn are identifiable.

It is important to recognize and understand that the columns are represented by letters at the top, while the rows are named with numbers on the left side. The intersection of the rows and

columns gives shape to the cells.

What Is a Spreadsheet for?

Before going into detail about each function, it is of great relevance to know why the Excel spreadsheet has multiple functions that benefit any professional and person in a certain trade. It is simple:

- The software facilitates the task of organizing and managing huge amounts of data. It allows you to sort lists and data sets by applying established criteria, saving, and printing them.
- It is intelligent and can apply basic or advanced formulas to obtain results. It graphs the information in different ways and simply presents them.
- Automates routine and repetitive tasks.

How to Use an Excel Spreadsheet?

First of all, it is important to download any version of the Microsoft Excel program. The latest versions are recommended) to start using Excel spreadsheets, create charts, its built-in formulas, work with data, numbers, pivot tables, and formatting options.

This spreadsheet as a computer program allows you to calculate and protect data. Once they are entered, it is possible to perform operations, analyses, and later display graphs.

Any type of data, usually numeric or text, can be inserted into the cells.

Note: A single cell can contain 32,767 numeric or alphabetic digits.

Cells can hold information in text format, numerical data in different formats, and an infinite number of formulas.

Normally, Excel formulas perform some specific operation based on the type of data stored in the cell or a combination of data stored in a range of cells.

The results of a formula are qualified as dynamic and give the option to change if the content of the cells or range of cells is modified.

These spreadsheets are very useful in the business world as they are used to present monetary information, accounting, budgets, invoicing, tax calculations.

They are an excellent tool for presenting a summary and presenting the information in different ways, always according to the user's interest.

These sheets allow you to interact with other sheets, take and refer to their values, or deliver results.

The spreadsheet has the advantage of being able to interact with other applications to import or export data, analysis, and results.

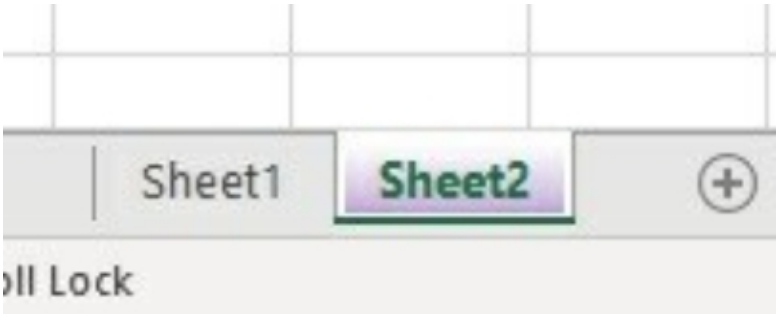
The information can also be sorted, filtered, and presented in a summarized or illustrated form through graphs.

It allows the presentation of information through different graphs such as trends, scatter, bars or pies.

Using an Excel document, it is possible to present summaries and flexible reports through its dynamic tables.

It automates excessively repetitive computations.

Basics of an Excel spreadsheet

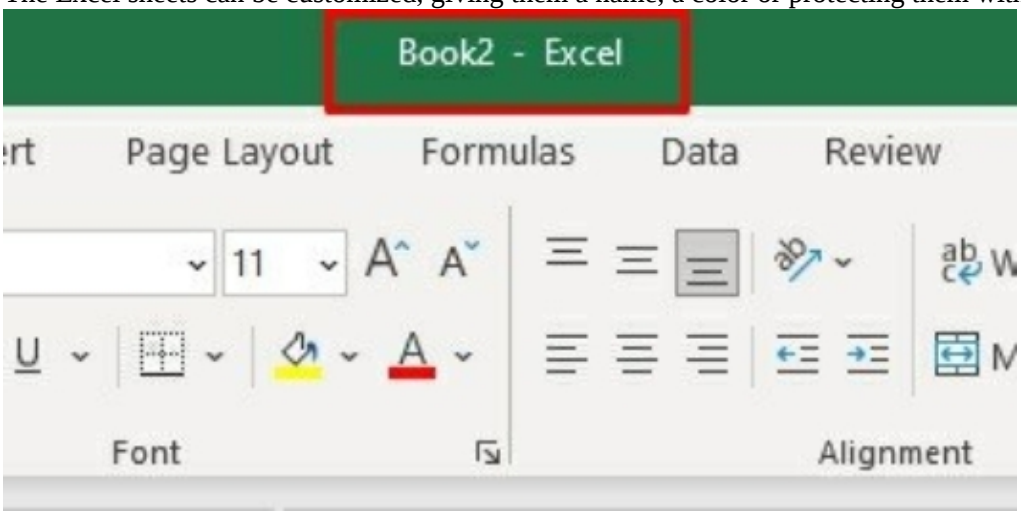


Sheet and Workbook

When you open an Excel document, the first thing you will find is the main sheet, where the work area is defined. With several sheets related to each other, a workbook is formed.

Normally, when you open a blank Excel document, it immediately loads a sheet by default, and the user can add sheets as needed.

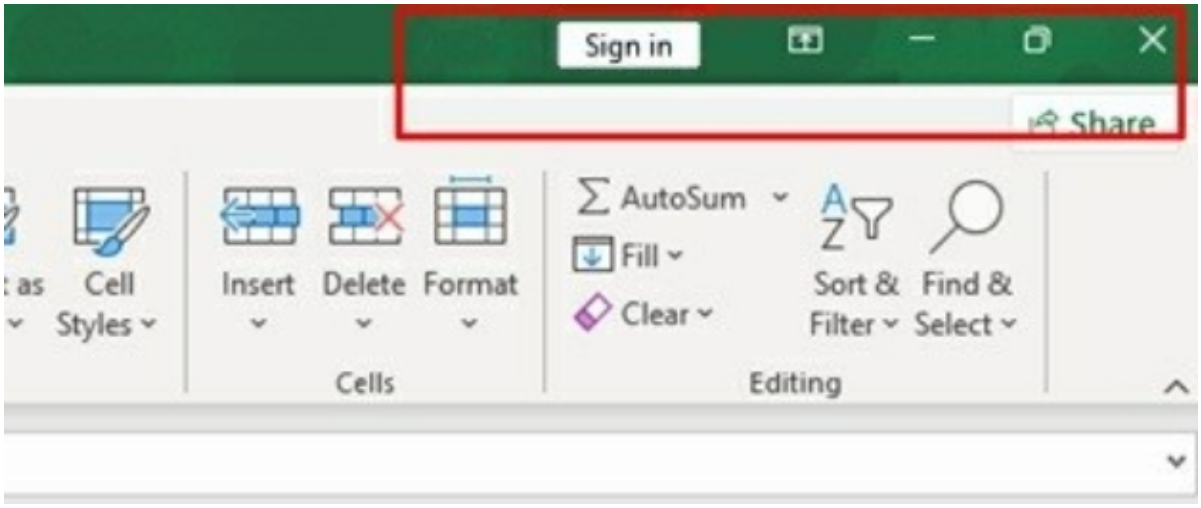
The Excel sheets can be customized, giving them a name, a color or protecting them with a password.



Title Bar

The title bar is located at the top of the screen and contains the name of the Excel file. In the case of opening an Excel document, by default, it will have the name Book1. This will change once the file has been saved and named.

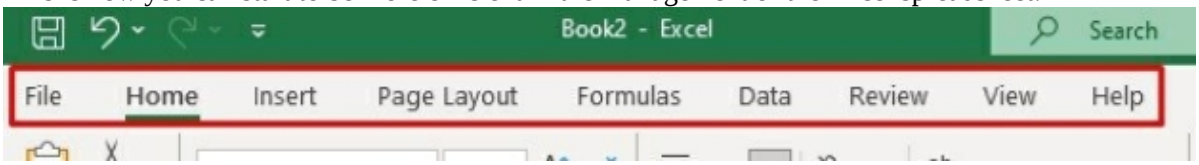
Title Bar in Excel



On the right side, we have the “close,” “minimize,” and “maximize” buttons. Also, you can see the name of the user account linked to Microsoft. On the left side, you will find the shortcut toolbar. You can customize it according to the functions you constantly perform.

The quick access toolbar helps to save time in actions that are usually done. Once they are identified, instead of navigating through the menus to perform a specific action, you can have it available in this section so that with just one click, it can be executed.

This is how you can start to be more efficient in the management of the Excel spreadsheet.

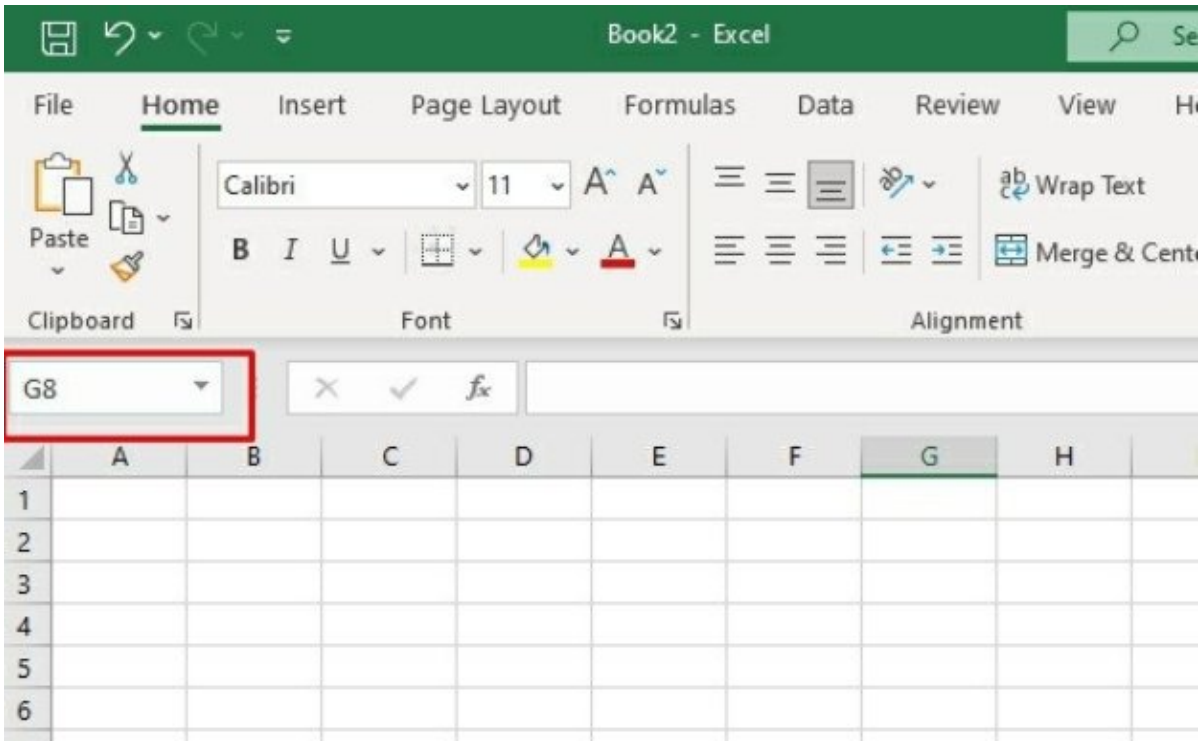


Menu Bar or Ribbon

Among the options that have several menus, this bar is located specifically under the title bar, where you can generally find options such as File, Home, Insert, Page Layout, Formulas, Data, Review, View, and Developer (Programmer).

Each time we click on a menu, the options related to that selection are displayed. For example, in the Insert menu, we can find options to insert a table, an image, a chart, etc.

Name Box



You can identify the name of the cell or table selected or where the cursor is located from the name box.

It is important to remember that the Excel program is made up of columns, which are named by letters, and rows, which in turn are made up of numbers. At the intersections of rows and columns, the cells are formed.

Every time we click on a cell, it is activated, and therefore, in the name box, it will show or identify the name of that cell, placing the letter of the column and the number of the row, such as A1.

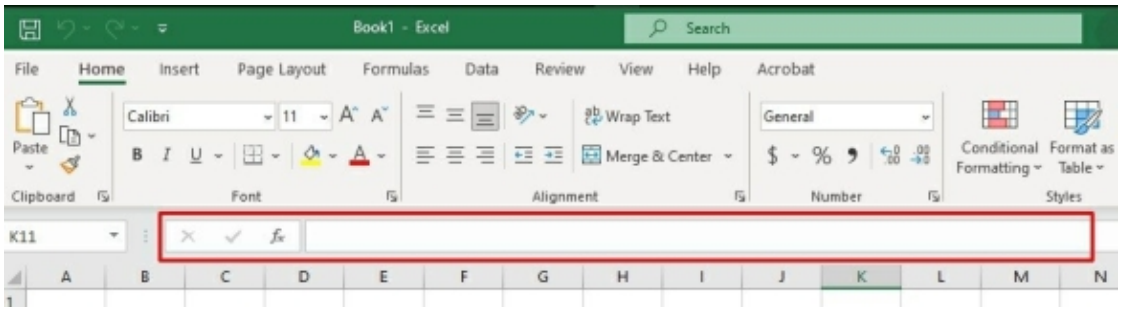
Toolbar

Several toolbars in the program provide quick and easy access to frequently used commands. You will automatically see the standard toolbar and the formatting toolbar when you open Excel.

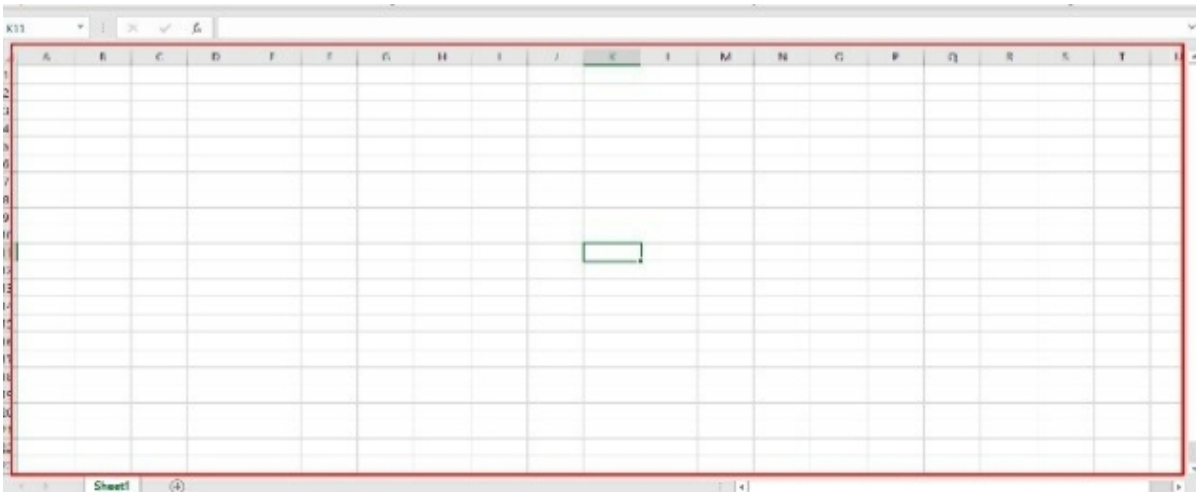
In the case of the standard toolbar, there are widely used options for handling files such as Open, Save, Print, Copy, Cut, Paste, Undo, Sort, Insert, etc.

The formatting toolbar contains commands to apply a certain kind of formatting to the cell or cells you are working on. Also, you can find options such as Font, Style, Size, Alignment, Borders, Color, etc.

Formula Bar



The formula bar facilitates the editing of data entered in the spreadsheet. Generally, this bar displays the information or formulas present in the active cell. This information is necessary to give some editing of the data or formulas contained in the cell or cells.



Workspace of the Spreadsheet

The work area is the main area where data, text, images, graphics, formulas, etc., are to be entered and formatted.

In essence, it is that grid area made up of rows and columns, and in turn, of cells where you work with data, numbers, text, etc.

Status Bar

The status bar is located at the bottom of the Excel window and allows you to control what is happening in Excel and with certain basic arithmetic operations.

Different options appear in this bar that you can customize by right-clicking and then selecting the options you want to appear.

Options displayed in the status bar:

- Cell mode.
- Fast fill in blank cells. Fast fill in modified cells. Signatures.
- Information management policy. Permissions.

- Caps Lock. Num Lock.
- Fixed number of decimal places. Overwrite mode.
- End mode. Macro recording. Selection mode. Page number.
- Average. Count.
- Numerical count. Minimum.
- Maximum. Sum.
- Load status. View shortcuts. Zoom slider.
- Zoom.
- Customize status bar.

Note: It is possible, and the user should be aware that some functions may not be available depending on the version of Excel installed.

The information contained in a spreadsheet can be copied to other software packages within the suites, such as the word processing package:

- Open Office Calc as part of the Apache Open Office suite. Libre Office Calc variant of Open Office.
- Gdocs Spreadsheet.
- Numbers, as an application integrated into Apple iWork.
- KSpread, the spreadsheet integrated into the KOffice Suite, known as the free Linux package.
- Corel Quattro Pro, from the Canadian Corel, integrated into the WordPerfect Suite.
- Gnumeric from The GNOME Project as part of GNOME Office.

Old or outdated spreadsheets:

- BCL or IBM's Business Computer Language, original 1963.
- VisiCalc, for some the first business application spreadsheet, original 1979. US Railway Association PLDOT modeling language from 1976.
- Bell Canada and AT&T's LAMPAR spreadsheet compiler, dating from 1969. Autoplan programming language & Autotab GE from 1968.
- Lotus 1–2–3 from Lotus Development Corporation for IBM, released in 1983.

- StarOffice Calc, formerly Oracle Open Office integrated into StarOffice.

CHAPTER 4 - INPUTTING AND CUSTOMIZING DATA ENTRIES IN WORKSHEETS IN MICROSOFT EXCEL

GETTING FAMILIAR WITH DATA TYPES IN EXCEL

- **Numbers or Numeric Values**

The Numeric data type simply refers to numbers. It can be in decimal, percentage, fraction, dates, or a specified currency. Note however that Excel only supports input of fifteen (15) digits in its cells.

- **Texts or Alphabets Data Types**

This data type primarily consists of alphabets. Microsoft Excel detects letters, numbers, and symbols, e.g. ampersand (&), percentage (%), as well as whitespaces and tabs as supported text inputs. Excel however has the limitation of only being able to display 1,024 characters in its cells.

The text data type can also be used for data labels, categorizing data, and as data titles or headings.

- **Logical (True/False) Data Type**

The results of operations carried out with this data type can only yield a True or a False. The logical data type is implemented when comparing data, defining conditions or criteria, and then putting these conditions to tests, and also for verifying data contained in cell locations. They are otherwise known as Boolean functions.

- **The Error or Invalid Data Type**

This data type occurs when Excel detects an error in data entry.

- **Formulas**

Formulas are expressions in Excel that carry out specific mathematical operations. Formulas in Excel usually begin with the equality sign “=” sign.

INSERTING TEXTS AND VALUES IN WORKSHEETS

- **Inserting Numbers**

Numbers can be entered manually in cells by placing your cursor on the desired cell. Autofill can also be used to automatically populate cells when dealing with sequential numbers or data. Just as for entering months of the year as discussed in Chapter One, the

Autofill feature can also be used to populate rows or columns with sequential numbers.

- **Inserting Texts**

Placing your cursor on a cell and typing in alphabetical characters is the simplest way to insert texts in your data entry.

Also, using the **Insert** option present in the ribbon, click on **Text** and then choose the **Text box** option. Highlight the inserted text box and drag it to the desired position in your worksheet.

- **Employing the Enter Mode**

The enter mode in Excel makes a cell-active for you to enter data. Double-clicking on a cell activates the Enter mode.

INSERTING TIME AND DATES IN WORKSHEETS

- **Dates and Times**

A very easy shortcut to inserting current dates and time in Excel is as follows:

- Rest your cursor on the cell you want the date to appear
- Use the following keyboard shortcut to insert the current date;

Ctrl + ;

- To insert the current time, use the following keyboard shortcut

Ctrl + Shift + ;

Both date and time can also be entered in a single cell; simply ensure to enter a space after using the first command, (**Ctrl + Shift + ;** SPACE **Ctrl + ;**). Any of these can be entered first.

Inserting Dates and Time That Can Update Itself

This involves writing an expression or a formula in the Formula bar. Dates and times that can update themselves are essential when dealing with data that requires whose time of occurrence is required to be updated in real-time.

- Highlight the cell where the date would be entered
- Type in this expression into the formula bar

=TODAY()

- For time and date that updates itself:

=NOW()

Note that the date and time do not keep updating when the worksheet is closed; the update only occurs when the worksheet is opened again or recalculated.

EDITING THE CONTENTS OF A CELL

Erasing and Overwriting Data Written in a Cell

- Select the cell to allow Excel to immediately highlight the data in that cell.
- Press the **Backspace** key on your keyboard or type in the correct text to be in the cell to carry out an overwrite procedure.
- If multiple cell data is to be deleted, click and highlight these cells, and press the Backspace key.

Fine Tuning Cell Data

- Select the cell to be edited or highlight the data in that cell

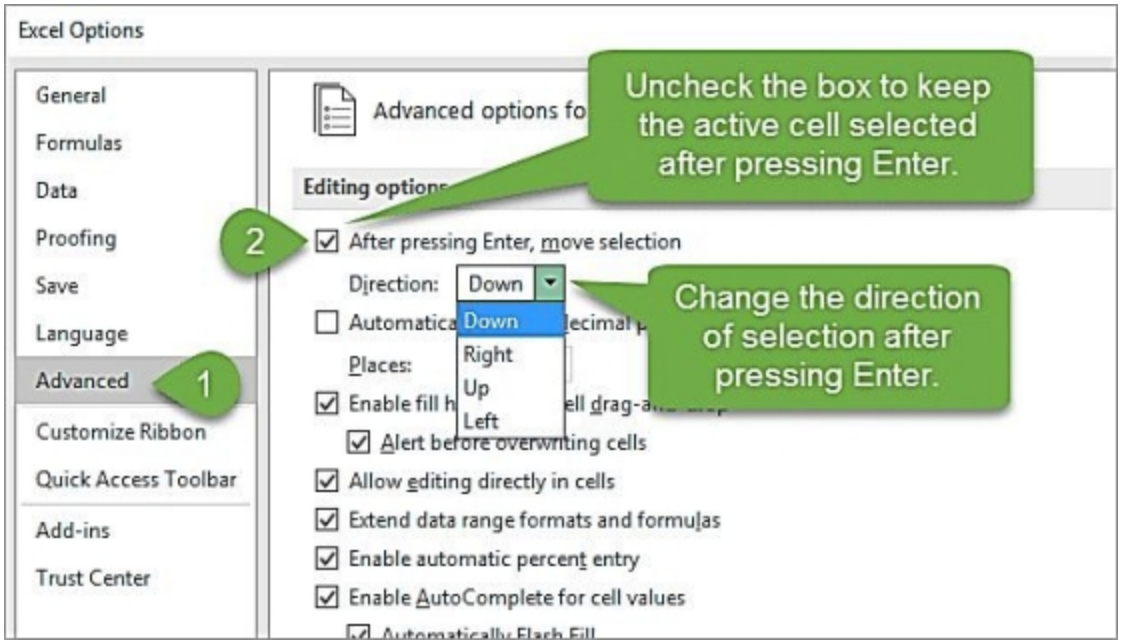
- Use the ribbon menu to perform edits such as fonts, font sizes, border settings, etc.

NECESSARY PROCEDURES TO KNOW WHEN ENTERING DATA IN CELLS

Changing Cells Automatically After Entering Data Ensure to press the **Enter** key on your keyboard after entering data in a cell to allow Excel to highlight the next cell for you.

How Excel selects the next can be customized:

- Go to **File**
- Select the tab for Options
- Select **Advanced** from the left menu
- Ensure to check the box for the move selection after pressing Enter
- Customize the movement direction in the next dropdown menu



Highlighting Numerous Cells Before Entering Data

- Set your mouse cursor to the starting point of the cells to be highlighted
- Drag your mouse to the desired stop.

Multiple cell highlights allow you to customize a large number of cells at once.

USING KEYBOARD KEYS CTRL + ENTER FOR INSERTING DATA IN MULTIPLE CELLS AT ONCE

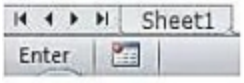
- Highlight the cells to be used
- Type in the data or formula in the top active cell
- Press the **Ctrl + Enter** keys

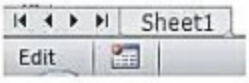
This action helps to avoid the stress of repeated copying and pasting of data, especially if similar data is to be entered in more than one cell.

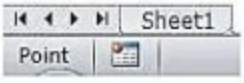
SWITCHING BETWEEN MODES OF CELL IN EXCEL The current modes of a cell can be seen in the status bar, present at the bottom of the Excel Window.

Three cell modes exist in Excel:

- **The Ready Mode:** This indicates a cell as dormant, awaiting being activated or selected.
- **The Enter Mode:** This mode defines the cell as active to accept input.
- **The Edit Mode:** This mode is initiated when a cell already containing data is selected.







AUTOMATIC WAY TO INSERT DECIMAL POINTS IN DATA

- Navigate to the **File** tab on the ribbon menu
- Select **Options**

- From the menu on the left, choose Advanced from the Options window
  - Tick the box indicating whether to include decimal places in your data

  - Set the number of decimal points to be included

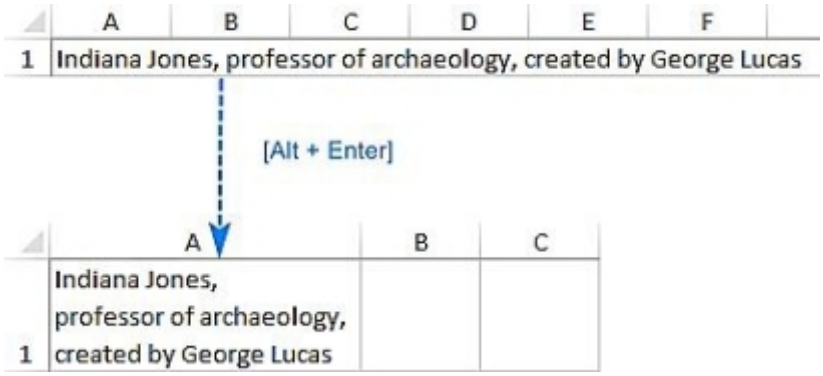
IMPLEMENTING AUTOCOMPLETE WHEN ENTERING DATA

AutoComplete simply means Excel gives you a/the suggestion of the word you are typing while still typing. Common examples occur when typing days of the week, or months, etc. AutoComplete suggestions also come up when Excel detects duplication of a word or number already entered previously. However, do not accept

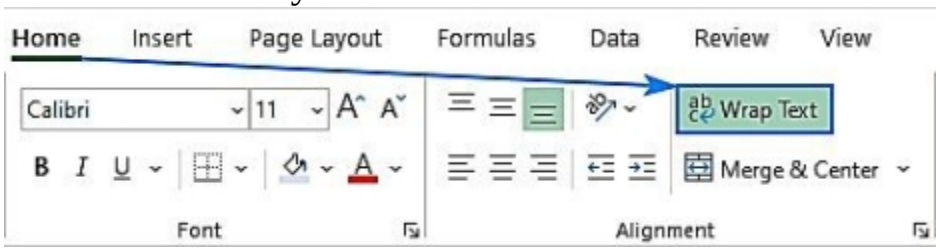
AutoComplete suggestions in cases of duplication if that same particular data will no longer be entered.

Implementing this feature can be done by pressing Enter on your keyboard when Excel brings up the suggestion. The AutoComplete feature can either be turned on or off by navigating to the **Advanced** tab from the **File** tab.

CUSTOMIZING THE APPEARANCE OF TEXTS ON NEW LINES IN A CELL



This procedure is also called line breaking. It can be executed by either selecting the **Wrap Text** option on the **Home** tab or by using keyboard keys **Alt + Enter** where you want the line breaks to be.



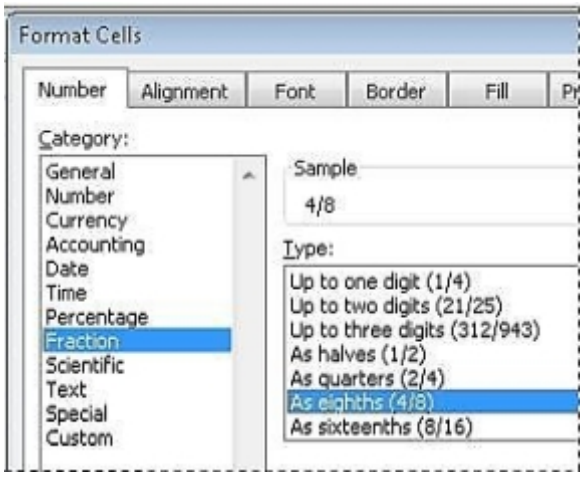
IMPLEMENTING AUTOCORRECT

Numerous options and configurations exist in Excel for AutoCorrect actions depending on necessity and the type of data being handled. All of these can be accessed and configured by navigating to the **Proofing** tab from **File** options.

The simplest form of implementing AutoCorrect in Excel works like the Find and Replace process. What certain inputs are replaced with can be decided and what suggestions are brought up for them when entering data.

INSERTING FRACTIONS IN EXCEL CELLS

- Highlight the cells where these fractions would be entered
- Select the **Dialogue Box** for numbers **icon** in the ribbon menu
- Choose Fractions from the Number tab on the window that appears

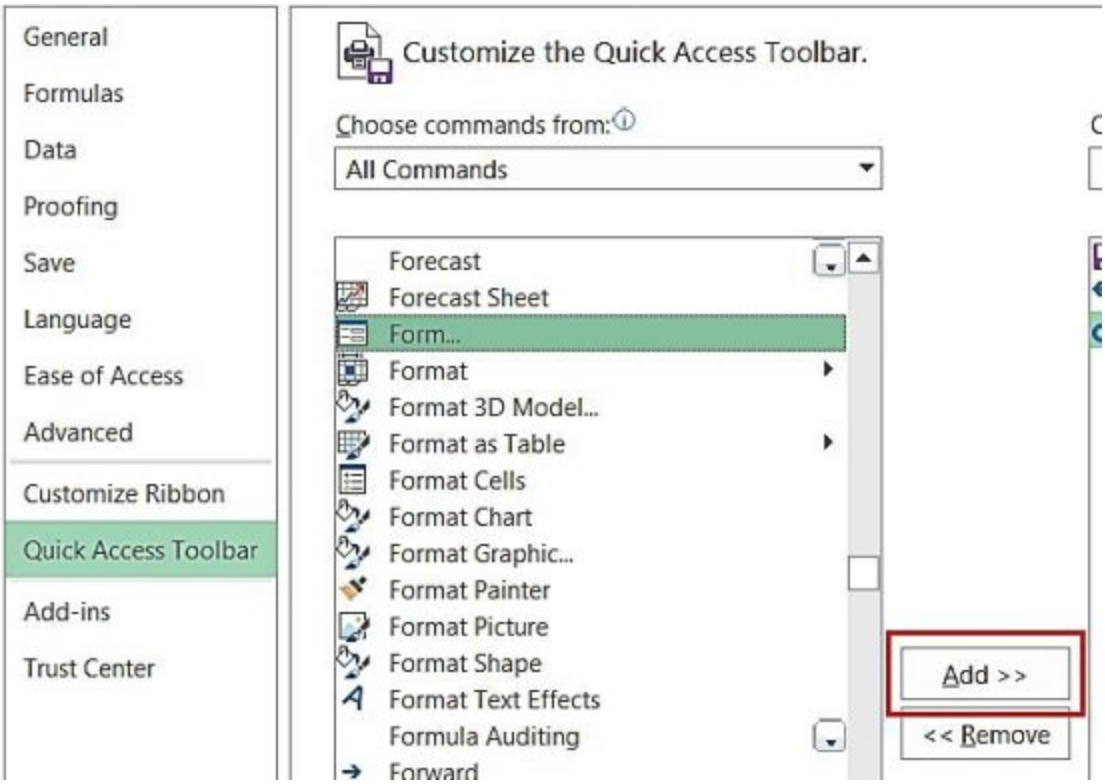


- Choose the desired fraction type to be implemented

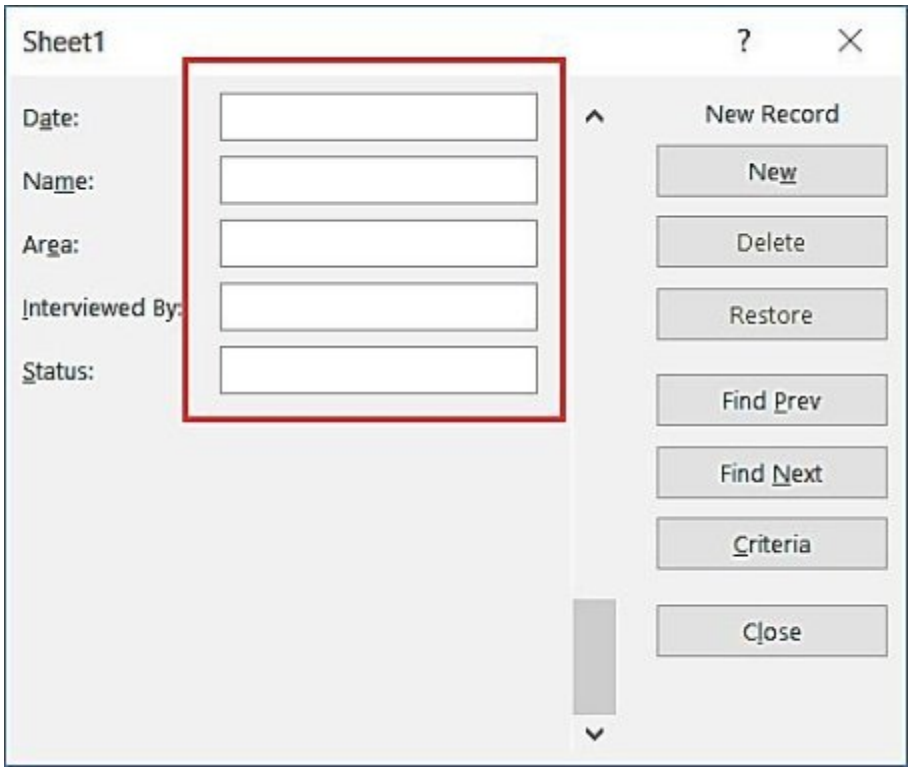
IMPLEMENTING FORMS WHEN ENTERING DATA

Using a form to enter data in Excel requires you to first include it in the Quick Access Toolbar.

- Make a right-click on any icon on the toolbar and select the option to customize the toolbar.
- Select the option for **All Commands** and click on **Forms.** Click on the add button to include it in the toolbar.



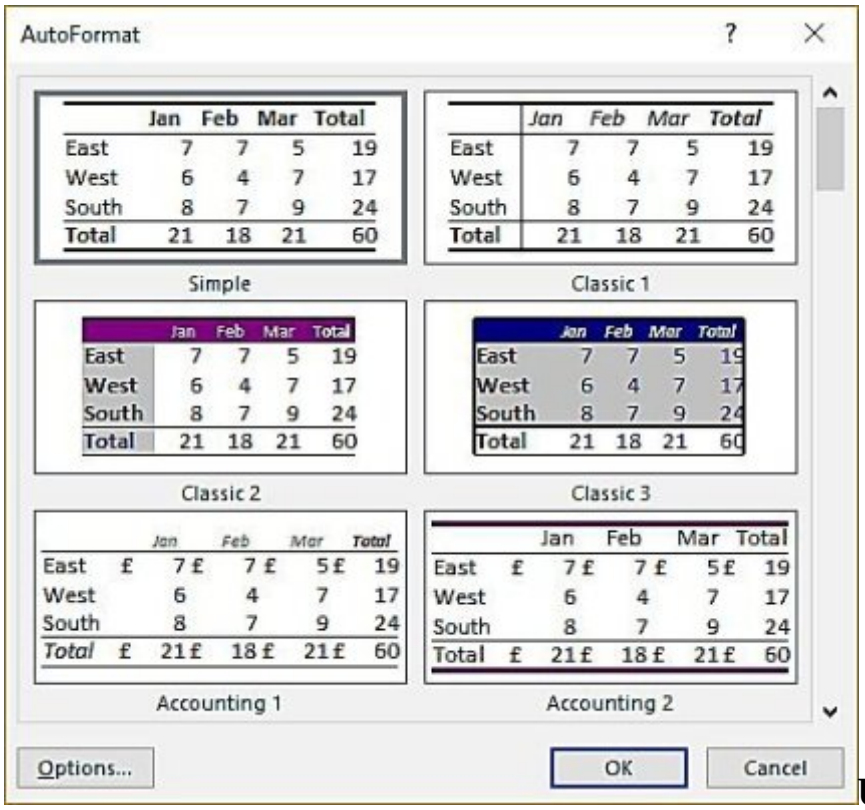
- Select any cell in your worksheet where you want the form action to take place. Select the **Form** icon recently added on your Quick Access Toolbar.


Sheet1
?
Date:
Name:
Area:
Interviewed By:
Status:
New Record
New
Delete
Restore
Find Prev
Find Next
Criteria
Close

FORMATTING NUMBERS IN EXCEL

The Automatic Number Formatting Option

- Highlight cells containing the numbers to be formatted
- Click on the icon for AutoFormat in the Quick Access Toolbar
- Select the desired template to be applied and select OK



Using the Ribbon Menu to Format Numbers

- Highlight the cells to be formatted
- Select the **Dialogue Box** icon for numbers in the ribbon menu

- Choose number formatting option to be applied from the Number tab window

This process is also how to use the dialogue box known as **Format Cells** to determine number formats. The tab to format numbers is housed by the Format Cells window.

Shortcuts on Keyboard to Format Numbers The Number tab window can be launched by pressing keys **Ctrl + Shift + Number key** (any number at the top of the keyboard).

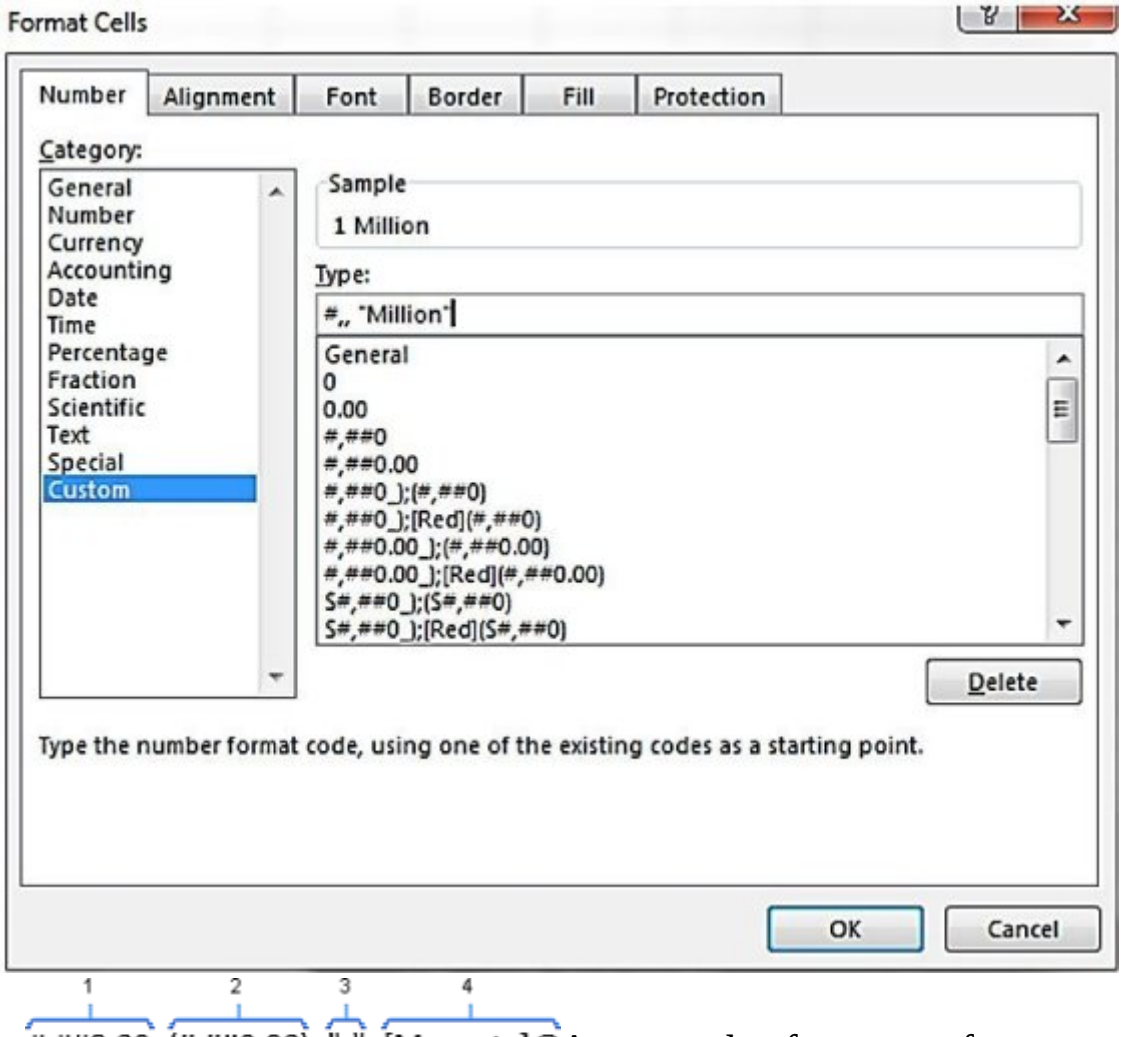
Also, particular keys can apply certain number formats, e.g.:

- **Ctrl + Shift** + ~ keys to apply the General number format
- **Ctrl + Shift + 1** keys to apply the Number format
- **Ctrl + Shift + 2** keys to apply the format for Time
- **Ctrl + Shift + 3** keys to apply the format for the date.

Including Your Custom Numbers in Excel

- Navigate to the **Format cells** window and select **Custom Numbers** from the **Number** tab

- Enter the format type in the box provided and click on OK


An example of a custom format type is as follows:

Generally, the number formatting types in Excel are of four components:

- The POSITIVE component
- The NEGATIVE component
- The ZERO component and,
- The TEXT component

These components are denoted in the above image. **Summary**

This chapter explained the input types present in Excel and how these can be customized and formatted. How forms can be used to easily enter data was discussed, as well as the use of custom numbers to aid data entry. The cell modes in Excel were also examined and how to work around the

contents of cells using AutoComplete and Autofill which saves time when entering data having multiple duplication instances were also examined.

CHAPTER 5- CARRYING OUT SIMPLE OPERATIONS IN YOUR

WORKSHEET

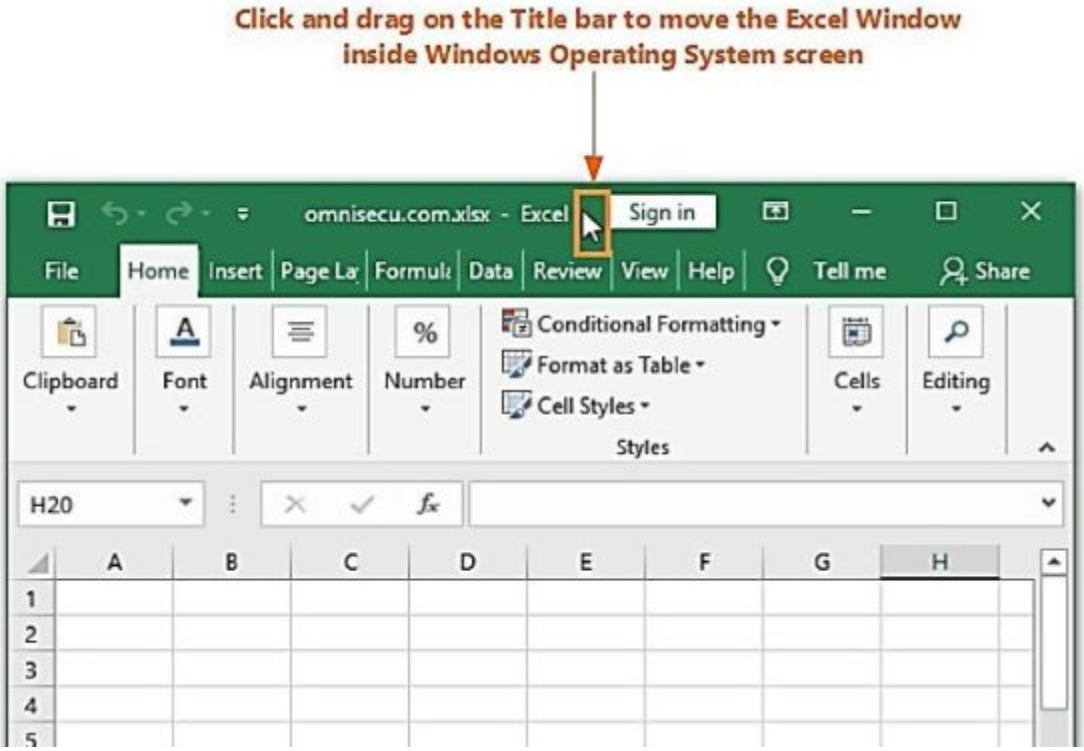
BASICS OF EXCEL WINDOWS

Basic operations that should be known about Excel windows include how their sizes can be adjusted, movement of the window, how these windows can be switched and then closed.

Changing Size and Moving the Excel Window

Resizing the Excel window can simply be done by taking your mouse cursor to the extreme top right of the window and then clicking on the Minimize icon (usually the middle icon). Clicking on this icon again maximizes the window.

An Excel Window can be moved about after being minimized by holding down and dragging the title bar of the window with the left button of your mouse.

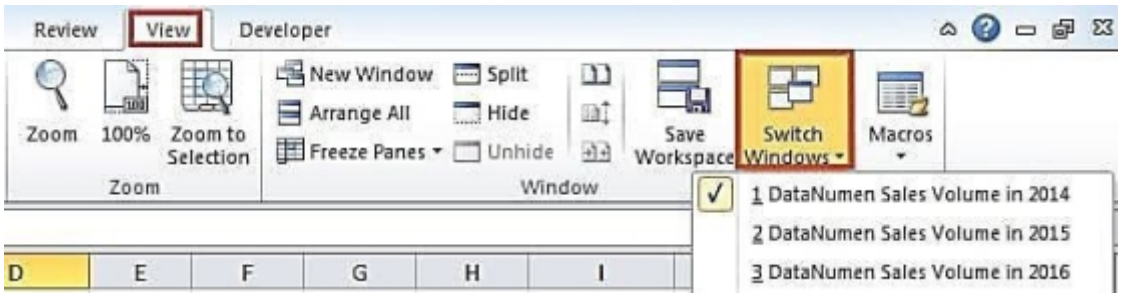


Switching Among Multiple Excel Windows

Before you can switch windows or workbooks in Excel, these windows must first be opened. A simple keyboard shortcut is all you need to perform this switching operation:

Use **Ctrl + Tab** or **Ctrl + F6**.

Navigating to the **View** tab and then selecting the drop-down option to switch between windows can also be used.



Closing Excel Windows

Move your mouse cursor to the **Close** icon at the top far right of the workbook.

ACTIVATING EXCEL WORKSHEETS

The VBA module in Excel can be used to activate worksheets. Press key **Alt + F11** to open the VBA code editor window. While in the window, enter the following code:

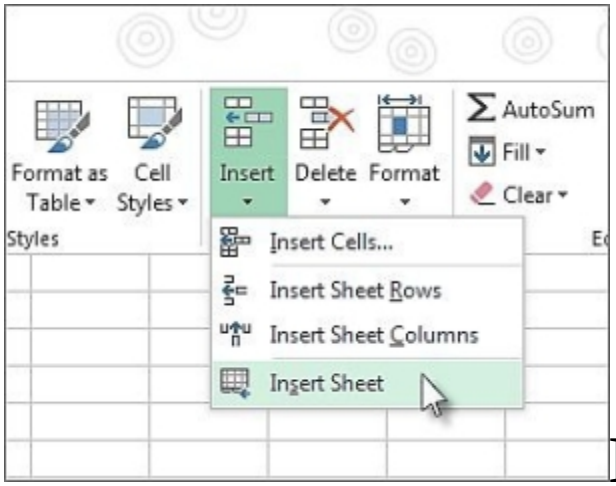
Sub Activate_Sheet() Worksheets(“Project1”).Activate ‘Or
Sheets(“Project1”).Activate End Sub

This code activates Excel sheets based on the name of the sheet. You can also activate the sheet by referring to the sheet number with this code:

Sub Activate_Sheet_BasedOnIndex()
Worksheets(1).Activate ‘Or
Sheets(1).Activate
End Sub **INCLUDING ADDITIONAL WORKSHEETS IN YOUR WORKBOOK**

Above the status bar in the Excel Window, click on the + icon beside the default available sheets to create new sheets. As many sheets as wanted can be added to your workbook.

The **Insert** menu can also be used in the **Home** tab. Just select the **Insert** drop-down menu and choose the option to insert new sheets.



DELETING EXCESS OR

UNWANTED WORKSHEETS

Make a right-click on the worksheet to be deleted and select the delete option. You can also navigate to the **Delete** menu in the **Home** tab and then select the option to remove the sheet. Ensure that you're on the sheet to be deleted when using the **Delete** menu option.

CHANGING THE NAME OF WORKSHEETS IN EXCEL

- Make a right-click on the worksheet to be renamed and select the

Rename option

- Enter the desired name

You can also make double-click on the sheet number above the status bar to perform the renaming process.

REARRANGING SHEET ARRANGEMENT IN A WORKBOOK

- Make a right-click on the worksheet to be moved

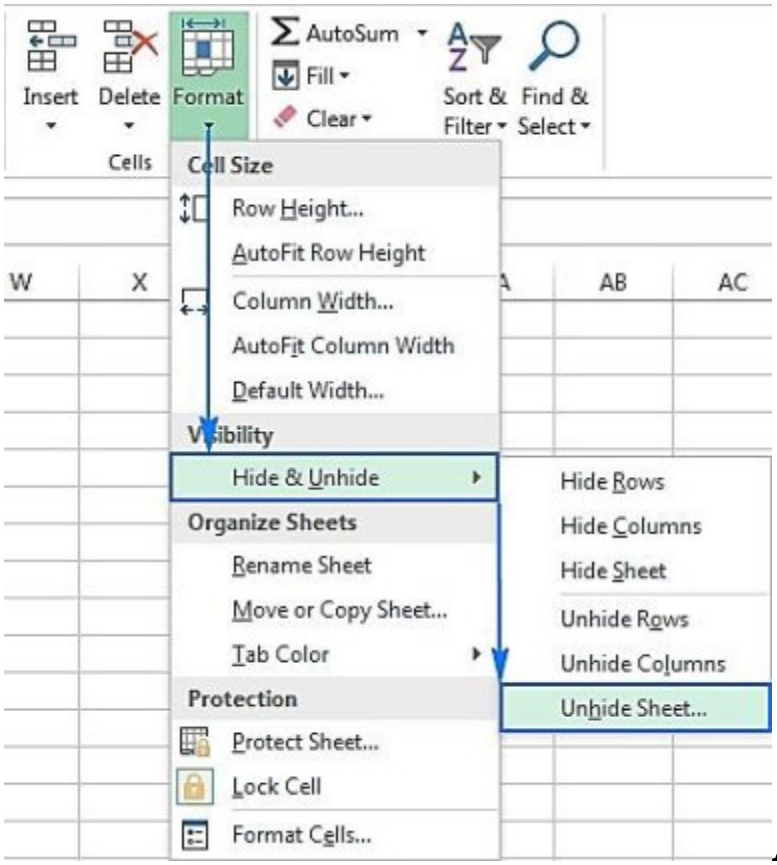
• Select the **Move** option and then select a desired direction from the pop-up dialogue box.

Another method is to simply hold and drag the desired sheet with your mouse to your wanted position.

SHOWING AND HIDING WORKSHEETS

• Right-click on the desired sheet and select the option to either hide or unhide the worksheet.

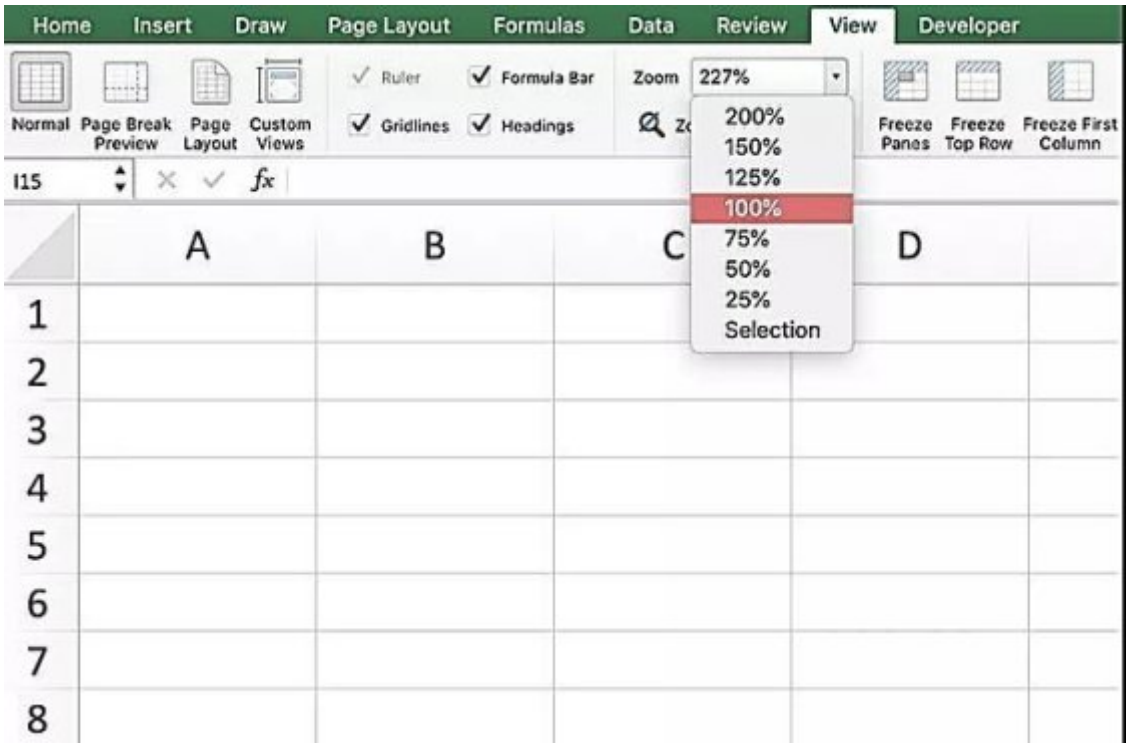
The **Format** tab in the **Home** menu can also be used. Select the option to hide or unhide from the menu and select appropriately from the next attached menu.



ADJUSTING THE EXCEL WINDOW RESOLUTION OR VIEW

Increasing the View Size of Your Workbook

- Excel workbooks and windows can be made larger by zooming in on the screen. At the bottom of the window, beside the status bar is a zoom bar that can be dragged to zoom in and out of the window.
- The **View** tab can also be used where you can enter zoom values in the Zoom box, or select options from the dropdown menu.



Making Worksheets Visible in Several Windows

- First, open a workbook and then navigate to the **View** tab

•

Select the option to open a new window.

- Select the worksheet to be opened in every new window you open

- Select the option to arrange these windows in the **View** tab after opening all desired worksheets

- Pick a suitable view arrangement

Checking Worksheets in a Side-by-Side View

- First, open a workbook and then navigate to the **View** tab
- Select the option to open a new window.
- Select the worksheet to be opened in every new window you open

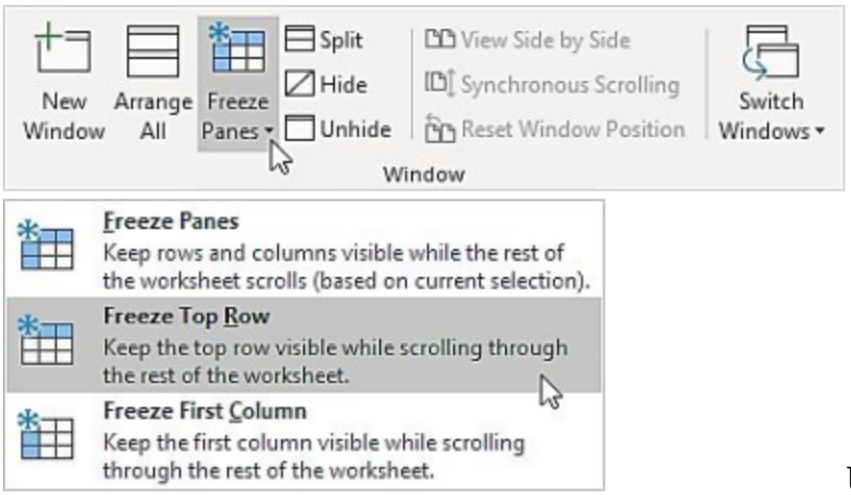
• After opening all worksheets, select the option to open these worksheets beside each other.

• You can also scroll through both of the worksheets by turning on

the option to scroll synchronously. **Dividing Worksheets Windows into Sections** First highlight the cell where the splitter would start from, then go to the **View** tab and select the **Split** option

Freezing Actions in Excel Worksheets

Rows, panes, and columns in Excel can be frozen to retain their view and content. Simply select the option for freezing panes in the **View** tab and select the desired option.



Using the Watch Window

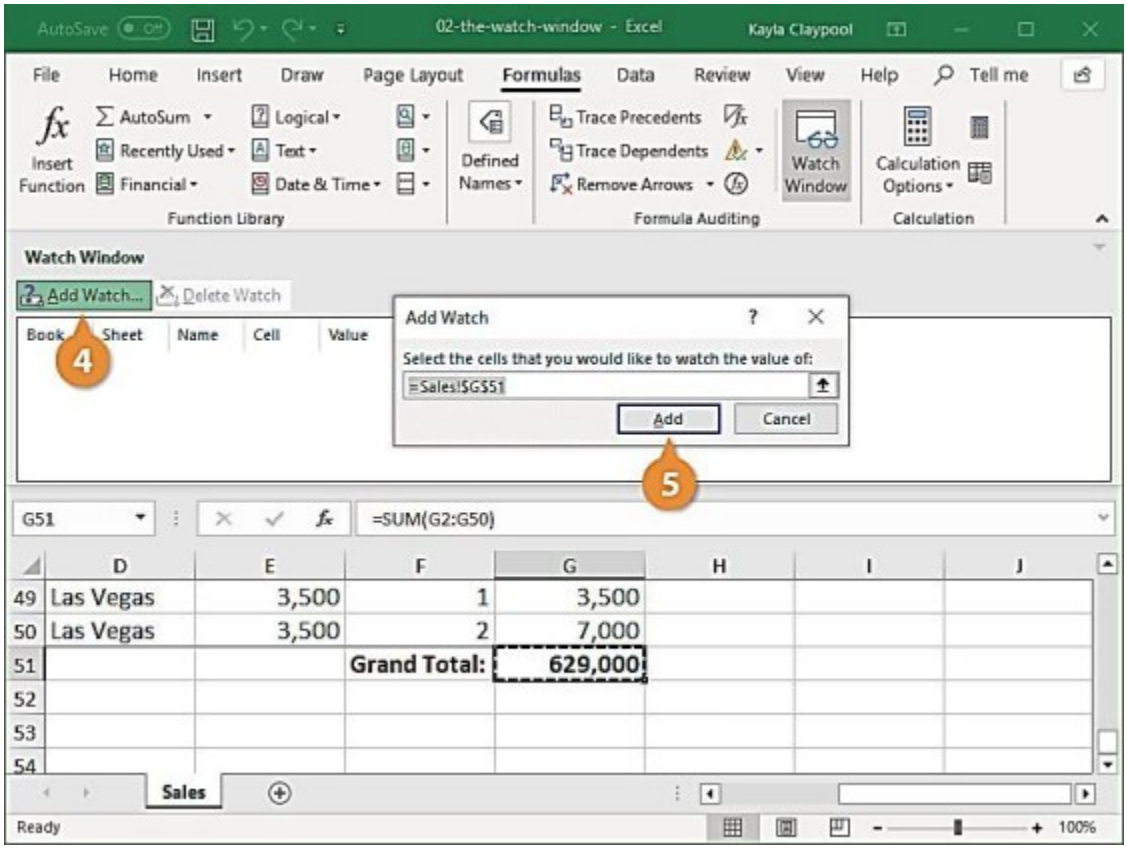
- Choose the cell to be watched and then navigate to the **Formula**

tab

•

Select the option for watching a window

- Select the option to add a watch to the desired cells
- Choose these cells in the dialogue that appears and select **Add**

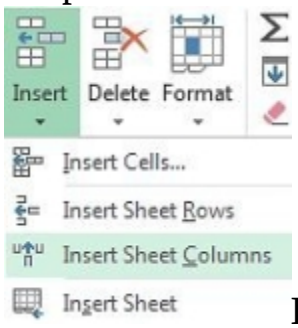


USING ROWS AND COLUMNS

Inputting Columns and Rows in Worksheet

- Select the point where the new row or column is to be inserted

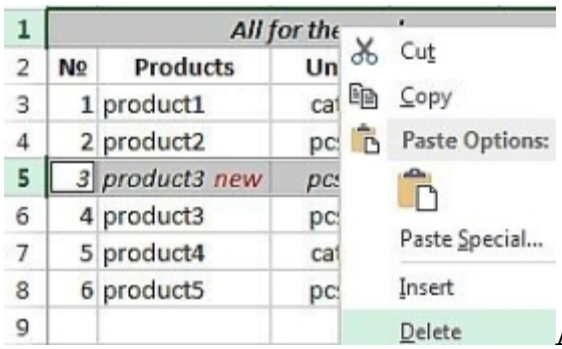
- Navigate to the **Insert** menu in the **Home** tab and select a suitable insert option



Erasing Columns and Rows in Worksheet

- Highlight the row or column to be deleted and make a rightclick click

- Select the **Delete** option



Alternatively, navigate to the **Delete** menu in the **Home** tab and choose a suitable delete option. **Adjusting the Size of Columns and Rows in Worksheet**

- Take your cursor to the edge of the column or row to be resized and ensure the cursor changes to the scaling arrow

- Drag the row or column to the desired size

The **Format** menu in the **Home** tab can also be used. Select this menu and choose a suitable option to adjust or AutoFit row and column size.

Showing and Hiding Columns and Rows in Worksheet

- Highlight the row or column to be removed or put into view

- Navigate to the **Format** menu and select the appropriate option for hiding or viewing rows and columns

You can also make a right-click on any row and column to either remove or put them in view.

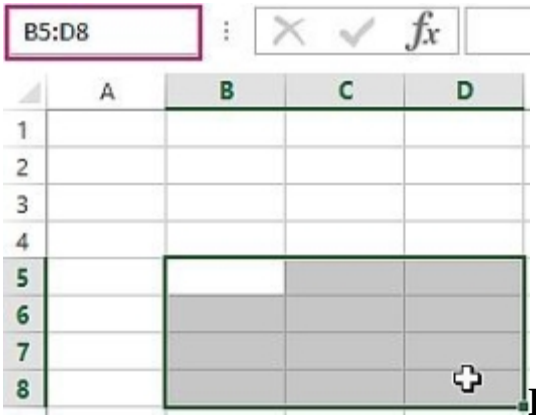
Summary

This chapter discussed and itemized how basic and easy operations can be carried out in Excel to help understand better how to navigate

around worksheets and workbooks. Also, multiple options and procedures on customizing your worksheet view, rows, and columns to decide what you see and how you see them were examined.

CHAPTER 6- USING RANGES AND TABLES IN EXCEL CELLS AND RANGES SELECTION

Selecting cells in ranges or blocks makes simultaneous input of data into these cells possible. This selection can easily be done by a continual press of your mouse's left button to drag and select desired cell ranges. Alternatively, the **Shift** key can be pressed down while you use the arrow keys or mouse to select a cell in any direction.



Highlighting Full Rows and Columns

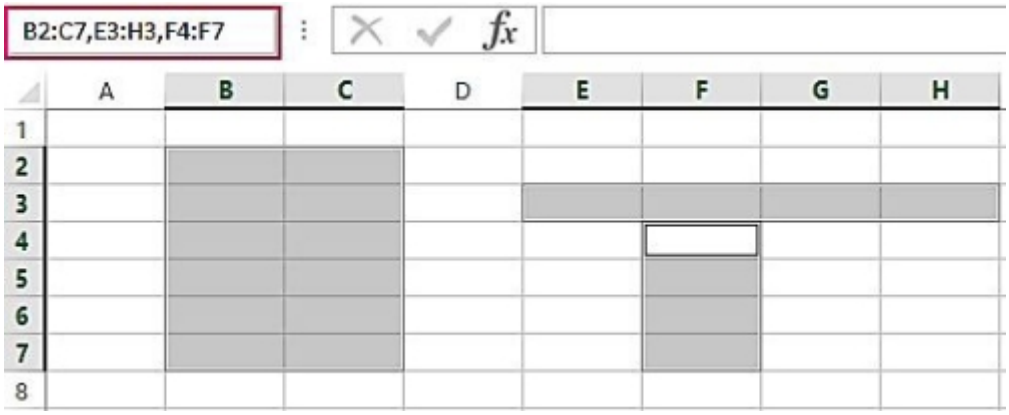
Two ways exist to do this, you can either:

- Click on the row number or the column letter

- Use the name box to enter the row number or the column letter to be selected e.g. C:C to select column C, 2:2 to select row 2, B:F to highlight columns B to F, etc.

Highlighting Cells Having Ranges That Are Noncontiguous or Non-adjacent

Highlight the first set of cell ranges you need, hold down the **Ctrl** key on your keyboard and then use your mouse to select the next ranges of cells.



The complete workbook can also be highlighted by clicking on the corner icon beside the row and column.

Highlighting Ranges in Multiple Worksheets

- Navigate to the tab where you have your sheets listed in the Excel window. This tab is usually just above the status bar.
- Press down the **Ctrl** key on your keyboard and use your mouse to select additional sheet(s)
- In the currently opened sheet, select desired cell ranges. This action highlights this cell ranges both on the opened sheet and on the previously selected worksheets.

Highlighting Particular or Special Cells The **Conditional Formatting** menu is used to highlight specific cells in Excel.

- First, select the cell ranges to which the formatting would be applied (this is usually your data area).

- Navigate to the **Conditional Formatting** menu in the **Home** tab
- Select the option for highlighting rules in cells
- Select the option to specify text rules to be checked for

- Type in the word Excel should look for to highlight the cells containing such word in the pop-up box

- Select OK

- A customized rule for formatting can also be defined by selecting the **New Rule** option in the **Conditional Formatting** menu.

Highlighting Cells by Search Action

- Highlight the cells or data where this action will be applied
- Navigate to the **Conditional Formatting** menu in the **Home** tab
- Select the option to create a new custom rule

- Select to implement a formula for the formatting operation in the dialogue box that appears
- Enter the corresponding formula related to your previously selected cell, e.g. =**A4=$B$1**

- Select the **Format** button and then define how the formatting

would be displayed in the next tab

- Click on OK

You can now type and search keywords in the B1 cell. Corresponding cell search results would then be highlighted as configured.

MOVING AND COPYING ACTIONS FOR CELL RANGES

Using the Ribbon Menu for Copying

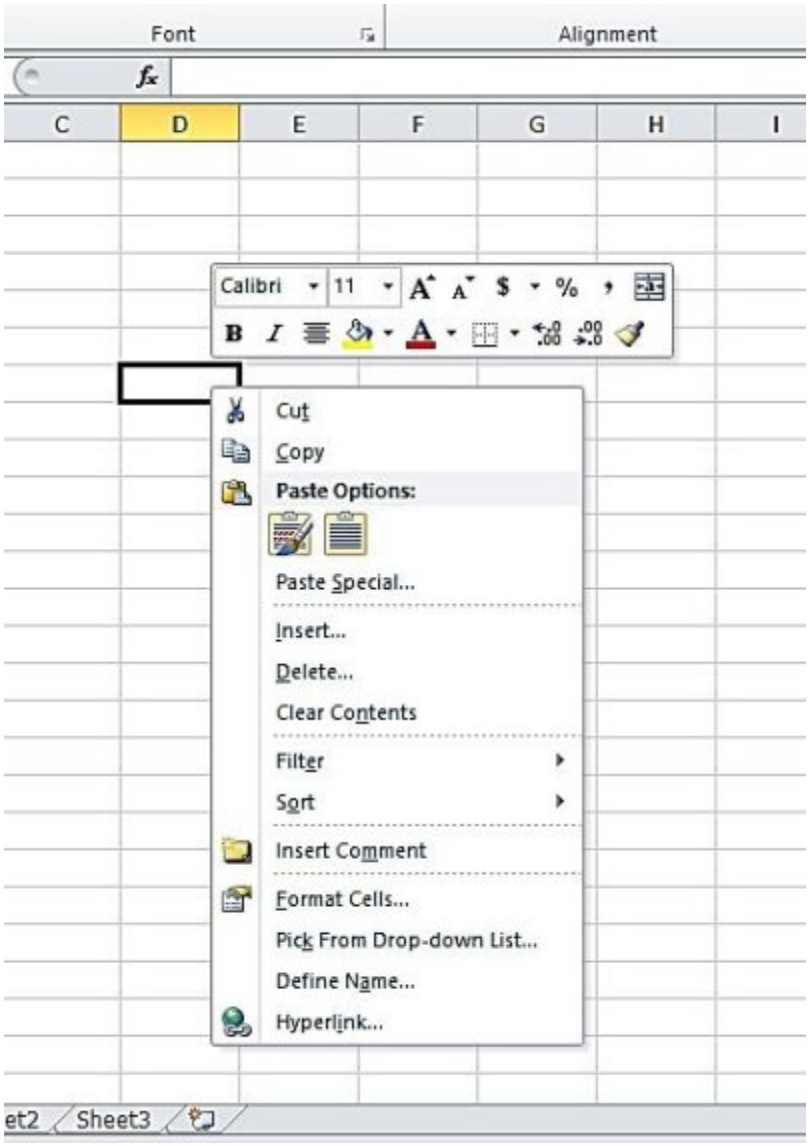
- First, highlight the ranges of the cell containing the data to be copied
- Navigate to the **Home** tab on the ribbon menu and select the copy icon
- Select the cells where you want the copied data to appear
- Select the option to paste on the ribbon menu

Using Shortcut Keys for Copying

- First, highlight the ranges of the cell containing the data to be copied
- Hold down key **Ctrl + C** on your keyboard
- Select the cells where you want the copied data to appear
- Press **Ctrl + V** keys on your keyboard to paste the data

Employing Shortcut Menu Commands for Copying Data

- First, highlight the ranges of the cell containing the data to be copied
- Make a right-click to bring up the shortcut menu
- Select the **Copy** option



- Select the cells where you want the copied data to appear
- Make a right-click on these newly highlighted cells and select the

Paste option

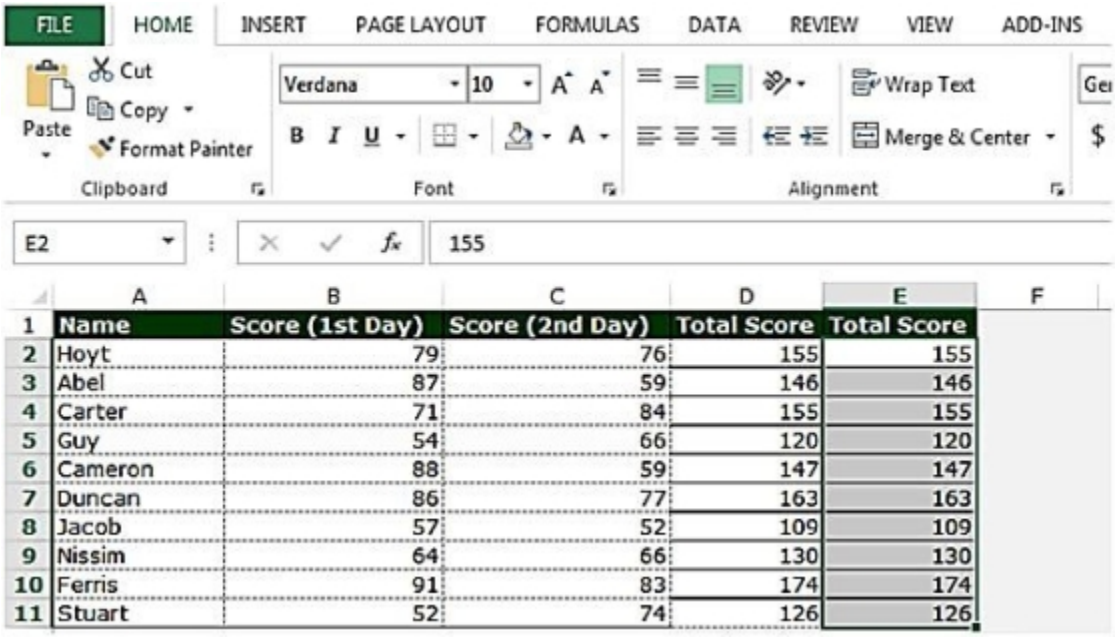
Using the Drag Arrow Technique for Copying

- Highlight the ranges of the cell containing the data to be copied

- Place your mouse cursor at the edge of the highlighted cells for the move cursor to come into view

You can then drag and drop the cells in the desired destination

Copying Data to Adjacent Cells Simply select the destination cells and use keys **Ctrl + R**



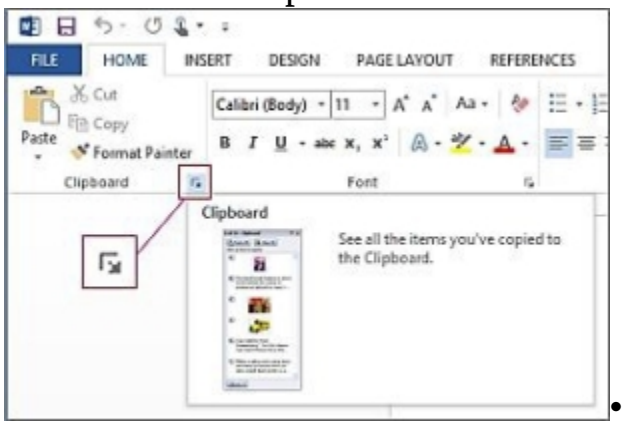
	A	B	C	D	E	F
1	Name	Score (1st Day)	Score (2nd Day)	Total Score	Total Score	
2	Hoyt	79	76	155	155	
3	Abel	87	59	146	146	
4	Carter	71	84	155	155	
5	Guy	54	66	120	120	
6	Cameron	88	59	147	147	
7	Duncan	86	77	163	163	
8	Jacob	57	52	109	109	
9	Nissim	64	66	130	130	
10	Ferris	91	83	174	174	
11	Stuart	52	74	126	126	

Data Copying Actions from Cell Ranges to Another Sheet

- Highlight the ranges of the cell containing the data to be copied and copy them using any desired technique
- Navigate to the tab containing the sheet list and select the destination worksheet
- Paste the copied data in any location on the opened worksheet

Using the Clipboard for Pasting Action

A simple way to carry out this process is by using **Ctrl + V** to paste previously copied data in the Clipboard to desired cells. But to use multiple copied data in the Clipboard:



- Navigate to the **Home** tab and select the Clipboard icon to open its dialogue box

- Select the data needed in the Clipboard list

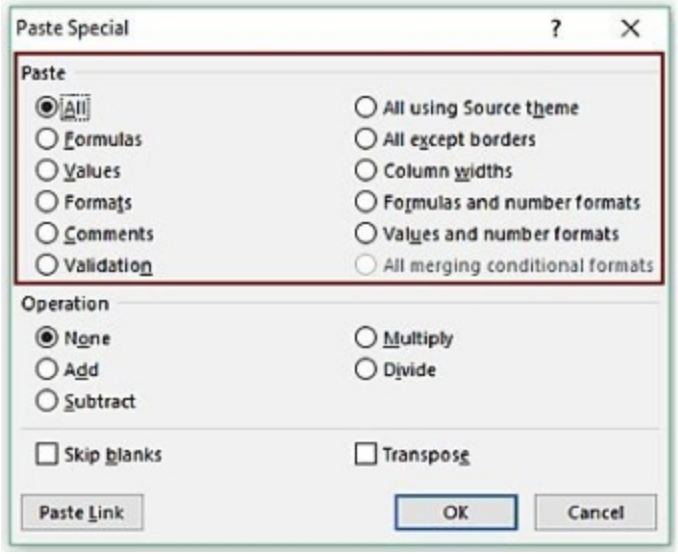
Pasting Data with Unique Techniques

- The unique or special pasting option in Excel copies every attribute of the selected cell. It pastes data along with every formatting

previously applied.

- After selecting and copying your data to the clipboard, navigate to the **Paste** button in the **Home** tab
- Select the drop-down icon below the button to see additional paste options to configure how your data gets pasted
- You can then also select the option to paste your data in special forms. Keyboard shortcut **Alt + E + S + V** can also be used.

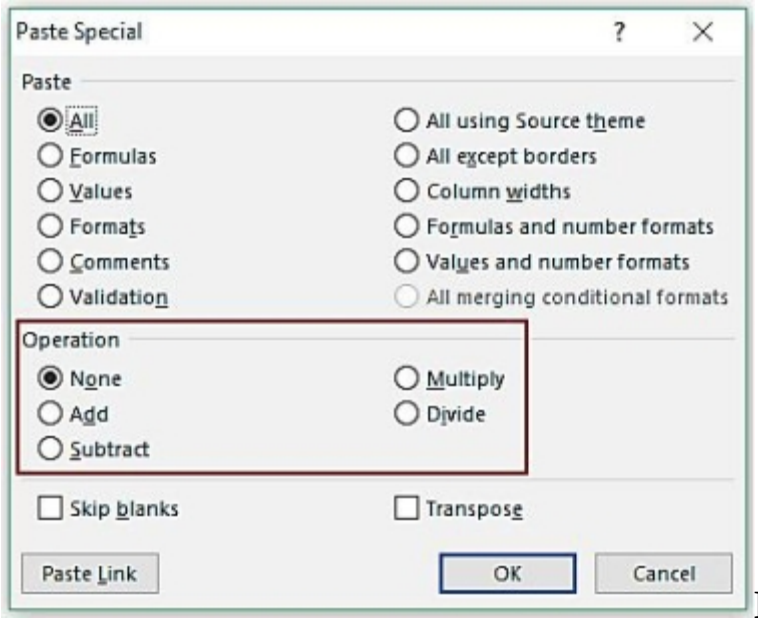
These actions open the Excel dialogue box for special pasting configurations.



PASTING DATA WITH THE PASTE DIALOGUE BOX

Executing Mathematical Operations without Formulas

- Highlight the cells containing the data on which a mathematical operation is to be performed
- Open the dialogue box for pasting using either the ribbon menu or the keyboard shortcut
- Select any needed mathematical operation from the dialogue box

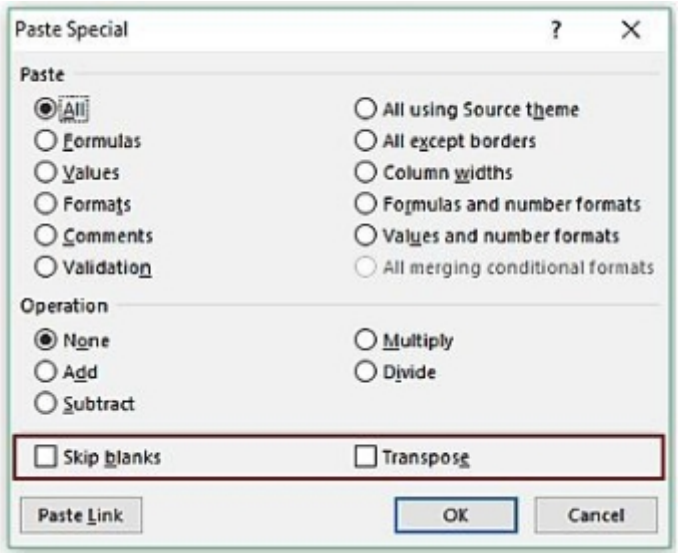


How to Skip or Ignore Copied Blank Cells and Spaces

In the paste dialogue box, select the box indicated to ignore blanks and choose the OK button

Transposing Ranges

This gives the inverse of copied data. It can be expressly seen when dealing with Boolean results. To transpose copied ranges; in the paste dialogue box, select the box indicated to transpose ranges and choose the OK button.



APPLYING NAME ATTRIBUTES IN RANGE OPERATIONS

Giving names to ranges of cell help to point to them when executing formatting or mathematical operations.

HOW TO ASSIGN NAMES TO RANGES

Using the Name Box

- Highlight the ranges to be named

- Navigate to the box for names beside the formula bar and type in your desired name

- This name is applied to the entire workbook for that cell range.

Employing the Dialogue Box for Assigning New Range Names

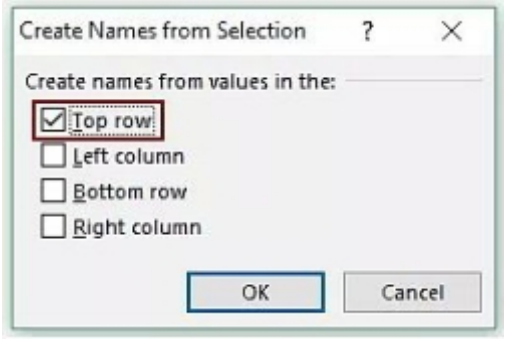
- To restrict range names to only a particular worksheet, use this option to define a range name in the **Formula** bar.
- First, select the cell range to be named and navigate to the option to define a name in the **Formula** bar
- In the dialogue box that appears for new names, enter an appropriate name and set a restriction level for the name

- Select the Ok button

Using the Dialogue Box for Selection

- Highlight the whole data you have on your worksheet
- Navigate to the option to create a selection in the **Formula** bar

- When the dialogue box for "**Create Names from Selection**" is opened, select where a name should be chosen from in the highlighted data



This technique chooses names for ranges from what you have on your worksheet. Range names do not support blank spaces; they are usually replaced with underscores.

WORKING WITH NAMES IN RANGES

In case you have a lot of range names already created in your worksheet, these names can be edited and managed using the **Manager for Names** in the option for defined names found in the **Formula** tab. Keyboard keys **Ctrl + F3** can also be used to access this **Manager.**

While in this Manager, you can select to add new names, edit existing names, or even delete them. Select the OK button to save all changes.

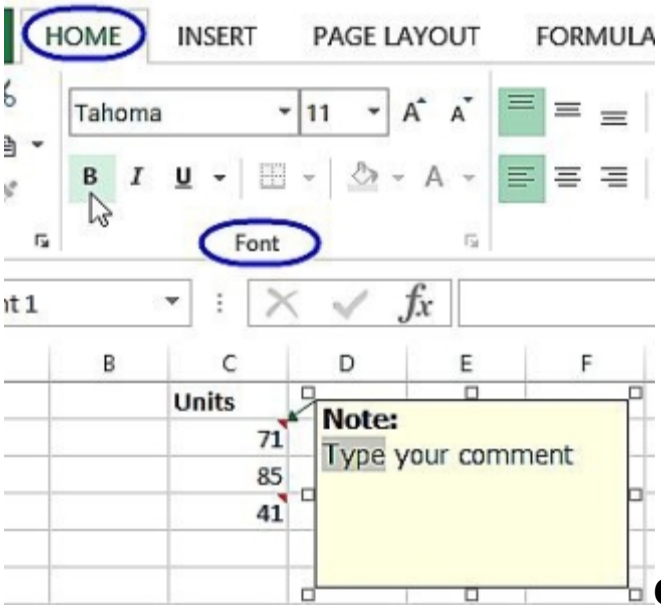
GIVING COMMENTS IN CELLS

To include comments in your cells in Excel, simply right-click on that cell and select the option for inserting comments.

Formatting Cell Comments

- Right-click on the particular having the comment to be formatted
- Select the edit option

- Highlight specific words in the comment to be formatted or select the edge of the box housing the comment to format the entire comment.



Configuring the Shape of the Comment Box

- Right-click on the particular having the comment to be formatted
- Select the edit option

- Select the edge of the box housing the comment

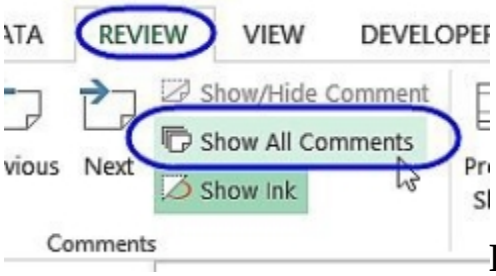
- Choose the option to edit shape in the Quick Access Toolbar and select the desired shape

- Make a click outside the comment box to apply changes

Reading Cell Comments

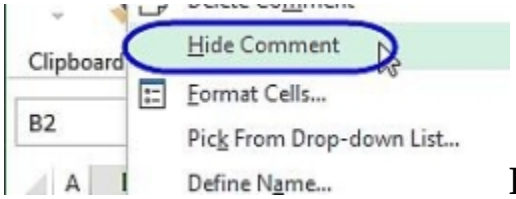
- Navigate to the **Review** tab on the ribbon menu

- Select the option to show every comment. This option displays all available comments in the entire workbook.
- To remove these comments from view, click again on the previous option.



Hiding and Un-hiding Cell Comments

- Right-click on the particular cell having the comment
- Select the option to either hide or show the comment



Editing Cell Comments Following the procedure for formatting cell comments, you can use the font menu on the ribbon tab to make all edits to comments.

Erasing Cell Comments Right-click on the particular having the comment and select the option to delete the comment

USING TABLES IN YOUR WORKSHEET

Excel tables can be quite tricky because the worksheet itself already looks like a table. After paying careful attention, however, users find out implementation of Excel tables is not tasking.

Getting Familiar with the Layout of the Excel Table Header Rows in Excel Table

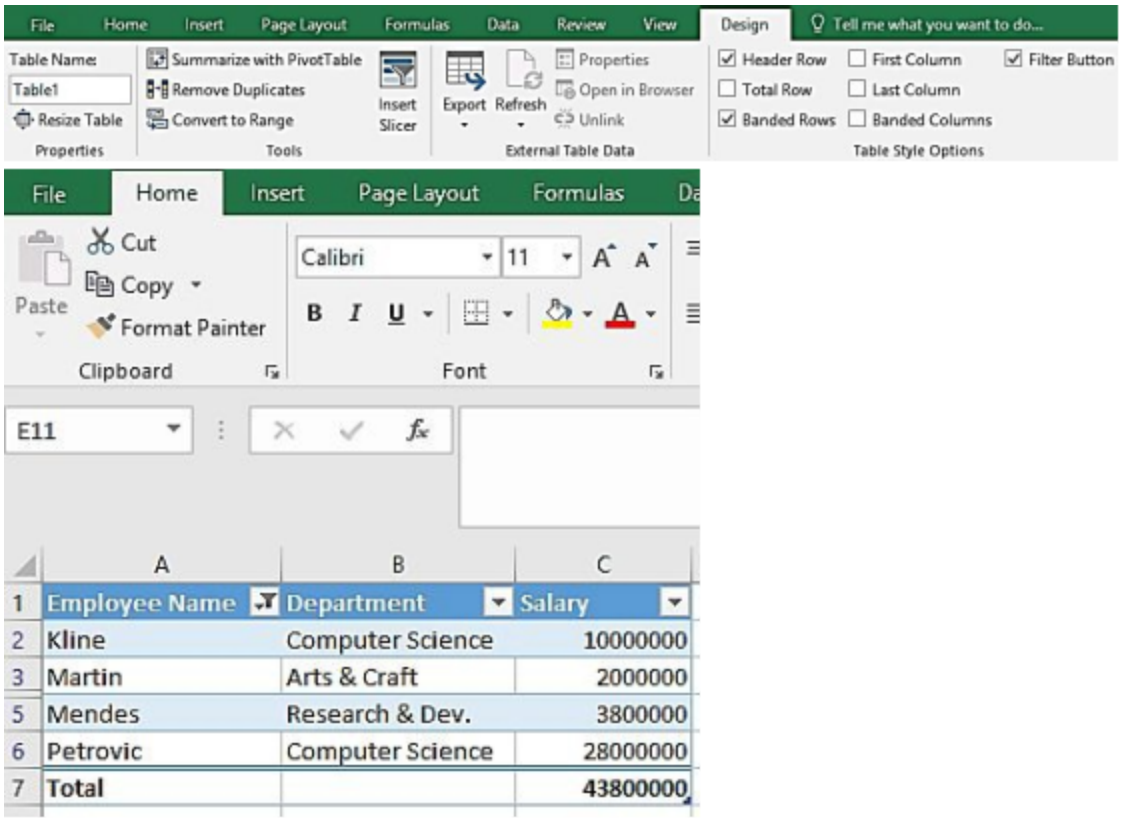
The header row in the Excel table is present at the top row of the table. It holds the name of the table column. Header rows can be easily created by freezing these panes on the **View** tab. It is good practice to add color to your header rows to set them apart from the body of the table.

The header row can also be hidden or shown by selecting the table and navigating to the **Design** tab in the **Table Tools** menu. Select the option for this configuration.

The Table Body This is the area below the header rows where you can enter your data.

The Row for Summing Operations

A row to perform summing operations can be added to your table by navigating to the **Design** tab in the **Table Tools** menu. Select the box to include this in your table.



Changing the Size of

Tables

Selecting the table and placing your mouse cursor on the enclosing line for adjusting the size of the table is all you need to do. Simply ensure your cursor changes to the double-edged arrow before dragging the resizing box.

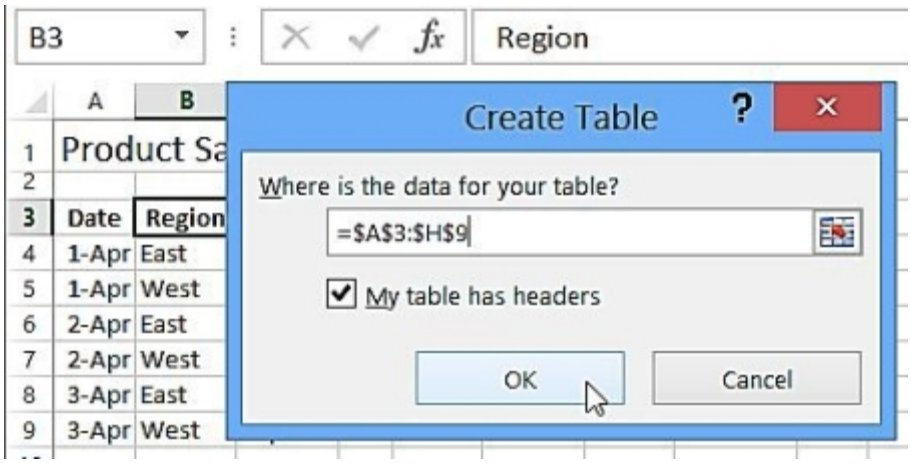
CREATING EXCEL TABLES

- Highlight a cell as the starting point of the table

•

Navigate to the **Insert** tab and select the option for tables

- Determine the range of cells across which the table would span
- Indicate if your table contains headers



- Select OK when done

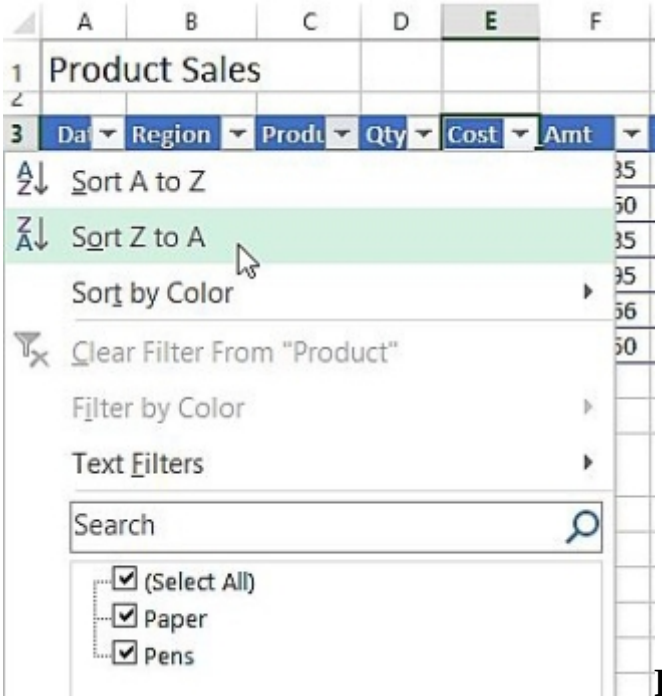
ADDING DATA TO YOUR CREATED TABLE

Select cells and enter your data. Both texts and number values can be inserted.

FILTERING AND SORTING OPERATIONS IN EXCEL TABLES

Sorting Operations in Tables

- Select the drop-down icon for filtering and sorting in the Home tab
- Select a sorting option in the available menu



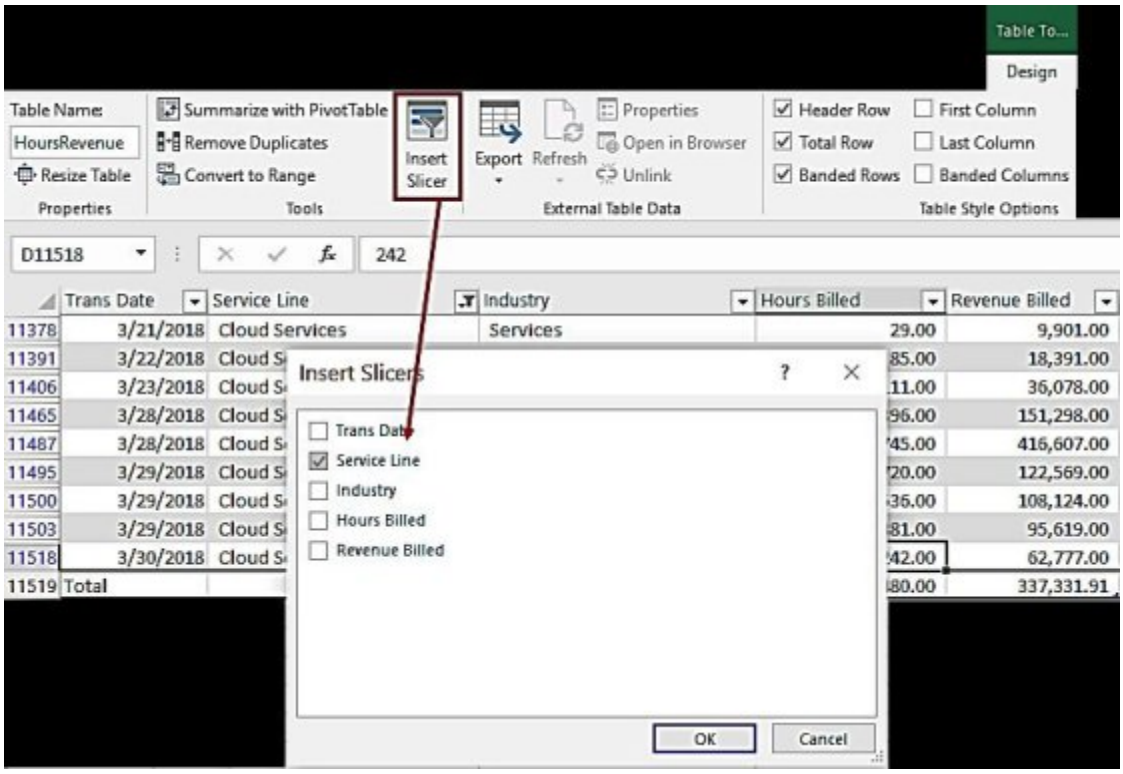
Filtering Operations in Tables

- Select the drop-down icon for filtering and sorting in the Home tab
- Select the **Filter** option

This selection puts an arrow beside your column headings. Click on this arrow to perform filtering operations according to the provided menu.

Performing Filtering Operations Using Table Slicers

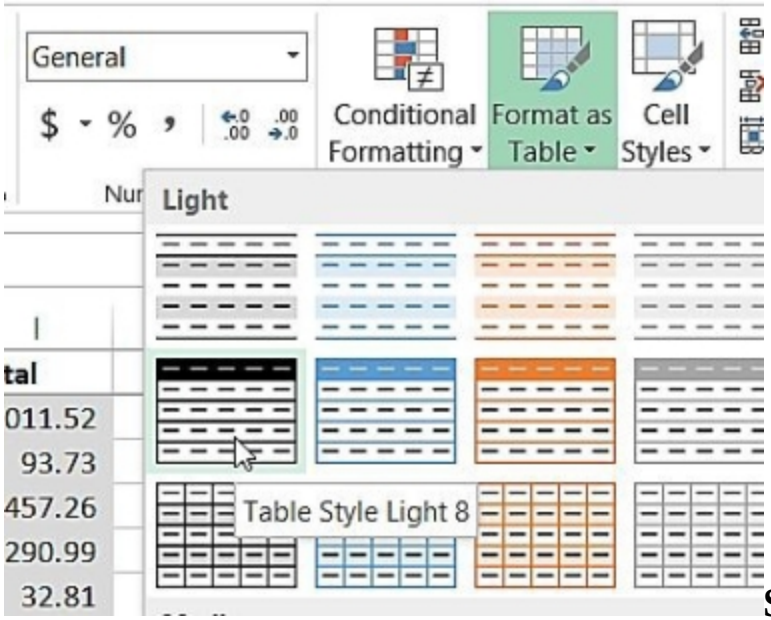
- Navigate to the **Design** tab in the **Table Tools** menu and select the option to insert a table slicer
- Tick the boxes containing your table header to select the fields to be filtered.



- Click on OK when done

Configuring the Appearance of Your Table

Select specific areas or fields in your table to edit the font or add a background or font color. These changes can be made on the **Home** tab.



Summary

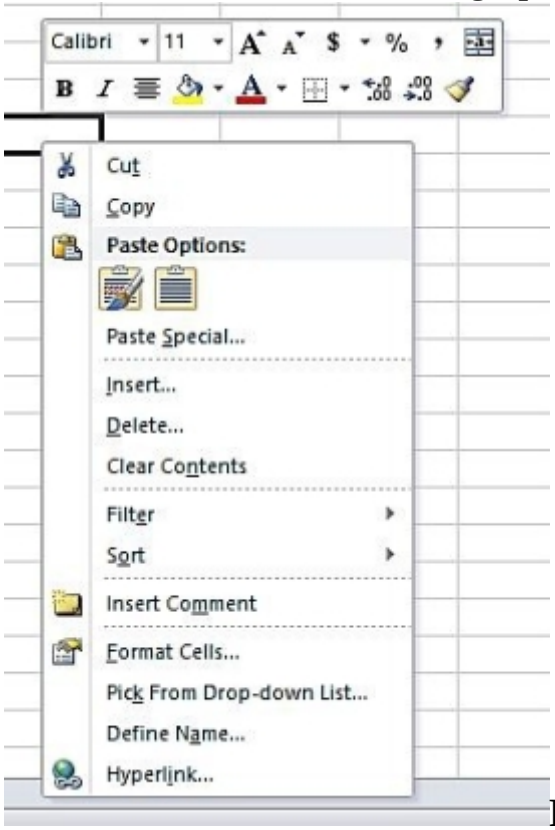
This chapter explained the operations that can be carried out in Excel cells according to ranges. Various techniques of selecting and copying data in cell ranges, the addition of comments, how they can be edited and configured were also discussed. Creation of Excel

tables, their layouts, and how simple operations such as filtering, sorting, editing the table appearance was examined.

CHAPTER 7 -FORMATTING YOUR WORKSHEETS

Formatting Worksheets Using Tools from the Home Tab

The ribbon menu of the Home tab is the most common way to format worksheets. Numerous formatting options are accessible in this tab.



Formatting Worksheets Using the Mini Toolbar

The shortcut menu that comes up by right-clicking on cells or items holds some formatting options for your worksheet.

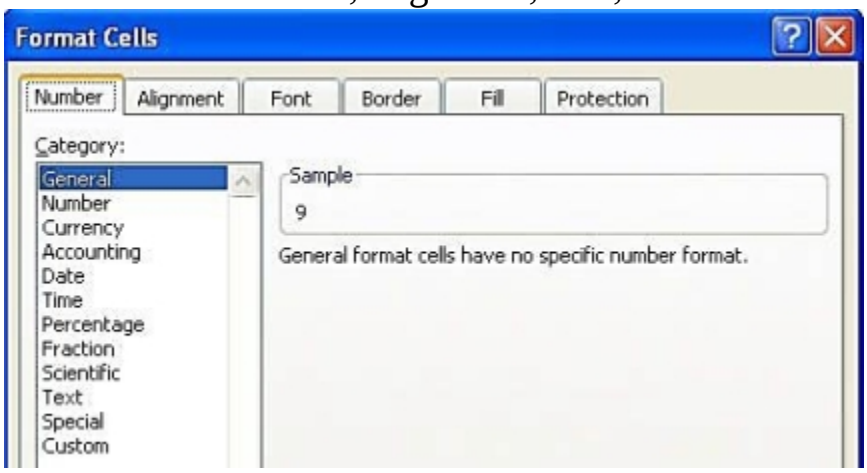
This mini toolbar holds the following tools for formatting:

- Font tools
- Alignment tools
- Number tools
- Clipboard tools

The Quick Access toolbar also holds formatting tools for your worksheet. Not all commands are however present by default on this toolbar, leaving you to manually add them when needed.

Formatting Worksheets Using the Dialogue Box for Formatting Cells

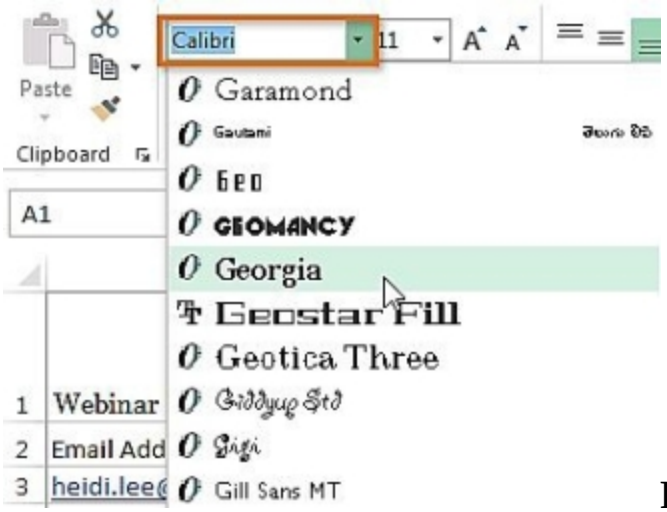
The dialogue box for cells formatting can be accessed by selecting the option for cell formatting in the **Home** tab. This dialogue box holds several tabs to format numbers, alignment, font, etc.



CARRYING OUT FORMATTING OPERATIONS IN YOUR WORKSHEET

Changing Fonts in Your Worksheet

Select any desired font from any of the tools previously highlighted. Font style and font sizes can both be formatted. You can also make your texts bold or italicize them during this formatting process.



Formatting Text

Alignments

This formatting operation allows you to decide how you want your data to appear and how they are arranged.

Alignment in Horizontal Direction

Three options exist for horizontal alignment of worksheet text or data:

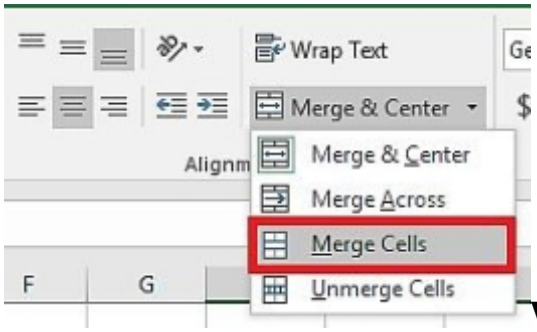
- Left alignment
- Center alignment
- Right alignment

Alignment in Vertical Direction Three options also exist for vertical alignment of worksheet text or data:

- Alignment to the top
- Alignment to the middle
- Bottom alignment

Text Wrap Formatting

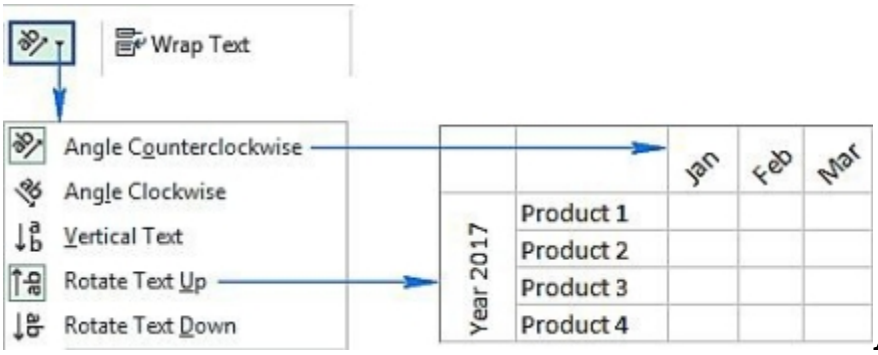
This can simply be done by selecting the option to wrap texts in the Excel **Home** tab. This formatting option allows all text to be made visible in a cell.



Worksheet Merge Formatting First, select the cells to be merged and then navigate to the merge option drop-down menu in the **Home** tab

Aligning Texts to Angles

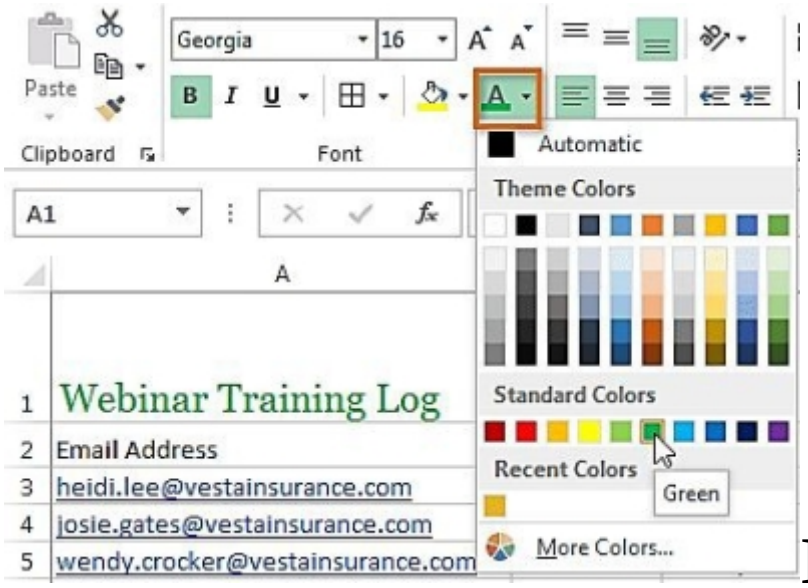
Select the drop-down menu to change text orientation. This menu gives you options to rotate your worksheet texts in directions suitable to your data.



ADDING

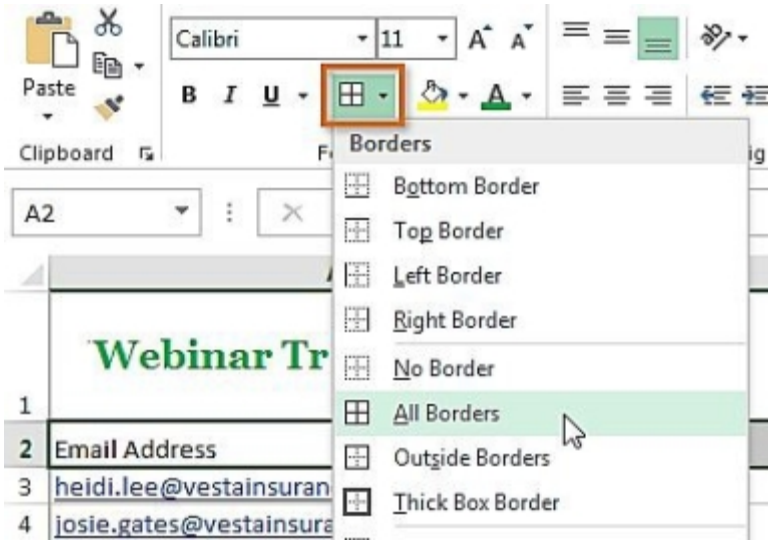
COLORS AND SHADES TO YOUR WORKSHEET

You can add color to your worksheet background or fonts. Select the appropriate color icon under the font menu. The additional color option can also be used to get access to a variety of colors.

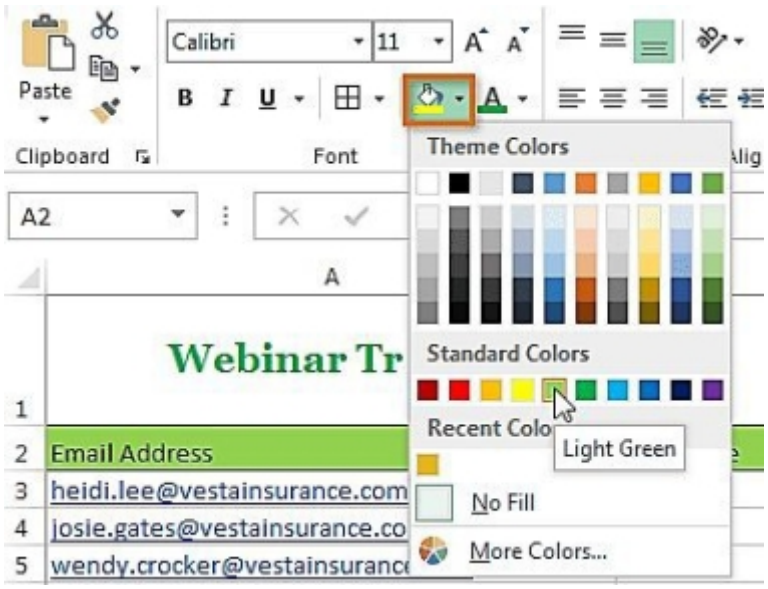


INSERTING BORDERS AND LINES IN YOUR WORKSHEET

- Highlight the cells to which the borders or lines would be added



- Select the drop-down menu for borders and select a desired border option from the displayed list. You can add colors to borders by selecting the added border and then clicking on the icon for **Fill.**


Calibri
11
Paste
Clipboard
Font
Theme Colors
Standard Colors
Recent Colo
Light Green
No Fill
More Colors...
A2
A
Webinar Tr
Email Address
heidi.lee@vestainsurance.com
josie.gates@vestainsurance.co
wendy.crocker@vestainsuranc

IMPLEMENTING CONDITIONAL FORMATTING IN WORKSHEETS

Defining the Conditional Formatting to be Applied

- First, highlight the ranges of the cell to which the rule will be applied

- Select the menu for **Conditional Formatting** in the **Home** tab

- Select any rule as suitable for your data

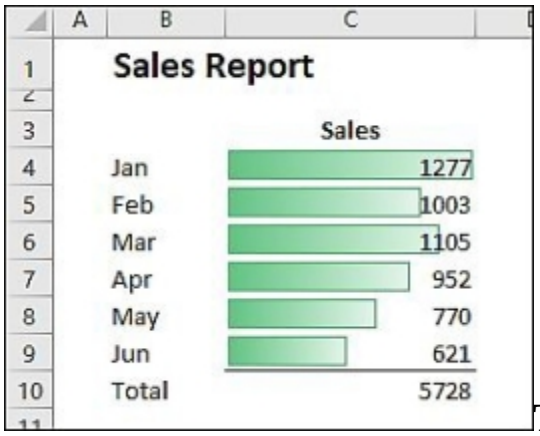
Implementing the Conditional Formatting Rule for Graphics The Data Bars

- Highlight the cells where the formatting rule will be applied.

Ensure not to highlight cells for summing operation.

- Navigate to the **Conditional Formatting** menu and select the option for **Data Bars**

- Select the desired fill for your bar



The Scales for Color

- Highlight the cells where the formatting rule will be applied

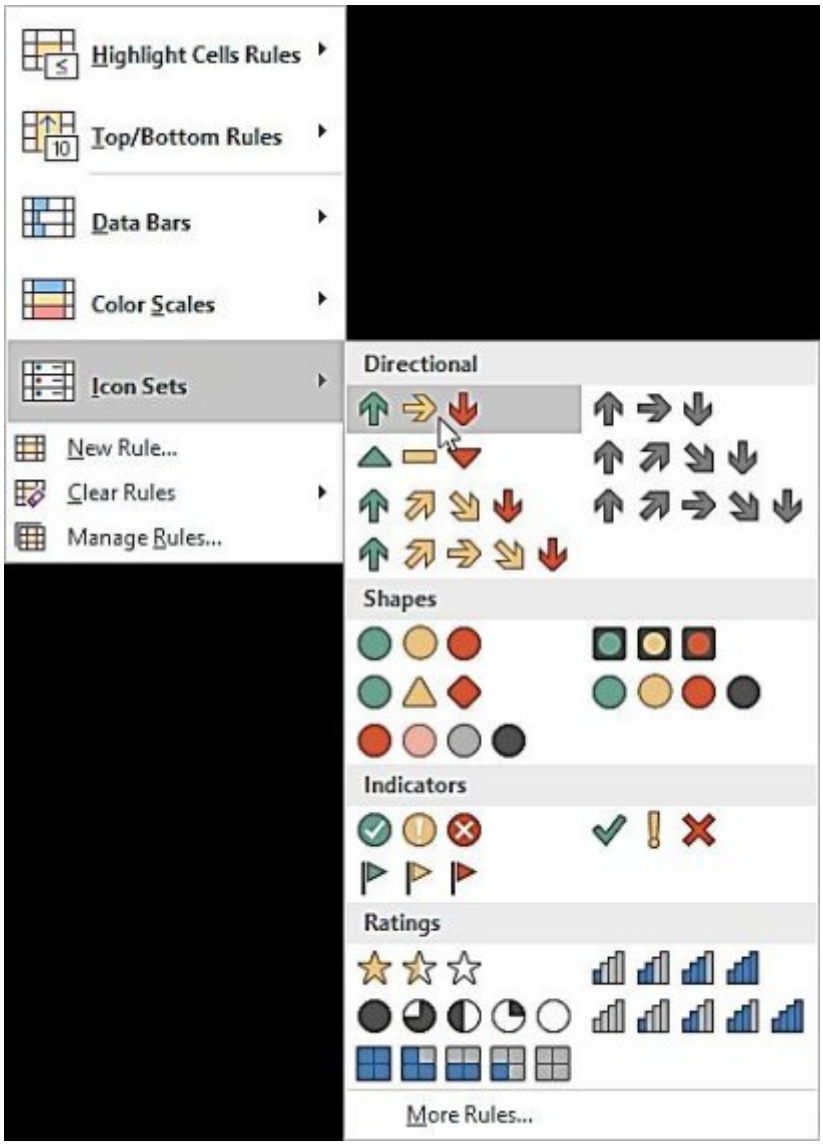
- Navigate to the **Conditional Formatting** menu and select the option for scales for color

- Select the desired fill for your scale

The Sets of Icon

- Highlight the cells where the formatting rule will be applied

- Navigate to the **Conditional Formatting** menu and select the option for scales for color



- Select the desired icon for your data

DEFINING FORMULA FORMATTING RULES Formulas can be defined for conditional formatting by selecting the **New Rule** option in the **Conditional Formatting** menu. **Relative and Absolute Cell References**

- **Relative:** This method of referencing cells causes a change in the formatting with reference to the location of the row or column. It is defined without the dollar sign, e.g.: B1.
- **Absolute:** This method of referencing cells does not cause a change in the cell formatting with reference to the location of the row or column. It is defined with the dollar sign, e.g.: $B1.

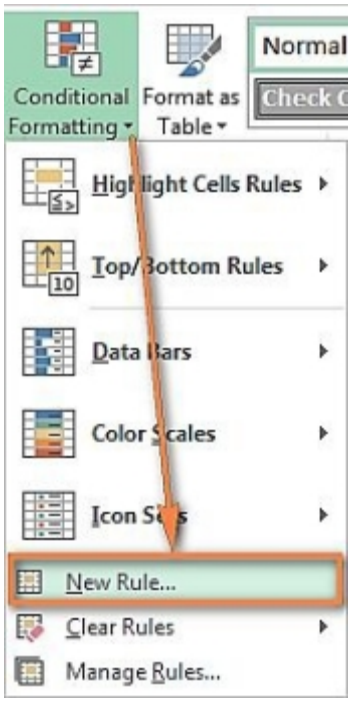
EXAMPLES OF FORMULAS IN CONDITIONAL FORMATTING

Formula to Select Weekends

• Highlight the cells where the formatting rule will be applied, usually a date data

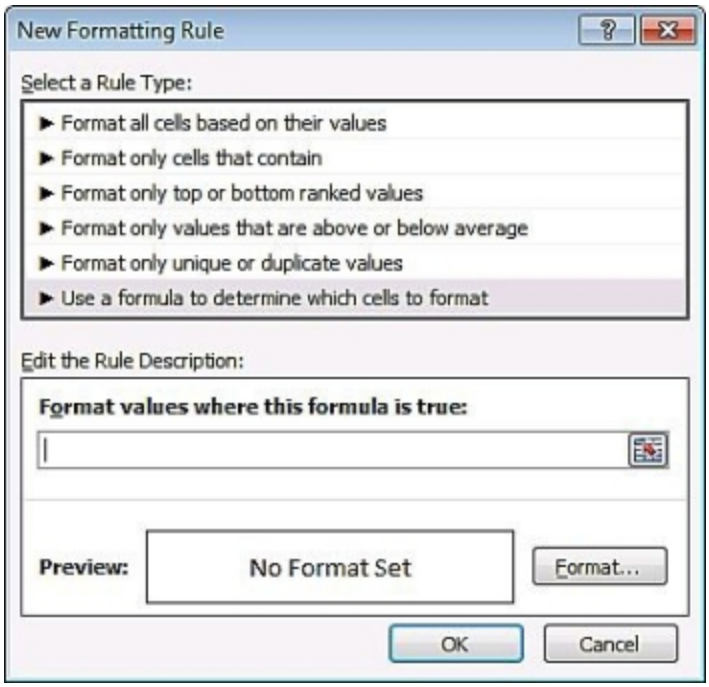
• Navigate to the **New Rule** option in the **Conditional Formatting**

menu



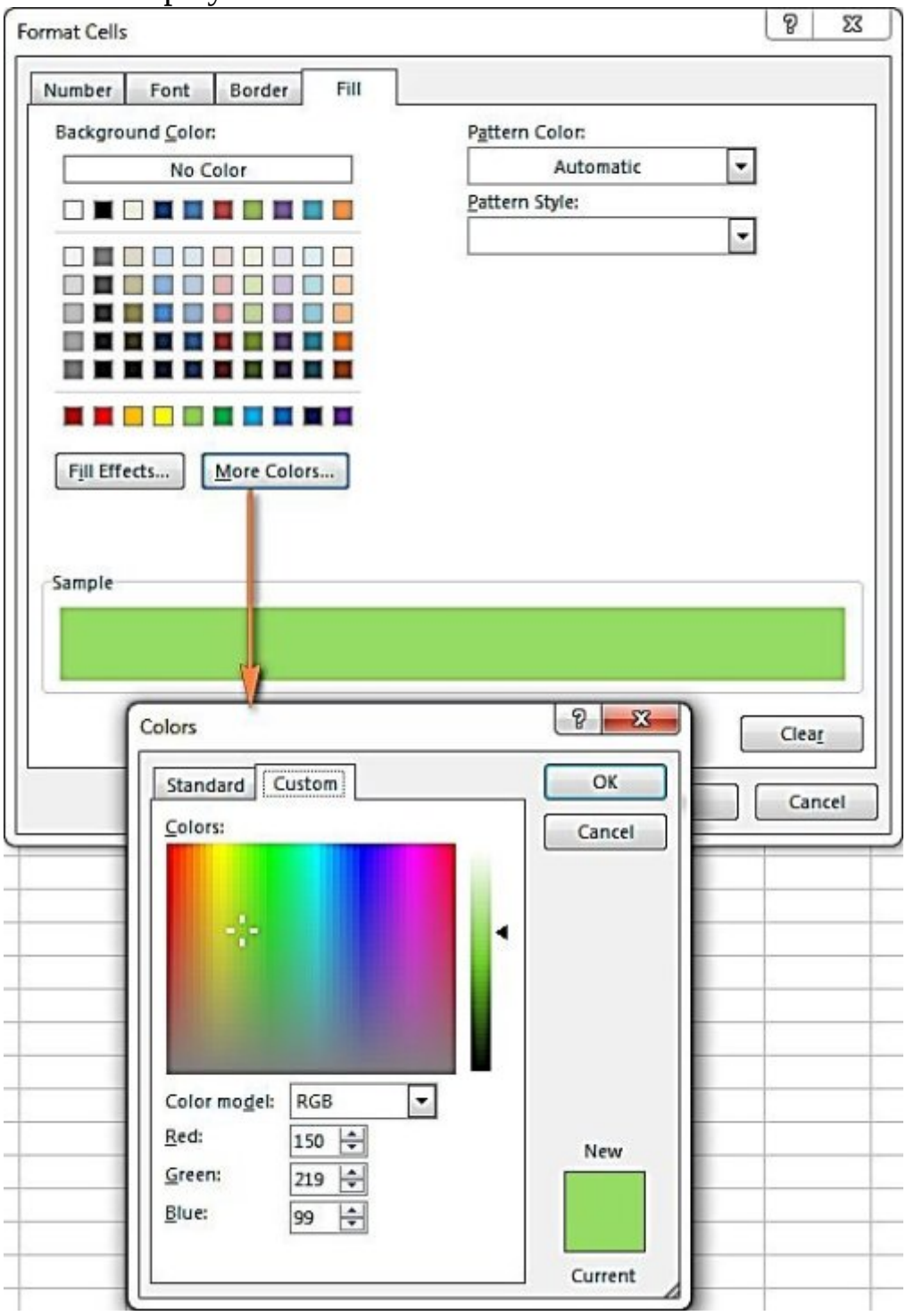
• In the resulting dialogue box, select the option to implement formulas for cell formatting

• Type in this formula with respect to the cell ranges highlighted:

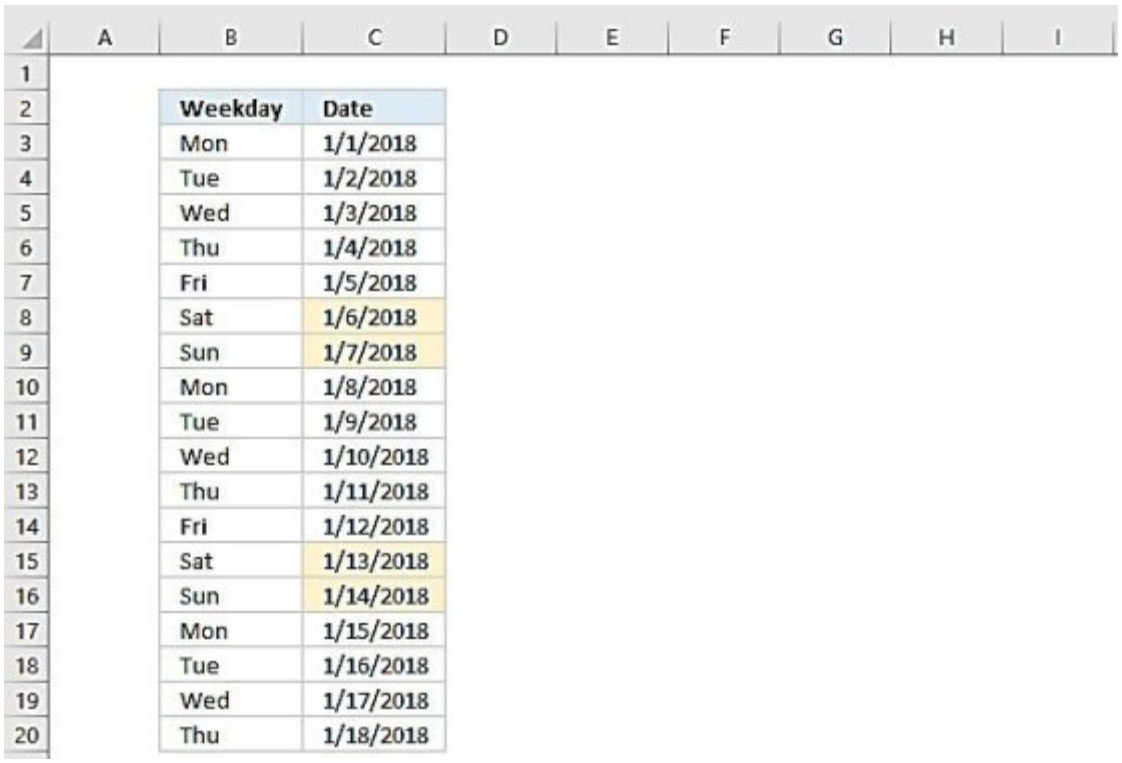


=WEEKDAY(C3,2)>5

• Select the **Format** option and configure how the formatting results would be displayed



• Select **OK** when done



	A	B	C	D	E	F	G	H	I
1									
2		Weekday	Date						
3		Mon	1/1/2018						
4		Tue	1/2/2018						
5		Wed	1/3/2018						
6		Thu	1/4/2018						
7		Fri	1/5/2018						
8		Sat	1/6/2018						
9		Sun	1/7/2018						
10		Mon	1/8/2018						
11		Tue	1/9/2018						
12		Wed	1/10/2018						
13		Thu	1/11/2018						
14		Fri	1/12/2018						
15		Sat	1/13/2018						
16		Sun	1/14/2018						
17		Mon	1/15/2018						
18		Tue	1/16/2018						
19		Wed	1/17/2018						
20		Thu	1/18/2018						

Selecting Rows Depending on Values

- Select the option to implement formulas for cell formatting in the

New Rule dialogue box

- Type in this formula with respect to the cell ranges highlighted:

=$C2=“Bob”

- Select the **Format** option and configure how the formatting results would be displayed

- Select OK when done

	A	B	C	D	E	F
1	Date	Item	Sales Rep	Quantity	Price	Commission
2	01-07-2018	Projector	Bob	13	150	11%
3	01-07-2018	White Board	Mark	8	40	9%
4	02-07-2018	White Board	Stacey	7	40	7%
5	03-07-2018	White Board	Mark	18	40	8%
6	05-07-2018	Office Chair	Stacey	19	230	6%
7	05-07-2018	Projector	John	4	150	10%
8	08-07-2018	Printer	Bob	9	80	6%
9	10-07-2018	Printer	Laura	16	80	2%
10	10-07-2018	Office Chair	Mark	15	230	9%
11	10-07-2018	Diary	Bob	15	16	1%
12	10-07-2018	Office Chair	John	7	230	2%
13	13-07-2018	Diary	Laura	23	16	11%
14	17-07-2018	White Board	Bob	20	40	5%
15	17-07-2018	Office Chair	Mark	9	230	3%
16	20-07-2018	White Board	Stacey	23	40	6%
17	20-07-2018	White Board	Stacey	4	40	5%

Using Shading for Alternate-rows

- Select the option to implement formulas for cell formatting in the

New Rule dialogue box

- Type in this formula with respect to the cell ranges highlighted:

=MOD(ROW(),2)

- Select the **Format** option and configure how the formatting results would be displayed

- Select **OK** when done

	A	B	C	D	E
1	Last Name	Sales	Country	Quarter	
2	Smith	$16,753.00	UK	Qtr 3	
3	Johnson	$14,808.00	USA	Qtr 4	
4	Williams	$10,644.00	UK	Qtr 2	
5	Jones	$1,390.00	USA	Qtr 3	
6	Brown	$4,865.00	USA	Qtr 4	
7	Williams	$12,438.00	UK	Qtr 1	
8	Johnson	$9,339.00	UK	Qtr 2	
9	Smith	$18,919.00	USA	Qtr 3	
10	Jones	$9,213.00	USA	Qtr 4	
11	Jones	$7,433.00	UK	Qtr 1	
12	Brown	$3,255.00	USA	Qtr 2	
13	Williams	$14,867.00	USA	Qtr 3	
14	Williams	$19,302.00	UK	Qtr 4	
15	Smith	$9,698.00	USA	Qtr 1	
16					

Inserting Shading for Checkerboards

- Select the option to implement formulas for cell formatting in the

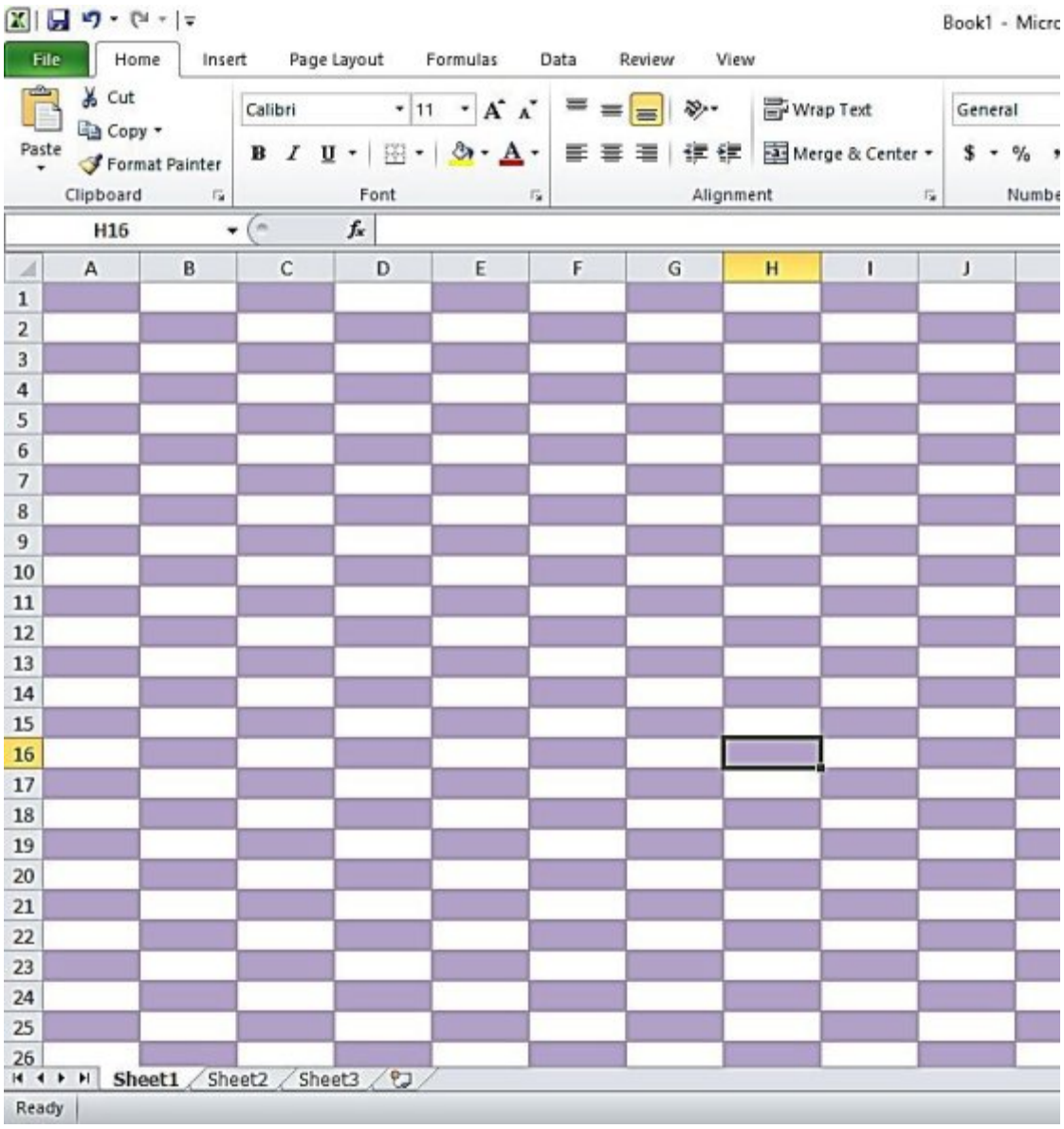
New Rule dialogue box

- Type in this formula with respect to the cell ranges highlighted:

=OR(AND(ISEVEN(ROW(A1)),ISEVEN(COLUMN(A1))),AND(ISODD(ROW(A1)),ISODD(COLUMN(A1))))

- Select the **Format** option and configure how the formatting results would be displayed

- Select OK when done



Formatting a Set of Rows to be Shaded

• After entering your data, you will have to include a cell to denote odd and even cells to form groups

• Select the option to implement formulas for cell formatting in the

New Rule dialogue box

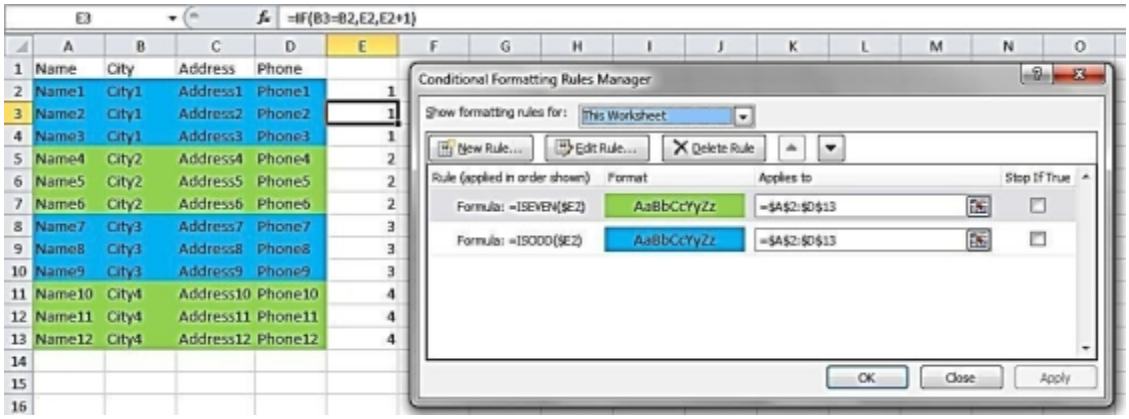
• Click on Ok and enter this formula in the respective box

=ISEVEN($E2)

=ISODD($E2)

- Select **OK**

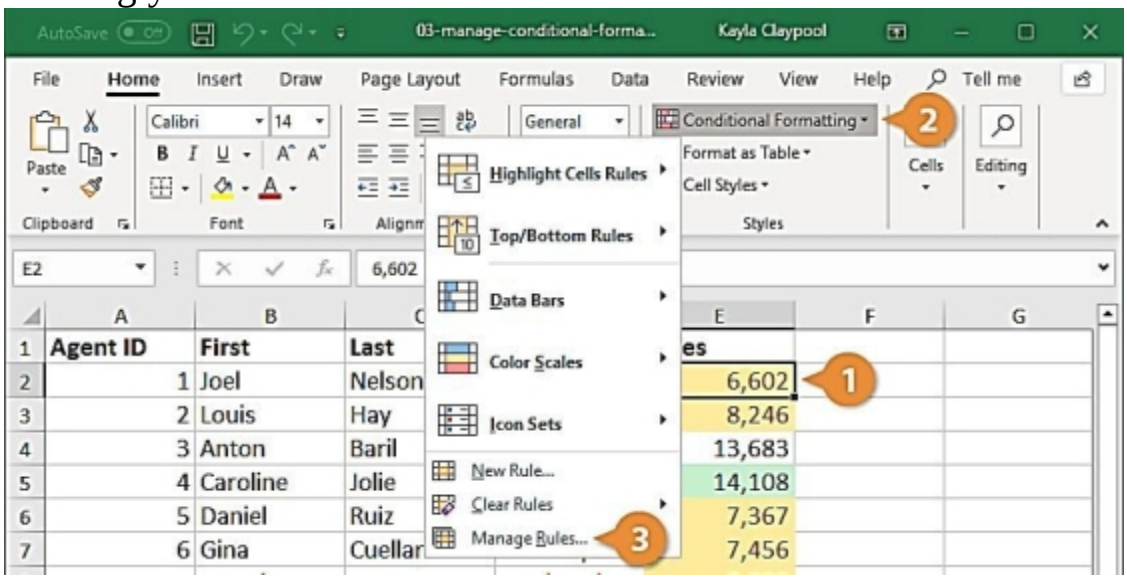
These formulas are to be entered one at a time.



	A	B	C	D	E
1	Name	City	Address	Phone	
2	Name1	City1	Address1	Phone1	1
3	Name2	City1	Address2	Phone2	1
4	Name3	City1	Address3	Phone3	1
5	Name4	City2	Address4	Phone4	2
6	Name5	City2	Address5	Phone5	2
7	Name6	City2	Address6	Phone6	2
8	Name7	City3	Address7	Phone7	3
9	Name8	City3	Address8	Phone8	3
10	Name9	City3	Address9	Phone9	3
11	Name10	City4	Address10	Phone10	4
12	Name11	City4	Address11	Phone11	4
13	Name12	City4	Address12	Phone12	4
14					
15					
16					

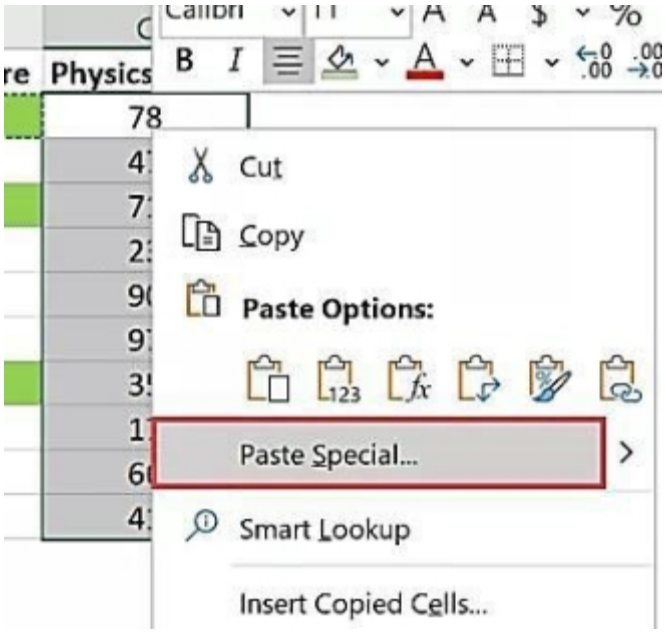
MANAGEMENT OF RULES FOR CONDITIONAL FORMATTING

Navigate to the option to manage your formatting rules in the **Configuration Formatting** menu. Select the rules to be managed and save accordingly.



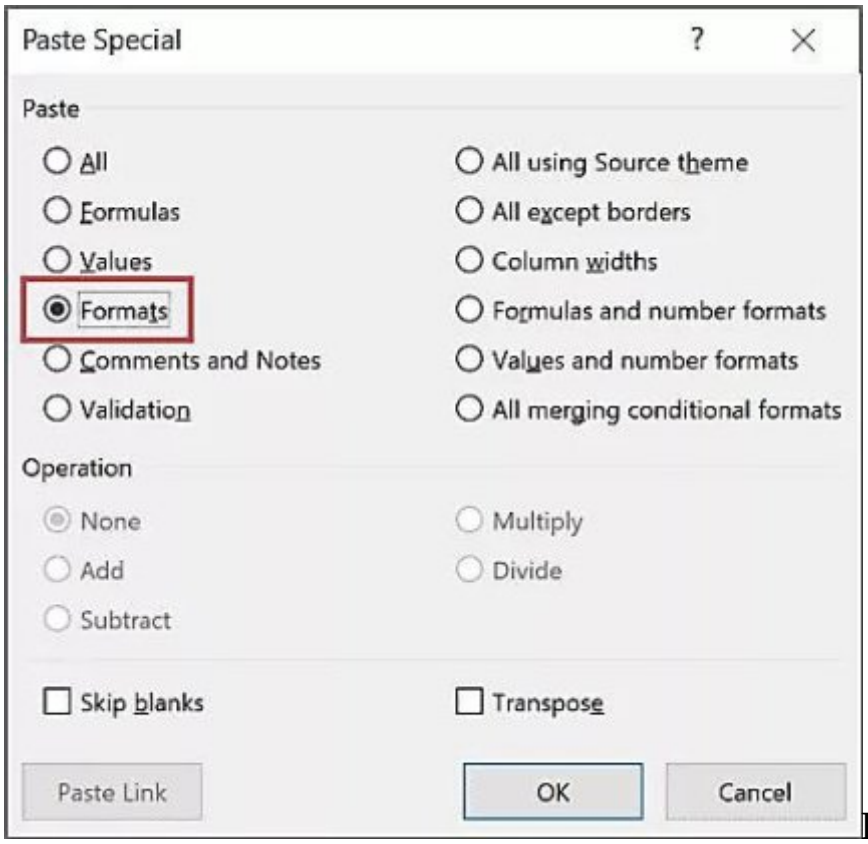
Pasting and Copying of Cells with Rules for Conditional Formatting

- Highlight and copy formatted cells, then select the option to paste the data in a special form



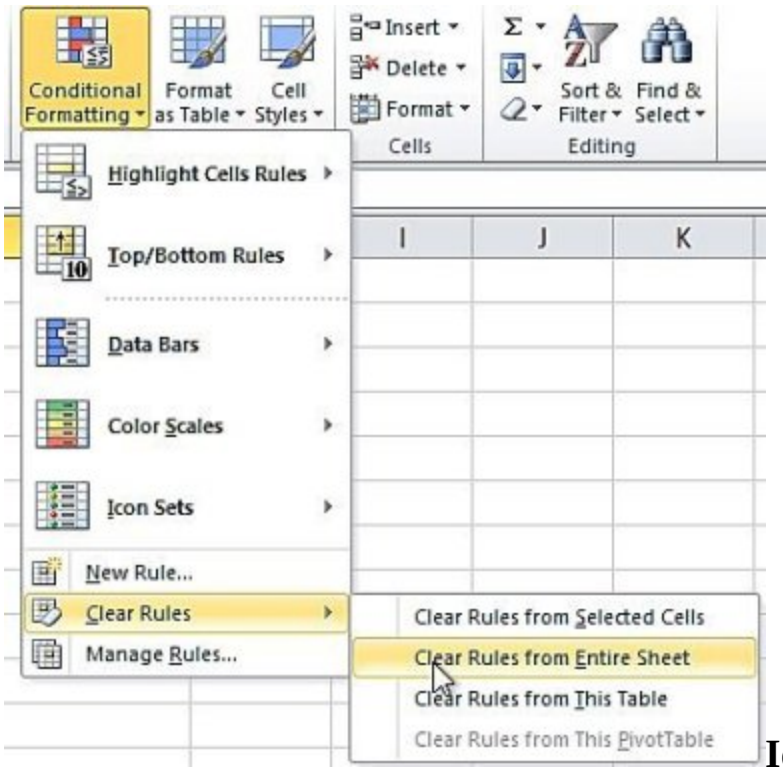
- Select the **Formats** option in the resulting dialogue box and select

OK



Erasing Conditional Formatting Rules

Navigate to the formatting rules manager and select the rule to be deleted. You can also use the option for clearing rules in the **Conditional Formatting** menu.



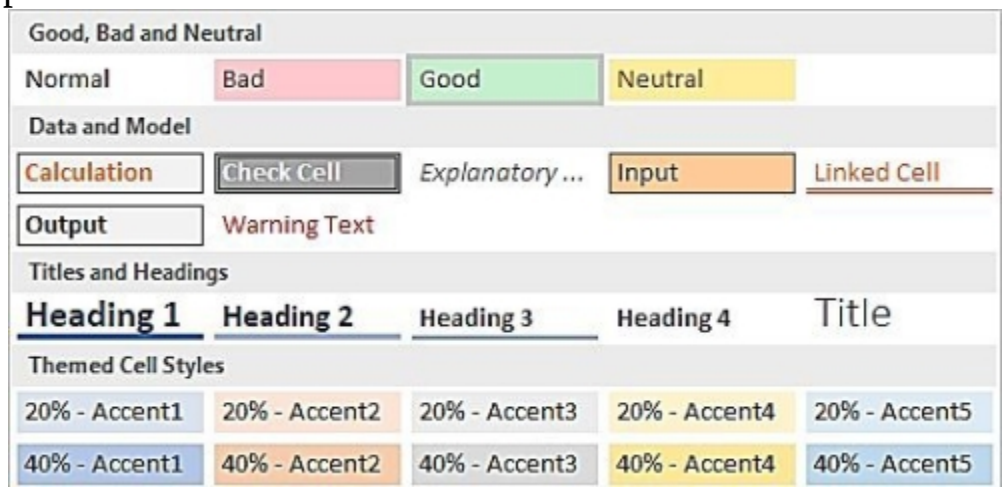
Identifying Cells Having Rules for Conditional Formatting

- Select any cell in your worksheet. You can also select a cell having a particular formatting rule to find that particular rule
- Navigate to the **Go To** option in the **Find** tab which can be found in the **Edit** menu
- Select **Special** and then choose the option for **Conditional formats**

APPLYING DEFINED STYLES FOR FORMATTING

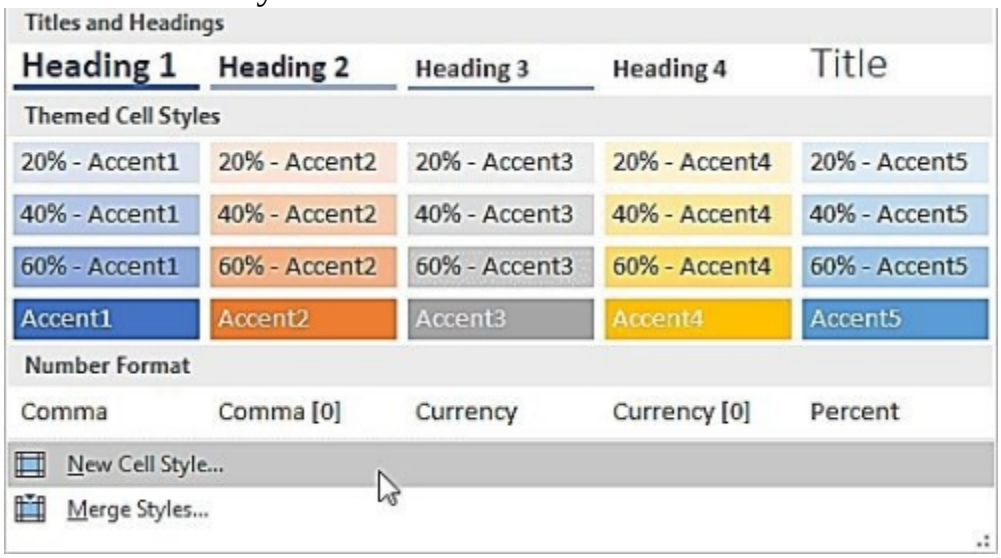
Applying the Styles

Styles for cells can be selected and applied from the group for styles in the ribbon menu. Clicking the drop-down menu icon shows additional style options.

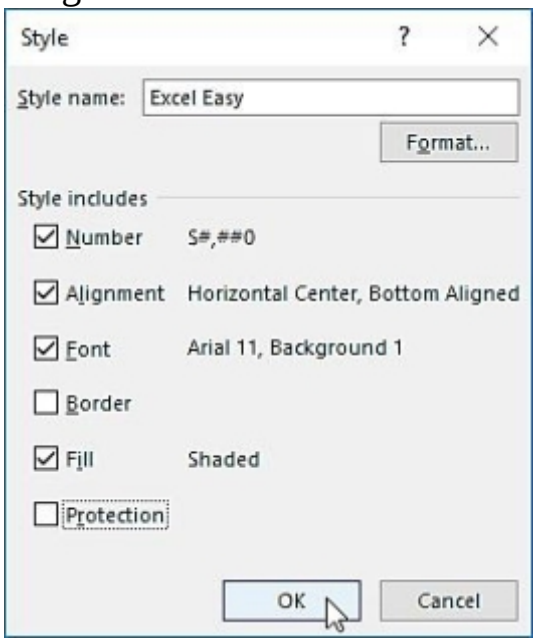


Configuring Custom Cell Styles

• In the drop-down menu for additional style options, select the option to create a new style



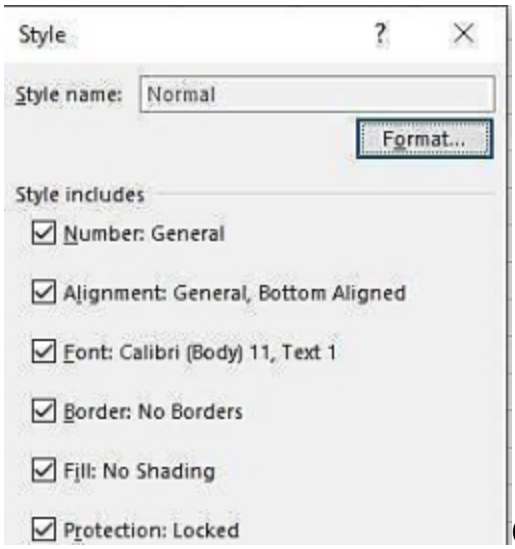
• Supply a name for the new style and set other necessary configurations



• Select **OK** when done

Changing a Style's Configuration

Make a right-click on the style to be modified and select the appropriate option

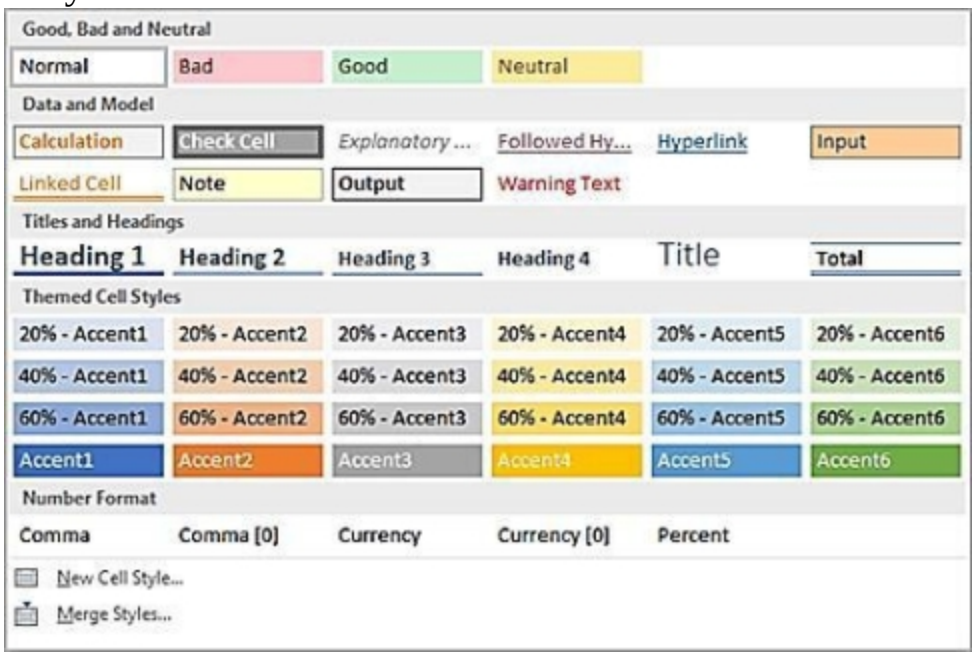


Combining Styles from Various Workbooks

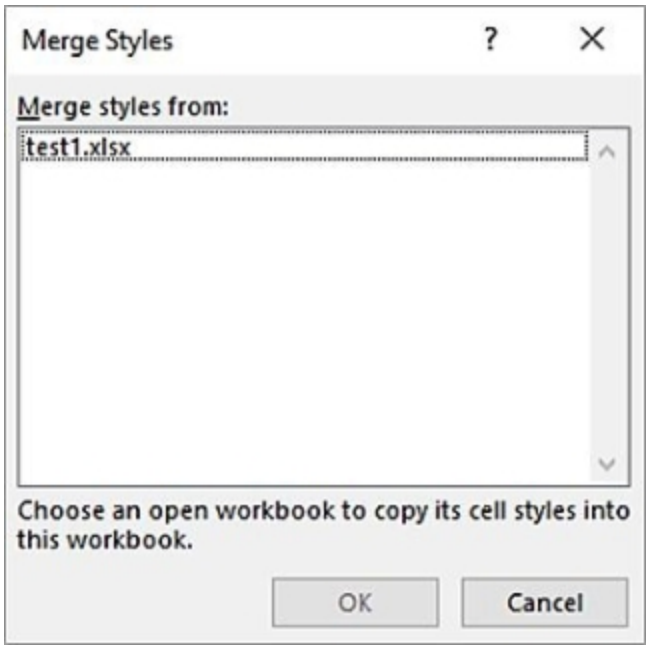
- First, keep the specific workbook having the desired cell styles opened

- Go to the workbook where these styles would be pasted or merged

- Select the drop-down menu for styles and click on the option to merge the styles



- Select the appropriate workbook for the styles in the resulting dialogue box



- Select **OK**

Using Templates for Managing Cell Styles

Worksheet templates or themes determine how cell styles appear on your worksheet. It is therefore of good practice to first apply your worksheet template before using cell styles.

WORKING WITH THEMES FOR YOUR WORKBOOK

Employing Themes in your Worksheets

Navigate to the tab for **Page Layout** and select the option for **Themes** or **Colors**

Creating Your Customized Theme Colors

- Select the option for you to configure colors in the Colors menu

- Select your desired colors and click on **Save**

Summary

Formatting your worksheet helps you to create simultaneous customized editing. You can determine specific cells to be highlighted based on formulas or any criteria, even how the highlights appear can be configured with the Conditional Formatting feature. This chapter explained how you can do these, along with defined cell styles and worksheet themes. How styles in multiple workbooks can be merged to further create an appealing worksheet was discussed and how you can accurately copy cells having formatting rules with the special pasting feature.

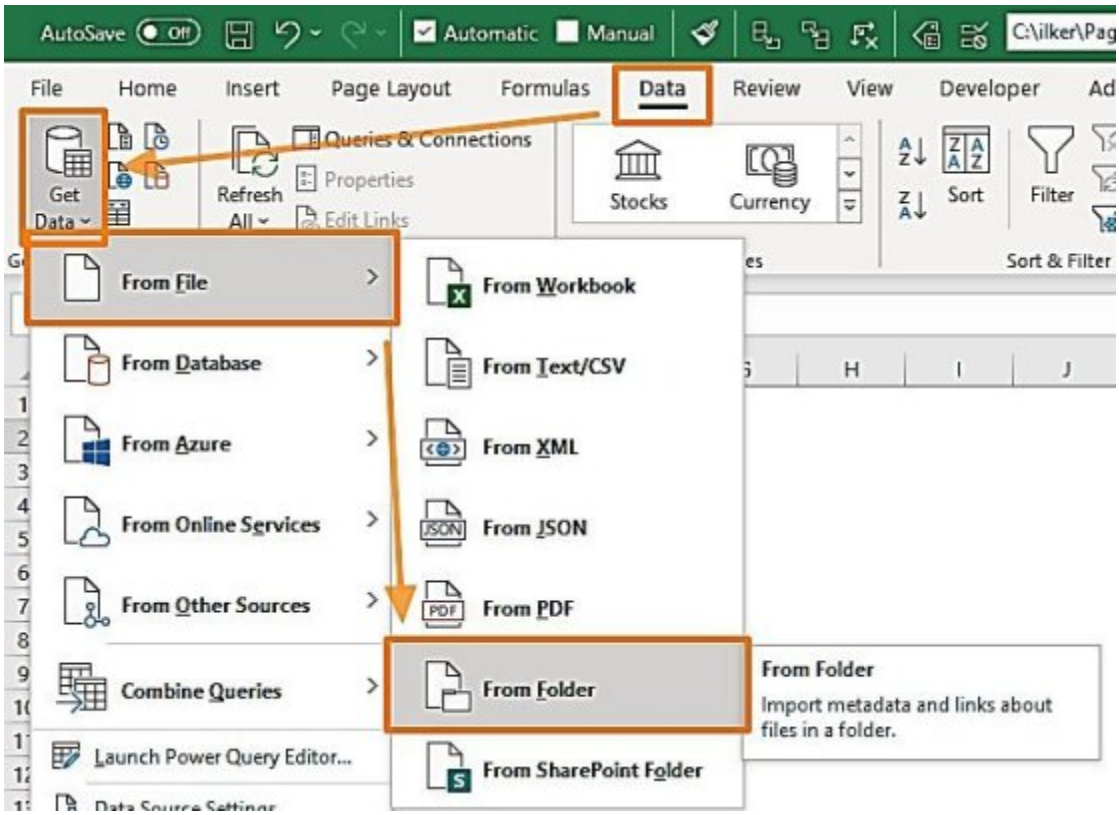
CHAPTER 8 - FILES AND TEMPLATES IN EXCEL

OPENING NEW WORKBOOKS Use the **File** menu and select **New.** Keyboard key **Ctrl + N** can also be used for opening new workbooks.

OPENING A SAVED WORKBOOK

Use the **File** menu and select **Open.** This opens a window where you can select saved workbooks from your File Manager. Keyboard keys **Ctrl + O** also open this window.

Filtering Name of Files This process can be done using Power Query. The Power Query can be accessed on the **Data** tab.



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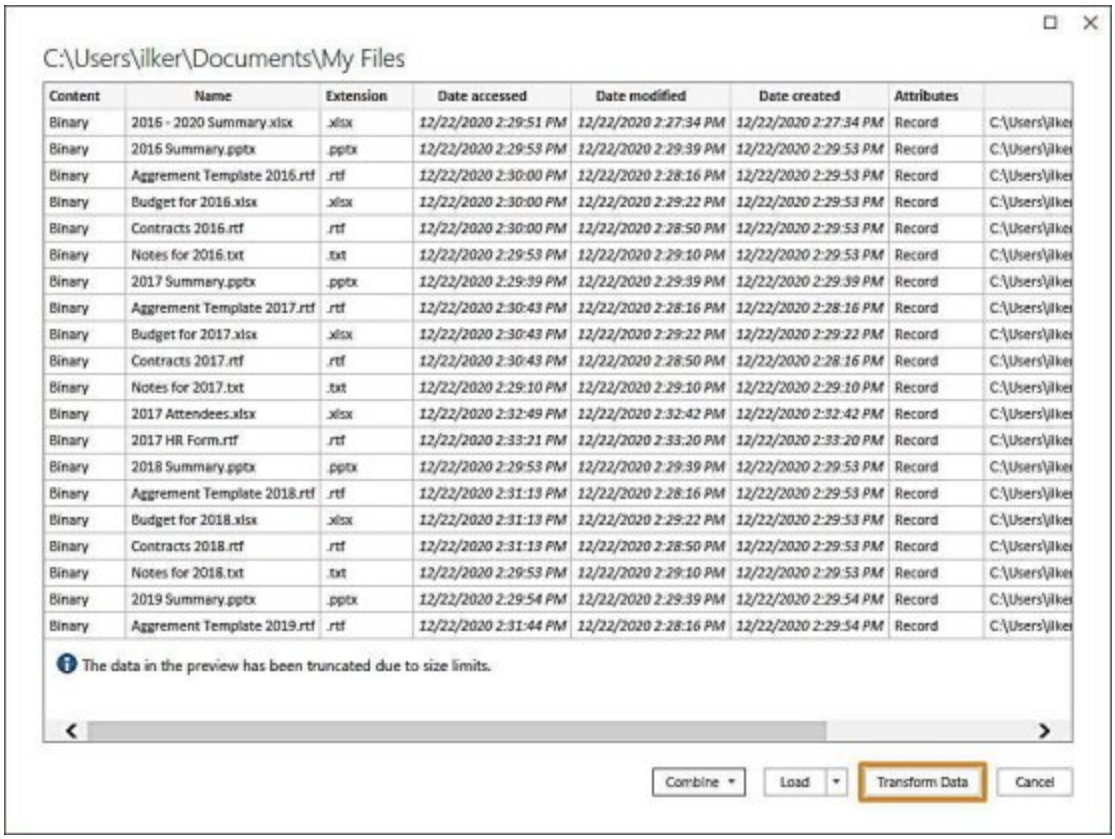
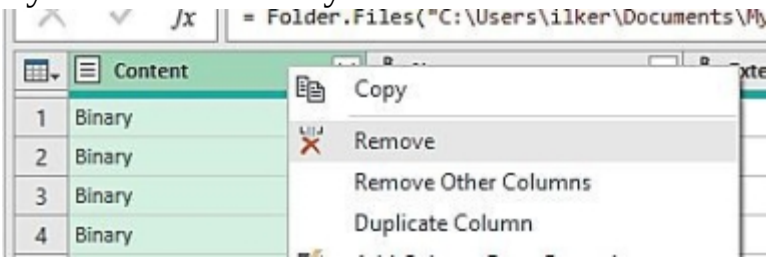
Enter the file path of your folder or use the **Browse** button

• Using the window for previewing files, you can select the **Load**

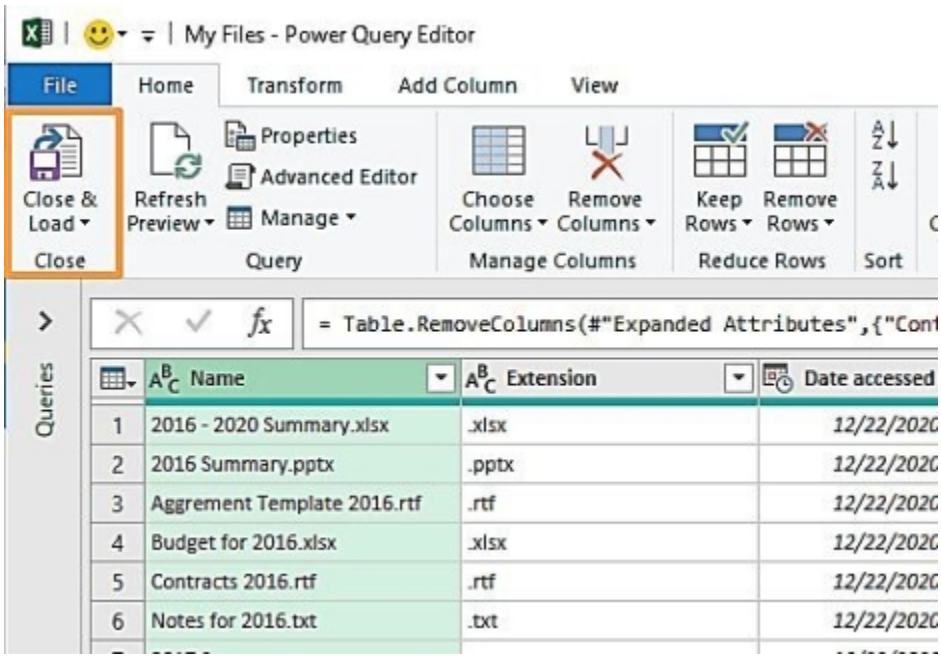
option to view more file results in your workbook



• Use the option for transforming data to delete or modify them before they are inserted into your worksheet



• When you’re done with necessary modifications in the Power Query window, select the close button on the ribbon menu.



Selecting Which Files are Displayed

- Navigate to the **Open** pane in the **File** menu to view the list of files opened recently
- Select the file you would like to always be on display and right- click on it
- Select the option to pin the file from the menu that appears Pinned Files can also be removed by right-clicking in the file to be removed and selecting the option to remove them

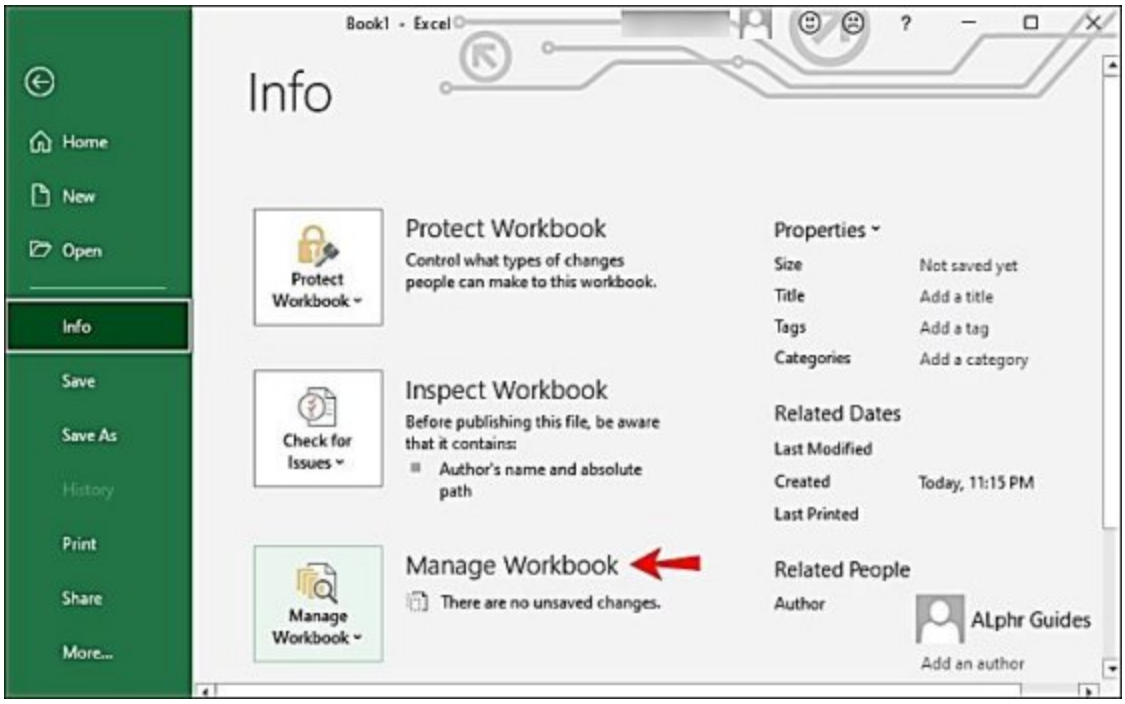
IMPLEMENTING AUTO-RECOVERY

Recovering Current Workbook Versions

•

Navigate to the **File** menu and click on **Info** from the left menu
- Select the option for managing the workbook and select the

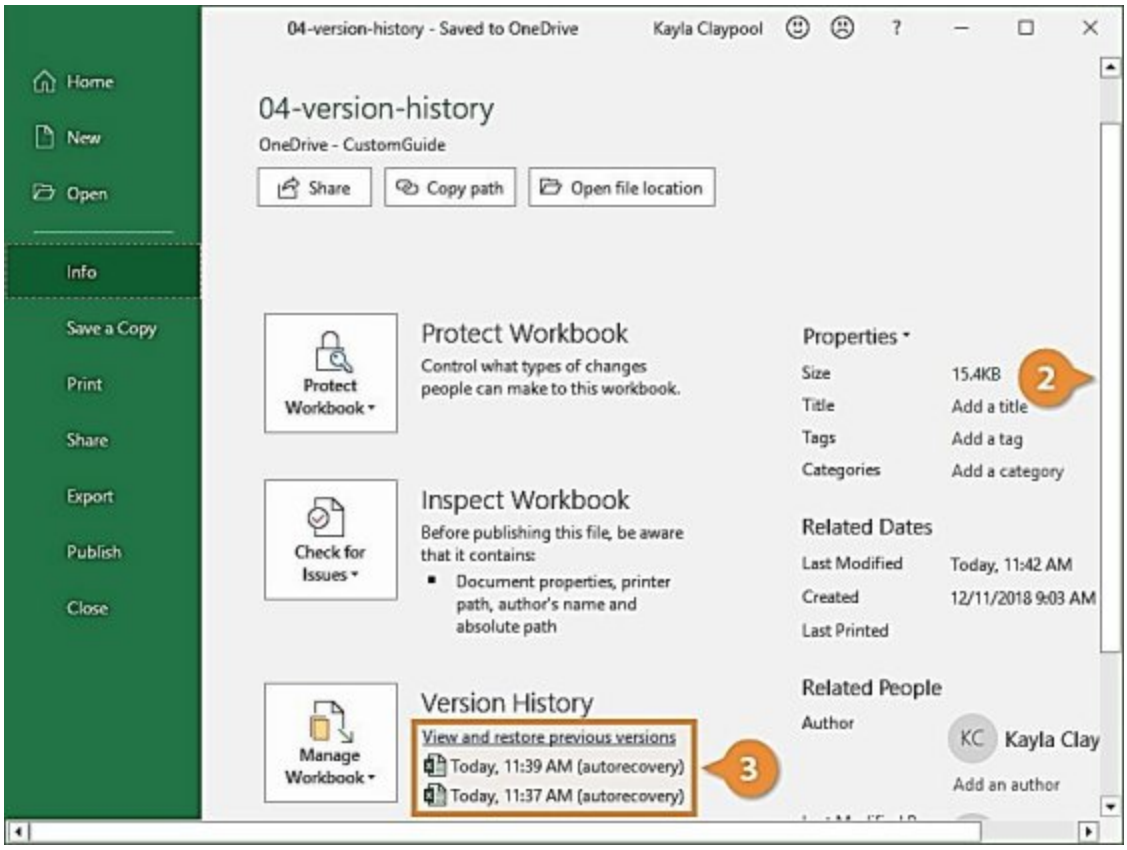
Restore option, or rather select **Compare.**



Recovering Unsaved Workbook Instances

- Navigate to the **File** menu and click on **Info** from the left menu

- Select a version of the autosaved workbook from the **Version History** tab

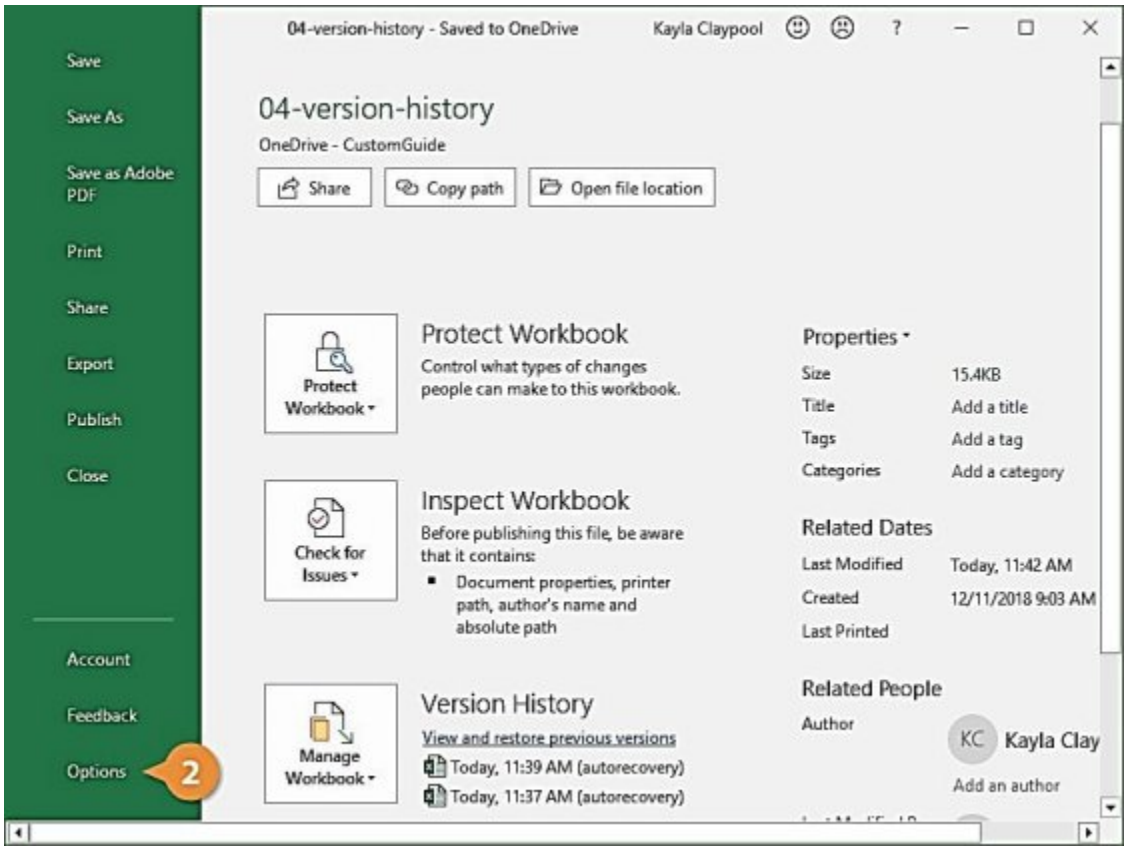


The tab for managing workbooks can also be used to view unsaved

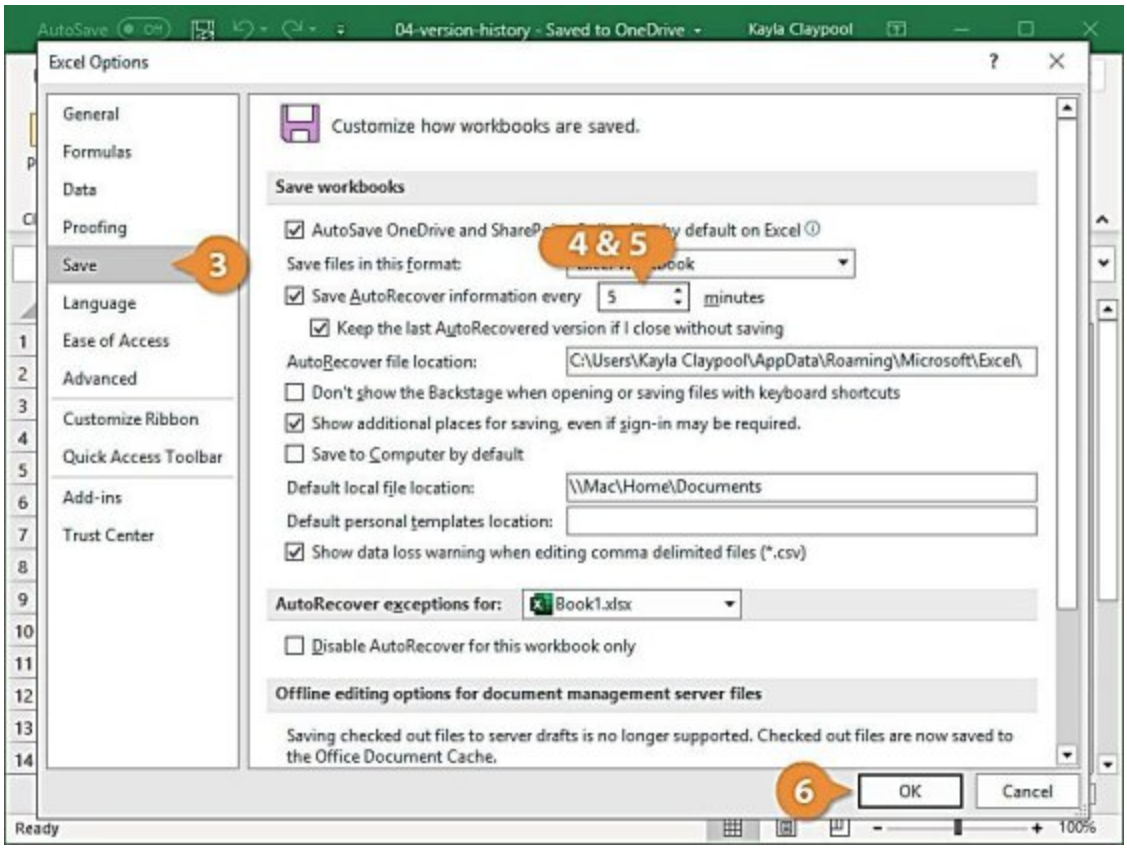
versions of the workbook

Customizing the Auto Recovery Feature

- Go to the **Options** tab in the **File** menu and select the **Save** option



- Select the **Minutes** section to define time intervals within which Excel AutoSaves your workbook


AutoSave
04-version-history - Saved to OneDrive
Kayla Claypool
Excel Options
General
Formulas
Data
Proofing
Save
Language
Ease of Access
Advanced
Customize Ribbon
Quick Access Toolbar
Add-ins
Trust Center
3
Customize how workbooks are saved.
Save workbooks
AutoSave OneDrive and SharePoint Online files by default on Excel
Save files in this format:
4 & 5
Save AutoRecover information every
5
minutes
Keep the last AutoRecovered version if I close without saving
AutoRecover file location:
C:\Users\Kayla Claypool\AppData\Roaming\Microsoft\Excel\
Don't show the Backstage when opening or saving files with keyboard shortcuts
Show additional places for saving, even if sign-in may be required.
Save to Computer by default
Default local file location:
\\Mac\Home\Documents
Default personal templates location:
Show data loss warning when editing comma delimited files (*.csv)
AutoRecover exceptions for:
Book1.xlsx
Disable AutoRecover for this workbook only
Offline editing options for document management server files
Saving checked out files to server drafts is no longer supported. Checked out files are now saved to the Office Document Cache.
6
OK
Cancel
Ready
100%

USING PASSWORDS TO SECURE YOUR WORKBOOKS

• Navigate to the **Review** menu and select the option for workbook protection.

- Enter your password, click on **OK**
- Confirm password and select **OK**

ORGANIZING WORKBOOK FILES Several ways exist to group and section your workbooks in Excel, among these are:

- Implement Excel workbook template for easy organization

• Create a worksheet that holds all crucial data of the workbook. This avoids the stress and time it would take to filter or search for these data.

- Implement data sorting

• Include additional sheets in your workbook to prevent bombarding and cramming large data into worksheets. Separate data analysis into different worksheets when necessary.

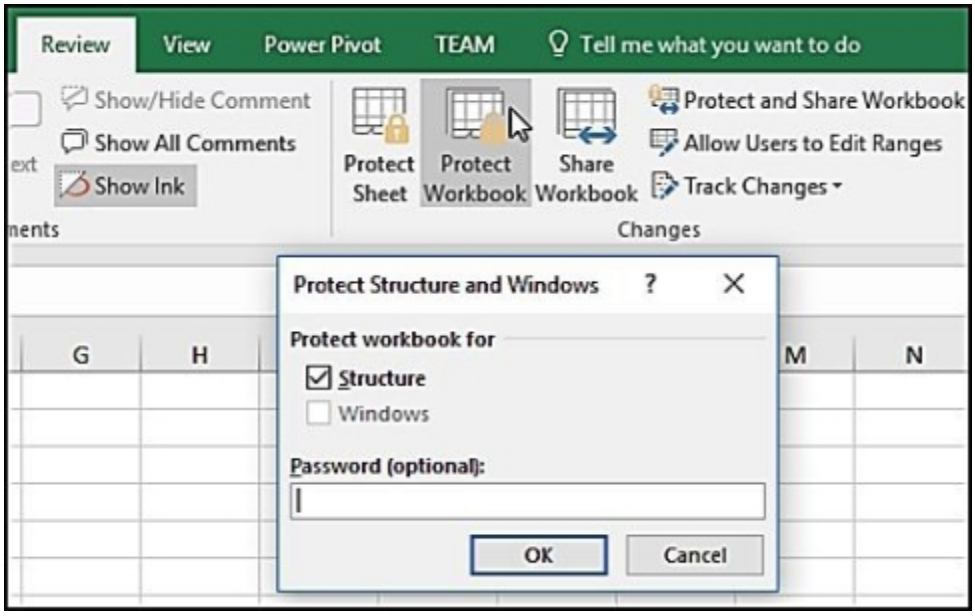
• Additional but unneeded data can be kept hidden and then displayed when called for

• Use hyperlinks for easy navigation in your worksheet when you have a large data

• Employ formula correctly, default functions in Excel can be implemented.

ADDITIONAL INFORMATION WHEN USING WORKBOOKS

Additional Options to Protect Your Workbook

1. 

Protection options for files include:

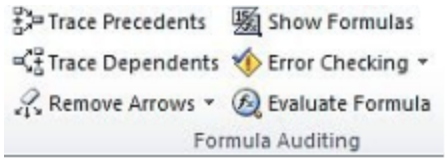
- Encryption of the file to prevent the opening of the file

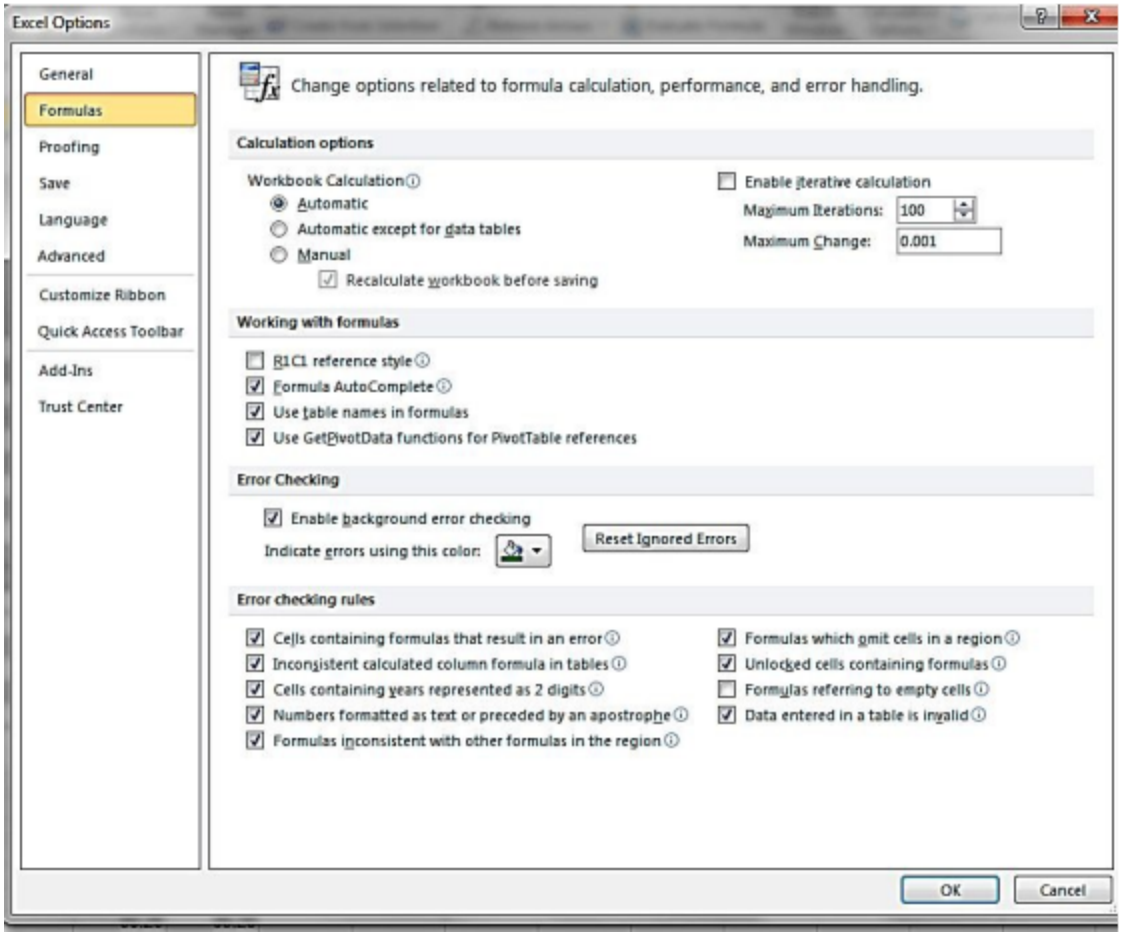
- You can set a password to prevent file modification or access to the file

1. The protection option for the workbook involves restricting access to modify the structure of the workbook by specifying a password.
2. Protection for the worksheet involves limiting what users can modify within the sheet. Worksheets are protected using protection for worksheets.

Looking Up Glitches or Errors

The error checker in Excel can be accessed in the **Formula** menu. This checker enables you to turn on background checking of errors among other aspects. You can also check for workbook issues by using the issues checker tab in the **Info** section under the **File** menu.





Options for Managing Your Workbook

You can switch between worksheets and workbooks by selecting your desired sheet from the sheet menu above the status bar, or using the **File** menu for opening other saved files. Navigation around the worksheet is also possible with keyboard keys or the scroll bar.

Worksheets can also be made hidden, named, added, etc. The application of conditional formatting further helps to customize how your workbook appears.

Workbook Appearance in Browsers

Navigating to the options for view in browsers in the **File** menu gives you multiple options for how your workbook would appear in a browser during sharing. Some of the view options include:

•

The gallery display

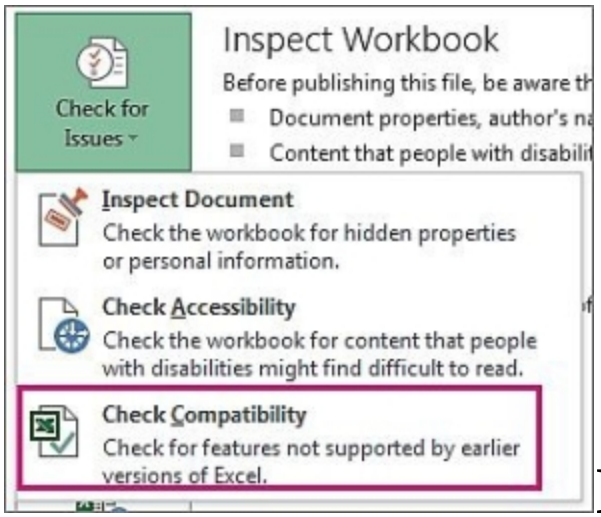
- The workbook display

- The web for Excel display

The Mode for Compatibility Section

The mode for compatibility in Excel ensures that versions of the workbook are retained, especially if the opened file was created with a different Excel version. This mode can be excited by selecting the **Convert** option in the **Option** section under the **File** menu.

You can also run checks on compatibilities by using the issues checker tab in the **Info** section under the **File** menu.



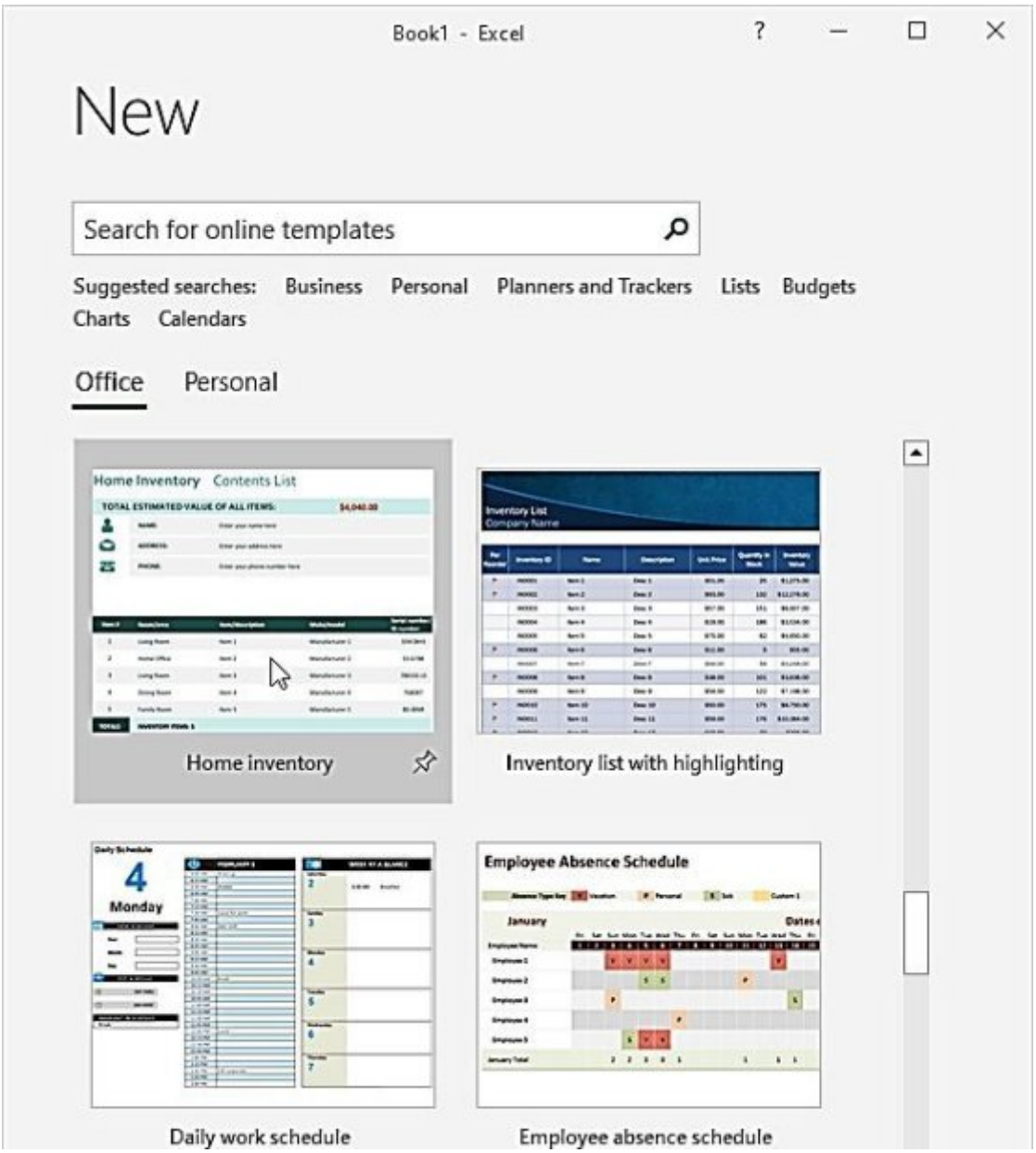
IMPLEMENTING EXCEL TEMPLATES IN YOUR WORKBOOK

Walking Through Templates in Excel

Using default templates in Excel enables you to create consistent and identical files because you are not the one in charge of some basic structures of the worksheet. Excel templates already come with some formatting rules, functions, macros, etc.

Accessing Excel Templates

Selecting the **New** option in the **File** menu takes you to the template gallery. You can also search for a template online. Click on the **Create** button to download and use a template. Excel automatically creates a workbook for you with your selected template.



Editing Excel Templates

- Navigate to **Open** in the **File** menu and select to open your

Documents folder

- Navigate to the folder for **Custom Office Template**
- Select the template you want to modify, make your desired

changes, and then save

MAKING USE OF EXCEL BUILT-IN TEMPLATES Changing

Default Structure of Your Workbook with Excel Templates Inserting templates in your workbooks automatically changes the structure of your worksheet.

Reverting Workbooks to Default Structure Excel can be reverted to its default settings by using the **Trust Centre** option.

- Select **Options** under the **File** menu and select the settings for

Trust Centre

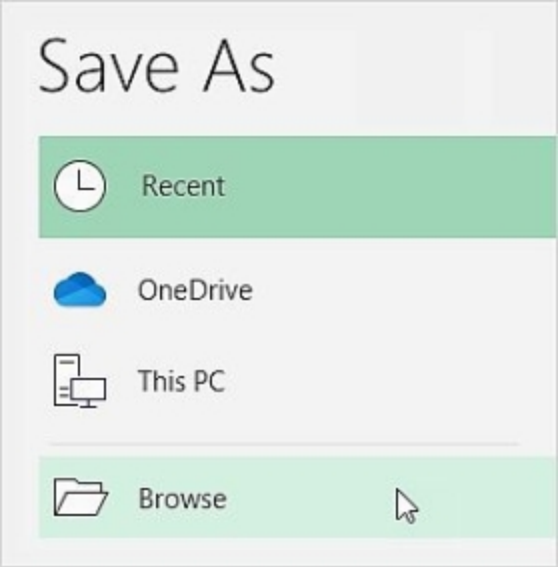
- Select the Add-in option on the left menu and tick the box to disable application add-in

- Select **OK** to save changes

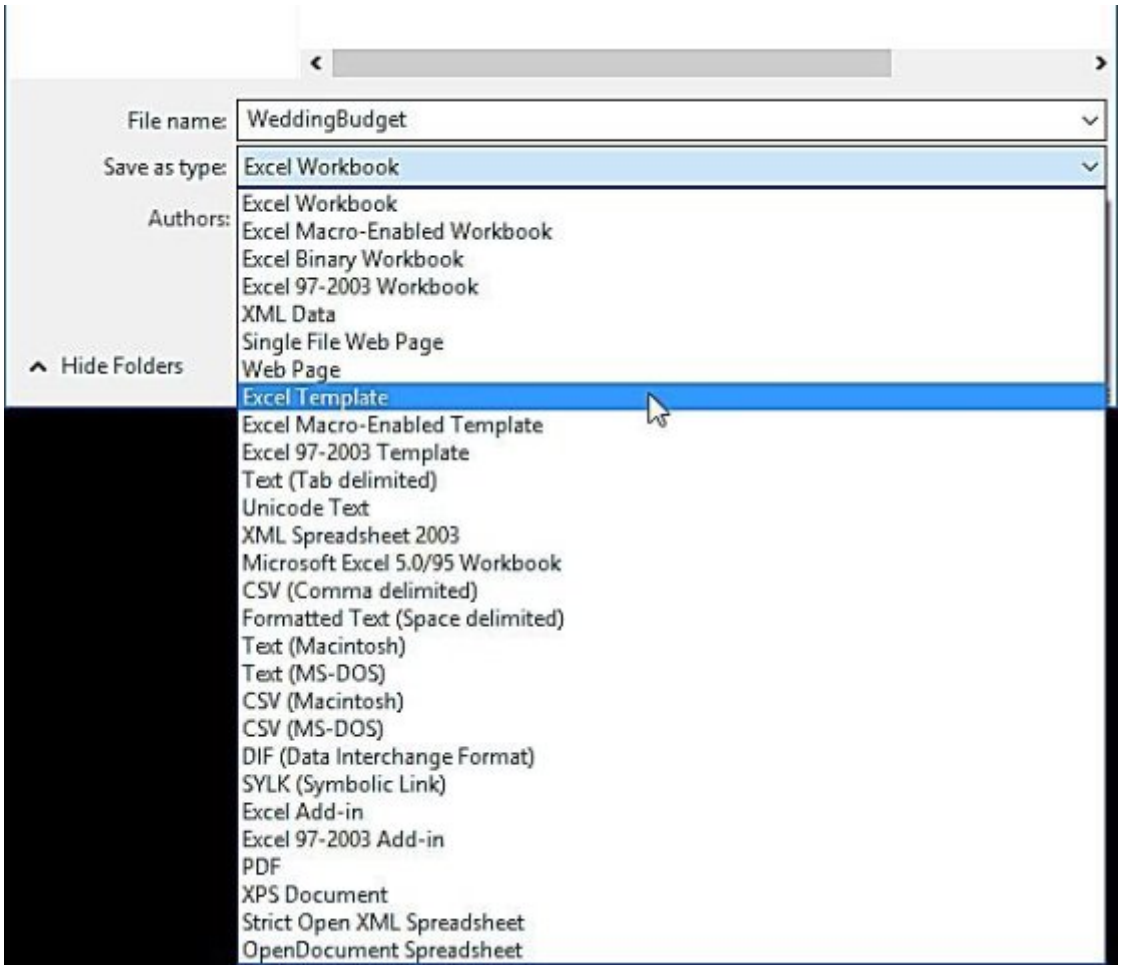
CUSTOMIZING YOUR WORKBOOK TEMPLATES

Designing Your Excel Template

- First, open a new workbook
- Select the **Save As** option in the **File** menu and click on **Browse**

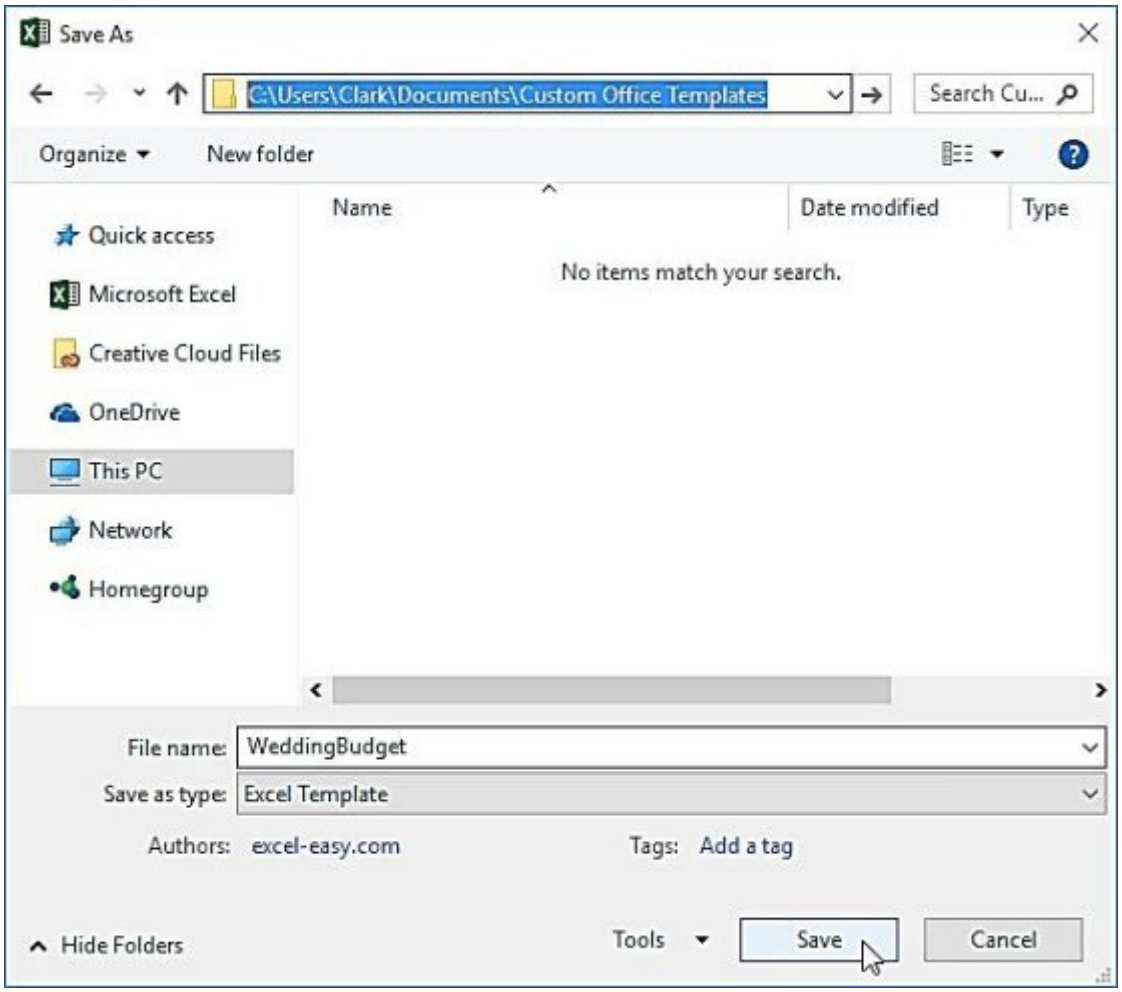


- Enter a name for the template file and choose to save it as an Excel template



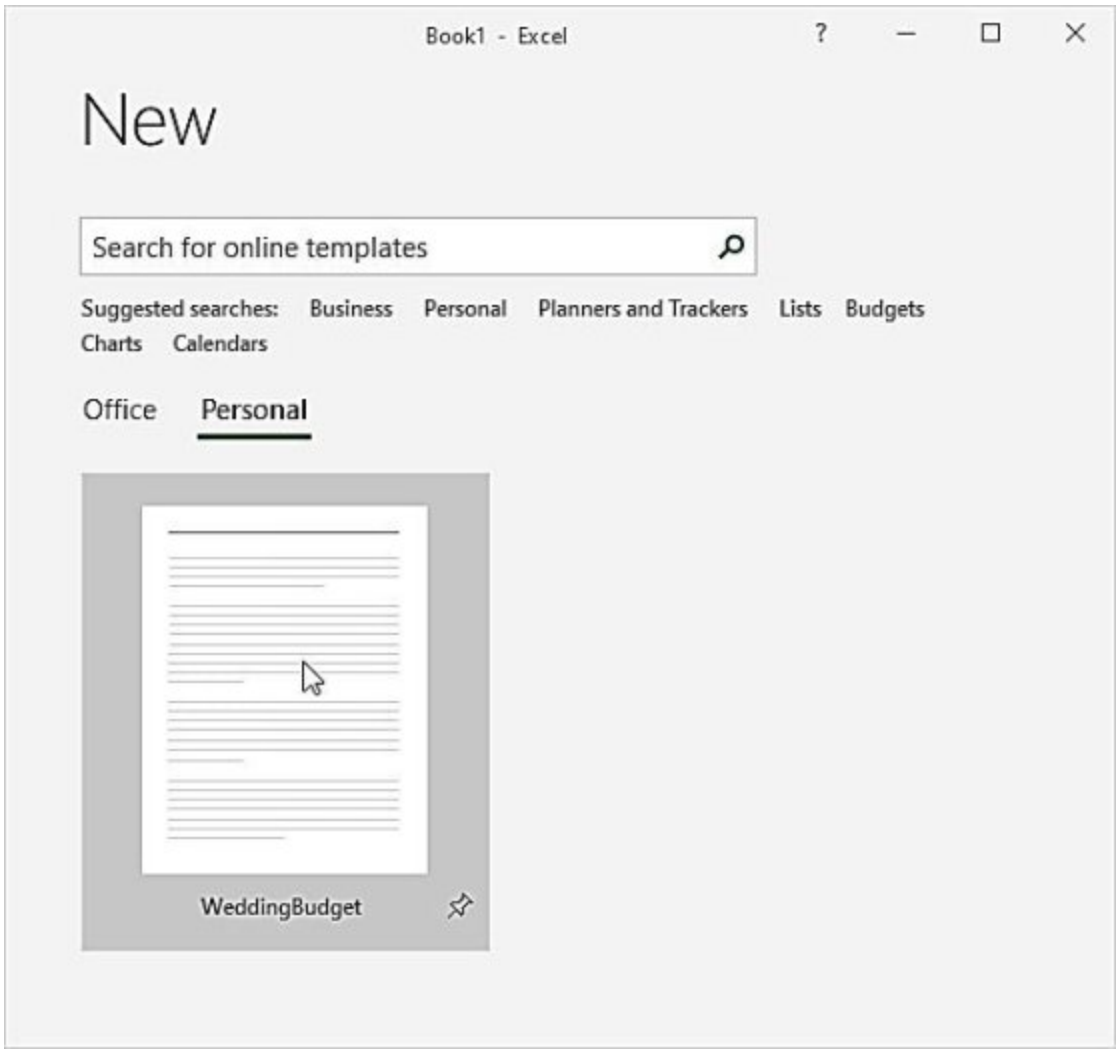
- Click on the **Save** option

Storing Your Created Templates After clicking on Save, you can find the template you created in this file location on your PC: C:\Users\ <username>\Documents\Custom Office Templates



Implementing Your Created Template in a Workbook

- Select to open a new workbook
- Navigate to the **Personal** tab and select the template



Summary

Templates and the management of Excel files were discussed in this chapter. You can set passwords or file encryptions to secure your worksheet or workbook and prevent access and unwanted modifications. Excel templates also allow you to work with already formatted worksheets and cells, you also have the freedom to edit and create your templates.

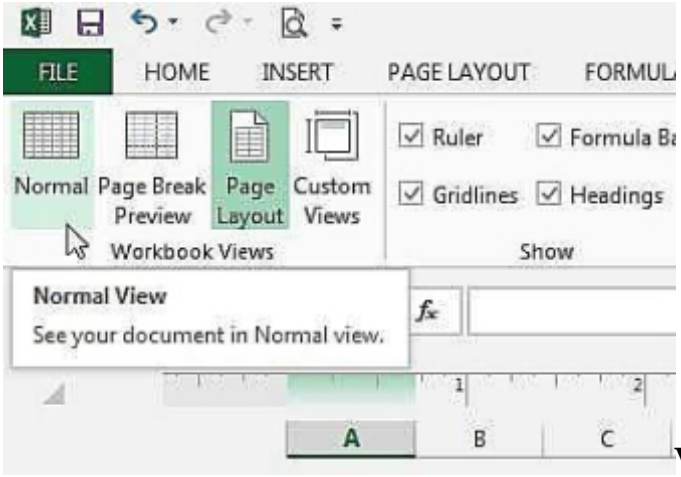
CHAPTER 9 PRINTING OPERATIONS IN YOUR WORKBOOK CARRYING OUT SIMPLE PRINTING OPERATIONS

Simply navigate to the **Print** option in the **File** menu or use key **Ctrl + P.** When in the print window, make necessary selections and configurations.

ADJUSTING HOW YOUR WORKBOOK IS VIEWED Default View

This is the view your workbook possesses by default as a result of a selected template. This view is chosen as the optimized option for your workbook by Excel itself.

This default or normal view can be initiated on the **View** tab by selecting the **Normal** button in the ribbon menu.



View Options from

Page Layout Menu

The **Page Layout** menu holds several options to configure how Excel displays your workbook. Select the option for **Orientation** and select between **Landscape** and **Portrait.**

Page margins can also be selected and inserted by clicking on the corresponding menu in the **Page Layout** pane. You can also customize your margins by selecting the appropriate option.

The Preview for Page

Breaks

The button to preview page breaks can be found at the base of the Excel window, beside the slider for zoom. Select this button and go to your worksheet to highlight the cell where the page break would be initiated.

Go to the **Breaks** menu and select the option to insert a page break in your worksheet. This same menu can be used to remove page breaks.

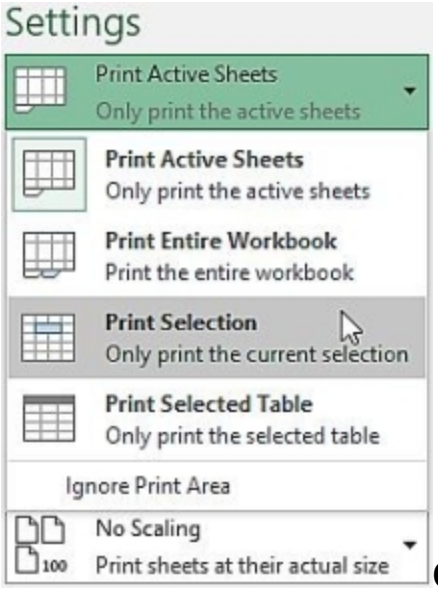
EDITING SETTINGS FOR PAGE SETUP

Selecting a Printer

Use the option for formatting printers to select a printer.

Indicating Print Content Select the menu for the area to be printed in the **Page Setup** section or use the settings menu while in the print section. Just click on the

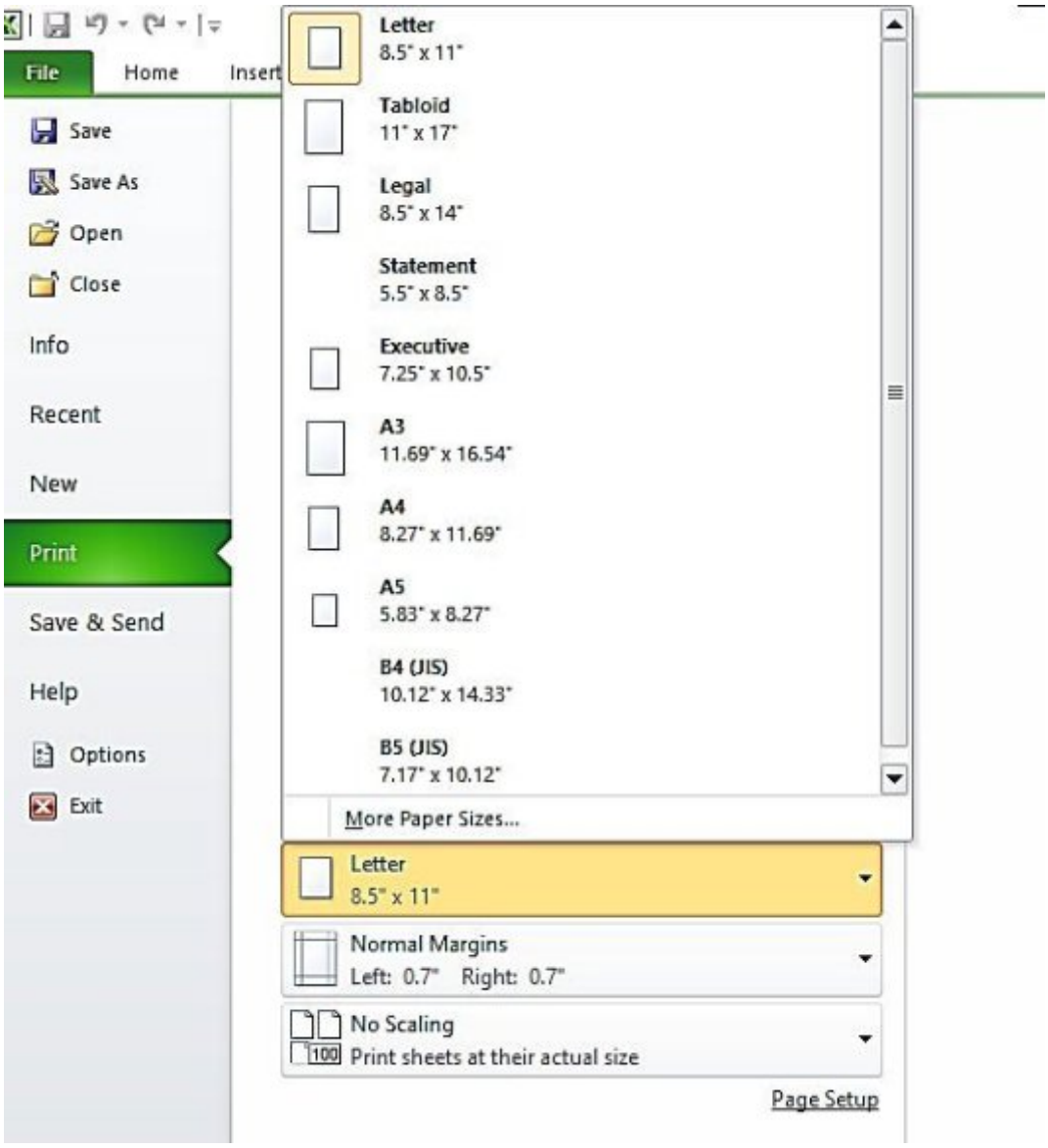
menu labelled for printing sheets that are active to access further options.



Changing Print Orientation for Pages

You can change the orientation for pages in the **Page Setup** section, or when in the print window.

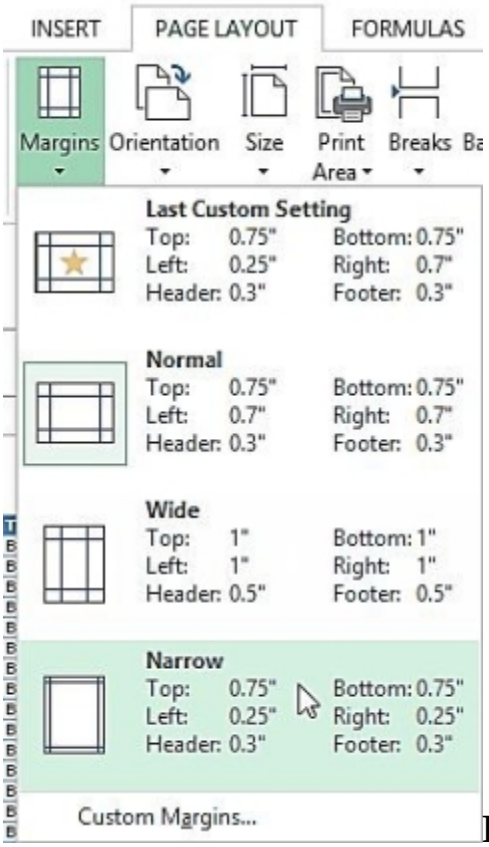
Indicating Size of Paper Click on the menu indicated **Letter** to see additional options for paper size.



Printing Numerous Copies of a File

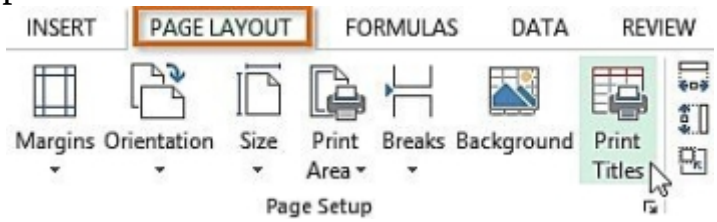
Indicate the number of copies in the box provided.

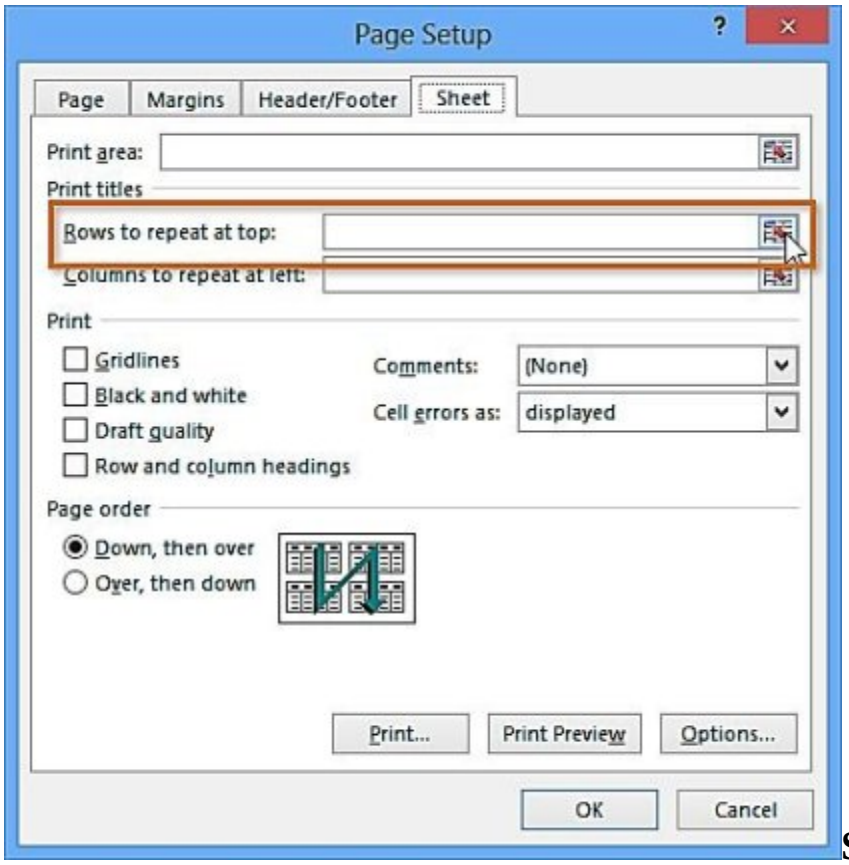
Editing Page Margins Select the margin menu.



Printing Excel Titles

Select the tab to print titles and select the rows and columns to be repeated.

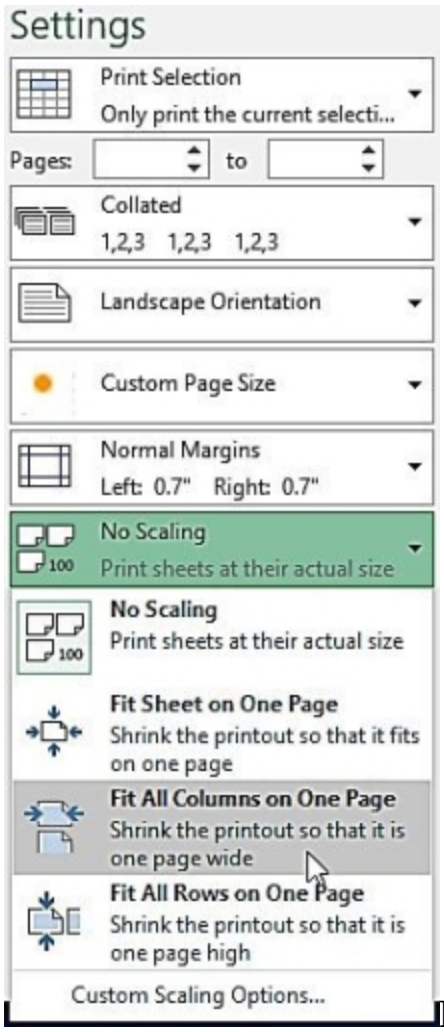




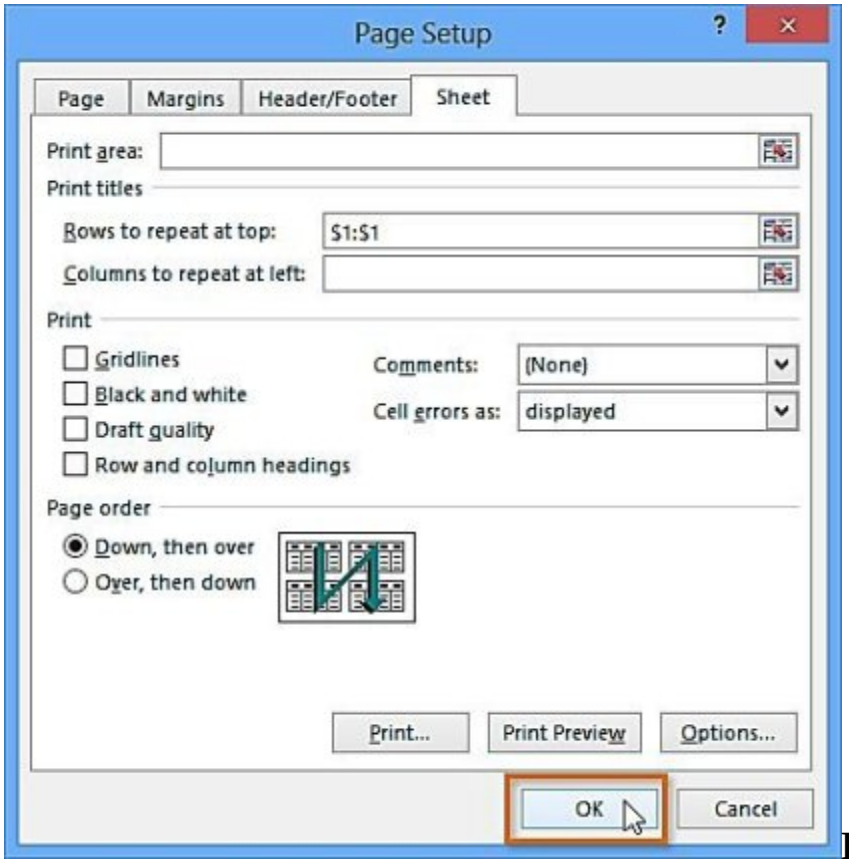
Scaling

Printing Output

Select the menu labelled for scaling and select an option.



Printing Gridlines Tick the box for **Gridlines** in the Excel **Page Setup** dialogue box.



Printing

Headings of Row and Columns

Tick the box for **headings** in the Excel **Page Setup** dialogue box.

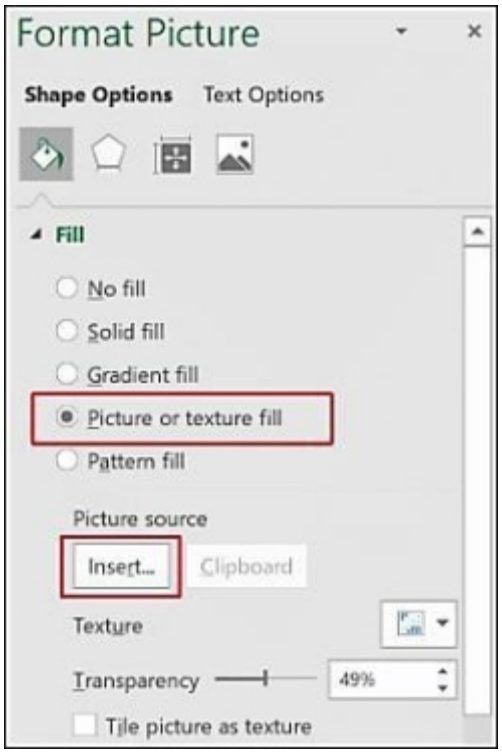
Using Background Images

- First, navigate to **Shapes** on the **Insert** menu

•

Right-click on this shape and select to format

- Select the option for picture and choose the **Insert** button in the



resulting dialogue box

- After inserting, use the slider for **Transparency** to adjust the picture

USING HEADERS AND FOOTERS IN YOUR EXCEL FILE

Inserting Excel Defined Headers and Footers Navigate to the **Header and Footer** option in the **Insert** menu. This action opens the **Design** menu.

When in the **Design** menu, select between **Header** and **Footer** and choose a header to your taste from available options.

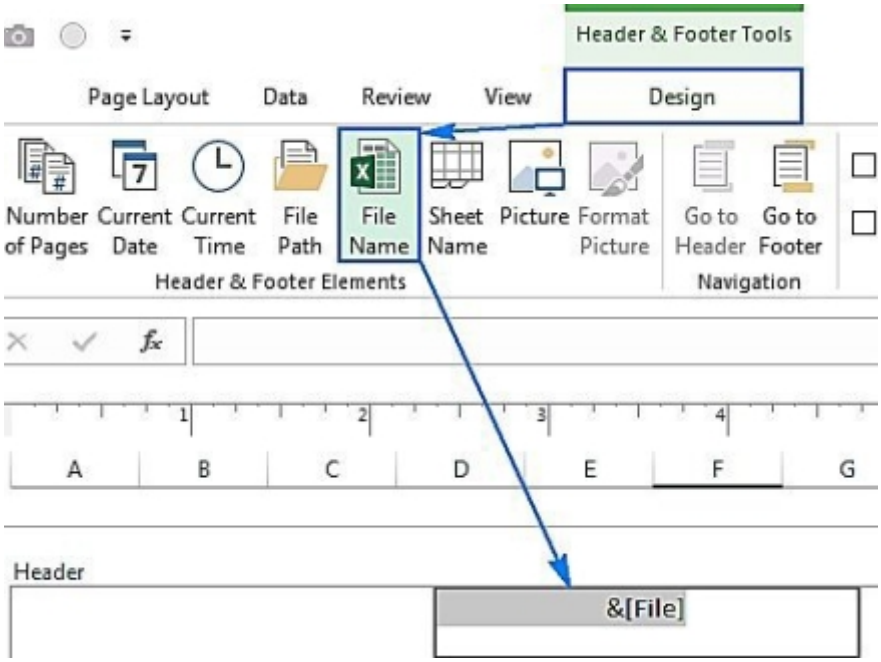
What Headers and Footers Contain The information in headers and footers include elements such as:

- the page number
- the title of the worksheet
- exact time and date
- total page number
- the workbook file path
- the name of the workbook
- a picture that can be resized to a logo

Additional Options in Headers and Footers 1. You can create your custom headers and footers following these steps:

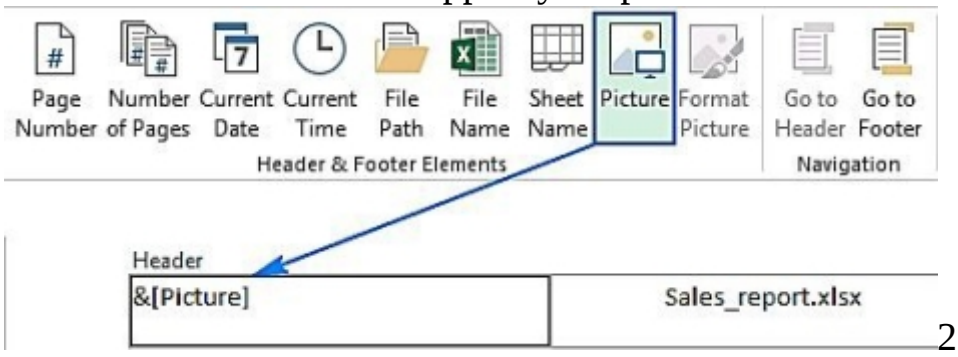
- First, select the **Header and Footer** option in the **Insert** menu

- Select the header box and enter the name of your workbook where indicated



- Enter the number of the current page in the specified box. To allow the word **Page** itself to be shown, right-click on the box and type in **Page,** including an ampersand (&).

- Select the **Picture** option in the ribbon menu and browse your File Explorer, insert the needed picture. Excel immediately puts the appropriate picture code in the header to support your picture.



2.

The **Page Setup** dialogue box can also be used to add headers and footers in your worksheet:

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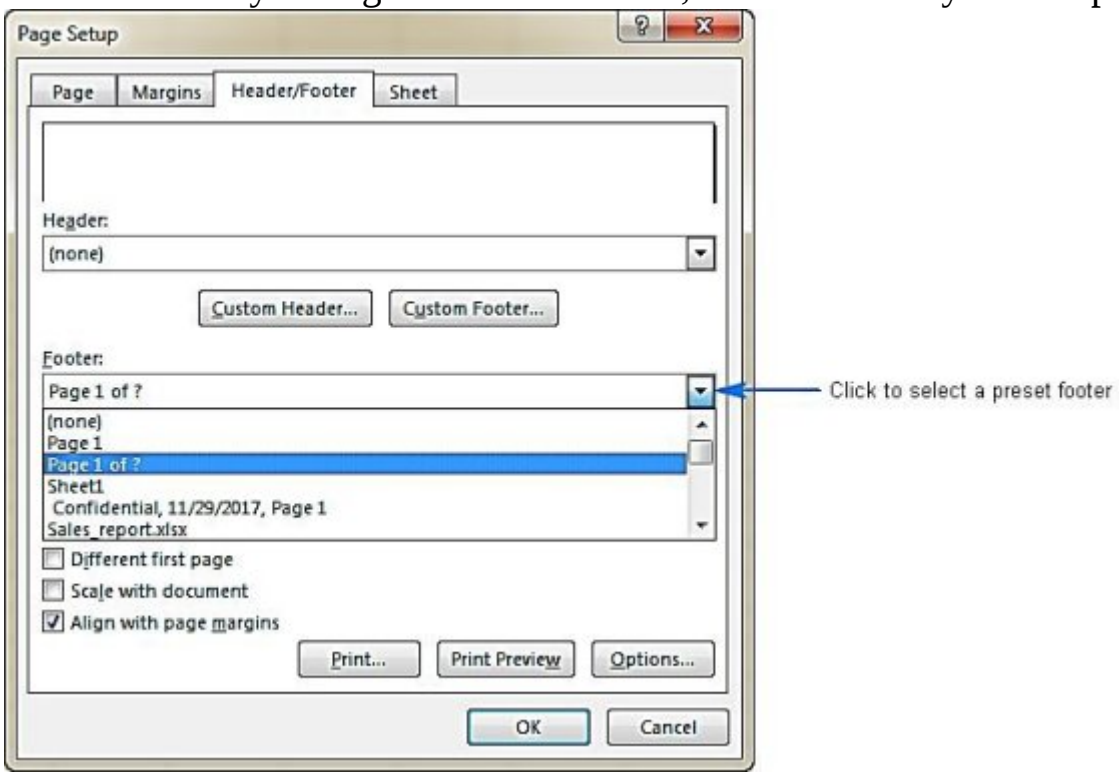
Click on the corresponding icon to launch the dialogue box

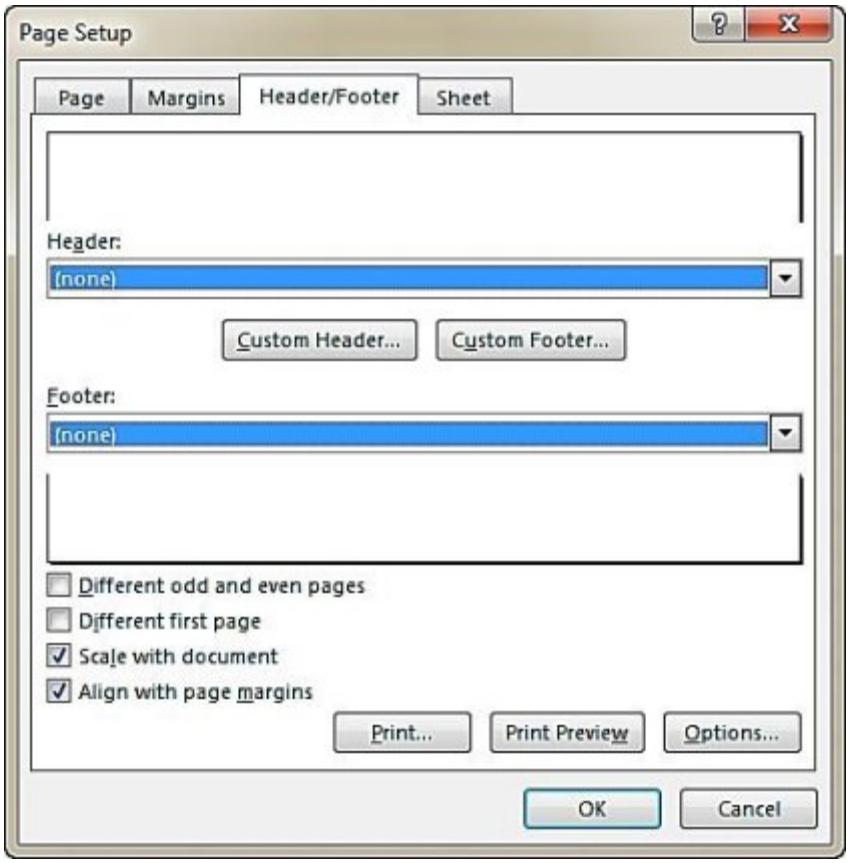
- Make necessary configurations in the box, or select a ready-made option



1. You can also close the header and footer by navigating to

Normal view in the **View** menu.

1. Headers and footers can be deleted by selecting none for both the header and footer in the **Page Setup** dialogue box.


Page Setup
Page
Margins
Header/Footer
Sheet
Header:
(none)
Custom Header...
Custom Footer...
Footer:
(none)
Different odd and even pages
Different first page
Scale with document
Align with page margins
Print...
Print Preview
Options...
OK
Cancel

ADDITIONAL OPTIONS FOR PRINTING YOUR WORKBOOK

Using Similar Page Setup Configurations in Multiple Worksheets

Select all these worksheets by holding down the **Ctrl** key and highlighting the sheets, then navigate to the **Page Setup** menu and make your configurations.

Marking Off Cells during Printing

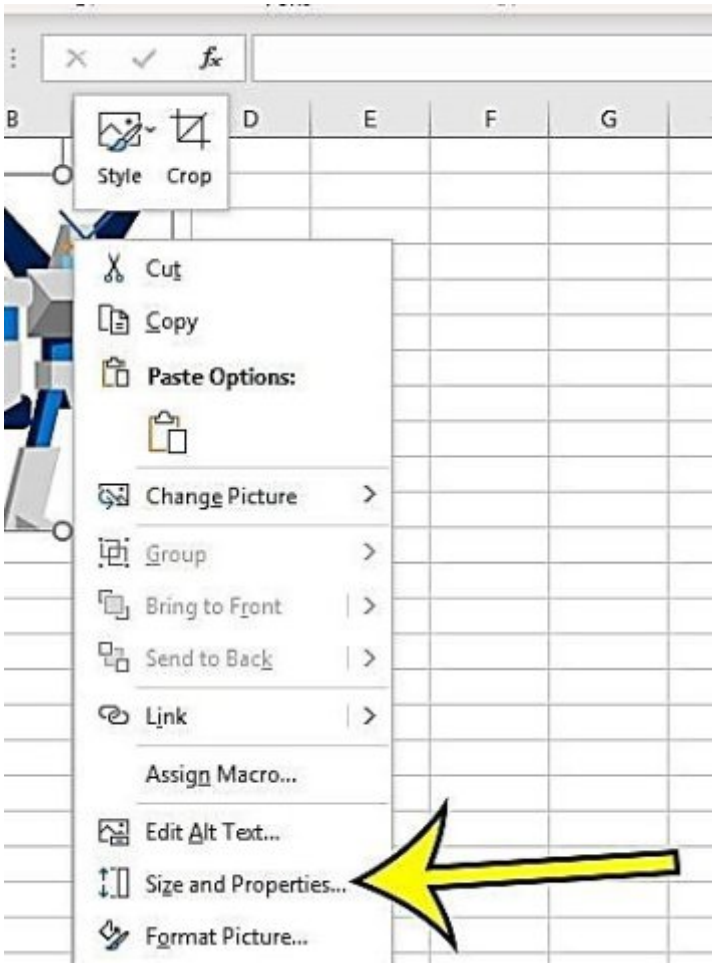
Removing some cells from printing can be done in any of the following two ways:

- Hide these cells

- Format these cells to blend with your worksheet background, e.g. if you have a white background for your worksheet, select a white font for the content of these cells

Marking Off Pictures during Printing

- Right-click on the picture and select the option for properties and size.



- Deselect the print box in the **Properties** menu of the picture.

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Format Picture

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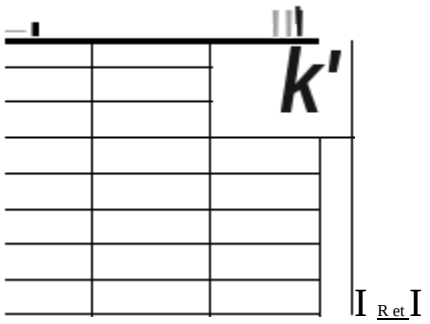

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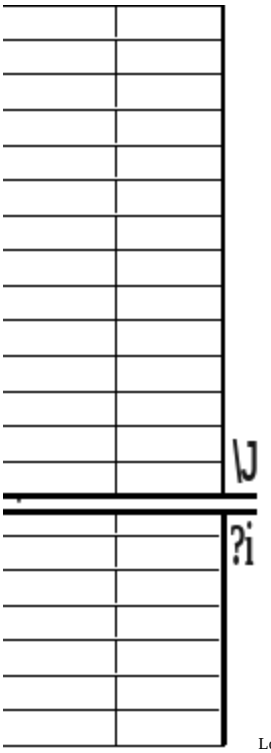

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Designing

Customized Views for Your Worksheets

- Navigate to views for your workbook in the **View** menu

•

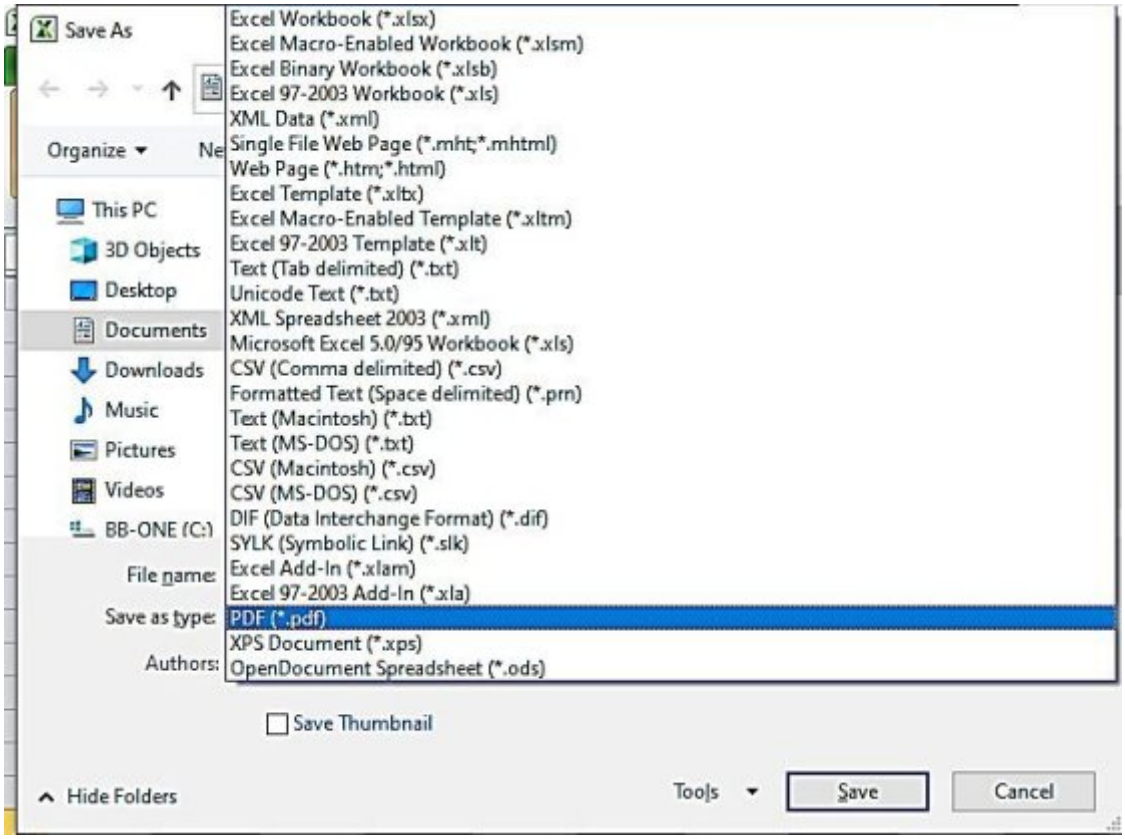
Select the option to add a customized view

• To apply your customized view, navigate to the corresponding option for self-built views and select. These views can also be deleted by right-clicking on them and selecting the **Delete** option.

Saving Your Workbook as a PDF File

- Select the **Save As** option in the **File** menu

• In the box indicating the format in which the workbook will be saved, select the drop-down menu and choose the option for a PDF format.

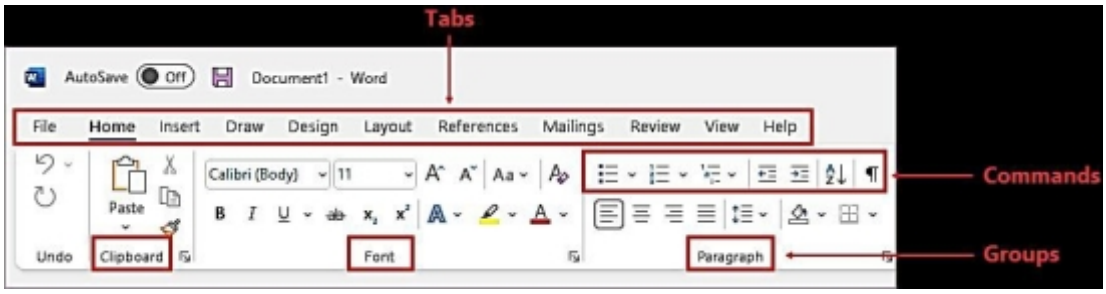


Summary

Defining and setting how your worksheet appears before and during printing helps to get the best results for your printed worksheets or workbooks. This chapter explained how this can be done using both the **View** and **Page Layout** menu. You can also select which cells and pictures get printed, fit your worksheet to a page for easier comprehension and also save your workbook in PDF format to facilitate sharing.

CHAPTER 10- REDESIGNING THE USER INTERFACE IN EXCEL

Customizing both the Quick Access Toolbar and the ribbon menu is a quick and easy way to upgrade the user interface in Excel. This action puts more menu, tools, and options within easy reach when working in worksheets.



REDESIGNING THE RIBBON MENU

The ribbon menu can be configured so that menus that tab that you often use are brought closer, or you hide those settings you don’t use. Customization of the ribbon allows you to rearrange menus and tabs; you can also import or customize ribbons. Note that any customization done on the ribbon menu in Excel is only limited to the application, they are not applied in other applications such as Word, etc.

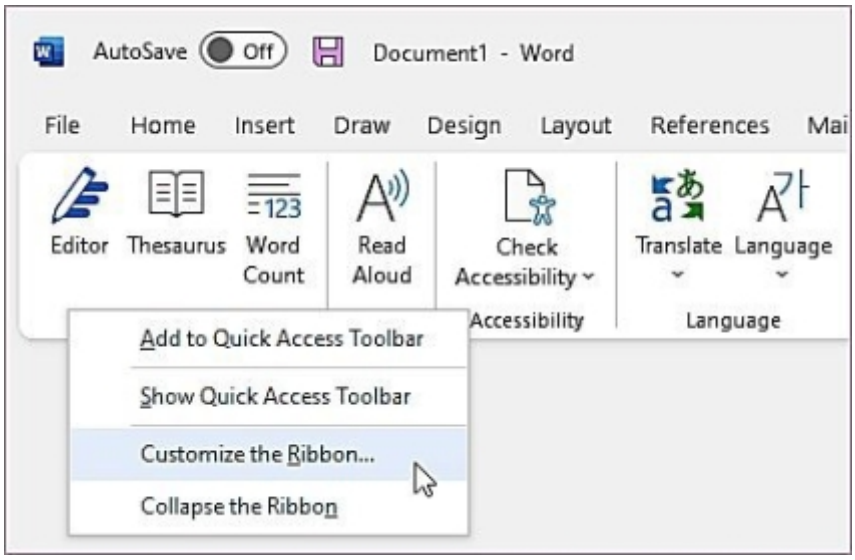
CONFIGURATIONS NOT SUPPORTED IN THE RIBBON MENU

The size of the ribbon, the font, the font size, and the icons cannot be edited. Slight changes can only appear in these aspects when you adjust the resolution of your display.

POSSIBLE CUSTOMIZATIONS IN THE RIBBON MENU

Adding Tabs

- Right-click on a blank space in the ribbon and select the customize option

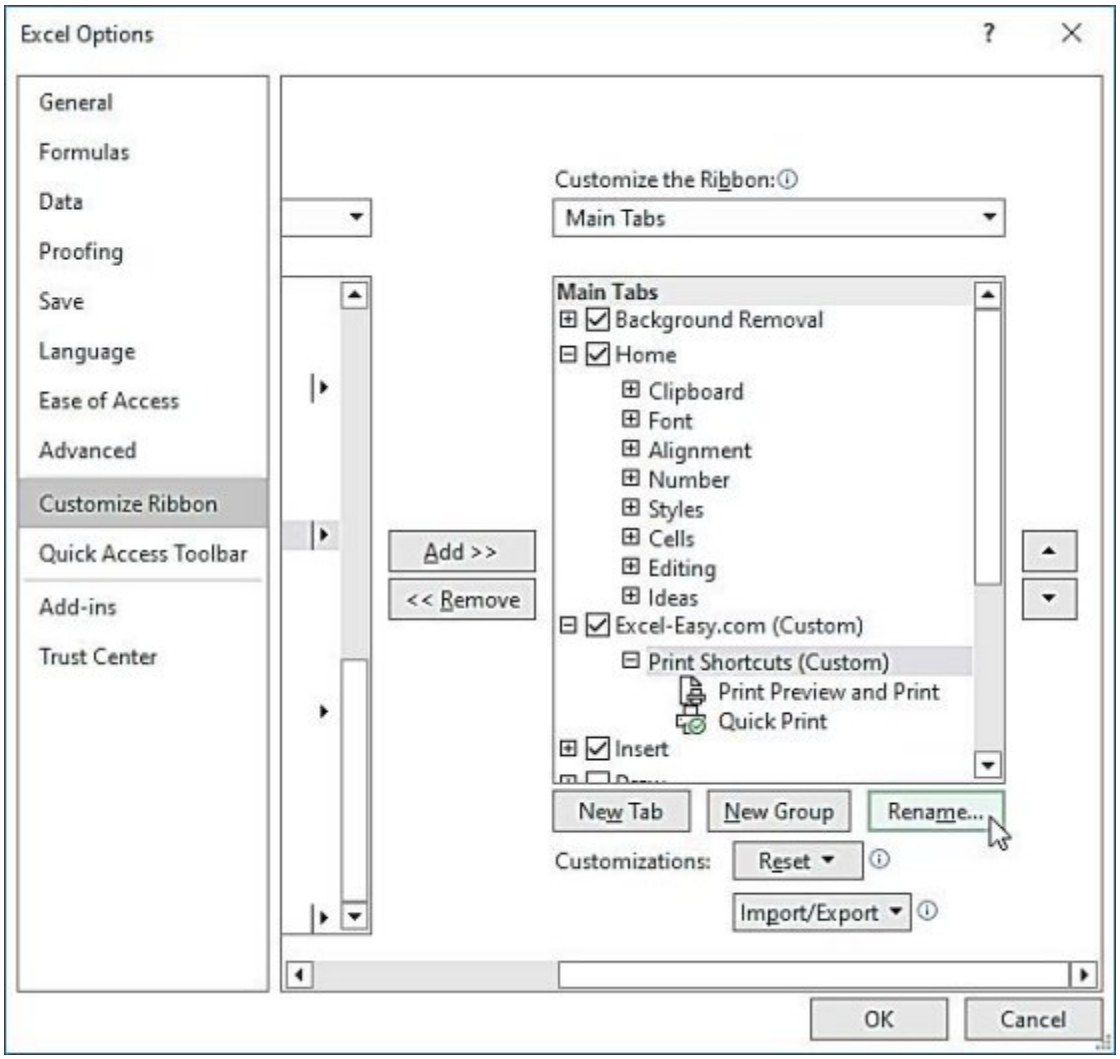


- Select the option to customize the ribbon the resulting window
- Select the option to add another tab and click on **OK** when done

Adding Groups

- Right-click on a blank space in the ribbon and select the customize option

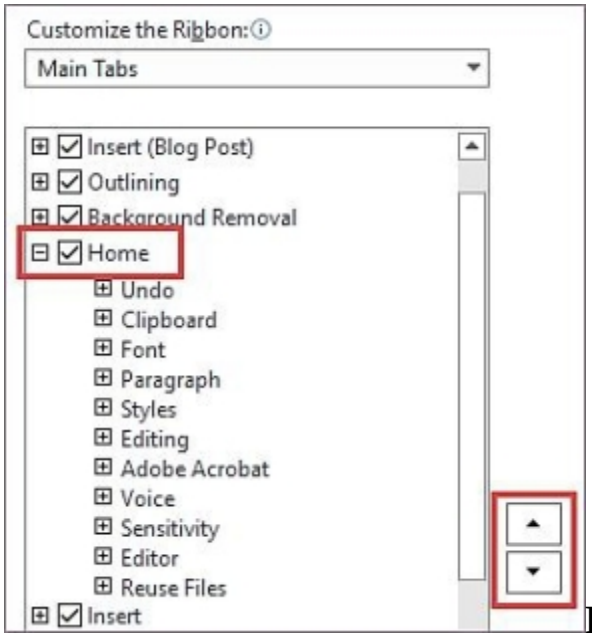
- Select the option to customize the ribbon the resulting window
- Select tabs to be added to the new group



• Select the option for a new group and rename the group by right-clicking on it

Rearranging the Ribbon Tabs

When in the window to customize the ribbon, select the tabs to be rearranged and click on the provided arrows.



Resetting the Ribbon to Default

When in the window to customize the ribbon, select the **Reset** option.

Importing and Exporting Custom Ribbon Menu When in the window to customize the ribbon, select the option to import or export a custom ribbon.

Summary

Customizing the ribbon menu puts your necessary and frequently used tab with easy reach. This chapter explained how to configure the ribbon menu to your taste, and also to revert to the default settings of the ribbon menu.

CHAPTER 11- INTRODUCTION TO CHARTS IN EXCEL

Charts are graphic visualization of data. They help you to visualize data as a diagram, which enhances analysis and also human comprehension.

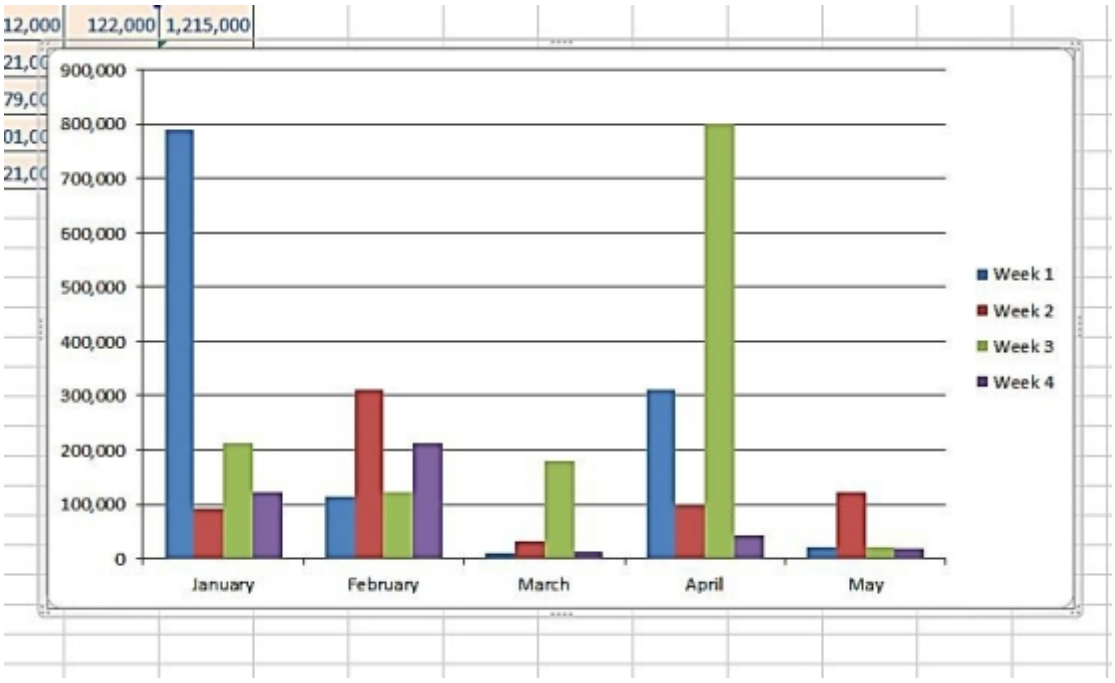
Format for Excel Charts

Before charts can be created, there must first be input data. After entering data, you can then select to input any style and type of chart to convert the data to a graphical representation. Note that editing the data produces a corresponding change in the chart.

Embedded Charts

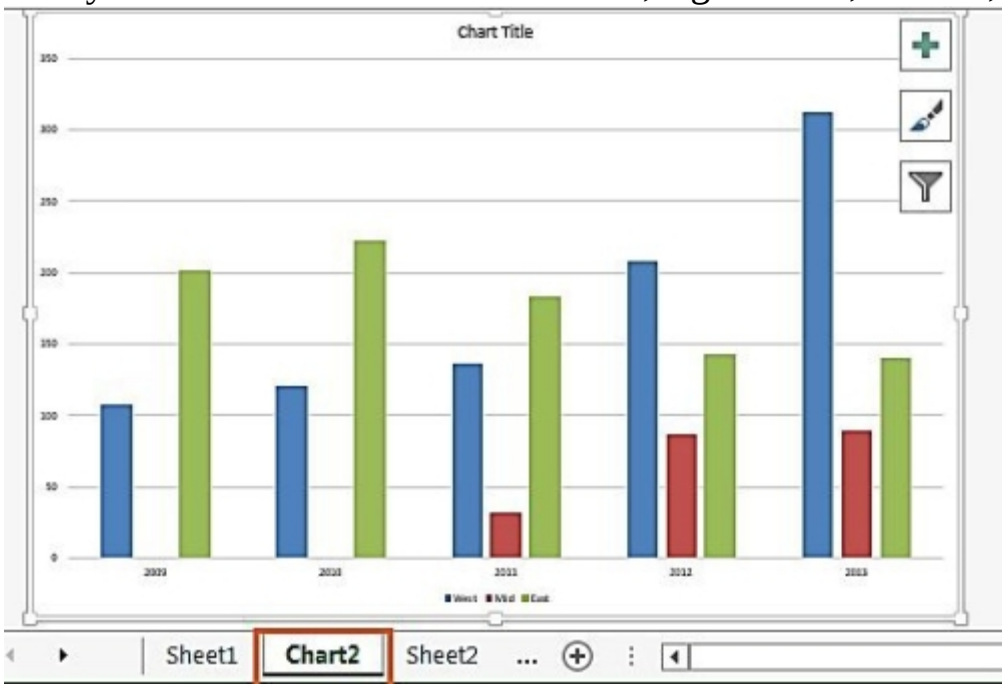
Most charts in Excel are embedded. They come on display on a special drawing layer that can be moved, formatted, and resized. These charts can be configured by clicking on any part of the chart

and a menu that is contextual comes up from which changes can be made.



Charts Sheets

These look like a worksheet itself. Only a chart is found in a chart sheet, and they are labeled like sheets are named, e.g. Chart 4, Chart 7, etc.



Embedded sheets can be moved to chart sheets and vice versa;

- Select the chart and choose the option to **Move** the chart from the

Location menu found in the **Design** tab under **Chart Tools**

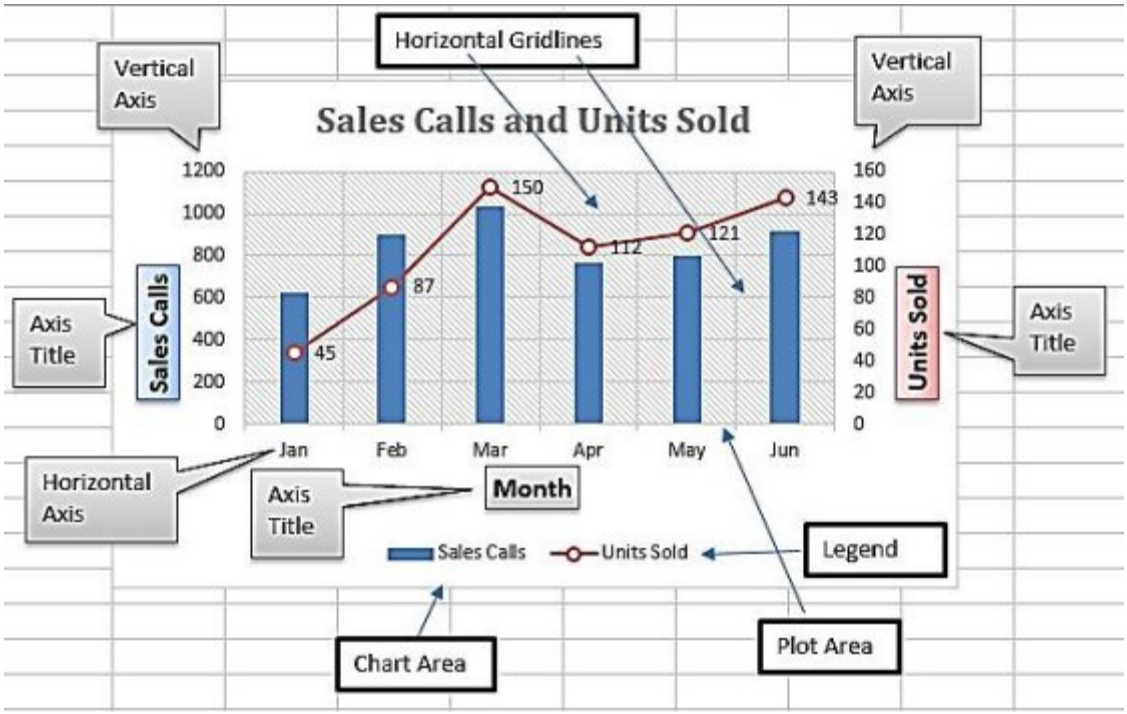
• In case of moving embedded charts, choose the option for another sheet in the **Move** dialogue box. Provide a new name for the chart if appropriate

• For moving chart sheet, choose the **Object** option and select a worksheet

• Click on **OK**

Elements of Excel Charts

- Axes
- Legend
- Title of the Axis
- Title of the Chart
- Labels for data
- Table of the data
- Bars for error
- Gridlines
- Trend lines, etc.

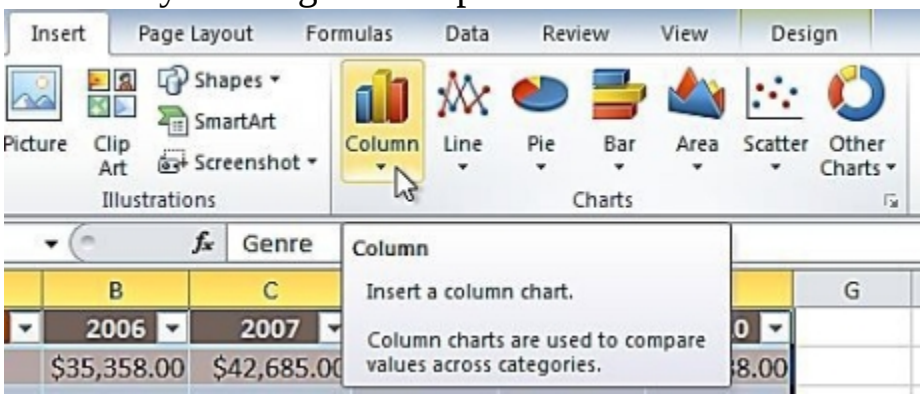


Limitations of Charts

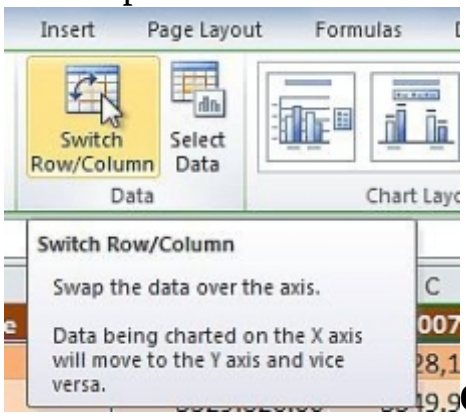
One main limitation of charts is that they mostly are not as precise about the data they represent as the raw data itself. Although they make data visualization easier, they help see how some factors affect events. With the inclusion of trend lines, viewers can make close to accurate predictions. They still however can produce wrong information which can mislead users. Rectifying this to make charts as precise as possible results in the charts being complex and crowded.

Creating Charts in Excel

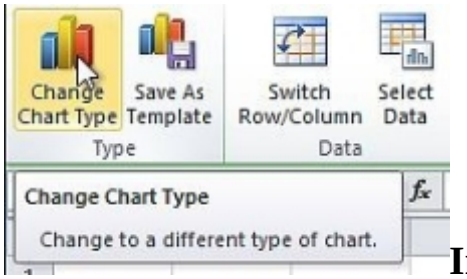
After entering your data, navigate to the **Insert** menu and select the option for **Charts.** Here, you can select any chart type that is suitable for your data by clicking on the option to view all available chart types.



Interchanging Rows and Columns in Charts Click on the chart and select the option to switch the row and column on the **Design** menu



Changing Type of Charts Select the option to change the chart type from the **Design** menu and select another chart.

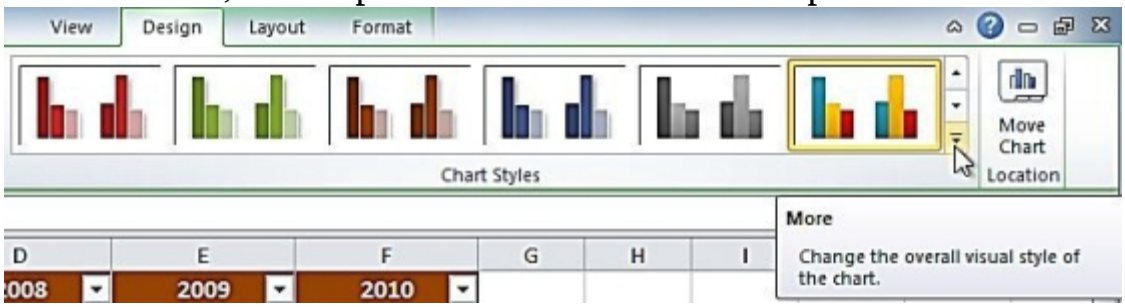


Inserting Chart Layouts

Select a chart layout from the chart group or click on the dropdown icon for **More** in the chart menu to access additional options for chart layouts.

Changing Chart Styles

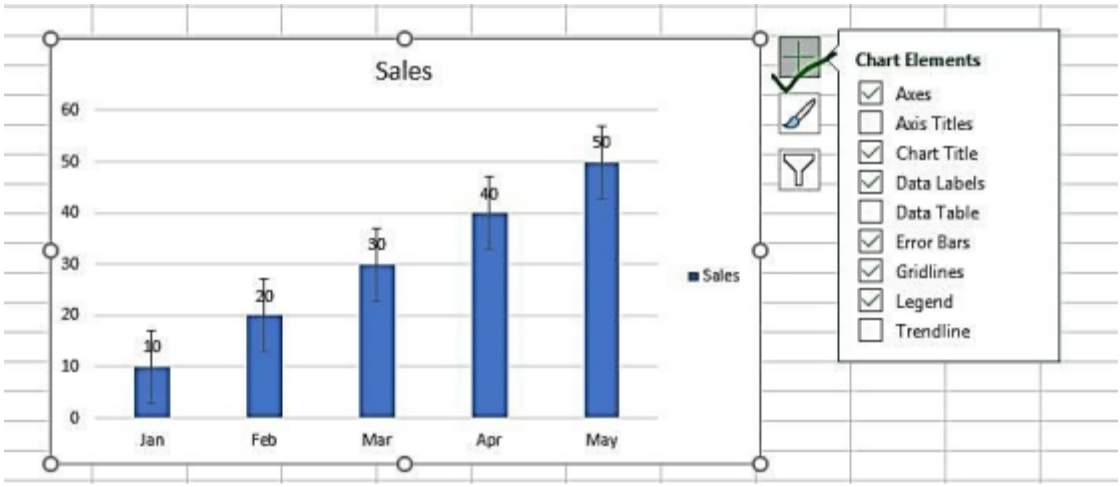
While in the **Design** menu, the group for **Chart Styles** can be selected from. Likewise, the drop-down icon to view more options can be selected.



Including and Removing Chart Elements

- Select the chart and click on the + icon

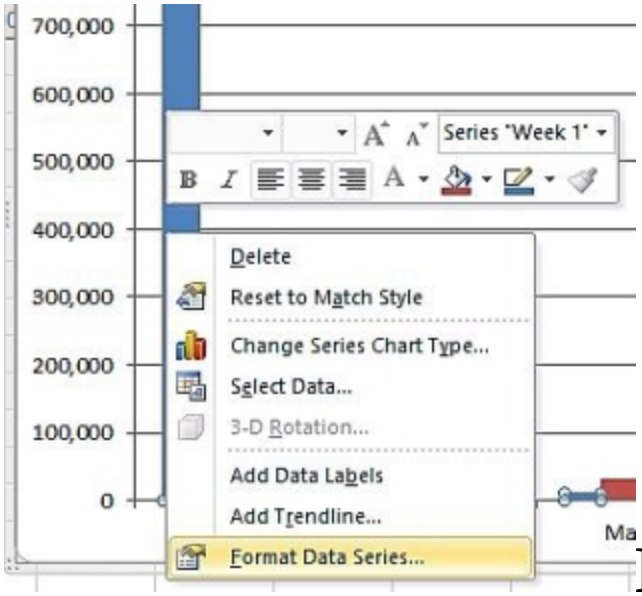
- Tick any box to include any chart element and untick a box to remove the element



Formatting Elements in a Chart

Click on the chart element to be formatted and make necessary configurations either from the shortcut menu that appears on right- clicking,

or use options from the ribbon menu.



EDITING AND CONFIGURING CHARTS

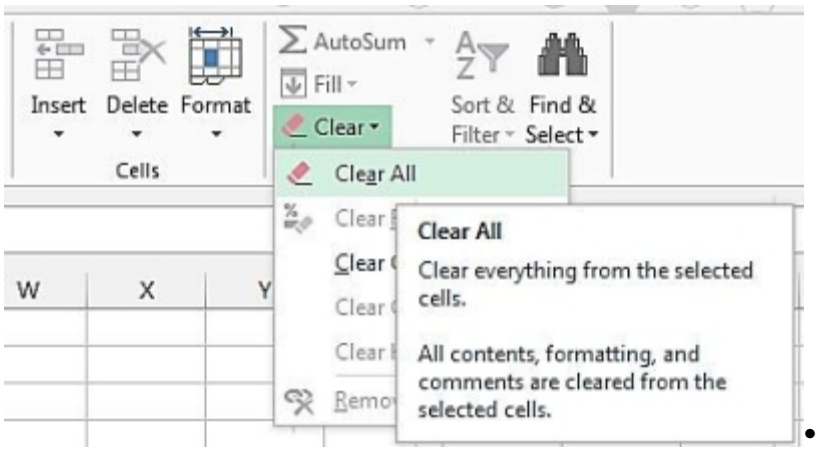
Resizing and Changing Chart Positions

Click in the chart and take your mouse cursor to the enclosing line borders around your chart. When the double-edged cursor for resizing appears, drag with your mouse to the desired size. Likewise, the position of the chart can be changed by letting the cursor change to the four corner arrow with which the chart can be dragged to any position.

Copying Charts

Select the chart and use **Ctrl + C** or right-click and select the copy option. The chart can then be pasted in any location. **Deleting Charts**

- Highlight the chart
- Navigate to the **Home** menu



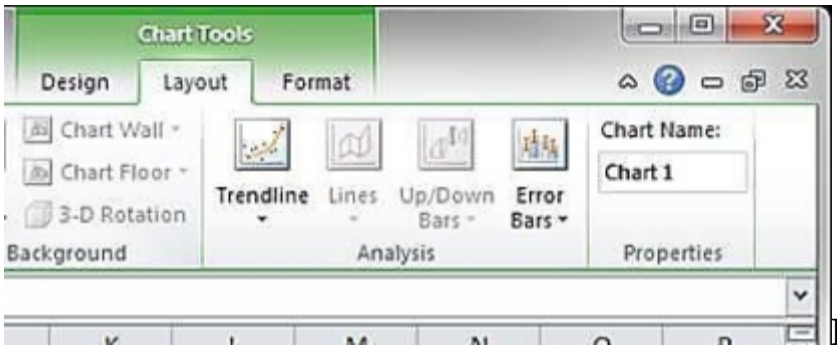
- Select the **Clear** option and click on the option to erase all.

Copying Formatting Rules Applied to a Chart When pasting copied charts

that are formatted, the **Paste Special** option can be used to retain all configurations. **Renaming Excel Charts**

- Select the chart and navigate to the **Layout** menu

- A box labeled **Chart Name** would be seen at the edge of the ribbon. Enter your desired chart name in the box.

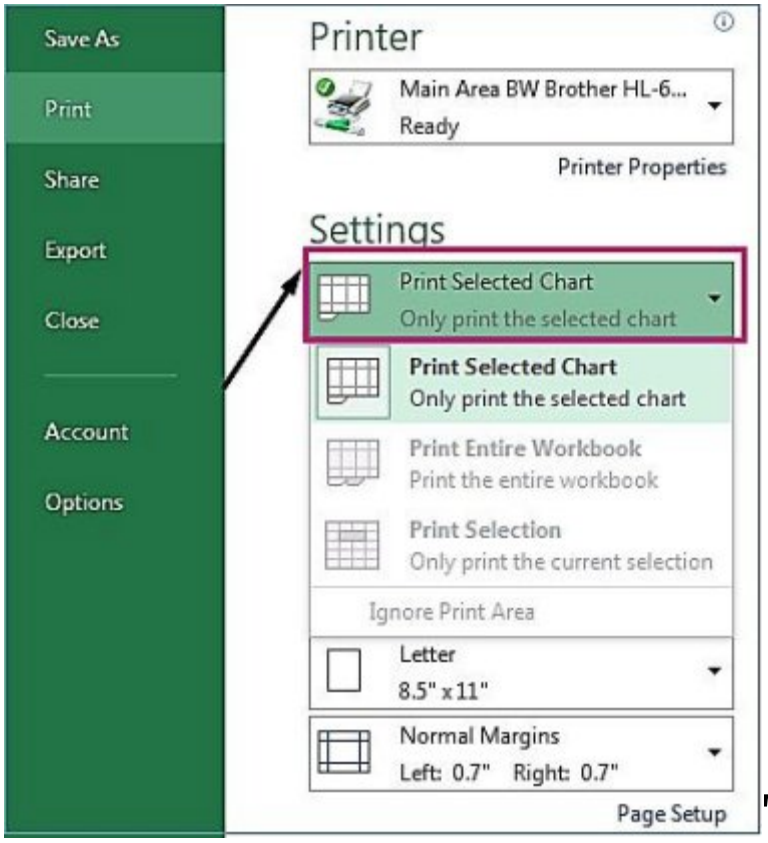


Printing Excel Charts

- Select the chart to be printed and press **Ctrl + P** to open the **Print**

menu

- Under **Settings,** select the option to print the highlighted chart



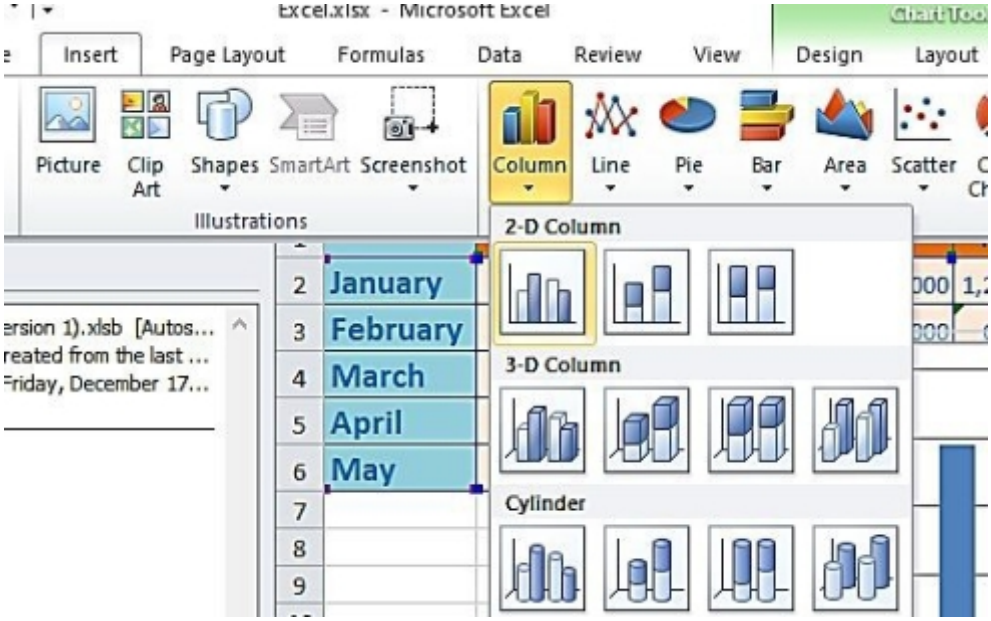
TYPES OF CHARTS IN EXCEL

Column Charts

These charts represent data with vertical bars. They are used when comparing groups of data. To use column charts:

- Highlight your data

- Select the option for **Columns** and then **Clustered Columns** in the chart menu.

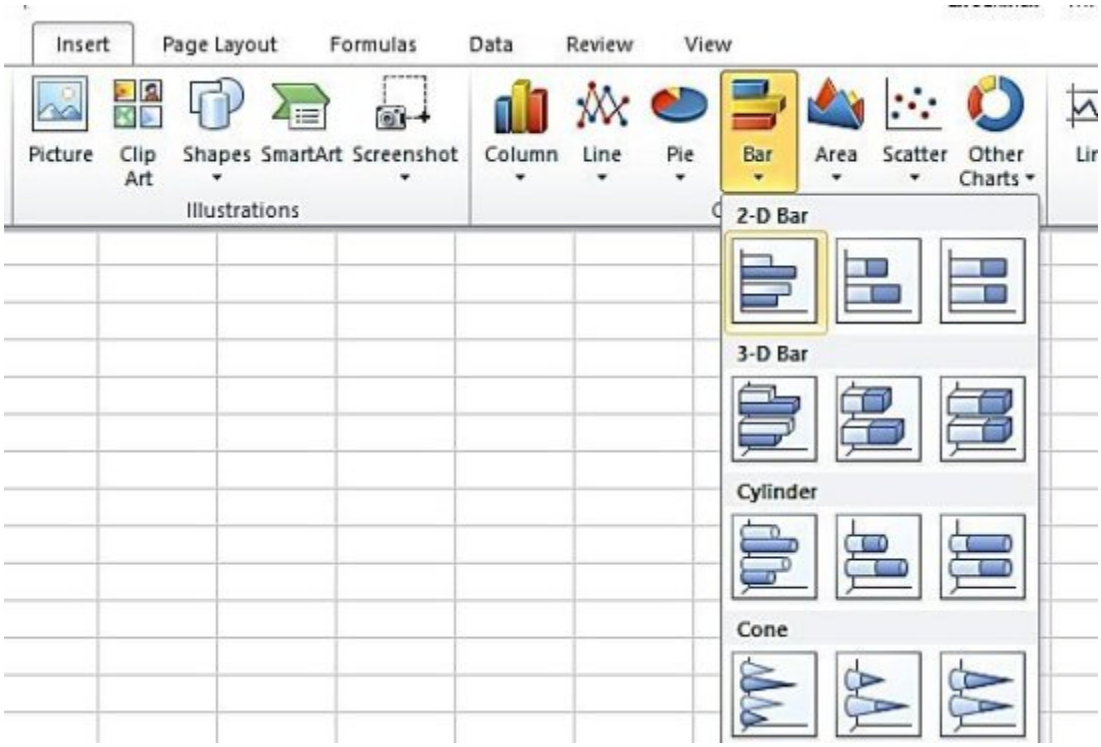


Bar Charts

They are also used for comparing a group of data. They differ from column charts because they represent data with horizontal bars. To use column charts:

- Highlight your data set

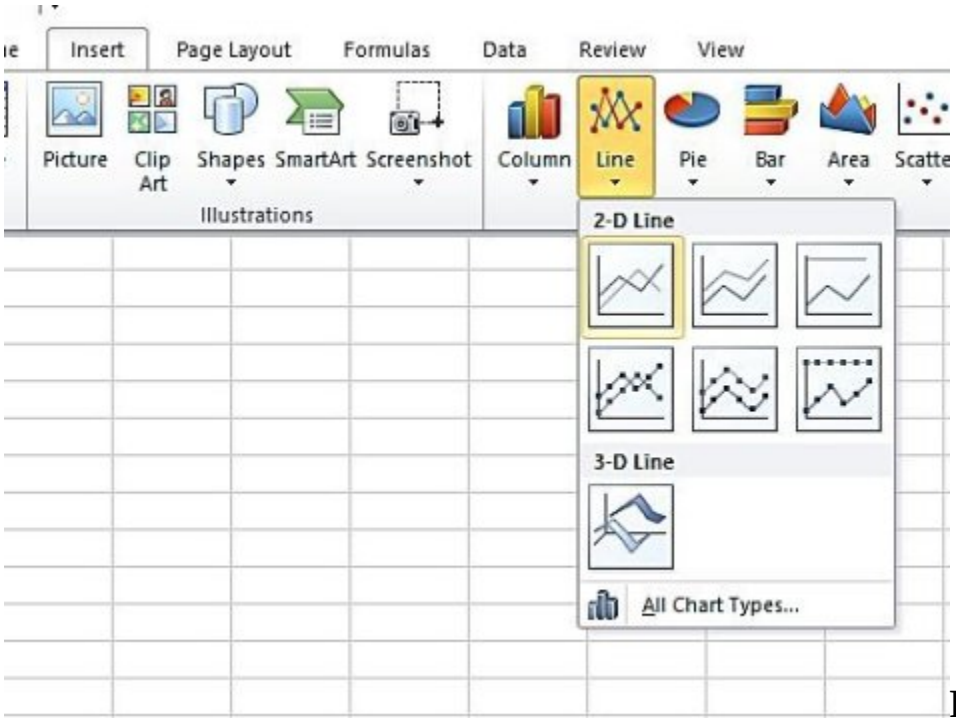
- Select the option for **Columns** and then **Clustered Bars** in the chart menu.



Line Charts

These are used for showing data progression or trends. To use line charts:

- Highlight your data
- Select the option for **Lines** and then select any style for the chart.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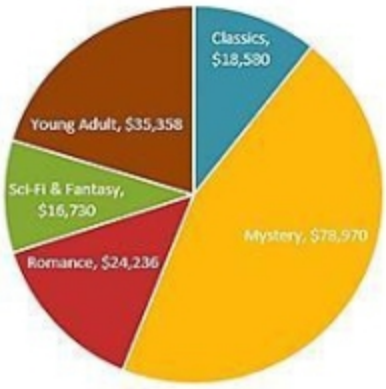
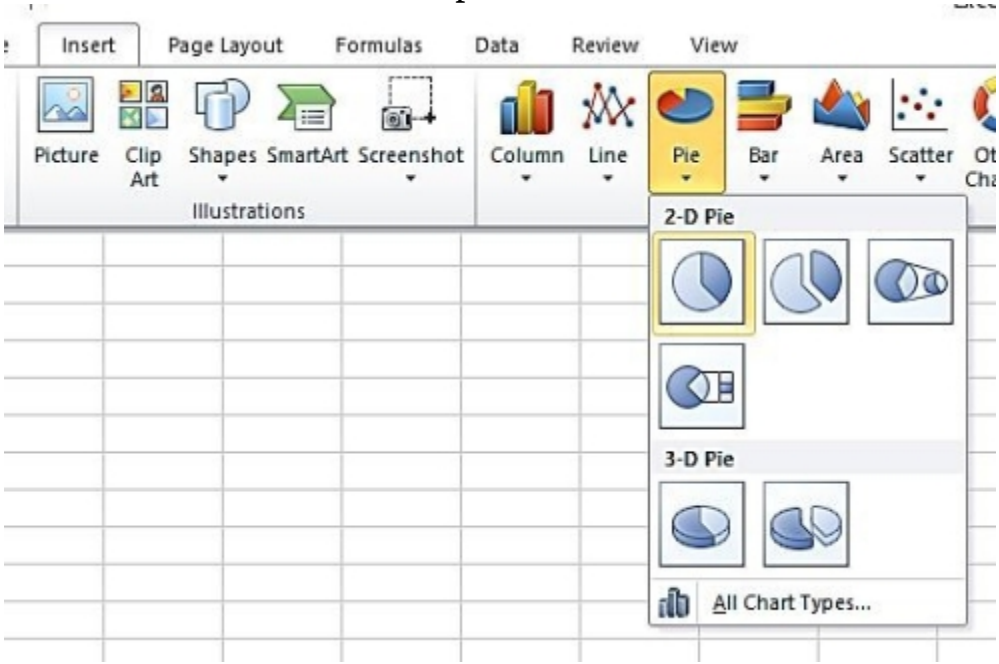
All Chart Types...

Pie Charts

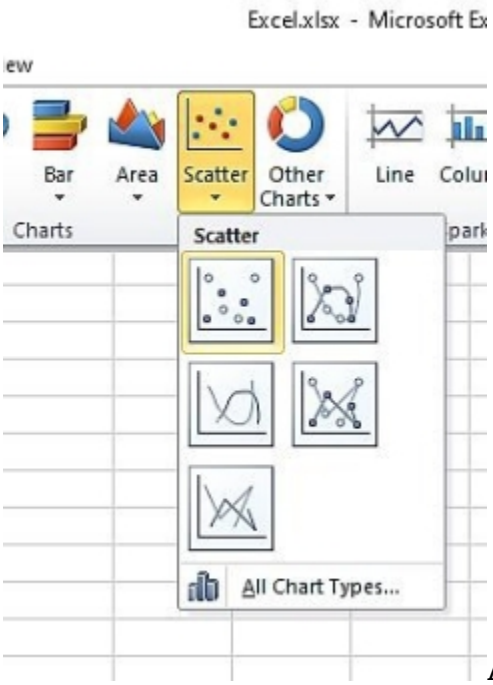


These are used for showing data in sections. To use pie charts, highlight your data and then select the option for **Pie Charts.**

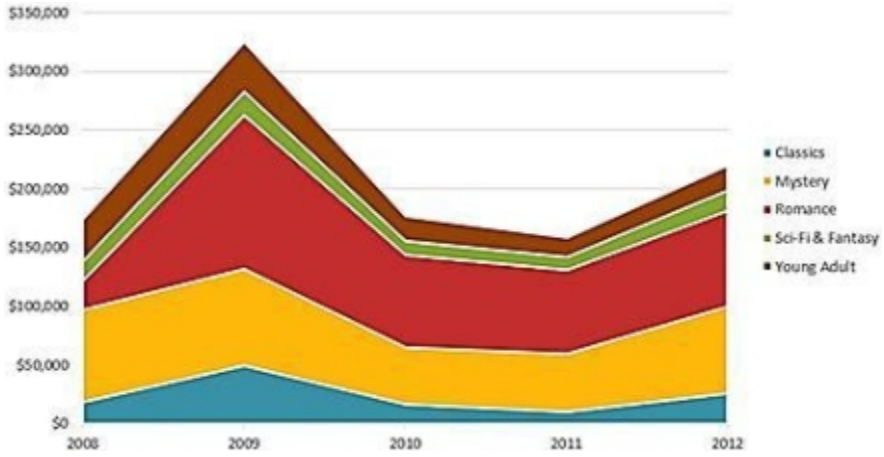


Scatter Plots or XY Charts

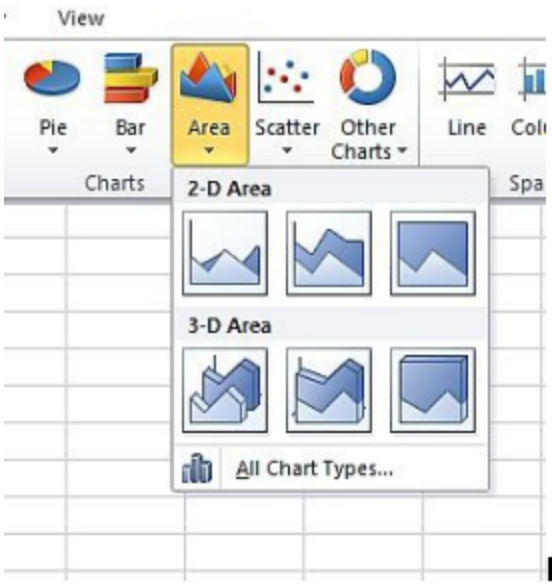
These are used when finding how X affects Y in a data series. To use scatterplots, highlight your data and select the option for **Scatter.**



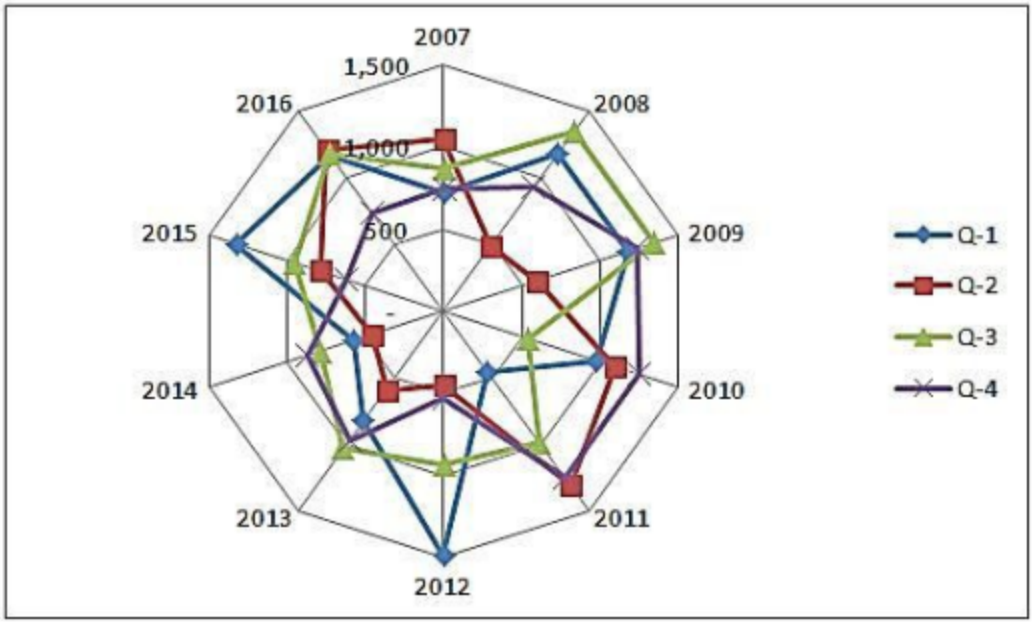
Area Charts



These represent data in filled colored areas. They can be inserted by selecting the **Line** chart option and then choosing **Area** under area for 2-D options.

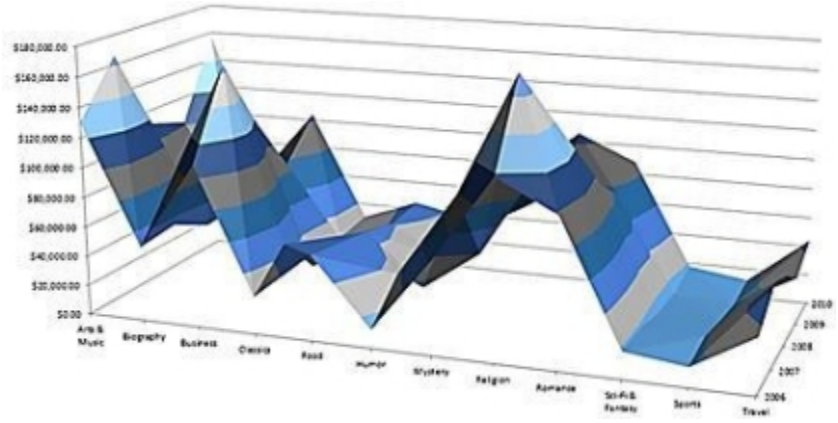


Radar



These charts are used to compare multiple items in 2-D representation in a data set. They are otherwise known as Spider Charts. Radar charts can be added to your worksheet by selecting the option for additional charts in the **Insert** menu and choosing appropriately after highlighting your data.

Surface Charts



These represent your data in clear 3-D formats. They can be inserted by selecting the option for additional charts in the **Insert** menu and choosing appropriately after highlighting your data.

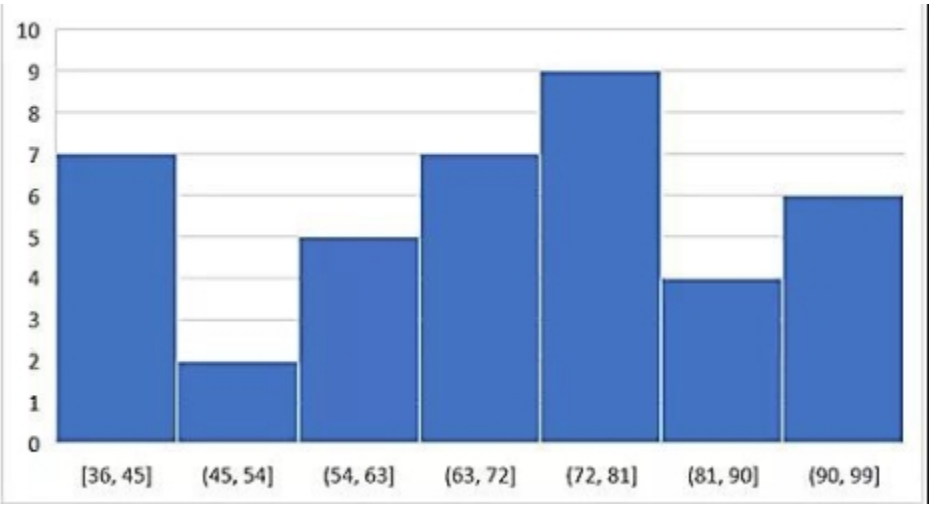
Stock Charts

Just as the name implies, they are best used for representing stocks in a data set. They can be inserted into your worksheet following the same procedure as Surface charts.

Bubble Charts

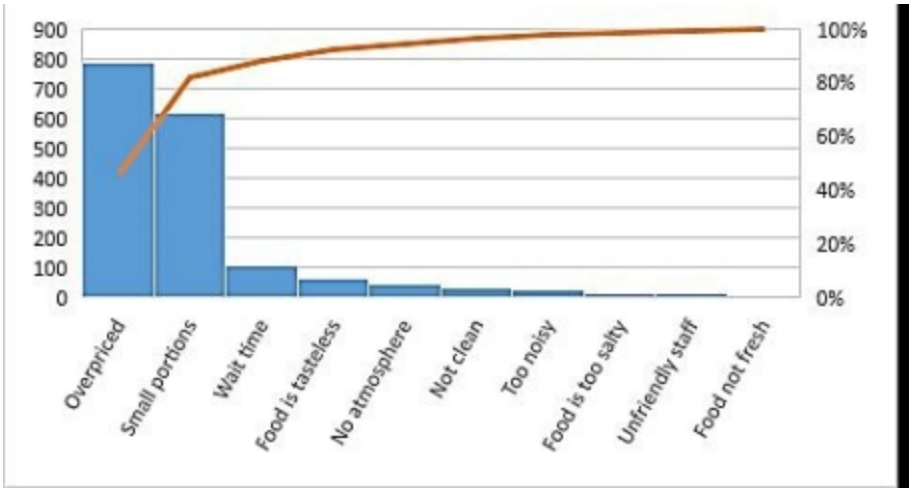
Highlight your data and select the option for additional charts and select **Bubble** charts.

OTHER TYPES OF CHARTS IN EXCEL



Histogram

This chart is used to show how often an event or item occurs in a data set. Insert histograms by selecting the option for **Static Charts** on the **Insert** menu and then choose the **Histogram** option. Do not forget to highlight your data. You can format the bars by right- clicking on the chart and selecting the format option.



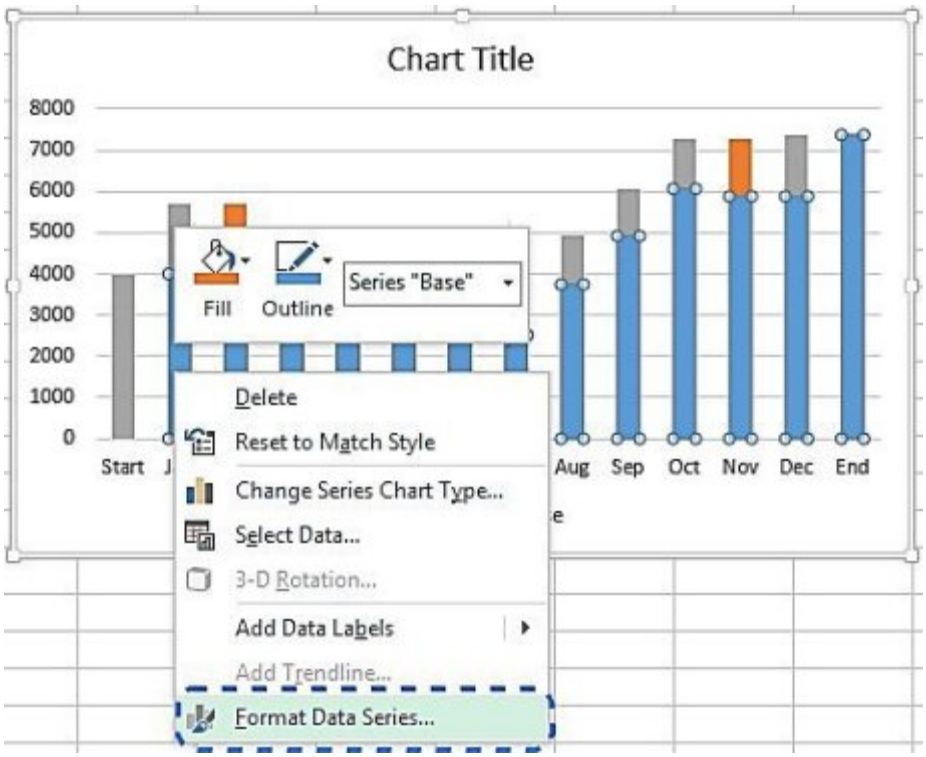
Pareto Charts

These can be inserted by highlighting your data, selecting the option for **Static Charts** on the **Insert** menu, and then choosing the **Pareto** option. These charts are for showing important parts of a data set.

They contain a line graph and bars.

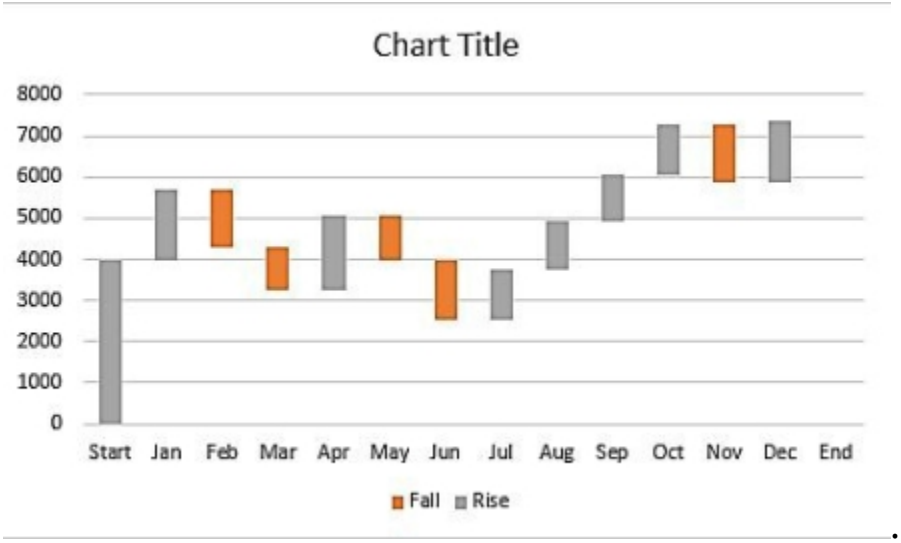
Waterfall Charts

- Highlight your data
- Select the option for **Stacked Columns** in the **Insert** menu
- Right-click on the inserted chart and select the format option

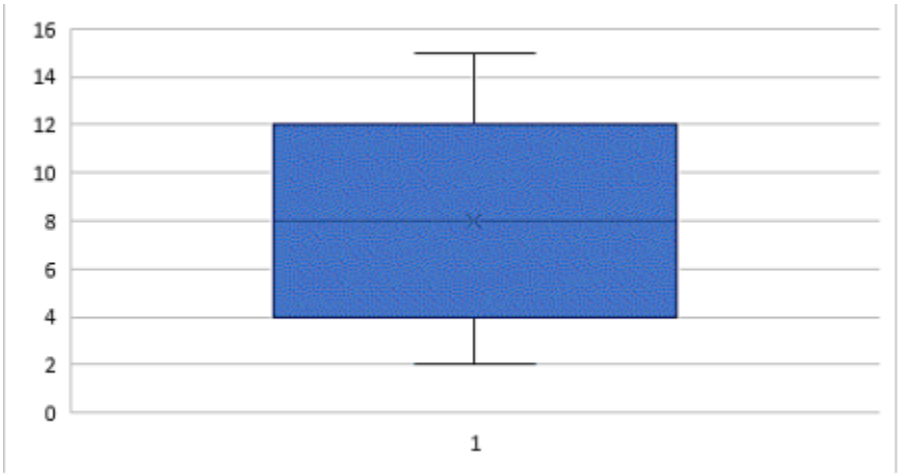


- Select the options to remove fill and borders in the **Format**

window
Waterfall charts show graphically how data flows in a data set

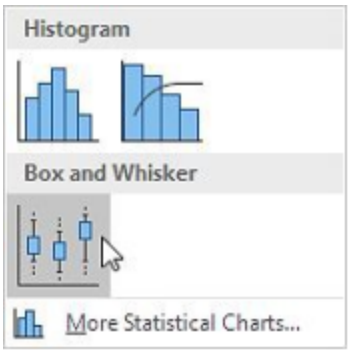


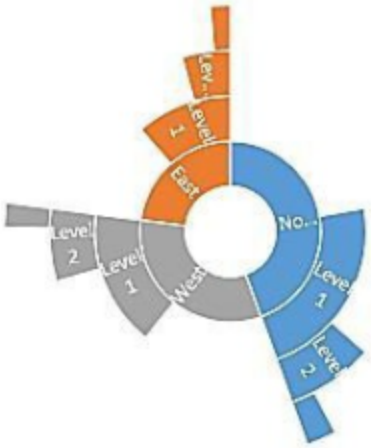
. **Box**



and Whisker Charts

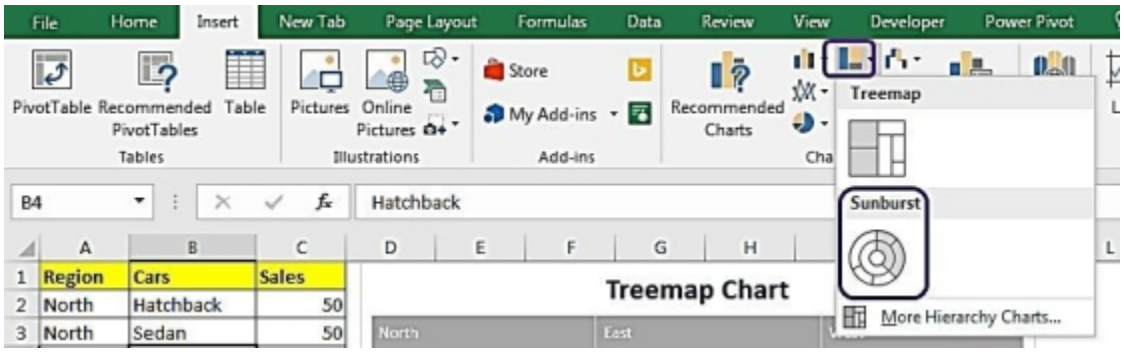
These show specific values of your data. Insert box and whisker charts by first highlighting your data, selecting the option for **Static Charts** on the **Insert** menu, and then choosing the appropriate option.



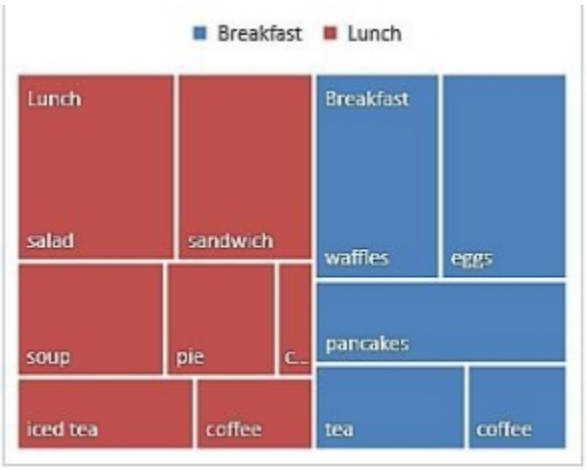


Sunburst Charts

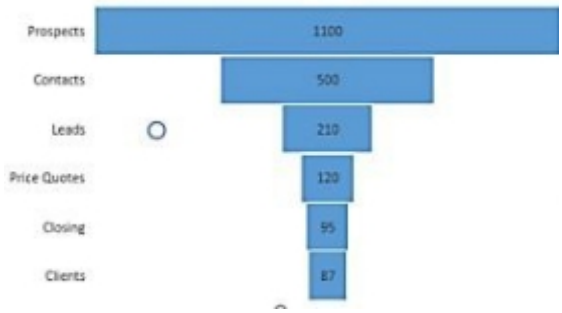
- Highlight your data
- Navigate to the option for charts which are **Hierarchical**
- Select **Sunburst** charts



Treemap Charts

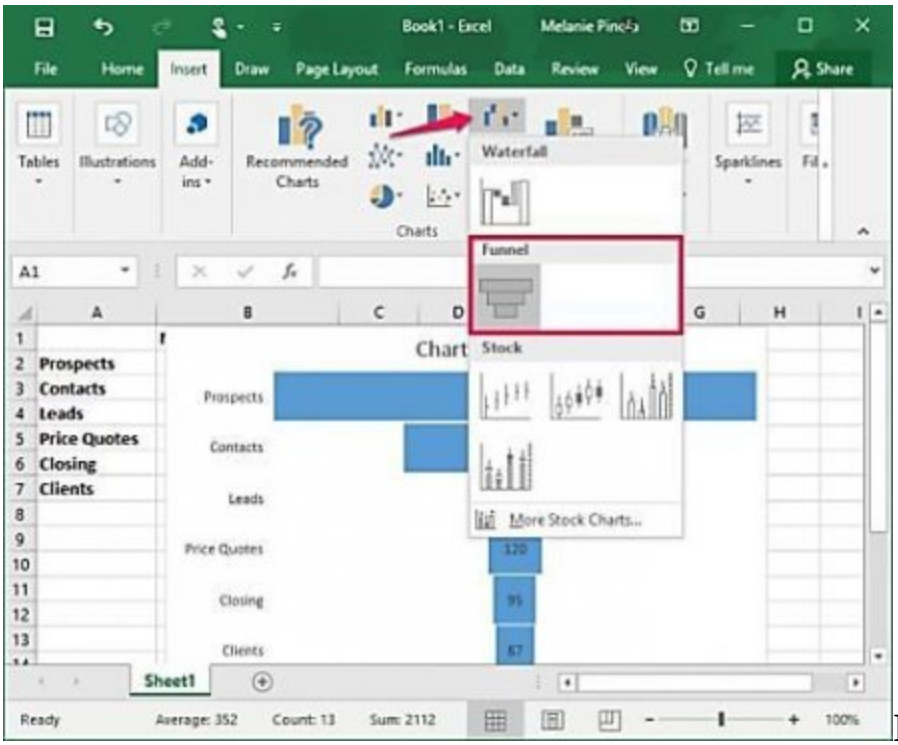


- Highlight your data
- Navigate to the option for charts which are **Hierarchical**
- Select **Treemap** charts



Funnel Charts

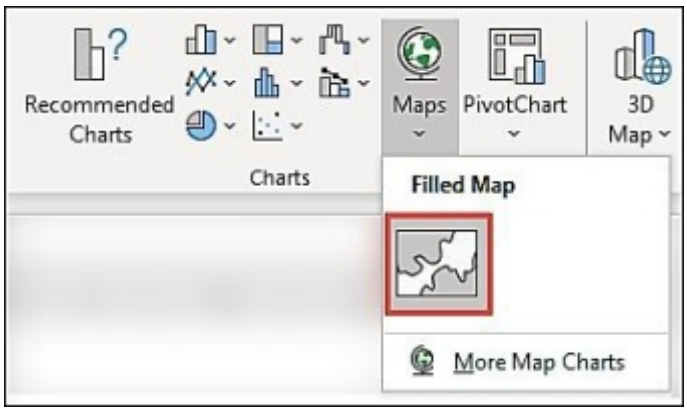
- Highlight your data
- Navigate to the icon for **Waterfall** charts
- Select **Funnel** charts



Map

Charts

- Select your data
- Navigate to the **Maps** option and select **Filled Maps**



Summary

Charts in Excel enhance visualization and representation of data in an easily comprehensible format. This chapter discussed charts and their elements, as well as how these charts can be customized,

modified, and managed. The various types of charts available in Excel were examined, alongside how these charts can be inserted into your worksheet.

CHAPTER 12- CREATING EXCEL CHARTS WITH ADVANCED TECHNIQUES

CHOOSING CHART ELEMENTS

Chart elements were introduced in the previous chapter. They are parts of a chart that adds information when inserted. They can be added and removed.

- **With the Mouse**

Chart elements can be selected with the mouse simply by clicking on them. To confirm that the selection was done, a resizing box appears around it. Also navigating to the chart element selection group in the **Format** menu shows your current selection of a chart element. Also, hovering your mouse over charts shows you the name of the chart element.

- **With the Keyboard**

The arrow keys are all you need to select elements of a chart with your keyboard. Selection can be confirmed using the chart element selection group in the ribbon.

Controls of the Chart Elements

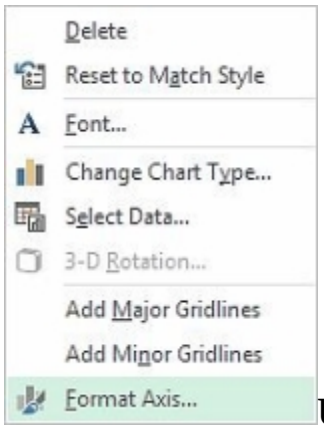
Right-clicking on a chart brings up the chart shortcut menu that contains a drop-down menu of this list of the element present in the chart. It also shows the current element selected. Use this drop-down menu to select any of the present chart elements.

EDITING ELEMENTS IN A CHART

Using the Format Menu

- Navigate to the **Format** menu

- Select any element of your chart from the corresponding drop- down menu in the chart element selection group.
- Select the option to format the selection below this dropdown menu

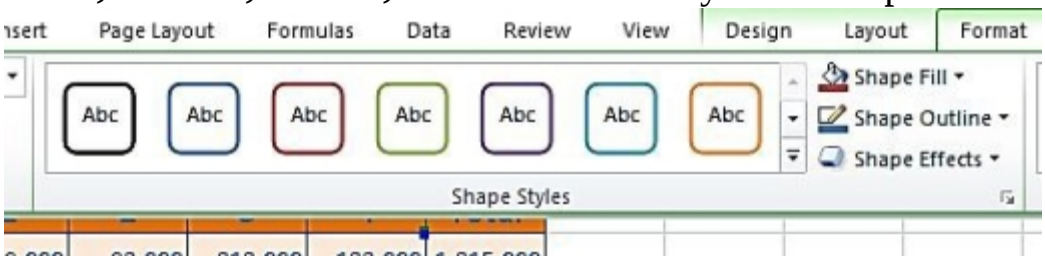


Using Customization Buttons of the Chart These buttons are present beside the chart. They provide a quick and navigation to select chart elements and also format the chart.

Using the Ribbon Menu

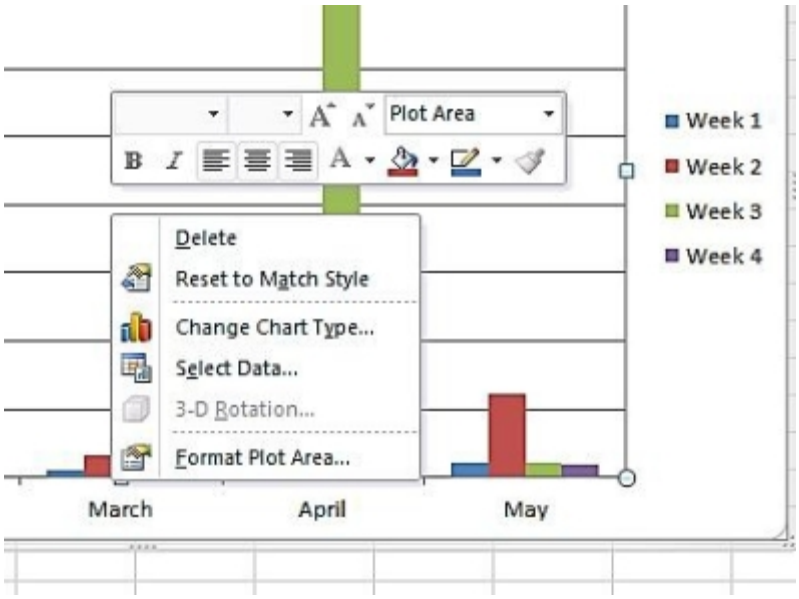
- Select a chart element
- Navigate to the ribbon menu and select formatting options such as

Fill, Outline, Effects, and also various styles for shape.



Using the Mini Toolbar

Make a right-click on a chart element and select the format option from the pop-up menu.


Plot Area
Delete
Reset to Match Style
Change Chart Type...
Select Data...
3-D Rotation...
Format Plot Area...
Week 1
Week 2
Week 3
Week 4
March
April
May

CONFIGURING THE AREA OF A CHART

- Select the area of the chart either from the chart or from the

Format menu

- Click on the option to format the selection and configure it as desired

CONFIGURING THE PLOT AREA OF A CHART

- Select the plot area of the chart either from the chart or from the

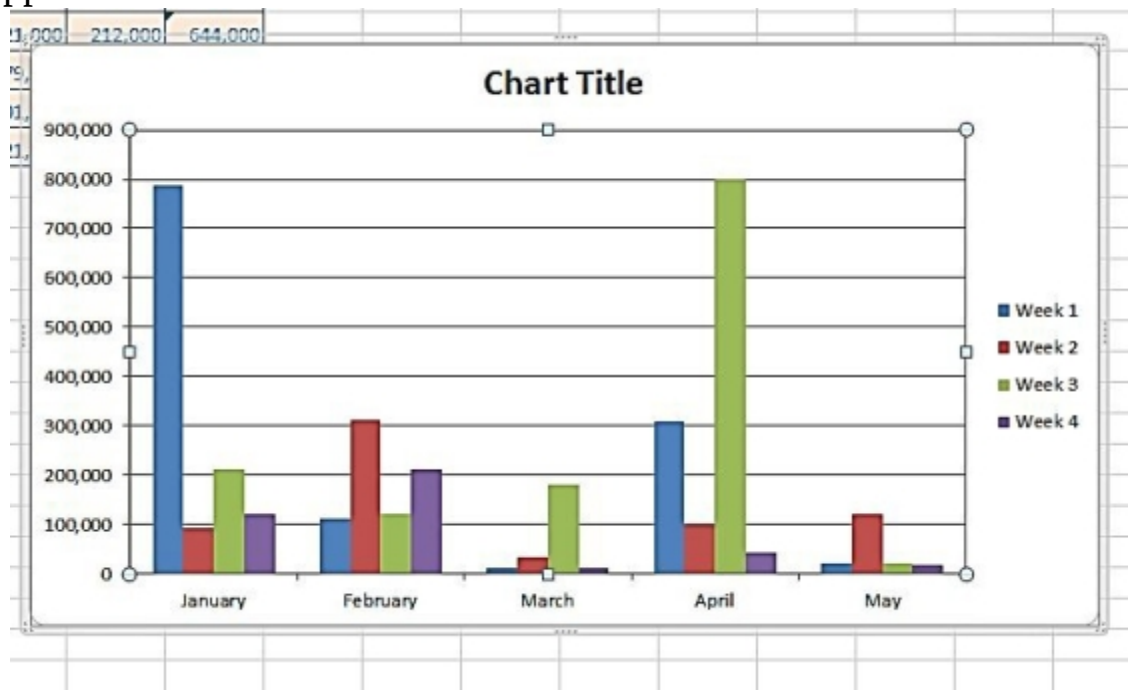
Format menu

- Click on the option to format the selection and configure it as desired

EXCEL CHART TITLES Chart titles describe what a chart represents. They can be added and removed.

- Add chart titles by navigating to the **Design** menu

- Select the layout option for charts and click to add elements to your chart
- Select the option for **Chart Titles** and type in a title in the box that appears



Edit chart titles by right-clicking on the **Chart Title** box and selecting the **Format** option.

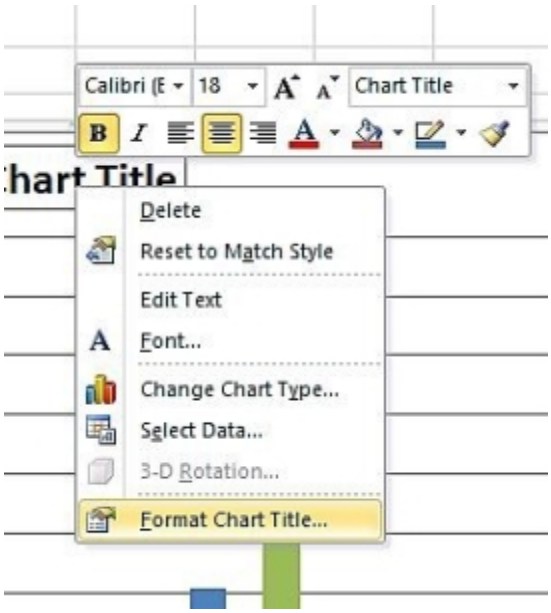
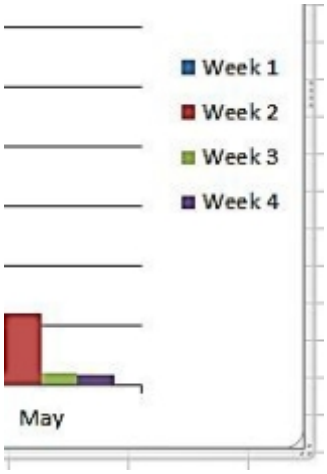


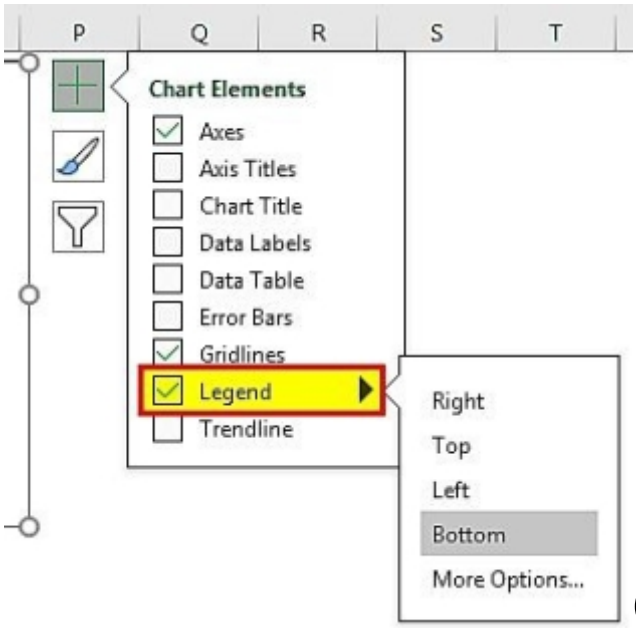
Chart titles can be removed by deselecting them from the list of added chart elements. You can also right-click on the chart title and then select the **Delete** option.

EXCEL CHART LEGENDS

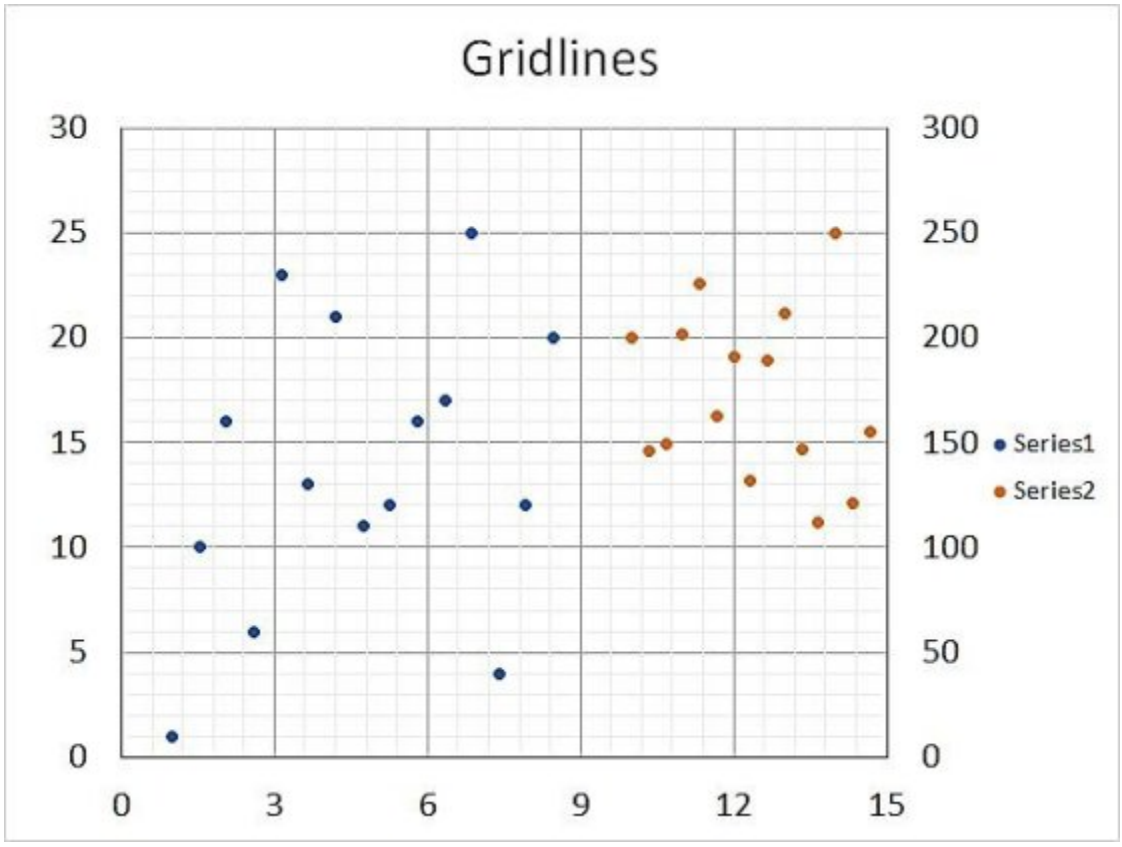
Legends add more details in charts. When multiple data are having similar representations, legends are used to differentiate them, especially with color codes.



Legends can be added and removed from your chart by selecting or deselecting them on the chart element list. Their positions can also be changed similarly. You can also use the **Design** menu to access and perform these operations on chart legends. Further settings and configurations can be done by selecting the tab for additional options.



GRIDLINES IN EXCEL



CHARTS

Gridlines add more detail and precision to charts. They can be added and configured by selecting them on the chart element list.

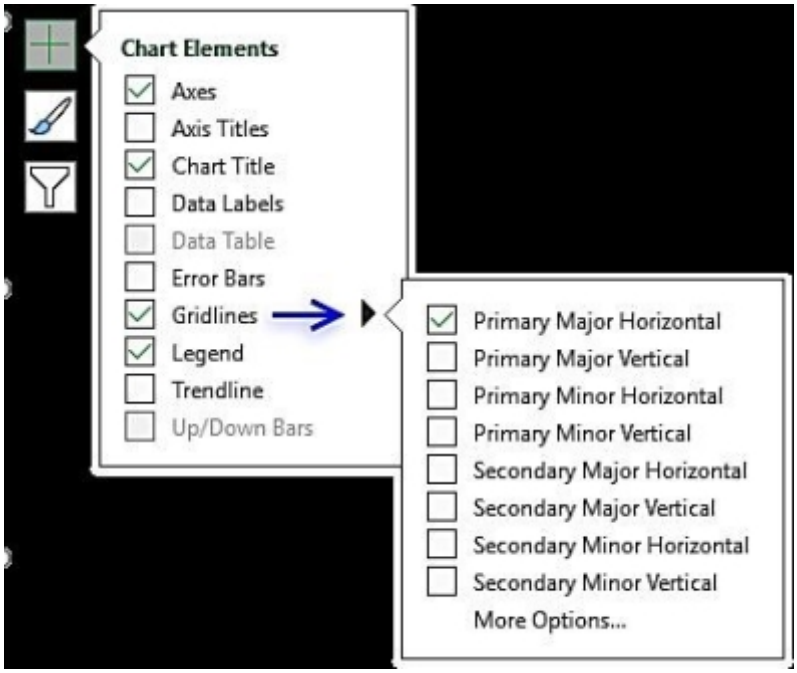
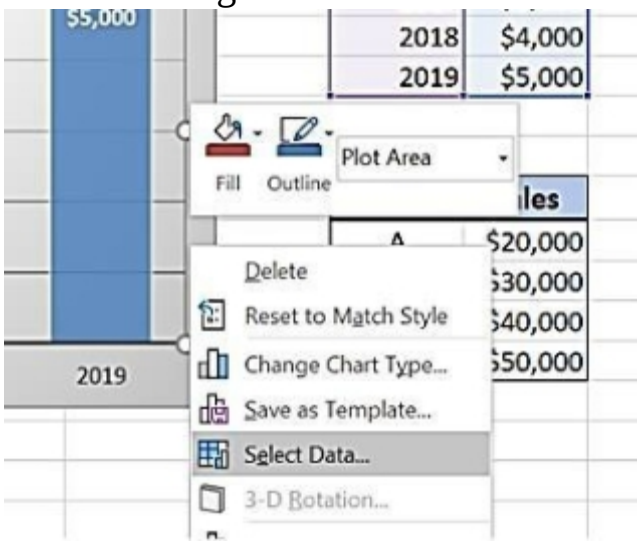


Chart Elements
Axes
Axis Titles
Chart Title
Data Labels
Data Table
Error Bars
Gridlines
Legend
Trendline
Up/Down Bars
Primary Major Horizontal
Primary Major Vertical
Primary Minor Horizontal
Primary Minor Vertical
Secondary Major Horizontal
Secondary Major Vertical
Secondary Minor Horizontal
Secondary Minor Vertical
More Options...

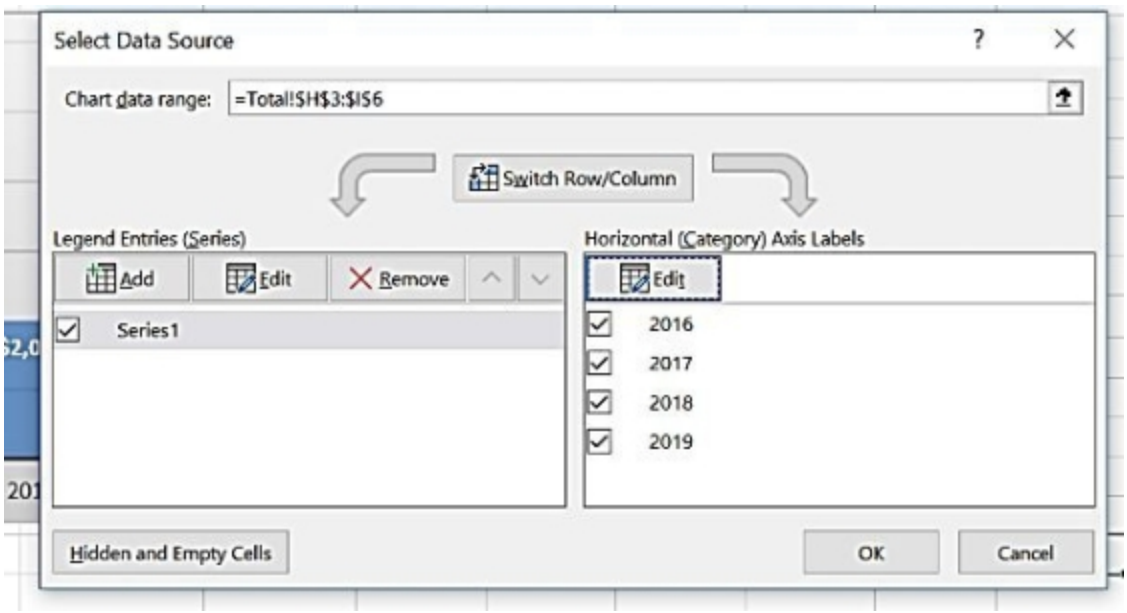
FORMATTING EXCEL CHART AXIS

Editing the Value and Category Axis To edit a chart's X or category axis values:

- Make a right-click on the chart and choose the option to **Select Data**



- Click on the button to **Edit** the horizontal axis in the resulting dialogue box



• Select or enter the cell range containing the new values for the axis and click on the **OK** button

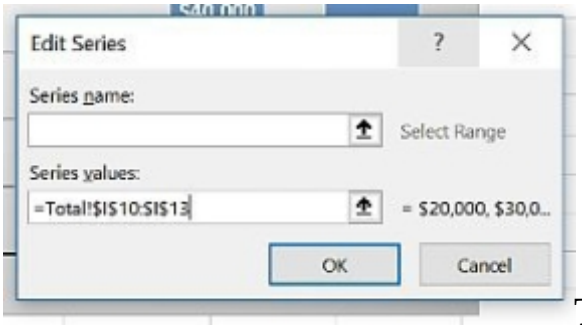
To edit a chart's Y or series axis values:

• Make a right-click on the chart and choose the option to

Select Data

• Click on the button to **Edit** the values for the vertical series in the resulting dialogue box

• Select or enter the cell range containing the new values for the axis and click on the **OK** button



To configure the axis intervals:

- Select and right-click on the axis to be edited
- Select the option to **Format** the axis
- Edit the values for the axis minimum and maximum entries

CHART DATA SERIES

Hiding or Removing a Data Series in Charts

- Select the option to **Filter** your chart

- In the **Value** menu in the resulting dialogue box, deselect the data you wish to hide or remove

- Click on the **Apply** button

Inserting Data Series in Charts The **Select Data** dialogue can be used for this procedure as previously explained in how to edit the values for your axis. **SWITCHING SERIES DATA**

Switching Data Range by Moving the Range Outline

- Highlight the chart

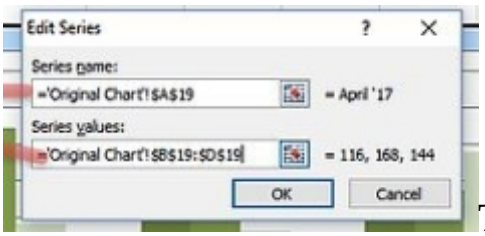
- Select the range of the new data and drag it to the chart **Switching Data Using the Dialogue Box for Editing Series and the Formula for the Series**

- Make a right-click on the chart and choose the option to

Select Data

- Click on the button to **Edit** the values for the vertical series in the resulting dialogue box for the editing series

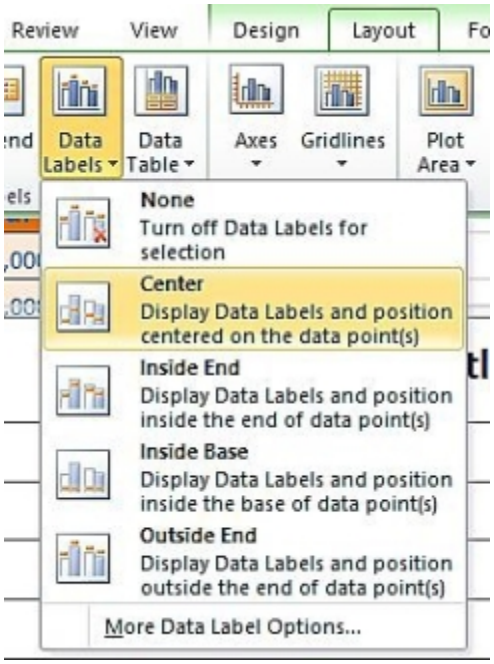
- Select or enter the cell range containing the new values for the axis and click on the **OK** button



The series formula can be edited in this dialogue box:

SHOWING LABELS OF DATA IN CHARTS

- Select the chart
- Navigate to the **Layout** menu and select the button for **Labels**



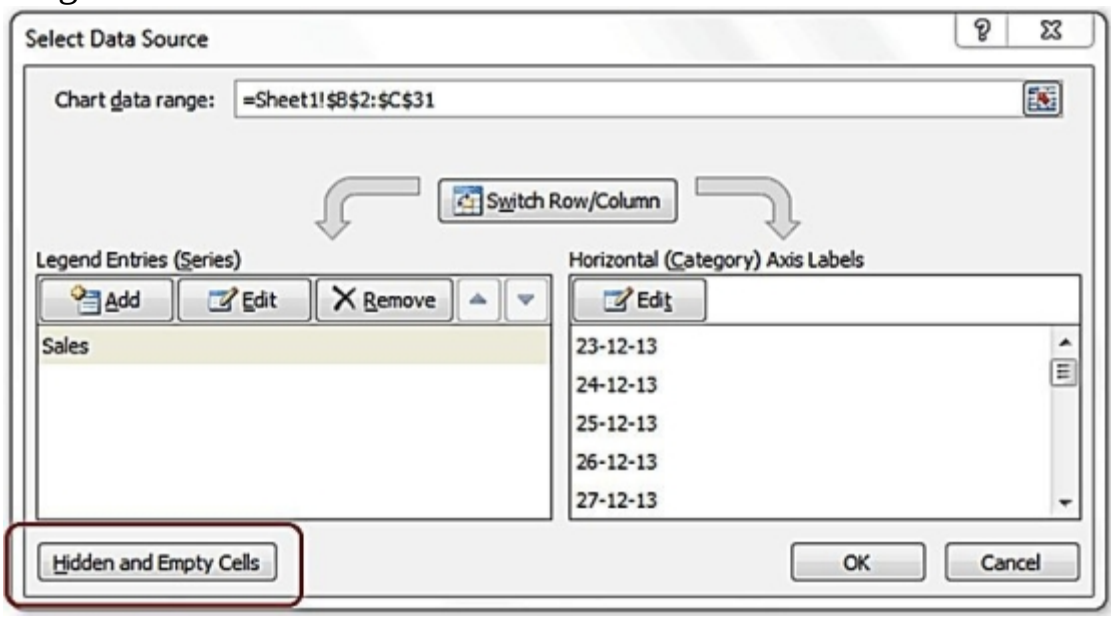
- Click on this button and select a position for the label from the menu

MANAGING LOST DATA IN EXCEL CHARTS

- Make a right-click on the chart and choose the option to

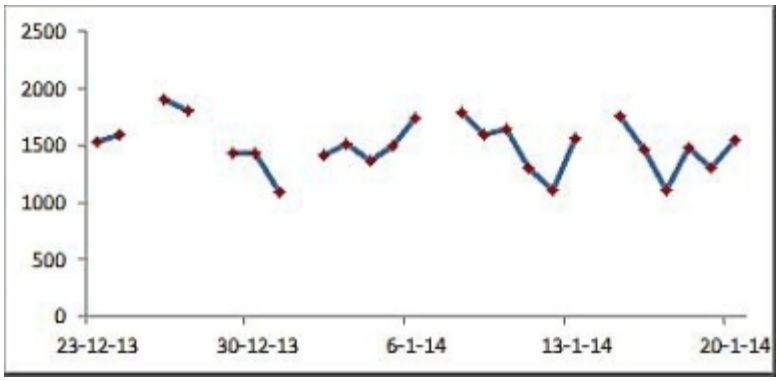
Select Data

- Select the option for **Hidden Cells** at the base of the resulting dialogue box



Excel has three ways to manage omitted data, these are:

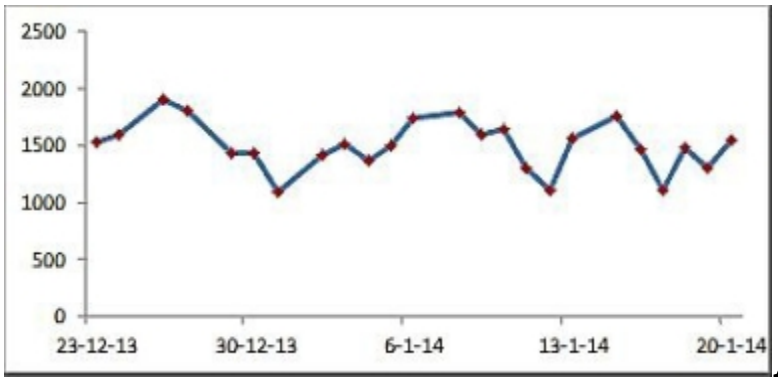
- Gaps



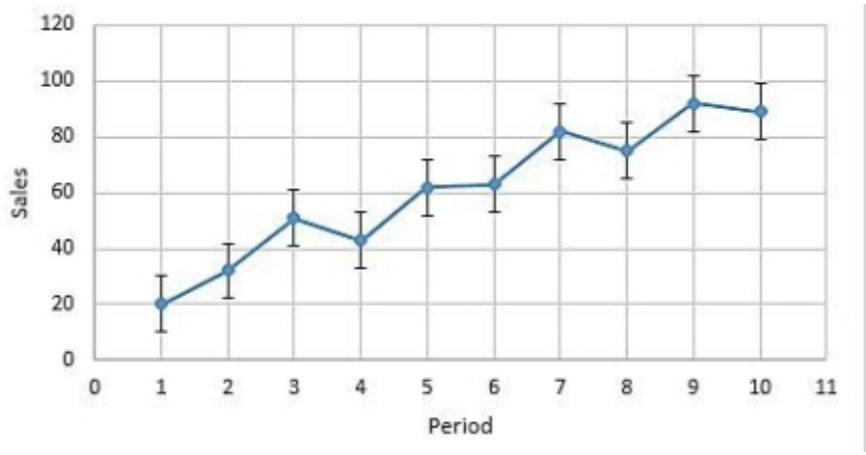
•

Zeros

- Line connection of data points

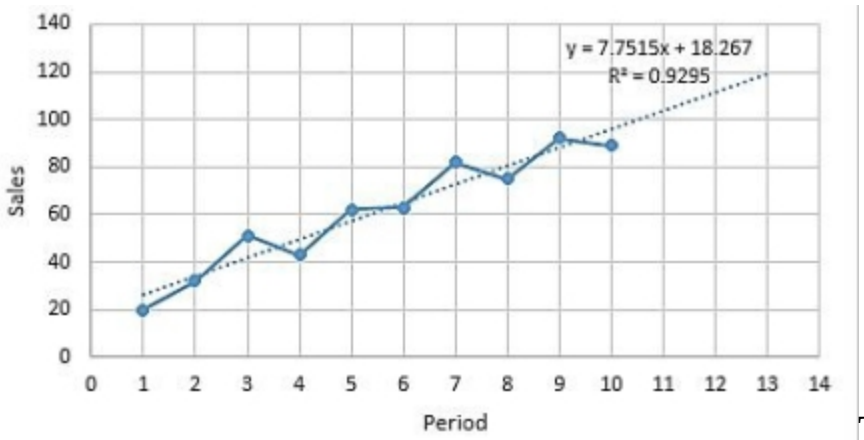


ADDING ERROR BARS AND TRENDLINES IN EXCEL CHARTS



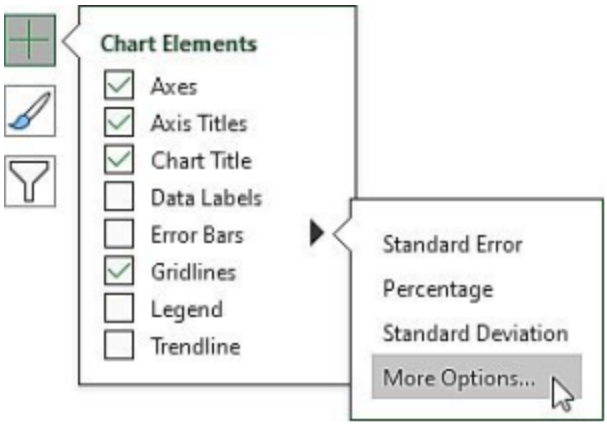
Error Bars:

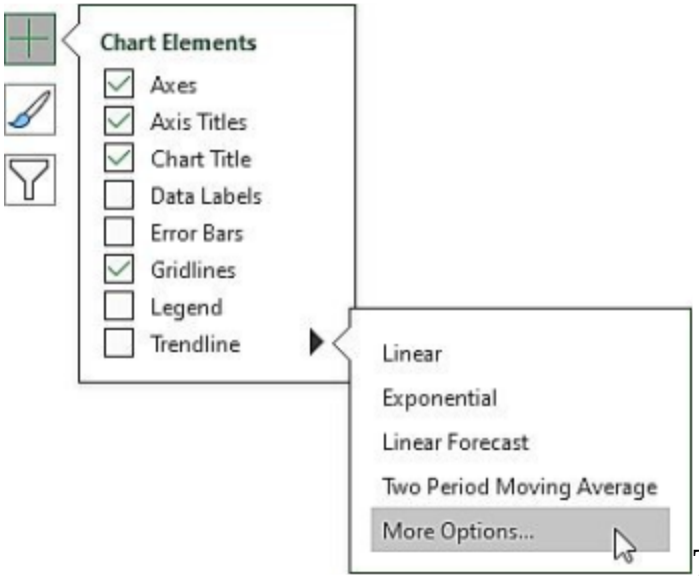
Trendlines:



These can be added by clicking on the **Chart Element** button or the + icon beside charts and then selecting from the provided list.

To select Error Bars:

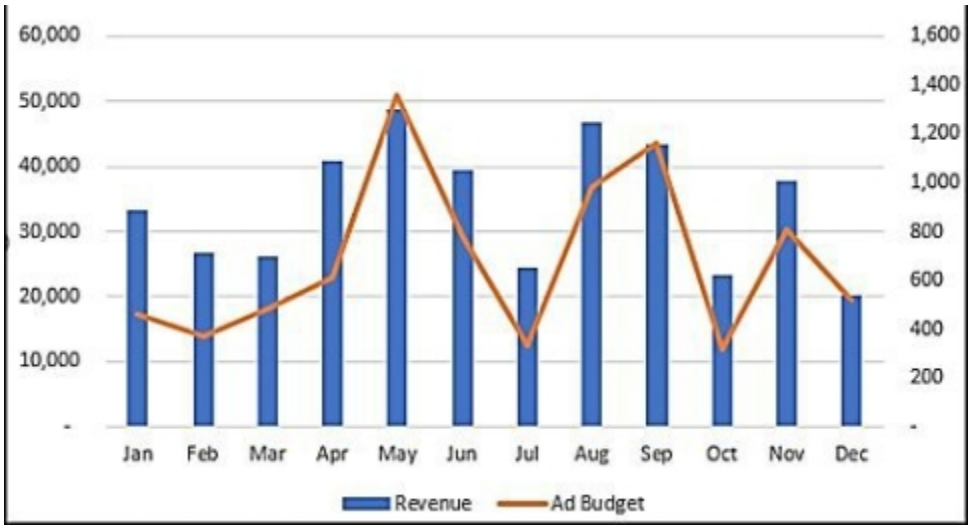




To select trendlines:

DESIGNING

COMBINATION CHARTS



These charts bring together different data sets in one chart for easy comparison and visualization. To create combination charts:

- Highlight your data

- Navigate to the ribbon menu and select the option for a **Combo Chart**

Existing charts can also be changed to combination charts following these steps:

- Select and right-click on your chart

•

Choose the option to edit the series chart

- Select the **Combo** option from the left menu
- Tick the box beside the second drop-down menu

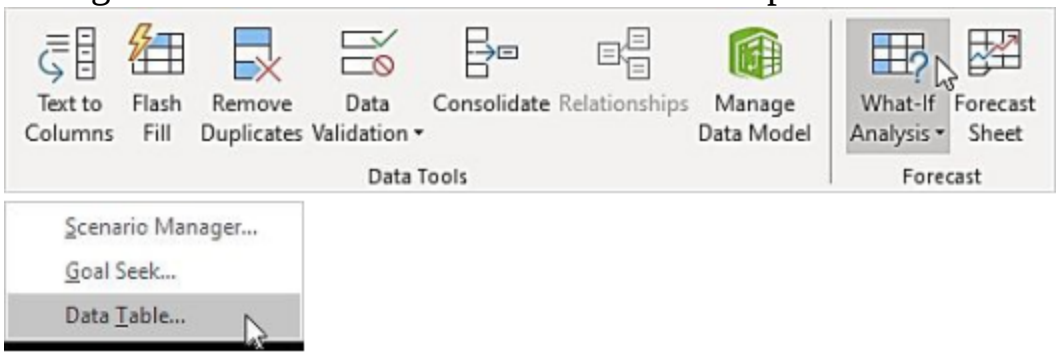
- Select the second drop-down menu and select the option for a line chart

- Click on **OK**

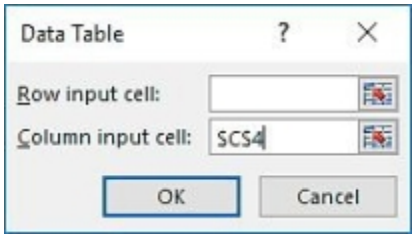
SHOWING TABLES OF DATA

- Select your data for which the table of data would be created

- Navigate to the **What if** button and select the option for a table of data



- Enter the cell range where the table would be inserted



- Select the **OK** button

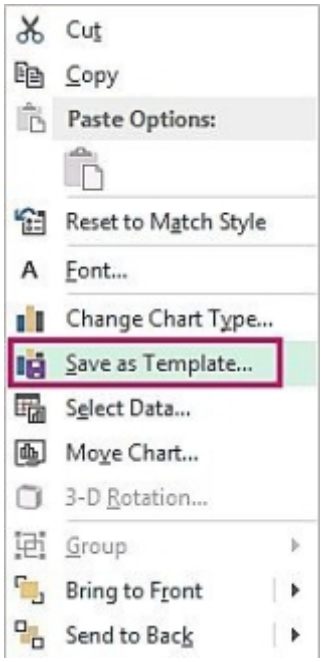
10		
11		
12		$3,800
13	60%	$3,800
14	70%	$4,100
15	80%	$4,400
16	90%	$4,700
17	100%	$5,000
18		

DESIGNING TEMPLATES

FOR EXCEL CHARTS

- Right-click on the chart you create, customized, and wish to save as a template

- Select the option to save the chart as a template



- In the **Save** dialogue box, enter a name for the template and select the **Save** button.

Summary

This chapter explained the various ways to insert elements in your chart and also modify them. Configuration of the chart and plot area, using chart titles, legends, gridlines, and axis were also examined.

Editing the plotted data series, the inclusion of additional information in your chart, and also turning your edited chart into a template you can use at any time can also be done with Excel charts

CHAPTER 13 - USING SPARKLINES IN EXCEL

Sparklines are similar to trendlines. They look like simple lines without the whole chart background, making them easy to include in

worksheets.

TYPES OF SPARKLINE

•

Line sparkline

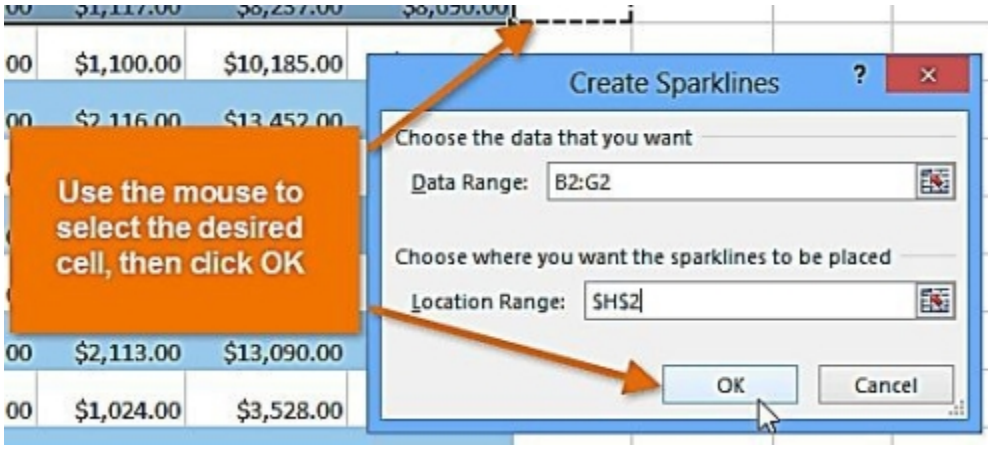
- Column sparkling

- Win or loss sparkline

HOW TO CREATE SPARKLINES

- Highlight your data
- Navigate to the **Insert** menu and select the **Lines** option in the **Sparklines** group

- Enter necessary cell ranges in the **Sparkline** dialogue box and select the **OK** button.



CONFIGURING EXCEL SPARKLINES

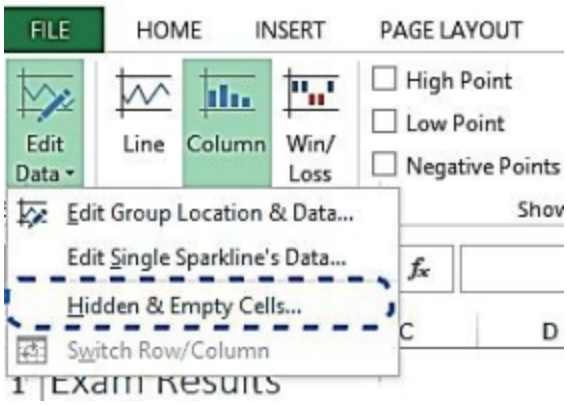
Adjusting Size of Sparklines

- Select the cell containing the sparkline and drag to cover additional cells

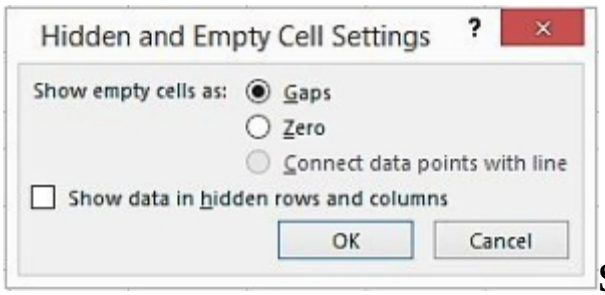
- Navigate to the ribbon menu and select the **Merge** option for a better look

Managing Missing Data in Sparklines

- Select the sparkline
- Navigate to the **Design** menu and select the **Edit** option
- Select the option for missing data on the drop-down menu

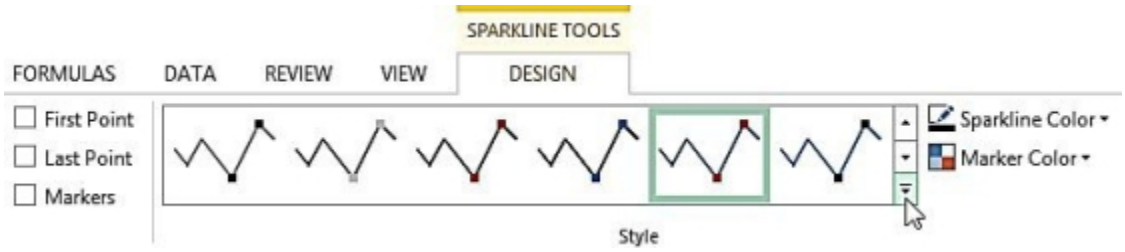


- In the resulting dialogue box, select how you want the missing data to be represented



Switching Sparkline Style

- Select the sparkline
- Navigate to the **Design** menu and select the style of sparkline desired



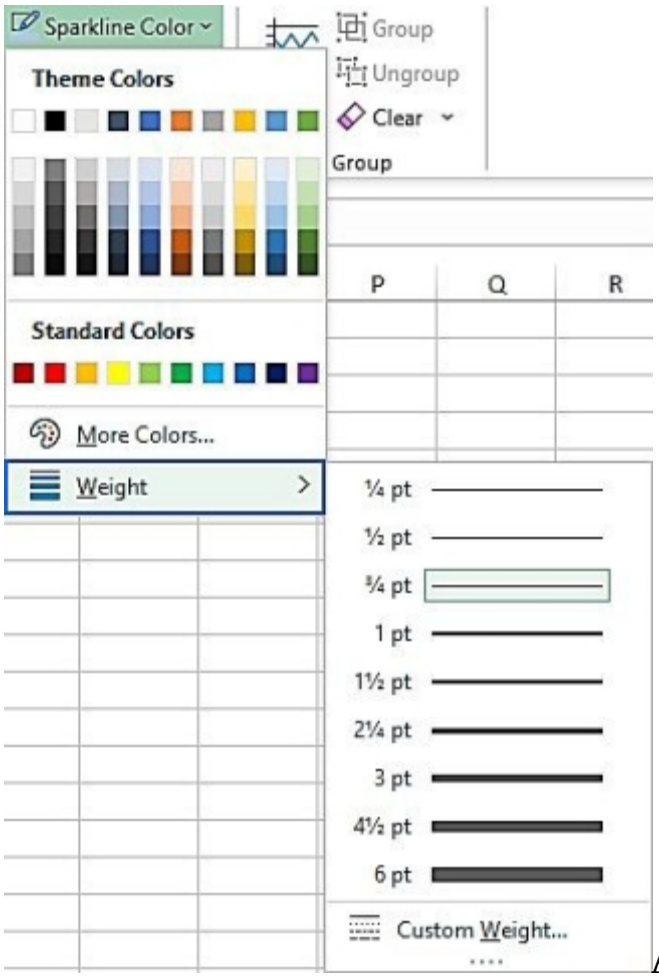
Switching Sparkline Type

- Select the sparkline

- Navigate to the **Design** menu and select the type of sparkline desired

Customizing Color and Weight of Sparklines

- Navigate to the options list beside the **Styles** group and select the color option
- Select the option to configure the sparkline weight below the color choices

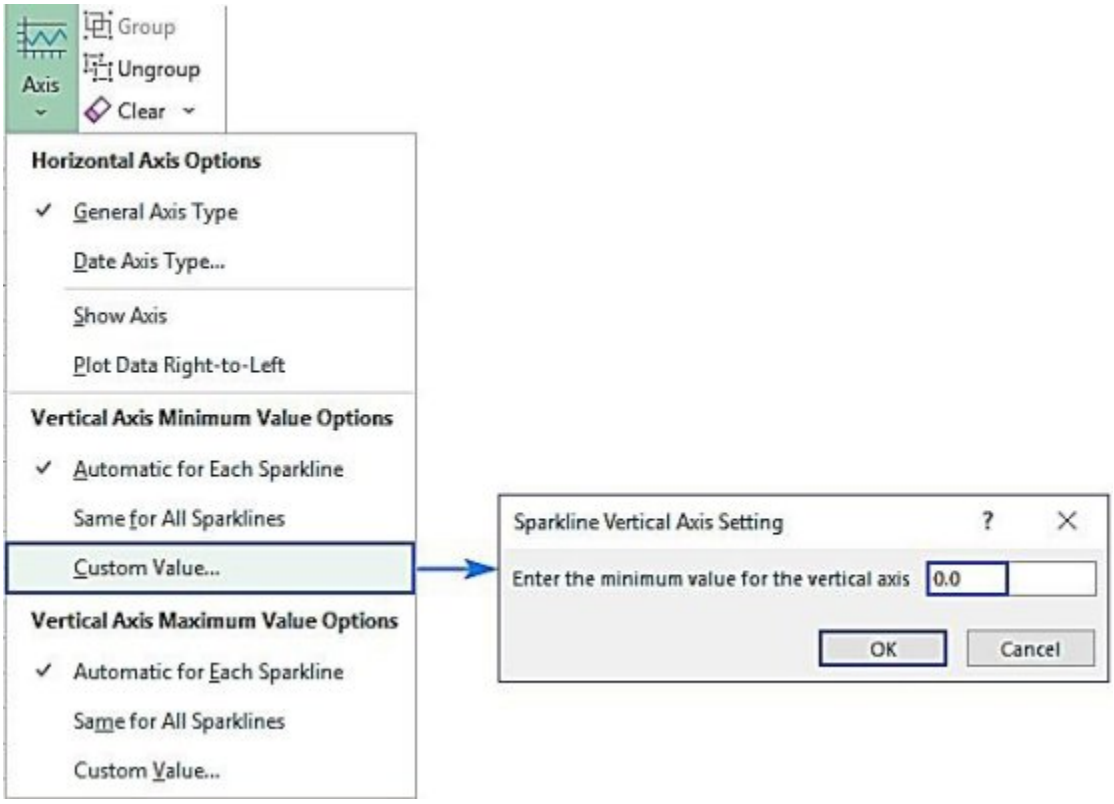


Adding Markers to Sparklines

Navigate to the group for **Show** in the **Design** menu and select any of the boxes

Configuring the Sparkline Axis

- Select the sparkline
- Select the option for **Axis** in the **Design** menu
- Choose the option to customize the axis values

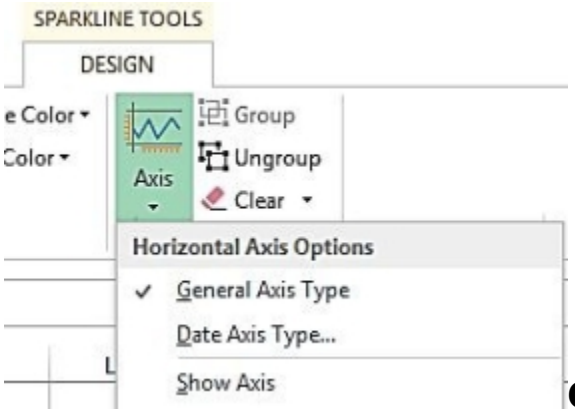


- Enter a value in the resulting dialogue box and click on the **OK**

button

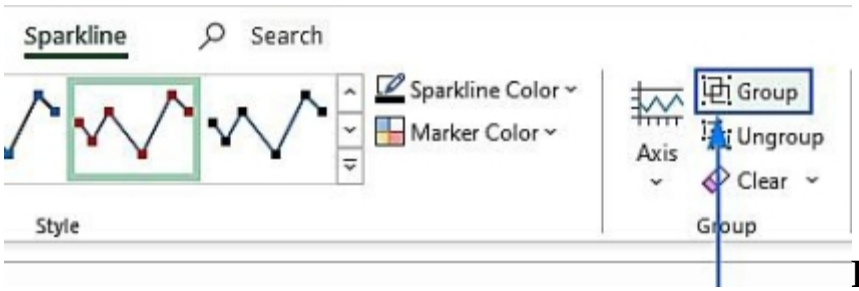
Faking a Line of Reference in Sparklines

Select the option to display the axis in the **Axis** drop-down list from the **Design** menu



Grouping and Un-grouping Sparklines

- Highlight multiple sparklines
- Select the option to **Group** or **Ungroup** them in the **Design** menu

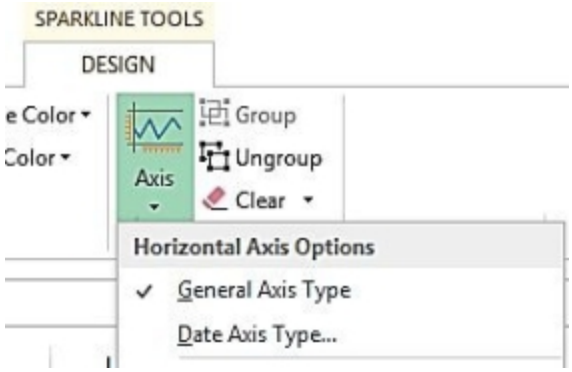


Removing Sparklines

- Highlight the sparkline to be deleted
- Select the option to clear the sparkline from the **Design** menu

INDICATING DATE AXIS IN SPARKLINES

Select this option for the date axis in the **Axis** drop-down list from the **Design** menu. The date axis is used for indicating inconsistent time ranges in a data set.



SETTING SPARKLINES

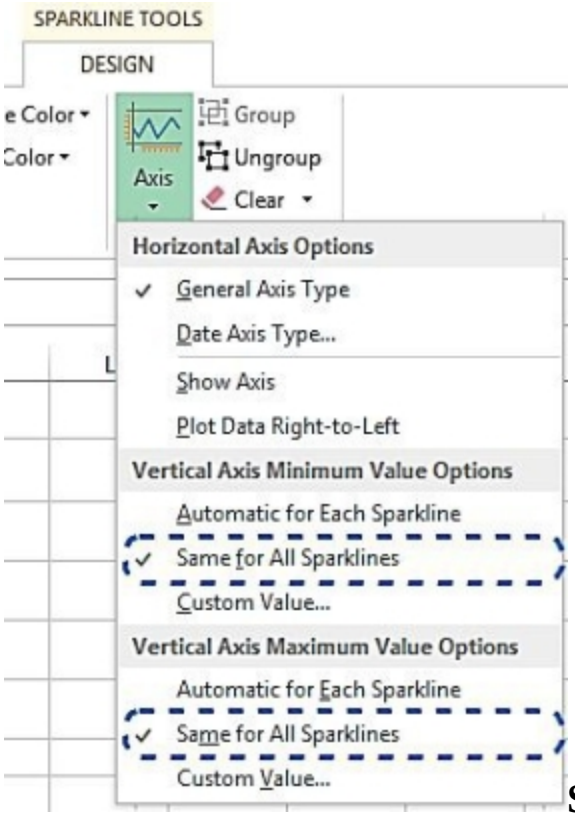
TO AUTO-UPDATE

Sparklines do not need any configuration to auto-update. They immediately and automatically adjust themselves to correspond to input data.

SETTING RANGES THAT ARE DYNAMIC IN SPARKLINES

- Navigate to the **Axis** drop-down list in the **Design** menu

- Select the option to set identical axis values for both horizontal and vertical options



Summary

This chapter focused on sparklines, how they can be added, styled, and configured. Sparklines give additional and graphic details to data changes in data sets. They are easier to visualize and understand as they can represent single data in their respective columns.

CHAPTER 14 -DATA ANALYSIS USING CUSTOMIZED SHAPES AND NUMBER FORMATS

Number formats define and specify how Excel should treat your numeric data. Rather than using plain numbers, number formatting indicates what each number represents, percentage, currency, etc.

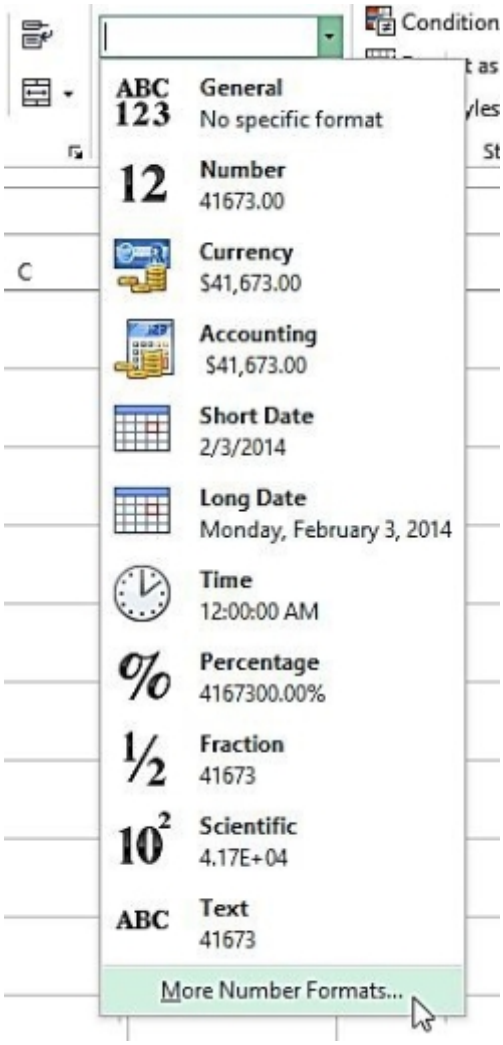
NUMBER FORMATTING IN EXCEL

Using Keyboard Shortcut Keys

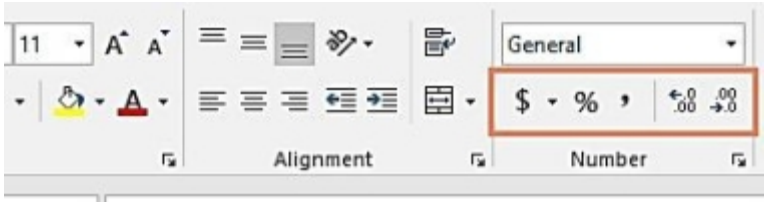
Ctrl + Shift + ~ keys to apply the General number format
Ctrl + Shift + 1 keys to apply the Number format
Ctrl + Shift + 2 keys to apply the format for Time
Ctrl + Shift + 3 keys to apply the format for the date, etc.
Using the Dialogue Box for Formatting Numbers

- Navigate to the **Home** menu and select the drop-down in the

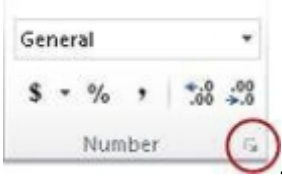
Number menu group



- The few quick available options below the drop-down can also be used



- The icon for the **Number** dialogue box can also be clicked to access more options for configuration



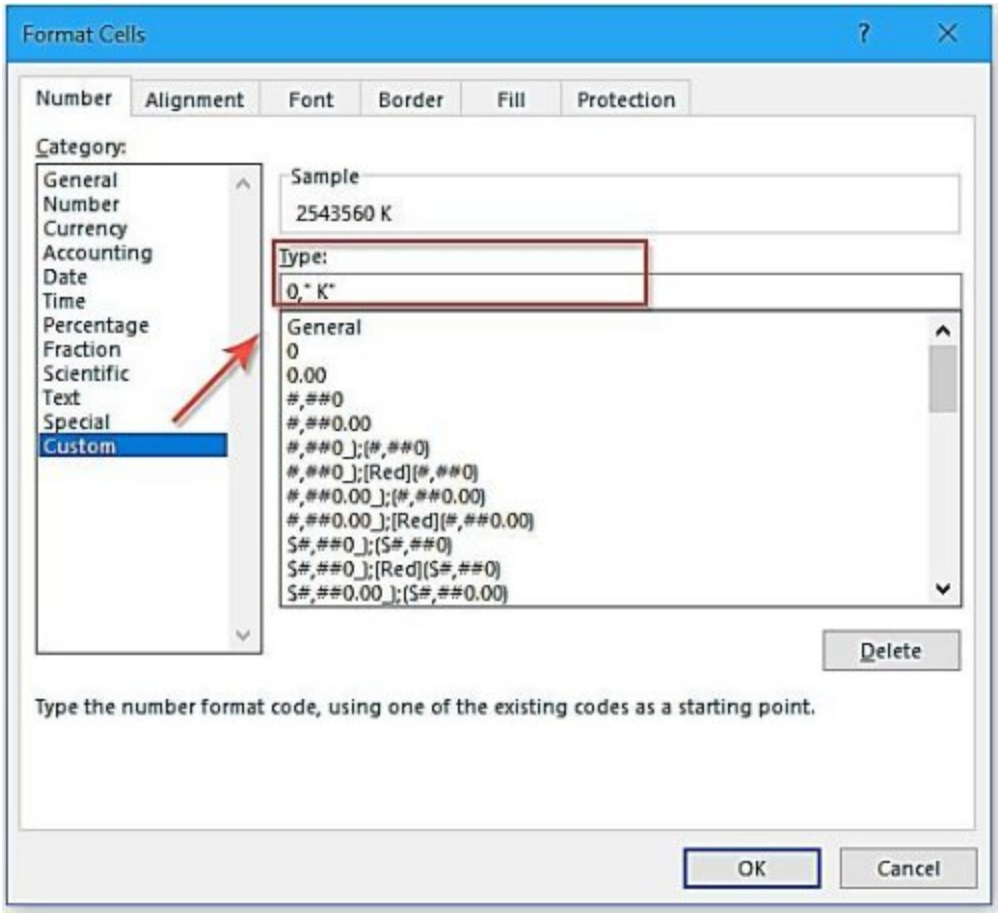
ADDITIONAL FORMATTING IN CUSTOM

NUMBERS

Configuring Numbers in Millions and Thousands When in the dialogue box for formatting numbers, select the option for **Custom** numbers.

In the provided box, enter the following:

- 0, “K” for formatting numbers in thousands
- 0,,“M” for formatting numbers in millions
- 0,,,“B” for formatting numbers in billions



Removing and Hiding Zeros

- Navigate to the **File** menu and select **Options** from the left tab
- Select **Advanced**

•

Deselect the box to show zeros in the options for **Display**

- Select **OK**

Applying Colors to Custom Numbers

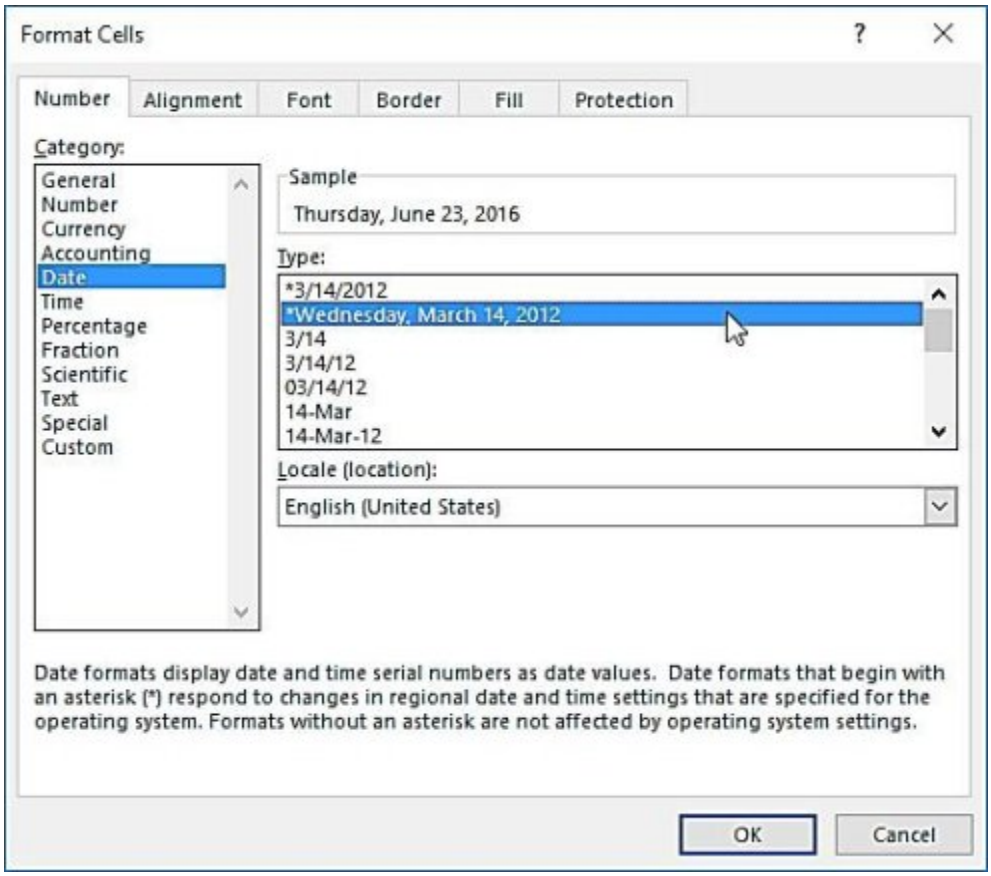
A list of specified colors is provided in Excel to include when configuring custom numbers, these are:

Black, Green, White, Blue, Magenta, Yellow, Cyan, Red

These colors must be in parenthesis when using them to format custom numbers. An example includes:

[Blue]$#,##0.00; [Red]-$#,##0.00; [Black]”-“; [Magenta]@

Formatting Excel Date and Time Select the option for **Date** in the dialogue box for formatting numbers.

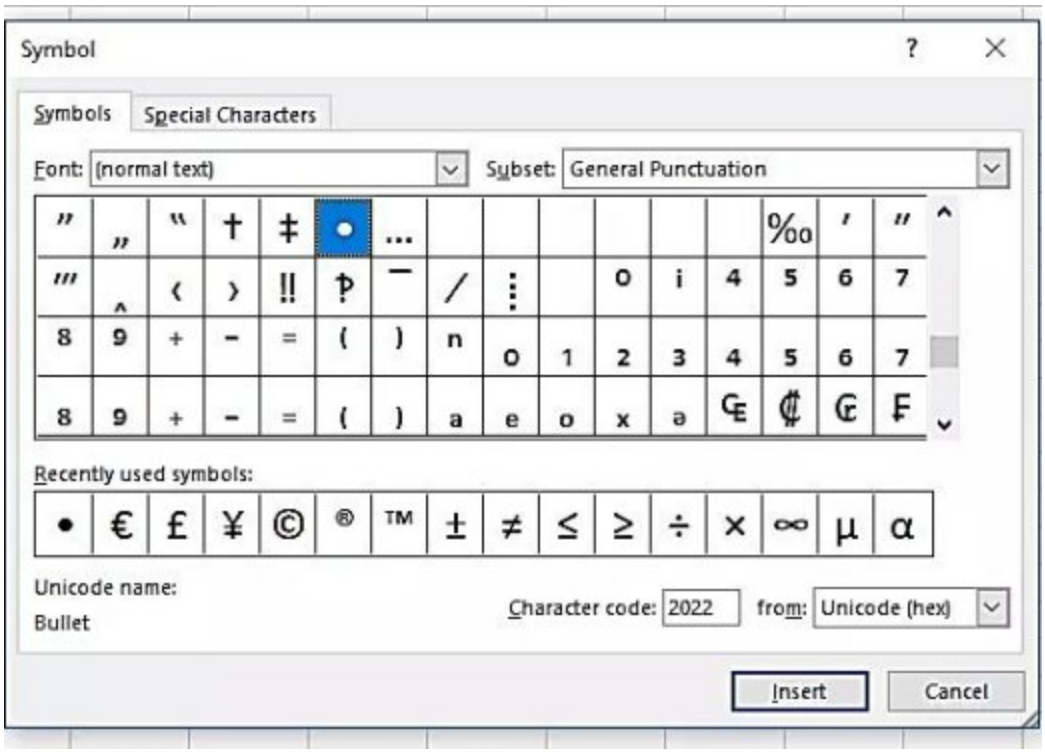

Format Cells
Number
Alignment
Font
Border
Fill
Protection
Category:
General
Number
Currency
Accounting
Date
Time
Percentage
Fraction
Scientific
Text
Special
Custom
Sample
Thursday, June 23, 2016
Type:
*3/14/2012
*Wednesday, March 14, 2012
3/14
3/14/12
03/14/12
14-Mar
14-Mar-12
Locale (location):
English (United States)
Date formats display date and time serial numbers as date values. Date formats that begin with an asterisk (*) respond to changes in regional date and time settings that are specified for the operating system. Formats without an asterisk are not affected by operating system settings.
OK
Cancel

INSERTING SYMBOLS IN DATA

- Navigate to the **Insert** menu and select the option for **Symbol** in the **Symbols** menu group

  This opens the various available symbols and special characters you can put in your data.

- Click the **OK** button after selecting your needed symbol.



Also, the **Alt** key on your keyboard can be used with any of the **Number keys** to insert common symbols.

INSERTING ICONS AND SHAPES FOR DATA GRAPHICAL REPRESENTATION

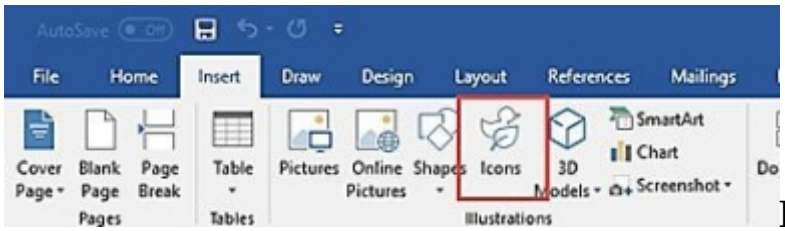
Inserting Shapes in Your Data

Navigate to the **Insert** menu and select the option to insert **Shapes**

Adding Graphics for SVG Icons

Icons can be easily added to your worksheet from the **Insert** menu. You can also add SVG (Scalable Vector Graphic) files or icons to your worksheet by selecting and inserting them from your PC's File Explorer. The technique of dragging and dropping the icons into your worksheet can also be used.

Icon list can also be accessed from the **Conditional Formatting** menu in the **Home** menu.



Editing Excel

Icons and Shapes

- Select the icon or shape

- Navigate to the **Format** menu where you can change colors, insert and edit borders, etc.

IMPROVING REPORTS IN EXCEL USING SHAPES

Designing Shapes with Containers

Add containers to your worksheet by selecting the **Container** option in the **Insert** menu. The containers can also be formatted by selecting them and using the **Format** menu

Shapes can be added to an empty container and vice versa. To add a container to an existing group of shapes:

- Select and right-click on any of the shapes

•

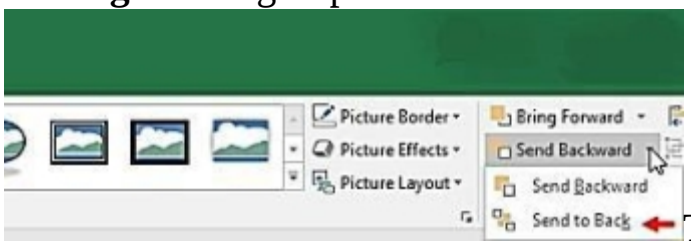
Choose the option to insert a container

• To make shapes one with the container, right-click on a shape and select the option to include it in the container.

Layering and Grouping Shapes for Space Management Selecting the shape

- Navigate to the **Format** menu and select the **Group** option in the

Arrange menu group

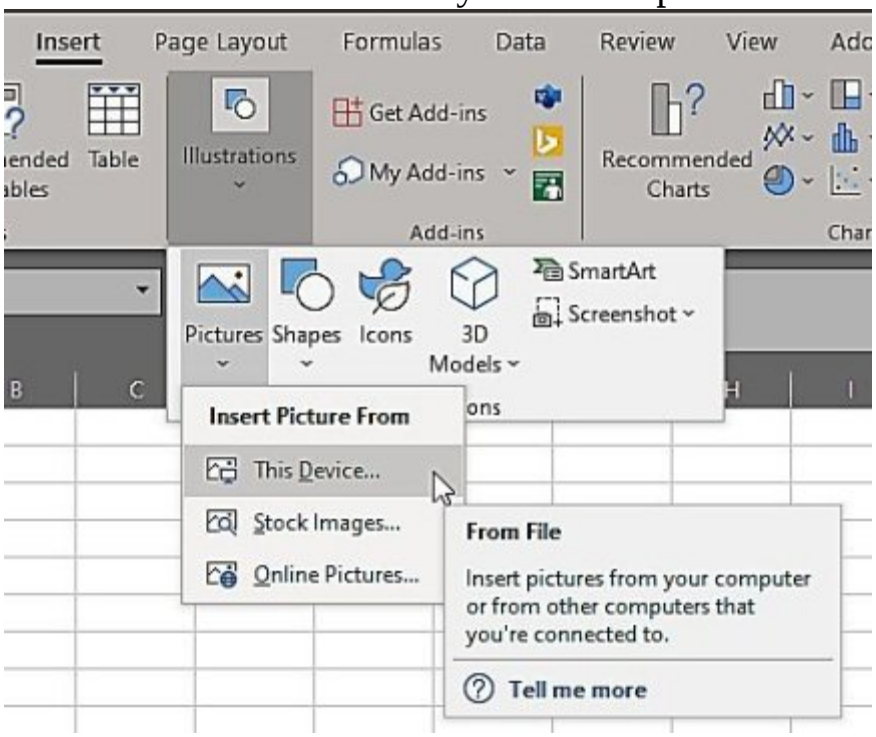


The **Arrange** menu group holds various options for organizing your shapes to improve the presentation of your worksheet. **Designing Custom Infographics Using Shapes**

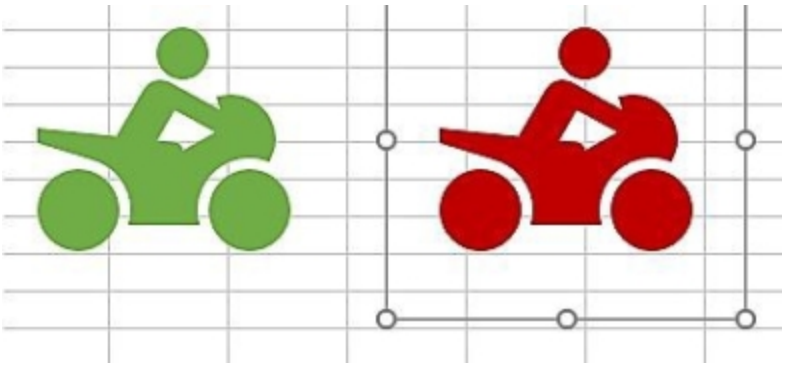
•

Prepare your data and insert a clustered column chart

• Select any cell in the worksheet that is empty and insert a shape either from the Excel menu or from your File Explorer

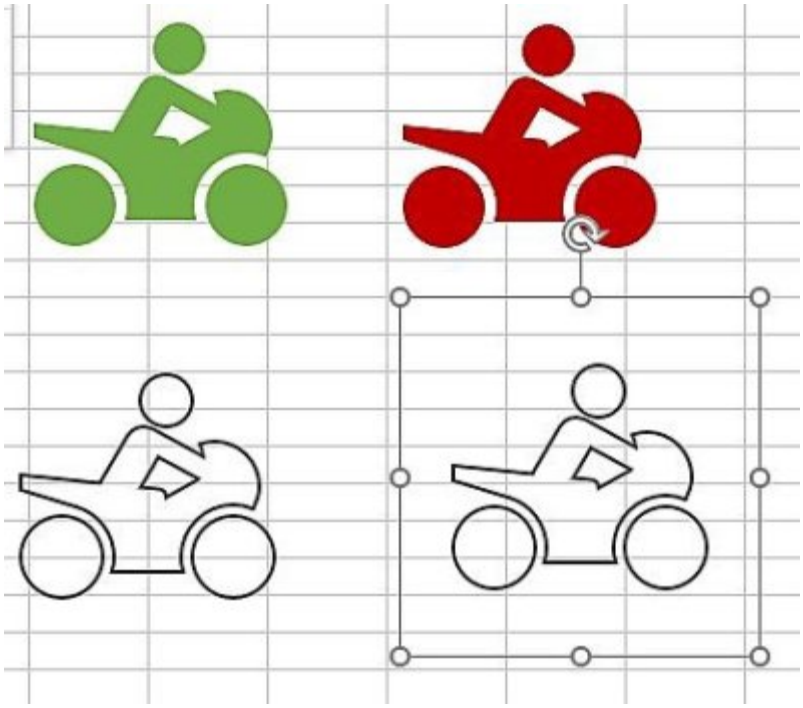


• Choose to format this shape by adding a fill color

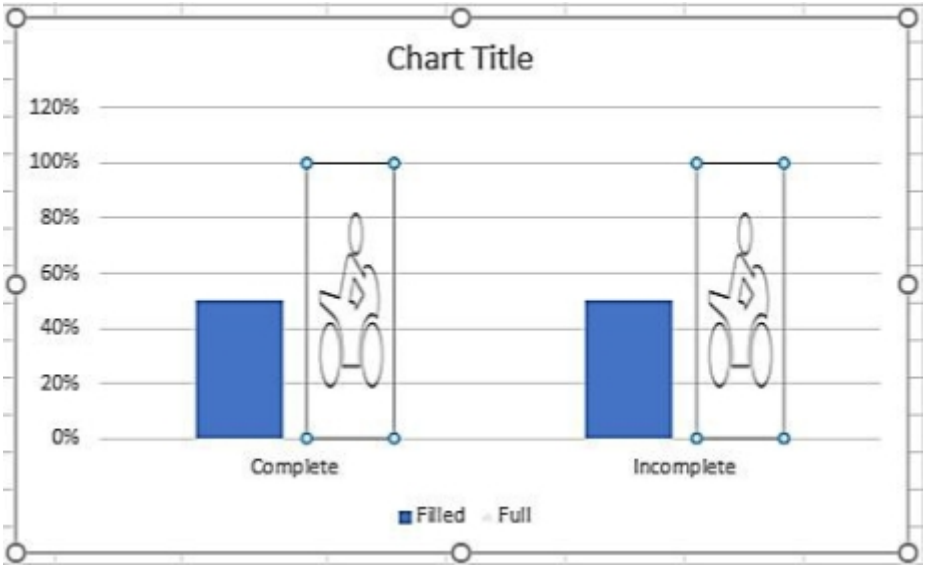


- Copy and paste this shape twice to make four shapes

- Choose to format the newly pasted shapes and select the option not to include a fill color

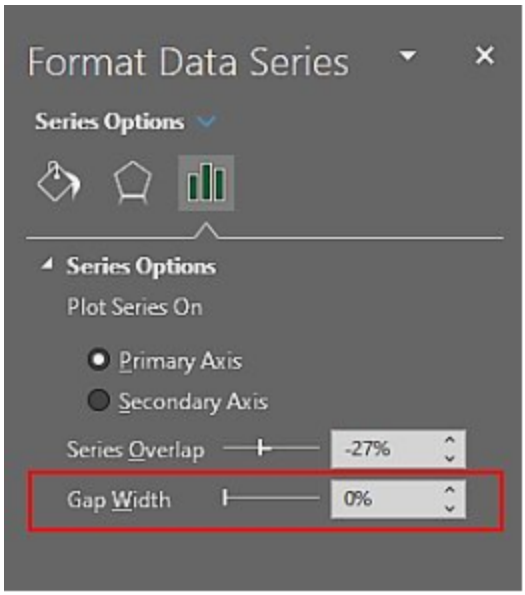


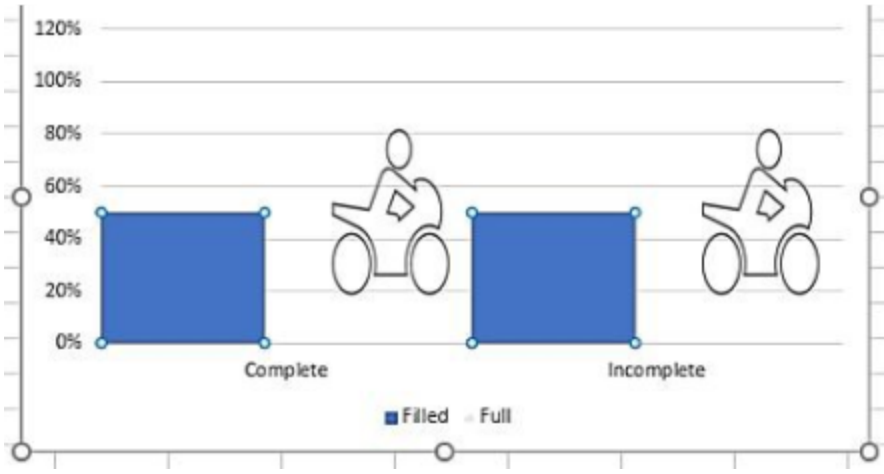
- Copy the newly formatted shapes, select the bigger bars of your clustered column chart and paste the copied shapes



- Click twice on any of the newly pasted shapes to open the **Format**

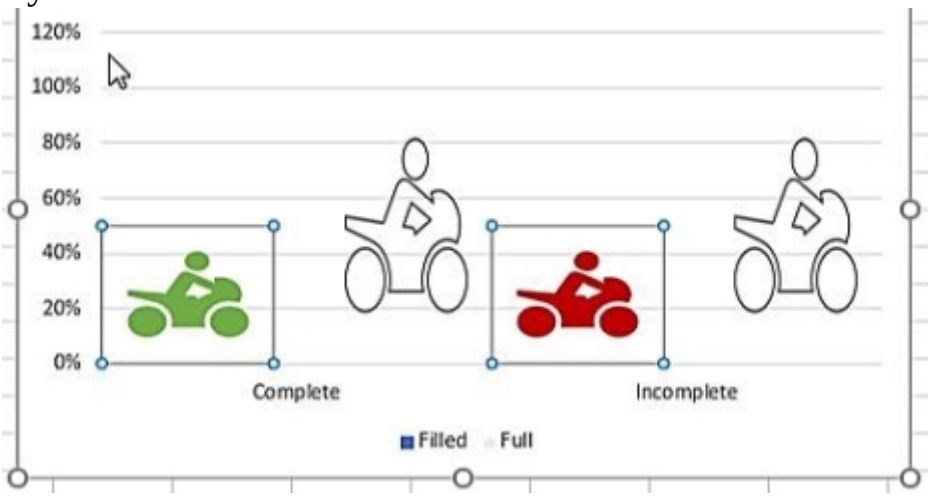
dialogue box



- 

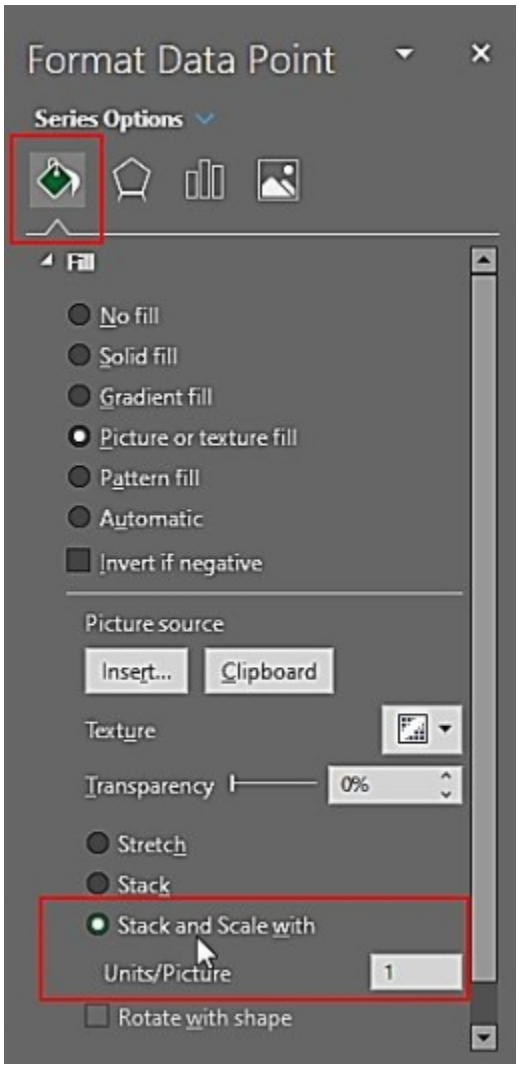
Edit the width for the gap to zero

• Copy and paste the fill colored shapes in the place of the shorter bars on your chart

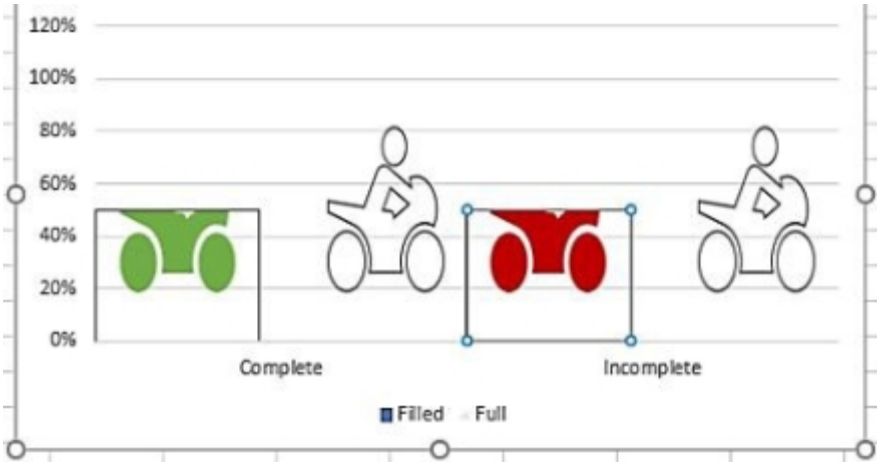


• To format this paste action, click twice on any of the newly pasted shapes

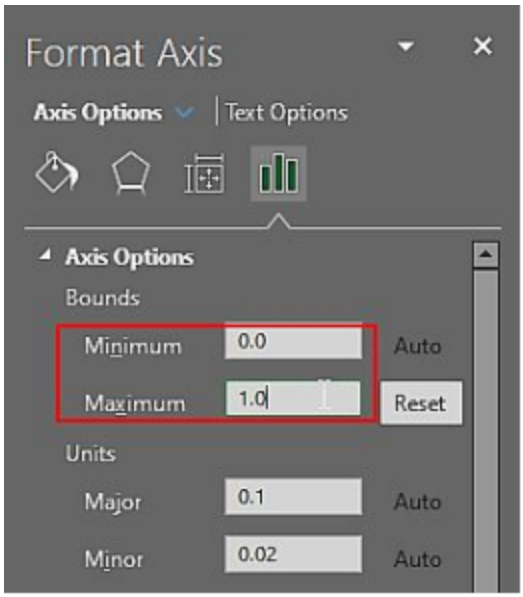
• Select the option for stacking and scaling

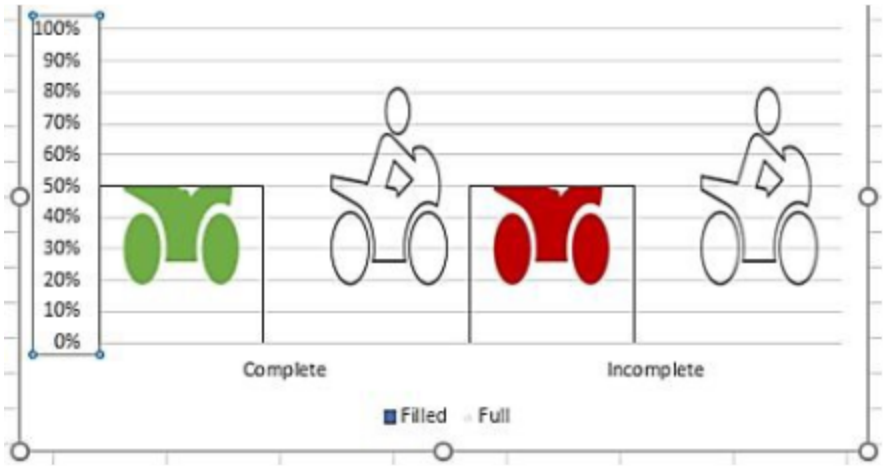

Format Data Point
Series Options
Fill
No fill
Solid fill
Gradient fill
Picture or texture fill
Pattern fill
Automatic
Invert if negative
Picture source
Insert...
Clipboard
Texture
Transparency
0%
Stretch
Stack
Stack and Scale with
Units/Picture
1
Rotate with shape

• To correct the resulting incomplete shape, click twice on the y axis in your chart



• Edit the **Maximum** and **Minimum** values for the axis to 1 and 0





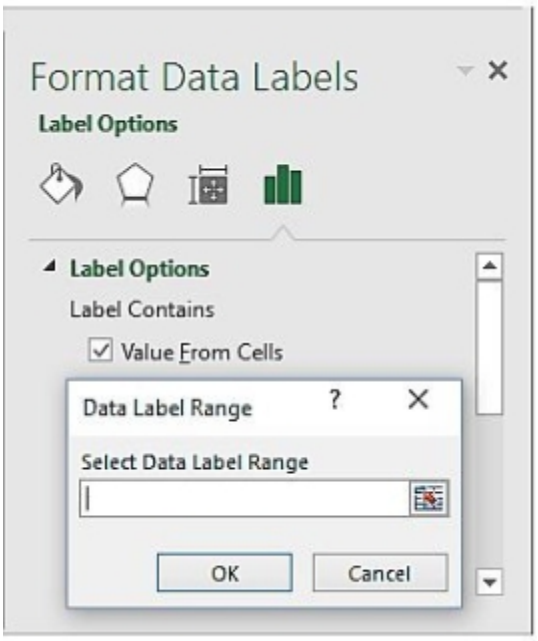
- Click twice again on the series and select the overlapping option for the series to edit it to become 100% Following these steps gives to add custom infographics to your worksheet.

DESIGNING DYNAMIC CUSTOM LABELS IN EXCEL

- Select the chart and make a right-click on it
- Choose the option to include a label for your data

- In the format dialogue box for labels, select the box to choose labels for your data from cells in your worksheet

- Select or enter the cell ranges and click on the **OK** button



DESIGNING PICTURE

LINKS

- Highlight the cells containing the picture and copy
- Select the cell where you want the link to appear and rightclick on it
- Select the **Paste** option from the ribbon menu
- Choose the option for pasting as a picture
- Select the option for a link

INSERTING WORDART AND SMARTART

Basics of SmartArt

1. Inserting SmartArt

•

Navigate to the **Insert** menu and select the **SmartArt** option
- Choose a style in the gallery and enter your text

1. Adding and Deleting Shapes in SmartArt

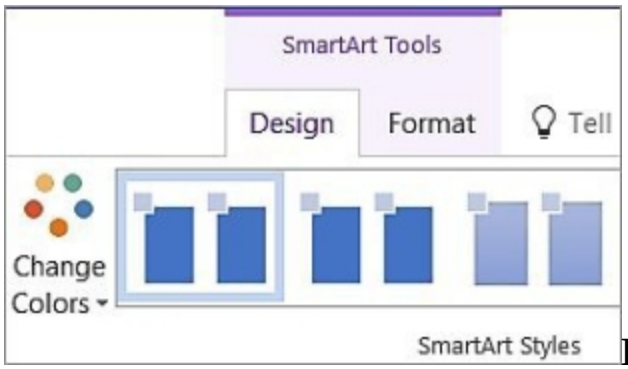
    - Select your inserted SmartArt and navigate to the **Design** menu

- Select the option to include a **Shape** under the group for creating graphics

1. **Formatting SmartArt Colors**

    - Select the SmartArt
    - Select the option for changing colors in the **Style** group, under the

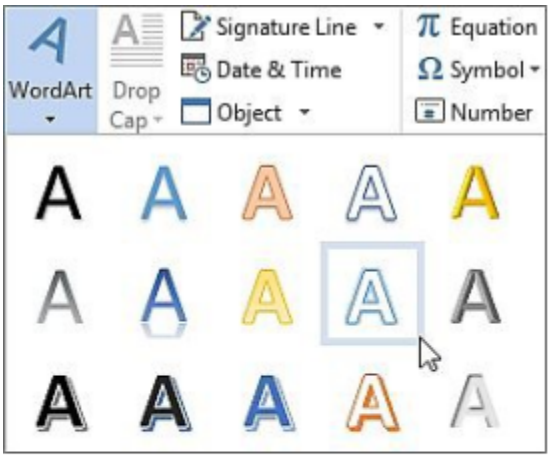
    Design menu



Basics of WordArt

1. Inserting WordArt

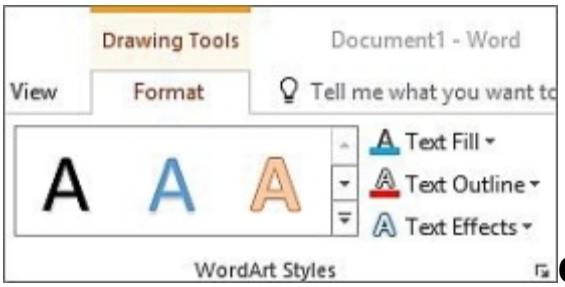
- Navigate to the **Insert** menu and select the **WordArt** option
- Choose a style in the gallery and enter your text

1. 

Formatting WordArts

- Select the WordArt

- Navigate to the **Format** menu and select formatting options from the tools for WordArt
- You can add **Fill** or **Borders** to your WordArt and even change the orientation

1. 

Changing WordArt Fonts

- Select the WordArt
- Navigate to the **Home** menu and select a font or font size

1. Deleting WordArts

Right-click on the WordArt and select the **Delete** option **USING ADDITIONAL TYPES OF GRAPHICS IN YOUR WORKSHEET**

Excel Graphic Files

Various formats exist for graphics in Excel, among these are:

- .bmp graphic files
- .png graphic files
- .jpg graphic files
- .gif graphic files

You can also save your charts as pictures:

- Select and copy the chart you want to save as a picture
- Paste the chart in any picture editor of your choice and

then save

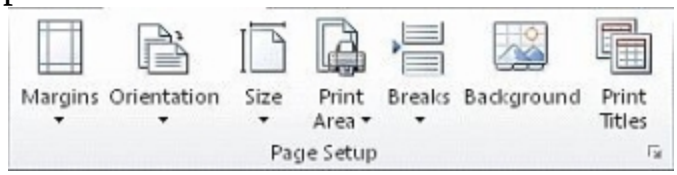
Adding Screenshots

- You can copy the screenshot from your File Explorer and then paste it into your worksheet

- You can also select the **Screenshot** option in the **Insert** menu

SHOWING THE BACKGROUND IMAGE OF YOUR WORKSHEET

- Select the worksheet
- Navigate to the **Page Layout** menu and select the **Background** option



- Select an image of your choice and click the **Insert** button

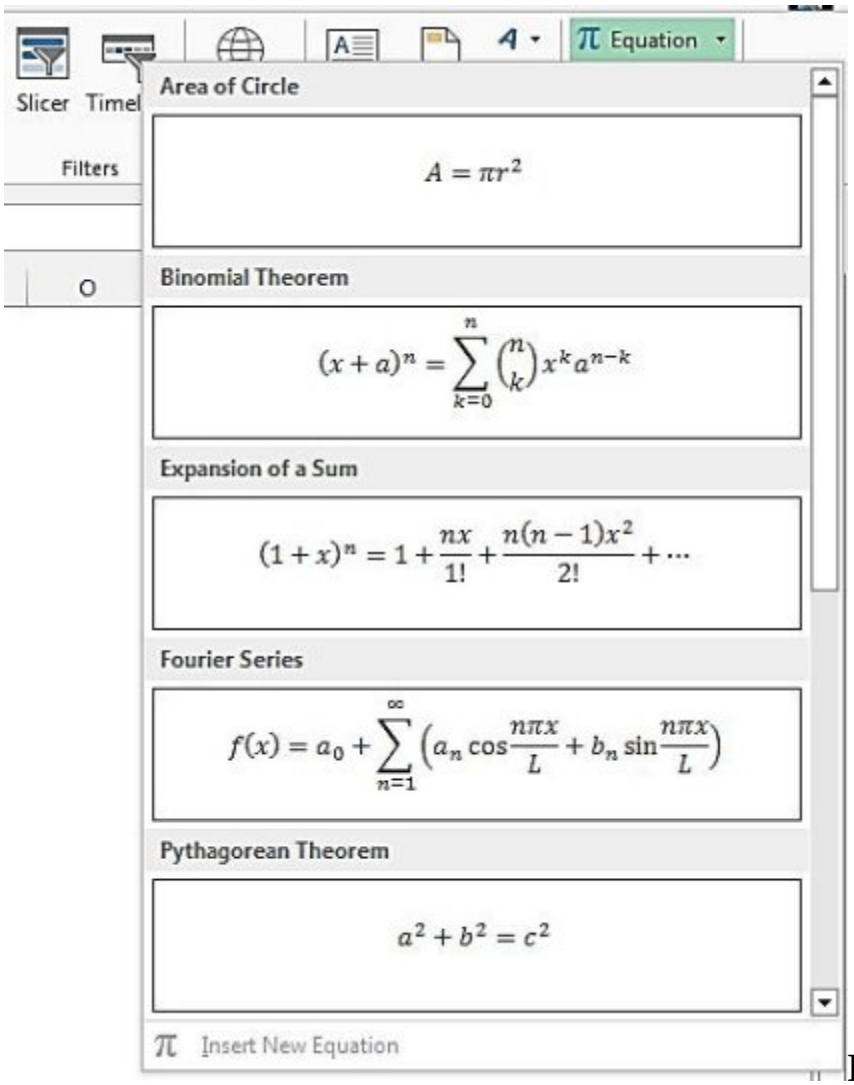
IMPLEMENTING THE EDITOR DIALOGUE BOX FOR EQUATIONS

- Navigate to the **Insert** menu

•

Select the option for **Equation**

- Enter your equation in the editor that appears



Default equations can also be inserted by clicking on the dropdown menu for **Equations**

Summary

Formatting your numbers present in a data set gives you more flexibility to customize how you want your data to be displayed. It also aids quick comprehension of the represented data. Inserting shapes, infographics, and icons also improves your data visualization as explained in this chapter. How to insert WordArts, SmartArt and screenshots were also discussed.

CONCLUSION

Microsoft Excel is an easy and common application for data entry and representation. Excel can be used by novices and beginners to successfully create data entries, simple charts and also apply basic and necessary formatting or customization to represent their data. Support can also be gotten from the Microsoft team when needed.

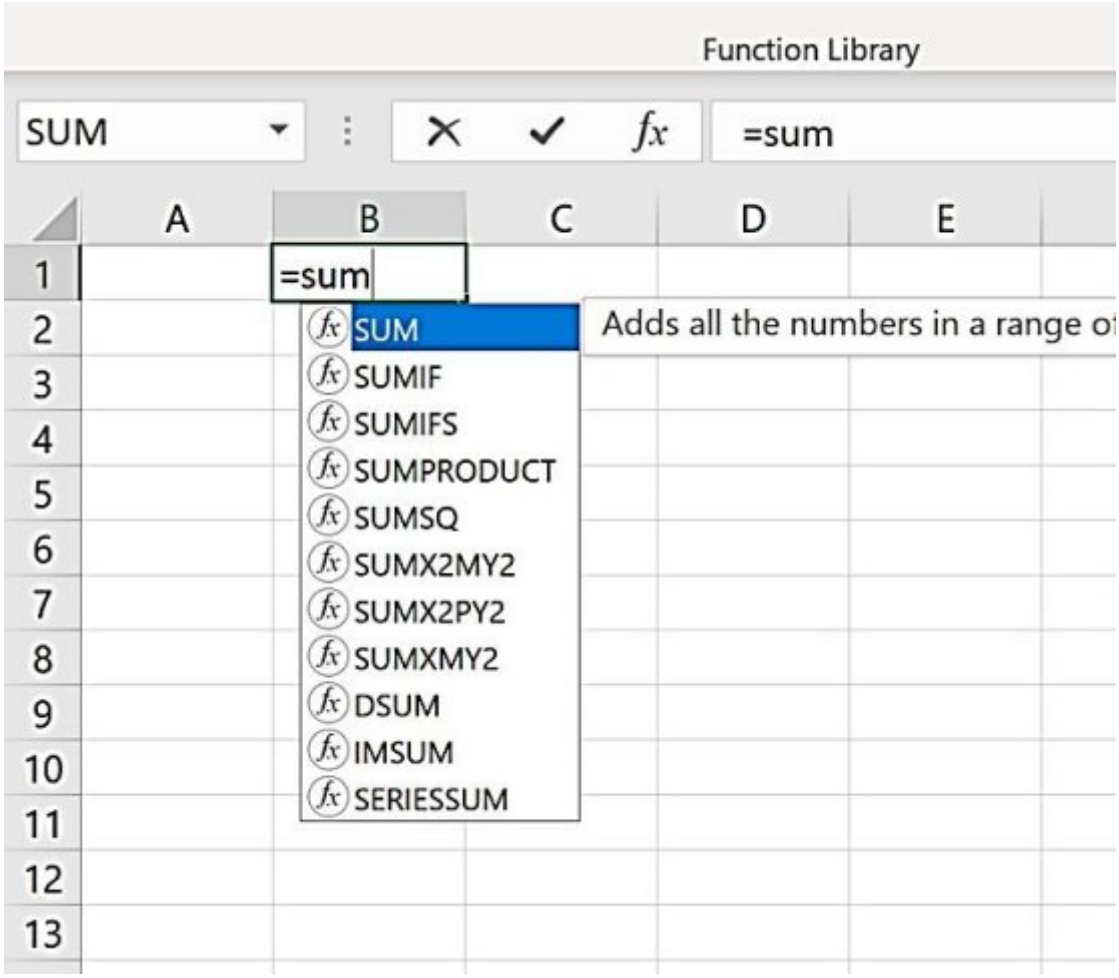
Part 2: EXCEL FORMULAS & FUNCTIONS INTRODUCTION TO EXCEL FUNCTIONS AND FORMULAS

Excel formulas and functions are used during calculations. They can be implemented when handling both text and numeric data. When carrying out calculations in Excel, you make use of either functions or formulas. Example of a function and a formula include

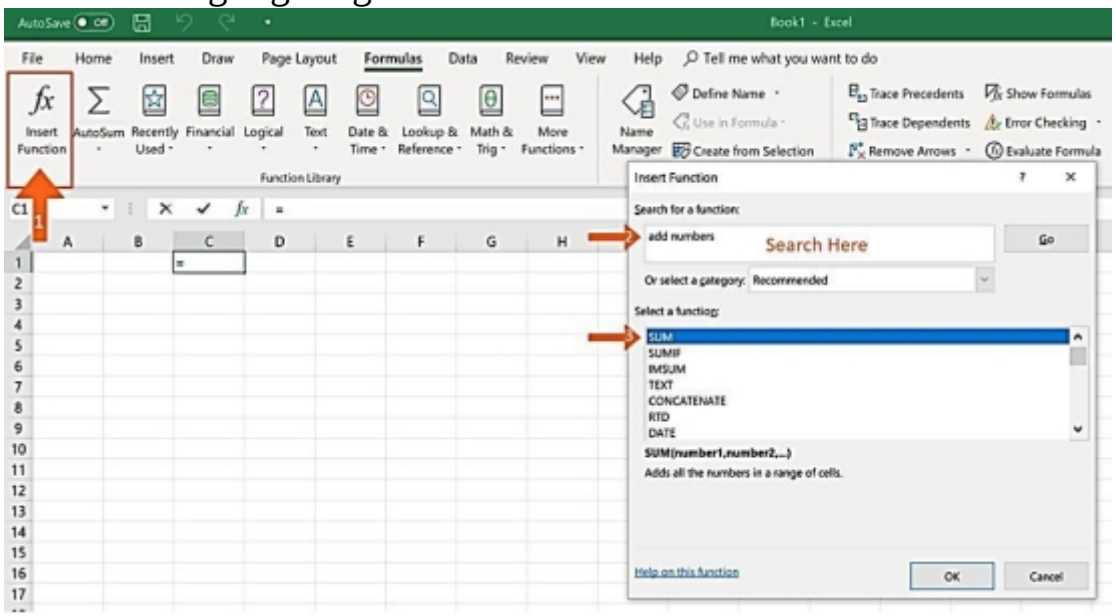
=SUM(B1:B4) and =B**1+B2+B3+B4** respectively. The two expressions perform similar addition of cells **B1** to **B4.** Every expression for calculation in Excel begins with the equality sign (=).

Multiple ways exist to input formulas or functions in your worksheet, among which are:

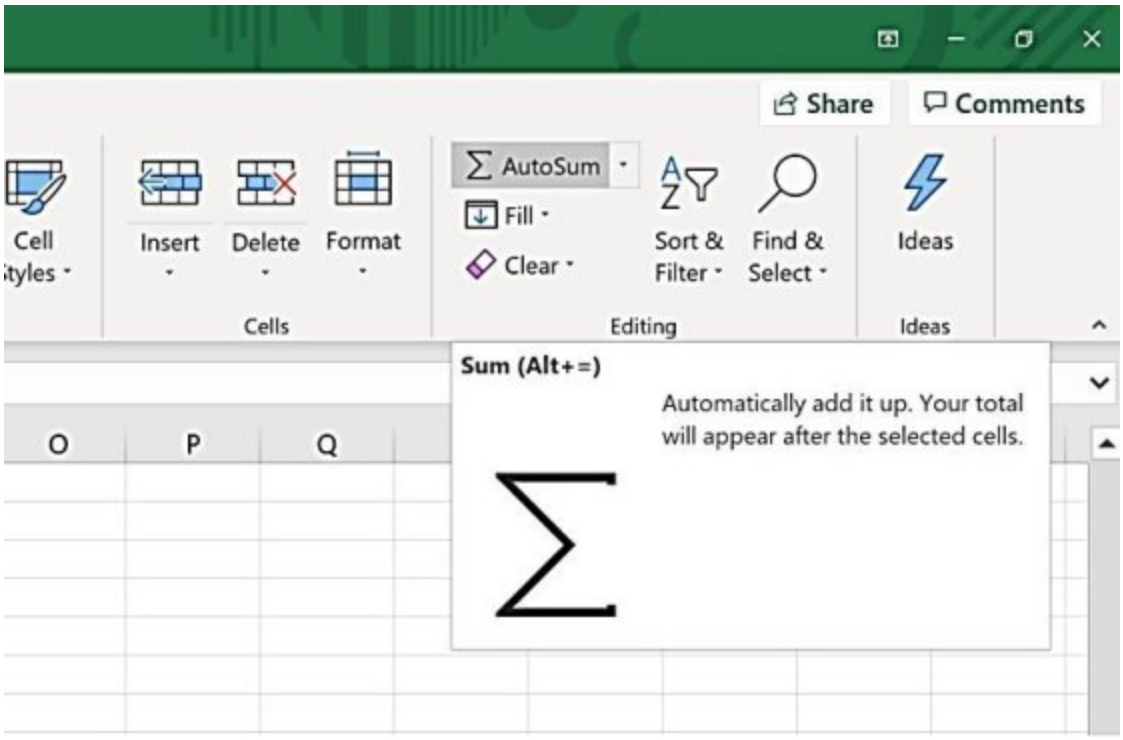
- Directly in the cell, you wish the calculation result to be displayed which gives a multiple suggestion list of possible functions:



• Making use of the option for inserting functions from the ribbon menu while highlighting a cell:



- Choosing a formula or function from the **Logical** functions tab:
- Employing the **AutoSum** tab:



- Choosing formulas from a list of those you used recently:

•

Using the bars for formulas:

Formulas and functions are introduced to enhance data analysis, data search, and improved visualizations.

CHAPTER 15- THE EXCEL FORMULA BAR

The formula bar is located beside the **Name box** at the top of your worksheet, just at the base of the ribbon menu. It is used for entering or editing cell contents and formulas. The formula bar can be hidden and displayed as a user wishes. These steps should be followed to hide or display the formula bar:

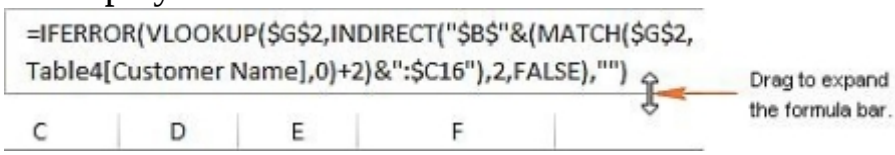
- Navigate to the **View** menu
- Select the box labeled **Formula bar** to either hide or display the bar

Increasing the Size of the Formula Bar

When dealing with advanced and extremely long formulas, it could be necessary to increase the size of the formula bar to aid the visualization of the typed formula.

To increase the size of the formula bar:

- Set your cursor on the lower edge of the bar for the adjustment cursor to be displayed

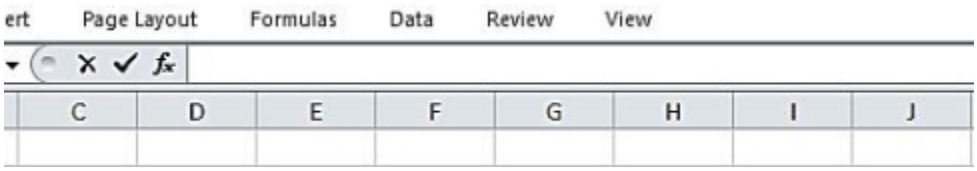


- Drag down your mouse to increase the size of the bar These same steps can also be followed to reduce the bar's size; simply drag up your mouse instead.

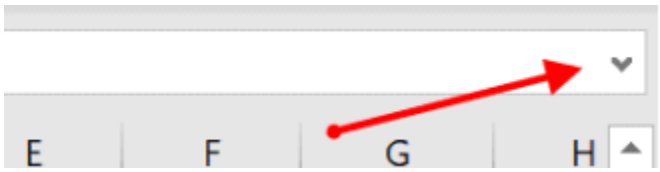
Keyboard keys **Ctrl** + **Shift** + **U** can be used as a shortcut to both increase and decrease the size of the formula bar. The vertical and horizontal expansion buttons can be implemented as well.

The formula bar has the following parts:

- The input space



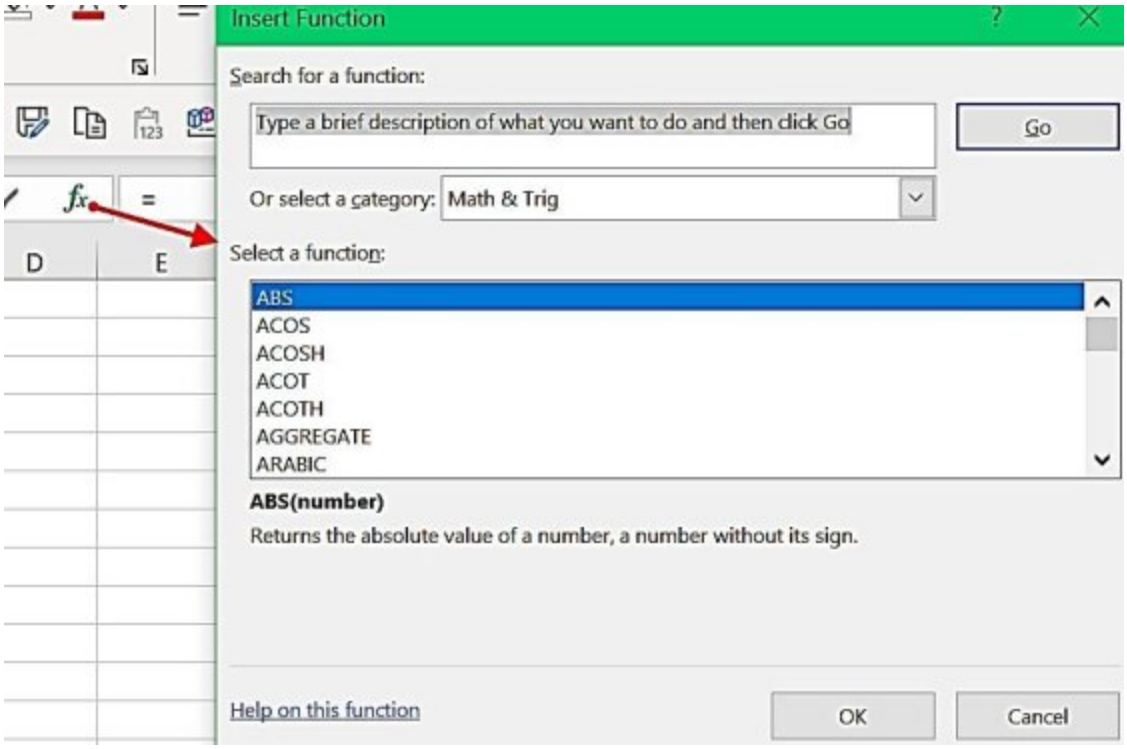
- Button for vertical expansion



•

The **Cancel** and **Enter** button

- Button for inserting functions


Insert Function
Search for a function:
Type a brief description of what you want to do and then click Go
Go
Or select a category: Math & Trig
Select a function:
ABS
ACOS
ACOSH
ACOT
ACOTH
AGGREGATE
ARABIC
ABS(number)
Returns the absolute value of a number, a number without its sign.
Help on this function
OK
Cancel
D
E
=

GETTING FAMILIAR WITH EXCEL FUNCTIONS AND FORMULAS

Basics of Formulas in Excel

- **Implementing Operators in Your Formulas**

Adding operators in your Excel operations makes Excel aware of what you wish to be done. One or more operators can be added in an expression.

Operators in Excel are of the following category: Operators for Arithmetic Operations

\+ represents **Addition** operation. Example: =**A9+B4**

- represents **Subtraction** operation

Example: =**A6–A21** or **–C17**

* represents **Multiplication** operation Example: =**A21*B33**

/ represents **Division** operation Example: =**B39/A20**

% represents **Percent** operation, i.e. division of numbers by 100. Example: **=B34%**

^ represents **Exponentiation** operation Example: **C16^7**

- **Operators for Comparison Operations**

These operators are used when checking for a condition. These results are usually either TRUE or FALSE. The comparison operators include:

= represents ” **Equal to**“. Example: =**A7=B31**

> represents “**Greater than**” Example**: =B36>A20**

< represents “**Less than**” Example: =**A2<D12**

>= represents “**Greater than or equal to**“. Example: =**B3>=A20**

<= represents “**Less than or equal to**“. Example: =**A12<=B23**

<> represents “**Not equal to**” Example: =**A22<>B13**

- **Operator for Text Operations**

The ampersand symbol (&) is used when combining two or more different texts in different cells to give one text or sentence.

Example: =**A32&” “&B31**. This operation is referred to as **Concatenation.**

- **Operator for Reference Operations**

The **Colon** symbol (:) represents the **Range** operator for references cell ranges.

Example: =**SUM(C14:D37)**

The reference and range operators also include:

The **Comma** (,) symbol represents the **Union** operator. It brings numerous cell ranges into one.

Example: =**SUM(A12,C4:D27,B13)**

A **Space** represents an operator for **Intersection** that produces a cell reference in similarity with two references.

Example: =**SUM(C13:C16 C13:E16)**

Precedence of Operators in Excel Formulas

When your Excel formula or expression is built from multiple operators, Excel employs an order of precedence in dealing with such. Starting from the left direction, the precedence of operators in Excel is as follows:

1. Negation
2. Percent
3. Exponentiation
4. Division and Multiplication

1. Subtraction and Addition
2. Concatenation
3. Comparison operations

ADDING FUNCTIONS TO FORMULAS

Sample Formulas that Implements Functions

Formulas are expressions that carry out operations on the data in cells. They employ operators for their operations. Functions, however, are predefined expressions. They are used to carry out quick operations, letting you avoid the task of spelling out long formulas or repeating operators.

Common Excel Functions

- **SUM**

This gives the summation of the indicated cell range. E.g.

=SUM(E14:E28)

- **MIN**

This gives the minimum number in the indicated cell range. E.g.

=MIN(E14:E28)

- **MAX**

This gives the maximum number of the indicated cell range. E.g.

=MAX(E14:E28)

- **AVERAGE**

This calculates and gives the average of the indicated cell range. E.g.

=AVERAGE(E14:E28)

- **COUNT**

This gives the number of cells indicated in a cell range. E.g.

=COUNT(E14:E28)

- **LEN**

This function calculates how many characters are present in a string.
E.g. =**LEN(B27)**

- **SUMIF**

This function carries out an addition operation only if the stated condition is satisfied. E.g. =**SUMIF(D24:D28,”>=900″,C14:C28)**

- **AVERAGEIF**

This function carries out an averaging operation only if the stated condition is satisfied. E.g.

=AVERAGEIF(F24:F38,“No”,E14:E18)

- **DAYS**

This function gives the days’ number present between dates. E.g.

=DAYS(D24,C24)

- **NOW**

This function gives the present time and date of your device. E.g.

=NOW()

String or Text Functions

- **LEFT**

This function gives the indicated characters present from the left of a text.
E.g. =**LEFT(“WISDOM”,3)** gives **WIS**

- **RIGHT**

This function gives the indicated characters present from the right of a text.
E.g. =**RIGHT(“WISDOM”,3)** gives **DOM**

- **MID**

This function gives the indicated characters present from the middle of a text. E.g. =**MIS(“WISDOM”,2,3)** gives **ISDO**

- **ISTEXT**

This function checks if the indicated value is a text and gives a result of either False or True. E.g. =**ISTEXT(“WISDOM1”)**

- **UPPER**

This function converts texts in lowercase to capital letters. E.g.

=UPPER(B12)

Time and Date Functions

- **DATE**

This gives the particular number that represents the date in an entry.

E.g**. =DATE(2022,9,12)**

- **MONTH**

This gives the particular number that represents the month in a date entry.
E.g. =**MONTH(“2022/9/12”)**

- **YEAR**

This gives the particular number that represents the year in a date entry. E.g. **=YEAR(“2022/9/12”)**

- **MINUTE**

This gives the value representing minute in a time entry. E.g.

=MINUTE(“9:31”)

Arguments in Functions

Arguments are used by functions for carrying out their operations. They are the values present in functions. Arguments in functions can also be singular: **UPPER(B12)**, or multiple: **SUM(C13:C16 C13:E16)**. The function =**SUM(E14, E15, E16)** has the following arguments:

E14, E15, E16

Some Excel functions do not require arguments, such as **TODAY()** and **NOW()**.

HOW TO INSERT FORMULAS IN WORKSHEETS

- **Inserting Formulas Manually**

You can manually insert formulas in your worksheet by selecting the cell where you want the results to be shown, and then entering the formula. For example, to perform an addition operation on cells A21 and B21, with the result displayed in cell C21:

- Select cell **C21**
- Type in the formula =**A21**+**B21**
- Press the **Enter** key

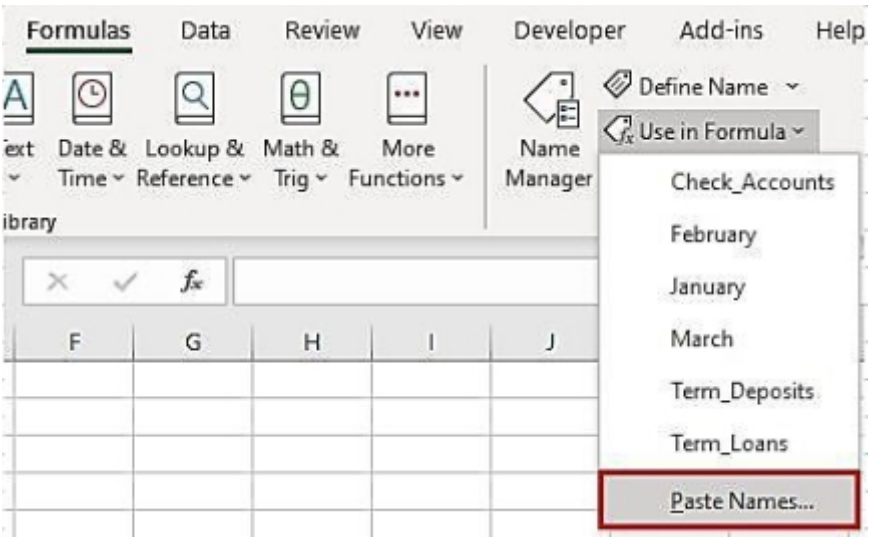
Inserting Formulas by Pointing
You can also select the individual cells to create your formula.

- In cell **C21**, type the equality sign "="
- Select cell **A21**
- Type the summation symbol "+" in **C21**
- Select cell **B21**
- Press the **Enter** key

Inserting Name of Ranges in Formulas

- Highlight the cell where the name of the range would appear
- On the ribbon menu, select the **Formula** tab

- Navigate to the option to select what you can use in your formula and select the choice to paste desired names



- Pick from the existing name of ranges and click the **OK** button
- Also, press the **Enter** key on your keyboard

Adding Functions to Formulas

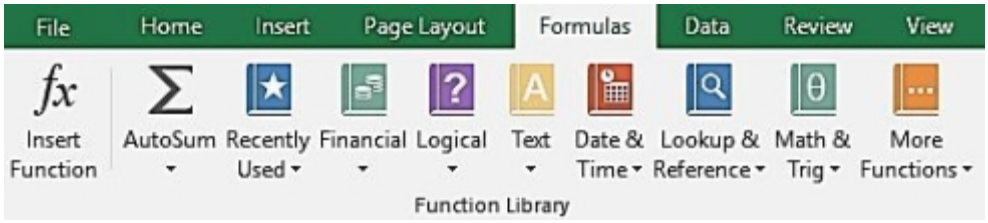
- Navigate to the **Home** tab and select the drop-down icon on the AutoSum button

•

You can also click to view additional available functions

• Navigating to the **Formulas** tab and selecting the option to enter a function can be used. This action brings up the dialogue box for inserting formulas.

- Any option from the **Library of Functions** group can be used



Pointers for Inserting Excel Functions

- Ensure the cell where you want the function result to appear is first highlighted
- Add brackets to your formulas or functions to indicate which should be first executed
- When writing complex and long functions, start the different sections of the function on a new line
- The handle for filling can be used to duplicate formulas and functions across multiple cells
- Keyboard keys **ALT** + = can be used to automatically sum up cell values:

- Highlight the cell where the result would be displayed

- Hold down the **Alt** key, type in **+,** and then = **CHANGING FORMULAS IN EXCEL**

- Select the cell where the formula was implemented
- Use the bar for formulas to then edit the formula
- You can also double-click on the cell itself to edit the formula

REFERENCING CELLS IN FORMULAS

Relative Cell Referencing

This type of cell referencing changes with the location of the cell. For instance, if you copy the formula **B2*D2** to another row, say row 14, the formula changes to **B14*B14**. The relative cell

referencing for formulas can be copied and implemented using the drag and fill procedure.

Absolute Cell Referencing

Here, the cell reference remains constant, regardless of the location. They are indicated by adding the sign of dollar (**$**) in formulas. E.g.

=**$B$3*$C$3*$E$1 Mixed Cell Referencing**

This cell referencing includes both the relative and absolute cell references. An example is **=(B3*C3)*$E$1** where the value in cell E1 remains constant. They can be used to reference cells where values such as discount, tax, etc. are entered.

Switching between Reference Types

The **F4** key on your keyboard can be used to alternate the types of cell references.

Referencing Cells in Other Worksheets

- Navigate to the cell to be referenced
- Take note of the worksheet name and the cell number
- Open the worksheet where the referencing is to be done
- Select the cell where the referencing result would be displayed
- Type in a formula in this format

='**Worksheet_Name'!Cell_Number**. E.g. = **'Wisdom'!D2**

- Press the **Enter** key

A change of name of the referenced worksheet results in an automatic update of the formula.

Referencing Cells in Other Workbooks

- Type in a formula in this format in the cell where the referencing result would appear **[Name_of_Workbook]Name_of_Worksheet!Cell_address**

- E.g **[Wisdom.xlsx]Writers!B2**
- Press the **Enter** key

IMPLEMENTING FORMULAS IN EXCEL TABLES

Summarizing Table Data

The **UNIQUE** and **SUMIF** functions are used to create a summary data table. The UNIQUE function works by indicating a range of cells from your dataset.

E.g **=UNIQUE(A12:A21)**

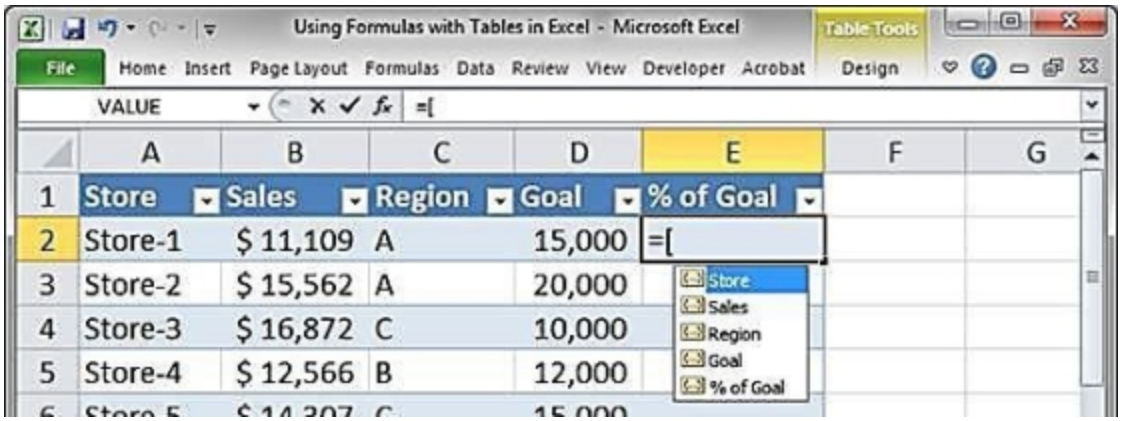
After this list is done, the SUMIF function is then introduced to fill the list created with the UNIQUE function. The **Spill Operator** is

used with the SUMIF function to create an array that is dynamic.
E.g. =**SUMIFS($C$12:$C$21,A$12:$A$21,E7#)**

Implementing Formulas in Tables

- Select the table cell where the formula would be implemented
- Type in =**[**

- This brings up the list of available columns that can be included in your formulas



- Insert the **@** symbol to indicate a reference to only the present row
- End the formula with **]** and press **Enter**

An example of a table formula is as follows: =**[@ Wisdom*@Writers]**

Making Reference to Table Data

- To reference a specific row:

=[@name_of_column]

- To reference the complete data columns in the table:

=[name_of_column]

- To reference data from another table:

=Table_Name[Column_Name]

- To reference the complete table:

=[#All]

- To reference every row of data:

=[#Data]

- To reference the table headers:

=[#Headers]

- To reference rows of summation:

=[#Totals]

RECTIFYING ERRORS IN FORMULAS

Rectifying Circular References

Circular referencing occurs in Excel formulas when the cell in which the formula result would be displayed is entered as an argument in the formula. For instance, cell D9 is the highlighted cell where the

calculation result would be shown, and the formula entered by a user is **=A3*D9**.

Circular reference errors can be found and corrected using the Ribbon menu.

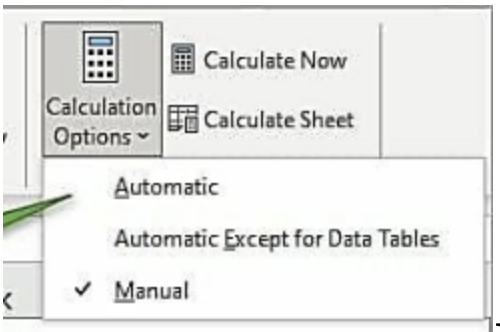
- Navigate to the **Formula** tab
- Select the drop-down option for checking errors

- Choose the option for **Circular References** and this would show a list of cells having the error

The **Status Bar** can also be used. Excel shows present circular references in the status bar.

Calculations Not Occurring in a Formula

This error can be easily corrected by switching your Excel calculation mode. Navigate to the **Formula** menu and select the tab to choose an option for your calculation. Choose the **Automatic** mode.

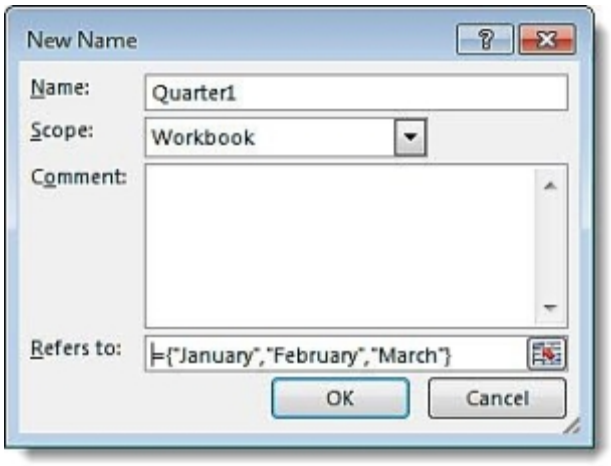


IMPLEMENTING COMPLEX TECHNIQUES FOR NAMING

Implementing Constant Names

- Go to the **Formula** menu and select the option to define a name
- This brings up the dialogue box to configure names.
- Enter a name for your constant

- In the **Refer to** bar, indicate what the constant name would represent



- Click on **OK** when done

Implementing Formula Names

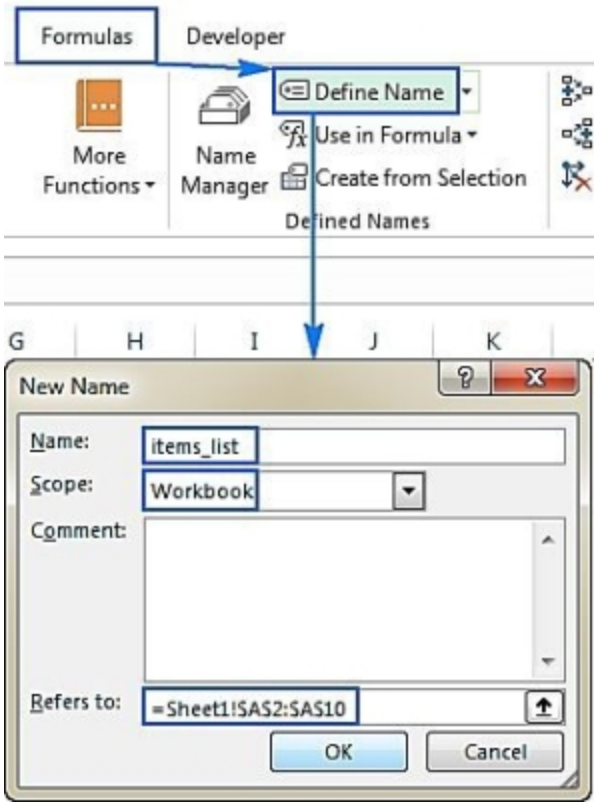
- Navigate to the **Formula** menu and select the option to implement an option in the formula
- Select the name to be used and press **Enter Implementing Intersection in Ranges**

Inserting a space between two cell ranges denotes a formula to find the cell range intersection. Example is **=C9:C13 A5:E5** or **=B9:C13 B6:D6.**

Adding Names to References

- Highlight the ranges of the cell to be named
- Enter a name in the box for names and press **Enter**

Likewise, the tab to define reference names from



the **Formula** menu can also be used.

USING FORMULAS

Preventing Hard-coding of Values

Hard-coding formula values refer to users inserting specific numbers in their formulas. For example, = **A1/B1 + 500.** The presence of

+500 in the formula makes it hard-coded.

A better way to do this is to use absolute cell references. Also ensure that cells either contain specific data or formulas, do not use both.

Making Use of the Formula Bar as a Calculator

The **Formula Bar** is one of the easy ways to insert formulas into your worksheet. Simply type in your formula after setting your cursor on the cell where the formula result would be displayed and then press **Enter.**

Duplicating Excel Formulas

The drag and fill procedure or the handle for filling can be used to make exact duplicates of formulas. You can also use the usual copy and paste technique.

Changing Formulas to Their Results

- Select the cells containing the formulas to be changed
- Use **Ctrl + C** key to copy them

- Use **Shift + F10 + V** keys to paste just the formula results in the cells.

Summary

Operators, arguments, and functions make up formulas. They denote specific operations that Excel is meant to carry out. Formulas can be entered either manually or by clicking on specific cells. You can also reference cells outside your present worksheet and workbook in your formulas. This chapter further explained how you can use formulas in tables, edit formulas, correct possible errors in your formula, change your formula to its values, and also how to use complex naming techniques.

CHAPTER 16-APPLYING FORMULAS IN REGULAR MATHEMATICAL OPERATIONS PERCENTAGE CALCULATIONS

Cells can be formatted into a percentage by highlighting the desired cell and then selecting the percentage option from the group for numbers. Percentages can be calculated either by division by 100 or by dividing a part with the total.

Goal Percentage Calculations

This is an example of finding percentages by dividing a part by the total. The formula for finding goal percent is as follows: **Goal Percent = Result / Goal**

For instance, having a target of 10,000, but the achieved result is 9,000; you can find the percentage of the goal achieved thus:

Goal Percent = 9000 / 10000

= 90%

The cell having the result and goal can simply be inserted as an argument in your formula, e.g. **G5/H5.** The cell where this result would be displayed must then be formatted to percentage.

Variance Percentage Calculations

The variance percent of a data set indicates the percentage difference when recent data is compared with reference data. The formula is as follows:

Variance Percent = (Recent Data - Reference Data) / Reference Data

Cells having the required data can simply be inserted as an argument in your formula. The cell where the formula result would be displayed must then be formatted to percentage.

Finding Variance Percent Using Negative Data

Using the **Abs**olute function gives the required positive result when you get a negative result for your variance percent. E.g. **=(C14- B14)/ABS(B14)**

A negative result usually occurs when the reference data is higher than the recent data.

Distribution Percent Calculations

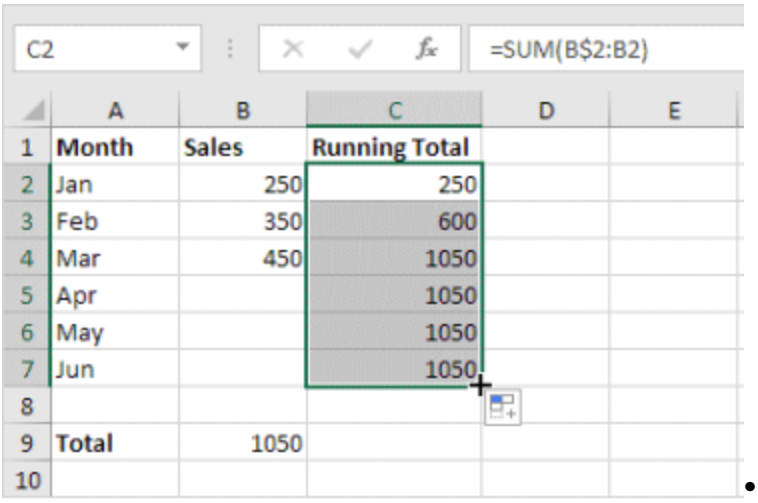
Distribution percent refers to the level at which a specific data is spread across its sub-data. It simply involves dividing cell values by the complete value. The cell holding the total value is usually referenced with an absolute referencing. E.g. **=D3/$C$7**

Running Total Calculations

Running total calculations shows how additional data affects the summation result of the previously added data. This can be done using the drag and fill procedure.

- Select the cell where the data cell begins and enter a formula of this format:

- **=SUM(B$2:B2)**
  - Press **Enter**



  - Use your mouse to drag and fill the next cells next to the additional data set

Including Increase or Decrease in Percentage to Excel Values

The formula format for this operation is as follows:

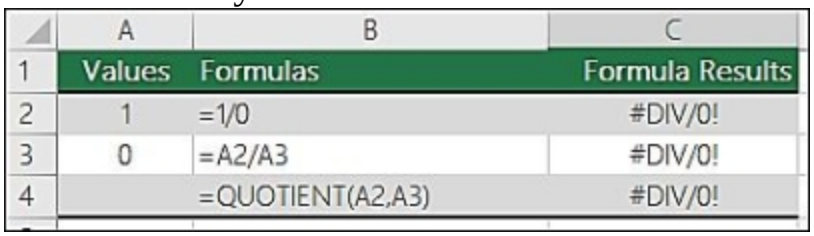
=existing_number*(1+percent)

The value of the percentage change can be included in cells that can be referenced, such as **=C15*(1+D15)**

The existing number to be increased resides in cell **C15** and the percentage by which the number would be either increased or decreased resides in cell **D15.**

Rectifying Errors of Division by Zero

Excel gives the error message **#DIV/0!** when an attempt is made to divide a value by zero.



	A	B	C
1	Values	Formulas	Formula Results
2	1	=1/0	#DIV/0!
3	0	=A2/A3	#DIV/0!
4		=QUOTIENT(A2,A3)	#DIV/0!

This error can be rectified by avoiding entering formulas having a reference to cells having zero value.

ROUNDING NUMBERS

1. By Formulas

The following formula syntax is used for rounding operations in Excel:

=ROUND(number_to_be rounded,num_digits)

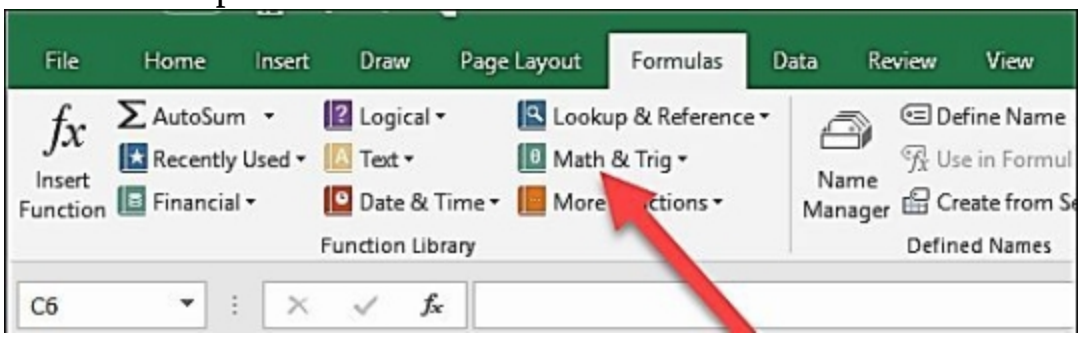
The first argument **number_to_be_rounded** denotes the cell reference, the argument **num_digits** denotes the number of numeric digits to which the first argument would be rounded.

E.g **=ROUND(A7, 3)**

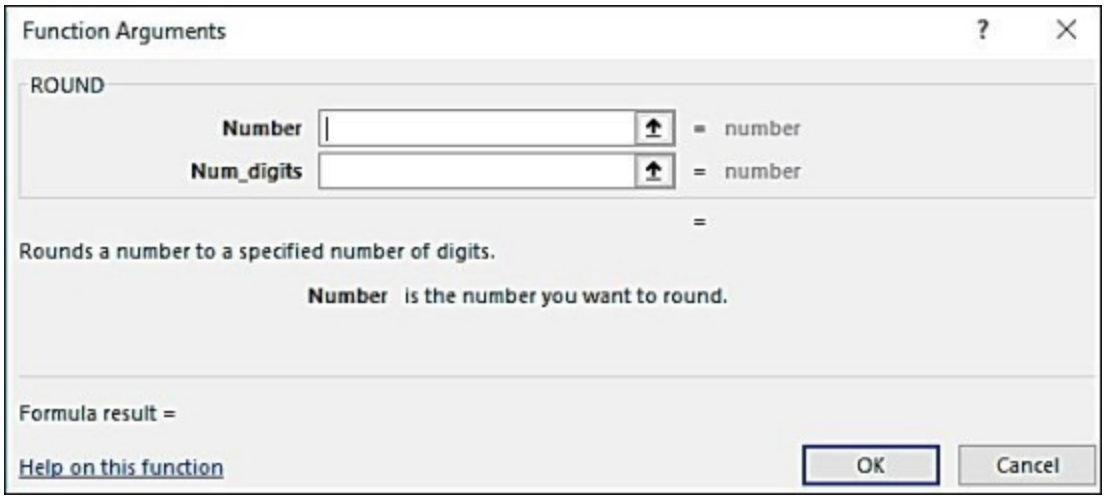
1. With the Formula menu

- Navigate to the **Math** tab drop-down menu and select any of the

ROUND options.



- Insert the number performed and the on which the operation is to be



resulting number of digits in the subsequent dialogue box

- Click on **OK** when done

Rounding to Closest Penny

Currencies can be rounded to the nearest significant pennies by setting the **num_digits** argument to zero. E.g. **=ROUND(B5,0).** The **ROUNDUP** or **ROUNDDOWN** functions can also be used.

Assuming you are dealing with the Dollar currency, to round values to the closest cent, set the **num_digits** argument to 2. E.g.

=ROUND(B5,2).

Rounding to Closest Whole Numbers

This is also done by setting the **num_digits** argument to zero.

CALCULATING THE NUMBER OF VALUES IN A CELL RANGE

This is done using the **COUNT** function. E.g. **=COUNT(B5:D9).**

Other usable functions include **COUNTA** for counting both text and numeric data and **COUNTBLANK** for counting empty cells in the indicated range of cells.

IMPLEMENTING THE FUNCTIONS FOR CONVERSION IN EXCEL

This function converts a data value from one SI unit to another. The syntax for the formula is as follows:

=CONVERT (number_to_be_converted, from_unit, to_unit) E.g. **=CONVERT(42,“C”,“F”)** or **=CONVERT(G12,“C”,“F”)**

Summary

How various percentage values such as percentage distribution, variance, goal, etc. were examined in this chapter. The functions for performing rounding operations were also discussed, alongside the

CONVERT function for changing data values from one unit to another.

CHAPTER 17 MANIPULATING EXCEL TEXTS WITH FORMULAS FUNCTIONS FOR TEXTS IN EXCEL

These functions are used in text data. Their presence in your formula allows Excel to concatenate, switch text cases, find and extract certain parts of the indicated text, etc.

Function to Combine Strings of Text

The **CONCATENATE** function is used for combining multiple strings of texts in Excel. An example is **=CONCATENATE(D1, F1).**

The operator to perform a similar operation is the ampersand (**&**) symbol.

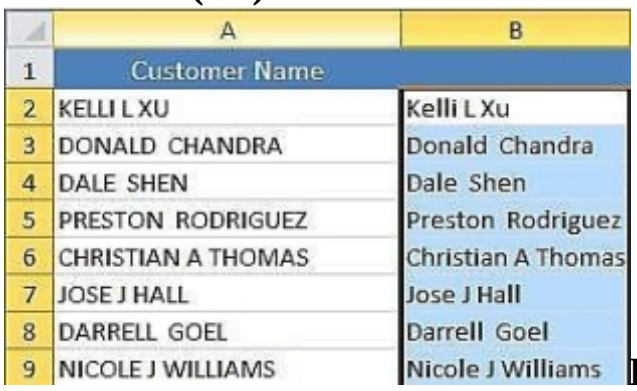
Switching Texts to Sentence Cases

The function **PROPER** is used for this operation. Other functions to switch text cases are the **UPPER** function for capital letters and the **LOWER** function for small letters. Examples are:

=LOWER(D2)

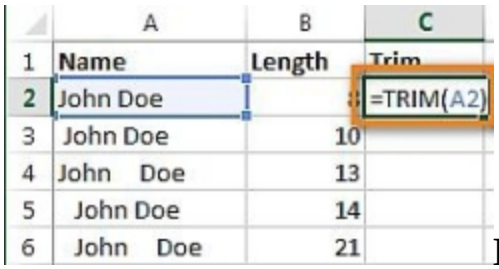
=UPPER(D2)

=PROPER(D2)



	A	B
1	Customer Name	
2	KELLI L XU	Kelli L Xu
3	DONALD CHANDRA	Donald Chandra
4	DALE SHEN	Dale Shen
5	PRESTON RODRIGUEZ	Preston Rodriguez
6	CHRISTIAN A THOMAS	Christian A Thomas
7	JOSE J HALL	Jose J Hall
8	DARRELL GOEL	Darrell Goel
9	NICOLE J WILLIAMS	Nicole J Williams

Deleting Excess Spaces in Strings of Text Excess spaces can be removed from your texts using the **TRIM** function. E.g. **=TRIM(D2)**



Discovering Parts of a String of Texts

Various functions are available to extract specific parts of your texts. These include:

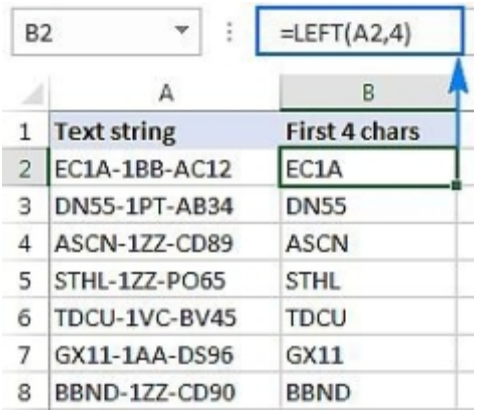
- **The LEFT Function**

This function finds characters starting from the left side of your text. The syntax for the formula is as follows:

=LEFT(cell_text, num_chars)

The **cell_text** argument denotes the cell holding the text, and **num_chars** denotes the number of characters to be extracted. E.g:

=LEFT(D2,4)



- **The RIGHT Function**

This function finds characters starting from the right side of your text. The syntax for the formula is as follows:

=RIGHT(cell_text, num_chars)

E.g: **=RIGHT(D2,4)**

- **The MID Function**

This function holds an addition argument to tell Excel where to start and end its extraction operation.

=MID(text, starting_num, num_chars)

E.g: **=MID(D2,6,3)**

This formula above tells Excel to start its extraction from the 6th character, and then to extract the next 3 characters.

Extracting Texts Before and After Particular Characters

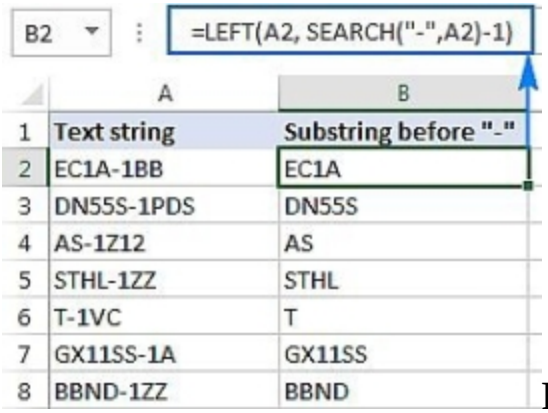
The **LEFT/RIGHT** functions and the **SEARCH** function are used as suitable.

For extracting texts before the character, use the following syntax for your function:

=LEFT(cell_text, SEARCH("char", cell_text)-1)

The **char** argument denotes the character to be used as the reference point. Example includes:

=LEFT(D2, SEARCH(“-“,D2)-1)



	A	B
1	Text string	Substring before "-"
2	EC1A-1BB	EC1A
3	DN55S-1PDS	DN55S
4	AS-1Z12	AS
5	STHL-1ZZ	STHL
6	T-1VC	T
7	GX11SS-1A	GX11SS
8	BBND-1ZZ	BBND

For extracting texts after the character, use the following syntax for your function:

=RIGHT(cell_text,LEN(cell_text)-SEARCH(“char”, cell_text)).

Example includes: **=RIGHT(D2,LEN(D2)-SEARCH(“-“,D2))**

Searching for Specific Text Characters in a String The **SEARCH** or **FIND** functions are used for this operation. The syntax is as follows:

=FIND(find_character, within_text) or

=SEARCH(find_character, within_text).

For example: **=FIND(“e”, “fine”)** or **=SEARCH(“wash”, “carwash”)**

Searching for Second Occurrence of Specific Text Characters in a String

This operation uses the **FIND** function. Where the specific character is first found is indicated in the formula. E.g: **=FIND(””,“POWER- 2-BIG”, 7)**

This formula tells Excel to search for the **“-”** character, and then to begin its search from the 7th character since the character is first found in the 6th character.

Replacing Content of Texts

The **SUBSTITUTE** function is applied with the following syntax:

=SUBSTITUTE (cell_text, old_text, replacing_text). E.g:

=SUBSTITUTE(D5,“c”,“b”). This formula replaces every “c” character with “b”.

If you want to only replace specific characters, you can add another argument to denote this:

E.g: **=SUBSTITUTE(D5,“c”,“b”, 2).** This tells Excel to only replace the second “c” character with “b”

Calculating the Number of Times a Character Appears in a Text

This operation uses the **LEN** and **SUBSTITUTE** functions. Example includes:

=LEN(D2)-LEN(SUBSTITUTE(D2,“A”,””)).

This formula calculates the number of times the character “**A**” appears in the text.

Starting Lines of Formulas on New Lines

- Place your mouse blinking cursor at the start of the argument where the new line would begin

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Press keys **Ctrl + Alt** and press **Enter**

Erasing Unwanted Characters from Fields for Text Follow this syntax to clean up unwanted characters in your texts:

=SUBSTITUTE (Cell_Text , “char_to_be_removed”, “replace_with”).

E.g: **=SUBSTITUTE(D3,”!”,” “)**

This formula replaces the “**!**” character in cell D3 with a space.

Formatting Numbers by Adding Zeros

The **TEXT** function is used in this case. E.g.

=TEXT(B2,“0000000000”)

The dialogue box for customizing numbers can also be used.

- Highlight the cells to be formatted

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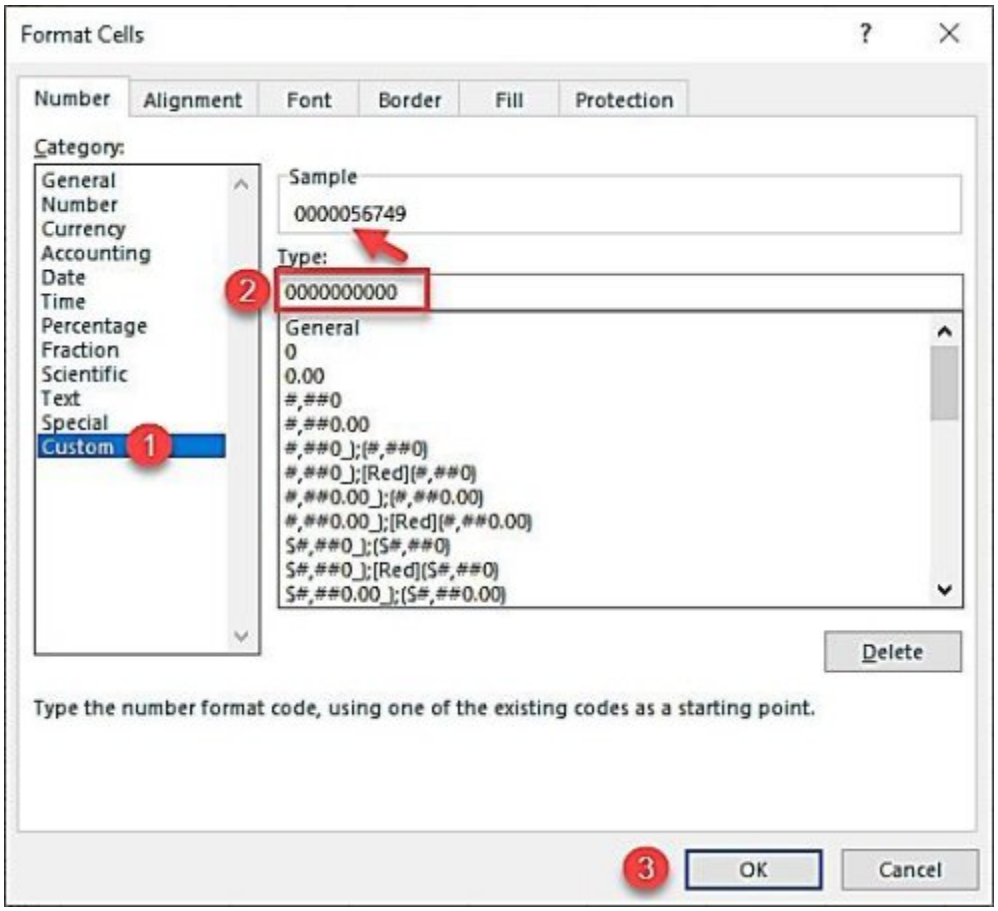
Right-click on these cells and select the option to format them
- Navigate to the option for **Custom** in the dialogue box
- Type in multiple zeros as desired and select the **OK** button



Formatting Numeric Values in Strings of Text

This operation includes the concatenation operator and the **TEXT** function for combining text and numeric values. Formatting the numeric values follows the syntax:

=TEXT (cell_reference, required_formatting)

E.g. **=B5&": "&TEXT(C8, "$0,000")**

This formula combines the text in cell B5 and the formatted currency value in cell C8.

Applying the DOLLAR Function

This function changes numeric values to text as mentioned in the previous includes: section for formatting numbers in texts. Example

=DOLLAR(259.99) that gives a result of **$259.99**

Combined with text for instance,

="Radio price is "&B6 would give a result of "**Radio price is 99**" Including the **DOLLAR** function:

="Radio price is "&DOLLAR(B6) would give a result of "**Radio price is $99.00**"

Summary

How texts can be manipulated using text-related functions was examined in this chapter. Joining, counting, replacement, and extraction operations can all be done with the appropriate functions. Numeric values can be formatted to text to improve their visualization when concatenated with text using the **DOLLAR** function.

CHAPTER FOUR

APPLYING FORMULAS FOR DATES AND TIME

Serial Numbers for Dates

Dates are saved as sequential numbers in Excel to facilitate calculations. The 1st of January, 1900 holds the first place in the serial number. The **DATEVALUE** function is used for converting dates saved as texts to serial values. The formula

=DATEVALUE("1/1/2008") would give a serial number of **39448** as its result. This means the specified date is the 39448th time the First of January occurred since the default start of 1900.

Inserting Dates in Your Worksheet

The **TODAY** or **NOW** functions can be used to insert recent dates that can update themselves in your worksheet.

Serial Numbers for Time

An **hour** in Excel can be expressed serially as **1/24** or **0.41666'**. **Minutes** are **1/60** or **1/1440** with respect to a day, which is also serially expressed as **0.00069444'**. **Seconds** are expressed as **1/86400** or **0.00001157407407407 41'** serially.

Inserting Time in Your Worksheet

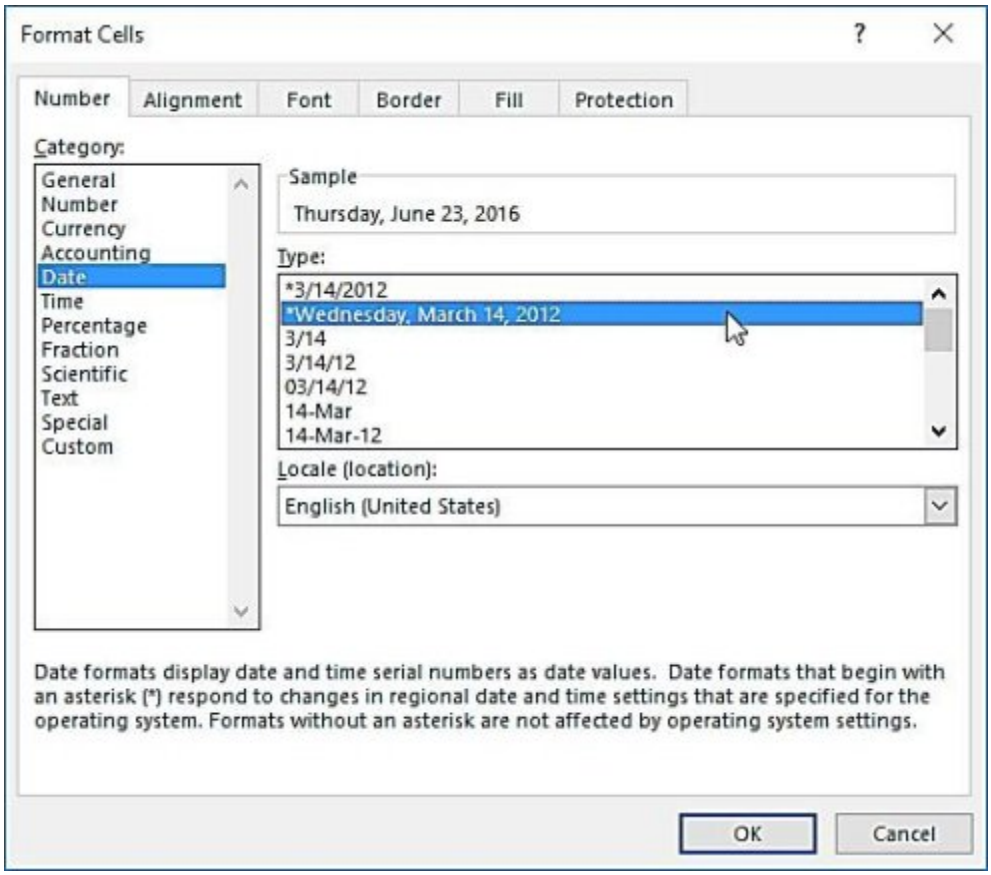
The **NOW** function inserts recent time that can update itself in your worksheet. The **TIME** function can also be used. This function has the following syntax:

=TIME(hour, minute, second). Configuring Excel Time and Dates

- Highlight the cells containing the time and date to be formatted or configured

- Right-click on the cells and select the **Format** option

- Navigate to the option for **Date** or **Time** from the **Category** pane and make necessary adjustments



- Select **OK** when done

Excel Date Issues

The Leap Year Loophole

Excel serial numbering of dates includes 29th of February 1900 which is incorrect. Excel treats the year 1900 as a leap year which is false; this loophole has its source from Lotus 1-2-3.

The Dates before 1900

Dates before the year 1900 if entered in Excel are treated as text; they cannot be converted into serial numbers as other dates.

Irregular Entries for Excel Dates

This issue can be solved by first clearing all formatting of the date cells.

- Navigate to the **Home** menu and select the option to clear all formatting from the group for **Editing.**

- This action converts your date into their serial number values

- Next, you can format the date cells using the **Format** dialogue box. The tab for carrying out text formatting to columns can also be used.

- First, highlight the cells

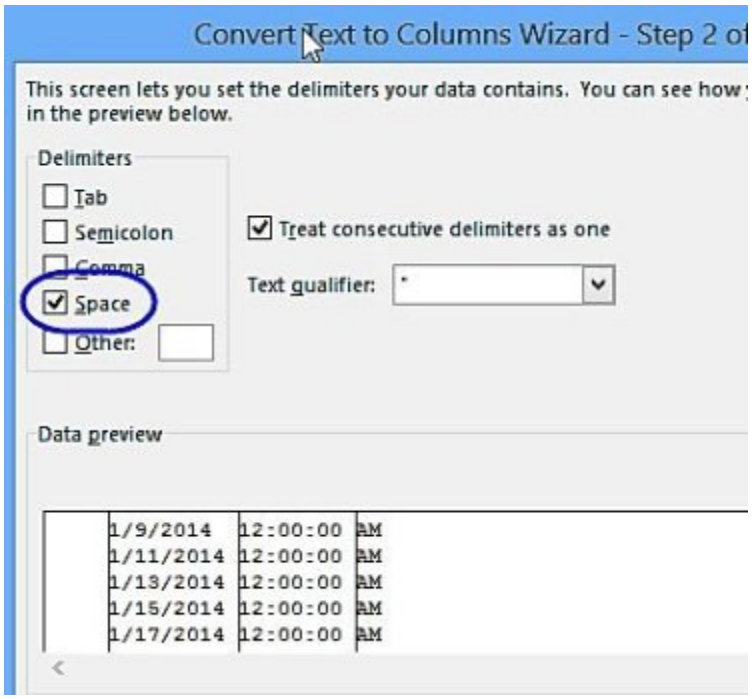
- Navigate to the **Data** menu and select the option for text formatting to columns

- This action opens the corresponding columns wizard

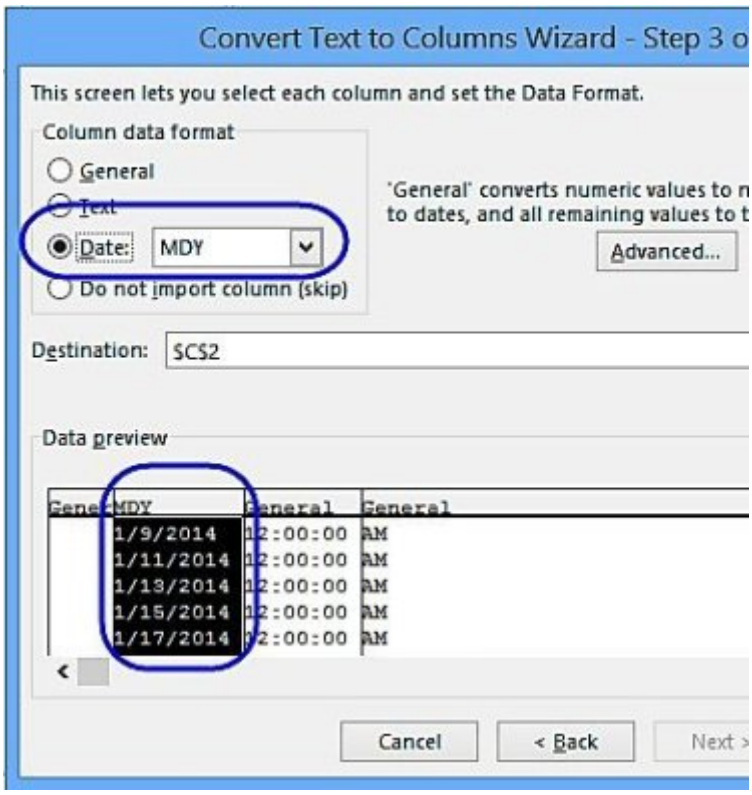
•

Select the box for **Delimited** and select **Next**

• Tick the box for **Space** to be used as the delimiter and select **Next**



• Tick the box for **Date** and select your desired format in the drop- down options



- Click on **Finish**

IMPLEMENTING THE FUNCTIONS FOR TIME AND DATE IN EXCEL

Dealing with Age

The date of birth should first be entered in a cell, say A7; then highlight the cell where the present age would be displayed and type in this formula:

=INT((TODAY()-A7)/365)

The **INT** function is added to remove possible decimals in the calculation.

Dealing with Days Number between Dates The **DAYS** function is used for this calculation. It follows this syntax:

=DAYS(ending_date, starting_date)

The two arguments present in the syntax can be made to be cell references, such as

=DAYS(C3, D3)

You can use also directly use the dates:

=DAYS(“27-October2019”, “11-October2020”).

Dealing with Workdays between Dates

The **NETWORKDAYS** function is used in Excel for automatically calculating weekdays. It follows the syntax:

=NETWORKDAYS(ending_date, starting_date)

Also, days for a holiday can be considered in the calculation. The syntax then becomes =**NETWORKDAYS(ending_date, starting_date, days_for_holiday)**

It is of good practice to make these arguments reference a cell. The **days_for_holiday** argument can be a range of cells, e.g.

=NETWORKDAYS(D7,E7,C1:C9)

The NETWORKDAYS.INTL Function

This function also calculates Workdays, considers days for holidays, and includes consideration for weekends to be specified. The syntax is as follows:

=NETWORKDAYS.INTL(starting_date, ending_date, [weekend], [holidays])

Excel has a predefined serial numbering for weekends as shown below:

Value	Explanation (days of week to include as weekend days)
1	Saturday and Sunday (default)
2	Sunday and Monday
3	Monday and Tuesday
4	Tuesday and Wednesday
5	Wednesday and Thursday
6	Thursday and Friday
7	Friday and Saturday
11	Sunday
12	Monday
13	Tuesday
14	Wednesday
15	Thursday
16	Friday
17	Saturday

An example of the formula implementation is

=NETWORKDAYS.INTL(D7,E7,12,C1:C9)

Generating Date Parts

Date parts in Excel that can be extracted along with their corresponding functions are listed below:

Year: =**YEAR(D7)** Month: =**MONTH(D7)** Day: =**DAY(D7)**

Weekday: =**WEEKDAY(D7)**

Number of Weeks: =**WEEKNUM(D7)**

Deriving Number of Months and Years between Ranges of Date

Excel uses the **DATEDIF** function for this calculation. It follows the syntax

=DATEDIF(starting_date, ending_date, unit)

The **unit** argument lets you specify if you want the calculation in days, years, or months. The defined **unit** annotations are as follows:

y for the number of completed years between the specified dates **m** for the number of completed months

d for number of completed days

md for number of completed days, without considering the years and months

ym for the number of completed months, without considering the years and days

An example of how the formula can be implemented is

=DATEDIF(D7,E7, m)

Changing Dates to the Format for Julian Dates

The Julian date can consist of five or seven numbers, where the preceding numbers denote the year, and the ending three numbers are usually for days. For instance, the Julian date 17003 or 2017003 represents 3/1/2017 in a normal date format. Converting dates to Julian dates uses the **TEXT**, **DATE,** and **YEAR** functions, along with the **&** operator. An example of the formula implementation for a 5 digit Julian date is:

=TEXT(D7,“yy”)&TEXT(D7-DATE(YEAR(D7),1,0),“000”)

TEXT(D7,“yy”) represents the year value and **and DATE(YEAR(D7),1,0),“000”)** caters for the date value. An example of the formula implementation for a 7 digit Julian date is:

=TEXT(D7)&TEXT(D7-DATE(YEAR(D7),1,0),“000”)

Calculating the Percentage of Year Remaining and Percentage Used

The **YEARFRAC, YEAR,** and **DATE** functions are used for year percentage calculations. It follows the syntax:

=YEARFRAC(DATE(YEAR(date_cell),1,1),date_cell) “**1,1**” in the formula denotes the first day of the first month, i.e. First of January. An implementation of the formula is:

=YEARFRAC(DATE(YEAR(D7),1,1),D7)

Excel does this calculation using a value of 360 days. It assumes that each month ends on day 30.

Deriving the Last Day of a Specific Month

Excel uses the **EOMONTH** function to calculate the last day of the month. The syntax is as follows:

=EOMONTH(date_cell,0)

” **0**” in the argument denotes that the calculation is to be carried out on the currently specified month. Different values can be placed in the argument signifying a calculation **=EOMONTH(date_cell,1)** signifying that Excel should calculate for the next month. An implementation of the formula includes:

=EOMONTH(D7,0)

Dealing with Quarters for a Calendar for Dates

The **ROUNDUP** and **MONTH** functions calculate the quarters of a calendar from a specified date. The functions follow the syntax:

=ROUNDUP(MONTH(date_cell)/3,0).

The quarters in a calendar year are as follows:

- Quarter 1: January, February, and March
- Quarter 2: April, May, and June
- Quarter 3: July, August, and September
- Quarter 4: October, November, and December

Dealing with Fiscal Quarters for a Calendar for Dates

The fiscal year for various organizations differs, causing a difference in the start of their fiscal quarters. The general fiscal quarter follows the series **1,1,1,2,2,2,3,3,3,4,4,4.** Putting this in a formula and including the **CHOOSE** and **MONTH** functions gives:

=CHOOSE(MONTH(date_cell),1,1,1,2,2,2,3,3,3,4,4,4)

But for a personalized calculation of your organization's fiscal quarter, these series can follow any orderly arrangement. Ensure however that these numbers are not mixed up, such as **1,1,2** or such as **=EOMONTH(date_cell,-1)**

for the previous month and **3,3,3,1,1,1;** these formats are not allowed in Excel fiscal quarter calculations. An illustration of a fiscal quarter arrangement is shown below:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	Fiscal Qtr	3	3	3	4	4	4	1	1	1	2	2	2

An implementation of an organisation's applicable fiscal quarter is:

=CHOOSE(MONTH(D7),3,3,3,4,4,4,1,1,1,2,2,2)

Dealing with Fiscal Months for a Calendar for Dates

As the regular year begins from January, fiscal months can start from any month within the year. An illustration of a fiscal month arrangement is shown below:

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Month	1	2	3	4	5	6	7	8	9	10	11	12
2	Fiscal Month	7	8	9	10	11	12	1	2	3	4	5	6

This calculation is done with the **CHOOSE** and **MONTH** functions;

=CHOOSE(MONTH(D7),7,8,9,10,11,12,1,2,3,4,5,6) 7 in this formula denote **January** as the 7th fiscal month in the organization's fiscal year calendar.

Dealing with the Nth Date of the Weekday of a Month

The Nth date of the Weekday of a Month refers to days such as the third Wednesday, fifth Monday of the month, etc. The **WEEKDAY** and **DAY** functions are used in this calculation. The formula syntax to be used is as follows:

=date-DAY(date_cell)+1+n*7-WEEKDAY(date DAY(date_cell)+8-day_of_the_week)

The **day_of_the_week** argument is usually an integer to indicate the day number in the week, e.g. Wednesday is day **4. Dealing with the Last Date of the Weekday of a Month**

This operation uses the **WEEKDAY** and **EOMONTH** functions.

functions. day_of_the_week) Generating Time Parts in Excel

The **HOUR, MINUTE,** and **SECOND** functions are used for extraction and generation of time parts. Examples are:

=HOUR(D7)

	A	B	C
1	12/23/2013 12:12:34		12
2	12/24/2013 13:34:59		13
3	12/25/2013 14:46:03		14
4	12/31/2013 20:43:57		20
5	1/23/2014 05:43:53		5

=MINUTE(D7)

=SECOND(D7)

Dealing with Elapsed Time

The **NOW** function can be used for this operation. The formula follows the syntax:

=NOW()-Starting_Time

The **Starting_Time** argument can be a cell reference, e.g. **=NOW()- D7**

Two cells containing the starting time and the ending time can also be subtracted, e.g **=D7-E7**

Note that the cell where this result would be displayed would have to be formatted to hold the time format.

Rounding Values of Time

Time in Excel can be rounded to the next, nearest and previous unit with the **CEILING.MATH, MROUND,** and **FLOOR.MATH**

functions respectively.

To round time to the nearest value:

=MROUND(time_cell,TIME(0,1,0)) for minutes

=MROUND(time_cell,TIME(1,0,0)) for hour To round time to the next value:

=CEILING.MATH(time_cell,TIME(0,1,0)) for minutes

=CEILING.MATH(time_cell,TIME(1,0,0)) for hour To round time to the previous value:

=FLOOR.MATH(time_cell,TIME(0,1,0)) for minutes

How to round time values in Excel

Nearest 15 seconds	8:29:08 PM	8:29:15 PM
Nearest 30 seconds	9:29:08 PM	9:29:00 PM
Nearest minute	10:29:08 PM	10:29:00 PM
Nearest 15 minutes	11:29:08 PM	11:30:00 PM
Nearest 30 minutes	12:29:08 AM	12:30:00 AM
Nearest hour	1:29:08 AM	1:00:00 AM

Next 15 seconds	8:29:08 PM	8:29:15 PM
Next 30 seconds	9:29:08 PM	9:29:30 PM
Next minute	10:29:08 PM	10:30:00 PM
Next 15 minutes	11:29:08 PM	11:30:00 PM
Next 30 minutes	12:29:08 AM	12:30:00 AM
Next hour	1:29:08 AM	2:00:00 AM

Previous 15 seconds	8:29:08 PM	8:29:00 PM
Previous 30 seconds	9:29:08 PM	9:29:00 PM
Previous minute	10:29:08 PM	10:29:00 PM
Previous 15 minutes	11:29:08 PM	11:15:00 PM
Previous 30 minutes	12:29:08 AM	12:00:00 AM
Previous hour	1:29:08 AM	1:00:00 AM

=FLOOR.MATH(time_cell,TIME(1,0,0)) for hour

The **TIME(1,0,0)**

argument can hold any value between the normal time values.

Changing Decimal Minutes, Hours, or Seconds to Regular Time **MINUTE, HOUR,** and **SECOND** functions are used.

=HOUR(time_cell)+MINUTE(time_cell)/60+SECOND(time_cell)/3600

Adding Seconds, Minutes, and Hours to Time The syntax to be used is as follows:

=time_cell+TIME(1,0,0)

This formula allows you to perform both addition and subtraction of all the time units.

Summary

This chapter examined how dates and times are treated in Excel. Functions needed to manipulate and configure time and date such as time format, fiscal year or month, year quarters, etc. were explained. How you can work with Julian dates, add or subtract time units from your time values, round time and also find the Nth day of a weekday were discussed.

CHAPTER FIVE

IMPLEMENTING FORMULAS WHEN DEALING WITH CONDITIONAL ANALYSIS What is Conditional Analysis?

These are operations that depend on one or more conditions being met before they can be successfully carried out. They are implemented when carrying out logical analysis.

Ascertaining for Single Conditions Satisfaction

The **IF** function is the easiest to be used in these cases. Single condition analysis simply aims to check for the result of a specified condition being true or false. The function argument first checks the condition, then gives a result if the condition is met or not. It follows the syntax:

=IF(conditional_test, [result_if_true], [result_if_false]) E.g.

=IF(D7>E7, “Good Job!”, “You can improve!”)

The arguments **[result_if_true]** and **[result_if_false]** can also be cell references.

Ascertaining for Multiple Conditions Satisfaction The **IF** function can be used alone and implemented as follows: **=If(D7<35, “F”,If(D7<45, “D”, If(D7<50,”C”,If(D7<70,”B”,”A”)**

Implementing Conditional Logic in Cells

The **AND** or **OR** functions can likewise be used and implemented as follows:

=IF(AND(D7>=40,E7>=60),”True”,”False”).
=IF(OR(D7>=40,E7>=60),”True”,”False”)
Remember the conditions for logical AND and OR:

- AND can only be true when the present two conditions are true.

- OR can only be false when both conditions are false; this means if either of the two present conditions is true, then the result of the condition is true.

Confirming Conditional Data

This refers to how users can decide the options present in a dropdown menu based on the content of a different cell. Two sheets are needed to validate conditional data. For instance, we will examine how to set different options to appear when selecting Fruits or Vegetables:

- Create two worksheets in your opened workbook
- Name one sheet **List** and the other **Data**
- Open the **List** sheet and enter the following data

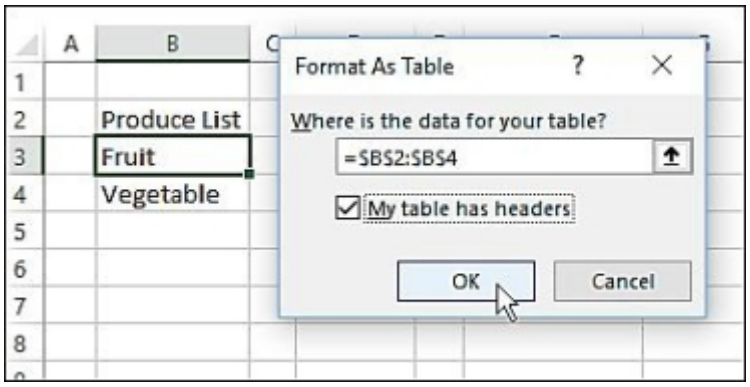
	A	B	C	D	E	F
1						
2		Produce List		Fruit List		Vegetable List
3		Fruit		Apple		Cabbage
4		Vegetable		Banana		Green Beans
5				Lemon		Lettuce
6				Peach		Rutabaga
7						
8						
9						

- Separately highlight each of the columns and carry out this formatting procedure individually:

- Navigate to the option to format columns into tables from the

Home menu

- Select the box to indicate a header for your table in the resulting dialogue box and select **OK**



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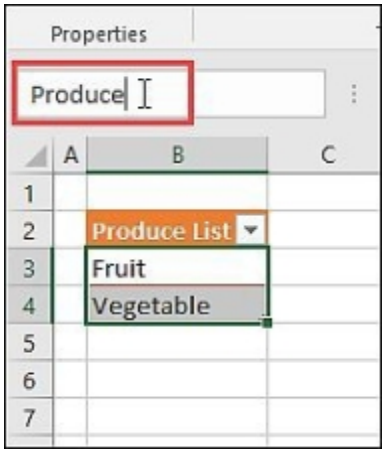
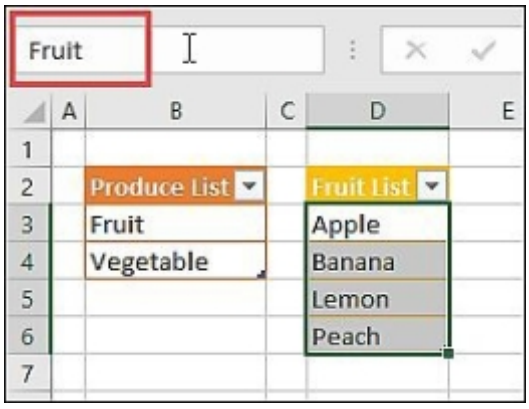
Your tables should appear like this:

- Highlight the items you have in the first table, i.e. **Produce**

- Go to the box for names and enter a reference, the most suitable being **Produce**



- Press the **Enter** key
- Repeat this process for the other two tables



- Open the **Data** worksheet and make the following entries:

•

Format each of these cells to tables as done in the **List** worksheet

- Select the cell where the first conditional data would appear in the

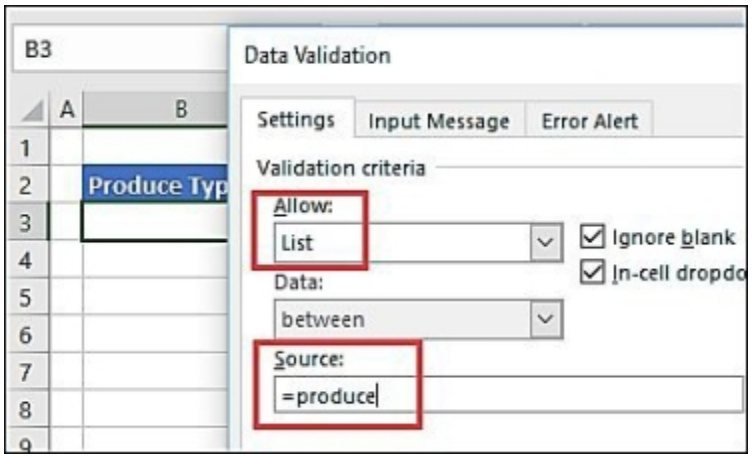
Data worksheet

- Navigate to the **Data** menu and select the option to validate data

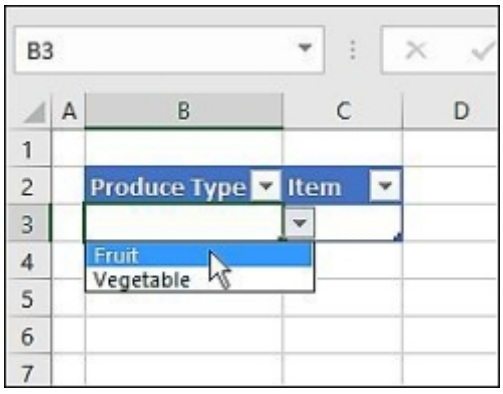
- In the resulting dialogue box, select the second worksheet, **List** in the drop-down option labeled **Allow**

- Choose the =**Produce** source list as previously named in the **List**

worksheet


B3
Data Validation
A
B
Settings
Input Message
Error Alert
Validation criteria
Produce Typ
Allow:
List
Ignore blank
In-cell dropdo
Data:
between
Source:
=produce

- Select **OK**



- Highlight the next cell to the right of the previously selected cell; this should be cell **C3**

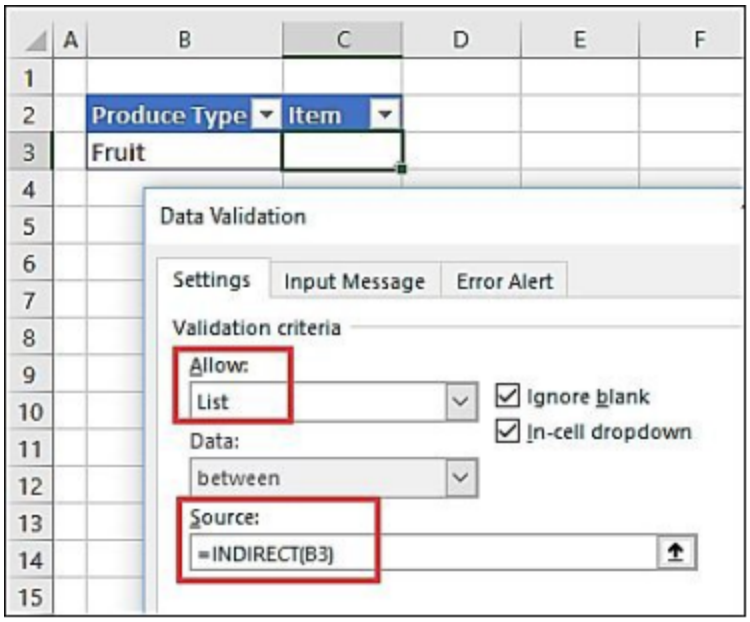
- Navigate to the **Data** menu and select the option to validate data
- In the box labeled **Source**, insert this formula

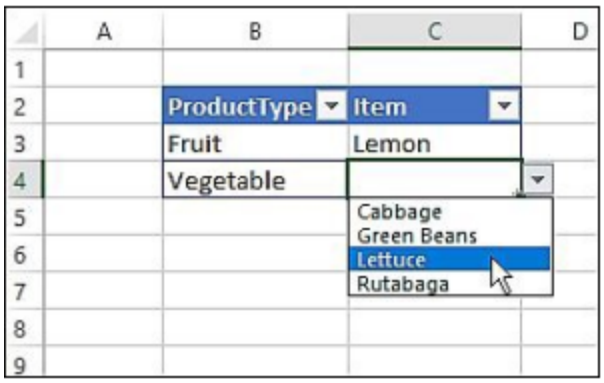
=INDIRECT(B3)

Cell **B3** is referenced here because cell **C3** has been highlighted

- Click **OK**
- Select the **Yes** option if Excel brings up an error message

- Select cell **B3,** Excel displays **$B$3** as the cell reference. Remove the dollar sign to make the reference of the cell relative.





To initiate another row in this table, the **Tab** key can be used. **Using the VLOOKUP Function**

- Select the cell where the formula would be implemented
- Navigate to the **Formula** menu and select the **Lookup** option

- Choose **VLOOKUP** from the drop-down menu to launch the corresponding dialogue box

- Indicate the cell where the data to be searched for would be entered

- Indicate the value the **VLOOKUP** function would use when searching

- Indicate the appropriate column reference

- Indicate if you desire only exact search matches to be found. This box takes either a **TRUE** or **FALSE** value.

- Click **OK**

CARRYING OUT CONDITIONAL MATHEMATICAL CALCULATIONS

Adding Up Values Satisfying a Single Specified Condition

This involves summation operation based on conditions being met. The **SUMIF** function is used. It follows the syntax:

=SUMIF(cell_range,condition,range_of_summation)

The **range_of_summation** argument denotes where the cells holding the values are to be summed. The formula can be implemented in this form:

=SUMIF (C7:C17, “Check”, D7:D17)

Adding Up Values Satisfying Multiple Specified Conditions

This operation uses the **SUMIFS** function. It has the syntax:

=SUMIFS(range_to_be_summed,condition_range1,condition1,condition_range2,condition2,.....)

It is implemented as follows:

=SUMIFS(D7:D11,A4:A11,“True”,B4:B11,”<100”)

Adding Up Non-zero Values

Use a formula such as:

=SUMIF(D7:D17,”>0”)

Adding Up Values within a Specific Range of Date Use a formula such as:

=SUMIF (C7:C11,”>5/31/2022”, C7:D11)

The SUMIFS Function

This function is used for aggregating values based on multiple conditions. Other functions for multiple condition operations exist such as **AVERAGEIFS, COUNTIFS,** etc.

AGGREGATING NUMBER OF VALUES MEETING SPECIFIED SINGLE AND MULTIPLE CONDITIONS

The operation uses **COUNTIF** and **COUNTIFS** functions for single and multiple condition satisfaction respectively. They follow the syntax:

=COUNTIFS((cell_range1,condition1,cell_range2,condition2 ,.....)

=COUNTIF((cell_range,condition)

Checking for Characters that are Non-standard

A simple formula exists to check for non-standard characters in your worksheet. However, for this formula to execute its operation, you first need to enter a VBA code in your workbook module;

- Use keyboard keys **ALT+F11** to launch the VBA console
- Enter the code below and save

Function ContainsSpecialCharacters(str As String) As Boolean For I = 1 To Len(str)

ch = Mid(str, I, 1) Select Case ch

Case “0” To “9”, “A” To “Z”, “a” To “z”, ” “

ContainsSpecialCharacters = False

Case Else ContainsSpecialCharacters = True Exit For
End Select Next
End Function

You can now use this formula to check if cells contain special characters or not

Strings	Contains Special Characters	Contains Special Characters
Assdqqwe	TRUE	Assdqqwe
I am Amazing	FALSE	I am Amazing
~asdw	TRUE	asdw
Wow	FALSE	Wow
Exceltip.Com	TRUE	ExceltipCom

=ContainsSpecialCharacters(D7)

AGGREGATING THE AVERAGE NUMBER OF VALUES MEETING SPECIFIED SINGLE AND MULTIPLE CONDITIONS

The operation uses **AVERAGEIF** and **AVERAGEIFS** functions for single and multiple condition satisfaction respectively. They follow the syntax:

=AVERAGEIFS((cell_range1,condition1,cell_range2,conditio n2,.....)

=AVERAGEIF((cell_range,condition) Summary

Conditional analyses are operations that depend on one or more conditions being met before they can be successfully carried out. Excel handles both single and multiple conditions. These conditions can be logical, comparison, or mathematical. Numerous functions exist to carry out operations on conditional analysis which were covered in this chapter. You can also check if your cell entries contain special characters with the C**ontainsSpecialCharacters** function after working on your VBA console for the module of your workbook.

CHAPTER SIX

IMPLEMENTING FORMULAS FOR LOOKUPS AND MATCHING

AN INTRODUCTION TO FORMULAS IN EXCEL LOOKUP

The function, LOOKUP in Excel, search an input argument from a single column or row range and gives a result from a different single column or row range. It follows the syntax:

=LOOKUP(value_to_lookup,single_column/row_cell_range,[result_range]))

The **[result_range]** argument is optional. This argument can be included to indicate where the **LOOKUP** formula should implement its search. Inclusion of the argument initiates a search in the **single_column/row_cell_range** and gives a result from a similar location in the **result_range**, otherwise, Excel gives the first data column. An implementation of the formula is as follows:

=LOOKUP(10251, D1:D7, E1:E6)

=LOOKUP(10251, D1:D7)

Other LOOKUP formulas include:

- Vertical Lookup with the function **VLOOKUP**
- Horizontal Lookup with the function **HLOOKUP**
- **MATCH** function
- **INDEX** function

IMPLEMENTING THE FUNCTIONS IN EXCEL LOOKUP

- **LOOKUP Function for Exact Result from a Left Column**

Looking up values from left columns in Excel can be done with the **VLOOKUP** and **CHOOSE** functions. This can be done with the formula

=VLOOKUP(F5,CHOOSE({1,2},D1:D7,C1:C7),2,0)

F5 is the value or cell content to be looked up, the cell range **D1:D7** is the column being looked up, and **C1:C7** holds the result value.

- **LOOKUP Function for Exact Result from Any Column**

This uses the **VLOOKUP** and **MATCH** functions. This lookup technique allows you to look up both rows and columns simultaneously. The formula is as follows:

=VLOOKUP(I9,C3:D11,MATCH(I3,C2:D2,0),0)

I9 denotes the value to be looked up on the row

I3 denotes the value to be looked up on the column

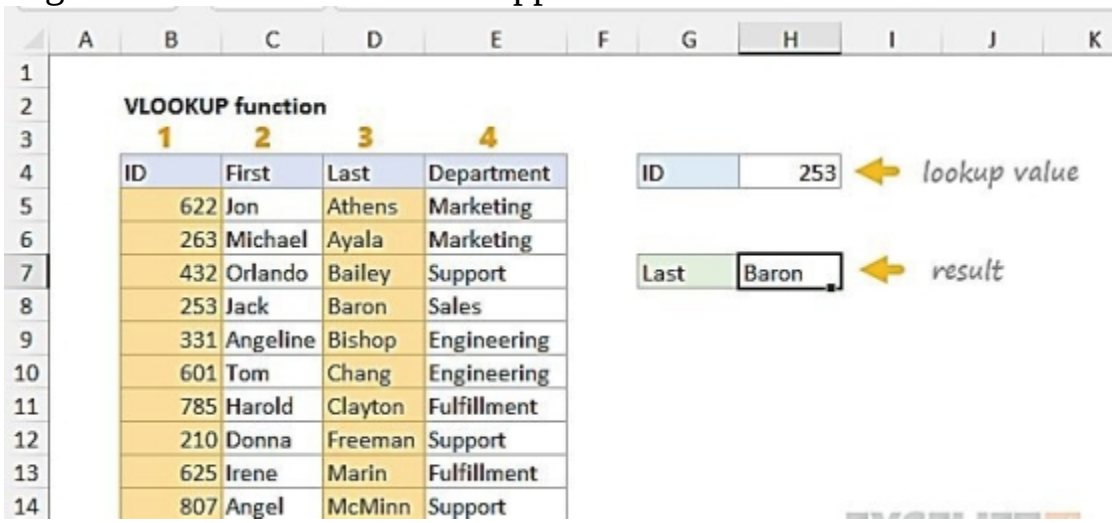
- **Using VLOOKUP**

This function looks up table value in a vertical direction. It follows this syntax:

=VLOOKUP (the_lookup_value, the_cell_range, column_number_index, TRUE/FALSE)

The argument **column_number_index** denotes the table column where **the_lookup_value** is present

Argument **TRUE** indicates an approximate or close search match

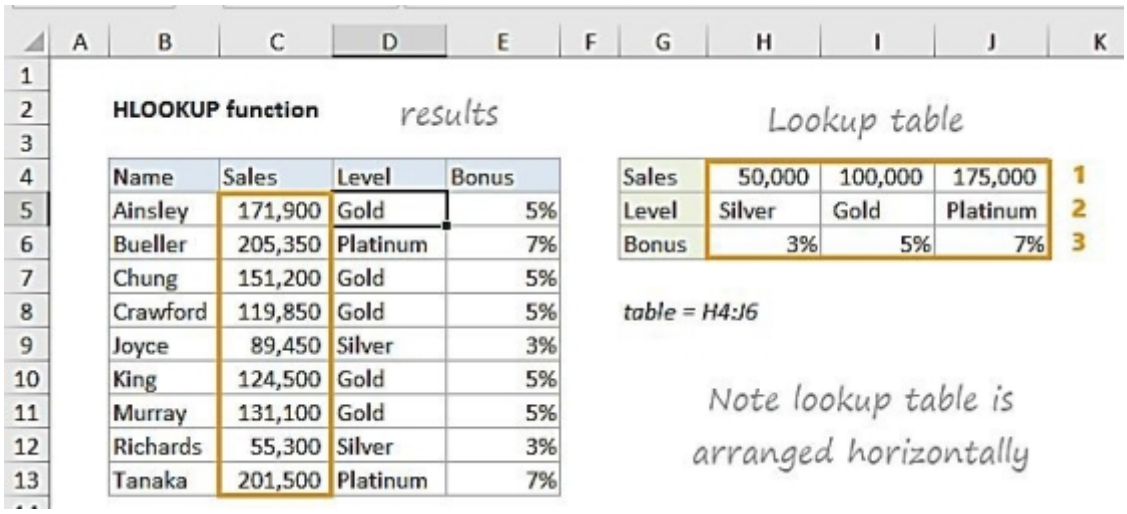


FALSE indicates an exact search match

- **Using HLOOKUP for Horizontal Lookup**

This function looks up table value in an horizontal direction. It follows the syntax:

=VLOOKUP(the_lookup_value,the_cell_range,column_number_index,TRUE/FALSE)



HLOOKUP function

results

Name	Sales	Level	Bonus
Ainsley	171,900	Gold	5%
Bueller	205,350	Platinum	7%
Chung	151,200	Gold	5%
Crawford	119,850	Gold	5%
Joyce	89,450	Silver	3%
King	124,500	Gold	5%
Murray	131,100	Gold	5%
Richards	55,300	Silver	3%
Tanaka	201,500	Platinum	7%

Lookup table

Sales	50,000	100,000	175,000	1
Level	Silver	Gold	Platinum	2
Bonus	3%	5%	7%	3

table = H4:J6

Note lookup table is arranged horizontally

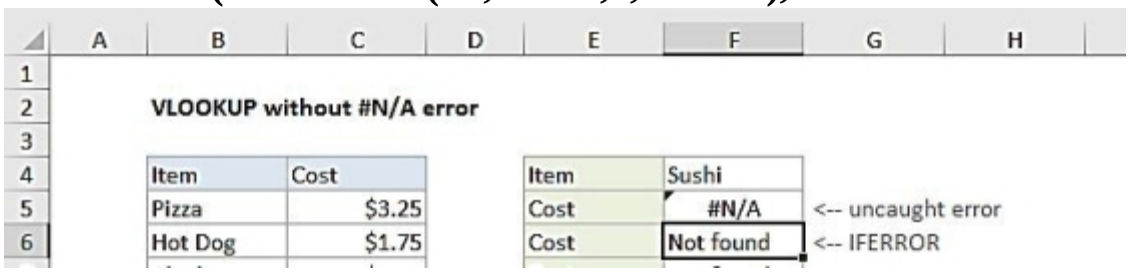
HANDLING ERRORS RESULTING FROM EXCEL LOOKUP

The **IFERROR** function is used to handle **#N/A** errors in Excel Lookup. This function can be used to detect the errors and then give a value of your choice. The syntax of this function is as follows:

=IFERROR(VLOOKUP(the_lookup_value,the_cell_range,column_number_index,TRUE/FALSE),“message”)

The **message** argument denotes what you want to be displayed when the error occurs, e.g.

=IFERROR(VLOOKUP(F7,B2:B8,3,FALSE),“Value not found”)



VLOOKUP without #N/A error

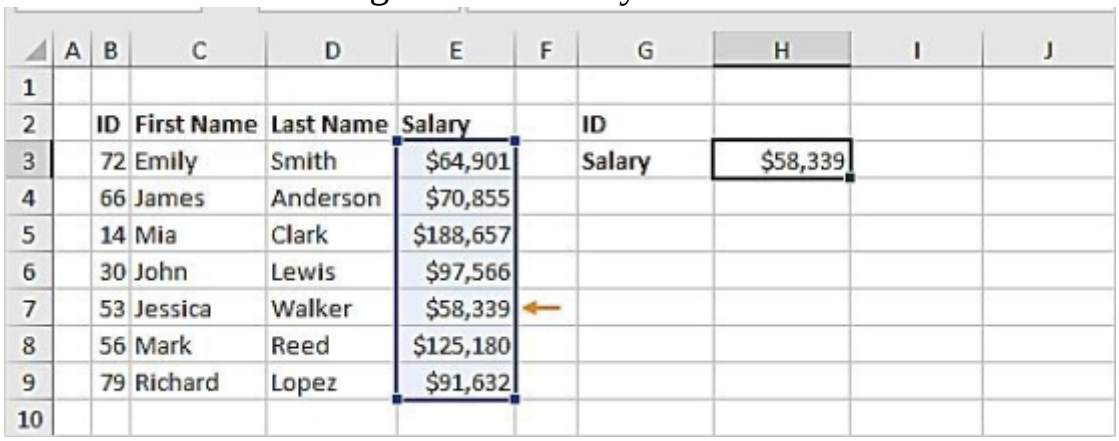
Item	Cost
Pizza	$3.25
Hot Dog	$1.75

Item	Sushi	
Cost	#N/A	<-- uncaught error
Cost	Not found	<-- IFERROR

SEARCHING FOR THE CLOSEST RESULT FROM A GROUP OF VALUES

- **Using the MATCH and INDEX Functions**

The **INDEX** function is implemented when searching for the indicated location of a value in a range of cells. Its syntax is as follows:

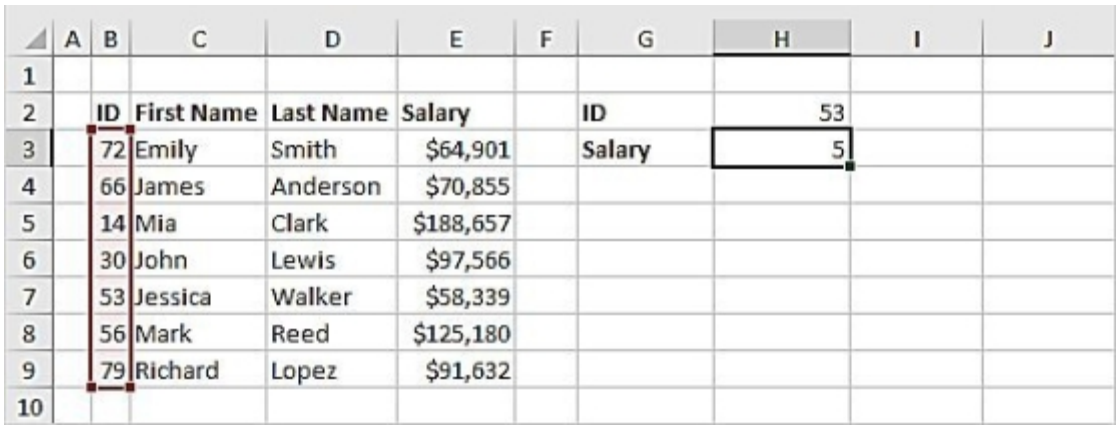


	A	B	C	D	E	F	G	H	I	J
1										
2		ID	First Name	Last Name	Salary		ID			
3		72	Emily	Smith	$64,901		Salary	$58,339		
4		66	James	Anderson	$70,855					
5		14	Mia	Clark	$188,657					
6		30	John	Lewis	$97,566					
7		53	Jessica	Walker	$58,339	←				
8		56	Mark	Reed	$125,180					
9		79	Richard	Lopez	$91,632					
10										

=INDEX(cell_range, row/column_number)

The **MATCH** function however gives the position of a value in a range of cells without indicating in the input formula. The syntax of the formula is as follows:

=MATCH(the_lookup_value,the_cell_range,column_number _index,TRUE/FALSE)



	A	B	C	D	E	F	G	H	I	J
1										
2		ID	First Name	Last Name	Salary		ID	53		
3		72	Emily	Smith	$64,901		Salary	5		
4		66	James	Anderson	$70,855					
5		14	Mia	Clark	$188,657					
6		30	John	Lewis	$97,566					
7		53	Jessica	Walker	$58,339					
8		56	Mark	Reed	$125,180					
9		79	Richard	Lopez	$91,632					
10										

The **MATCH** and **INDEX** functions can however be combined to create a Lookup formula that is dynamic, such that;

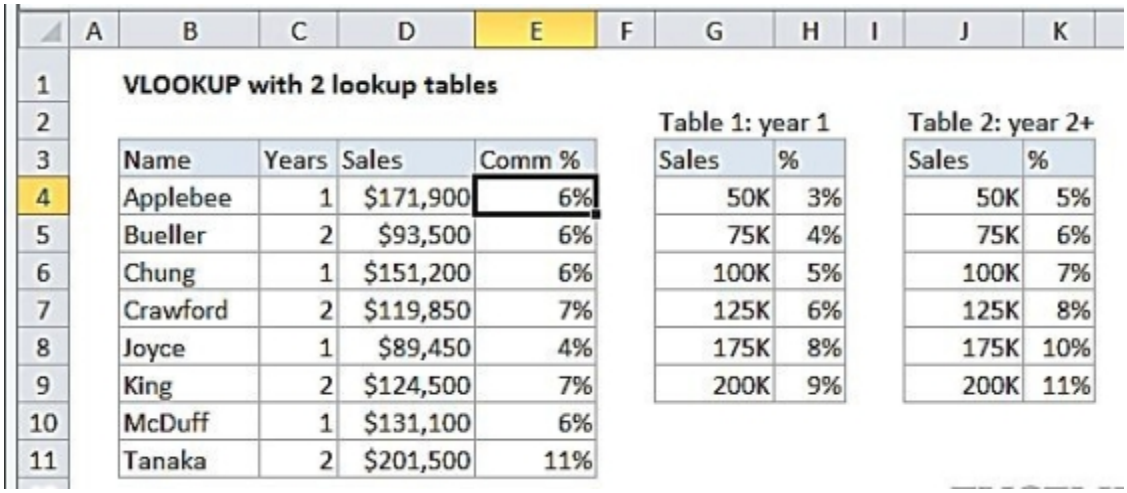
=INDEX(result_range,MATCH(the_lookup_value,the_cell_range,column_number_index,TRUE/FALSE))

- **Searching Out Values from Numerous Tables**

The syntax is as follows:

=VLOOKUP(the_lookup_value,IF(condition,cell_range1,cell_range),column_number_index,TRUE/FALSE)

An example of the formula implementation is:



VLOOKUP with 2 lookup tables

Name	Years	Sales	Comm %
Applebee	1	$171,900	6%
Bueller	2	$93,500	6%
Chung	1	$151,200	6%
Crawford	2	$119,850	7%
Joyce	1	$89,450	4%
King	2	$124,500	7%
McDuff	1	$131,100	6%
Tanaka	2	$201,500	11%

Table 1: year 1

Sales	%
50K	3%
75K	4%
100K	5%
125K	6%
175K	8%
200K	9%

Table 2: year 2+

Sales	%
50K	5%
75K	6%
100K	7%
125K	8%
175K	10%
200K	11%

=VLOOKUP(D7,IF(B4<2,G3:H9,J3:K9),2,FALSE)

- **Searching Out Values of Two-way Matrixes** This procedure uses the **VLOOKUP** and **MATCH** functions. The syntax to be used is as follows:

=VLOOKUP(vertical_lookup_value, cell_range, MATCH(horizontal_lookup_value, row_cell_range,TRUE/FALSE), TRUE/FALSE)

Note that the **cell_range** argument does not include rows or the headers for your table, it should only cover the cells containing data.

- **Using Multiple Criteria for Searching Out Values** This procedure follows this syntax:

{=INDEX(cell_range1,MATCH(TRUE/FALSE,(the_lookup_value1=cell_range2)*(the_lookup_value2=cell_range3)*(the_lookup_value3=cell_range4),TRUE/FALSE))}

USING SUMPRODUCT FUNCTION TO GIVE TEXT RESULTS

This function is also used for looking up two conditions, both in row and columns simultaneously. It follows this syntax:

=SUMPRODUCT(vertical_lookup_column_range=vertical_lookup_value)*(horizontal_lookup_row_range=horizontal_lookup_value),cell_range)

An operator known as the double **Unary** operator (-) can be included in the formula when dealing with Boolean tests. The operator is a conversion of the usual **TRUE/FALSE** argument.

Looking Up a Concluding Column's Value

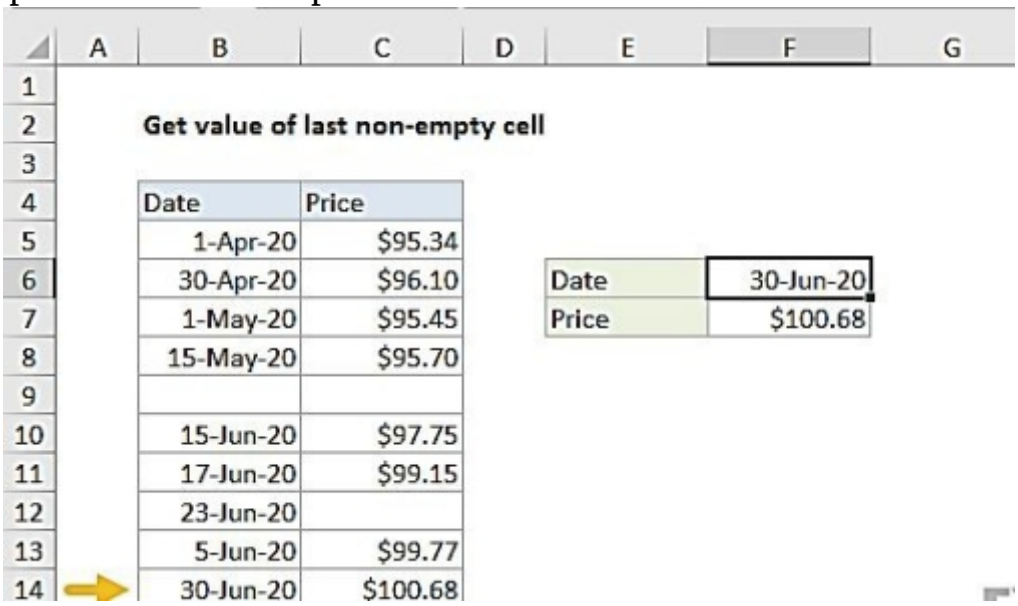
When dealing with large data and the last column needs to be retrieved, Excel made it easy to carry out this retrieval using the **LOOKUP** function.

=LOOKUP(2,1/(cell_range<>””),cell_range)

The expression **cell_range<>””** denotes that the indicated cell range is not empty. An example of the formula implementation is as follows:

=LOOKUP(2,1/(D:D<>””),D:D)

Referencing the cell range in this manner considers the whole column D, regardless of the presence of empty cells. This formula would give the data input in the last occupied cell in column **D.**



Get value of last non-empty cell

Date	Price
1-Apr-20	$95.34
30-Apr-20	$96.10
1-May-20	$95.45
15-May-20	$95.70
15-Jun-20	$97.75
17-Jun-20	$99.15
23-Jun-20	
5-Jun-20	$99.77
30-Jun-20	$100.68

Date	30-Jun-20
Price	$100.68

To handle possible errors in case the last value is an error so that Excel gives a result, you can include the **NOT** and **ISBLANK** functions.

=LOOKUP(2,1/(NOT(ISBLANK(D:D))),D:D)

To obtain the row number that the last value falls in, you can include the **ROW** function in your formula:

=LOOKUP(2,1/(D:D<>””),ROW(D:D))

To obtain another value related to the last value being looked up, you can switch the formula to this form:

=LOOKUP(2,1/(D:D<>””),E:E)

Looking Up a Concluding Column’s Numeric Value

If the last cell in the column contains numeric data, use the **ISNUMBER** function:

=LOOKUP(2,1/(ISNUMBER(D:D)),D:D)

Summary

This chapter discussed how you can search out and reference values in your data entry. Numerous Lookup functions exist in Excel to help users avoid the stress of searching through large data to obtain particular needed data. Note, however, that arguments labeled **cell_range** can also be replaced with named cell ranges, while input values to be looked up can be replaced with the actual data rather than its cell reference.

CHAPTER SEVEN

HANDLING FINANCIAL ANALYSIS WITH EXCEL FORMULAS

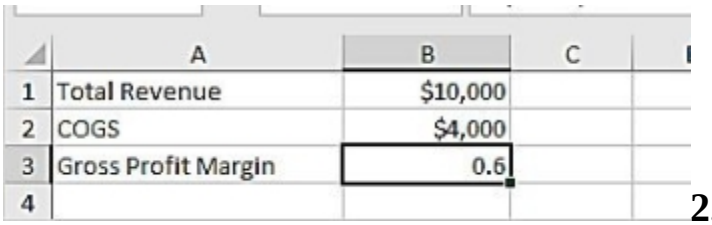
Executing Traditional Financial Calculations 1. Gross Profit Margin

This value is mathematically expressed thus:

Gross Profit Margin = (Total Income or Revenue - Total Sales) ÷ Total Income

Each of these parameters can simply be referenced by their cells, such as:

=(E8-E9)/E8

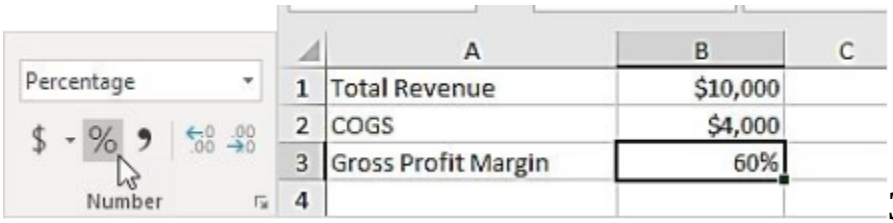


	A	B	C
1	Total Revenue	$10,000	
2	COGS	$4,000	
3	Gross Profit Margin	0.6	
4			

2. Percentage of Gross Profit Margin

The previous calculation can be converted to percentage following these steps:

- Highlight the cell containing the previous result
- Navigate to the **Home** menu
- When in the **Number** section, select the **Percentage** option



3.

Dealing with Operating Profit Margin

This margin includes expenses such as rent, marketing, machinery, etc. It should be converted to a percentage after it is calculated. The formula for this is as follows:

Operating Profit Margin = (Total Income or Revenue - Total Sales - Cost of Operation) ÷ Total Income

	A	B	C
1	Total Revenue	$10,000	
2	COGS	$4,000	
3	OPEX	$1,000	
4	Operating Profit Margin	50%	
5			

1. **Dealing with Net Profit Margin**

This margin includes expenses such as taxes and interest, etc. It should be converted to a percentage after it is calculated. The formula for this is as follows:

Net Profit Margin = (Total Income or Revenue - Total Sales Cost of Operation - Tax - Interest) ÷ Total Income

	A	B	C
1	Total Revenue	$10,000	
2	COGS	$4,000	
3	OPEX	$1,000	
4	Interest	$500	
5	Taxes	$1,000	
6	Net Profit Margin	35%	
7			

1. **Dealing with Markup**

Markup is mathematically calculated as:

Markup = (Price of Goods - Cost) ÷ Cost

Each of these parameters can simply be referenced by their cells. Markup price is the additional amount included in a goods cost price as a remedy for making a profit.

GENERATING EBITDA AND EBIT

EBITDA stands for **“Earnings before Interest, Tax, Depreciation, and Amortization”.** An organization’s EBITDA can be realized by summing up its net revenue, tax, interest, etc. It shows an organization’s income before certain dues are deducted.

Mathematically, it is visualized as:

EBITDA = Net Revenue + Interest + Tax + Depreciation and Amortization

EBIT however is used for determining an organization’s profitability. It is expressed as

EBIT = (Total Sales - Cost of Sold Goods - Cost of Operation) ÷ Total Sales

It can be expressed **as** a percentage. An alternative formula is to use the Net Income;

EBIT = (Net Income + Interest + Taxes) ÷ Total sales

GENERATING THE COST OF SOLD GOODS

Cost of sold goods is the expenses incurred by an organization during a product’s production process, such as production materials, labor, etc. It can be expressed as:

Cost of Sold Goods = Start-of-year Inventory + Purchases Inventory – End-of-year Inventory

GENERATING ASSETS RETURN

This measure is also used to determine the profitability of a company and should be converted to a percentage. It can be calculated as follows:

Return on Assets (ROA) = Profit ÷ Assets GENERATING EQUITY RETURNS

This is calculated and then converted to percentage in Excel using the cell references holding these parameters:

Return on Equity (ROE) = Profit ÷ Capital of Equity

A key difference between ROA and ROE is that ROA enables investors to decide how an organization manages and channels its resources and assets to generate profit; while ROE enables investors to decide how well their investments bring about profitmaking.

However, both are measures of an organization’s profitability.

GENERATING BREAK EVEN

Break-even denotes zero profits and loss. The organization neither gained nor lost in the sales of its goods. The break-even point for a company occurs when the summation of fixed expenses and variable expenses, such as labor, amounts to the total revenue realized. This can be mathematically expressed thus:

Fixed Expenses + Variable Expenses = Revenue

VARIATIONS OF BREAK-EVEN CALCULATION These can be calculated in per unit, percentages, or as a total

- **Break-Even for Sales**

This is calculated to enable a company to determine the needed cost to keep the organization functional. It is calculated as follows: **Break-Even for Sales = Fixed Expenses ÷ Contribution Ratio** Where the **Contribution Ratio** is calculated as **Variable Expenses ÷ Revenue**

- **Break-Even for Sold Units**

An organization implements this to determine the number of units that are needed to be sold to attain a point of break-even. It is calculated as:

Break-Even for Sold Units = Fixed Expenses ÷ (Unit Price Unit Variable Expenses)

USING GOAL SEEK FOR BREAK-EVEN

- Open a worksheet and enter necessary data as follows:

- Use these formulas to fill in needed parameters **Revenue = Unitary price * Sold units**

Variable Expenses = Unit cost * Sold units

Profit or Gain = Revenue - Variable Expenses Fixed Expenses

- Navigate to the **Data** menu and select the option for analyzing

What-ifs

- Select the **Goal Seek** option from the drop-down menu
- Carry out the following indications in the resulting dialogue box:
- Enter the cell for **Profit** in the **Set cell** box
- Type in **0** in the next box
- The **Cell Changing** box should be set to the cell referencing

Unitary Price

- Click on **OK**
- Select **OK** in the next dialogue box

This action changes the **Profit** value to **0** because there is no profit realized at break even. It also calculates the approximate price the

goods are required to be sold at for the indicated **Sold Units.**

GENERATING CUSTOMER CHURN

This measure indicates the number of buyers or customers that stop purchasing a particular product over a certain period. It is otherwise known as Rate of Attrition and calculated as follows:

Rate of Attrition = Number of Customer Churn ÷ Total Customer in a Given Period

This calculation is essential in business analysis to prevent running into excess loss due to a shortage of customers purchasing a product.

GENERATING ANNUAL RATE OF CHURN

This is calculated by setting the value for **Total Customer in a Given Period** to the customer number at the beginning of a year, i.e.

Rate of Attrition = Number of Customer Churn ÷ Total Customer at Year Start

GENERATING THE AVERAGE VALUE OF A CUSTOMER LIFETIME

This is the total amount received from a customer from starting period to the time of churn. This value is calculated as follows: **Average Customer Value = Average Size of Transaction * Number of Purchases * Period of Purchase**

GENERATING TURNOVER OF EMPLOYEES

Turnover of employees is similar to churn of customers. It describes the unit or percentage of employees that left an organization within a period. It can be calculated as follows:

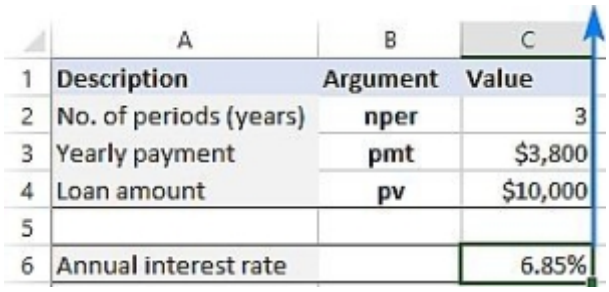
Annual Turnover of Employees = Number of Departed Employees ÷ Total Average of Employees

Total Average of Employees = (Employee Number at the Start of the year + Employee Number at the End of the Year) ÷ 2

IMPLEMENTING FUNCTIONS FOR FINANCIAL OPERATIONS IN EXCEL

- **Calculating Rate of Interest**

This can be done using the **RATE** function as follows:
=RATE(Time,Periodical_Payment,Principal)



	A	B	C
1	Description	Argument	Value
2	No. of periods (years)	nper	3
3	Yearly payment	pmt	$3,800
4	Loan amount	pv	$10,000
5			
6	Annual interest rate		6.85%

- **Calculating Rate of Effectiveness Using FV**

FV in Excel denotes Future Value. It generates the total amount accrued over an investment, depending on a predefined rate of interest. The **FV** syntax is as follows:

=FV(Rate,Time,Periodical_Payment,[Capital],[Type_of_Pay ment])

Capital and **Type_of_Payment** arguments are optional. The **Type_of_Payment** argument denotes when the amount due is to be paid. The argument takes two values:

- **0** denotes payment at the end of the specified period. It can be omitted in the formula.
- **1** denotes payment at the beginning of the specified period.

DESIGNING A CALCULATOR FOR LOAN REPAYMENT

Generating a Schedule for Loan Amortization The functions involved in designing this calculator are as follows:

- **PMT** function for deriving the amount of total payments over the set period
- **PPMT** function for deriving the amount of principal for every payment
- **IPMT** function for deriving the interest on every payment Follow these steps to design a schedule for loan amortization:

•

Make a data entry such as this:

- Enter a serial numeric order in the **Period** column

• Highlight the first cell in the **Payment** column to calculate the amount of total payments over the set period using this syntax:

=PMT((Annual_rate_of_interest ÷ Number_of_payment_periods), (Loan_duration * Number_of_payment_periods),Amount_of_Loan)

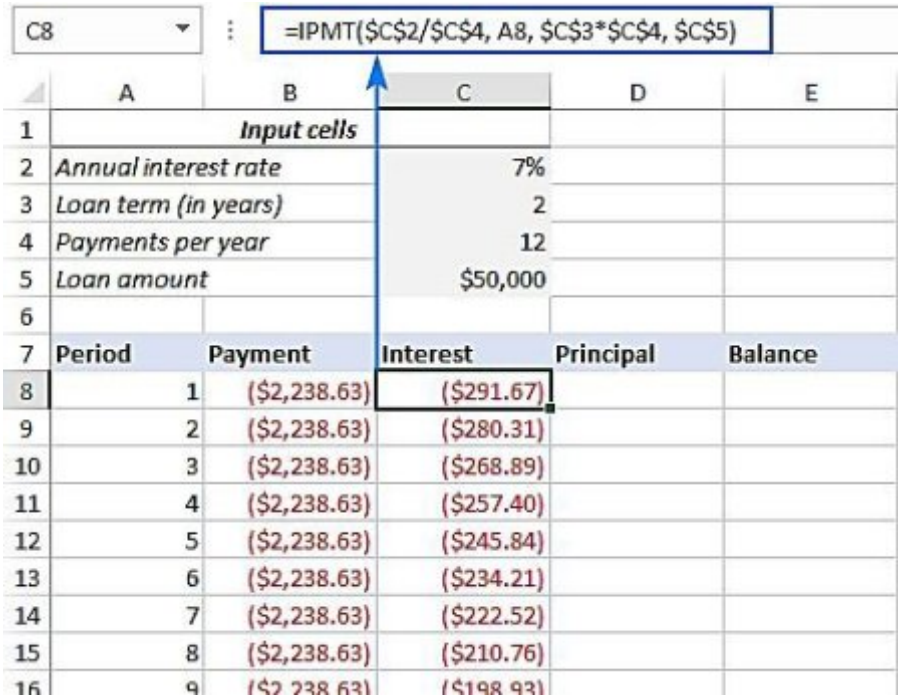
Annual_rate_of_interest ÷ Number_of_payment_periods is for generating the periodic rate

• Ensure to use absolute referencing when writing your formula to prevent changes in your cell values.

•

Using the drag and fill procedure, autofill the **Payment** column

• Highlight the first cell in the **Interest** column to calculate the interest on every payment using this syntax: **=IPMT(Periodic_rate, Payment_period, (Loan_duration ***



	A	B	C	D	E
1		*Input cells*			
2	*Annual interest rate*		7%		
3	*Loan term (in years)*		2		
4	*Payments per year*		12		
5	*Loan amount*		$50,000		
6					
7	**Period**	**Payment**	**Interest**	**Principal**	**Balance**
8	1	($2,238.63)	($291.67)		
9	2	($2,238.63)	($280.31)		
10	3	($2,238.63)	($268.89)		
11	4	($2,238.63)	($257.40)		
12	5	($2,238.63)	($245.84)		
13	6	($2,238.63)	($234.21)		
14	7	($2,238.63)	($222.52)		
15	8	($2,238.63)	($210.76)		
16	9	($2,238.63)	($198.93)		

Number_of_payment_periods), Amount_of_Loan))

Note that the **Payment_period** argument is to be referenced relatively so that the calculation is done based on the period value of each row.

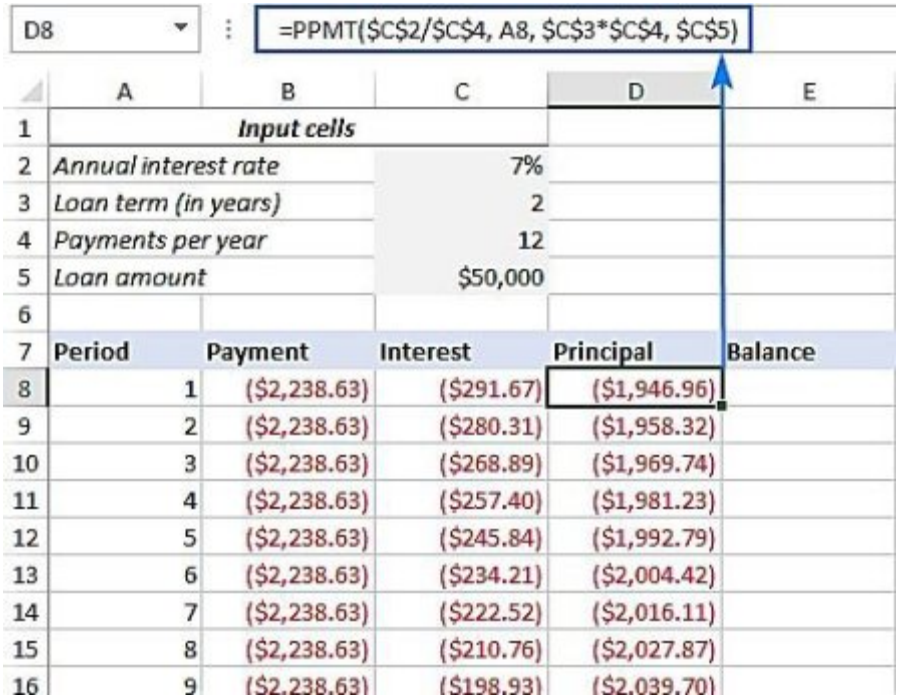
•

Using the drag and fill procedure, autofill the **Interest** column

• Highlight the first cell in the **Principal** column to calculate the amount of principal for every payment on every payment using this syntax:

=PPMT(Periodic_rate, Payment_period,(Loan_duration * Number_of_payment_periods), Amount_of_Loan)

- Using the drag and fill procedure, autofill the **Principal** column



	A	B	C	D	E
1	*Input cells*				
2	*Annual interest rate*		7%		
3	*Loan term (in years)*		2		
4	*Payments per year*		12		
5	*Loan amount*		$50,000		
6					
7	**Period**	**Payment**	**Interest**	**Principal**	**Balance**
8	1	($2,238.63)	($291.67)	($1,946.96)	
9	2	($2,238.63)	($280.31)	($1,958.32)	
10	3	($2,238.63)	($268.89)	($1,969.74)	
11	4	($2,238.63)	($257.40)	($1,981.23)	
12	5	($2,238.63)	($245.84)	($1,992.79)	
13	6	($2,238.63)	($234.21)	($2,004.42)	
14	7	($2,238.63)	($222.52)	($2,016.11)	
15	8	($2,238.63)	($210.76)	($2,027.87)	
16	9	($2,238.63)	($198.93)	($2,039.70)	

- To calculate the **Balance** of the loan for the first cell:

- Highlight the first cell under the **Balance** column use this formula with relative cell referencing:

Balance_for_Period1 = Amount_of_Loan + Principal_for_Period1

- For subsequent **Balance** cells, implement this formula:

Balance_for_Period2 = Principal_for_Period2 Balance_for_Period3 = Principal_for_Period3 Balance_for_Period4 = Principal_for_Period4 Balance_for_Period1 +

Balance_for_Period2 + Balance_for_Period3 +

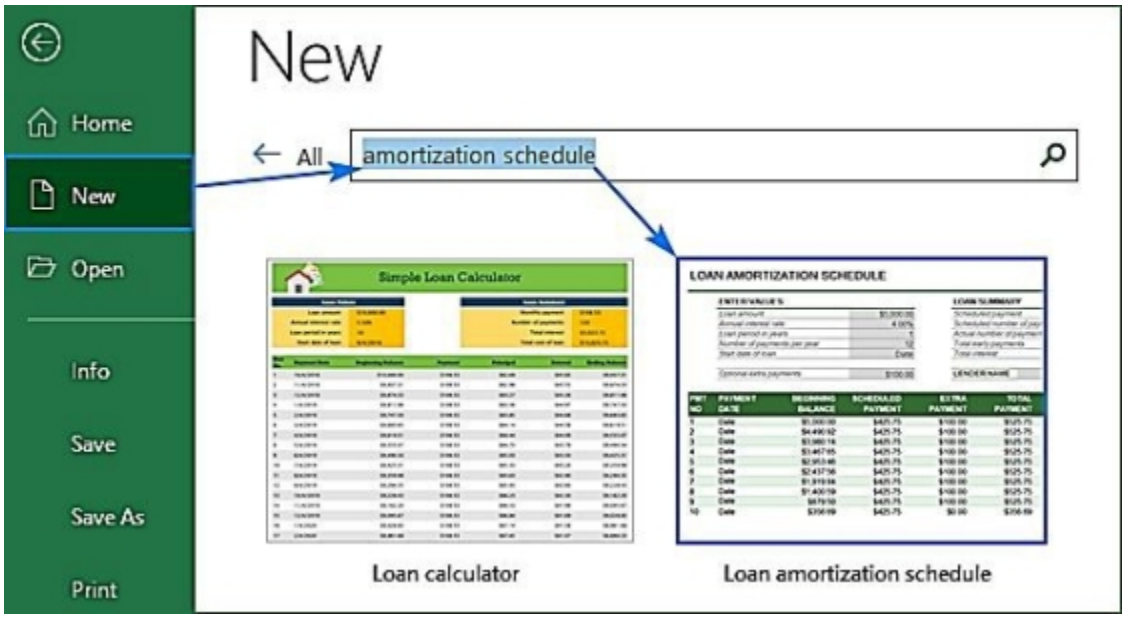
- This formula continues until the end of the 24-month period.

	A	B	C	D	E	F
1	*Input cells*					
2	*Annual interest rate*		7%			
3	*Loan term (in years)*		2			
4	*Payments per year*		12			
5	*Loan amount*		$50,000			
6						
7	**Period**	**Payment**	**Interest**	**Principal**	**Balance**	
8	1	($2,238.63)	($291.67)	($1,946.96)	$48,053.04	=C5+D8
9	2	($2,238.63)	($280.31)	($1,958.32)	$46,094.72	=E8+D9
10	3	($2,238.63)	($268.89)	($1,969.74)	$44,124.98	=E9+D10
11	4	($2,238.63)	($257.40)	($1,981.23)	$42,143.74	=E10+D11
12	5	($2,238.63)	($245.84)	($1,992.79)	$40,150.95	etc.
13	6	($2,238.63)	($234.21)	($2,004.42)	$38,146.54	
14	7	($2,238.63)	($222.52)	($2,016.11)	$36,130.43	
15	8	($2,238.63)	($210.76)	($2,027.87)	$34,102.56	
16	9	($2,238.63)	($198.93)	($2,039.70)	$32,062.86	
17	10	($2,238.63)	($187.03)	($2,051.60)	$30,011.27	
18	11	($2,238.63)	($175.07)	($2,063.56)	$27,947.70	
19	12	($2,238.63)	($163.03)	($2,075.60)	$25,872.10	
20	13	($2,238.63)	($150.92)	($2,087.71)	$23,784.40	
21	14	($2,238.63)	($138.74)	($2,099.89)	$21,684.51	
22	15	($2,238.63)	($126.49)	($2,112.14)	$19,572.37	
23	16	($2,238.63)	($114.17)	($2,124.46)	$17,447.92	
24	17	($2,238.63)	($101.78)	($2,136.85)	$15,311.07	
25	18	($2,238.63)	($89.31)	($2,149.31)	$13,161.75	
26	19	($2,238.63)	($76.78)	($2,161.85)	$10,999.90	
27	20	($2,238.63)	($64.17)	($2,174.46)	$8,825.44	
28	21	($2,238.63)	($51.48)	($2,187.15)	$6,638.29	
29	22	($2,238.63)	($38.72)	($2,199.91)	$4,438.38	
30	23	($2,238.63)	($25.89)	($2,212.74)	$2,225.65	
31	24	($2,238.63)	($12.98)	($2,225.65)	$0.00	

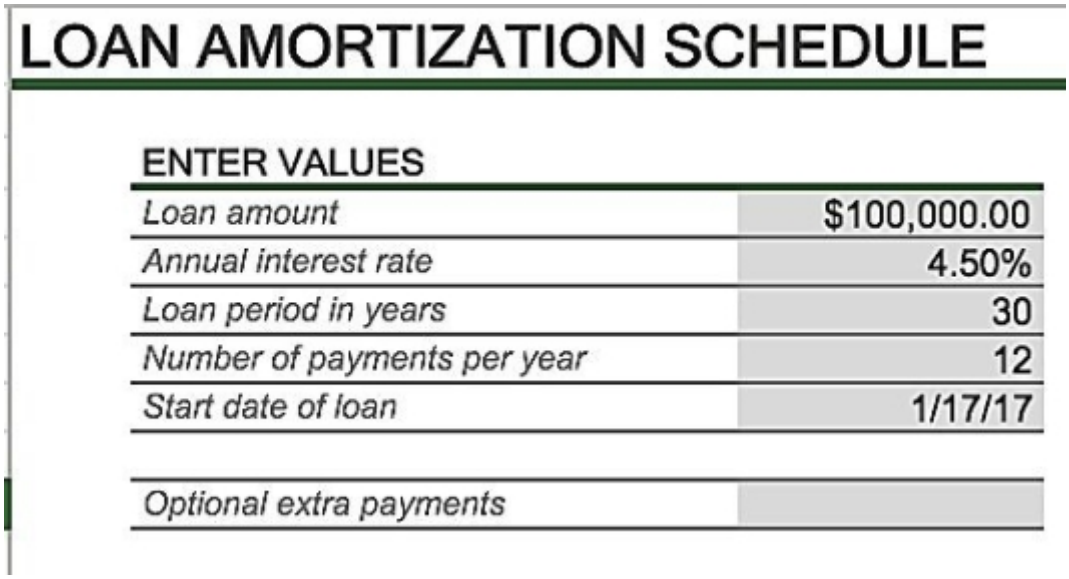
An amortization schedule can be easier created using the Excel built-in Amortization template.

- Launch Excel and navigate to **New**

- Search and select the option for an **Amortization Schedule** from the gallery for templates



- Enter your beginning data in the appropriate spaces provided



LOAN AMORTIZATION SCHEDULE

ENTER VALUES	
Loan amount	$100,000.00
Annual interest rate	4.50%
Loan period in years	30
Number of payments per year	12
Start date of loan	1/17/17
Optional extra payments	

- Excel then uses this data to calculate every necessary data

LOAN AMORTIZATION SCHEDULE

ENTER VALUES	
Loan amount	$100,000.00
Annual interest rate	4.50%
Loan period in years	30
Number of payments per year	12
Start date of loan	1/17/17
Optional extra payments	

LOAN SUMMARY	
Scheduled payment	$506.69
Scheduled number of payments	360
Actual number of payments	360
Total early payments	
Total interest	
LENDER NAME	

PMT NO	PAYMENT DATE	BEGINNING BALANCE	SCHEDULED PAYMENT	EXTRA PAYMENT	TOTAL PAYMENT	PRINCIPAL	INTEREST	ENDING BALANCE	CUMULATIVE INTEREST
1	1/17/17	$100,000.00	$506.69	$0.00	$506.69	$131.69	$375.00	$99,868.31	$375.00
2	2/17/17	$99,868.31	$506.69	$0.00	$506.69	$132.18	$374.51	$99,736.14	$749.51
3	3/17/17	$99,736.14	$506.69	$0.00	$506.69	$132.67	$374.01	$99,603.46	$1,123.52
4	4/17/17	$99,603.46	$506.69	$0.00	$506.69	$133.17	$373.51	$99,470.29	$1,497.03
5	5/17/17	$99,470.29	$506.69	$0.00	$506.69	$133.67	$373.01	$99,336.62	$1,870.04
6	6/17/17	$99,336.62	$506.69	$0.00	$506.69	$134.17	$372.51	$99,202.44	$2,242.56
7	7/17/17	$99,202.44	$506.69	$0.00	$506.69	$134.68	$372.01	$99,067.77	$2,614.56
8	8/17/17	$99,067.77	$506.69	$0.00	$506.69	$135.18	$371.50	$98,932.59	$2,986.07
9	9/17/17	$98,932.59	$506.69	$0.00	$506.69	$135.69	$371.00	$98,796.90	$3,357.07
10	10/17/17	$98,796.90	$506.69	$0.00	$506.69	$136.20	$370.49	$98,660.70	$3,727.55
11	11/17/17	$98,660.70	$506.69	$0.00	$506.69	$136.71	$369.98	$98,523.99	$4,097.53
12	12/17/17	$98,523.99	$506.69	$0.00	$506.69	$137.22	$369.46	$98,386.77	$4,467.00
13	1/17/18	$98,386.77	$506.69	$0.00	$506.69	$137.73	$368.95	$98,249.04	$4,835.95
14	2/17/18	$98,249.04	$506.69	$0.00	$506.69	$138.25	$368.43	$98,110.79	$5,204.38
15	3/17/18	$98,110.79	$506.69	$0.00	$506.69	$138.77	$367.92	$97,972.02	$5,572.30
16	4/17/18	$97,972.02	$506.69	$0.00	$506.69	$139.29	$367.40	$97,832.73	$5,939.69
17	5/17/18	$97,832.73	$506.69	$0.00	$506.69	$139.81	$366.87	$97,692.91	$6,306.56
18	6/17/18	$97,692.91	$506.69	$0.00	$506.69	$140.34	$366.35	$97,552.58	$6,672.91
19	7/17/18	$97,552.58	$506.69	$0.00	$506.69	$140.86	$365.82	$97,411.71	$7,038.74
20	8/17/18	$97,411.71	$506.69	$0.00	$506.69	$141.39	$365.29	$97,270.32	$7,404.03

COMPUTING DEPRECIATION

Computing Accelerated Depreciation

Accelerated depreciation occurs when the value of an asset reduces faster than is expected. This form of depreciation does not obey the usual steady straight-line principle. Excel uses the **DDB** function for this calculation, which is known as **Double Declining Balance.** The syntax is as follows:

=DDB (Asset_cost, Ending_salvage_value, Asset_life, Depreciation_period, [Rate_of_depreciation])

The **Rate_of_depreciation** argument is optional in the formula. It denotes the rate of reduction in the asset cost. Excel sets the default value at **2** if not specified.

COMPUTING CURRENT VALUES

Computing the Current Value of Future Payments

The **PV** function calculates the current value of payments. The syntax is as follows:

=PV(Rate,Time,Periodical_Payment,[FP],[Type_of_Payment])

FP (future payment)**, Type_of_Payment** arguments are optional.

COMPUTING NET CURRENT VALUE

Computing Negative and Positive Flow of Cash

The calculation of net current values using the **NPV** function employs a rate of discount and a forecasted flow of cash. The syntax is as follows:

=NPV(Discount_rate,cash_flow_value1, [cash_flow_value2], ...)

The cash_flow_value argument is a reference to a range of cells.

COMPUTING INTERNAL RETURN RATE

Computing Non-periodic Future Flow of Cash

Excel uses the **XIRR** function for this calculation. The function has the following syntax:

=XIRR(cash_flow_value, cash_flow_dates, [Estimate IRR])

The **Estimate IRR** function is optional and denotes an estimated value for the internal return rate. It is usually expressed as a percentage. Excel assigns a default value of 10% or 0.1 if not specified.

CARRYING OUT FINANCIAL FORECAST

Time-based historical data are needed for carrying out the financial forecast in Excel. Financial forecasts help to predict income flow, trends, sales, etc. When the option for a forecast is selected, Excel creates the forecast chart in another worksheet, along with a forecast table containing the input data and the forecasted values.

- Open an Excel worksheet and create a data entry having dates or times and values which correspond, such as sales

	A	B
1	Date	Sales
2	1/1/2011	3,240,325
3	2/1/2011	2,741,349
4	3/1/2011	2,987,427
5	4/1/2011	3,456,892
6	5/1/2011	3,740,738
7	6/1/2011	3,979,178
8	7/1/2011	4,160,454
9	8/1/2011	4,162,013
10	9/1/2011	3,809,132
11	10/1/2011	3,794,419
12	11/1/2011	3,719,219
13	12/1/2011	3,812,981
14	1/1/2012	3,480,451
15	2/1/2012	3,183,133

- Highlight your input data and navigate to the **Data** menu

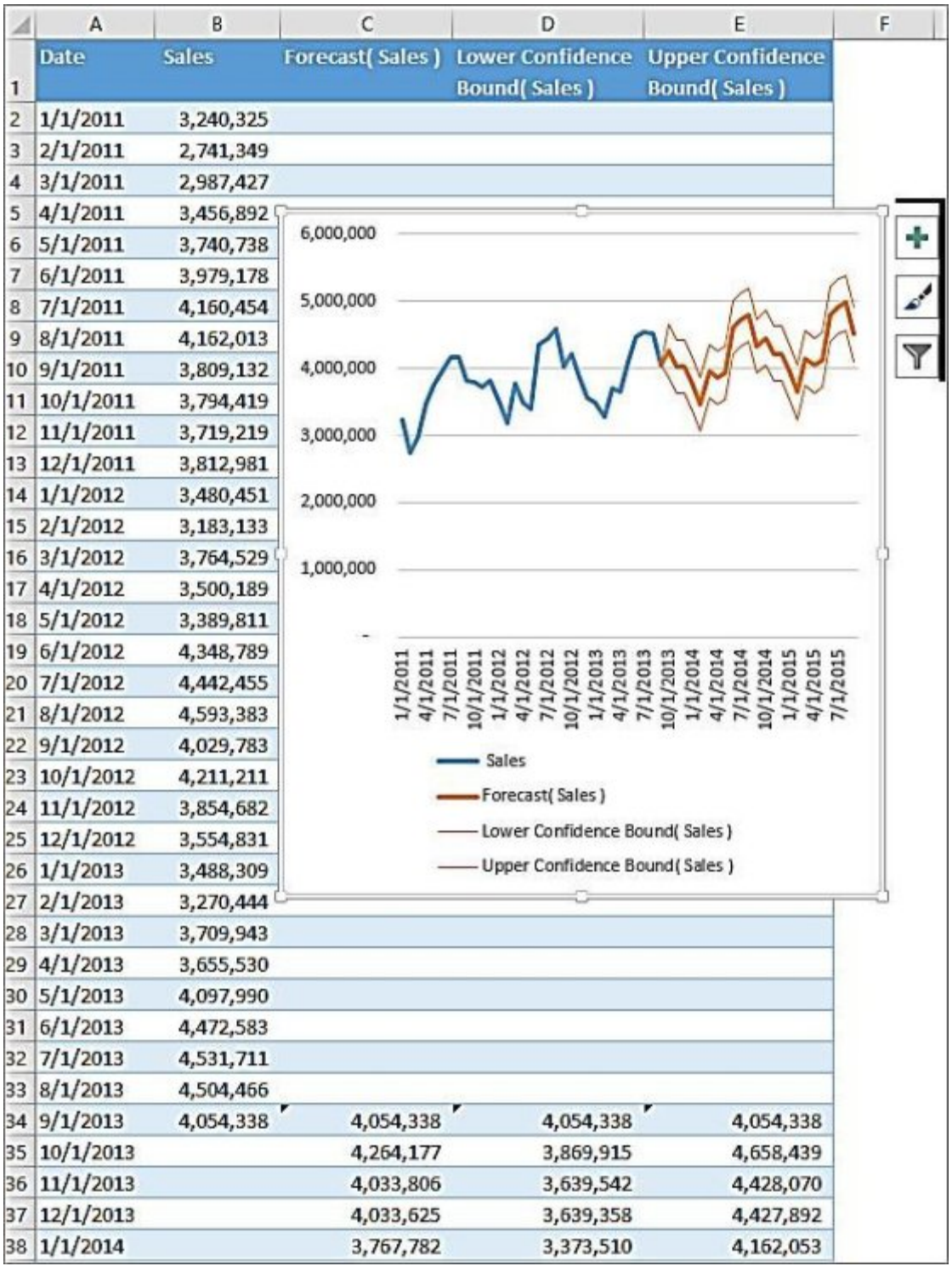
•

Select the option for a **Forecasting Sheet**

• Choose the type of chart desired, either a line or column chart in the resulting dialogue box

• Also, select an ending date for the forecast and then click on

Create



	A	B	C	D	E	F
1	Date	Sales	Forecast(Sales)	Lower Confidence Bound(Sales)	Upper Confidence Bound(Sales)	
2	1/1/2011	3,240,325				
3	2/1/2011	2,741,349				
4	3/1/2011	2,987,427				
5	4/1/2011	3,456,892				
6	5/1/2011	3,740,738				
7	6/1/2011	3,979,178				
8	7/1/2011	4,160,454				
9	8/1/2011	4,162,013				
10	9/1/2011	3,809,132				
11	10/1/2011	3,794,419				
12	11/1/2011	3,719,219				
13	12/1/2011	3,812,981				
14	1/1/2012	3,480,451				
15	2/1/2012	3,183,133				
16	3/1/2012	3,764,529				
17	4/1/2012	3,500,189				
18	5/1/2012	3,389,811				
19	6/1/2012	4,348,789				
20	7/1/2012	4,442,455				
21	8/1/2012	4,593,383				
22	9/1/2012	4,029,783				
23	10/1/2012	4,211,211				
24	11/1/2012	3,854,682				
25	12/1/2012	3,554,831				
26	1/1/2013	3,488,309				
27	2/1/2013	3,270,444				
28	3/1/2013	3,709,943				
29	4/1/2013	3,655,530				
30	5/1/2013	4,097,990				
31	6/1/2013	4,472,583				
32	7/1/2013	4,531,711				
33	8/1/2013	4,504,466				
34	9/1/2013	4,054,338	4,054,338	4,054,338	4,054,338	
35	10/1/2013		4,264,177	3,869,915	4,658,439	
36	11/1/2013		4,033,806	3,639,542	4,428,070	
37	12/1/2013		4,033,625	3,639,358	4,427,892	
38	1/1/2014		3,767,782	3,373,510	4,162,053	

Summary

Excel has a provision for major financial operations that the user would need to be executed in a straightforward and presentable format. This chapter explained and discussed various financial analytic values, ranging from EBITDA, profit margins, break-even, customer churn, and the

computation of future values, Excel provides easy representation and formulas for these calculations.

Built-in functions such as NPV, DB, PV, FV, etc. also exist for easy

value computation. The stress of manually creating an Amortization Schedule for Loan repayment is also taken care of by implementing a corresponding Excel template.

CHAPTER EIGHT

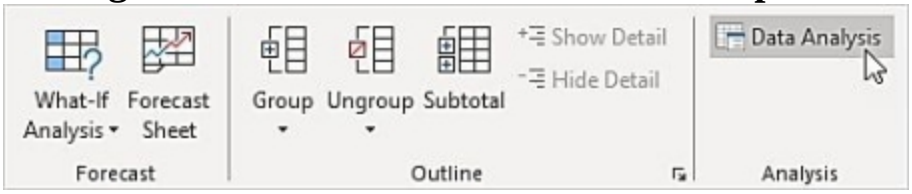
HANDLING WEIGHTED AVERAGES Adding Moving Averages to Your Data

The tool for Exponential Smoothing is used in Excel for handling moving averages. The averaging weights of exponential smoothing are such that current values are made to have more effect in the calculation of the average, while the effect of the existing values is reduced. Computing the averaging weights for moving averages using exponential smoothing involves a constant for smoothing.

Follow these steps to compute the averaging weights for moving averages:

- Prepare your data such as this:

Navigate to the Data menu and select the option for Analysing Data

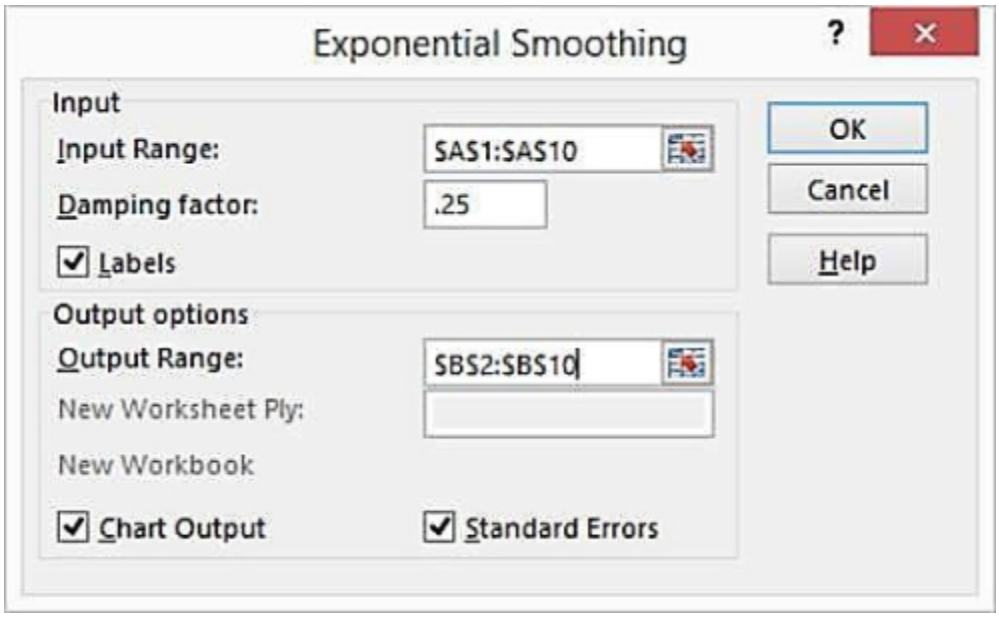


- Select **Exponential Smoothing** in the resulting dialogue box and click on the **OK** button

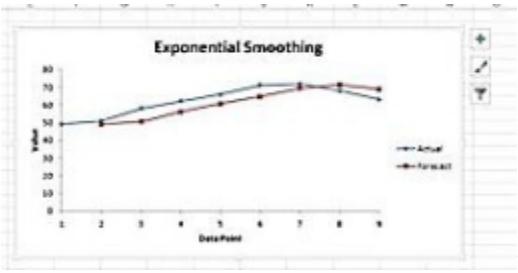
- This action brings up the **Exponential Smoothing** dialogue box
- Enter the cell range for your data in the box for range input

- Specify a constant for the smoothing in the labeled box for **Dampening.** Excel suggests using a value between the range of 0.2 to 0.3. You can indicate higher values if desired.

- Specify the cell range for your output data



- If you desire a chart, select the corresponding box for the exponential smoothing chart
- Also, indicate to include the possible errors which are standard by selecting the appropriate box. (These two previous steps are optional)



- Select **OK**

CREATING DESCRIPTIVE STATISTICS USING FORMULAS

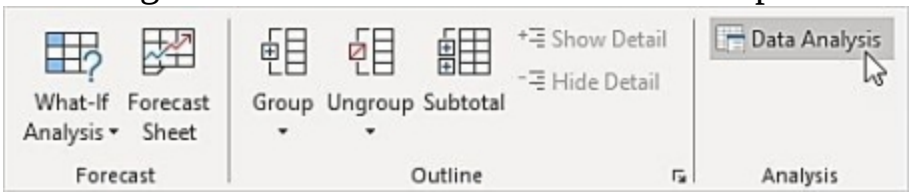
The menu for analyzing data in Excel holds the option for performing descriptive analysis. Values such as mean, mode, deviation, variance, etc. can be easily calculated with a click.

Generating the Biggest, Smallest, Mean, Mode Values (Summarizing Statistics)

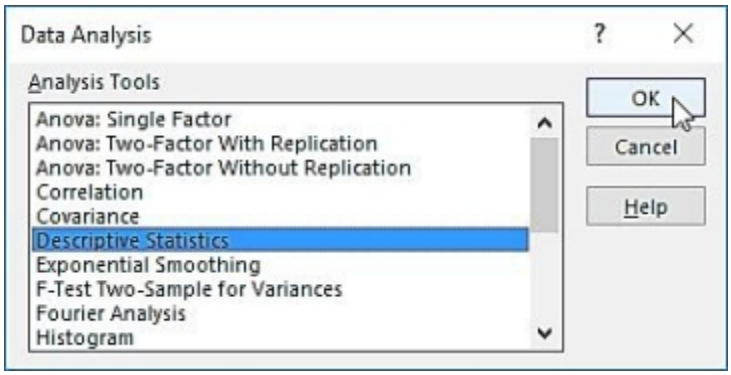
- Prepare your data in this format:

	A	B
1	Scores	
2	82	
3	93	
4	91	
5	69	
6	96	
7	61	
8	88	
9	58	
10	59	
11	100	
12	93	
13	71	

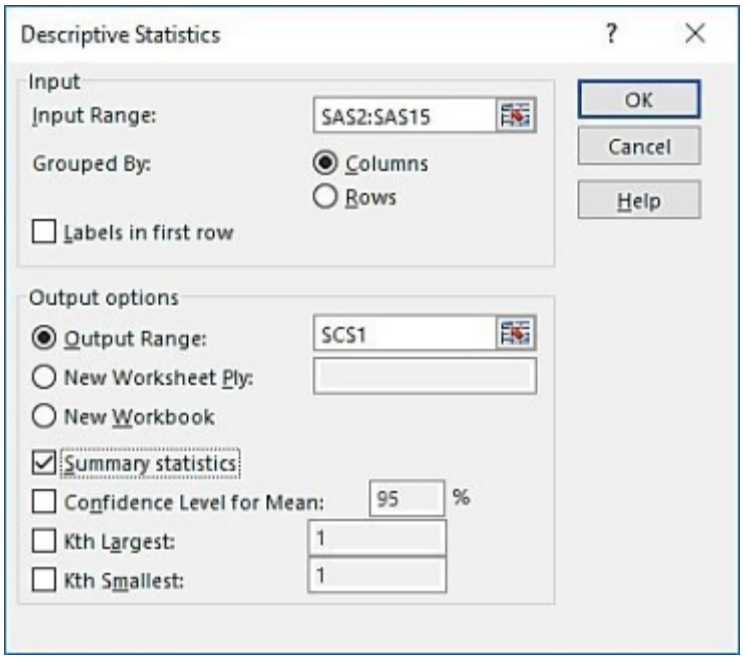
- Navigate to the **Data** menu and select the option for **Analysing Data**



- Select **Descriptive Analysis** from the available menu
- This action brings up the **Descriptive Analysis** dialogue box



- Enter the cell range for your data in the box for range input
- Specify the cell range for your output data
- Select the box for **Summarizing Statistics**


Descriptive Statistics
Input
Input Range:
SAS2:SAS15
Grouped By:
Columns
Rows
Labels in first row
OK
Cancel
Help
Output options
Output Range:
SCS1
New Worksheet Ply:
New Workbook
Summary statistics
Confidence Level for Mean:
95
%
Kth Largest:
1
Kth Smallest:
1

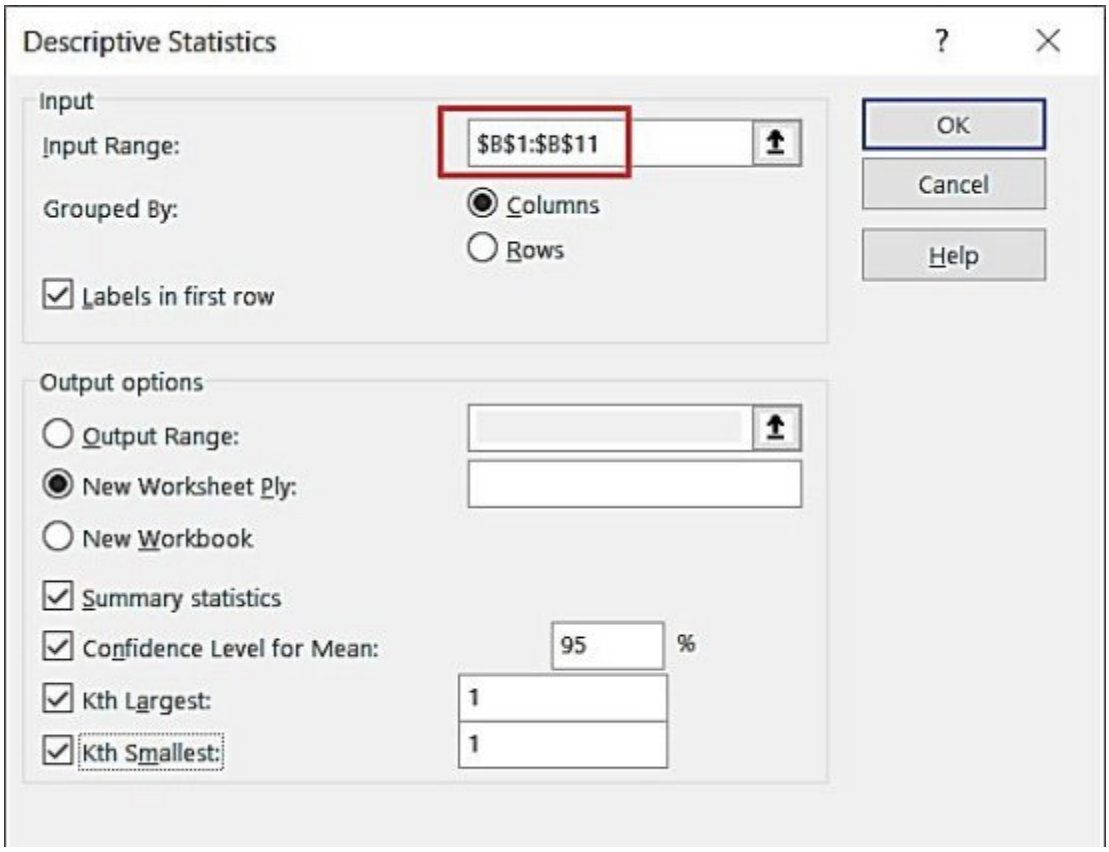
- Select **OK**

	A	B	C	D	E
1	Scores		*Column1*		
2	82				
3	93		Mean	81.21428571	
4	91		Standard Error	4.045318243	
5	69		Median	85	
6	96		Mode	93	
7	61		Standard Deviation	15.13619489	
8	88		Sample Variance	229.1043956	
9	58		Kurtosis	-1.426053506	
10	59		Skewness	-0.402108004	
11	100		Range	42	
12	93		Minimum	58	
13	71		Maximum	100	
14	78		Sum	1137	
15	98		Count	14	
16					

Computing the Kth Smallest and Largest Value

- In the **Descriptive Analysis** dialogue box, select the box for **Kth largest** or **smallest** value

- Specify the cell range for your output data and select **OK**



The default value for the **Kth largest** or **smallest** is 1, but it can be edited to any number of your choice. Entering 4 for instance would give you the 4th largest or smallest value in your data. A change in the dataset would require another procedure of the descriptive analysis.

Dividing Data into Percentiles

Percentiles can be calculated using the **PERCENTILE** function:

=PERCENTILE(data_range, percentile_value) percentile_value is usually expressed in percentage, e.g.

=PERCENTILE(D2:D15, 0.4)

This formula calculates the 40th percentile.

Quartiles can also be calculated using the **QUARTILE** function:

=QUARTILE(data_range, quartile_value)

The **quartile_value** depends on the amount of data. Quartiles are usually a division of four, i.e. it splits the data into four parts.

Relating Quartiles to Percentiles goes thus:

- First Quartile = 25% Percentile
- Second Quartile = 50% Percentile
- Third Quartile = 75% Percentile
- Fourth Quartile = 100% Percentile

Recognizing Interquartile Ranges in Statistical Outliers

This process follows these steps:

- First, make a data entry such as this:

- Compute the first and third quartiles using these formulas respectively:

=QUARTILE(data_range, 1)

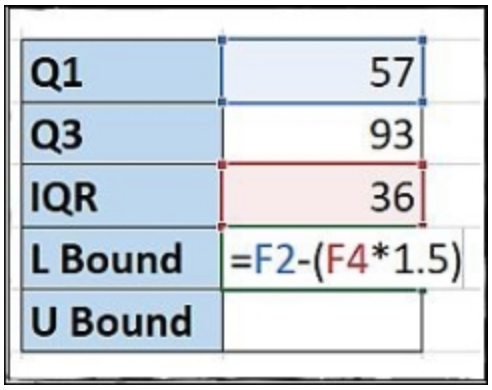
Q1	57
Q3	93
IQR	
L Bound	
U Bound	

=QUARTILE(data_range, 3)

- Compute the interquartile range using this formula **Interquartile Range = First Quartile - Second Quartile**

Q1	57
Q3	93
IQR	36
L Bound	
U Bound	

- Compute the lower boundary



LB = First Quartile - (Interquartile Range * 1.5)

- Compute the upper boundary

UB = Third Quartile + (1.5 * Interquartile Range)

Q1	57
Q3	93
IQR	36
L Bound	3
U Bound	147

- Compute the Outliers

Outliers are the values below the lower boundary and above the upper boundary. The **OR** function is used to compute the outliers:

=OR(cell_reference<Lower_boundary,cell_reference>Upper _boundary)

Ensure to set the **Lower_boundary** and **Upper_boundary** cell references to absolute references. The result of this calculation is either True or False.

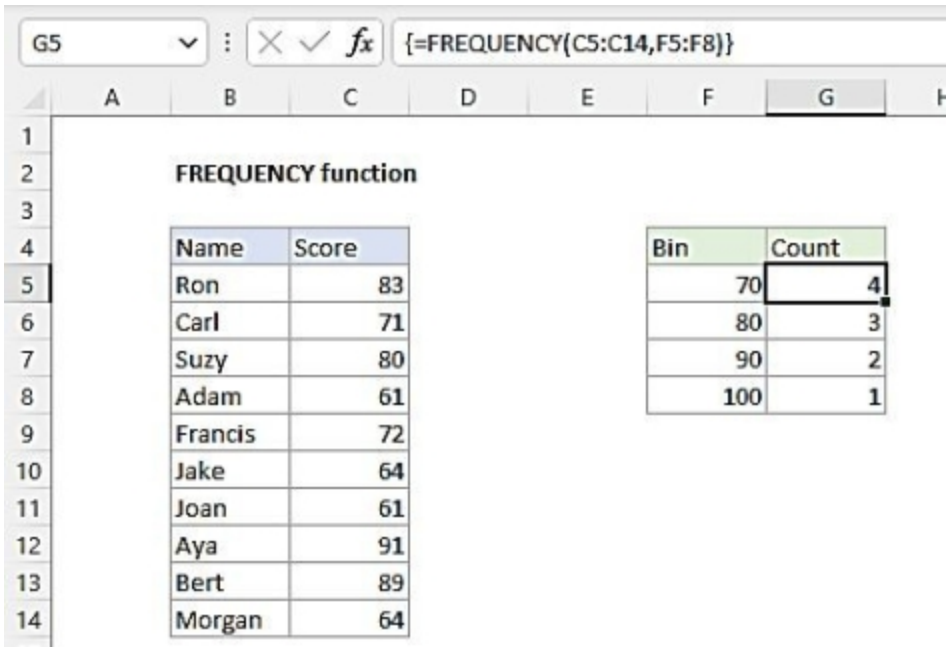
GENERATING A FREQUENCY DISTRIBUTION A frequency distribution can be generated using the **FREQUENCY** formula:

=FREQUENCY(cell_range, data_range) Alternative to FREQUENCY Function

The **COUNTIF** function can also be used in place of the **FREQUENCY** function for computing frequency distribution.

=COUNTIF(cell_range, cell_data)

Use the drag and fill method to fill up other cells. You can first use the **UNIQUE** function to sort out the distinctly available data in the distribution. These are called **Bins**.



=UNIQUE(cell_range)

Summary

This chapter explained weighted moving averages and how they can be calculated using exponential smoothing. It also discussed descriptive analysis, how the **Data Analysis** option in Excel easily computes these values in a click, percentile, and then, the functions for computing frequency distribution.

CHAPTER NINE

IMPLEMENTING FORMULAS IN TABLES AND CONDITIONAL FORMATTING SELECTING CELLS SATISFYING INDICATED CRITERIA

Excel allows you to highlight cells depending on the value of a separate cell using conditional formatting.

- Navigate to the **Home** menu and select the **Conditional Formatting** option

- Choose the option to define a rule

•

Select the option as shown below in the resulting dialogue box

• Enter your formatting condition in the formula bar This example chooses to highlight cells having lesser values than that in cell B3, the formula therefore used is as follows:

=E3<$B$3

- Click on **Format** to determine how Excel highlights the cells

•

Click on **OK** when done

HIGHLIGHTING DATA EXISTING IN LIST 1 BUT ABSENT

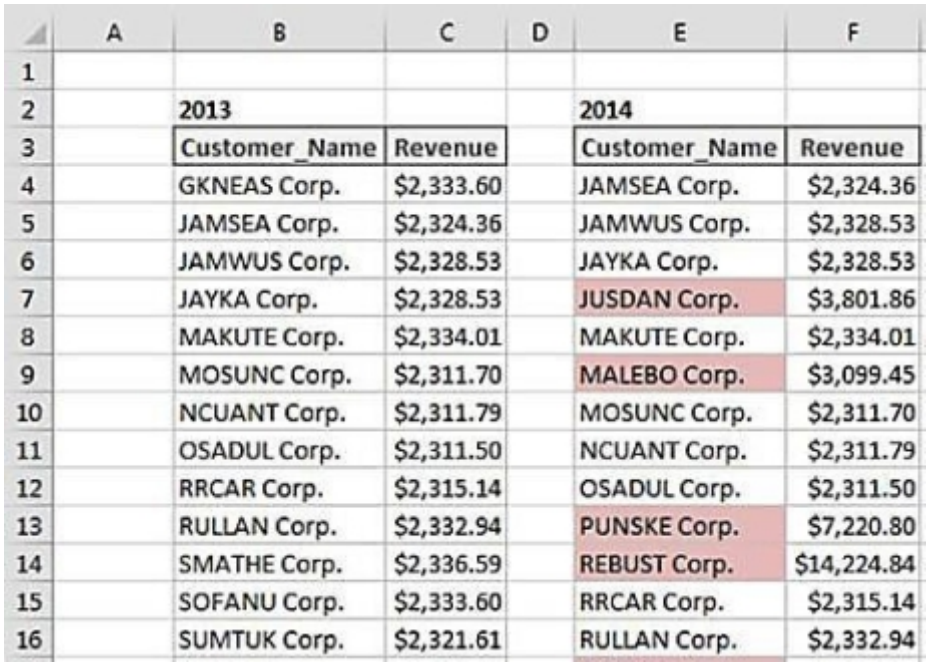
IN LIST 2

- When in the **Conditional Formatting** dialogue box, enter the comparison formula below:

=COUNTIF($B$4:$B$16,E4)=0

This formula evaluates the cell values in cell **E4** which is the cell the formatting is to be applied and checks for similar values in the indicated cell range. An absence of a similar value gives **0** which Excel then highlights. Absolute referencing is used in referencing the cell range to make its values static.

- Apply your highlight formatting by selecting the **Format**



	A	B	C	D	E	F
1						
2		2013			2014	
3		Customer_Name	Revenue		Customer_Name	Revenue
4		GKNEAS Corp.	$2,333.60		JAMSEA Corp.	$2,324.36
5		JAMSEA Corp.	$2,324.36		JAMWUS Corp.	$2,328.53
6		JAMWUS Corp.	$2,328.53		JAYKA Corp.	$2,328.53
7		JAYKA Corp.	$2,328.53		JUSDAN Corp.	$3,801.86
8		MAKUTE Corp.	$2,334.01		MAKUTE Corp.	$2,334.01
9		MOSUNC Corp.	$2,311.70		MALEBO Corp.	$3,099.45
10		NCUANT Corp.	$2,311.79		MOSUNC Corp.	$2,311.70
11		OSADUL Corp.	$2,311.50		NCUANT Corp.	$2,311.79
12		RRCAR Corp.	$2,315.14		OSADUL Corp.	$2,311.50
13		RULLAN Corp.	$2,332.94		PUNSKE Corp.	$7,220.80
14		SMATHE Corp.	$2,336.59		REBUST Corp.	$14,224.84
15		SOFANU Corp.	$2,333.60		RRCAR Corp.	$2,315.14
16		SUMTUK Corp.	$2,321.61		RULLAN Corp.	$2,332.94

option and then clicking **OK**

HIGHLIGHTING SIMILAR VALUES IN LIST 1 AND LIST 2

When in the **Conditional Formatting** dialogue box, enter the comparison formula below:

=COUNTIF($B$4:$B$16,E4)>0

This formula evaluates the cell values in cell **E4** which is the cell the formatting is to be applied and checks for similar values in the indicated cell range. Detection of a similar value gives a result greater than 0 which Excel then highlights. Absolute referencing is used in referencing the cell range to make its values static.

- Apply your highlight formatting by selecting the **Format** option and then clicking **OK**

	A	B	C	D	E	F
1						
2		2013			2014	
3		Customer_Name	Revenue		Customer_Name	Revenue
4		GKNEAS Corp.	$2,333.60		JAMSEA Corp.	$2,324.36
5		JAMSEA Corp.	$2,324.36		JAMWUS Corp.	$2,328.53
6		JAMWUS Corp.	$2,328.53		JAYKA Corp.	$2,328.53
7		JAYKA Corp.	$2,328.53		JUSDAN Corp.	$3,801.86
8		MAKUTE Corp.	$2,334.01		MAKUTE Corp.	$2,334.01
9		MOSUNC Corp.	$2,311.70		MALEBO Corp.	$3,099.45
10		NCUANT Corp.	$2,311.79		MOSUNC Corp.	$2,311.70
11		OSADUL Corp.	$2,311.50		NCUANT Corp.	$2,311.79
12		RRCAR Corp.	$2,315.14		OSADUL Corp.	$2,311.50
13		RULLAN Corp.	$2,332.94		PUNSKE Corp.	$7,220.80
14		SMATHE Corp.	$2,336.59		REBUST Corp.	$14,224.84
15		SOFANU Corp.	$2,333.60		RRCAR Corp.	$2,315.14
16		SUMTUK Corp.	$2,321.61		RULLAN Corp.	$2,332.94

HIGHLIGHTING VALUES DEPENDING ON THE DATE

1. Highlighting the Days Present between Two Dates

• When in the **Conditional Formatting** dialogue box, enter the comparison formula below:

=AND(E3>=$B$3,E3<=$C$3)

This formula compares the dates in cells **B3** and **C3** with those in

E3.

• Apply your highlight formatting by selecting the **Format** option and then clicking **OK.**

1. 

	A	B	C	D	E
1					
2		Start	End		Highlight Days within 2010 and 2012
3		1/1/2010	12/31/2012		1/23/2012
4					12/28/2009
5					9/26/2010
6					12/8/2014
7					4/25/2010
8					11/7/2012
9					7/31/2014
10					11/24/2014
11					12/28/2010
12					7/28/2011
13					12/17/2014
14					8/3/2014
15					5/1/2011
16					4/2/2011

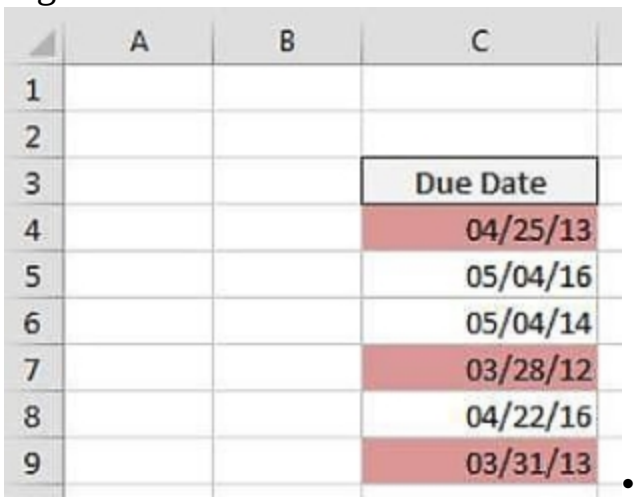
Highlighting Dates Depending on Date Due

- When in the **Conditional Formatting** dialogue box, enter the

comparison formula below:

=TODAY()-C4>90

This formula considers the current date and the next 90 days which is the due date. If the date in cell **C4** is greater than this date, Excel then highlights the cell.



	A	B	C
1			
2			
3			Due Date
4			04/25/13
5			05/04/16
6			05/04/14
7			03/28/12
8			04/22/16
9			03/31/13

- Apply your highlight formatting by selecting the **Format** option and then clicking **OK.**

Summary

This chapter explained how conditional formatting can be applied in Excel tables by using formulas to determine what cells to highlight. Depending on the specified criteria, the cell(s) satisfying the indicated condition is highlighted, making such values easier to locate and work with.

CHAPTER TEN

GETTING FAMILIAR WITH THE USE OF ARRAY FORMULAS

ARRAY FORMULAS

These arrays are of two forms which are as follows:

1. Multi-cell Formula Array

This formula gives a result in more than one cell at a time. It uses the **ROW** function.

- Highlight multiple cells that would hold the formula result
- Enter this formula in the bar for formula

{=ROW(1:20)}

- Press keyboard keys **Ctrl** + **Shift** + **Enter**

This formula enters a serial number of 1 to 20 in the highlighted cells. The content of these cells cannot be edited; neither can cells be added because they contain a similar formula. Also, to edit the formula, the entire cell range must be selected.

Rows can be converted into columns using the **TRANSPOSE** function as follows:

- Prepare a data entry such as is shown below:

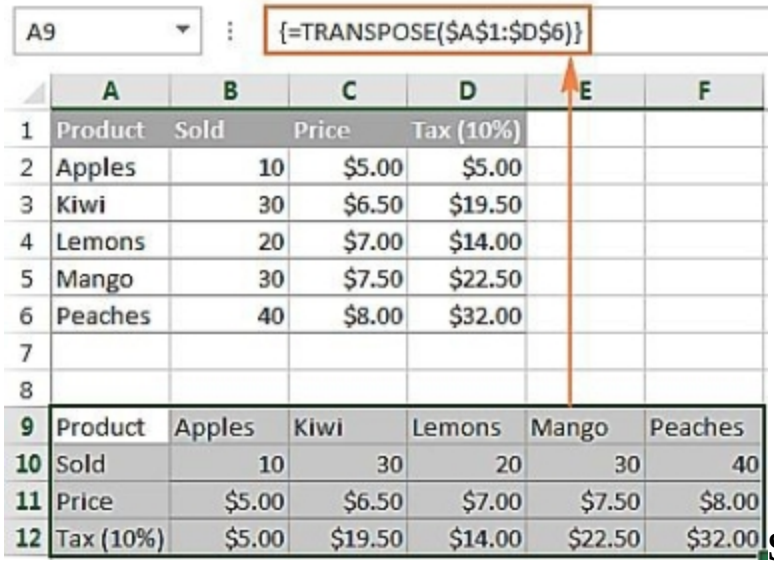
	A	B	C	D
1	Product	Sold	Price	Tax (10%)
2	Apples	10	$5.00	$5.00
3	Kiwi	30	$6.50	$19.50
4	Lemons	20	$7.00	$14.00
5	Mango	30	$7.50	$22.50
6	Peaches	40	$8.00	$32.00

- Highlight multiple cells which would hold the formula result. Ensure the highlighted cell range would be equivalent to the transposed result

- Press key **F2** to initiate the mode for editing
- Enter this formula with respect to your data cell range:

=TRANSPOSE($A$1:$D$5)

- Press keyboard keys **Ctrl** + **Shift** + **Enter**
- You should get a result like this:

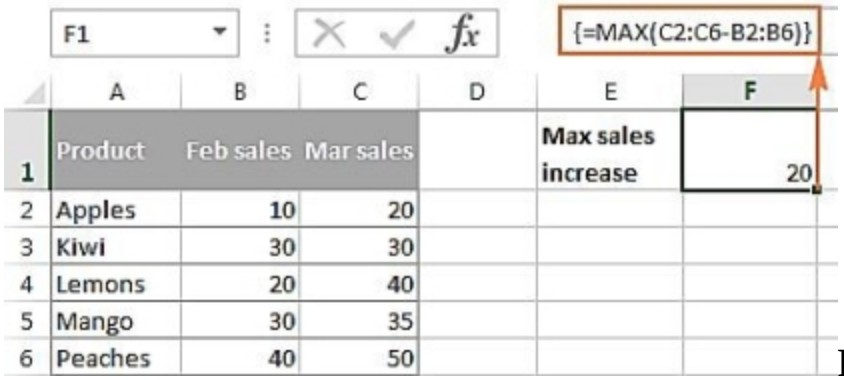
1. 

	A	B	C	D	E	F
1	Product	Sold	Price	Tax (10%)		
2	Apples	10	$5.00	$5.00		
3	Kiwi	30	$6.50	$19.50		
4	Lemons	20	$7.00	$14.00		
5	Mango	30	$7.50	$22.50		
6	Peaches	40	$8.00	$32.00		
7						
8						
9	Product	Apples	Kiwi	Lemons	Mango	Peaches
10	Sold	10	30	20	30	40
11	Price	$5.00	$6.50	$7.00	$7.50	$8.00
12	Tax (10%)	$5.00	$19.50	$14.00	$22.50	$32.00

Single Cell Formula Array

This formula gives a result in a single cell. Just a cell is needed to be highlighted when performing this operation. It uses the **MAX** function for example as follows:

=MAX(cell_range1-cell_range2)



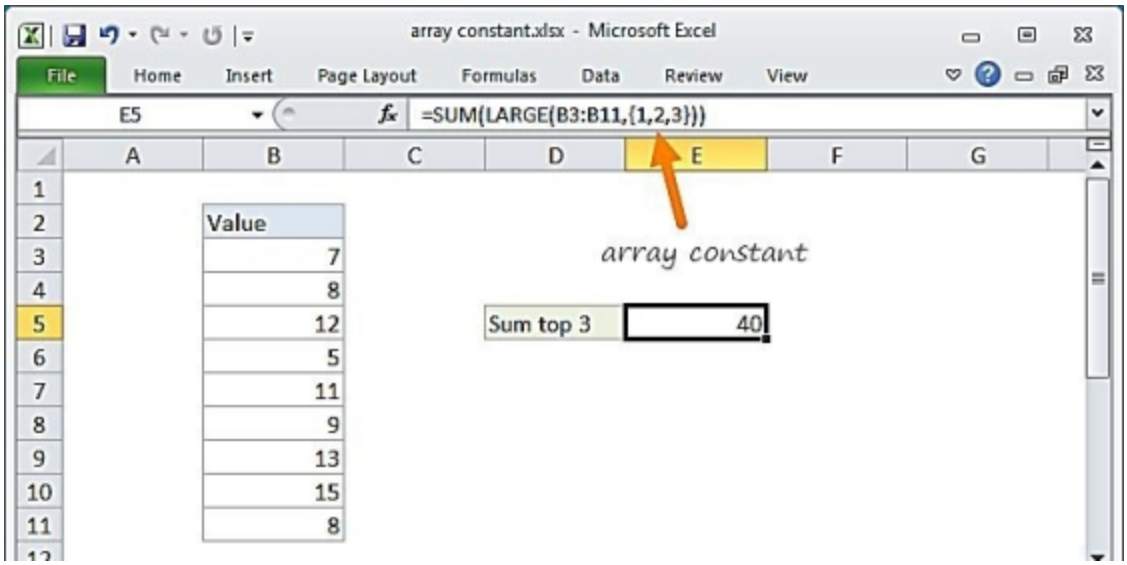
Press keyboard keys **Ctrl** + **Shift** + **Enter** after entering your formula in the bar for formulas.

CREATING ARRAY CONSTANTS

Array constants are declared in curly braces **{}** in your array formula. They are hard codes values for customizing multiple values simultaneously. Including array constants in your formula usually gives multiple results, for instance:

=LARGE(B3:B9,{1,2,3,4})

This formula gives a result of the four highest numbers in the data range. These results can however be manipulated into one by introducing another function, such as **SUM;**



=SUM(LARGE(B3:B9,{1,2,3,4}))

Note that cell references and functions cannot be entered as a parameter in the curly braces.

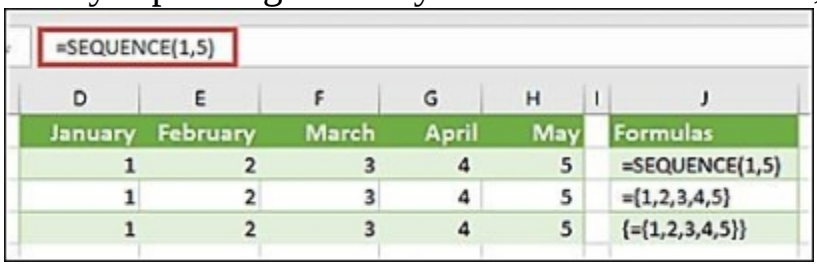
ARRAY DIMENSIONS

1. One-dimensional Arrays

These are usually arranged data in a single line, either in a row or a column. They are of two forms:

- **Horizontal One-dimensional Array**

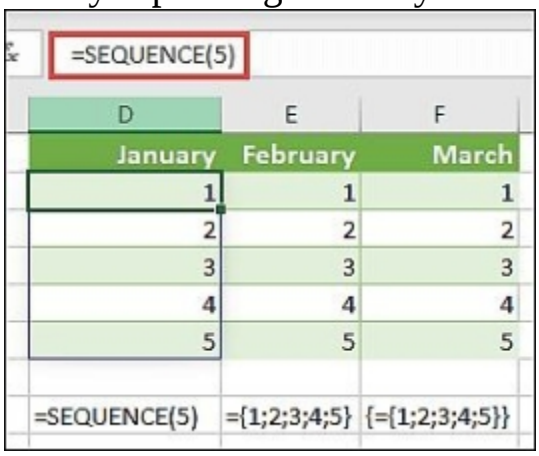
This type of array is also known as data arranged in a row. They are created by separating the array constant with a comma, for instance:



=SEQUENCE(1,5) or **{={1,2,3,4,5}}**
Ensure to highlight adequate cells and then press keyboard keys **Ctrl + Shift + Enter** after entering your formula in the bar for formulas.

- **Vertical One-dimensional Array**

This type of array is also known as data arranged in a column. They are created by separating the array constant with a semicolon, for instance:



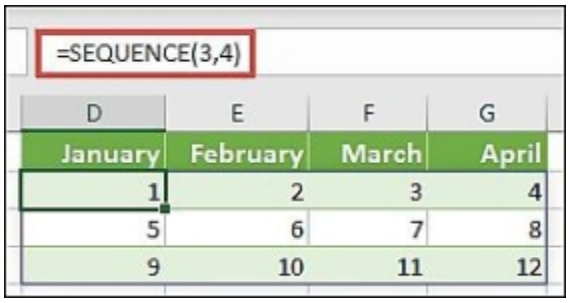
=SEQUENCE(5) or **{={1;2;3;4 5}}**
Ensure to highlight adequate cells and then press keyboard keys **Ctrl + Shift + Enter** after entering your formula in the bar for formulas.

1. Two-dimensional Arrays

These are also called matrices. They can span over multiple cell rows and columns. Here, row data are separated with commas and column data with a semicolon. For example:

{={“a”, “b”, “c”; 1, 2, 3}}

=SEQUENCE(3,4) signifying 3 columns and 4 rows. It can also be written as:



{={1,2,3,4;5,6,7,8;9,10,11,12}}

Ensure to highlight adequate cells and then press keyboard keys **Ctrl + Shift + Enter** after entering your formula in the bar for formulas.

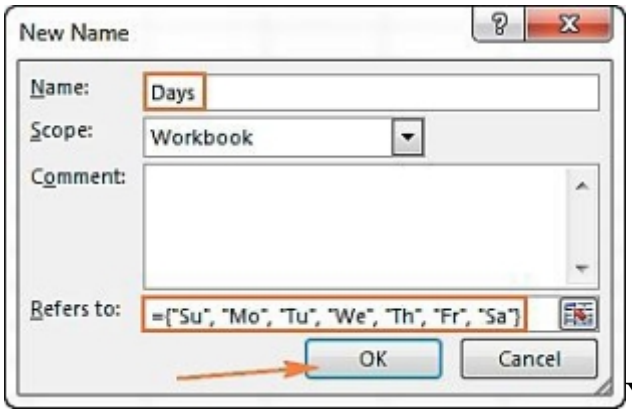
ASSIGNING NAMES OF ARRAY CONSTANTS

- Navigate to the **Formula** menu and select the option for defining names. You can also use keyboard keys **Ctrl + F3.**

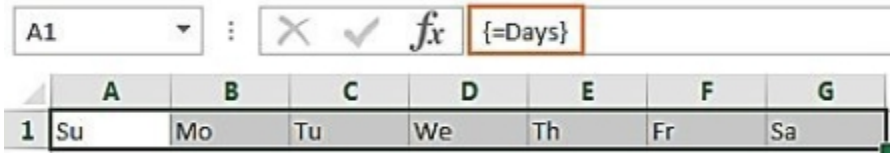
    - Select the option to define a **New** name
    - Enter a desired name in the appropriate box when the **Name**

    dialogue box comes up

    - Enter your array constant in the provided box and select **OK**



You can use your named constant as follows:



{=Days}

DEALING WITH FORMULAS FOR ARRAYS Entering Formulas for Arrays

Type in your formula in the bar for formulas and then press keyboard keys: **Ctrl + Shift + Enter.**

Highlighting Ranges of Formulas for Arrays

Highlighting as many cells as would accommodate your input array formula. You can also use keyboard keys **Ctrl + /** to highlight the whole array after entering it in your worksheet.

Making Changes to Formulas for Arrays

When highlighting array formula cell ranges for editing:

- Select one of the cells in the array
- Press keyboard keys **Ctrl + /** to highlight the whole array

- Press key **F2** to initiate the edit mode. You can then edit your array formula in the bar for formulas
- Press keyboard keys **Ctrl + Shift + Enter** after editing to effect the changes

Adding or Removing from a Multi-cell Array To add cells to the array:

- Highlight the cells containing the array formula and also the additional cells to be covered

- Press key **F2** to initiate the mode for editing

- Expand the previous cell range to accommodate the additional highlighted cells
- Press keyboard keys **Ctrl + Shift + Enter** after editing to effect the change

To remove cells from the array:

- Highlight the cells containing the array formula
- Press key **F2** to initiate the mode for editing

- Press keyboard keys **Ctrl+Enter** to initiate a mode to enter a similar non-array formula in the selected cells

- Edit the selected range to remove the excess cells
- Press key **F2** again to initiate the mode for editing

- Press keyboard keys **Ctrl + Shift + Enter** after editing to effect the change

Deleting Formulas for Arrays

- Highlight the cell(s) containing the formula
- Navigate to the **Home** menu and select the **Find** option in the

Editing tab

- Select **Go To** and then choose **Special**
- Select the option for the currently highlighted array
- Select **Delete**

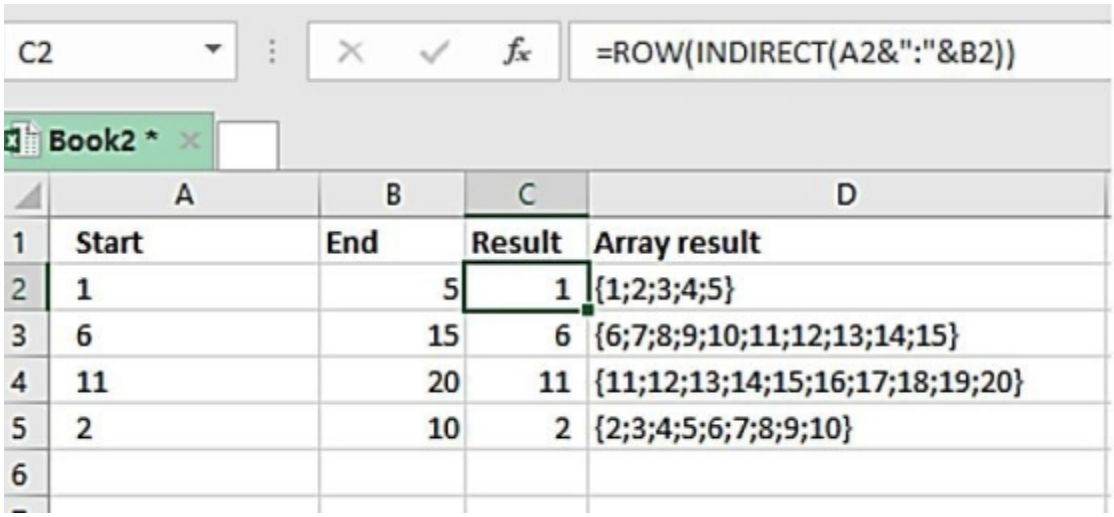
IMPLEMENTING FORMULAS FOR MULTICELL ARRAYS

Generating Arrays from Range Values

This uses the **ROW** and **INDIRECT** functions with the following syntax:

{=ROW(INDIRECT(start_range&":"&end_range))} E.g.:

{=ROW(INDIRECT(A2&”:”&B2))}



	A	B	C	D
1	Start	End	Result	Array result
2	1	5	1	{1;2;3;4;5}
3	6	15	6	{6;7;8;9;10;11;12;13;14;15}
4	11	20	11	{11;12;13;14;15;16;17;18;19;20}
5	2	10	2	{2;3;4;5;6;7;8;9;10}
6				

{=ROW(INDIRECT(“1:5”))}

This formula populates five rows in serial order

Generating Array Constants from Range Values

- Create a table data entry as shown below

- Navigate to the bar for formulas and type in a formula with your desired function such as:

=SUM(A2:A6)

• Highlight the parameter **A2:A6** and press the **F9** key This changes the formula to an array constant:

=SUM{1;2;3;4;5}

Implementing Functions with Arrays

- The **SEQUENCE** function can be used to generate an array, such as: =**SEQUENCE(5)** or **{=1;2;3;4 5}}**

- The **SUM** function sums up the array, such as:

=SUM(LARGE(B3:B9,{1,2,3,4}))

- The **LEN** function counts the number of every character in a string array, such as:

=LEN(C9:C13)

• The **AVERAGE** function gives the average number of every character in a string array, such as:

=AVERAGE(LEN(C9:C13))

Other functions include **INDEX, MAX, MATCH, SMALL, ROW, INDIRECT, TRANSPOSE,** etc.

Creating an Array of Serial Integer

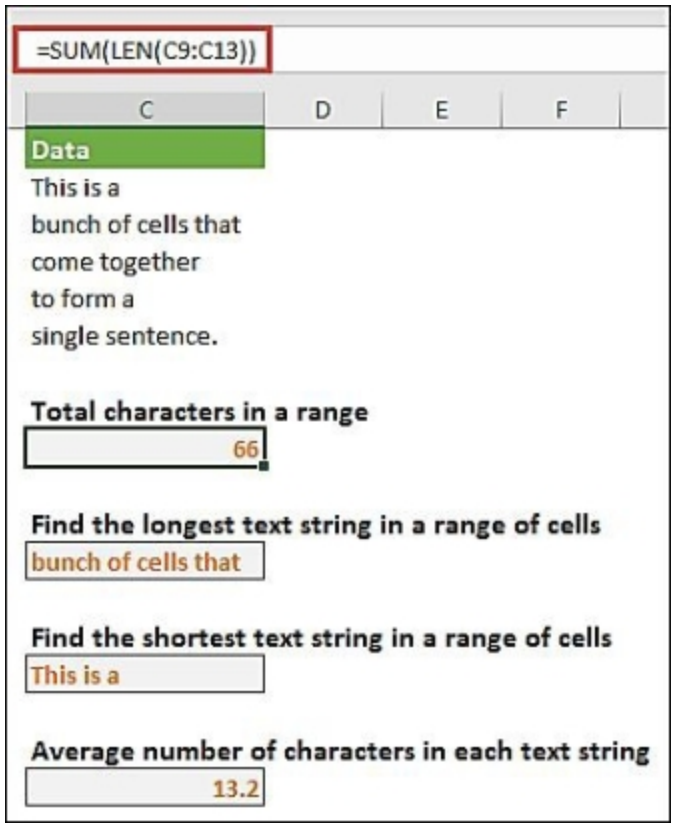
The **ROW** function can be used for this:

{=Row(1:12)}

This formula creates a row array of numbers 1 to 12.

IMPLEMENTING FORMULAS FOR SINGLE-CELL ARRAYS

Determining Number of Characters in a Range This uses the **SUM** and **LEN** functions.



=SUM(LEN(C9:C13))

Getting the Summation of the Three Lowest Values in an Array

=SUM(SMALL(A1:D10,{1,2,3}))

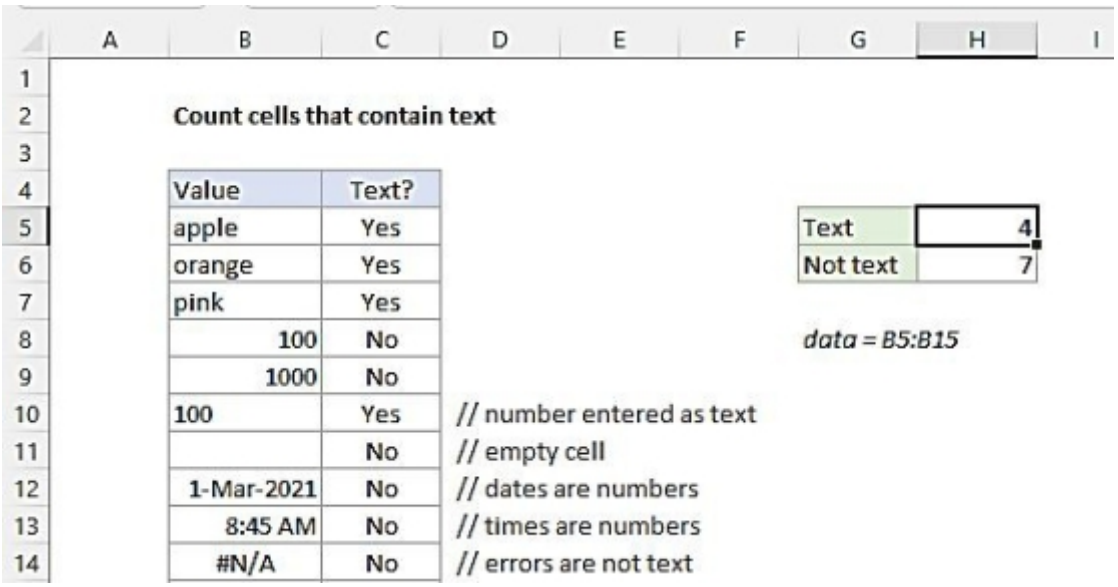
This formula first gets the values of the lowest three numbers in the array range and then carries out the summation operation. The formula **=SUM(LARGE(A1:D10,{1,2,3}))** sums up the highest three numbers in an array range.

Calculating Number of Cells Containing Text in a Range Excel uses the **COUNTIF** function for this with the following syntax:

=COUNTIF(cell_range, “*”)

The asterisk in the argument denotes text.

E.g **=COUNTIF(D7:D15, “*”)**



Count cells that contain text

Value	Text?	
apple	Yes	
orange	Yes	
pink	Yes	
100	No	
1000	No	
100	Yes	// number entered as text
	No	// empty cell
1-Mar-2021	No	// dates are numbers
8:45 AM	No	// times are numbers
#N/A	No	// errors are not text

Text	4
Not text	7

data = B5:B15

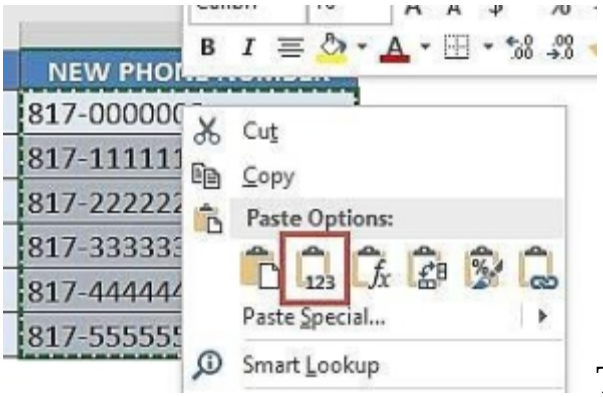
Removing Intermediate Formulas

- Highlight the cells containing these formulas

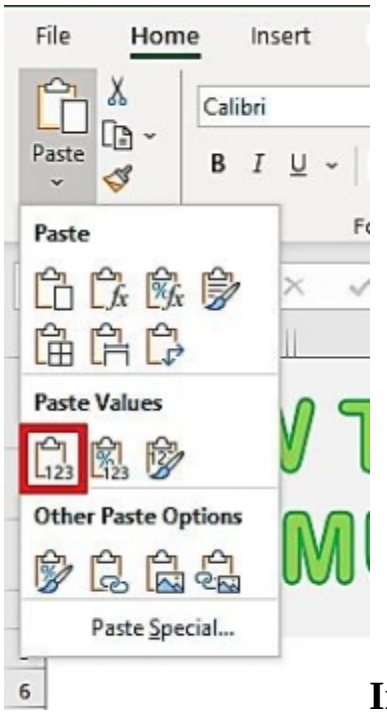
•

Right-click and select the option to **Copy** or use keys **Ctrl + C**

- Make another right-click and select the option to paste only values



The paste and copy section of the **Home** menu can also be used.



Implementing Arrays in Place of Cell

References

After inserting a formula with a cell range argument in the bar for formulas, you can use the **F9** key to change the cell reference to an array.

Summary

Arrays enhance data input because it allows you to enter multiple data at a time. Two types of arrays exist in Excel, depending on the user's need, which is one-dimensional and multidimensional arrays. Functions can also be included in the formula for arrays to boost data analysis. You can also transpose an existing array to change its orientation as desired. This chapter explained the ways you can create, edit, expand and shrink an array. Your array formulas can also be deleted if no longer needed.

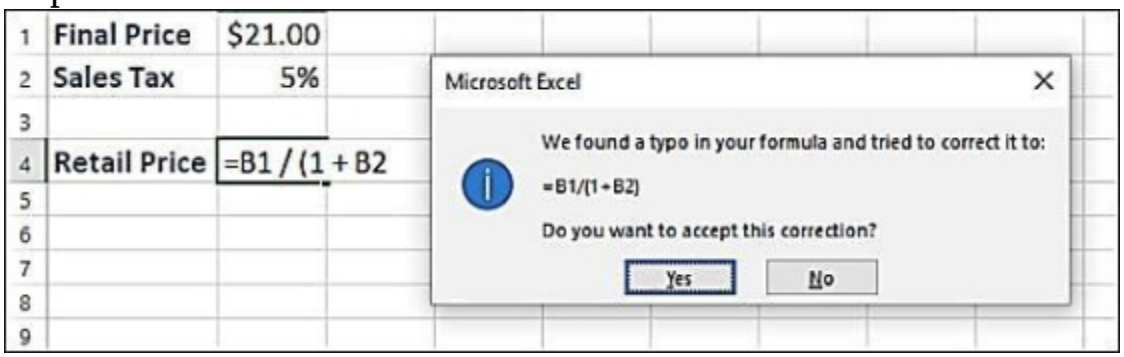
CHAPTER ELEVEN

CREATING ERROR-FREE FORMULAS LOCATING AND RECTIFYING ERRORS IN YOUR FORMULAS

Sometimes, input formulas may contain errors unknown to the user, probably due to typing too fast, not being familiar with the appropriate syntax, inappropriate closing of brackets, etc. When you have a long, confusing formula, locating the point of error may get difficult. Excel, however, provides easy ways to locate and rectify errors that may be present in your formula.

Incomplete Parentheses

Entering a formula such as **=B1/(1+B2** and pressing the **Enter** key brings up the Excel formula to notify you of the error. The dialogue box also gives you a suggestion for the rectification, just click the **Yes** option to accept.

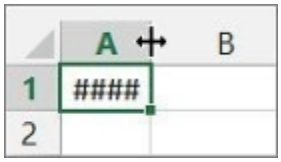


If the Excel suggestion is not what you intend, select **No** and then edit the formula correctly.

Cells Containing Hash Marks

Hash marks are displayed in cells when Excel detects a cell holding more characters than it can hold. This is known as an overflow.

Correcting this requires you to expand the cell or make the column wider to accommodate your input.

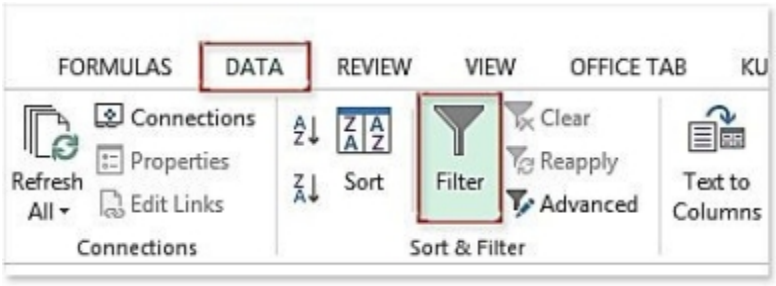


Another cause of hash marks in cells can also be incorrect cell formatting. Take, for instance, cells in Excel can take texts of up to 32,000 characters, but formatting a cell to **Text** reduces this to 255 text characters. If a cell displays a hash due to the overflow of a **Text** formatted cell, you only have to change the cell formatting to **General** to accommodate over 255 text characters.

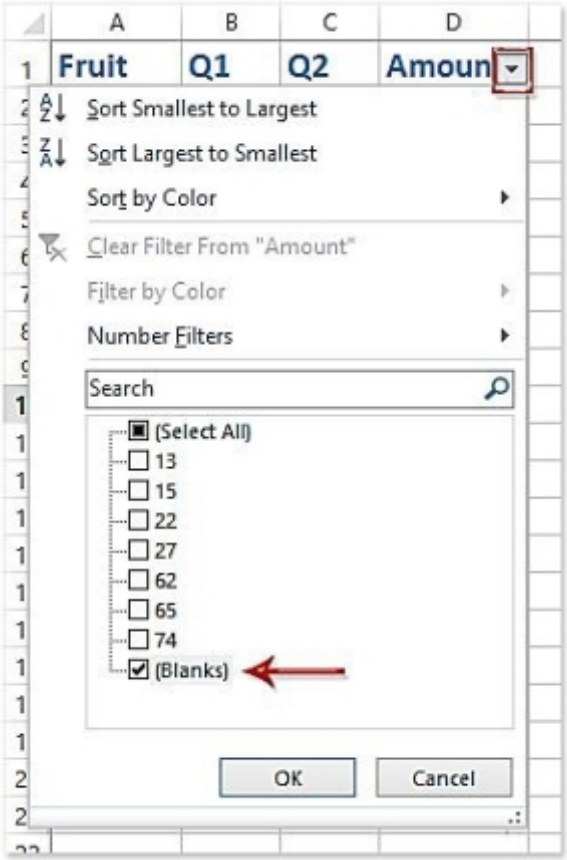
Entering date values beyond the acceptable date range in Excel **(1/1/1900 up to 12/31/9999)** causes the hash error as well. **Clearing Blank Cells that Hold Values**

Cells can hold hidden data which would appear blank; you can clear these cells following these steps:

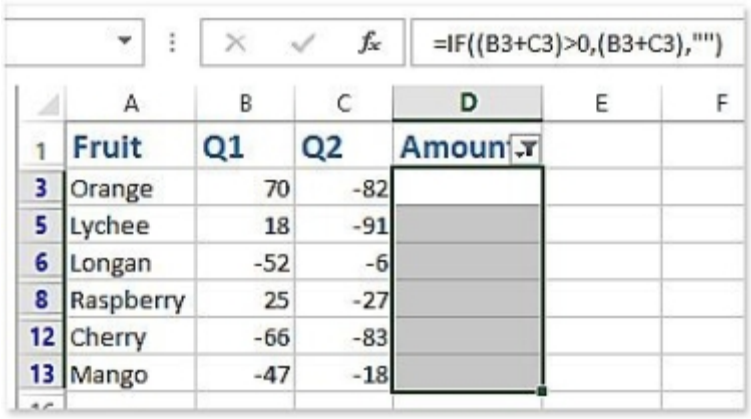
- Navigate to the **Data** menu and select the **Filter** option



- Click on the drop-down arrow in the desired column
- Deselect all other boxes except the **Blanks** box

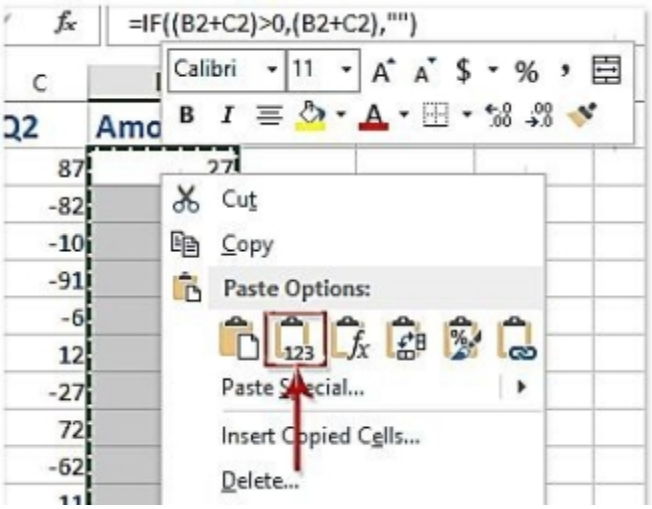


- Select **OK**
- Select the seemingly blank cell and press the **Delete** key



You can remove the filtering by navigating to the **Filter** option in the **Data** menu

The **Special Pasting** menu can also be used to clear these types of cells. Select the option to only paste the values when in this **Special** menu.



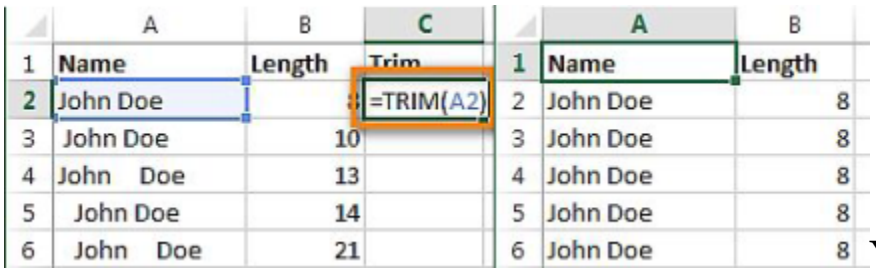
Characters Having

Excess Spaces

The **TRIM** function can be used to delete excess spaces in characters. Use the following syntax:

=**TRIM(cell_reference)**

E.g. =**TRIM(A7)**



	A	B	C
1	Name	Length	Trim
2	John Doe		=TRIM(A2)
3	John Doe	10	
4	John Doe	13	
5	John Doe	14	
6	John Doe	21	

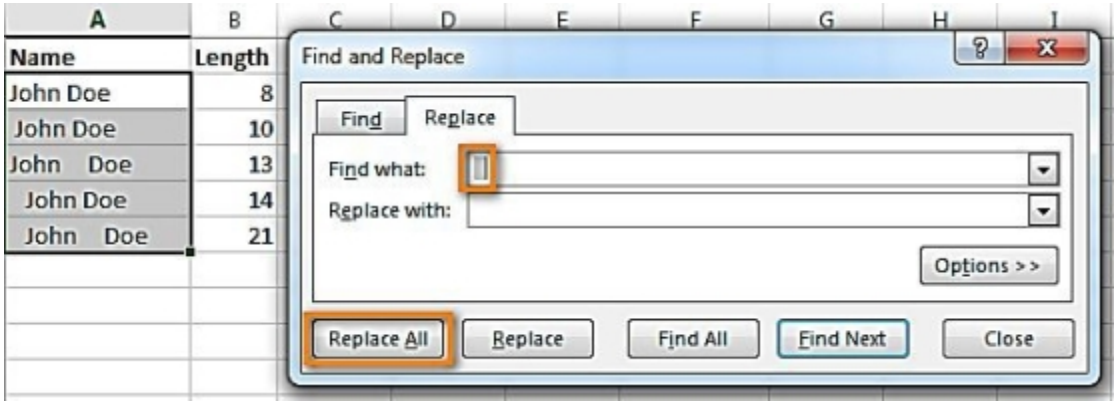
	A	B
1	Name	Length
2	John Doe	8
3	John Doe	8
4	John Doe	8
5	John Doe	8
6	John Doe	8

You can likewise use the **Replace and Find** dialogue box.

Highlighting Cell Containing Excess Spaces in Its Characters

- Press the keyboard shortcut keys **Ctrl + H** to launch the **Replace and Find** dialogue box

- In the **Find** bar, press the **Space bar** key two times
- In the **Replace** bar, press the **Space bar** key once
- Select the option for **Replac**ing **All**



Solving Formulas Giving an Error

Excel formulas can result in various types of errors, depending on what causes the error. Examples of such errors and how they can be solved are:

Errors of #DIV/0!

This error is displayed when an attempt is made to divide a number by zero. This can be corrected by correcting the divisor in your formula to a non-zero value or a cell reference having an appropriate value.

	A	B	C
1	Values	Formulas	Formula Results
2	1	=1/0	#DIV/0!
3	0	=A2/A3	#DIV/0!
4		=QUOTIENT(A2,A3)	#DIV/0!

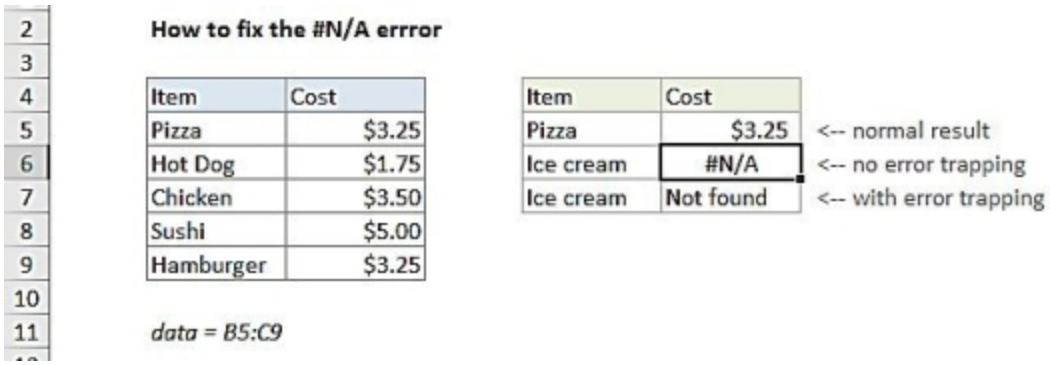
You can make use of the **IFERROR** function to determine the result or message Excel should display if an error should occur.

=IFERROR(A6/D6,“Please enter a valid divisor”)

This formula tells Excel to display the message **“Please enter a valid divisor”** if it runs into this error.

Errors of #N/A

This error occurs when Excel cannot find the expected value in the referenced cell. This error is mostly prone to occur when using functions such as **HLOOKUP**, **MATCH**, or **VLOOKUP.** It can be corrected by providing the right cell reference or parameter in the formula.



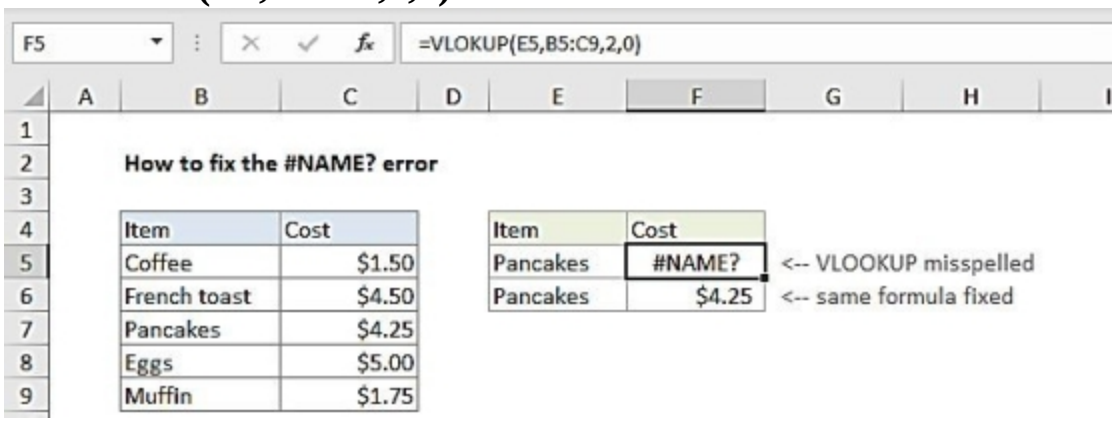
The **IFERROR** function can then be used to configure your desired error message or Excel action.

Errors of #NAME?

Excel gives this error when it cannot identify a function or a cell range. For example:

=MIN(CC:D7) has an unidentified cell range of **CC** as a parameter.

=VLOKUP(D3,A3:B7,2,0) has an unidentified function of

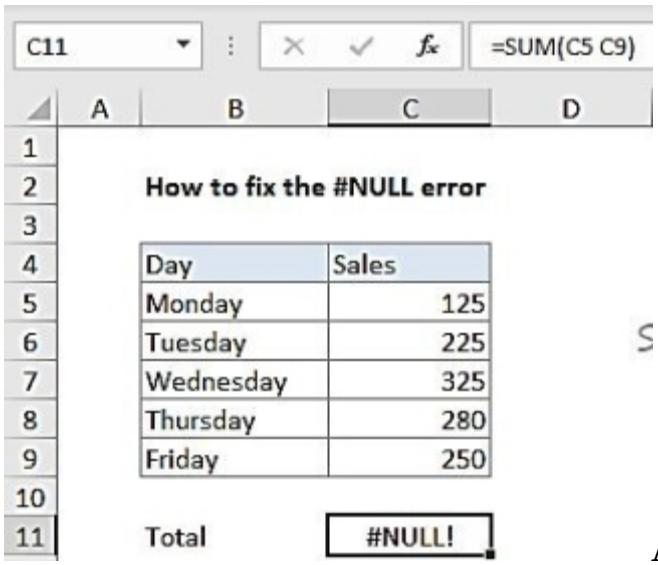


VLOKUP as a parameter.

The error can be rectified by providing the correct cell range or function.

Errors of #NULL!

This error occurs when cell references are separated with a space.

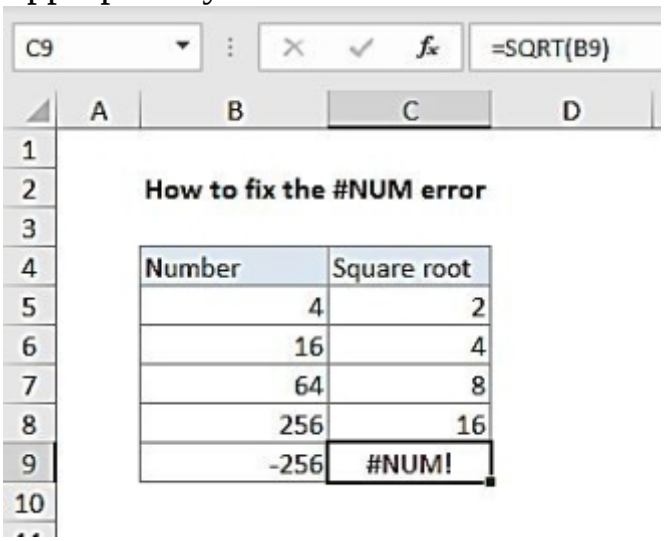


Adding a semicolon or a

comma fixes this error.

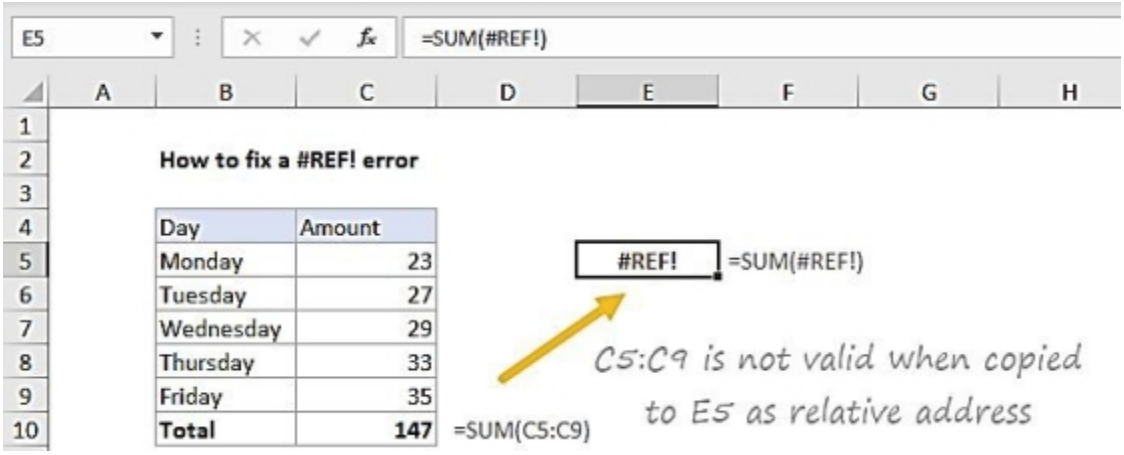
Errors of #NUM!

Excel gives this error when a calculation is impossible. For example, calculating the root of negative numbers, or using the **SORT** function inappropriately.



Entering correct inputs or parameters solves this error. **Errors of #REF!**

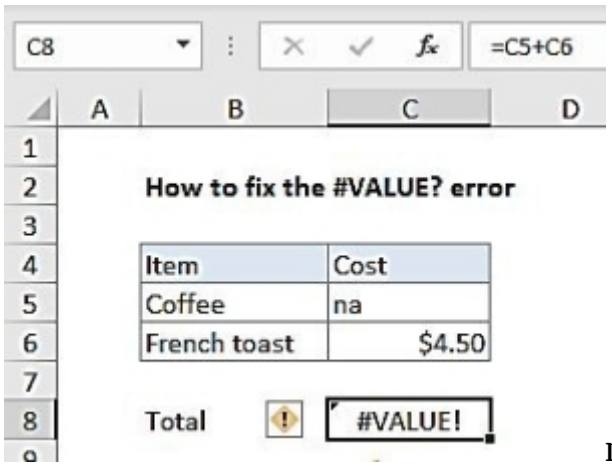
This error is thrown if Excel fails to recognize the specified cell reference. It can occur when referencing cells in deleted worksheets, deleted columns or rows, etc.



Use valid and correct references to rectify this error. You can clear numerous **#REF!** errors using the **Replace and Find** dialogue box as shown below:

Errors of #VALUE!

This error occurs when the entered data is not the appropriate type, probably as a result of cell formatting. For instance, entering a



numeric value in a **Text** formatted cells, or entering a text in a formula or function that demands numeric values.

You can correct this error by inserting the appropriate type of values where necessary.

The **IFERROR** function can be used to define your desired error message or Excel action for major types of Excel errors. You can also search to view all errors in your formulas using the **Special Go To** dialogue box. A press of key **F5** and a selection of **Special** launches this dialogue box.

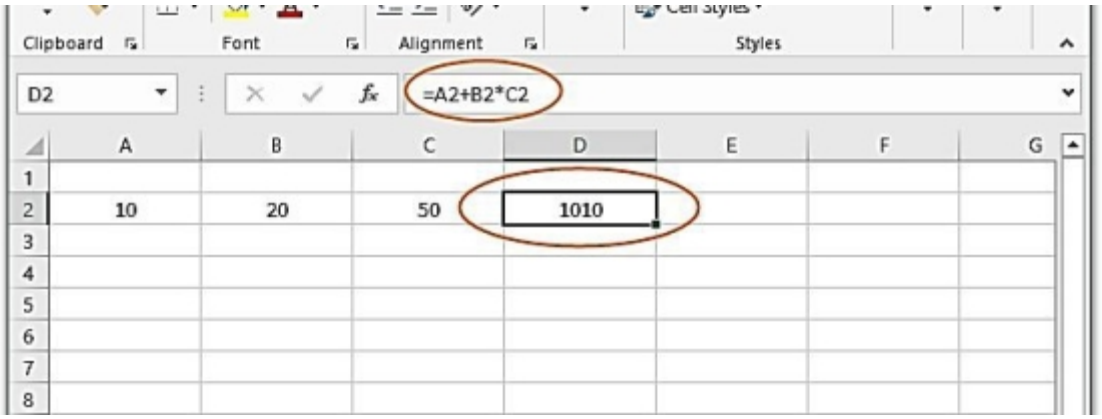
Problems with Precedence of Operators

Order of Operations

Order	Symbols	Operation	Example
1	()	Parentheses	=(5-2)*4 = 12
2	: ,	Reference operators	=SUM(A1:A5)
3	-	Negation	=-3^2 = 9
4	%	Percent	=5%*100 = 5
5	^	Exponentiation	=5^2*2 = 50
6	* /	Multiplication and Division	=7-6/2 = 4
7	+ -	Addition and Subtraction	=6/2+1 = 4
8	&	Concatenation	="score: "&5+1 = score: 6
9	> < = <>	Logical comparisons	=3^2>5+3 = TRUE

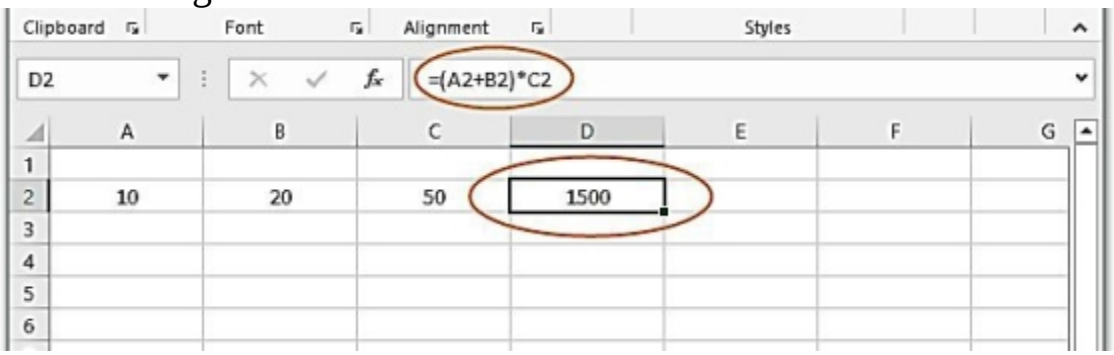
By default, Excel treats precedence of operators in this order:

A formula containing multiple operators having a similar level of precedence is handled from the left direction to the right. A simple addition of parenthesis can change the priority Excel gives to operators. Consider this example; by default, the multiplication operator is given higher precedence in this formula:



=A2+B2*C2

Introducing parenthesis in this form **=(A2+B2)*C2** changes the order of precedence to give a different result:



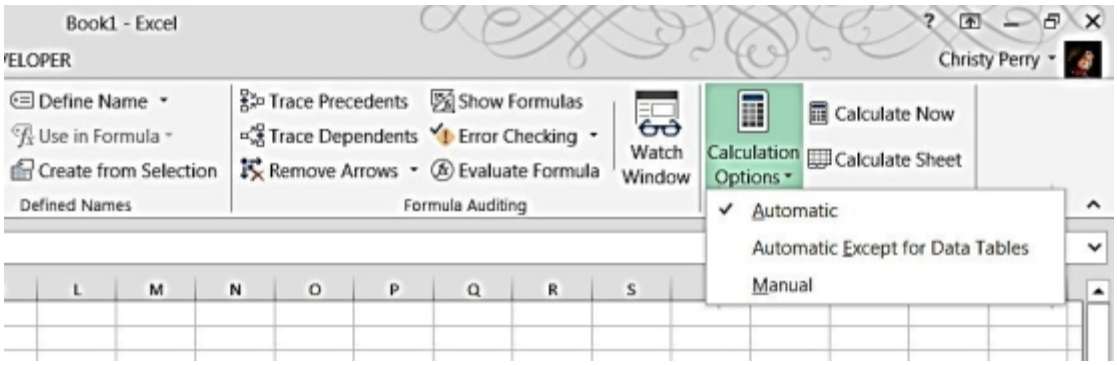
Solving Issue of Formulas not Performing Calculations Three possible ways exist to fix the issue of Excel formulas not executing calculations.

1. Ascertaining Calculation Mode

• Navigate to the **Formula** menu and select the **Option** for

Calculations

• In the drop-down menu options, select the **Automatic** option if not selected

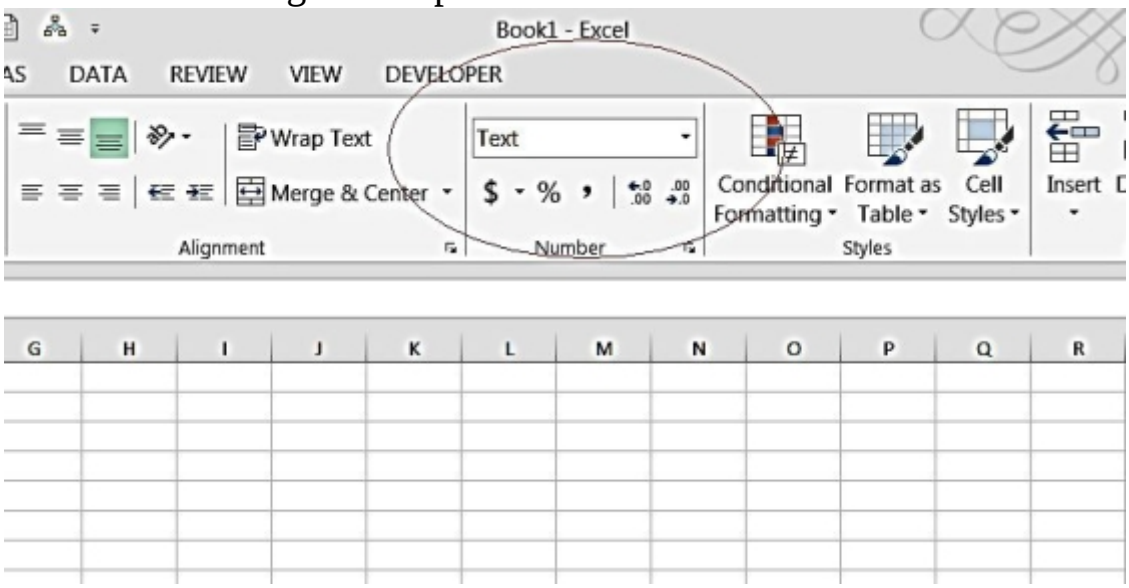


1. Confirming your Cell Formatting Option

• Highlight the cell where you are to have the result of the non-calculating formula

• Navigate to the **Home** menu and select the option for formatting

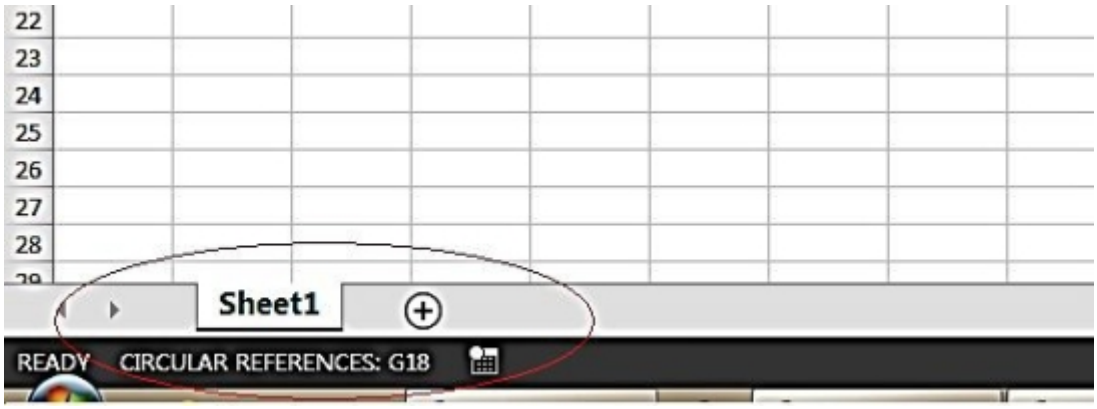
• If it is set to **Text,** change the setting to **Numbers.** In Excel, a cell formatted as a text ignores input formulas.



- Re-enter your formula in the bar for formulas and press the **Enter**

key.

1. Check the **Status bar** and confirm Excel is not flagging a



Circular Reference.

Circular reference refers to a formula containing a cell reference parameter that refers to itself. Simply correct the cell reference and initiate your calculation again.

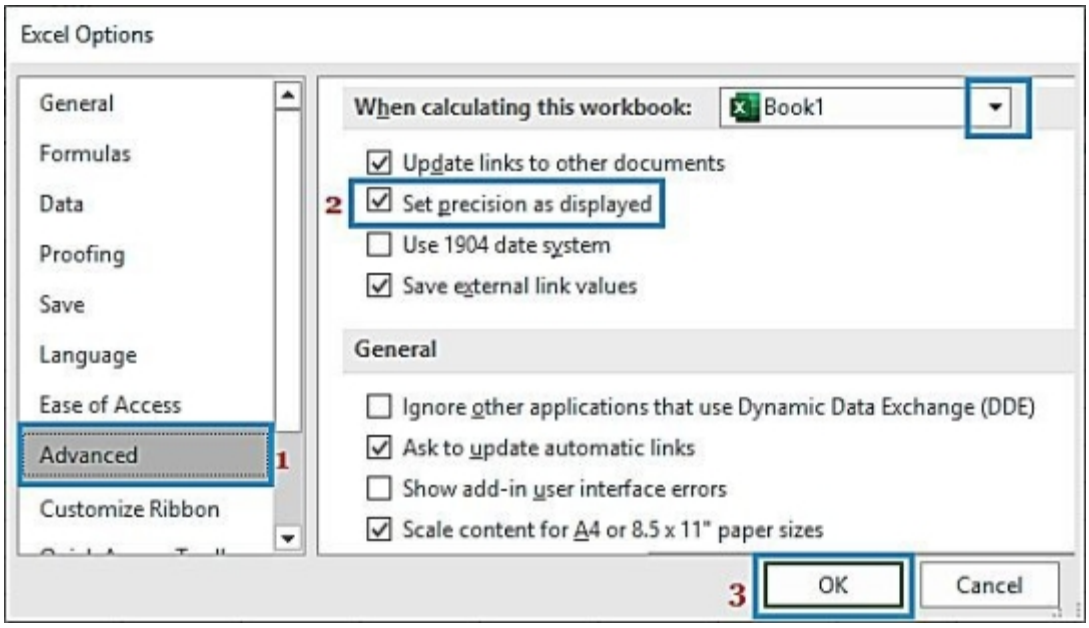
The Precision of Decimal Issues

•

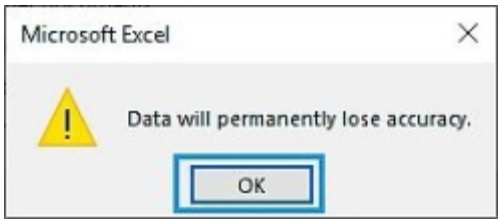
Navigate to the **File** menu

- Select **Options**

- Select the **Advanced** option from the left menu
- Select the option to set the precision of decimals as displayed

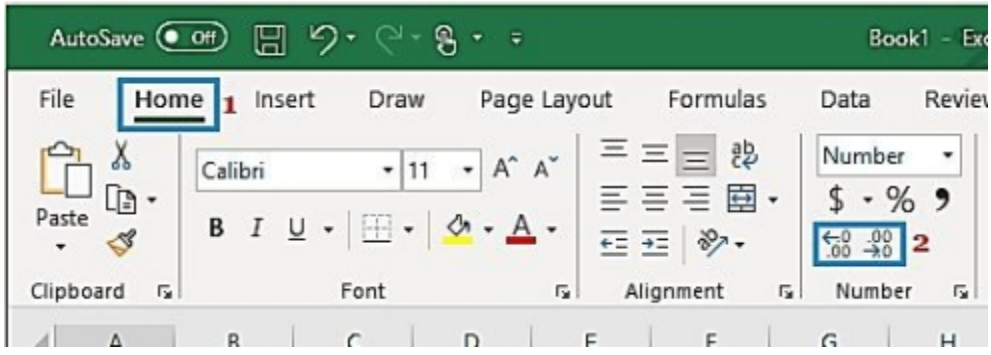


- Select **OK** again when Excel gives a warning



- Select **OK**

• Navigate to the **Home** menu and then select the precision of decimals desired.



Solving Errors of Phantom Links

Phantom links can be of this format

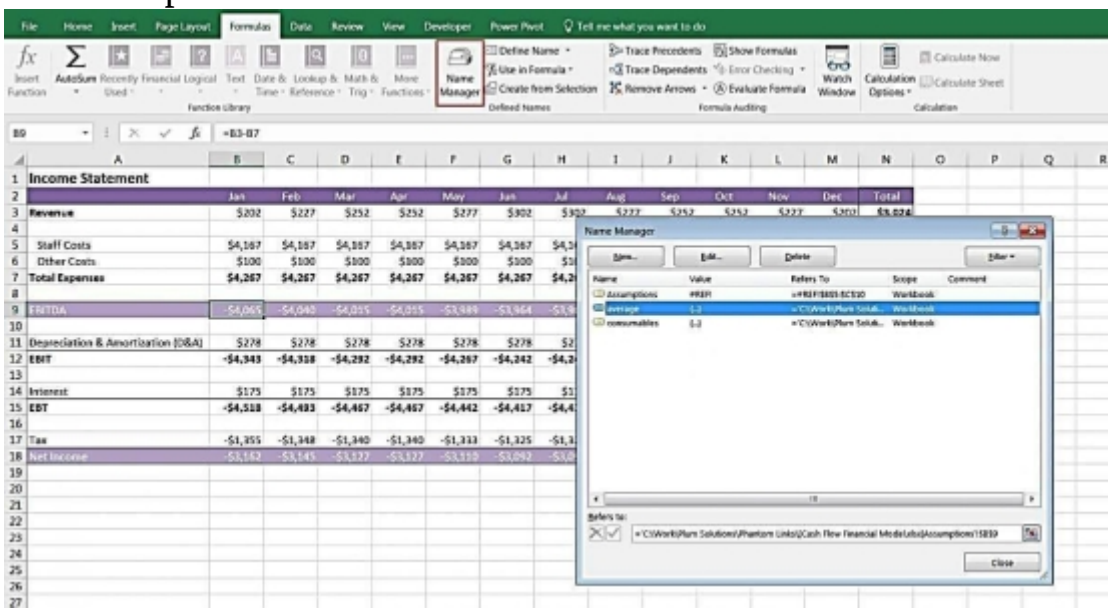
='G:\Company\Solutions\Phantom Links\[Cash Financial Model.xlsx]IS Flow OF CASH'!$D$5

They are inserted in worksheets as a result of copying data from external sources or workbooks. Phantom links are simply external links that reference input in your worksheet.

Phantom links can be deleted via any of the following procedures: **1. Using the Manager for Names**

• Navigate to the **Formula** menu and select the option for managing names

• In the resulting dialogue box, select the link to be deleted and click on the **Delete** option



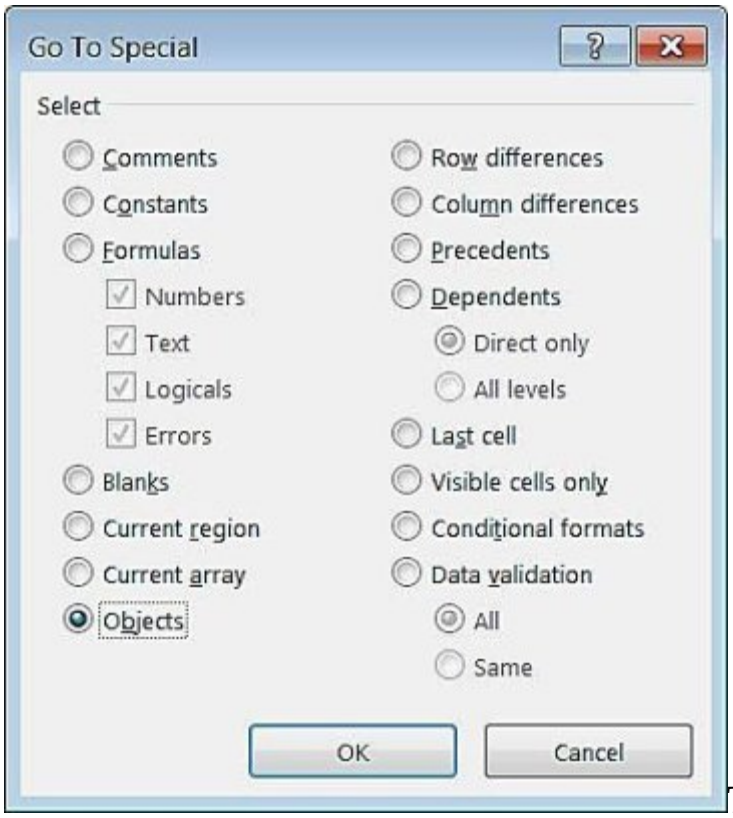
1. Using the Manager for Rules

• Navigate to the **Home** menu and select the option for managing rules

• In the resulting dialogue box, select the link to be deleted and click on the **Delete** option

1. Using the Find Menu

- Press key **F5** or **Ctrl + G**
- Select the option for **Special** and then **OK**
- Select **Objects** in the next menu and click **OK**



This option highlights all the objects in your worksheet, both the displayed and hidden ones

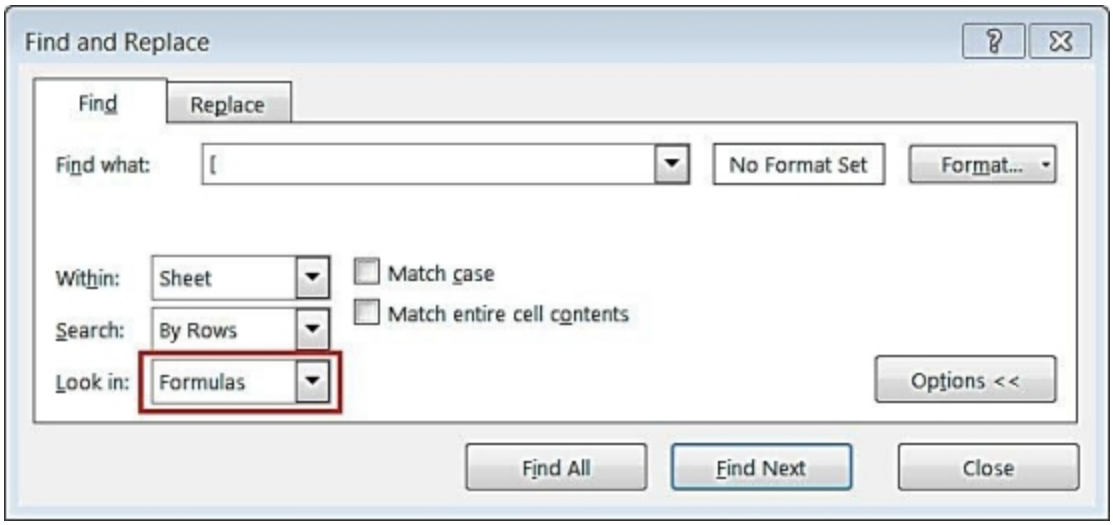
- Select **Delete**

- Repeat this procedure if you have numerous sheets. **4. Using the Replace and Find Dialogue Box**

- Press keys **Ctrl** + **F** to launch the **Replace and Find** dialogue box

- Enter any part of the phantom link (refer to the given format above). Values such as **=[** or **!** can be used.

- Check all sections available in the **Look** drop-down


Find and Replace
Find
Replace
Find what:
[
No Format Set
Format...
Within:
Sheet
Match case
Search:
By Rows
Match entire cell contents
Look in:
Formulas
Options <<
Find All
Find Next
Close

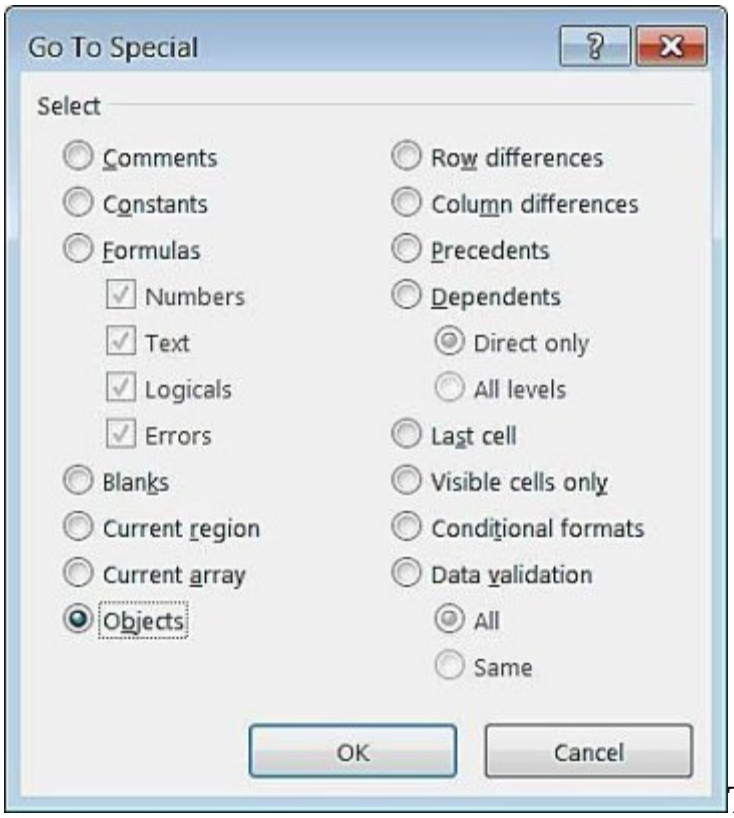
- You can then delete the links when found.

IMPLEMENTING TOOLS FOR AUDITING IN EXCEL

Highlighting Cells of Particular Features

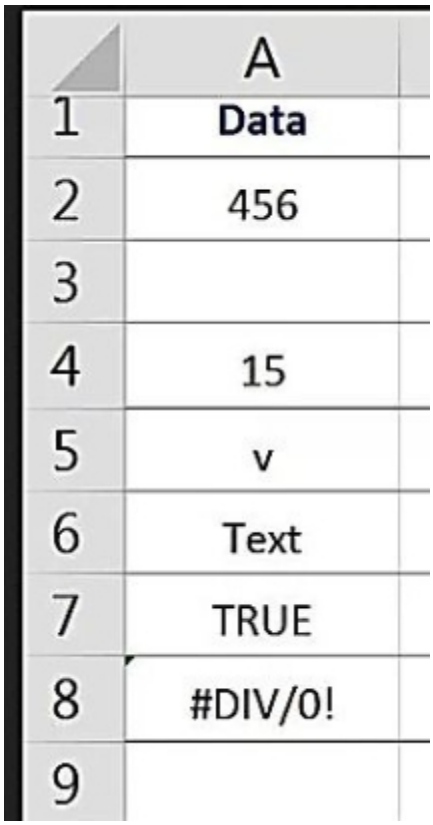
- Select the particular cell range, row, or column

- Press the key **F5** and then select **Special** to launch the corresponding dialogue box.
- Select the box for any desired criteria or feature that you want to identify



The **TYPE** dialogue box or function can also be used.

- Prepare a data entry as shown below



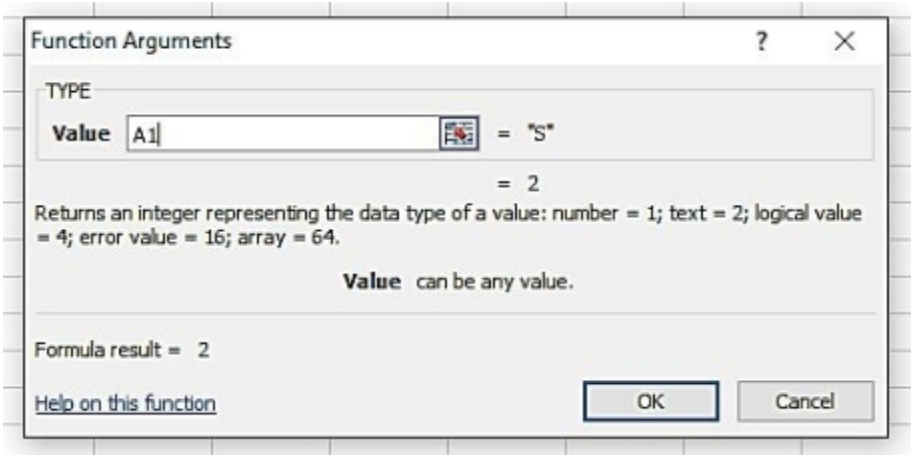
	A
1	**Data**
2	456
3	
4	15
5	v
6	Text
7	TRUE
8	#DIV/0!
9	

- Navigate to the **Formula** menu and select the option for additional functions

•

Select **Information** and click on **TYPE** from the list dropdown

- This action launches the corresponding dialogue box
- Select the cell containing the data to be checked and click **OK**



The **TYPE** function can also be used directly with the syntax:

=TYPE(cell_reference)

E.g. **=TYPE(B4)**

	A	B	C
1	**Data**	**Result**	**Formula**
2	456	1	=TYPE(A2)
3		1	=TYPE(A3)
4	15	1	=TYPE(A4)
5	v	2	=TYPE(A5)
6	Text	2	=TYPE(A6)
7	TRUE	4	=TYPE(A7)
8	#DIV/0!	16	=TYPE(A8)
9		64	{=TYPE({1,2,3})}
10		64	{=TYPE({"doe","rae","me"})}

Excel returns a set of numbers that denotes the data **Type.** These numbers are:

- 1 denotes a numeric data type
- 2 denotes a text data type
- 4 denotes a logical or Boolean data type
- 16 denotes an error
- 64 denotes an array

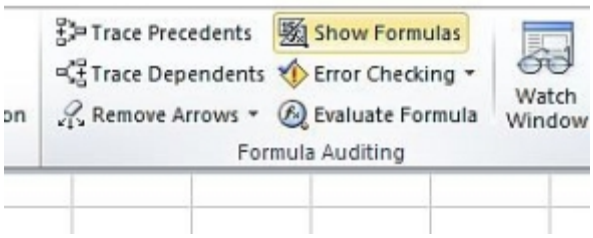
When checking for array types, the formula syntax does not take the cell reference as a parameter; the array itself is needed to be entered in the formula, such as:

{=TYPE{{1,2,3}}}

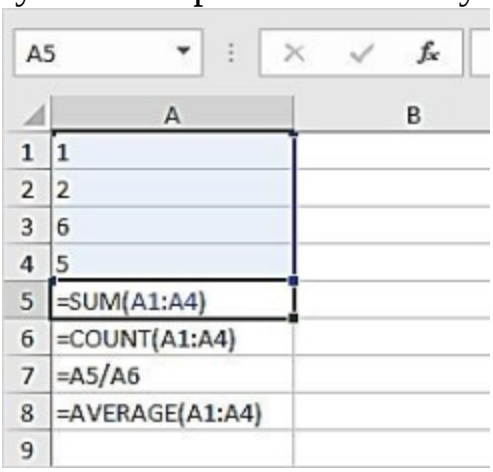
Viewing Your Formulas

By default, when you select a cell in Excel, the background formula in the cell can be seen in the bar for formulas. The **Formula** menu can also be used following these steps:

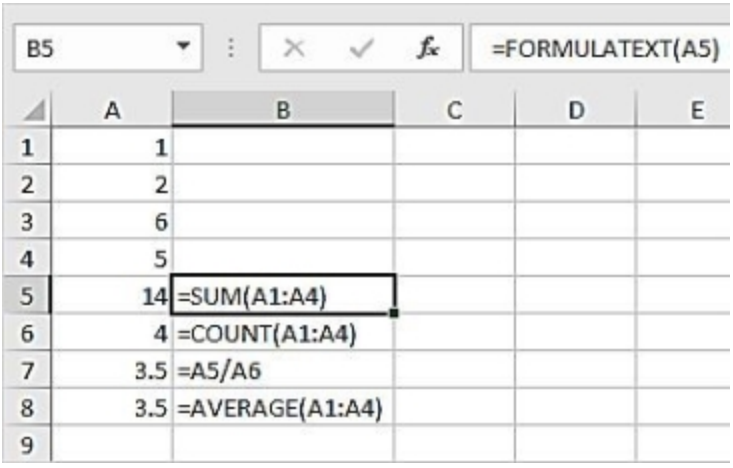
- Highlight the cells containing formula results
- Navigate to the **Formula** menu
- Select the option to **Show** your **Formulas**



You can otherwise use keyboard keys **Ctrl** + ` after highlighting the cells. The key (`) known as the grave accent key is found above the **Tab** key. Another press of these keys hides the formulas.



The **FORMULATEXT** function can be used to display the formula in cells adjacent to the data cells.



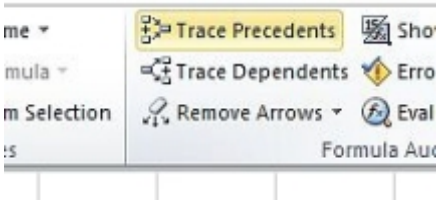
=FORMULATEXT(D7)

IDENTIFYING RELATIONSHIPS BETWEEN CELLS

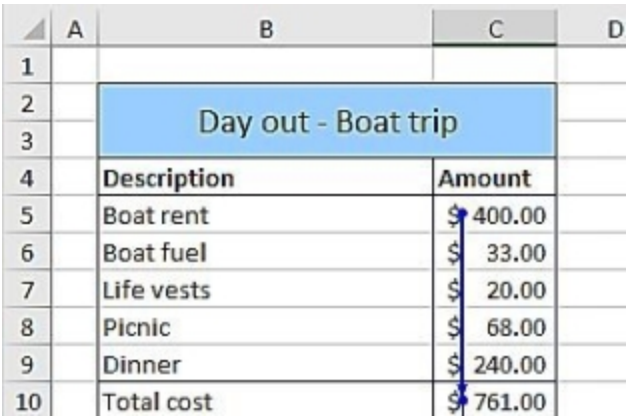
Recognizing Precedents

- Select an empty cell close to your data

- Navigate to the **Formula** menu and select the option for **Tracing Precedents** in the **Auditing Formulas** group.



Precedents show the values used for another highlighted value. In the diagram below, it is shown that all the input **Amount** was used to get the **Total** value.

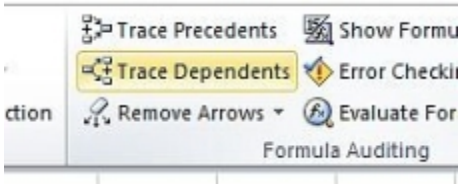


	A	B	C	D
1				
2		Day out - Boat trip		
3				
4		**Description**	**Amount**	
5		Boat rent	$ 400.00	
6		Boat fuel	$ 33.00	
7		Life vests	$ 20.00	
8		Picnic	$ 68.00	
9		Dinner	$ 240.00	
10		Total cost	$ 761.00	

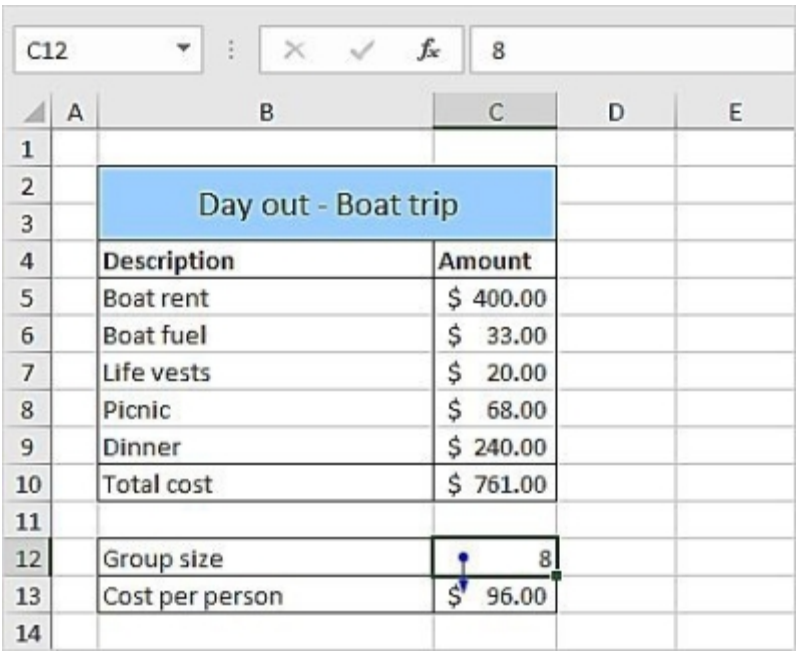
Recognizing Dependents

- Select an empty cell close to your data

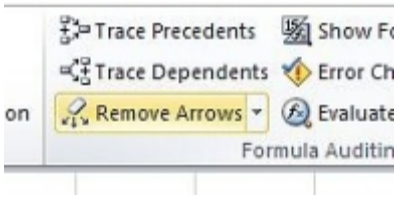
- Navigate to the **Formula** menu and select the option for **Tracing Decedents** in the **Auditing Formulas** group.



Decedents show the values on which another highlighted value depends. In the diagram below, it is shown that the cost for each person is dependent on the size of the group.



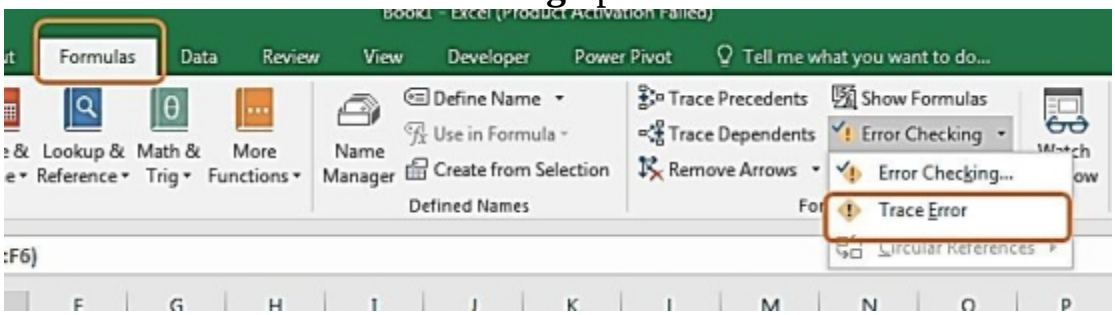
- The arrows can be removed by selecting the tab to remove them.



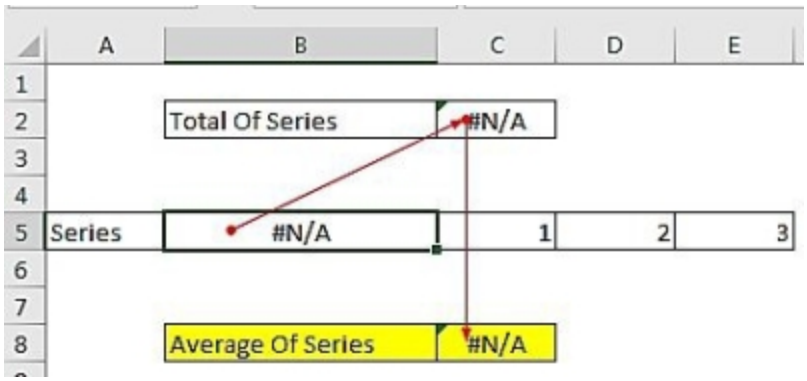
TRACKING ERROR VALUES

- Select the cell to be checked for an error

• Navigate to the **Formula** menu and select the option for **Checking Errors** in the **Auditing Formulas** group. For instance, to check for circular reference errors: The **Error Tracing** option can also be used



- Selecting this option brings up lines in red on your worksheet.

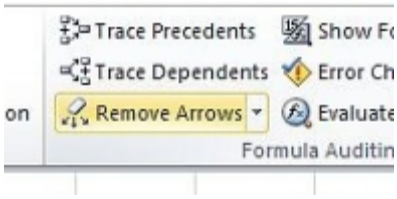


They are drawn to show the source of the error.

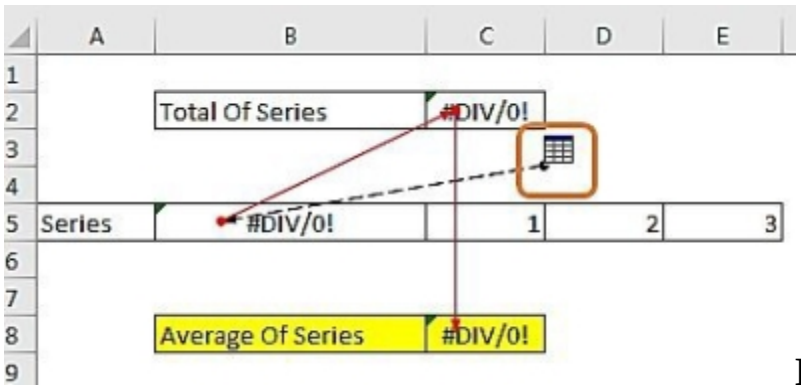
- The diagram above shows that an error resides in **B5** which was passed to **C2,** resulting in the error in cell **C8.** Correcting the value in **B5** rectifies the error and the lines become blue

- Select the option to remove the tracing arrows in the **Formula**

menu.



- If an error is traced to another worksheet, Excel shows the trace in this form:

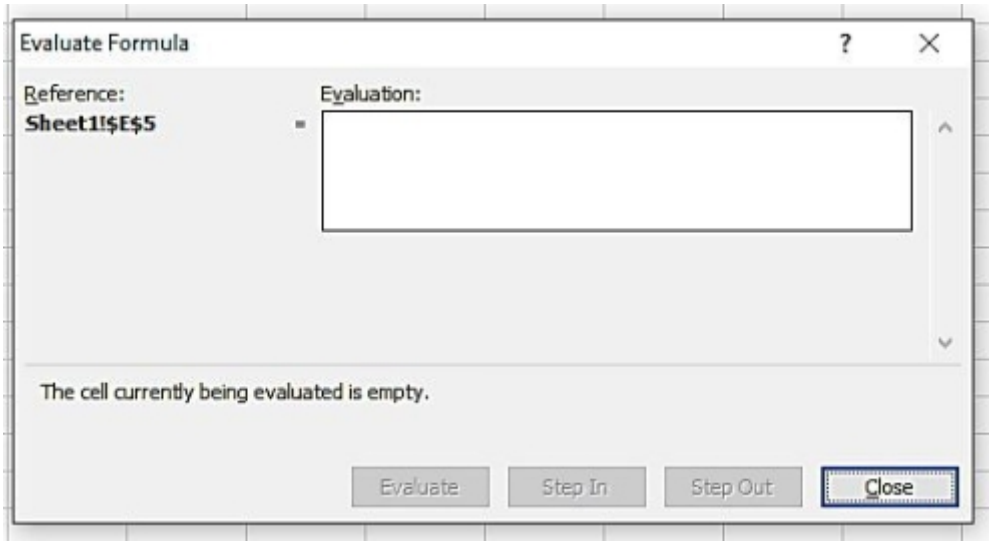


Evaluating Formulas

- Select the cell to be evaluated holding a formula or a formula result
- Navigate to the **Formula** menu and select the option for

Evaluating Formulas in the **Auditing Formulas** group

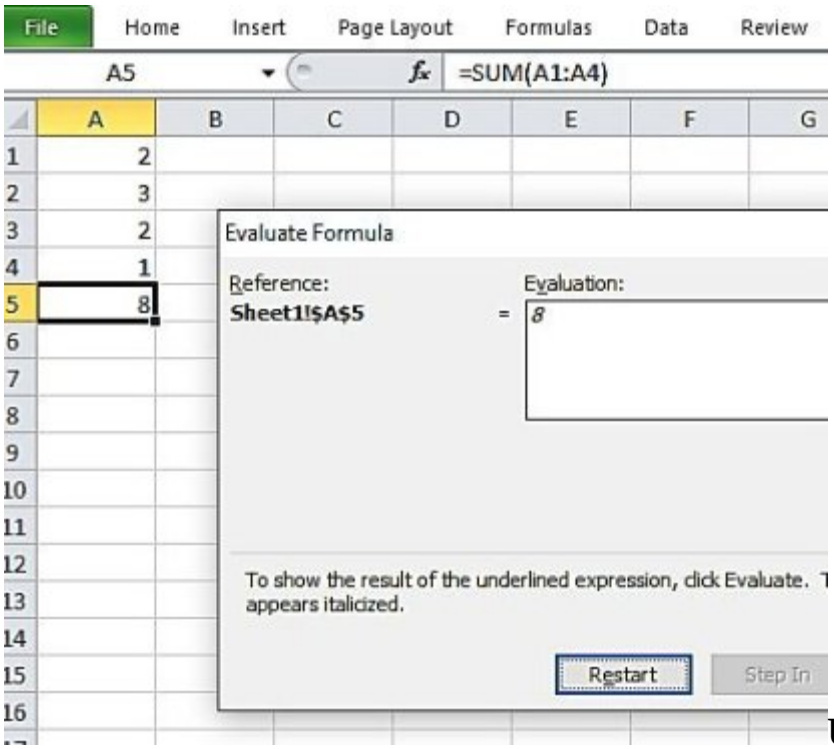
- Click on this option the number of times corresponding to the number of arguments you have in your formula.



For instance, to evaluate **=SUM(A1+B2)**, click on the **Evaluate** option three times

To evaluate **=SUM(A1+A2+A3+A4),** click on the **Evaluate** option four times. However, the expression **=SUM(A1:A4)** requires a two- time press of the **Evaluate** button.

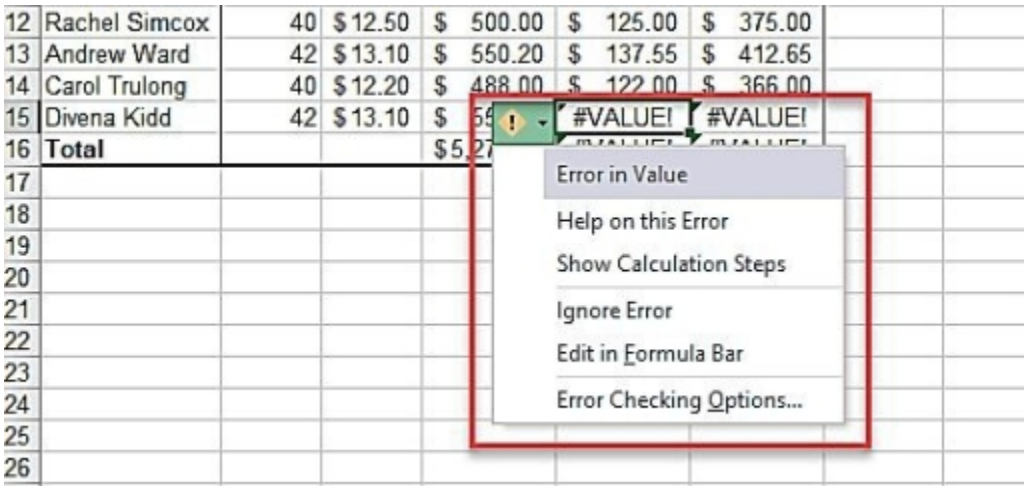
- Excel then shows the result of the formula after evaluating each part (argument) of the formula.



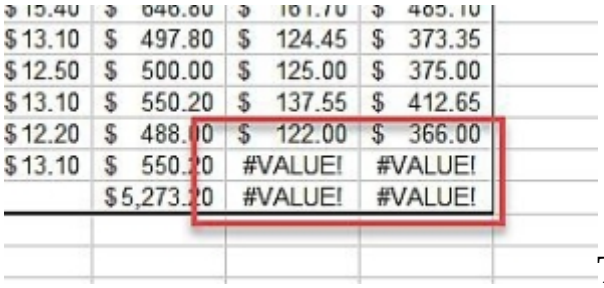
Using the

Excel Background Feature for Checking Errors

When the background feature for checking error is turned on, Excel shows errors as a green colored triangle



Otherwise, the hash errors are displayed:



$ 13.10	$ 497.80	$ 124.45	$ 373.35
$ 12.50	$ 500.00	$ 125.00	$ 375.00
$ 13.10	$ 550.20	$ 137.55	$ 412.65
$ 12.20	$ 488.00	$ 122.00	$ 366.00
$ 13.10	$ 550.20	#VALUE!	#VALUE!
	$ 5,273.20	#VALUE!	#VALUE!

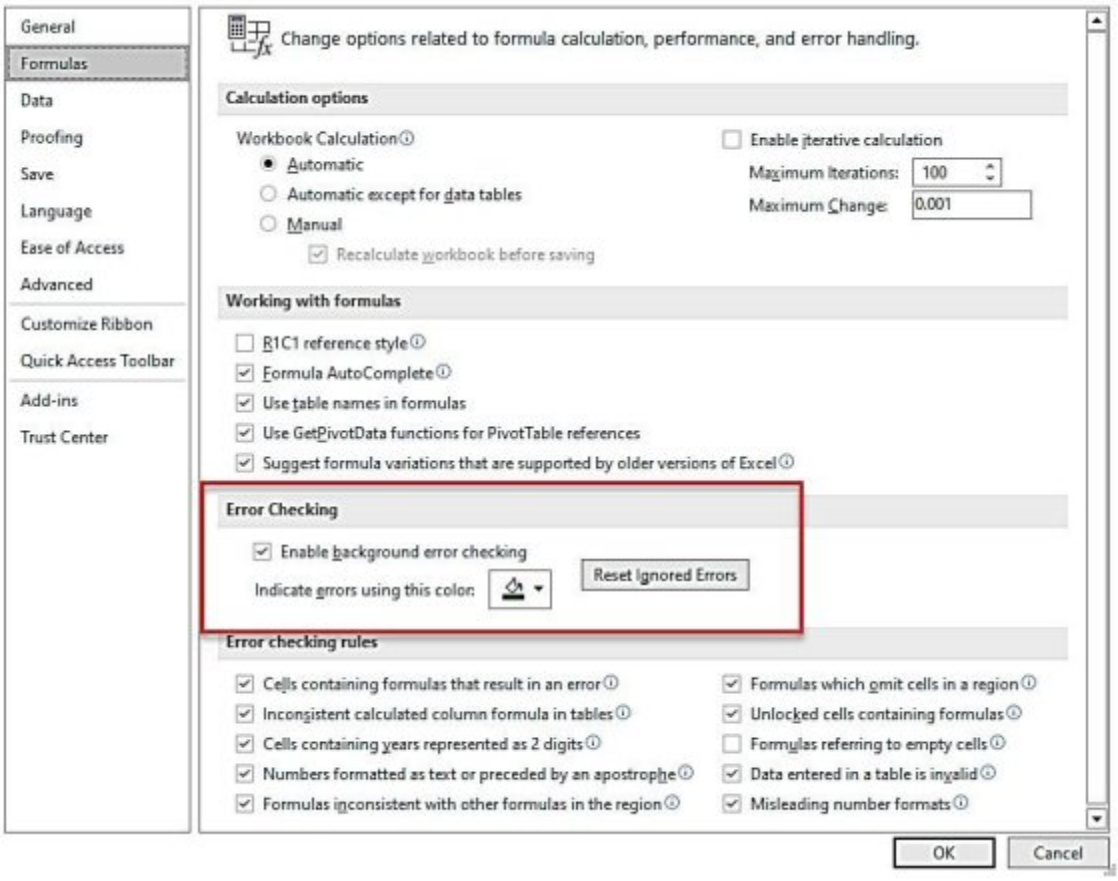
To turn on this background feature:

- Navigate to **Option** in the **File** menu

•

Select **Formulas** from the left menu

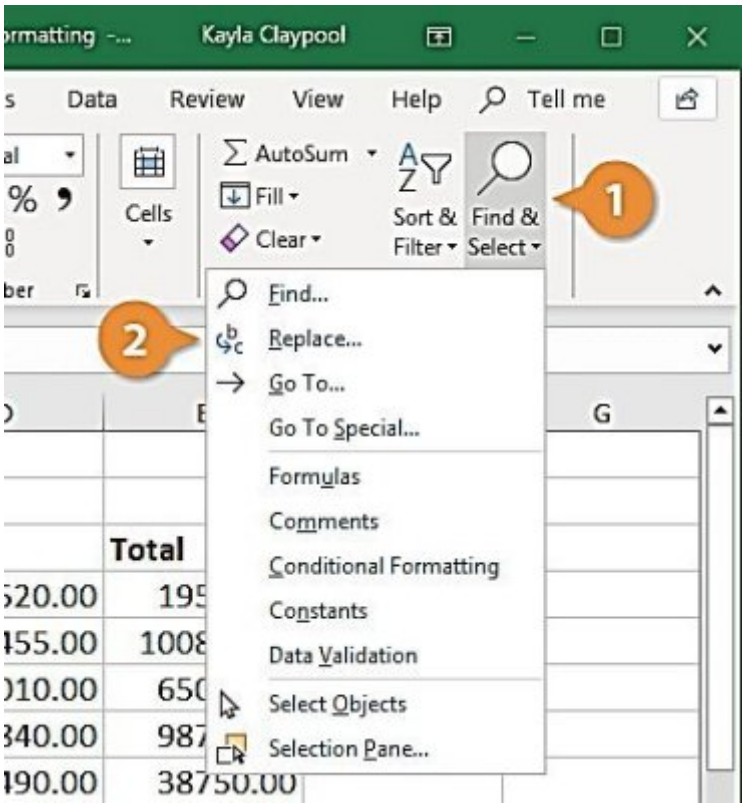
- Check the box to turn on this error checking feature



- Select **OK**

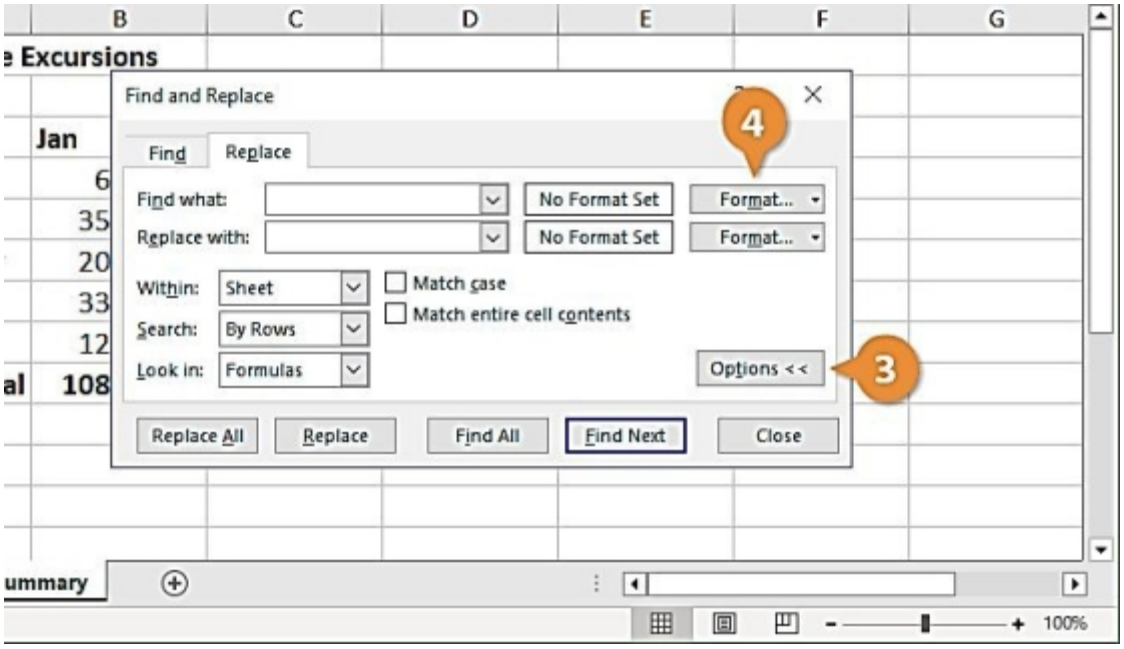
FINDING AND REPLACING CELL VALUES You can search and replace cell values using the **Find** dialogue box. The dialogue box can be launched using keys **Ctrl + H. Finding Information**

- Navigate to the **Home** menu and select the **Find and Select** tab
- Select the **Find** option in the drop-down menu **Format Search**
- Navigate to the **Replace** option in the **Find and Select** drop-down

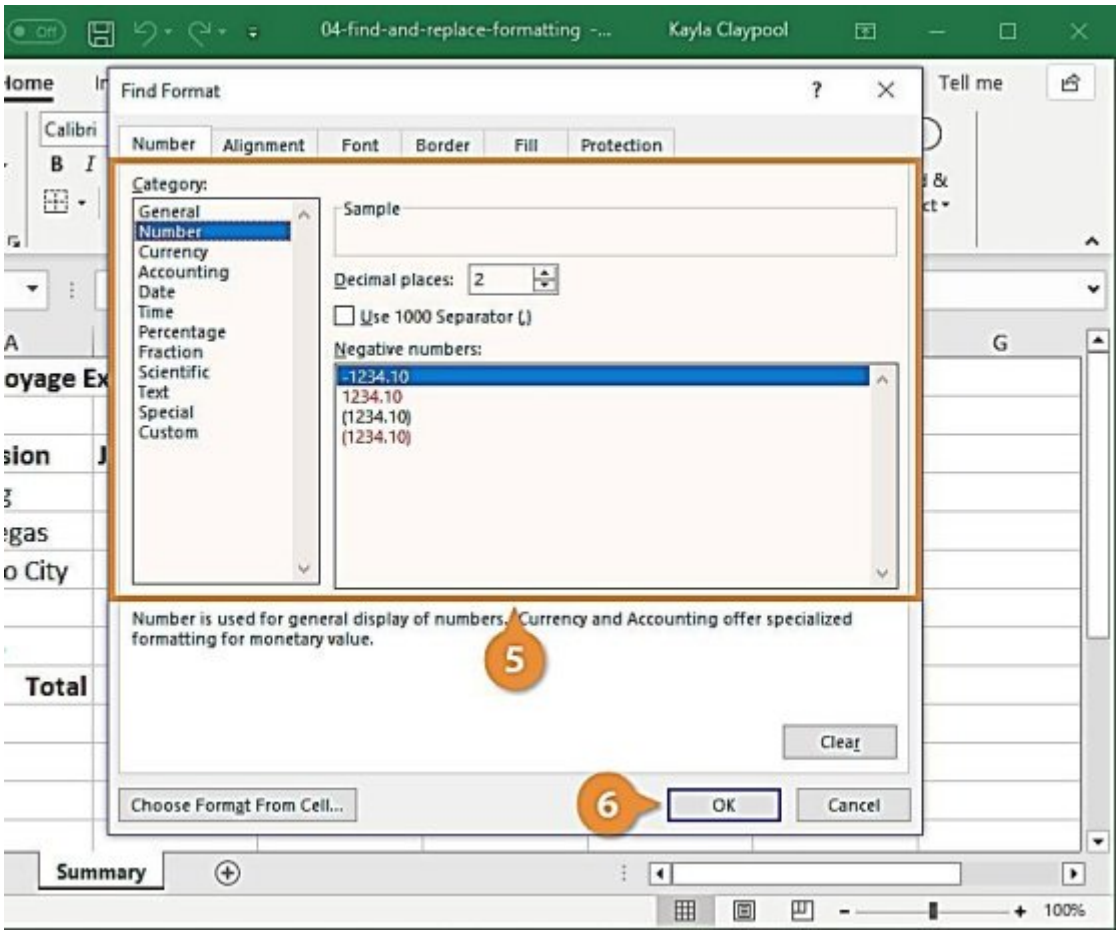


menu

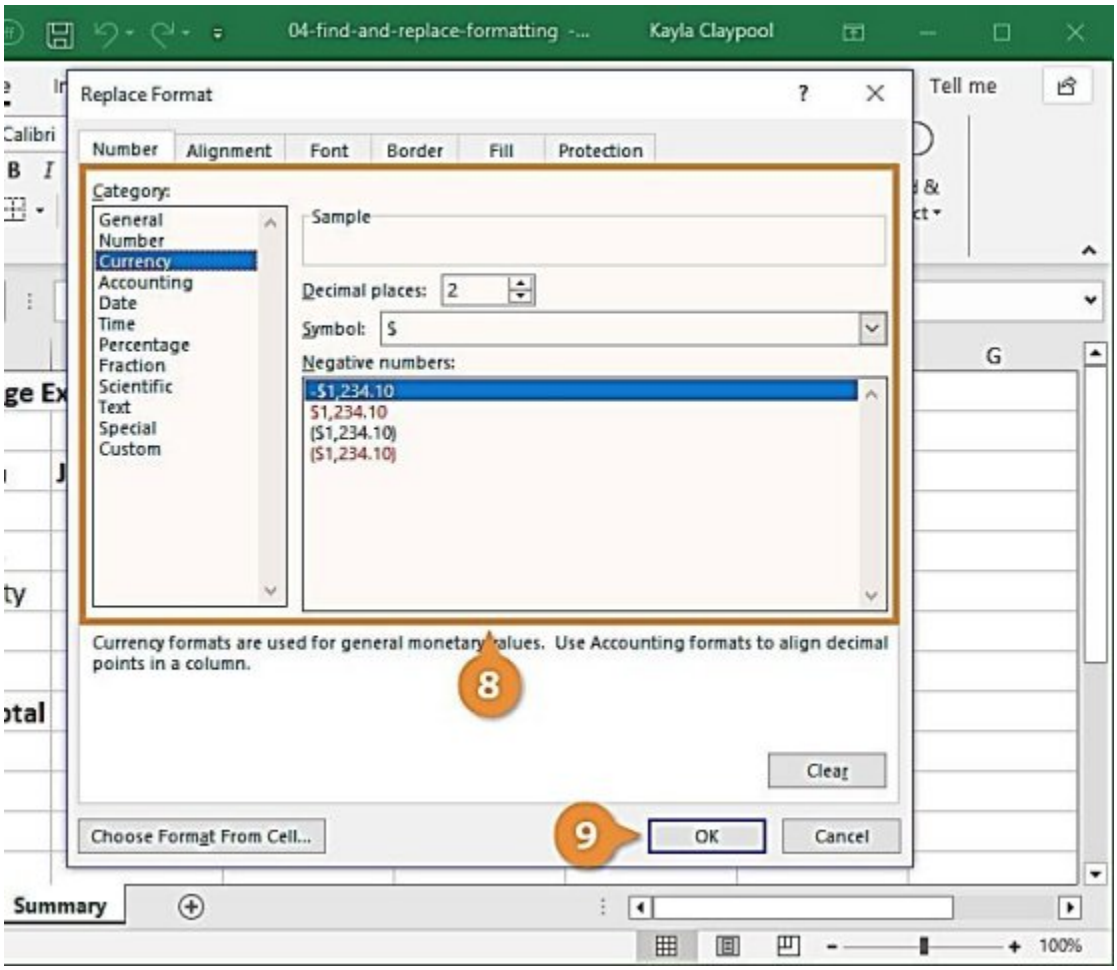
- Select **Options** in the dialogue box
- Click on the **Format** option in front of the **Find** box



- This opens the **Format Finding** dialogue box
- Choose the needed formatting and select **OK**



- Click on the **Format** option in front of the **Replace** box
- Select the new replacement formatting and select **OK**



• Select the option for replacing all corresponding formatting or any other desired option

• Select **OK** and then **Close** the dialogue box

Performing Spell Checks in Your Worksheet

•

Navigate to the **Review** menu and select the **Spelling** tab

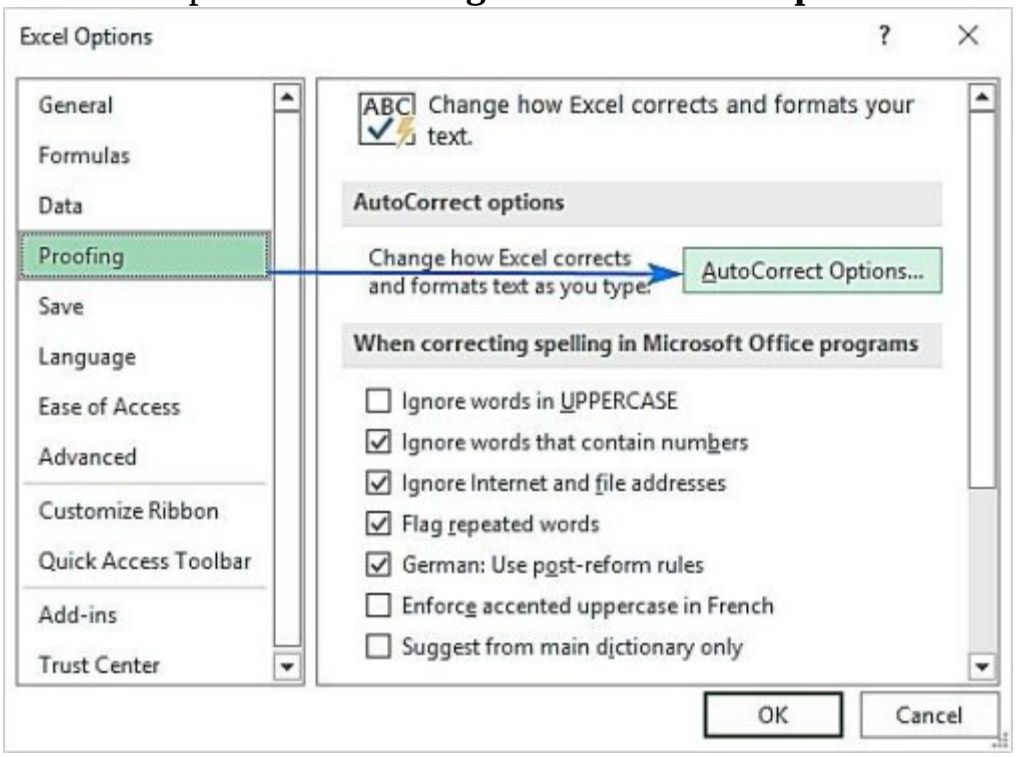
• This launches the **Spelling** dialogue box

Keyboard key **F7** can be used after highlighting the cells on which the spell checks are to be done.

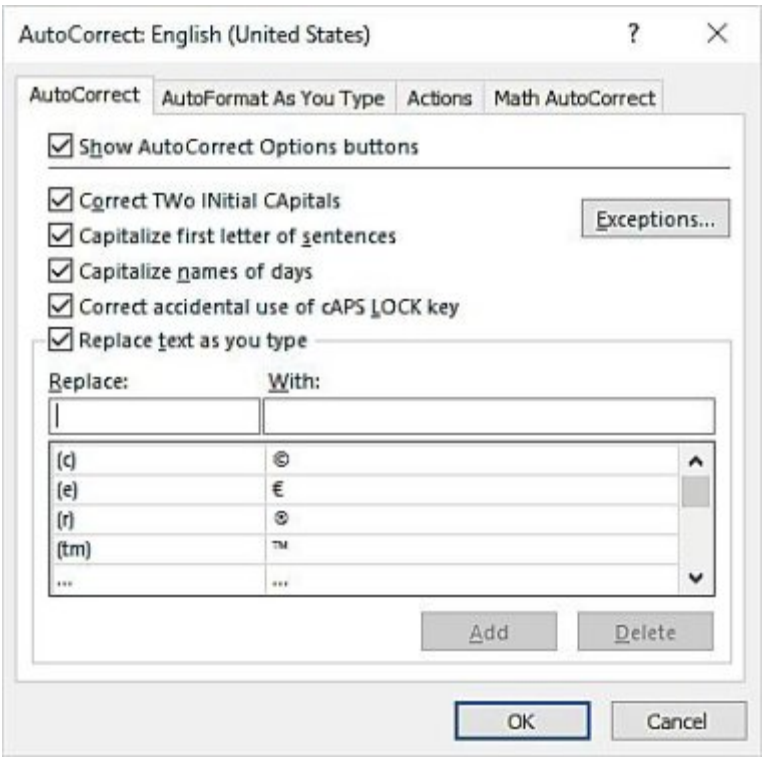
IMPLEMENTING AUTOCORRECT IN YOUR WORKSHEET

- Navigate to **Option** in the **File** menu

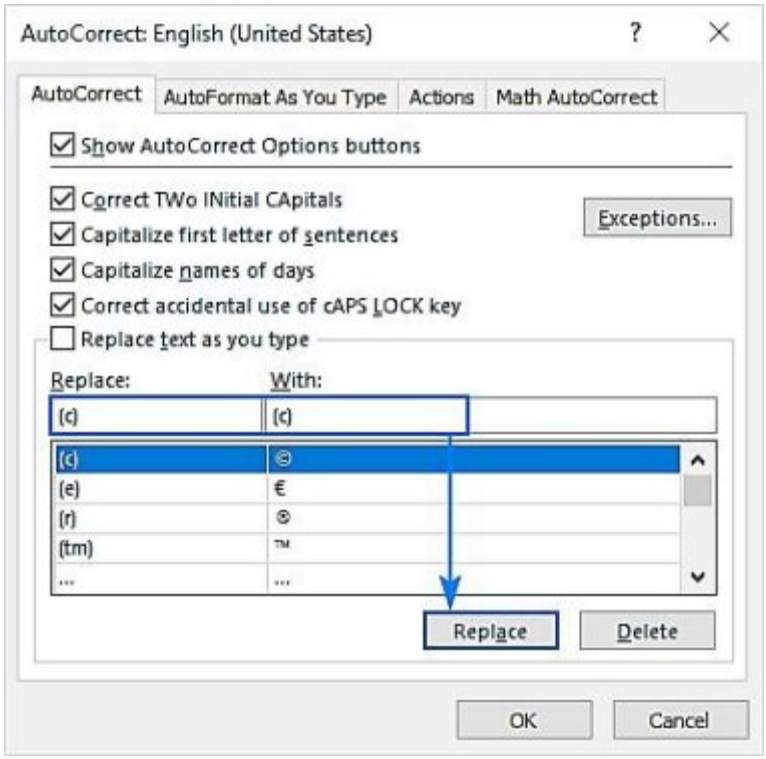
- Select the option for **Proofing** and then choose **Option for AutoCorrect**



- You can insert new AutoCorrect values by selecting the **Add** option

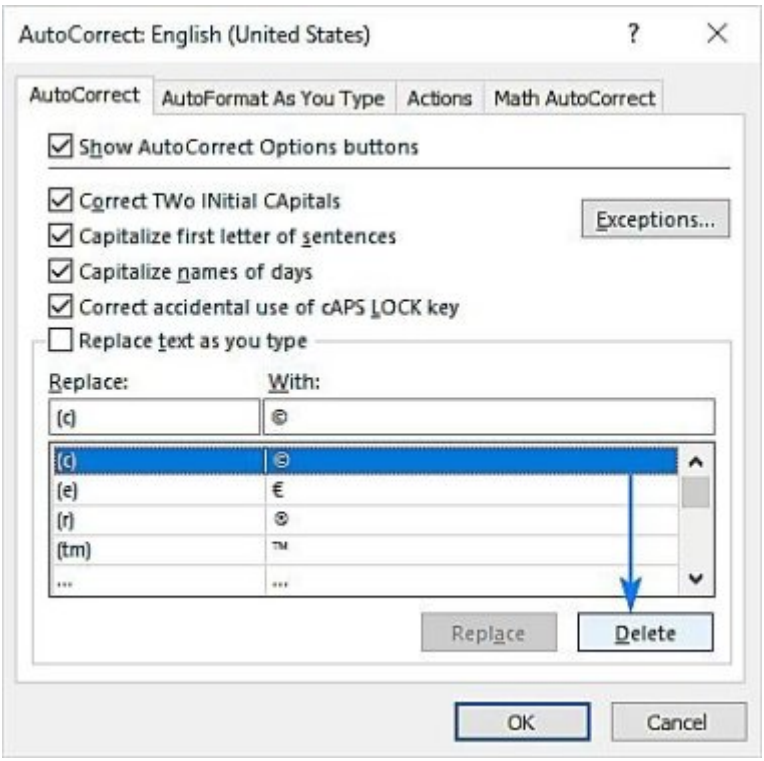


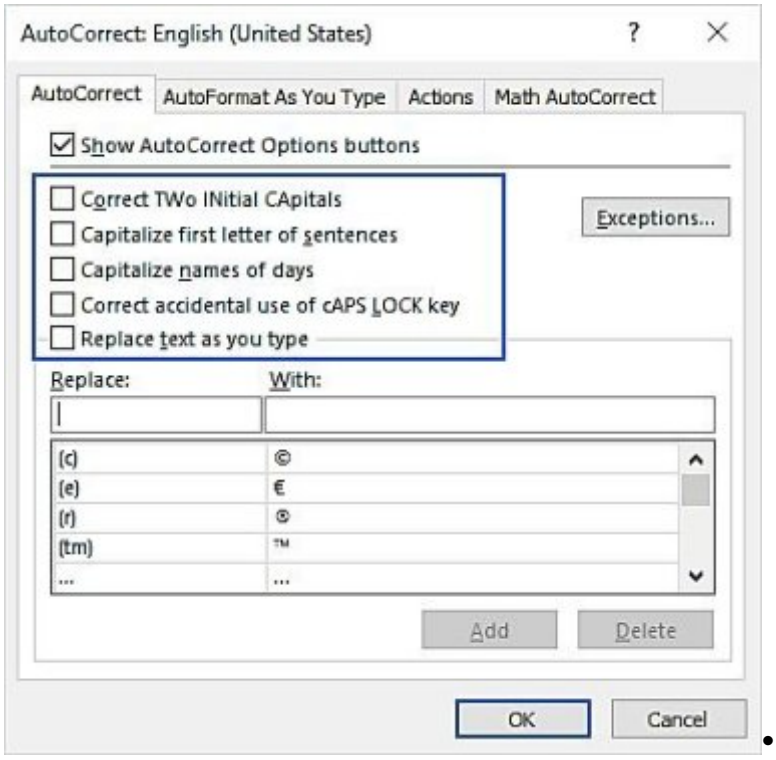
- Edit an AutoCorrect input by selecting it and then clicking on



Replace

- Select **Delete** to erase an option from the list





- You can turn off AutoCorrect for some instances by deselecting any of these boxes

Summary

Excel provides measures with which you can make your data analysis and worksheet free of errors, both for texts, numbers, and formulas. This chapter explained how you can rectify errors such as incomplete parentheses, hash marks, errors in formulas, etc. Steps

and methods to audit your worksheet using the **Auditing Formulas** group in the **Formula** menu were also discussed. Finding and replacing values in your worksheet using the corresponding dialogue box was examined.

Conclusion

Functions and formulas in Excel are very important to save time during data analysis. The feature of being able to search and carry out calculations for particular data and cells by referencing them comes in handy when dealing with large data. The inbuilt functions enable you to write shorter expressions and carry out similar operations as without them. Good knowledge of Excel formulas, their functions, and tools for auditing assists you in having presentable error-free worksheets.

Part 3: PIVOT TABLES & DASHBOARDS

INTRODUCTION

Excel Pivot tables were introduced in 1994. It has since proved to be a necessary feature for containing and visualizing important data and information from the main table. With pivot tables, firms and clients do not need to go through numerous data before finding necessary points and drawing crucial conclusions. Pivot tables are needed to be added manually to worksheets. They are added from the **Insert** menu in the ribbon tab. Upon selection of this option, users are presented with the option of either creating the pivot table in the current worksheet or a new worksheet.

Pivot tables in Excel are subsets of an originally large table, derived from another table containing large data for easier comprehension and visualization. It is advised to have an existing table from which Excel would then create the pivot table. Although pivot tables can also be created from other data formats such as **TXT** files, this would however require a data clean up and conversion. Data from external sources can also serve as the foundation for pivot tables.

Excel pivot tables are easy to use along with the various functionalities attached to them. Charts, slicers, summary functions, filters, etc. can all be added and configured for use with pivot tables.

CHAPTER 18 GETTING FAMILIAR WITH EXCEL PIVOT TABLES

Pivot tables in Excel are subsets of an originally large table. They are derived from another table containing large data for easier comprehension and visualization. Pivot tables usually contain important data and information from the main table, so that firms do not need to go through numerous data before finding necessary points.

Microsoft introduced the Pivot tables feature in Excel in 1994 and it has undergone many improvements such as:

- Excel version for 1997 came with an upgrade to the Wizard for PivotTables, features for calculated fields creation, and provision of objects in the pivot cache for writing macros for the creation and modification of pivot tables.

- Charts in pivot tables to graphically represent the data in pivot tables were introduced in the Excel version for the year 2000.

Also, Oracle Corporation added PIVOT and UNPIVOT to its list of operators for Oracle Database in the year 2007.

HOW TO CREATE PIVOT TABLES

Pivot tables do not appear automatically, they have to be selected from the **Insert** menu in the ribbon tab. On selection of this option, a user is presented with the option of either creating the pivot table in the current worksheet or a new worksheet. Note that you must first have an existing table from which Excel would then create the pivot table. The steps to inserting a pivot table in your worksheet are explained below:

•

Select any cell in your prepared table

• Navigate to the **Insert** menu and select the option for **PivotTables**

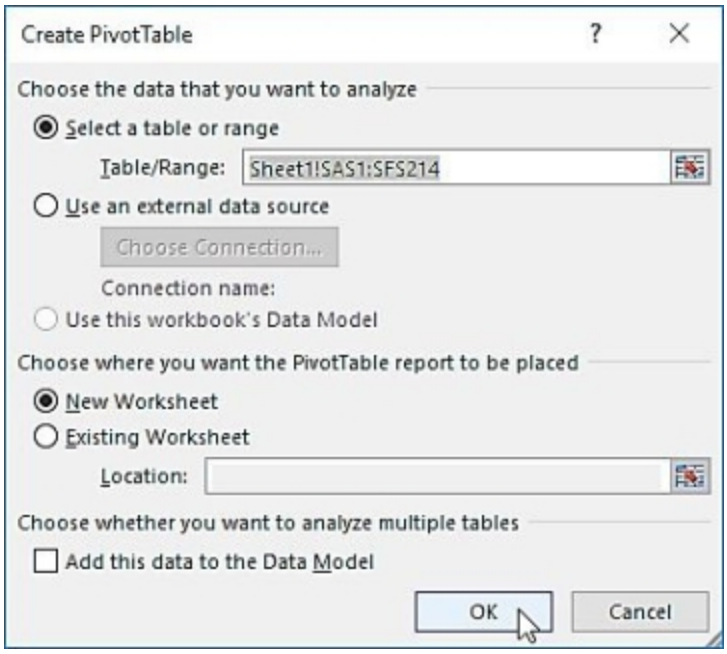
in the group for **Tables.**

• In the resulting dialogue box:

- Select the full cell range of the existing table

- Choose whether the pivot table should be created in the current worksheet or a new worksheet

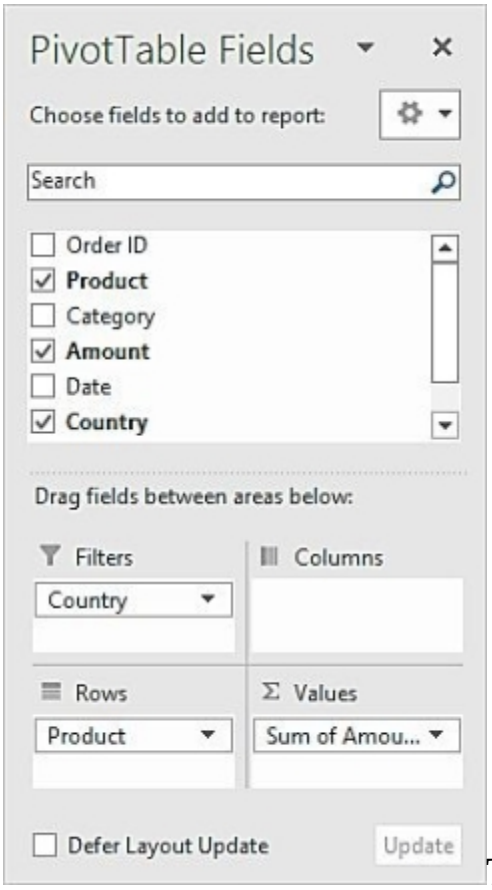
- Select the box for analyzing more than one table if applicable



- Select **OK**

- The Pane for fields in Pivot tables appears next. You decide how you want the table to be formed in this pane. For example, to view the number of each exported product:

- Drag **Product** to the area for **Rows**
- Drag **Amount** to the area for **Values**
- Drag **Countries** to the area for **Filters**



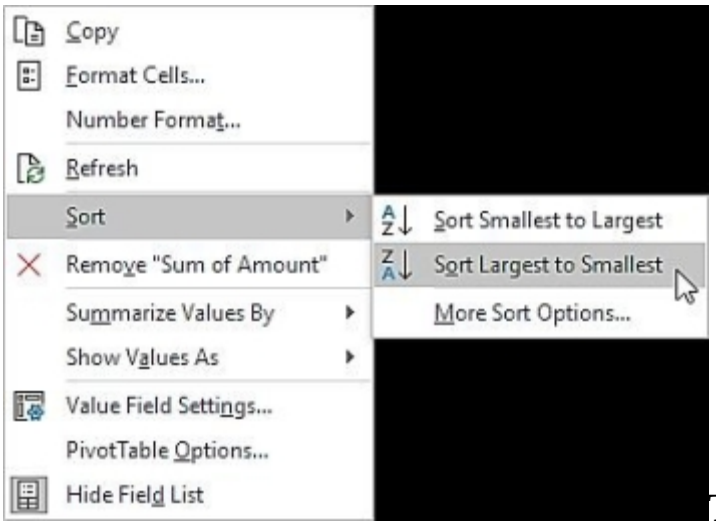
This creates a result as shown below:

	A	B	C
1	Country	(All)	
2			
3	Row Labels	Sum of Amount	
4	Apple	191257	
5	Banana	340295	
6	Beans	57281	
7	Broccoli	142439	
8	Carrots	136945	
9	Mango	57079	
10	Orange	104438	
11	Grand Total	1029734	
12			

Here, you can easily point out how well every product is being exported.

Performing Basic Operations in Your Pivot Tables 1. Sorting

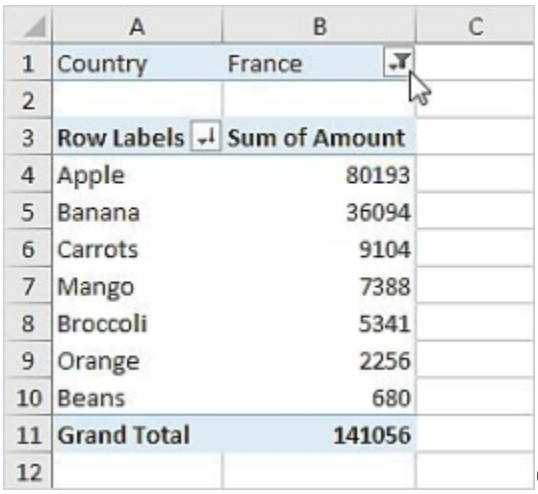
- Highlight one of the cells in the column for **Sum Amount**
- Make a right-click and select the **Sort** option
- Choose from any of the provided options



This creates a result as shown below:

1. Filtering

Select the filter drop-down icon. The available filter option is **Country** because that was what we placed in the area for filters when the pivot table was created.



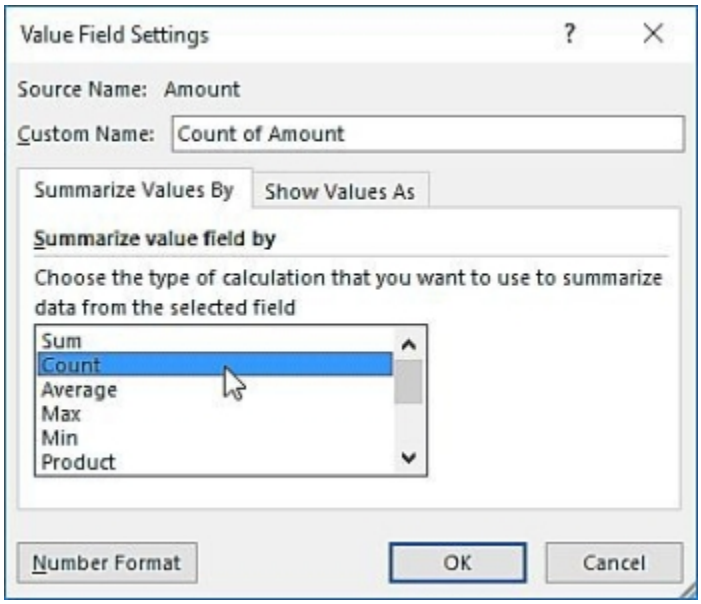
	A	B	C
1	Country	France	
2			
3	Row Labels	Sum of Amount	
4	Apple	80193	
5	Banana	36094	
6	Carrots	9104	
7	Mango	7388	
8	Broccoli	5341	
9	Orange	2256	
10	Beans	680	
11	Grand Total	141056	
12			

1. Changing How Your Data is Summarized

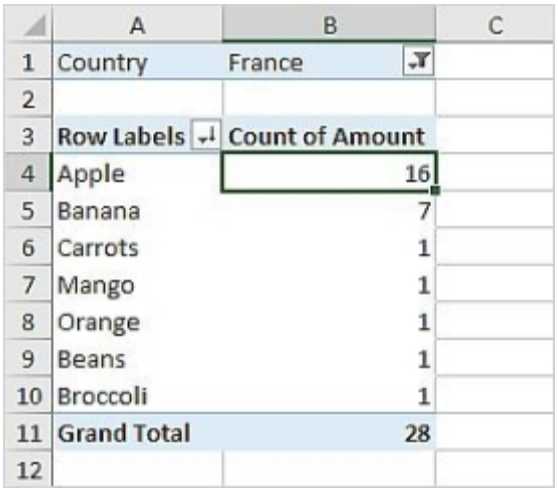
Excel summarizes data in pivot tables by count or sum by default. You can however change this by following these steps:

- Highlight one of the cells in the column for **Sum Amount**
- Make a right-click and select the option for settings for field values

- Select how you want your data to be calculated in the dialogue box that appears.


Value Field Settings
Source Name: Amount
Custom Name: Count of Amount
Summarize Values By
Show Values As
Summarize value field by
Choose the type of calculation that you want to use to summarize data from the selected field
Sum
Count
Average
Max
Min
Product
Number Format
OK
Cancel

- Select **OK**



	A	B	C
1	Country	France	
2			
3	Row Labels	Count of Amount	
4	Apple	16	
5	Banana	7	
6	Carrots	1	
7	Mango	1	
8	Orange	1	
9	Beans	1	
10	Broccoli	1	
11	Grand Total	28	
12			

COMPONENTS OF PIVOT

TABLES

The components of a pivot table are made up of **Fields.** These fields are dragged into these components or layouts to determine the foundation on which users decide how their created pivot tables would appear. Pivot fields are made up of the following parts:

1. Filters

Filters determine the basis on which the pivot table would be created. They are applied to the complete table. For instance, dragging **Country** to the area for Filter in the previous example gave a summary according to the countries in the original table. A filter drop-down icon is usually present to select certain filter options based on **Country.**

1. Columns

Columns are filters that are applied to only the columns present in the original table. They are not applied to the whole table as in **Filters.** They divide the pivot data into sections.

1. Rows

Rows provide a means of grouping the data in your original table. Fields placed in the area for rows are the basis by which your pivot data would be grouped. For example, we placed **Products** in **Rows** in the previous example and we see the resulting table showing **Sum Amount** based on products. Rows are the entities by which fields are measured or grouped.

1. Values

These components usually hold numerical fields that can be employed when carrying out various calculations. However, if a field containing texts is placed in this component, it is displayed in the table as a **Count.** Values are the measured entity in Pivot tables. Pivot tables are found in applications such as:

- Spreadsheets: Microsoft Excel, Apache POI, Google Sheets, etc.

- Databases: Microsoft SQL Server, PostgreSQL, Microsoft Access, MariaDB, Oracle Database, etc.
- Web: a framework in Ajax known as **ZK** allows you to embed pivot tables when creating applications for the web.

- Programming Languages: Python has the **Pandas toolkit** and **R**

provides a meta-package known as **Tidyverse. Summary**

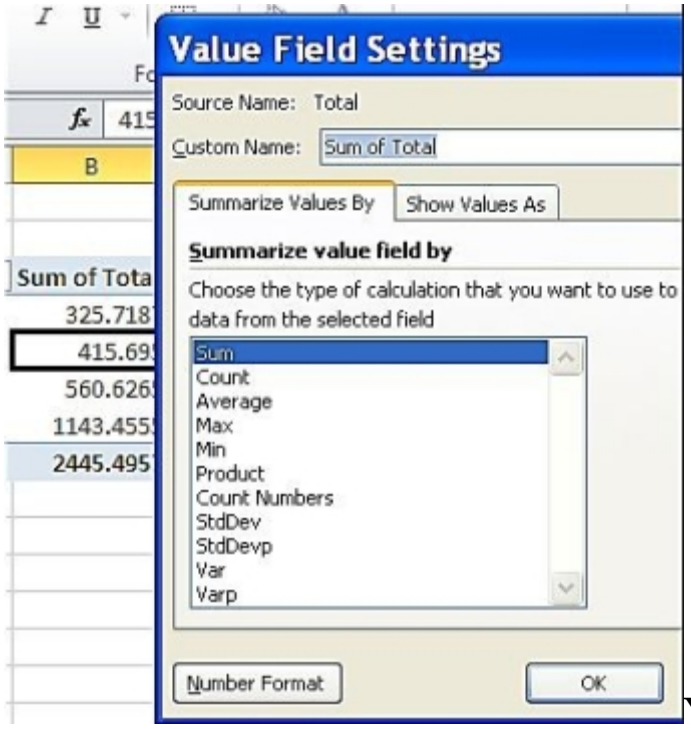
Pivot tables provide a quick way to analyze large tables to easily visualize results and then draw educated conclusions. They are extracted from originally large tables. Pivot tables are made up of components that determine how they are formed and the information they display. This chapter explained how pivot tables can be created and the necessary basic operations that can be carried out on them.

CHAPTER 19- DESIGNING SIMPLE PIVOT TABLES WITH CHARTS FIELD SETTINGS FOR NUMBER SUMMARY

Adding fields to the area for **Values** in pivot tables makes available eleven possible summary options for your field. These summary options are similar to functions that can be used in everyday worksheets, however with slight differences. Available summary options for **Values** include:

- Sum
- Count

- Average
- Max
- Min
- Product
- Count Numbers
- StdDev
- StdDevp
- Var
- Varp



You can switch between these summary options by following these steps:

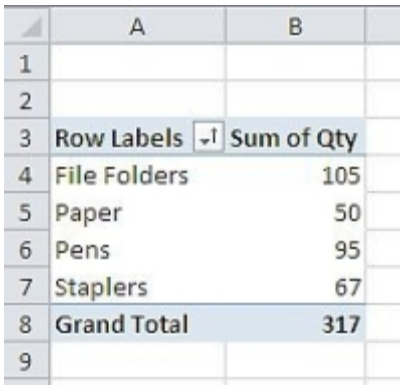
- Highlight any of the cells in the field placed in **Values**
- Make a right-click and select the option for settings for field values

- Select how you want your data to be calculated in the dialogue box that appears.

The Sum Summary Function

This function adds up all the data of the field placed in **Values.** Sum summary is similar to using the conventional **SUM** function in your worksheet. If fields containing numerical values are placed in the area for

Values, Excel automatically assigns the **Sum** summary to such field unless it is changed by the user. Empty cells and cells containing texts are usually ignored when using this summary option.



	A	B
1		
2		
3	Row Labels	Sum of Qty
4	File Folders	105
5	Paper	50
6	Pens	95
7	Staplers	67
8	Grand Total	317
9		

When you have more than one field in your area for **Values,** you can avoid the task of manually changing the summary option used in each field by using macros. The following code can be copied to a module in your workbook. You can launch the code module editor by pressing keys **Alt + F11.**

Sub SumAllValueFields() Dim pt As PivotTable Dim pf As PivotField Dim ws As Worksheet

Set ws = ActiveSheet

Set pt = ws.PivotTables(1) Application.ScreenUpdating = False

pt.ManualUpdate = True

For Each pf In pt.DataFields pf.Function = xlSum Next pf

pt.ManualUpdate = False

Application.ScreenUpdating = True Set pf = Nothing

Set pt = Nothing Set ws = Nothing

End Sub

The Count Summary Function

This summary function is chosen by default for pivot tables in Excel when fields containing texts are placed in **Values.** The **Count** summary function counts errors, texts, and also numbers. The function does not count empty cells and it follows the **COUNTA** function in regular worksheets. Take this data table as an example:

	A	B	C
1	ID	Product	Qty
2	6	File Folders	8
3	8	File Folders	97
4	1	Paper	20
5	4	Paper	10
6	9	Paper	20
7	3	Pens	
8	5	Pens	95
9	2	Staplers	42
10	7	Staplers	25
11			
12	Count	9	8
13			

The entry tells us the product **Pen** was ordered twice, but when the field **Qty** was placed in the area for **Values,** it displays a count of **1**, due to the presence of an empty cell for one of the **Pen** orders. This can be rectified by removing **Qty** from the area for **Values** and then placing the field **Product** in this component. Excel then counts the texts and gives an accurate count of **2.**

The Average Summary Function

	A	B
1		
2		
3	Row Labels	Average of Qty
4	File Folders	52.5
5	Paper	16.66666667
6	Pens	95
7	Staplers	33.5
8	Grand Total	39.625
9		

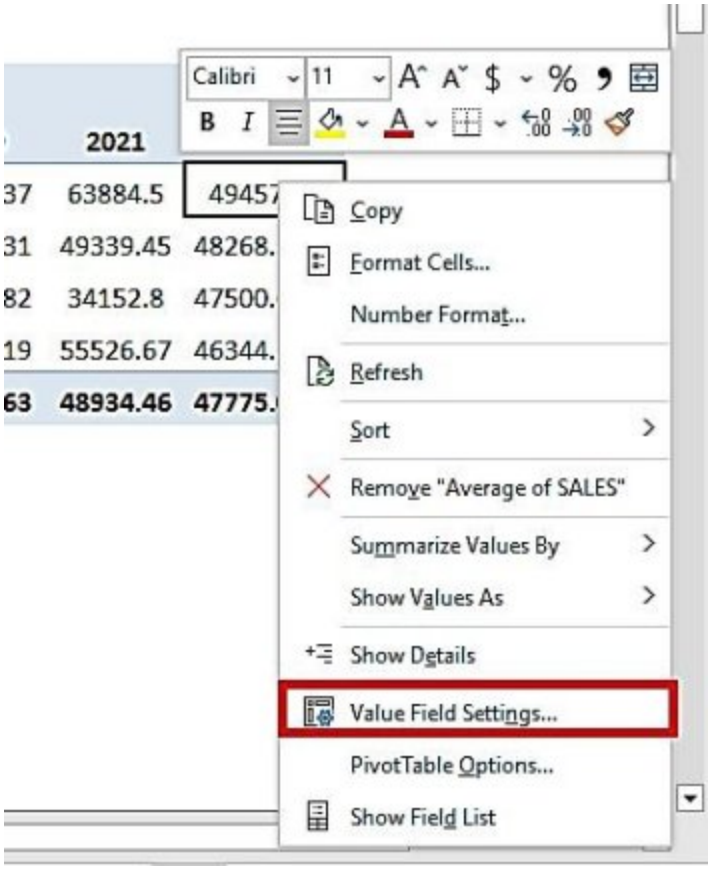
The **Average** option sums up all the data in the field placed in **Values** and divides this sum by the number of present data. This option is similar to the usual **AVERAGE** function used in worksheets. Empty cells and cells containing texts are not considered when this option is chosen.

The result given by the pivot table would require formatting so that every data correspond to equal decimal places.

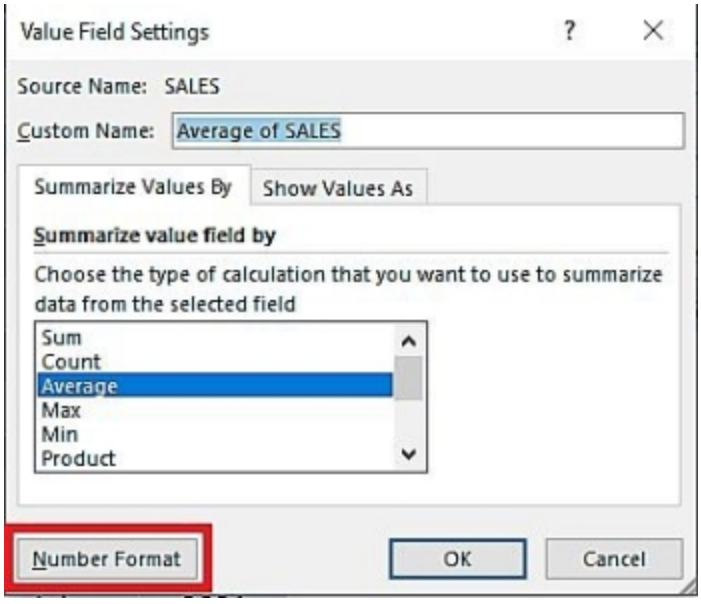
- Select and make a right-click on any of the cells in the area for

Values

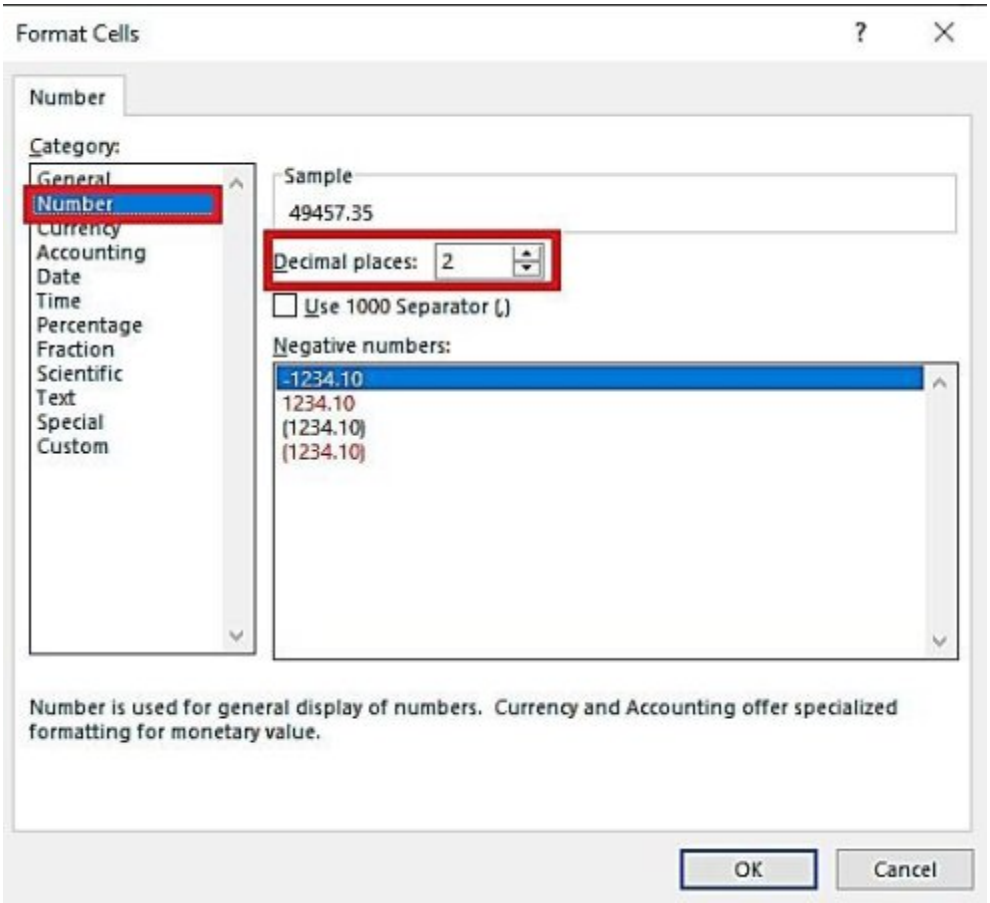
- Select the option to configure the settings of the field



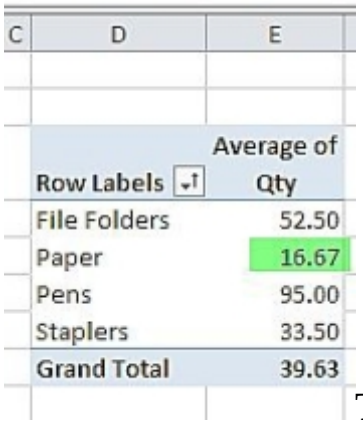
- In the resulting dialogue box, select the tab for formatting numbers



- In the dialogue box for formatting numbers that come up, make necessary adjustments



- Click on **OK**



Row Labels	Average of Qty
File Folders	52.50
Paper	16.67
Pens	95.00
Staplers	33.50
Grand Total	39.63

The pivot table then displays the **Average** values in uniform decimal places.

The Max Summary Option

The **Max** option gives the maximum data in the field placed in **Values.** It is similar to the **MAX** function used in worksheets. Blank cells are usually ignored when using this summary option.

The Min Summary Function

The **Min** option gives the maximum data in the field placed in **Values.** It is similar to the **MIN** function used in worksheets. Blank cells are usually ignored when using this summary option.

	A	B	C
1			
2			
3	Row Labels	Min of Qty	
4	File Folders	8	
5	Paper	10	
6	Pens	95	
7	Staplers	25	
8	Grand Total	8	
9			

The Product Summary Function

This summary function calculates the product of the values in the field placed in **Values.** It is similar to the **PRODUCT** function used in worksheets. Although the **Product** option finds less application when dealing with pivot tables extracted from a large table with large data, it requires a bit of cell formatting to enable Excel to accommodate the product results. Excel assigns the **Scientific number** format as default when dealing with such large numbers, this can however be changed to the **Number format.** Note that Excel would only display numbers up to a precision of the 15th significant number, after which zeros are displayed.

	A	B	C	E
1				
2				
3	Row Labels	Product of Qty		Product of Qty
4	File Folders	776		776
5	Paper	4000		4,000
6	Pens	95		95
7	Staplers	1050		1,050
8	Grand Total	3.09624E+11		309,624,000,000
9				
10				

The Count Numbers

Summary Function

This summary function counts all numbers present in the field placed in **Values.** Similar results are gotten when you use the **COUNT** function in your worksheet. Errors, empty cells, and texts are not considered in this summary function.

Difference between Count Numbers and Count

The data below shows the product and its ordered quantity. The highlighted cell has been formatted to **Text** and the column **Qty was** added twice to the area for **Values.** The result is shown below: Column B shows the result for **the Count Numbers** summary function and column C the result for the **Count** summary function. Column B shows a result of **2** for **Paper** because one of the data has

been formatted to text so the **Count Numbers** option ignores it. **Pen** shows a result of **1** because one of the data is an empty cell which is not counted. Column B however shows a result of **3** for **Paper** because it uses the **Count** summary function that considers numbers, as well as texts. **Pen** shows **1** just as **Count Numbers** because **Count** also ignores data with empty cells.

The StdDev and StdDevp Summary Function

The **StdDev** summary function calculates the standard deviation of all data present in the field placed in **Values.** Similar results are gotten when you use the **STDEV.S** function in your worksheet.

Standard deviation is the value by which data differ from the total average value of the present data. It is used when just a part of a distribution is being considered.

StdDevp, is also a measure of standard deviation, but it is used when the total distribution or population is being considered. Similar results are gotten when you use the **STDEV.P** function in your worksheet.

	A	B
1		
2		
3	Row Labels	StdDevp of Qty
4	File Folders	44.5000
5	Paper	4.7140
6	Pens	39.5000
7	Staplers	8.5000
8	Grand Total	32.8667

The Var and Varp Summary

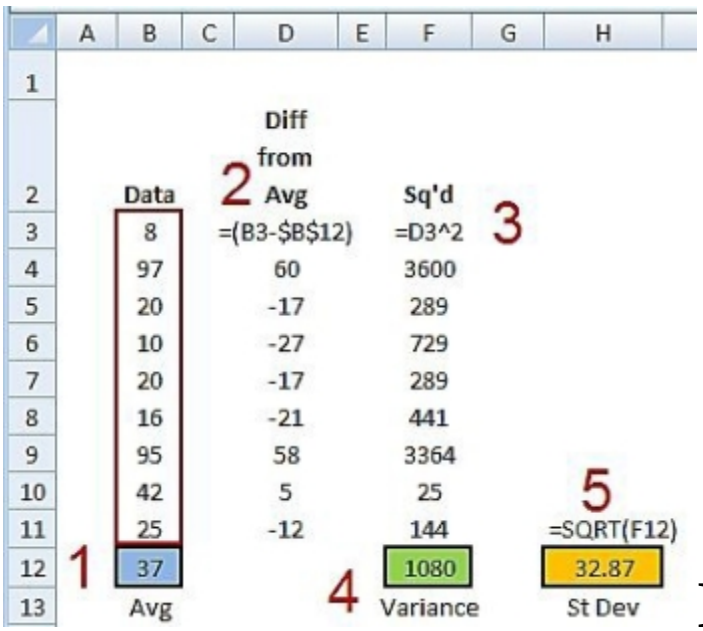
Function

The **Var** option calculates the variance of all data present in the field placed in **Values.** Similar results are gotten when you use the **VAR.S** function in your worksheet. It is used when just a part of a distribution is being considered.

Varp, is also a measure of variance, but it is used when the total distribution or population is being considered. Similar results are gotten when you use the **VAR.P** function in your worksheet. Follow these steps to manually calculate variance and standard deviation:

- Find the total average of all your present data
- Subtract each data from the calculated total average

- Find the square of the result gotten from step 2 and add them up This result is your variance
- Find the square root of the variance to get the standard deviation of your data



DRILLING DOWN

DATA IN PIVOT TABLES

Drilling down data in an Excel pivot table can be likened to peeling off layers of a hierarchy until the simplest data is obtained. Its a technique used for obtaining the list of data is made up of. Drilling down is not possible for simple data without numerous levels, i.e. data is made up of no other data. This process is made easier with **Quick Explore** which is available in the newer versions of Microsoft Excel. Follow these steps to drill down data in your pivot tables:

- Select any item present in a field on your pivot table

•

Select the icon for **Quick Explore** that comes up

- This opens up the **Explore** dialogue box.
- Select the item to be drilled and then click on the drilling down

option

- Excel then displays a list of data with which the selected item is made up of.

This process can be followed continuously until the needed data is obtained.

DRILLING UP DATA IN PIVOT TABLES

This process is in direct opposition to drilling down. Here, you choose a better-summarized version of a group of data. You can use the **Undo** option in the Quick Access menu or shortcut keys **Ctrl +**

Z. The **Quick Explore** menu can also be used following these steps:

- Select any item present in a field on your pivot table to be drilled up

- Select the icon for **Quick Explore** that comes up
- This opens up the **Explore** dialogue box.

•

Select the item to be drilled and then click on the drilling up option

- Excel then displays a summary of the list of data of the selected item.

This process can be followed continuously until the needed data is obtained.

INCLUDING MORE ROWS OR CATEGORIES IN YOUR PIVOT TABLES

You can add multiple fields to the **Rows, Values, Columns,** or **Filters** categories in your pivot tables. However, make sure you do not add numerous to prevent the pivot table from being complex.

Also, the order in which fields are added to each category affects how the pivot table is rendered. Follow these steps to include additional fields in your pivot table categories:

- Click on any cell in your pivot table to launch the **Field Pane for PivotTables.**

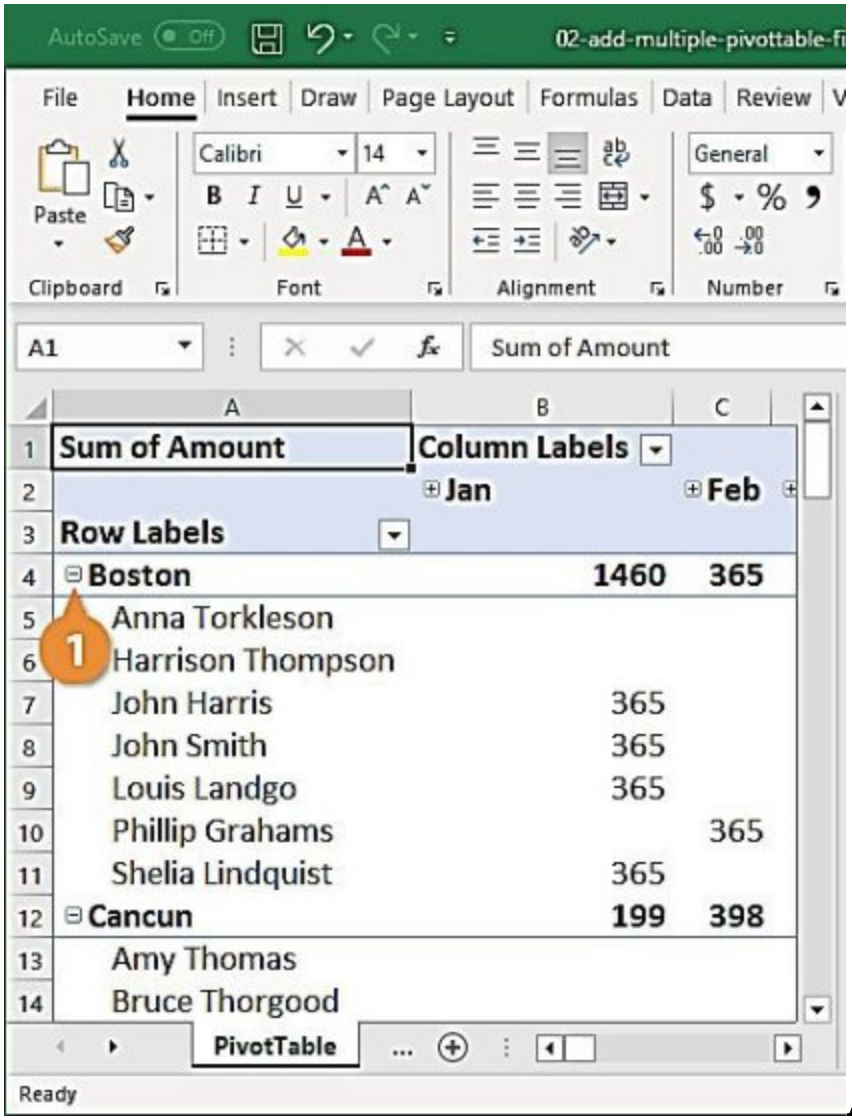
•

Select and drag any field to the **Columns** or **Rows** area.

The pivot table then gets updated according to the newly included fields in each category. A pivot table having both **Rows** and **Columns** fields is a **Two-dimensional** pivot table.

EXPANDING AND COLLAPSING A PIVOT TABLE HEADING

When you add multiple fields in the pivot table categories, Excel includes a collapsible and an expansion button at the top-level data with which you can decide how much of the data is to be displayed at a time. A click on this button collapses and expands the available data in the selected heading.



ADDING

BASIC CHARTS TO YOUR PIVOT TABLES

Pivot charts are used to graphically represent the data that can also be represented using pivot tables. While pivot tables may be cumbersome or difficult to understand due to the presence of numerous data, pivot charts give needed information at a simple glance. To create pivot charts:

- Highlight any cell in your usual worksheet table

•

Navigate to the **Insert** menu and select the option for **PivotCharts**

• Choose the range of the cells of your pivot table in the resulting dialogue box

•

Click on **Ok**

Excel then inserts a chart such as this to graphically summarize your table for easier visualization. Pivot charts can also be created from existing pivot tables following these steps:

- Highlight any cell in your pivot table
- Navigate to the **Tools for PivotTables** option and select **Analyze**
- Choose the option for **PivotCharts**
- Choose a chart option

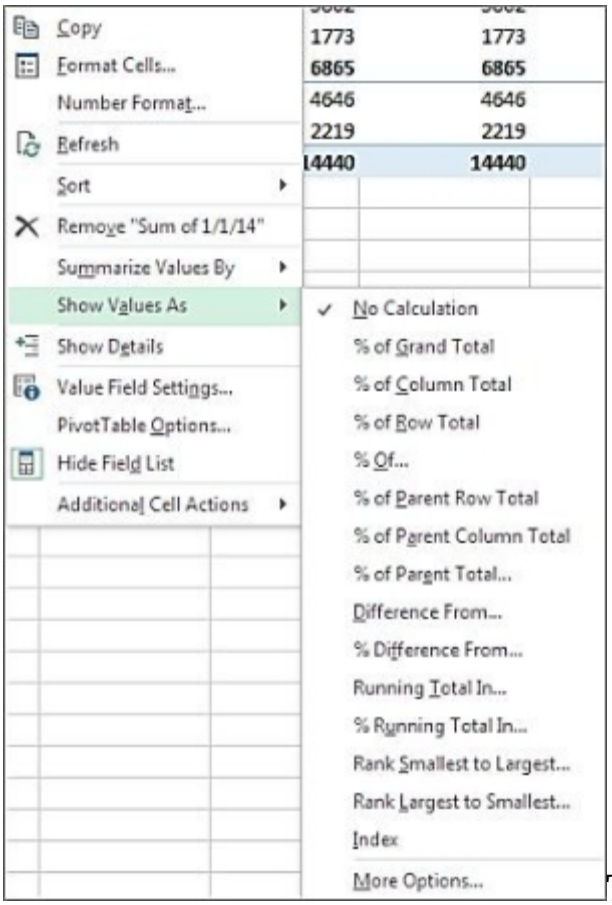
- Click on **Ok Summary**

Pivot tables give various options for how you summarize your data. Although Excel uses either the **Sum** or **Count** summary option by default, this can be changed following the steps explained in this chapter. If you also wish to obtain the simplest data an item is made up of, the drilling down technique can be used following the **Quick Explore** menu. This chapter also discussed how multiple fields can be added in pivot table categories to create two-dimensional pivot tables and how pivot charts can be included in your worksheet.

CHAPTER THREE

CONFIGURING PIVOT TABLES TO DISPLAY PERCENTAGES

Percentages can be displayed in Excel pivot tables using the **Show Value As** option which can be accessed by either making a right- click on a cell in the pivot table or using the **Settings for Field Values** dialogue box. The possible percentage calculations for pivot tables are as follows:

1. 

The Grand Total Percentage

This percentage shows the comparison of each data to the total data. The **Grand Total Percentage** can be obtained following these steps:

The example used contains the **Item** field in **Rows, Region** in **Column** area, and **Units** in the area for **Values.** To calculate the percentage of the sales in each region when compared to the **Grand Total** sales for every **Item:**

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Grand Total Percentage**

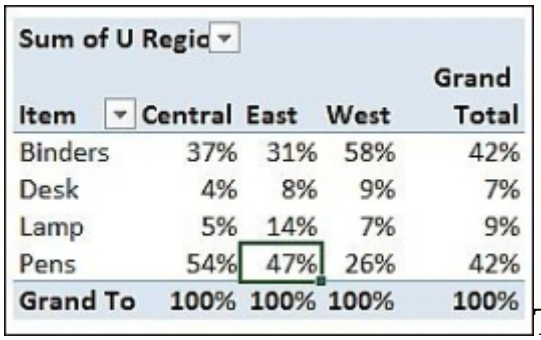
Sum of U Regio				
Item	Central	East	West	Grand Total
Binders	11%	10%	21%	42%
Desk	1%	3%	3%	7%
Lamp	2%	5%	2%	9%
Pens	17%	15%	10%	42%
Grand To	**31%**	**33%**	**37%**	**100%**

The pivot table fields changes to reflect the configuration.

1. Column Total Percentage

The example used contains the **Item** field in **Rows, Region** in **Column** area, and **Units** in the area for **Values.** The following steps describe how to configure pivot tables to display the percentage sales for every single item in each column for **Region:**

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Column Total Percentage**

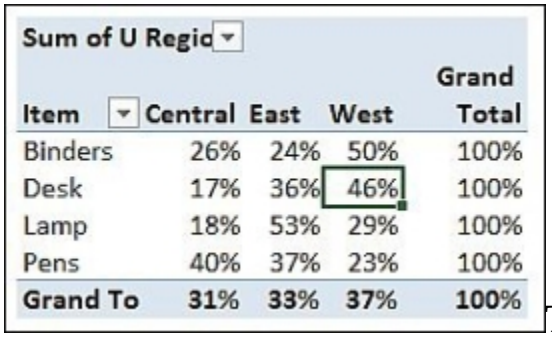


Sum of U Regio				
Item	Central	East	West	Grand Total
Binders	37%	31%	58%	42%
Desk	4%	8%	9%	7%
Lamp	5%	14%	7%	9%
Pens	54%	47%	26%	42%
Grand To	100%	100%	100%	100%

The pivot table fields changes to reflect the configuration.

1. **Row Total Percentage** The following steps describe how to configure pivot tables to display the percentage regional sales for items in a row**:**

   - Make a right-click on a cell in the **Units** field
   - Select the option for configuring how values are shown
   - Select the option for **Row Total Percentage**



Sum of U Regio				
Item	Central	East	West	Grand Total
Binders	26%	24%	50%	100%
Desk	17%	36%	46%	100%
Lamp	18%	53%	29%	100%
Pens	40%	37%	23%	100%
Grand To	31%	33%	37%	100%

The pivot table fields changes to reflect the configuration.

The example used contains the **Item** field in **Rows, Region** in **Column** area, and **Units** in the area for **Values.**

1. Percentage Of

This percentage calculation configuration allows you to compare every value to specific data. The example used contains the **Item** field in **Rows, Region** in **Column** area, and **Units** in the area for **Values.** Two applications of this percentage configuration are examined.

- **Regional Percentage**

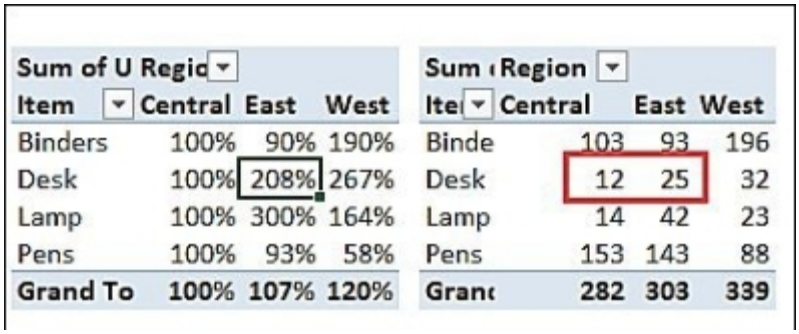
This percentage considers the comparison of the sales of each item in every region to the total sales of the item in the Central region.

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Percentage Of**

This launches a dialogue box where you decide how the pivot table calculates this percentage.

- Place **Region** in the **Field** bar and **Central** in the **Item** bar
- Select **OK**

The pivot table fields changes to reflect the configuration. For instance, the highlighted cells show sales of **12 pieces of furniture** in the **Central** region and sales of **25 pieces of furniture** in the **East.** When the percentage of the Eastern region is then calculated against the Central region, it was found to be **208%.**



Sum of U	Regio		
Item	Central	East	West
Binders	100%	90%	190%
Desk	100%	208%	267%
Lamp	100%	300%	164%
Pens	100%	93%	58%
Grand To	100%	107%	120%

Sum	Region		
Ite	Central	East	West
Binde	103	93	196
Desk	12	25	32
Lamp	14	42	23
Pens	153	143	88
Gran	282	303	339

- **Item Percentage**

This percentage considers the comparison of the sales of each item to the sales of **Blinders** in a similar region.

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Percentage Of**

This launches a dialogue box where you decide how the pivot table calculates this percentage.

- Place **Item** in the **Field** bar and **Blinders** in the **Item** bar
- Select **OK**

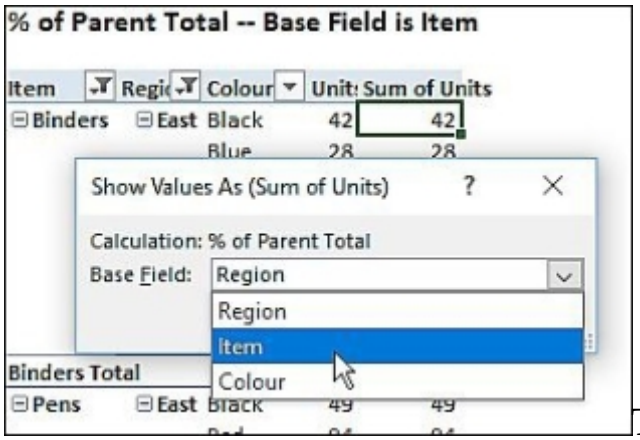
The pivot table fields changes to reflect the configuration.

1. Parent Percentage

- This option enables you to select a field basis for your calculation.
- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Parent Percentage**

This launches a dialogue box where you decide how the pivot table calculates this percentage.

- Choose a field base from the drop-down list
- Select **OK**



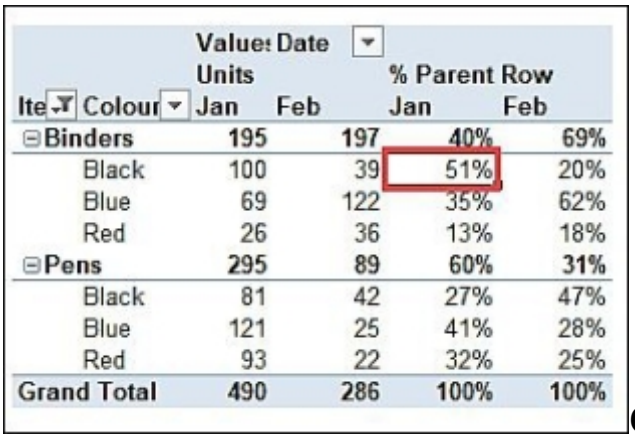
The pivot table fields changes to reflect the configuration.

1. **Row Parent Percentage**

The example used contains the **Color** field in **Rows, Month** in **Column** area, and **Units** in the area for **Values.** This percentage option is used when the field representing the parent is placed in the **Rows** category.

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Row Parent Percentage**

The pivot table fields changes to reflect the configuration. The number of sales of **Binders** in **January** was **195**, out of which **51%** were **Black**.

1. 

Ite	Colour	Values: Units Jan	Date Feb	% Parent Row Jan	Feb
⊟Binders		195	197	40%	69%
	Black	100	39	51%	20%
	Blue	69	122	35%	62%
	Red	26	36	13%	18%
⊟Pens		295	89	60%	31%
	Black	81	42	27%	47%
	Blue	121	25	41%	28%
	Red	93	22	32%	25%
Grand Total		490	286	100%	100%

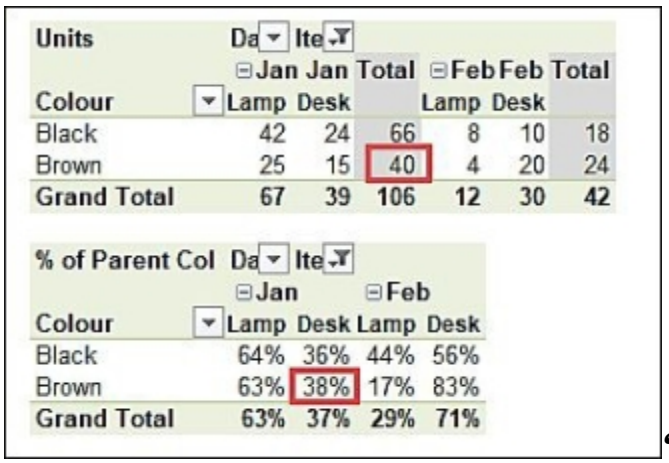
Column Parent Percentage

This percentage option is used when the field representing the parent is placed in the **Columns** category. The example used contains the

Color field in **Rows, Month** in **Column** area, and **Units** in the area for **Values.**

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Column Parent Percentage**

The pivot table fields changes to reflect the configuration. The number of **Brown** items sold in **January** was **40**, out of which **38%** were **Desks**.

1. 

Units	Da	Ite				
	Jan	Jan	Total	Feb	Feb	Total
Colour	Lamp	Desk		Lamp	Desk	
Black	42	24	66	8	10	18
Brown	25	15	40	4	20	24
Grand Total	67	39	106	12	30	42

% of Parent Col	Da	Ite		
	Jan		Feb	
Colour	Lamp	Desk	Lamp	Desk
Black	64%	36%	44%	56%
Brown	63%	38%	17%	83%
Grand Total	63%	37%	29%	71%

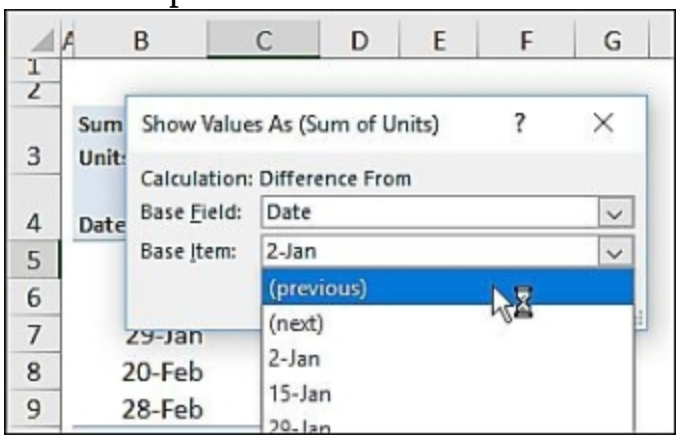
“Difference From” in Pivot Tables

This calculation is used for subtracting a value from another.

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Difference From**

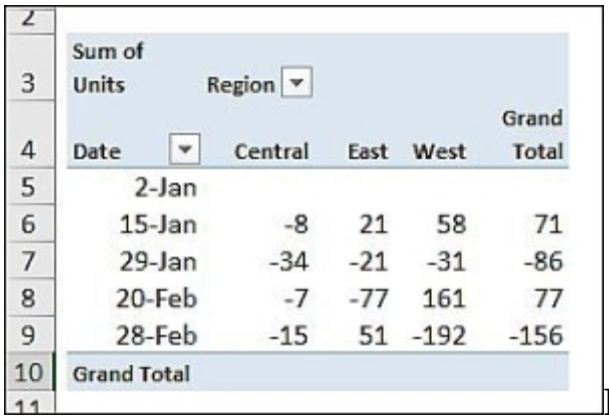
This launches a dialogue box where you decide how the pivot table calculates this result.

- Place **Date** in the **Field** bar and select **(previous)** in the **Item** bar. This means the pivot table would subtract individual sales of the week from the sales of the previous week.



- Select **OK**

The pivot table fields changes to reflect the configuration.

1. 

Sum of Units	Region			
Date	Central	East	West	Grand Total
2-Jan				
15-Jan	-8	21	58	71
29-Jan	-34	-21	-31	-86
20-Feb	-7	-77	161	77
28-Feb	-15	51	-192	-156
Grand Total				

Percentage Difference From

This example has the **Item** field in **Rows, Date** in **Column** area with respect to Year, and **Total** in the area for **Values.** The steps below calculate the percentage of the sales of the present year when compared to the sales of the previous year.

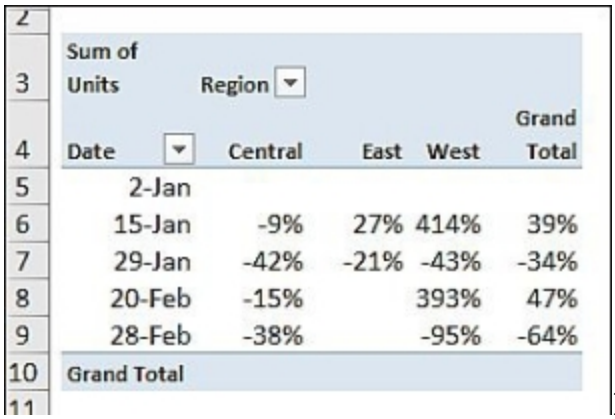
- Make a right-click on a cell in the **Total** field
- Select the option for the **Settings of Fields**

In the resulting dialogue box, enter a suitable name for the calculation field

- Select **Percentage Difference From** in the drop-down list for how data is shown

- Place **Year** in the **Field** bar and select **(previous)** in the **Item** bar.
- Select **OK**

The pivot table fields changes to reflect the configuration.



Sum of Units	Region			
Date	Central	East	West	Grand Total
2-Jan				
15-Jan	-9%	27%	414%	39%
29-Jan	-42%	-21%	-43%	-34%
20-Feb	-15%		393%	47%
28-Feb	-38%		-95%	-64%
Grand Total				

10. Running Total In This calculates the running total for every region with respect to dates. This example has the **Date** field in **Rows, Region** in **Column** area with respect to Year, and **Units** in the area for **Values.**

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Running Total In**

This launches a dialogue box where you decide how the pivot table calculates this result.

- Place **Date** in the **Field** bar and select **OK**

The pivot table fields changes to reflect the configuration.

3	Sum of Units	Region			
4	Date	Central	East	West	Grand Total
5	2-Jan	89	77	14	180
6	15-Jan	170	175	86	431
7	29-Jan	217	252	127	596
8	20-Feb	257	252	329	838
9	28-Feb	282	303	339	924

11. Percentage Running Total In

This calculates the division of the present amount for the **Running Total** by the **Grand Total.**

- Make a right-click on a cell in the **Units** field
- Select the option for configuring how values are shown
- Select the option for **Percentage Running Total In**

This launches a dialogue box where you decide how the pivot table calculates this result.

- Place **Date** in the **Field** bar and select **OK**

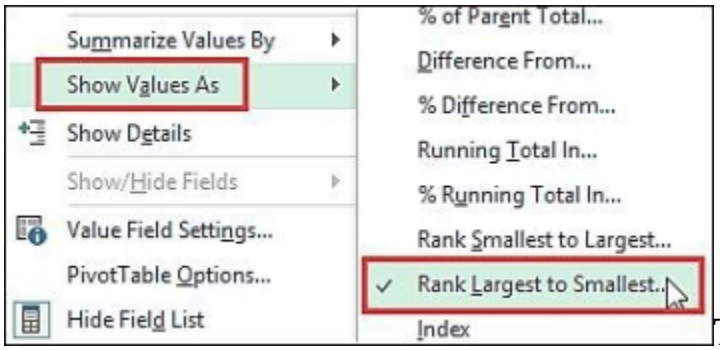
The pivot table fields changes to reflect the configuration.

	A	B	C	D	E	F
3		Sum of Units	Region			
4		Date	Central	East	West	Grand Total
5		2-Jan	32%	25%	4%	19%
6		15-Jan	60%	58%	25%	47%
7		29-Jan	77%	83%	37%	65%
8		20-Feb	91%	83%	97%	91%
9		28-Feb	100%	100%	100%	100%

12. Rank

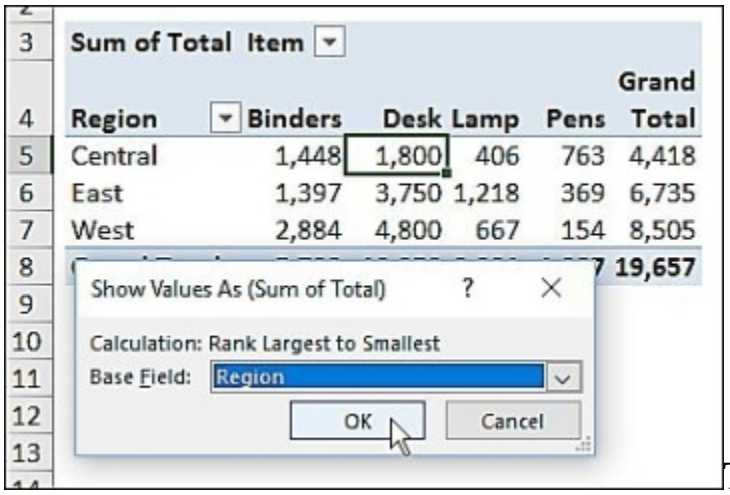
This option arranges data from highest to smallest or vice versa.

- Make a right-click on any cell in the field to be ranked
- Select the option for configuring how values are shown
- Select any of the ranking options as needed

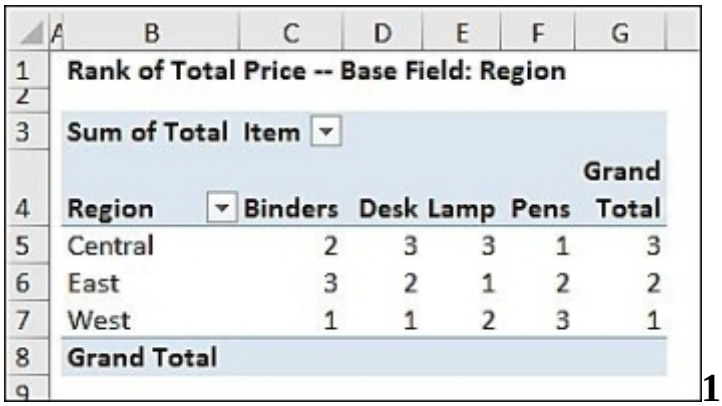


This launches a dialogue box where you decide how the pivot table calculates this result.

- Place **Region** in the **Field** bar and select **OK**



The pivot table fields changes to reflect the configuration.

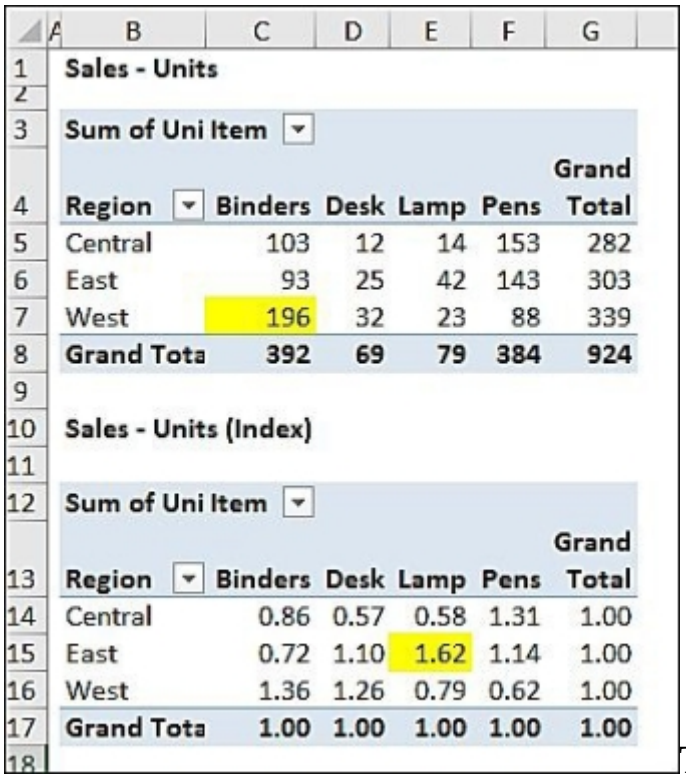


	A	B	C	D	E	F	G
1		Rank of Total Price -- Base Field: Region					
2							
3		Sum of Total	Item				
4		Region	Binders	Desk	Lamp	Pens	Grand Total
5		Central	2	3	3	1	3
6		East	3	2	1	2	2
7		West	1	1	2	3	1
8		Grand Total					
9							

13. Index

This calculates the weight of a cell in comparison to the total row, column, and Grand Total. It is not the same as the percentage of grand total. The index shows the effect each item has with respect to its row and column.

- Make a right-click on any cell in the area for **Values**
- Select the option for configuring how values are shown
- Select the **Index** option



Sales - Units

Sum of Uni Item					
Region	Binders	Desk	Lamp	Pens	Grand Total
Central	103	12	14	153	282
East	93	25	42	143	303
West	196	32	23	88	339
Grand Tota	392	69	79	384	924

Sales - Units (Index)

Sum of Uni Item					
Region	Binders	Desk	Lamp	Pens	Grand Total
Central	0.86	0.57	0.58	1.31	1.00
East	0.72	1.10	1.62	1.14	1.00
West	1.36	1.26	0.79	0.62	1.00
Grand Tota	1.00	1.00	1.00	1.00	1.00

The pivot table fields changes to reflect the configuration.

The following key points are to be noted when dealing with the **Index:**

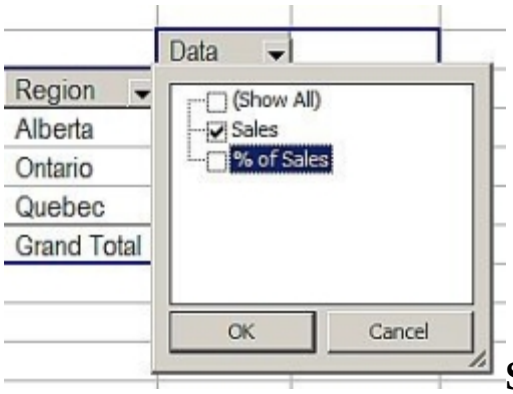
- If every value in the row and column is of equal and similar importance, all the values would have an index value of **1.**
- If an item has an index below **1,** it is then of low importance in that row and column when compared to other present items
- If an item has an index above **1,** it is then of higher importance in that row and column when compared to other present items.

The formula for manually calculating **Index** is as follows: **Index = (Value of Item in the Cell * Grand Total of Rows and Columns) / (Grand Total of Rows * Grand Total of Columns)**

REMOVAL OF CUSTOM CALCULATIONS IN PIVOT TABLES

- Select the drop-down icon in the field for **Data**

- Deselect any of the selected fields to remove them from the custom calculation.



Summary

Percentages are displayed in pivot tables using the option to configure how values are shown. Many percentage calculations are possible in Excel pivot tables which were explained and described in this chapter, alongside how they can be implemented and also removed.

CHAPTER FOUR

CONFIGURING PIVOT TABLES TO DISPLAY AVERAGES

After setting up your pivot table:

- Select and make a right-click on any of the cells in the area for

Values

- Select the option to configure how your values are summarized

•

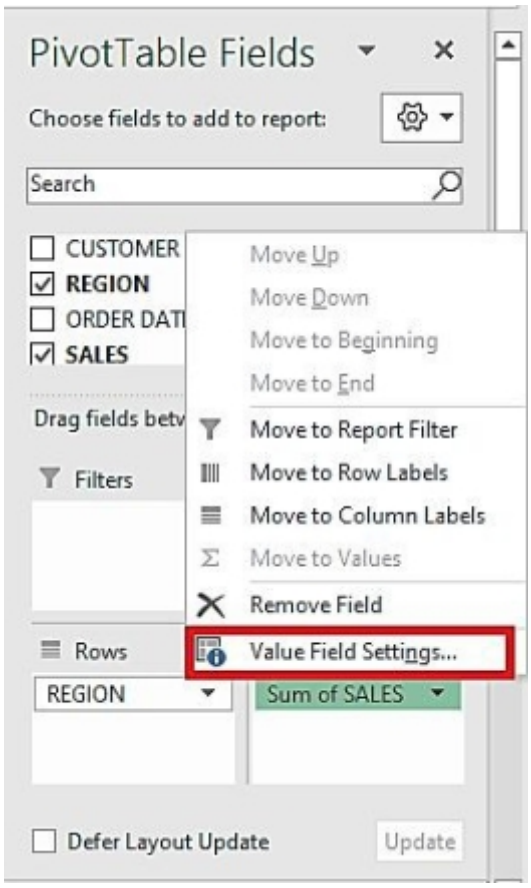
Select the option for **Average**

An alternative procedure is as follows:

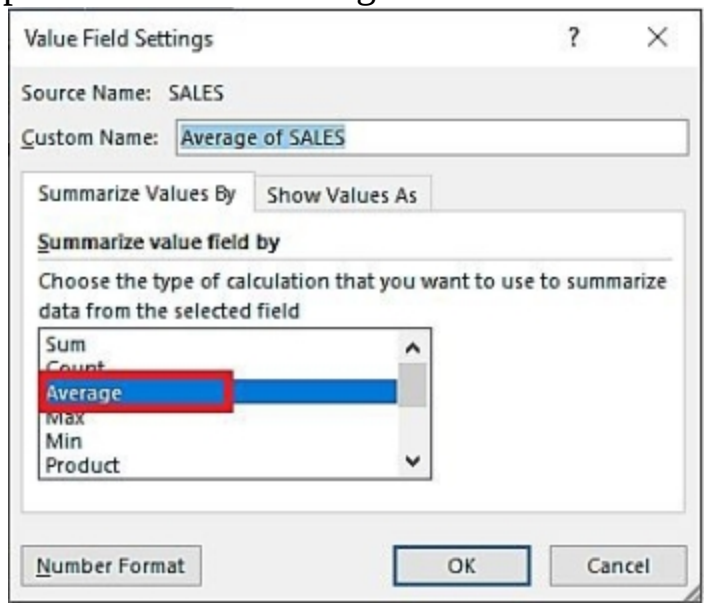
- Click on the drop-down icon beside the field placed in the area for

Values

- Select the option to configure settings for the field



- In the resulting dialogue box, select **Average** from the list of available options for summarizing values



- Click on **OK**

The result given by the pivot table would require formatting so that every data correspond to equal decimal places.

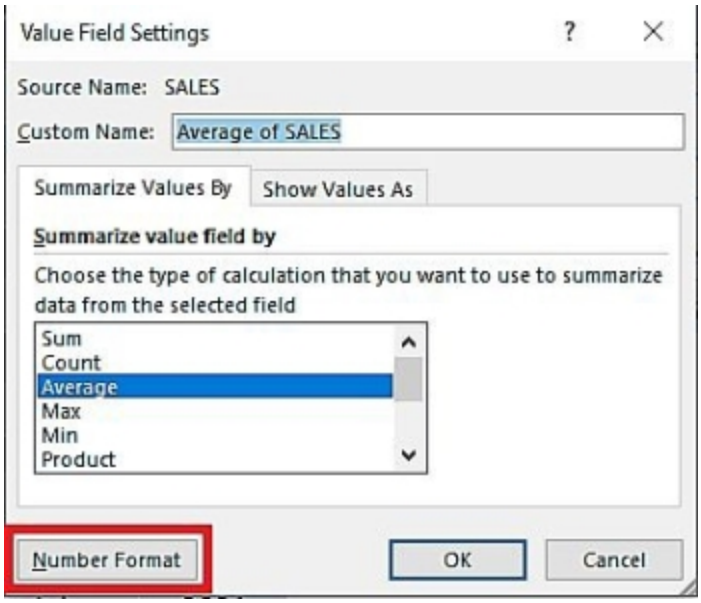
- Select and make a right-click on any of the cells in the area for

Values

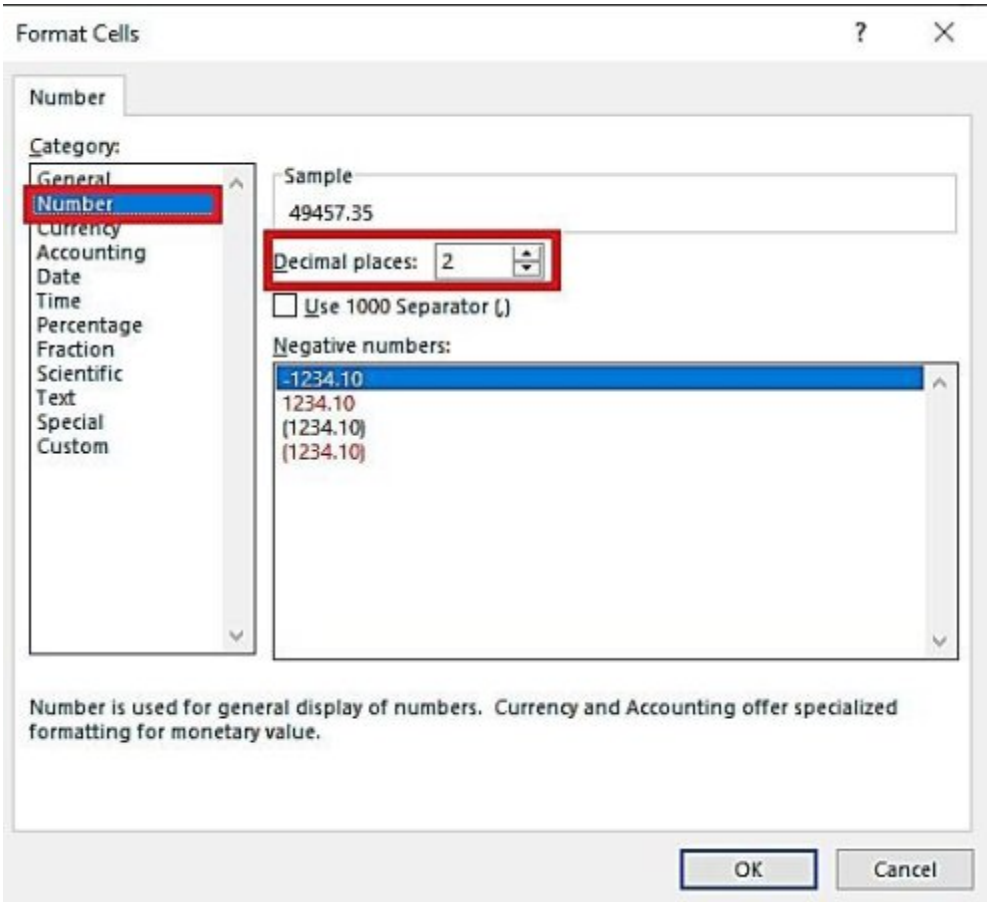
•

Select the option to configure the settings of the field

• In the resulting dialogue box, select the tab for formatting numbers



• In the dialogue box for formatting numbers that come up, make necessary adjustments



- Click on **OK**

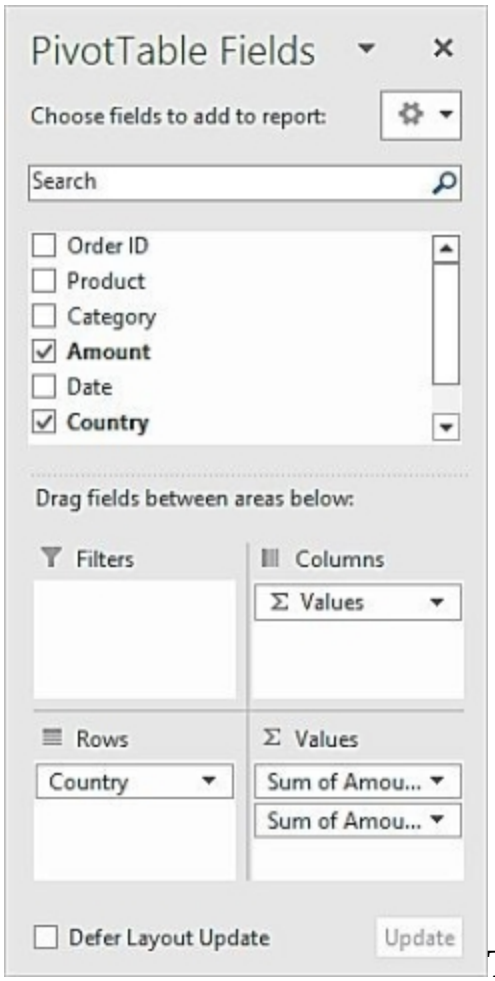
The pivot table then displays the **Average** values in uniform decimal places.

Average of SALES olumn La				
Row Labels	**2020**	**2019**	**2021**	**Grand Total**
NORTH	47177.68	50218.37	63884.50	49457.35
SOUTH	48921.98	44848.31	49339.45	48268.39
WEST	47309.88	51796.82	34152.80	47500.65
EAST	44638.40	47165.19	55526.67	46344.18
Grand Total	**47107.30**	**48805.63**	**48934.46**	**47775.02**

CREATING MULTIPLE FIELDS IN THE VALUE AREA

- First, create a data entry and select the option for inserting pivot tables
  For this example:

  - Drag the field, **Country** to the area for **Rows**
  - Drag the field, **Amount** to the area for **Values** twice



The resulting pivot table is as follows:

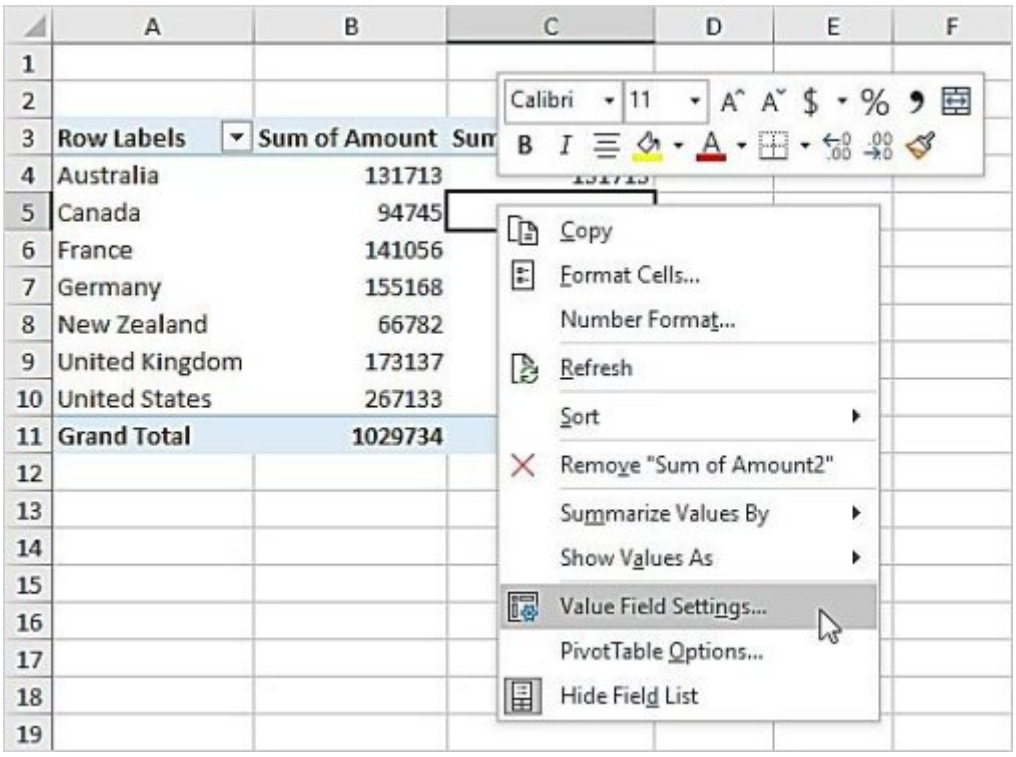
	A	B	C	D
1				
2				
3	**Row Labels**	**Sum of Amount**	**Sum of Amount2**	
4	Australia	131713	131713	
5	Canada	94745	94745	
6	France	141056	141056	
7	Germany	155168	155168	
8	New Zealand	66782	66782	
9	United Kingdom	173137	173137	
10	United States	267133	267133	
11	**Grand Total**	**1029734**	**1029734**	
12				

To configure the second column for **Amount** to show **Percentages** and not to just be a duplicate of the preceding column:

- Select and make a right-click on any cell in this second column for

Amount Sum

- Select the option to configure the settings of the field



• Change the name of the column in the **Name** bar to an appropriate label such as **Percentage**

• Select the tab to configure how values are shown

•

Select the option for **Grand Total Percentage**

• Click on **OK**

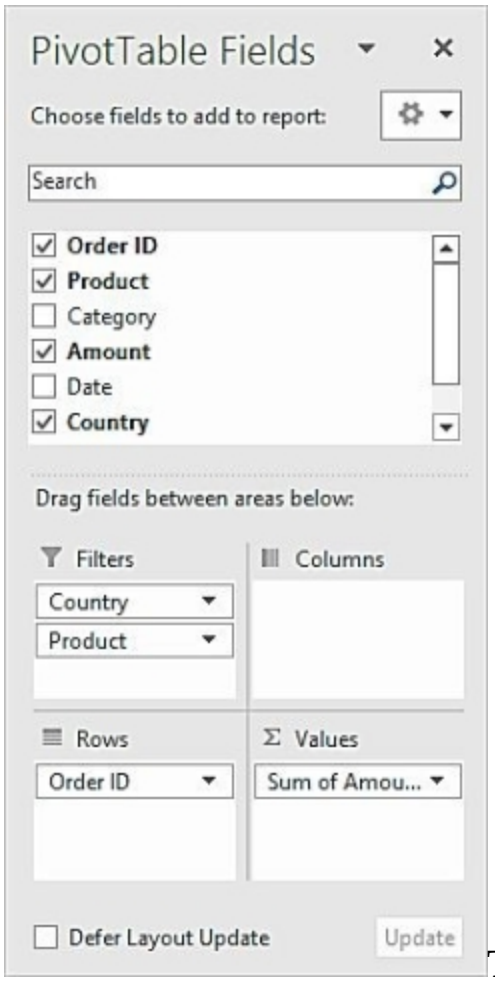
The resulting pivot table is as follows:

	A	B	C	D
1				
2				
3	Row Labels	Sum of Amount	Percentage	
4	Australia	131713	12.79%	
5	Canada	94745	9.20%	
6	France	141056	13.70%	
7	Germany	155168	15.07%	
8	New Zealand	66782	6.49%	
9	United Kingdom	173137	16.81%	
10	United States	267133	25.94%	
11	Grand Total	1029734	100.00%	
12				

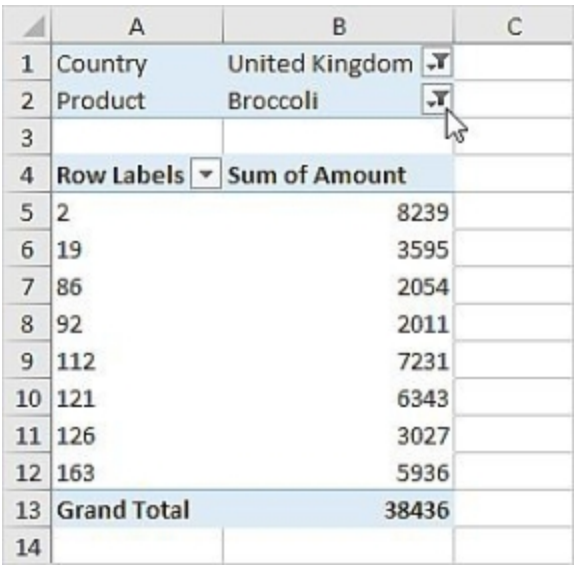
CREATING MULTIPLE FIELDS IN THE FILTERS AREA

- First, create a data entry and select the option for inserting pivot tables
  For this example:

  - Drag the field, **ID for Orders** to the area for **Rows**
  - Drag the field, **Amount** to the area for **Values**
  - Drag the fields **Product** and **Country** to the area for **Filters**



The resulting pivot table is as follows:



	A	B	C
1	Country	United Kingdom	
2	Product	Broccoli	
3			
4	Row Labels	Sum of Amount	
5	2	8239	
6	19	3595	
7	86	2054	
8	92	2011	
9	112	7231	
10	121	6343	
11	126	3027	
12	163	5936	
13	Grand Total	38436	
14			

- Use the filter icon present beside these fields to control what is displayed on your pivot table

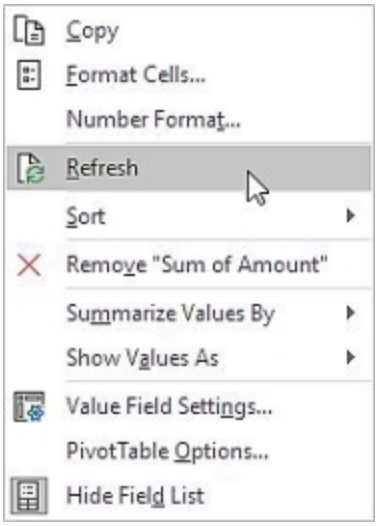
UPDATING PIVOT TABLES

Pivot tables require an update or a refresh because changes are not being reflected as you update the data in the source table. When you make changes in your source data, there are two options to be chosen from to make Excel update your pivot tables accordingly:

1. Refreshing the pivot table
2. Changing your source data

REFRESHING THE PIVOT TABLE

- Select any cell in the pivot table and make a right-click
- Select the **Refresh** option

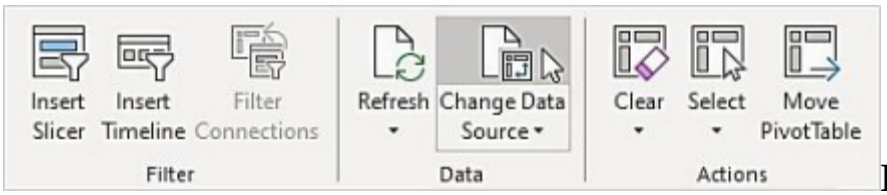


Excel then updates your pivot table to reflect the data changes.

CHANGING YOUR SOURCE DATA

- Select any cell in the pivot table

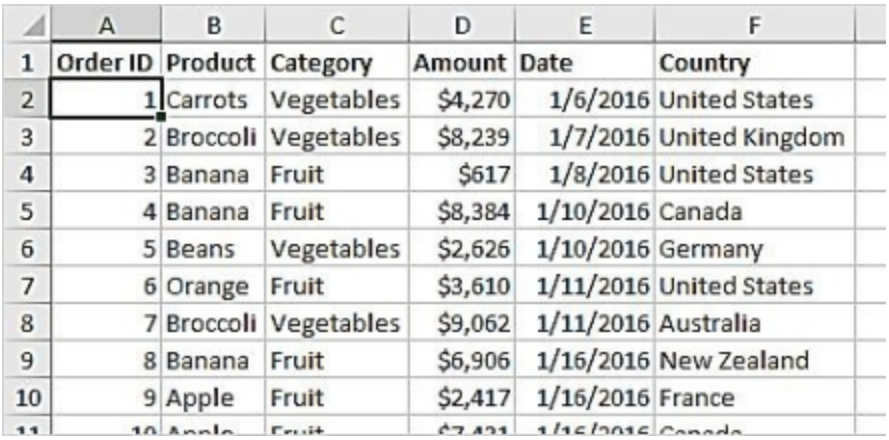
• Navigate to the **Analyze** menu and select the option for changing the pivot table source data.



Excel then updates your pivot table to reflect the data changes.

CREATING FREQUENCY DISTRIBUTION WITH EXCEL PIVOT TABLES

- First, create a data entry such as shown below:

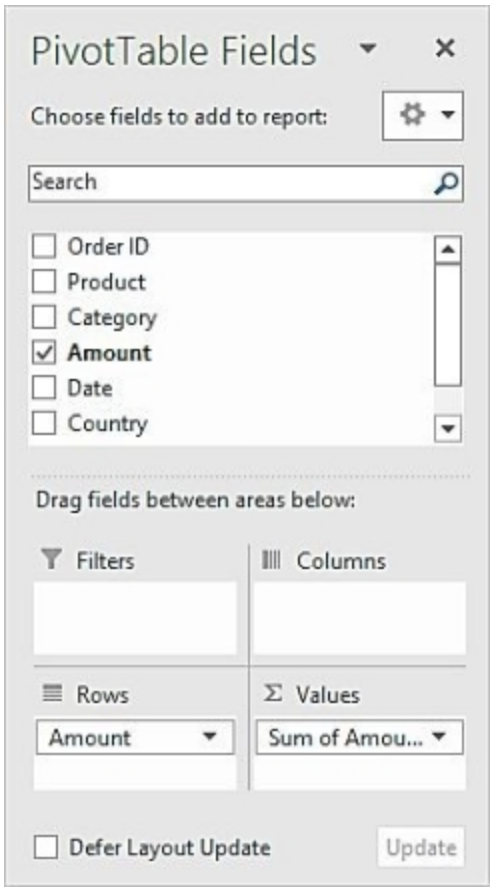


	A	B	C	D	E	F
1	Order ID	Product	Category	Amount	Date	Country
2	1	Carrots	Vegetables	$4,270	1/6/2016	United States
3	2	Broccoli	Vegetables	$8,239	1/7/2016	United Kingdom
4	3	Banana	Fruit	$617	1/8/2016	United States
5	4	Banana	Fruit	$8,384	1/10/2016	Canada
6	5	Beans	Vegetables	$2,626	1/10/2016	Germany
7	6	Orange	Fruit	$3,610	1/11/2016	United States
8	7	Broccoli	Vegetables	$9,062	1/11/2016	Australia
9	8	Banana	Fruit	$6,906	1/16/2016	New Zealand
10	9	Apple	Fruit	$2,417	1/16/2016	France

- Select the option for inserting pivot tables For this example:

  - Drag the field, **Amount** to the area for **Rows**
  - Drag the field, **Amount,** or another desired field to the area for

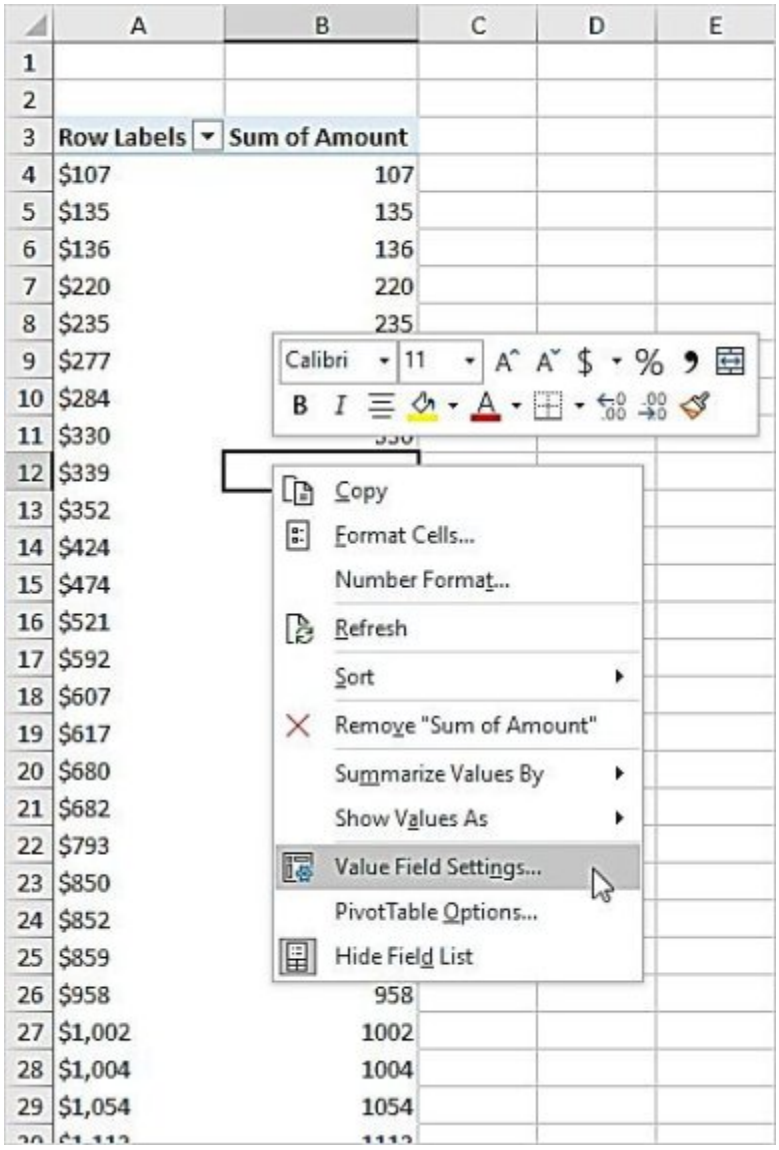
  Values



- Select and make a right-click on any cell in the column for

Amount Sum

- Select the option to configure the settings of the field

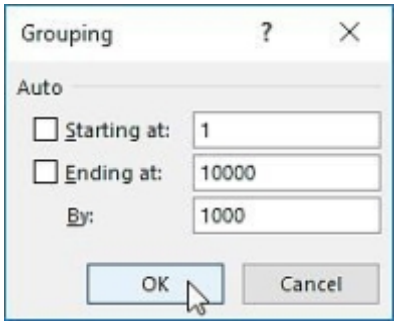


- Select **Count** as the summarizing function for your data

• Click on **OK**
• Select and make a right-click on any cell in the column for **Label**

•

Select the option for **Group**
• In the **Grouping** dialogue box, configure the following:
- The **Starting** bar is set to **1**
- The **Ending** bar is set to **10000**
- The **By** bar is set to **1000**



Note that these bars can hold any value of your choice

- Click on **OK**

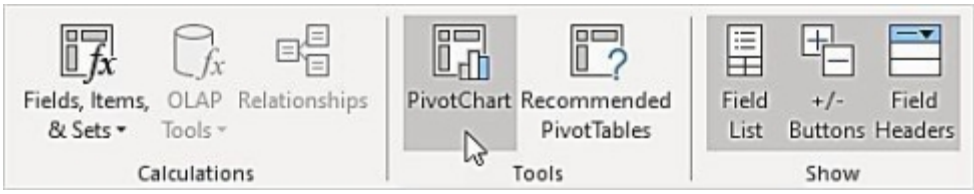
A frequency distribution table is created as shown below:

	A	B	C
1			
2			
3	Row Labels	Count of Amount	
4	1-1000	23	
5	1001-2000	19	
6	2001-3000	22	
7	3001-4000	19	
8	4001-5000	27	
9	5001-6000	25	
10	6001-7000	17	
11	7001-8000	26	
12	8001-9000	23	
13	9001-10000	12	
14	Grand Total	213	
15			

A chart can be inserted to better visualize this distribution for comparison:

- Highlight any cell in the pivot table

- Navigate to the **Analyze** menu and select the **PivotChart** option from the **Tools** section



- Click on **OK** in the resulting dialogue box The resulting chart is shown below:


Count of Amount
Sales Amount Distribution
30
25
20
15
10
5
0
1-1000
1001-2000
2001-3000
3001-4000
4001-5000
5001-6000
6001-7000
7001-8000
8001-9000
9001-10000
Amount

Summary

Fields in pivot tables can be configured to display averages in place of the total sum. Using the pane for configuring settings for fields or the dialogue box for configuring how your values are summarized can both be used. Pivot tables also require a refresh or an update when a change is made in its source data. This chapter further explained how you can add multiple fields in the **Filters** area, the area for **Values,** alongside how to create a frequency distribution table with pivot tables and also include a corresponding PivotChart.

CHAPTER FIVE

EXCEL PIVOT TABLE SLICERS AND COMPLEX FILTERING

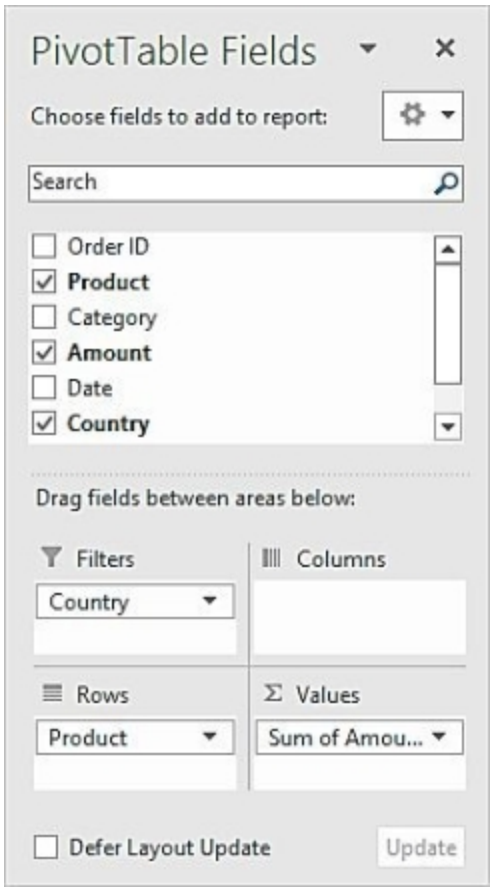
Slicers enable easy and quick filtering of pivot tables. They show all available values from a specific column in your table, with each of these values shown as distinct buttons in the slicer pane. Various slicers can also be connected to numerous pivot tables to get better analysis results. Follow these steps to add slicers to your pivot tables:

•

Create a pivot table such as shown below:

The pivot table was created as follows:

- The field **Product** was dragged to the area for **Rows**
- The field **Amount** was dragged to the area for **Values**
- The field **Country** was dragged to the area for **Filters**



- Insert a pivot table slicer following these steps:
- Select a cell in the pivot table

- Navigate to the **Analyze** menu and select the option for **Inserting a Slicer** from the **Tools** section

- Select any box from the available options in the resulting dialogue box. Here, we choose **Country**

- Select the **OK** button

- Choose any of the available **Country** shown to enable the pivot table to display the most exported product to the chosen **Country**

To insert a second slicer:

- Select a cell in the pivot table

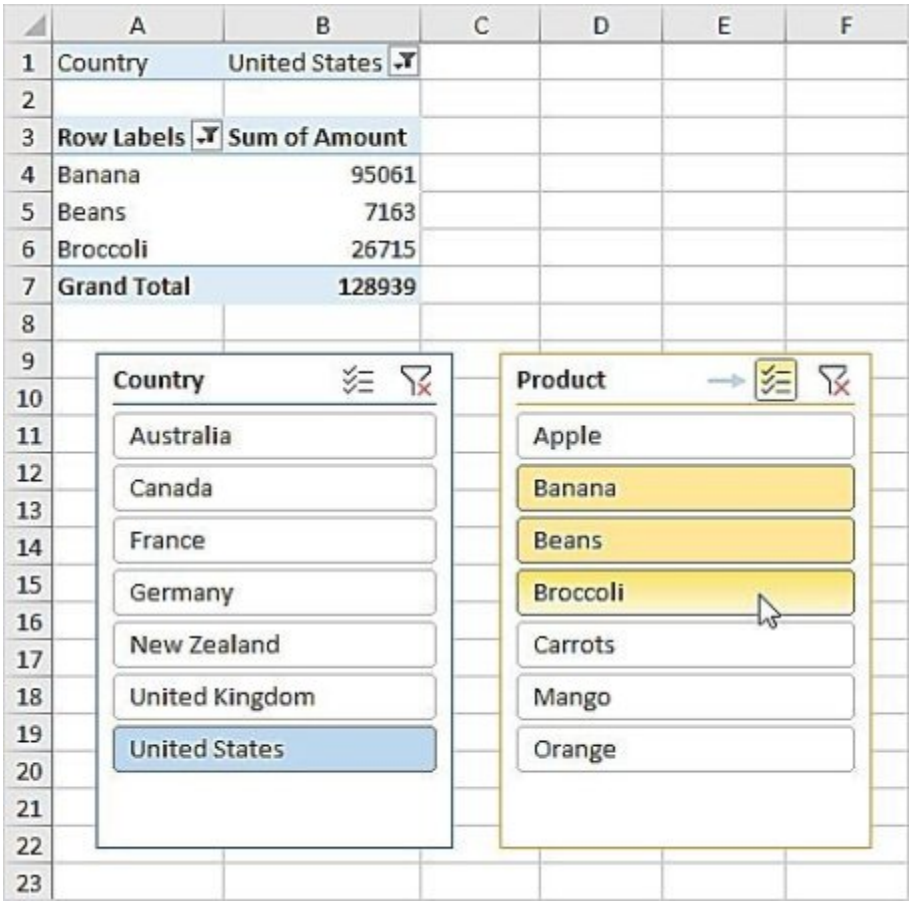
- Navigate to the **Analyze** menu and select the option for **Inserting a Slicer** from the **Tools** section

- Select any box from the available options in the resulting dialogue box. Here, we choose **Product**

- Select the **OK** button

- Navigate to the **Options** menu and select a **Style** for your slicers in the **Group for Slicer Styles** to differentiate the slicers

The result is shown below:



• In the newly added **Product** slicer, click on the icon for selecting multiple options at the top of the slicer pane

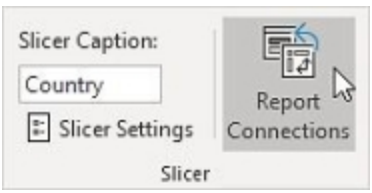
• Highlight multiple options for **Product**

• Holding down the **Ctrl** key and selecting multiple **Product** options can be used in place of clicking the icon for selecting multiple options (Multi-select)

Connecting Slicers to another Pivot Table

• From the previously inserted slicers, highlight the first slicer, i.e. the **Country** slicer

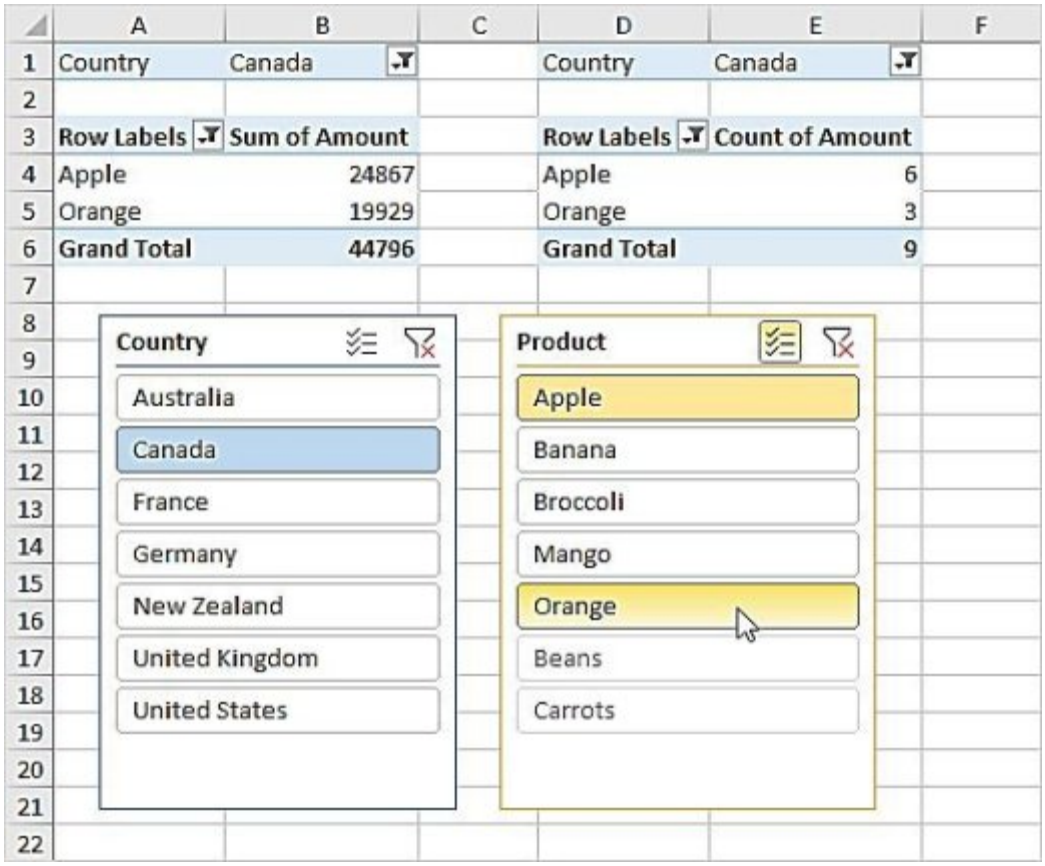
• Navigate to the **Options** menu and select the option for **Report**ing **Connections** from the **Slicers** section



•

Select the box for the other pivot table in the resulting dialogue box

- Select **OK**
- Repeat these steps for the **Product** slicer
- Use the two slicers on both pivot tables



Slicer filters can be cleared using the filter icon at the top of the slicer pane

Differences between Slicers and Filters

1. Slicers are dynamic and can be changed from their visible pane, unlike filters that require editing the settings of the fields of your pivot table.
2. Slicers are not fixed to a cell, they can be changed and moved as desired. Filters are however fixed to a cell. 3. Filters cannot be connected to numerous pivot tables, unlike slicers that support this feature.

1. Filters are easily automated and manipulated with VBA modules with simple codes. Slicers on the other hand require advanced codes to be manipulated.

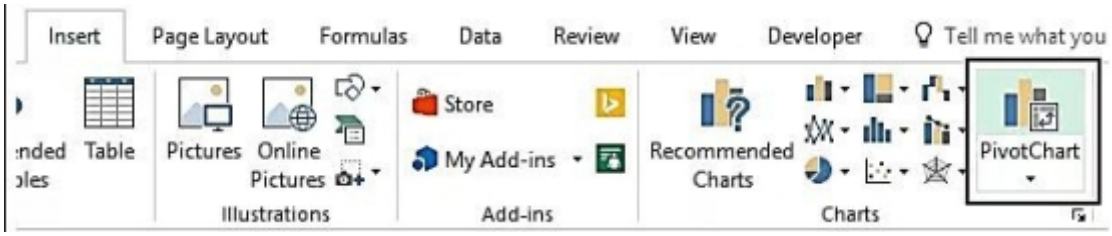
CREATING PIVOT CHARTS THAT ARE DYNAMIC WITH SLICERS

Dynamic pivot charts enable you to select the particular chart to be displayed from a single chart. This chart, though shown as one, can be made to show different charts by selecting available chart option buttons.

Follow these steps to create dynamic pivot charts with slicers:

- Highlight a cell in the pivot chart and navigate to the **Options**

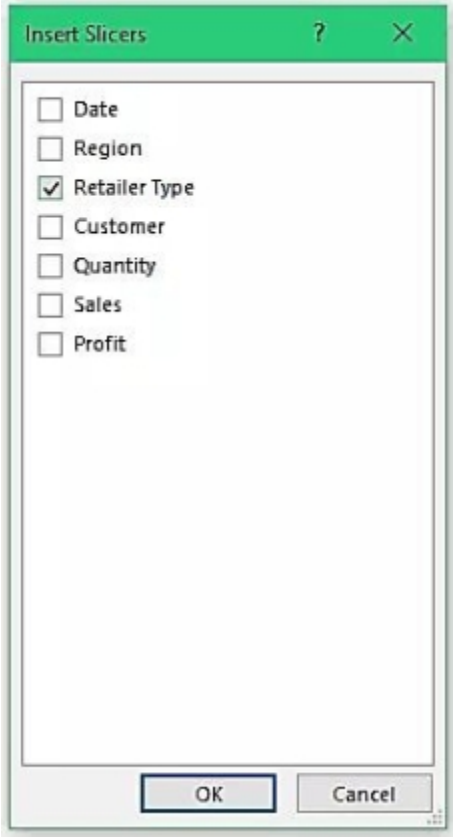
menu to insert a **PivotChart** from the **Charts** section



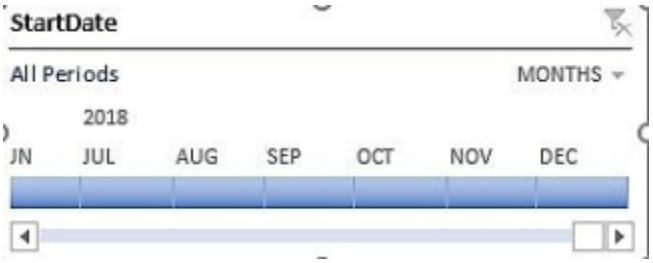
- Enter the cell range for your pivot chart in the resulting dialogue box. Also select for the chart to be created in a new worksheet

- Go to the **Insert** menu and select the option for **Slicers**

- Select any desired dimension or item for your slicer



- Configure the chart to add colors and styles as needed



TIMELINE SLICERS

These add a graphical visualization when you use them. Timelines are mostly used with date-related fields. They make it easy to filter data by a range of days, months, years, quarters, etc. These dates are shown represented with a horizontal bar spanning from previous dates to current dates. To insert timelines in your pivot tables:

- Highlight the pivot table to which the timeline would be added
- Go to the tab for **Analyzing Pivot Tables**

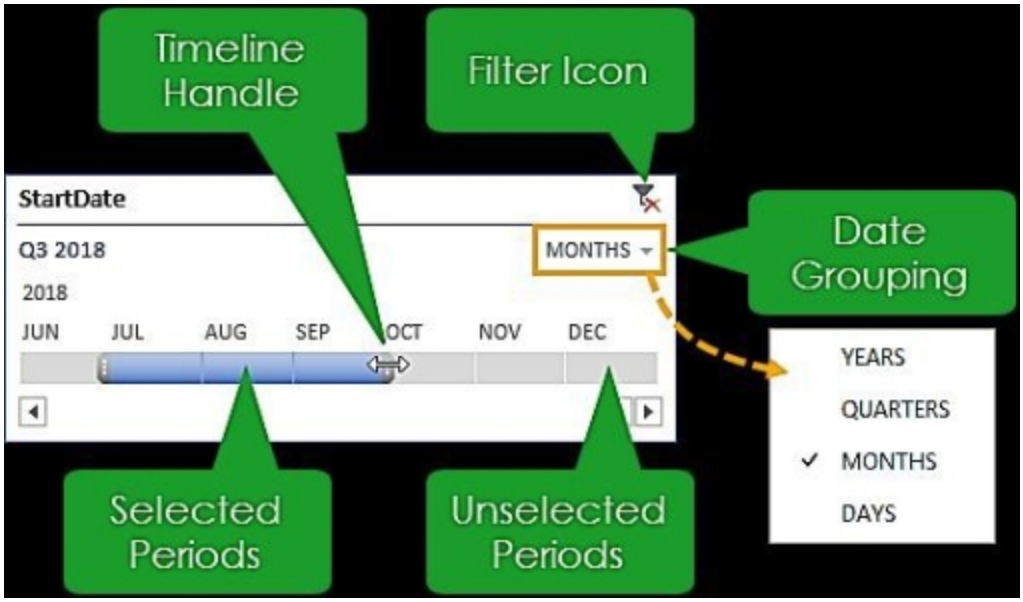
•

Select the option to **Insert a Timeline**

The pane for editing field settings can also be used to insert a timeline in your pivot table as shown below:

- Select any available field of your choice

- Make a right-click on the field to which the timeline slicer is to be added



Using Timelines

The grouping option for a timeline can be changed by clicking on the drop-down icon for **Grouping Dates**

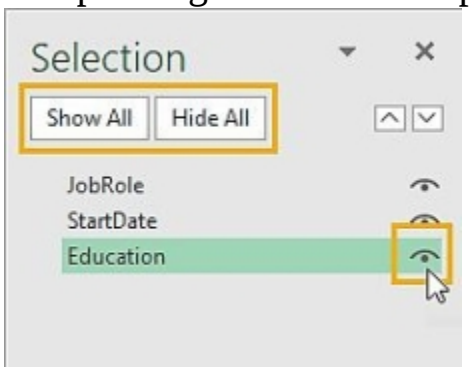
- Single timeline periods can be selected by clicking on the particular period.
- Select multiple timeline periods by clicking on the first period and then dragging it down to the end of the desired period.
- Selected timeline periods can be expanded or reduced using the handles for the timeline.
- Clear the selected timeline periods with the icon for filter present at the top of the timeline pane. Keyboard keys **Alt + C** can be used while

clicking on the timeline periods to be cleared.

Hiding and Showing Timelines or Slicers

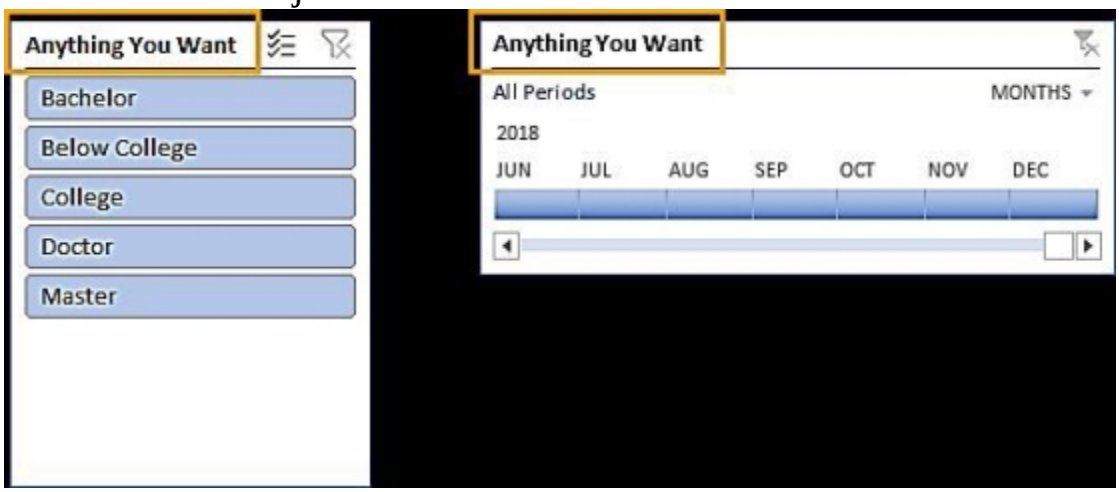
- Highlight the timeline or slicer to be hidden or shown
- Navigate to the tab for **Timeline** or **Slicers**
- From the **Arrange** pane, click on the **Selection** menu

• You can hide or show every timeline or slicer by selecting the corresponding button at the top of the **Selection** window



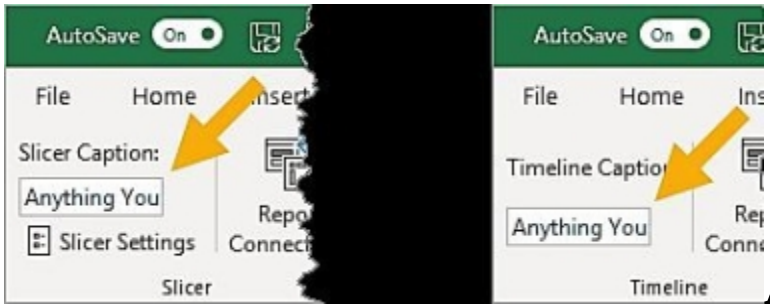
• Hide or show individual timeline or slicer by clicking on the **Eye**

icon beside the object



Changing the Caption for Timelines or Slicers

Timeline or slicer captions are the names attached and written at the top of their panes. They can be changed using the **Timeline** or **Slicer** menu.



ADVANCED

FILTERING OF PIVOT TABLES

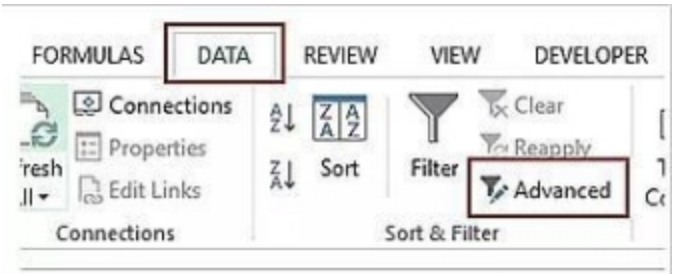
Implementation of advanced filters in your pivot tables helps to safeguard your original data, choose particular fields as output, and also gives values as result.

Advanced Filtering Example

Using the dataset shown below, it would be observed that some entries were made multiple times. Advanced filtering can be used to extract all unique data in another location while leaving the original dataset untouched.

- Highlight all the data in the data set, as well as the headers

- Navigate to the **Data** menu and select **Advanced** from the **Sort and Filter** tab



- This selection launches the **Advanced Filters** dialogue box
- Select the option to copy the filter results to a new location

- Select your **Range for List** to contain the cells of your original data as well as its headers

- Leave the **Range for Criteria** bar empty

- Specify where the filter results should be displayed in your worksheet in the **Copy** bar

•

Select the box to only copy distinct records

- Click on **OK**

The result is as shown below:

1	Date	Sales Rep	Sales
2	03-12-2017	Jenny	6238
3	11-11-2017	Rachel	4412
4	14-10-2017	Martha	4682
5	13-09-2017	Joe	5881
6	13-09-2017	Joe	5881
7	31-08-2017	Tom	4748
8	20-08-2017	Bob	3158
9	08-08-2017	Greg	2588
10	31-07-2017	Joe	4366
11	19-07-2017	Tom	7081
12	19-07-2017	Tom	7081
13	08-06-2017	Mike	3807
14	24-05-2017	Mike	8373
15	23-05-2017	Jenny	5086
16	05-05-2017	Joe	5106
17	19-04-2017	Jenny	3904
18	19-04-2017	Jenny	3904
19	28-02-2017	Martha	8365
20	26-02-2017	Bob	9650

Date	Sales Rep	Sales
03-12-2017	Jenny	6238
11-11-2017	Rachel	4412
14-10-2017	Martha	4682
13-09-2017	Joe	5881
31-08-2017	Tom	4748
20-08-2017	Bob	3158
08-08-2017	Greg	2588
31-07-2017	Joe	4366
19-07-2017	Tom	7081
08-06-2017	Mike	3807
24-05-2017	Mike	8373
23-05-2017	Jenny	5086
05-05-2017	Joe	5106
19-04-2017	Jenny	3904
28-02-2017	Martha	8365
26-02-2017	Bob	9650

Summary

Slicers in Excel pivot tables provide a flexible and more comfortable way to filter table values. They provide multiple filter options within easy reach and more than one slicer can be created at once while you connect them to other pivot tables. Timelines also show periods with a horizontal bar that can be easily used to decide the data to be displayed according to the selected timeline period. This chapter also explained how the advanced filtering technique helps to keep your original data intact while filtering operations are carried out on the data.

CHAPTER SIX

GETTING FAMILIAR WITH DASHBOARDS

Dashboards in Excel hold tables and charts that are made up of data. They are created so that decisions can be easier made at a glance with the concise way it presents data.

Creating Dashboards in Excel

When creating dashboards for data visualization, the following points must first be considered:

- Why is the dashboard being created? What purpose would it serve?
- What type of data would be dashboard contain?
- For whom is the dashboard being created?
- Would the dashboard require a regular update?

After successfully providing answers to these questions, you can then decide on a suitable approach to which the dashboard would be created. Also, consider the version of Excel your client uses to prevent the non-compatibility of some features.

Acquiring Data for Excel Dashboards

Client data can come in various formats. Data in Excel format are easier to use as they can be implemented directly. Other data formats such as Text or CSV would require conversion to Excel format before you can use them. You would also need to standardize the data after the necessary conversation.

Data standardization involves cleaning up the data to remove blank spaces, duplicates, errors, etc. The data might also require restructurings, such as placing the data in a table or a pivot table.

Structuring Your Dashboards

It is considered good practice to structure the workbook in which your dashboard would be created as follows:

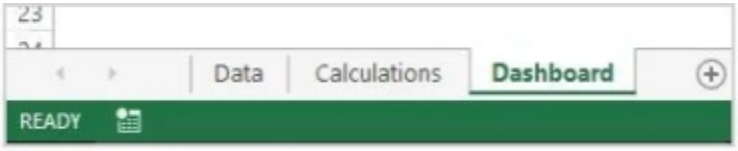
1. A Worksheet for Data

This worksheet will hold your standardized and restructured data. Your data can be more than one worksheet, depending on how large your raw data is.

1. A Worksheet for Calculations

This worksheet would hold all your required calculations to avoid crowding the data worksheet(s). Multiple sheets can be used for calculations as well.

1. The Dashboard Sheet



This is usually a single sheet. It is the sheet where the dashboard would reside.

Notable Functions to be Considered when Creating Dashboards

- The SUMPRODUCT function
- The MATCH or INDEX functions
- The VLOOKUP function
- The IFERROR function
- The TEXT function
- The ROW and COLUMN functions

Interactive and Dynamic Tools for Dashboards

- **Scroll Bars:** These can be used to see additional data.

- **Check Boxes:** Selection or deselection of checkboxes updates what is displayed on the dashboard. They help to make your dashboard dynamic.
- **Drop-down Lists:** They are also used to update dashboard displays. They can be used in place of or with checkboxes.

Tips for Creating Dashboards

- Avoid overcrowding your dashboards
- Avoid formulas that reduce the efficiency of calculations
- Remove unneeded data

- Ensure your charts are numbered, labeled, and sectioned for easy reference and navigation

- Rows can be hidden to prevent unwanted navigation

- Freeze important rows and columns for them to constantly remain visible
- Provide a guide to the dashboard if it is a complex dashboard. This guide can be written on a separate sheet. **ADDING NUMEROUS PIVOT TABLES TO YOUR WORKSHEET**

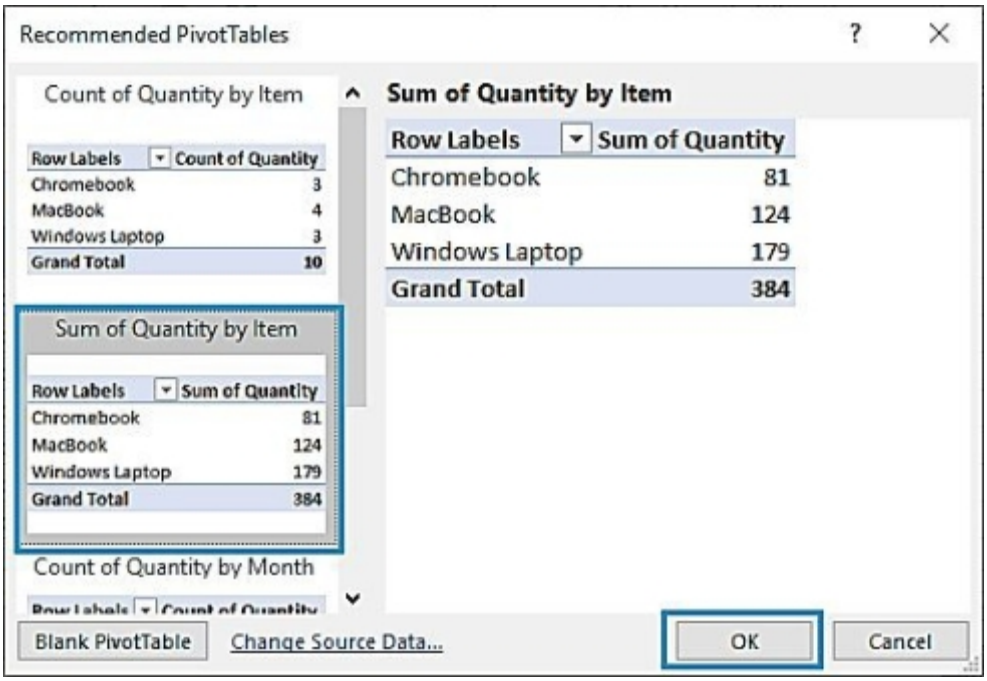
Two or more pivot tables can be used for analyzing data in multiple ways. Using the record below as an example:

	A	B	C	D	E
1					
2	Gadget Sales at Store#1 and Store#2				
3	Item	Items Sold	Unit	Store	Month
4	Laptops	50	Each	Store#1	Jan
5	Tablets	30	Each	Store#2	March
6	Phones	125	Each	Store#1	Feb
7	Laptops	10	Each	Store#2	Jan
8	Tablets	30	Each	Store#2	March
9	Phones	125	Each	Store#1	Feb
10	Laptops	50	Each	Store#1	Jan
11	Tablets	30	Each	Store#2	Feb
12	Phones	125	Each	Store#2	March
13					

Two pivot tables can be created from this data; the first pivot table would analyze the sales according to the type of gadgets, while the second pivot table would analyze the sales according to stores.

To create the first pivot table for analyzing the sales according to the type of gadgets:

- Highlight a cell in the data source
- Navigate to the **Insert** menu and select the **Tables** option
- Choose the tab for **Recommended Tables**
- Select your desired layout from the resulting window and select



OK

This action inserts one of the pivot tables in your worksheet

- Select any cell in this table to bring up the window for configuring the fields of the pivot table

- Here you can drag and drop fields into the areas for **Rows, Values,**

or **Columns.**

To insert the second pivot table for analyzing the sales according to stores:

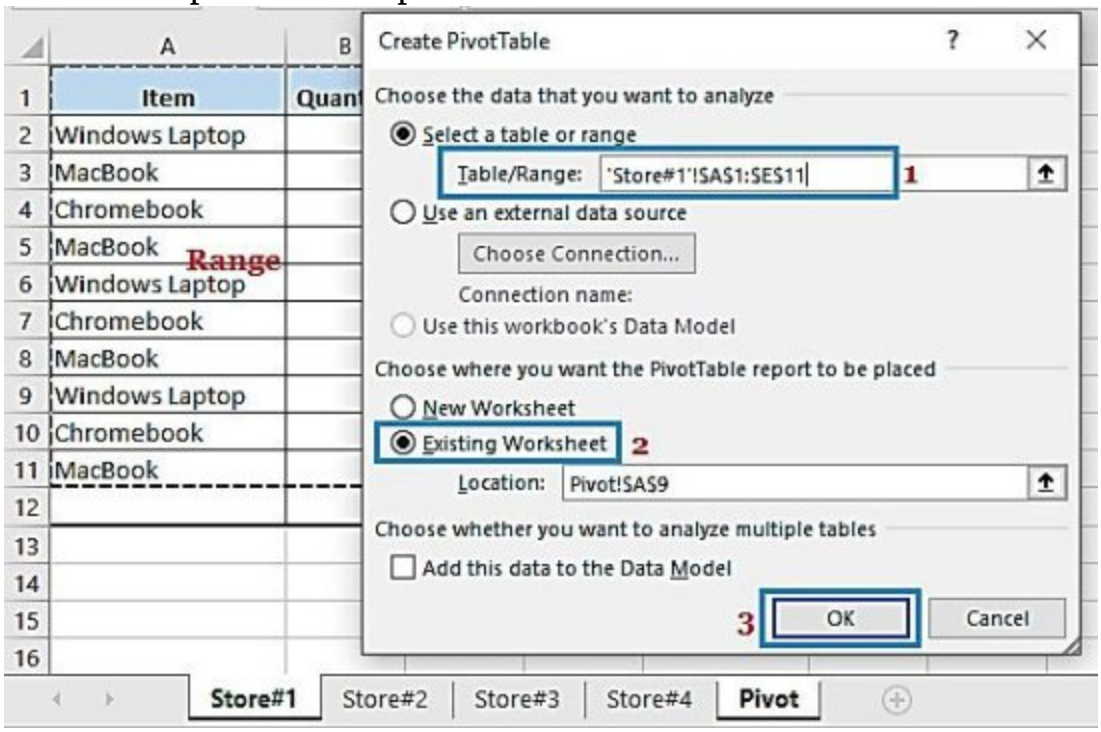
- Select a blank cell in your worksheet that is far from the previously created pivot table

•

Navigate to the **Insert** menu and select **PivotTable**

- In the resulting dialogue box:
- Select the range of cells holding your data source

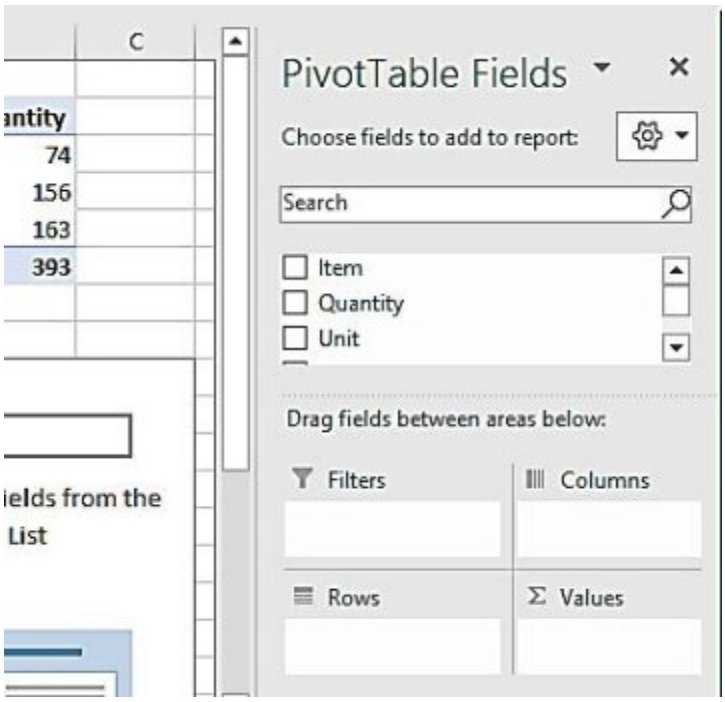
- Select the option for the pivot table to be created in the same worksheet



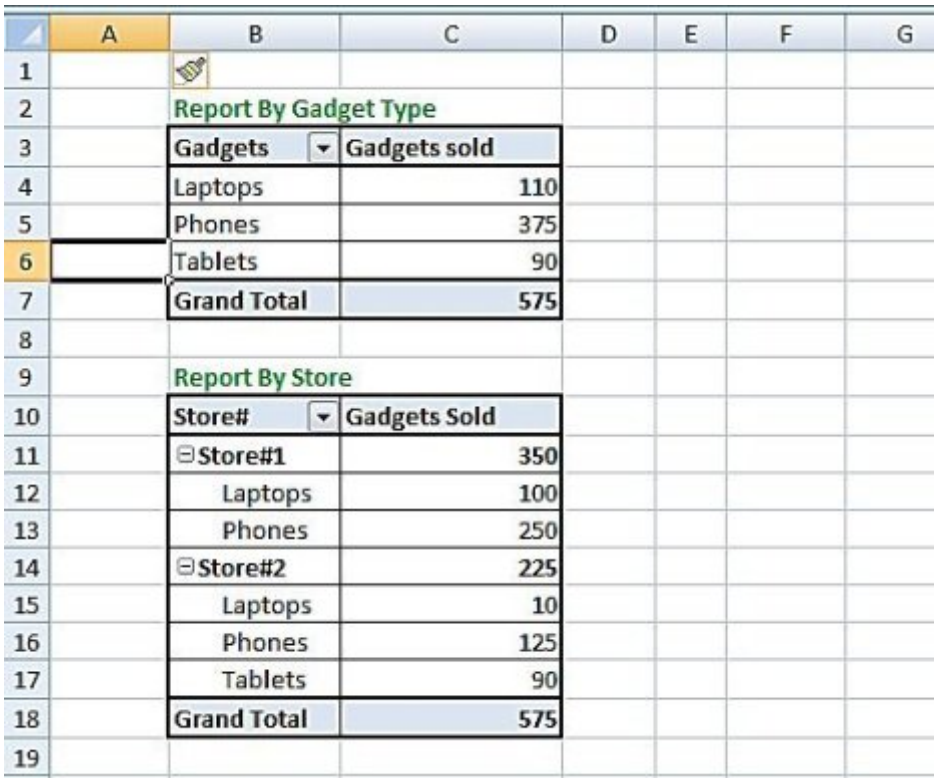
- Select **OK**

This action inserts the second pivot table in your worksheet

- Select any cell in this table to bring up the window for configuring the fields of the pivot table



The result is shown below:



Report By Gadget Type

Gadgets	Gadgets sold
Laptops	110
Phones	375
Tablets	90
Grand Total	575

Report By Store

Store#	Gadgets Sold
⊟Store#1	350
Laptops	100
Phones	250
⊟Store#2	225
Laptops	10
Phones	125
Tablets	90
Grand Total	575

FORMATTING OPERATIONS ON DASHBOARDS

Dashboard formatting aids visualization as it helps to configure how data appears and is arranged. Conditional formatting is the best technique to be applied when formatting your dashboards.

Highlighting Specific Cells

Consider the data below; follow these steps to arrange the cell data for **Total Amount** in a particular order:

	A	B	C	D	F
1					
2		S. No.	Month	Region	Total Amount
6		4	April	East	950225
10		15	April	North	874207
14		27	April	South	1216288
18		39	April	West	760180
25		23	June	North	1026550
29		35	June	South	1149736
33		47	June	West	1313984
37		8	May	East	599385
41		19	May	North	719262
45		31	May	South	599385
49		43	May	West	1318647

- Select the **Total** column
- Navigate to the **Home** menu and select **Conditional Formatting**

from the group for **Styles**

- Select the option to specify highlight rules from the dropdown menu

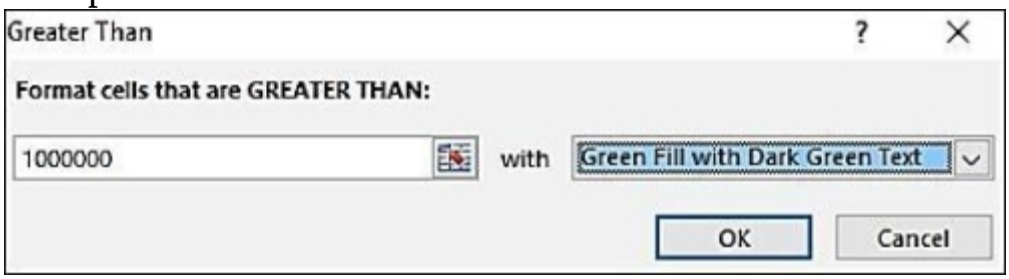
•

Select the **Greater Than** option from the next list that appears

- Specify the condition to highlight cells with values more than

1000000 in the resulting dialogue box

- Select the **highlight color** in the next box from the available drop-down options



- Select **OK**

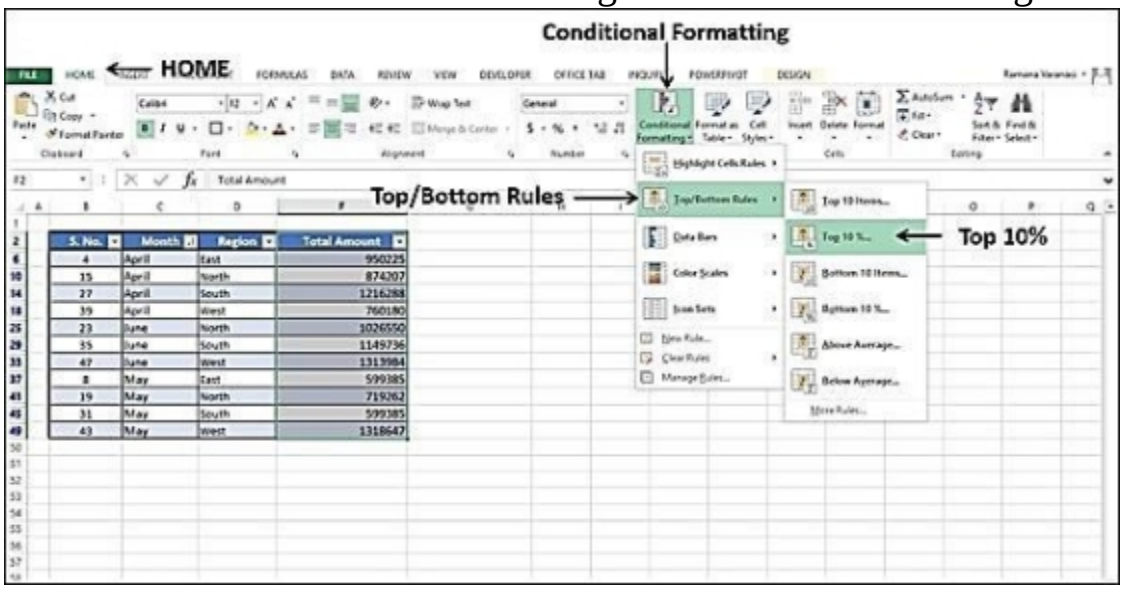
The result is of this formatting is shown below:

	A	B	C	D	F
1					
2		S. No.	Month	Region	Total Amount
6		4	April	East	950225
10		15	April	North	874207
14		27	April	South	1216288
18		39	April	West	760180
25		23	June	North	1026550
29		35	June	South	1149736
33		47	June	West	1313984
37		8	May	East	599385
41		19	May	North	719262
45		31	May	South	599385
49		43	May	West	1318647

The Top or Bottom Rules

This formatting highlight cells that any of the following conditions:

- **10 Top Items:** This formatting option would highlight the 10 top items having the highest values in the data.
- **Top 10 Percent:** This formatting option would highlight the top 10 percent items having the highest percentage in the selected data range.
- **10 Bottom Items:** This formatting option would highlight the 10 bottom items having the lowest values in the selected data range.
- **Bottom 10 Percent:** This formatting option would highlight the bottom 10 percent items having the lowest percentage in the selected data range.
- **Above Average:** This formatting option would highlight all items with values above the calculated average of the selected data range.
- **Below Average:** This formatting option would highlight all items with values below the calculated average of the selected data range.



However, suppose you wish to highlight the top **5 percent** data in your entry:

- Select the **Total** column
- Navigate to the **Home** menu and select **Conditional Formatting**

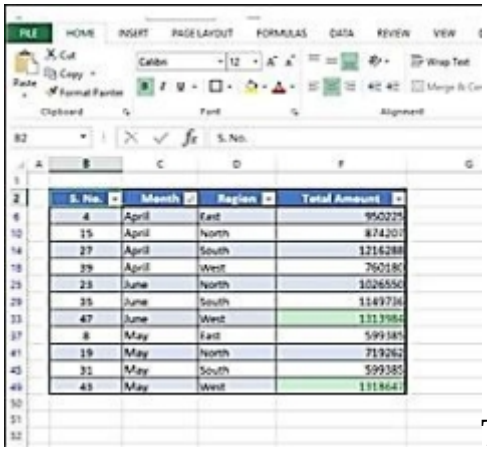
from the group for **Styles**

- Select the option to specify **Top or Bottom** rules from the drop- down menu

- Select the option for **Top 10 Percent** from the next list that appears

- Specify the condition to highlight cells with top **5 percent** values in the resulting dialogue box
- Select the **highlight color** in the next box from the available drop-down options

- Select **OK**



The result is of this formatting is shown below:

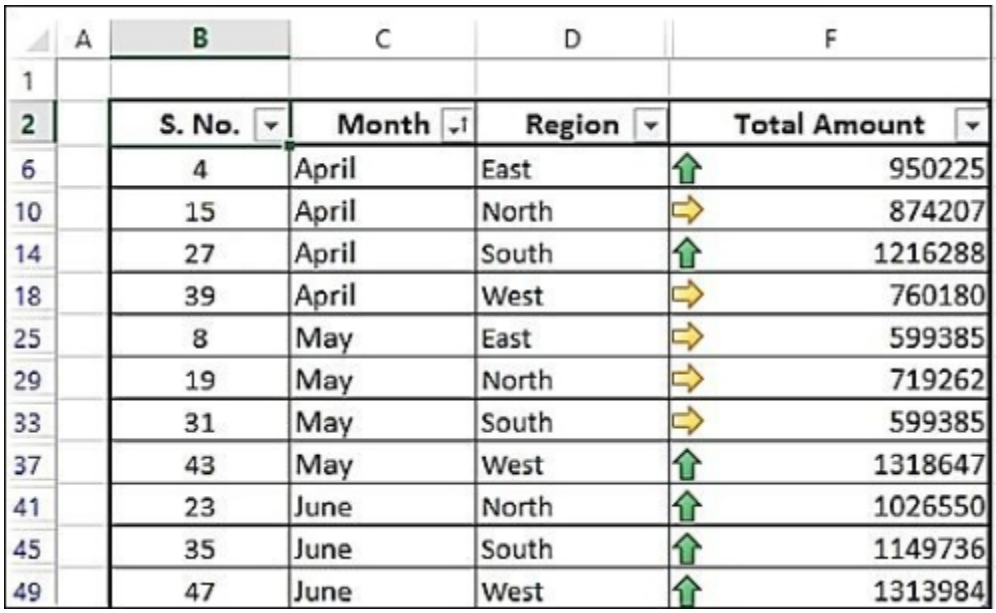
Other formatting options that can be implemented on your dashboard include:

- Data bars

•

Color scales

- Icons, etc.



	A	B	C	D	F
1					
2		S. No.	Month	Region	Total Amount
6		4	April	East	950225
10		15	April	North	874207
14		27	April	South	1216288
18		39	April	West	760180
25		8	May	East	599385
29		19	May	North	719262
33		31	May	South	599385
37		43	May	West	1318647
41		23	June	North	1026550
45		35	June	South	1149736
49		47	June	West	1313984

You can also specify your formatting rules by selecting the option to **Customize Rules.** Additional formatting options can likewise be accessed using the **More Rules** option.

INSERTING CHARTS IN YOUR DASHBOARDS While in the dashboard worksheet, navigate to the **Insert** menu and select any chart of your choice

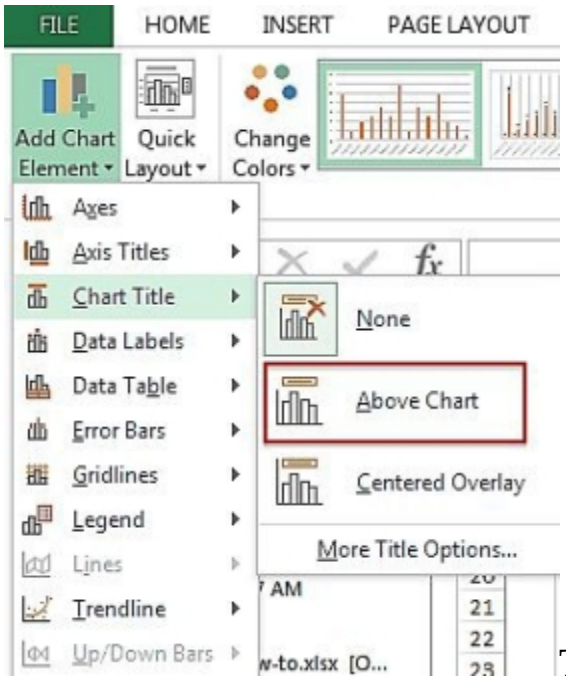
- Make a right-click on the inserted chart and enter your data range

•

Configure the **Series** and **Category** fields as desired and click **OK**

• Add a title or label to your chart following these steps:

- Select the chart and navigate to the **Design** menu
- Select the option to insert elements in your charts



This opens a drop-down menu from which various elements can be selected to be added to your chart.

Summary

Dashboards are built on data and charts. They are created for better data visualization to enhance easier comprehension and results. This chapter explained why adding multiple pivot tables to your worksheet enables the analysis of data in multiple forms. How you can insert more than one pivot table was also explained. Dashboard

formatting that configures how data is displayed was also considered, alongside how you can add charts to your dashboard.

CHAPTER SEVEN

INSERTING PERFORMANCE SYMBOLS AND SLICERS TO DASHBOARDS SLICERS

After adding charts to your dashboard, you can then add slicers to further create a dynamic dashboard that can be filtered from a slicer pane.

Highlight the PivotChart

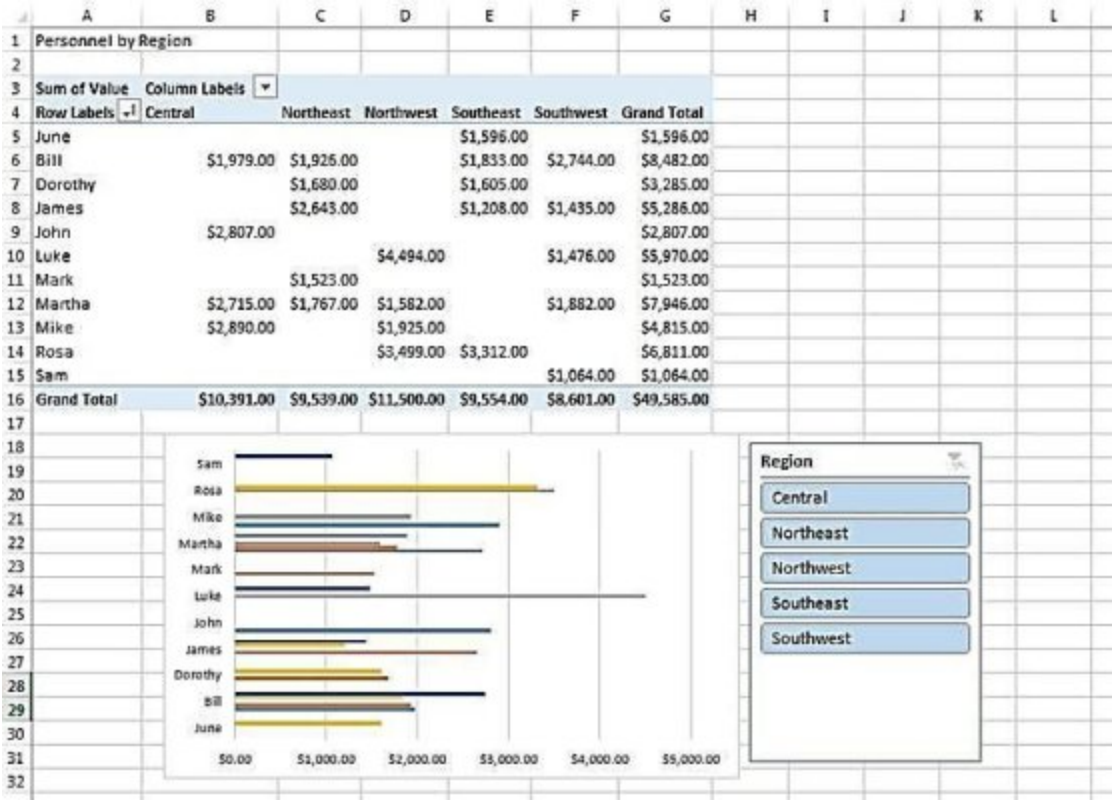
- Navigate to the **Analyze** menu and select the option for **Inserting Slicers** from the **Filter** section

•

You can then select any of the fields available in the slicer pane

- Select **OK**

This selection brings up further options with respect to the previously chosen option from which your dashboard can then be filtered.



Personnel by Region						
Sum of Value	Column Labels					
Row Labels	Central	Northeast	Northwest	Southeast	Southwest	Grand Total
June				$1,596.00		$1,596.00
Bill	$1,979.00	$1,925.00		$1,833.00	$2,744.00	$8,482.00
Dorothy		$1,680.00		$1,605.00		$3,285.00
James		$2,643.00		$1,208.00	$1,435.00	$5,286.00
John	$2,807.00					$2,807.00
Luke			$4,494.00		$1,476.00	$5,970.00
Mark		$1,523.00				$1,523.00
Martha	$2,715.00	$1,767.00	$1,582.00		$1,882.00	$7,946.00
Mike	$2,890.00		$1,925.00			$4,815.00
Rosa			$3,499.00	$3,312.00		$6,811.00
Sam					$1,064.00	$1,064.00
Grand Total	$10,391.00	$9,539.00	$11,500.00	$9,554.00	$8,601.00	$49,585.00

Changing the Color of Slicers

- Highlight the slicer
- Navigate to the **Tools for Slicers** menu and click on **Options**

•

Select the tab **Style for Slicers**

Here you can select a **Light** or **Dark** theme for your slicers. You can also customize your slicer theme by selecting the option for adding **New Style for Slicers.**

Adding Multiple Columns to Slicer Pane

Excel slicers usually have one column with a scroll bar added when the slicer item exceeds what can be displayed at once. To avoid

scrolling up and down to see additional slicer items, you can insert an additional column in the slicer pane.

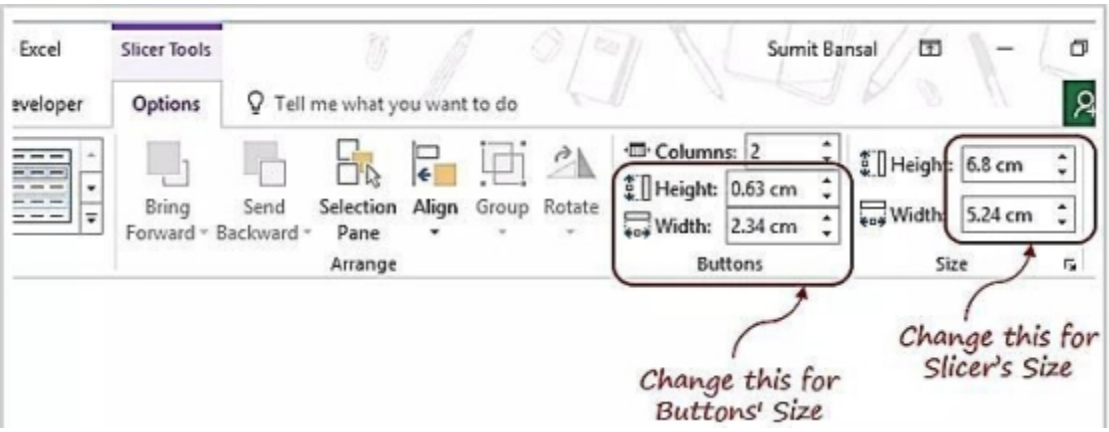
- Highlight the slicer
- Navigate to the **Tools for Slicers** menu and click on **Options**
- Select the **Buttons** option

- Edit the value for columns to **2** or any choice number The result is shown below:

This display does not show the complete name of the items in the slicer, to rectify this:

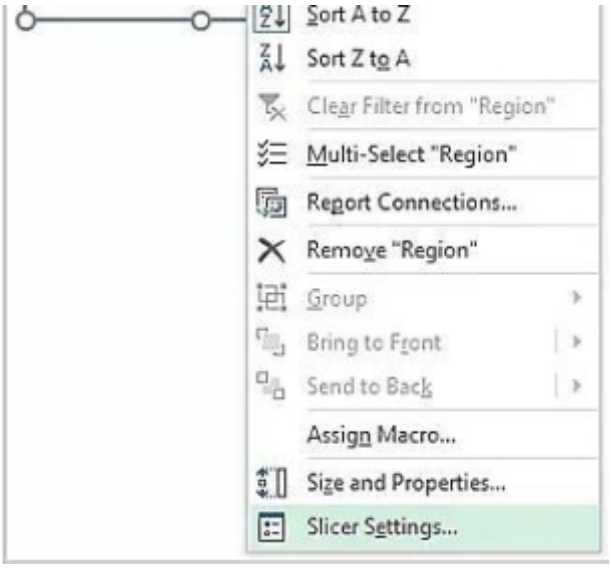
- Highlight the slicer
- Navigate to the **Tools for Slicers** menu and click on **Options**

From here, adjust the **Width** and **Height** of the slicer buttons and the slicer pane. Note that the size of the slicer pane can be adjusted from the dashboard by selecting the edges of the pane and dragging it to the desired size. However, to adjust the size of the slicer buttons, you can only use the **Options** menu.

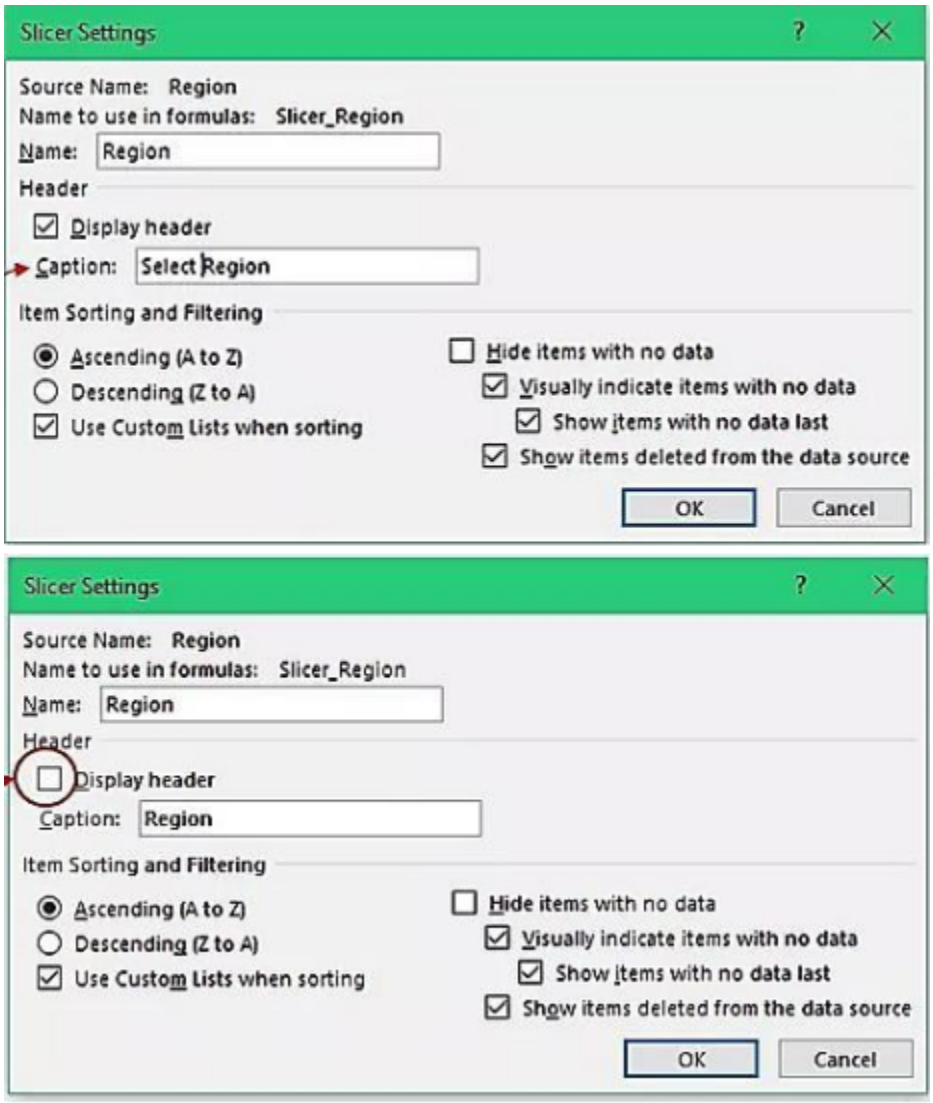


Removing Headings for Slicers

- Make a right-click on the slicer
- Select the option to adjust the **Settings of the Slicer**



- You can change the header of the slicer in the resulting dialogue box or deselect the box for displaying the header



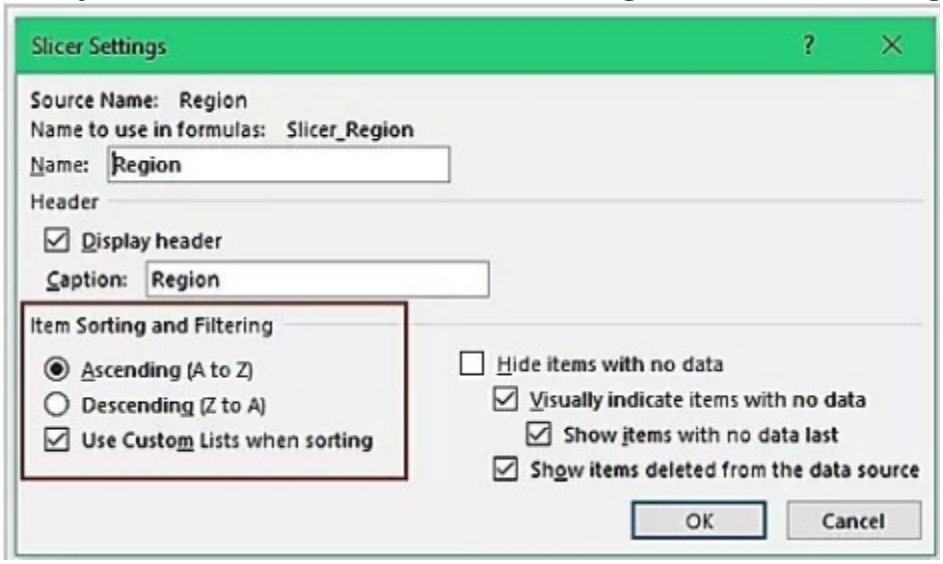
- Select **OK**

Customizing How Items are arranged in the Slicer Pane

Slicer items are usually arranged in ascending order for text and from older to current for dates or numbers. You can however change this default arrangement to use your sorting rules as follows:

- Make a right-click on the slicer
- Select the option to adjust the **Settings of the Slicer**

- When the dialogue box for the **Settings of the Slicer** is launched, you can adjust how the slicer items are arranged from the sorting options



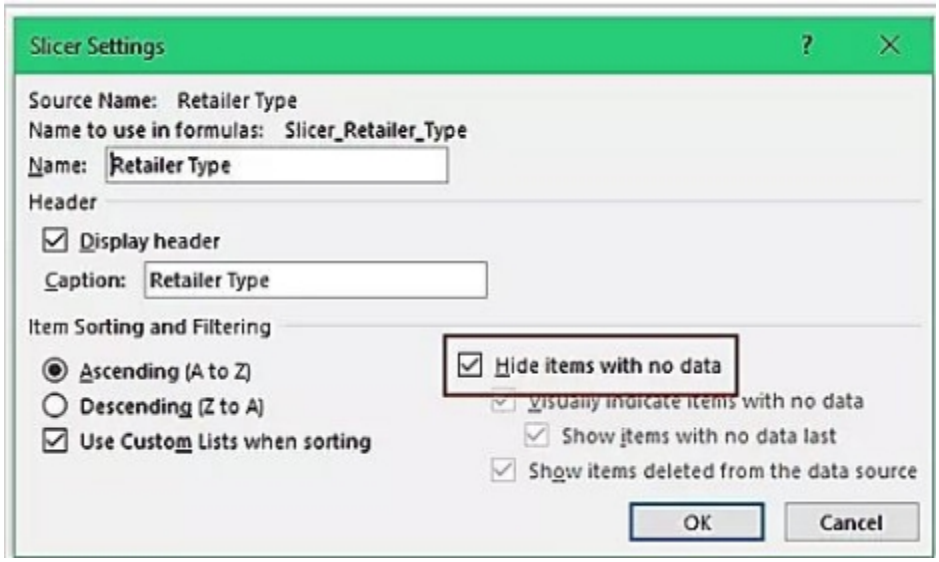
- Select **OK** when done

Removing Items with Empty Data from the Slicer Pane

Several items in the slicer pane may have no data related to them from the pivot table, these items can then be removed or hidden from display on the slicer pane.

- Make a right-click on the slicer
- Select the option to adjust the **Settings of the Slicer**

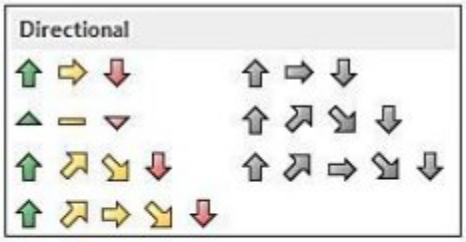
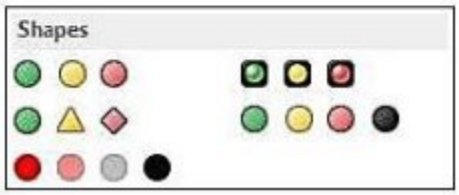
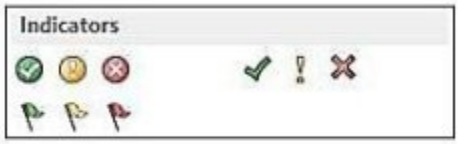
- When the dialogue box for the **Settings of the Slicer** is launched, select to hide these items with no data associated with them.


Slicer Settings
Source Name: Retailer Type
Name to use in formulas: Slicer_Retailer_Type
Name: Retailer Type
Header
Display header
Caption: Retailer Type
Item Sorting and Filtering
Ascending (A to Z)
Descending (Z to A)
Use Custom Lists when sorting
Hide items with no data
Visually indicate items with no data
Show items with no data last
Show items deleted from the data source
OK
Cancel

ADDING SYMBOLS FOR PERFORMANCE TO YOUR DASHBOARDS

Symbols, arrows, and additional indicators are used in Excel dashboards to aid visualization. They graphically show the direction of data from applied conditional formatting. **Set of Icons** are used to insert symbols for performance in dashboards. These icons consist of the following classification:

- Directional icons
- Shape icons
- Indicator icons
- Rating icons

Directional	
Shapes	
Indicators	
Ratings	

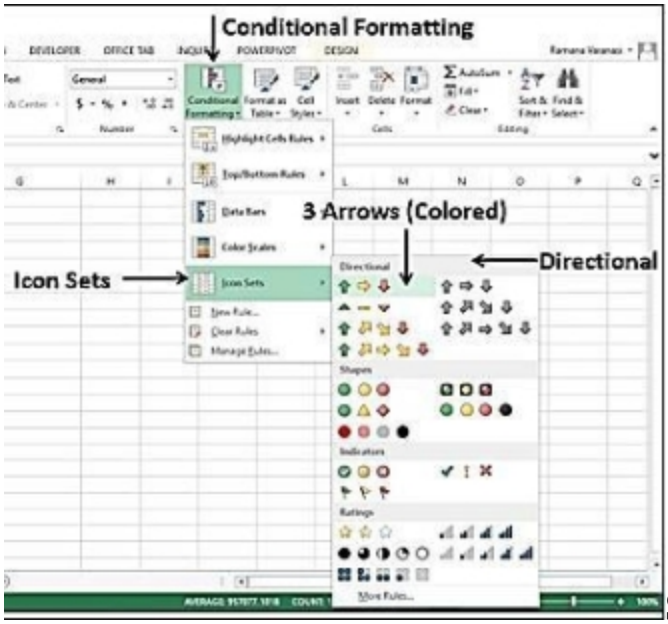
To add these icons:

- Select the data that the icons would represent
- Navigate to the **Home** menu and select **Conditional Formatting**

from the **Styles** section

- Select **Icons** from the drop-down menu

- Choose any of the icon groups



Summary

This chapter explained how you can insert slicers in your dashboards, edit the styles of the slicer, adjust the size of the slicer and its buttons, and also change its sorting order. Symbols for performance such as directional arrows, shape icons, rating icons, etc. are added to dashboards for graphical representation of your data to enhance comprehension and accurate decision making.

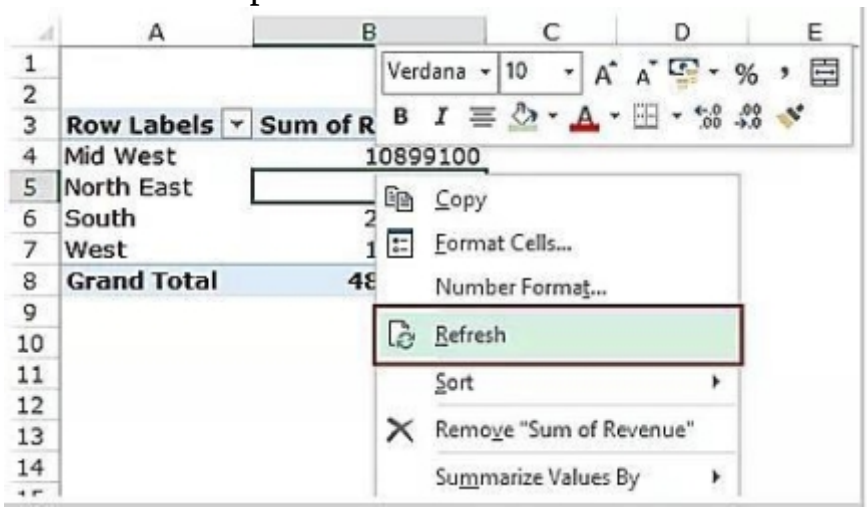
CHAPTER EIGHT

REFRESHING YOUR PIVOT TABLES AND DASHBOARD DATA

Refreshing from the Quick Menu

Pivot tables and data in your dashboards are refreshed to keep them up to date with your data source.

- Select any of your data cells and make a right-click
- Select the option to **Refresh** the table or data from the launched menu



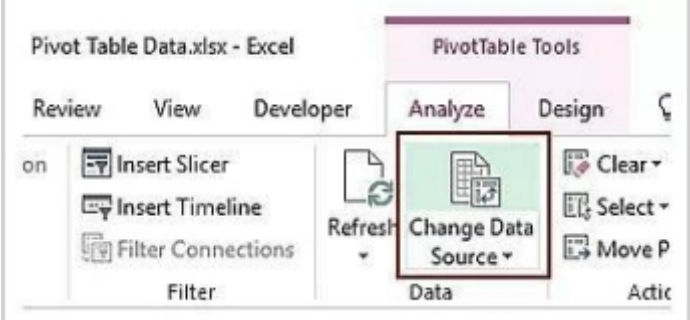
• Keyboard keys **ALT + F5** can also be used after selecting a data cell to initiate a refresh.

Putting the data source in an Excel table format enables a simple refresh action on pivot tables or dashboard data to update data changes. Even the addition of new columns or rows in the source table data would also be reflected on the pivot table when refreshed.

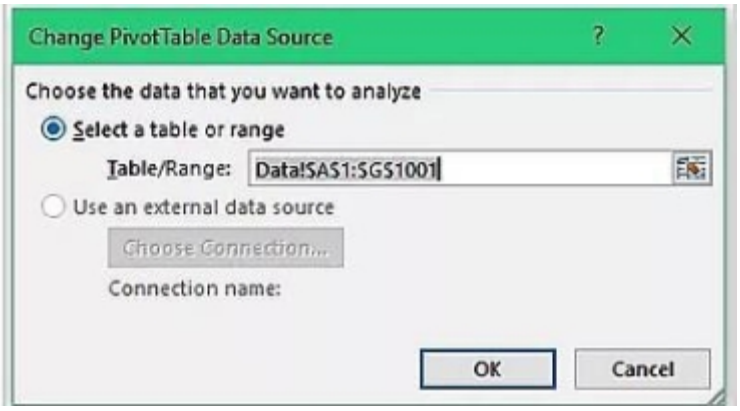
Refreshing Pivot Tables by Changing the Source Data

• Select a data cell in the pivot table or dashboard

• Navigate to the **Analyze** menu and select the option to edit the source data from the **Data** section



This selection launches the corresponding dialogue box where you update and specify the table cell range, including the additional columns, rows, or data.



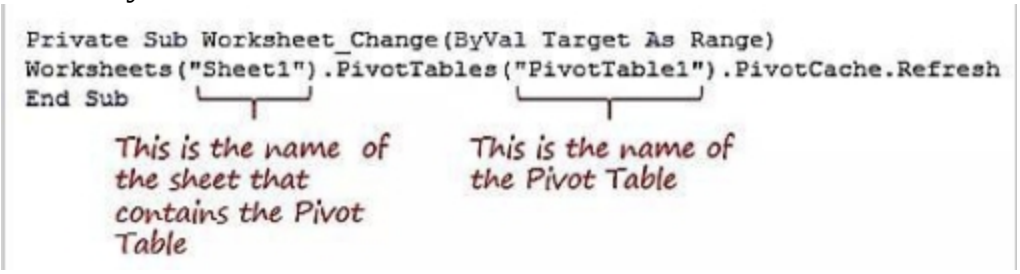
• Select **OK** when done.

When Excel tables are used to create pivot tables, the procedure of changing the source data need not be followed to update or refresh the pivot table. In this case, the **Refresh** option would suffice.

These two methods still have their shortcomings. They require you to manually refresh or update your pivot tables and dashboard data whenever there is a change in the data source. You can however use the automatic refresh and table update approach for your pivot tables and dashboards using an Excel VBA code. The VBA code written below can be modified to suit your workbook:

Private Sub Worksheet_Change(ByVal Target As Range)
Worksheets(“Sheet3”).PivotTables(“PivotTable2”).PivotCache.R efresh
End Sub

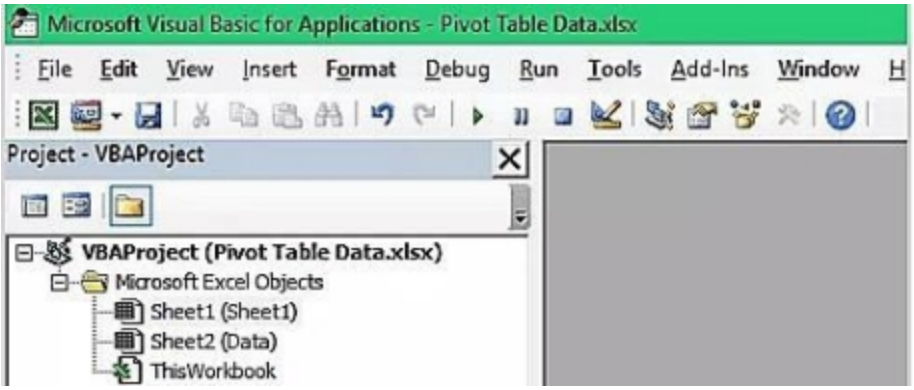
Sheet3 and **PivotTable 2** in this code can be modified to correspond with how your workbook is structured.



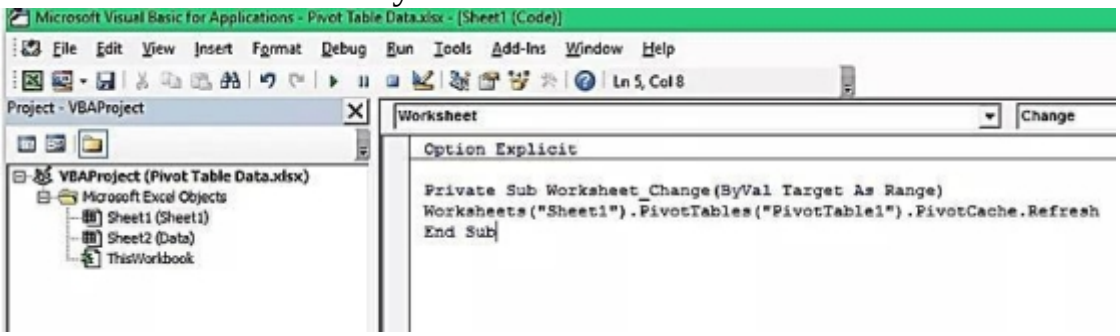
To use this code:

- Press keyboard keys **Alt + F11** to launch the **VB Code Editor**

- Select the sheet containing the pivot table to be automatically updated from the left menu



- Copy and paste the code above in the code module on the right. Here you can make all necessary modifications.



You can now exit the VB editor module and all pivot table and dashboard data reflects an automatic update and refresh when you edit the source data.

Summary

Pivot tables and data on your dashboard are refreshed and updated to reflect changes or the addition of rows and columns in the data

source. It is advised to put your data source in Excel table format and then create your pivot tables from this data. The VBA code module can likewise be used to initiate an automatic update whenever you change any data or insert new columns and rows in the source Excel table.

CHAPTER NINE

SECURING YOUR DASHBOARD DATA Hiding the Source Data of Your Pivot Tables

Sending or sharing a pivot table with the source data attached makes it possible for those shared with to access the source table and make modifications. Deleting the source data sheet is still not enough protection from third parties editing the source data as it can still be recreated.

A good option to prevent this is to disable the option for saving the pivot table source data. This can be done from the **PivotTable Options** dialogue box. Note however that this would make clients unable to make changes to the pivot table or even refresh it.

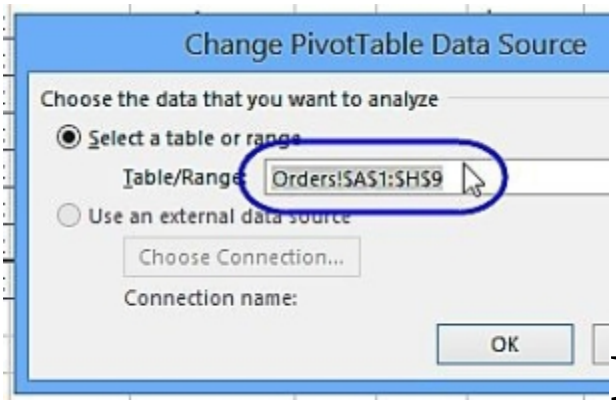
Finding the Source Data of Your Pivot Tables

- Highlight a cell in the pivot table
- Navigate to the **Analyze/Options** menu

•

Select the option to edit the source data from the **Data** section

• In the resulting dialogue box, you can see the source Excel table or cell range in the **Range/Table** box



PROTECTING EXCEL

DASHBOARDS AND WORKSHEETS

You can protect your dashboards and worksheets from unauthorized modifications by adding passwords or encryption.

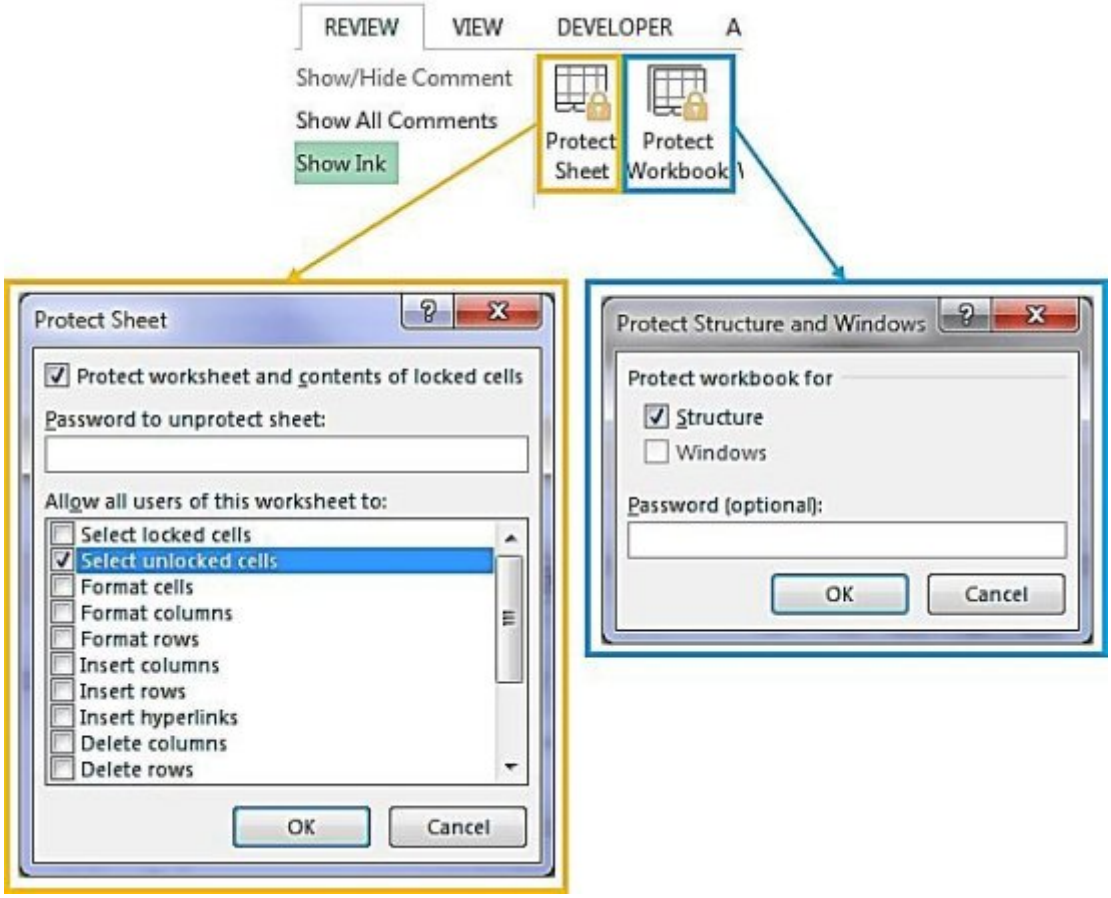
- Navigate to the **File** menu and select **Info**
- Click on the option to **Protect your Workbook** and select the

Password Encryption button

- Type in a password in the provided box and select the **OK** button
- Enter this password again for confirmation and select the **OK**

button

Navigating to the **Review** menu and selecting the option to **Protect the Worksheet** or the **Workbook** also protects your pivot table worksheet and dashboard.



Separating Sources of Data

When handling large data that comprises records from multiple regions, or sectors; data from each region can be separated with pivot tables added to each separate data. Doing this and including passwords to these individual worksheets would prevent access to the full source data while providing effective pivot tables for every region with its data attached.

Creating Static Pivot Tables

This involves using the **Special Pasting** options. Creating static pivot tables allows you to only paste values and results in the tables, making it impossible for users to make changes to the layout of the pivot tables. Static pivot tables can also be designed for separate data sources as follows:

- Select the name of a region from the **Filter** section
- Highlight the pivot table and make a right-click

- Select **Copy** from the launched menu or use keyboard keys **Ctrl + C** after selecting the table
- Open another worksheet or workbook and make a rightclick on the cell where the pivot table would be passed

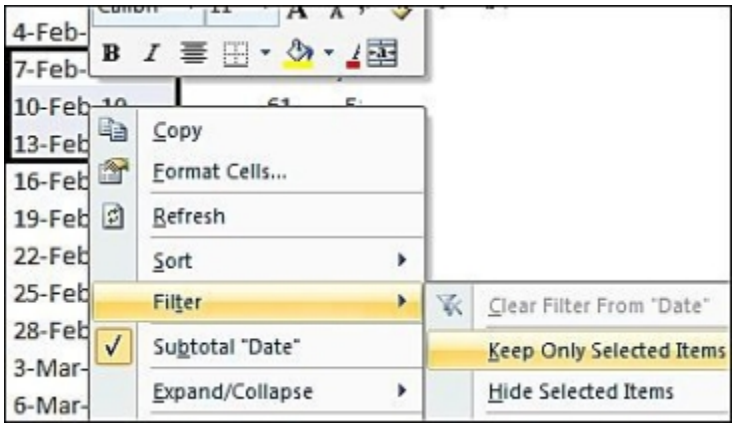
- Select the option for **Special Pasting** in the launched menu
- Select **Values** and then select **OK**

You can then format the copied table as desired.

HIDING ITEMS IN EXCEL PIVOT TABLES

Columns and rows can be temporarily hidden in pivot tables. Selecting the drop-down icon of the column or row item can be used to deselect items to be hidden. However, this can be tedious if the data is not properly arranged and when handling large data. An alternative and easier method are to use the **Filter** menu.

- Select an item or multiple items in the pivot table and make a right-click



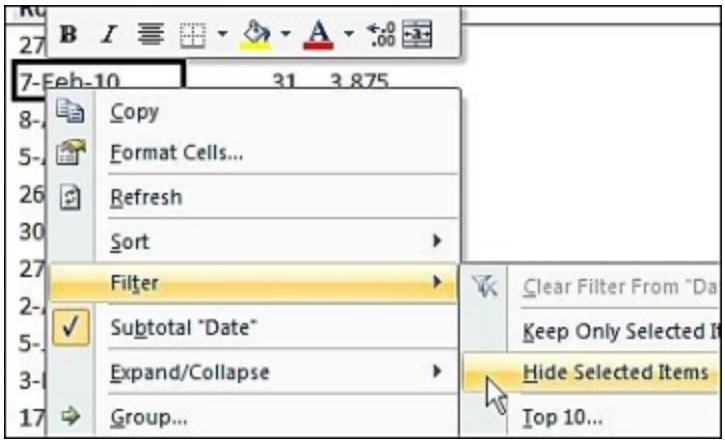
- Choose the option to hide the items you selected

SHOWING SELECTED ITEMS IN EXCEL PIVOT TABLES

Just as you can selectively hide multiple columns or rows from view in your pivot table, likewise you can choose to only show the items you select. While this can be done by selecting the dropdown icon of the column or row item to select items to be shown, this can be time-

consuming if the data is not properly arranged and in cases of large data. An alternative and easier method are to use the **Filter** menu.

- Select an item or multiple items in the pivot table and make a right-click



- Choose the option to only show or keep the items you selected

Summary

Protecting the data source of your pivot tables, dashboard data, and worksheets is essential in Excel. It prevents unwanted modification of the pivot tables or data source. This chapter explained how you can add a password to your worksheet, separately create pivot tables for distinct regions, create static pivot tables, and also hide the data source of your tables. You can also choose to hide or display selected data in your pivot table using the **Filter** menu.

CHAPTER TEN

PUTTING PIVOT TABLE DATA IN GROUPS

In cases of large data having certain similarities, it may be necessary to put them into groups for easy accessibility. Putting your data in a group also helps remove the repetition of records, thereby reducing the amount of data. Excel allows you to put **Number, Date,** and **Text** fields into a group and specify the grouping interval.

AUTOMATIC GROUPING OF DATES IN EXCEL

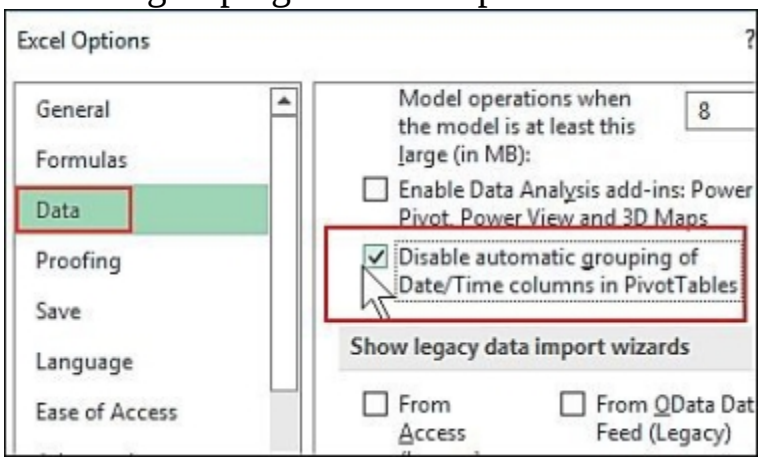
Later versions of Excel starting from Excel 2016 puts date entries into groups immediately they are entered as a field in a pivot table. This automatic grouping for dates can however be disabled and undone. The disabling feature is only made available in Excel 2016 and recent versions; earlier and all versions only allow you to undo the automatic date group.

Disabling the Automatic Grouping for Date Feature in Excel 2016 and Recent Versions

Note that this action would have effects on all Excel workbooks, not just the current workbook as this action affects the Excel application itself.

- Navigate to **File** and select **Options**
- From the left menu, select the **Data** option

- From the resulting options on the right, select the **Disable** box for the automatic grouping of dates in pivot tables



- Select **OK** to apply the change

UNDOING AUTOMATIC GROUPING FOR DATES IN ALL VERSIONS OF EXCEL

Using Keyboard Shortcut Keys

- First, make an entry of a date field in your pivot table

- As soon Excel automatically puts the dates in a group, use keyboard key **Ctrl + Z** to immediately undo the grouping

This reverts the data to its original single entries.

Using the Ungroup Option

- First, make an entry of a date field in your pivot table

- As soon Excel automatically puts the dates in a group, make a right-click on the grouped data

- Select the **Ungroup** option

This reverts the data to its original single entries.

PUTTING DATE RECORDS IN GROUPS

Many predefined options or intervals exist in Excel for putting date records into groups, these include:

- Seconds
- Hours
- Days
- Months
- Quarters
- Years

To put date field records into groups:

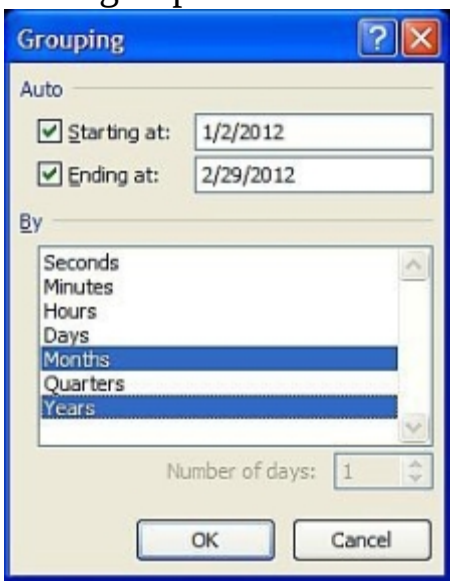
- Select a cell containing a date field data in your pivot table and make a right-click

•

Select **Group** from the resulting menu

- This action launches the **Grouping** dialogue box

- Put in a **Starting** date in the provided box and an **Ending** date in the corresponding box
- In the **By** box, choose a time or period by which your date field data will be grouped



- Select **OK**

Putting Date Records in Week Groups

- Select a cell containing a date field data in your pivot table and make a right-click

- Select **Group** from the resulting menu
- This action launches the **Grouping** dialogue box

- Put in a **Starting** date in the provided box and an **Ending** date in the corresponding box
- In the **By** box, choose **Day** as the interval by which your date field data will be grouped
- Above the **OK** button, enter **7** in the box for **Days Number** With the **Days Number** box, you can enter any number by which your dates would be grouped. Ensure that you first select **Day** as your interval in the **By** box.

Changing the Starting and Ending Date of Excel Date Groups

- Select a cell containing a date field data in your pivot table and make a right-click

- Select **Group** from the resulting menu
- This action launches the **Grouping** dialogue box
- Deselect the boxes for an automatic **Starting** or **Ending** date

- Enter your desired dates in the corresponding boxes Typing in a date in the **Starting** or **Ending** date box also immediately deselects the boxes for automatic **Starting** or **Ending** date.

PUTTING NUMERICAL DATA INTO GROUPS

- Select a cell containing a date field data in your pivot table and make a right-click

    - Select **Group** from the resulting menu
    - This action launches the **Grouping** dialogue box

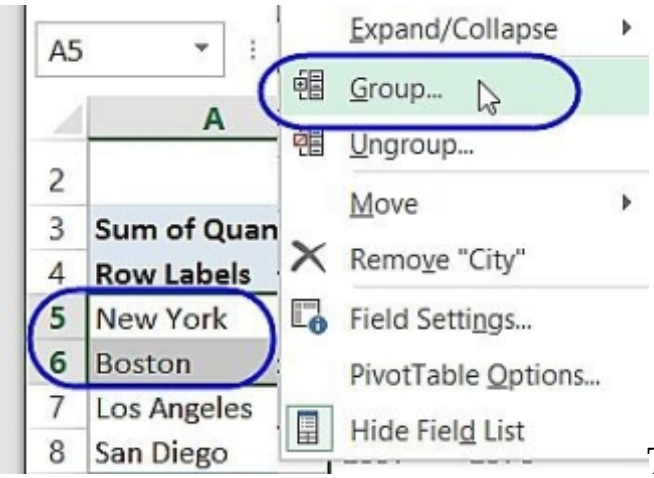
- Put in a **Starting** number in the provided box and an **Ending** number in the corresponding box with respect to the least and highest number in your data
- In the **By** box, enter a number interval of your choice by which the data would be grouped

    - Select **OK**

PUTTING TEXT DATA INTO GROUPS

Although the **Grouping** dialogue box cannot be used to put text field data into groups, you can however manually put these data into groups by following these steps:

- Highlight the text data to be grouped
- Make a right-click on the data and select the **Group** option



This action automatically adds a new field group to the list of fields. To edit this name to one of your choices:

- Select the cell heading having the name to be edited

•

Type in a new name

Adding Items to the Group

- Highlight the items in the newly created group

- Press down the **Ctrl** key and select the additional data from the pivot table with your mouse
- Make a right-click on these selected items and choose **Group** in the resulting menu

This adds the new data in the highlighted group. This action might require you to perform the rename operation again if previously done.

Putting Multi-selected Data in a Group

- Highlight the data or press down the **Ctrl** while selecting the data with your mouse

- Make a right-click and select **Group** from the resulting menu

- When in the **Grouping** dialogue box, put in a **Starting** value in the provided box and an **Ending** value in the corresponding box

- In the **By** box, choose a time or period by which your data will be grouped if dealing with date-related data. For numerical data, enter a numeric value for intervals

- Select **OK**

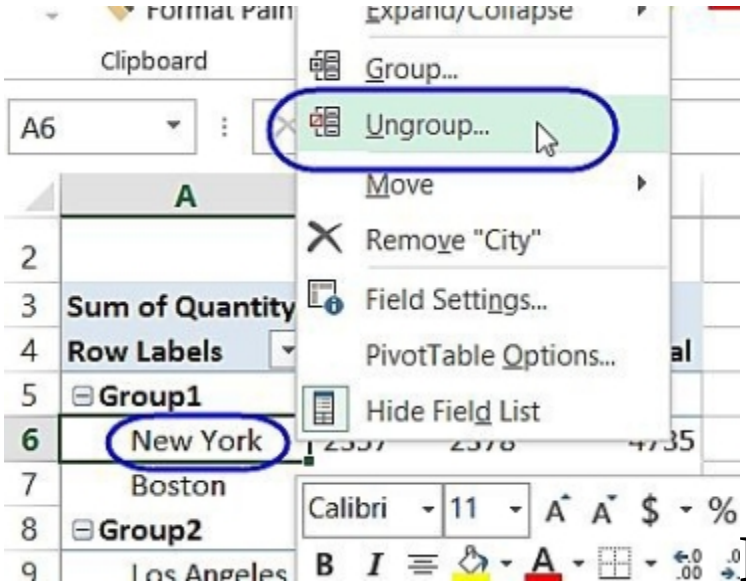
This puts only the selected item in a group.

Assigning Names to Groups

- Highlight the group to be named

- Navigate to the **Analyze** menu and select the option to configure the **Settings of the Field**
- Select **Custom Name** and edit it to your choice **Disbanding Data in a Group**

- Select any item in the group to be disbanded and make a right-click
- Select the **Ungroup** option from the resulting menu



POSSIBLE

ISSUES WITH DATA GROUPING

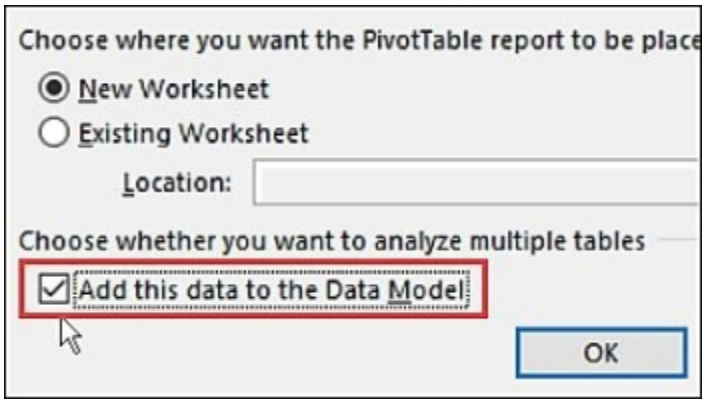
When attempting to put data into groups and Excel throws an error message of being unable to carry out the grouping action, this error may be as a result of the model of the data. This issue stems from when a pivot table is being created. Endeavor to deselect the **Data Model** box when creating your pivot tables

Processing)

to avoid creating an based Pivot Table.

OLAP (Online Analytical

This would make some functionalities or editing possibilities impossible in your pivot table.



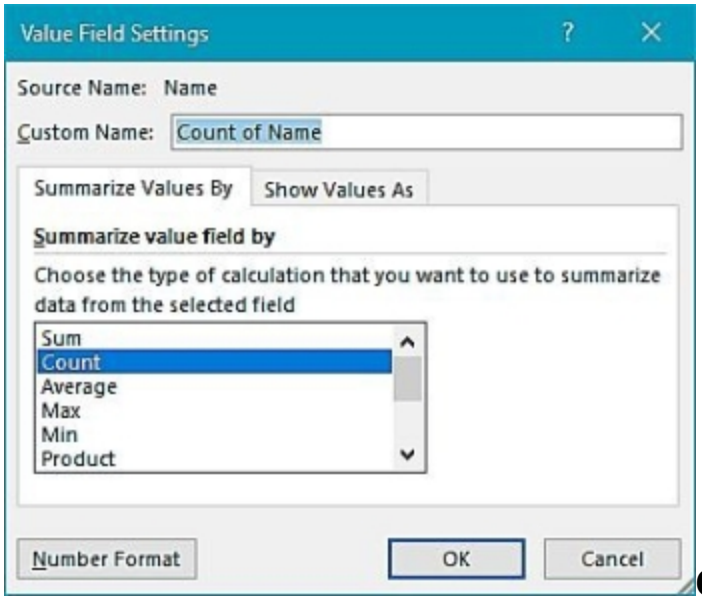
This error message can also arise as a result of an attempt to group data of different formats. For example, grouping a **Number** and **Text** data. Also, remember that numbers can be formatted into texts in Excel. Rectifying the issue requires you to format or convert the data to be grouped into similar formats.

THE COUNT SUMMARY FUNCTION FOR GROUPING DATA IN PIVOT TABLES

Consider an Excel table with the following data shown below; A pivot table can be used to put the data into groups with the **Count** summary function.

- Create a pivot table with the fields placed in the following areas as shown
- Configure the field for **Names** using the dialogue box for **Setting Field Values**

- Change the name of the field in the **Custom** box
- Select the tab for **Summarizing Values of the Fields** and choose



Count

Summary

Grouping the data or records in pivot tables makes it easier for you to locate them and work with them. Data grouping promotes data analysis and result findings. Text, number, and date data fields can be put into groups through different steps as explained in this chapter. An attempt to group data of different formats results in an error that would require converting these records into an identical format. The **Count** summary function also groups data by counting the number of times the record is made.

CHAPTER ELEVEN

CREATING CALCULATED FIELDS IN YOUR PIVOT TABLES

Calculated Fields vs Calculated Items

Calculated fields denote other fields in the pivot table while calculated items denote other items in the pivot table. Calculated items usually become one of the **items** in the pivot table, and they can be calculated using the **summation of items** in a similar field. They are displayed with other items in the area for **Columns** or **Rows** when configuring pivot tables. However, they are **not added** to the pivot table list for fields. Calculated items come with the following restrictions:

- Fields containing calculated items cannot be added in the area for

Filters

- Fields containing calculated items cannot be added multiple times in the area for **Values.**

Calculated fields on the other hand usually become one of the **fields** in the pivot table, and are used in the pivot table to **carry out calculations on other fields.** They can likewise be calculated using the summation of fields. They are displayed with other fields in the area for **Values** when configuring pivot tables and they are added in the pivot table list for fields.

Inserting Simple Calculated Items

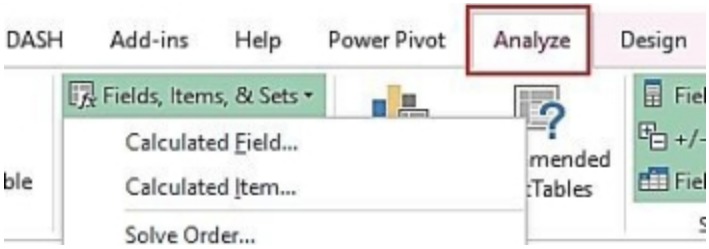
In the example below, to create a **Calculated Item** for **Sold** items that would include all the available status of Orders:

	A	B	C	D	E
3			Values		
4	Region	Order Status	Units	Total	
5	East	Backorder	262	3,373.46	
6		Canceled	60	299.40	
7		Pending	248	1,134.53	
8		Shipped	450	1,612.50	
9	East Total		1020	6,419.89	
10	Central	Backorder	88	355.12	
11		Canceled	88	535.13	
12		Pending	297	1,196.03	
13		Shipped	531	2,470.71	
14	Central Total		1004	4,556.99	

- Select any cell containing data in the pivot table
- Navigate to the **Analyze** menu under the tools tab for Pivot Table

- Select the drop-down option for **Fields, Sets, and Items** from the group for **Calculations**

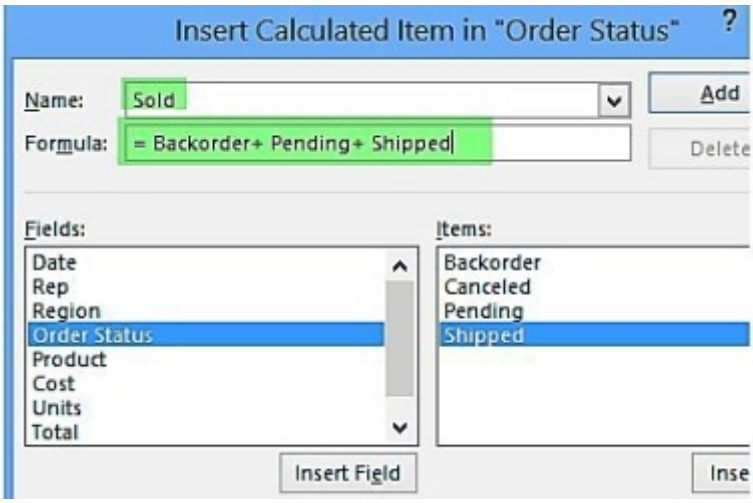
- Click on the option for **Calculated Items**



In the resulting dialogue box:

- Enter a name for the calculated item
- Enter your summation formula to include all the field items except

Canceled



- Select the **Add** option when done

The resulting pivot table shows all the field items replaced with the **Sold** calculated item

	A	B	C	D
1				
2				
3			Values	
4	Region	Order Status	Units	Total
5	East	Canceled	60	299.40
6		Sold	960	6,120.49
7	East Total		1020	6,419.89
8	Central	Canceled	88	535.13
9		Sold	916	4,021.86
10	Central Total		1004	4,556.99
11	West	Canceled	174	636.26
12		Sold	752	7,720.65
13	West Total		926	8,356.91
14	Grand Total		2950	19,333.79
15				

Inserting Simple

Calculated Fields

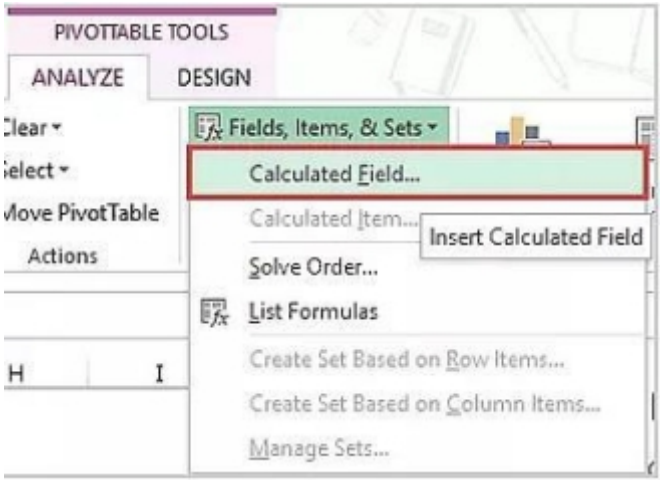
Using the pivot table data below:

	Customer	Sales	Profit
4	Casey's	29,15,900	6,99,201
5	Costco	66,29,700	16,16,486
6	Dollar General	24,32,900	5,65,422
7	Dollar Tree	28,21,300	6,44,954
8	Family Dollar	26,73,500	6,27,374
9	Foot Locker	22,57,800	5,33,421
10	JC Penney	23,94,000	6,25,566
11	Kohl's	23,97,300	5,83,060
12	Nordstrom	26,47,000	5,90,512
13	Office Depot	28,10,500	6,77,981
14	Staples	29,05,100	6,72,327
15	Target	29,77,600	7,06,384
16	The Home Depot	30,04,600	7,15,289
17	The Kroger	26,08,300	5,45,612
18	Walmart	40,57,000	9,86,670
19	Winn-Dixie	34,26,000	8,41,773
20	**Grand Total**	**4,89,58,500**	**1,16,32,032**

- Select any cell containing data in the pivot table
- Navigate to the **Analyze** menu under the tools tab for Pivot Table

- Select the drop-down option for **Fields, Sets, and Items** from the group for **Calculations**

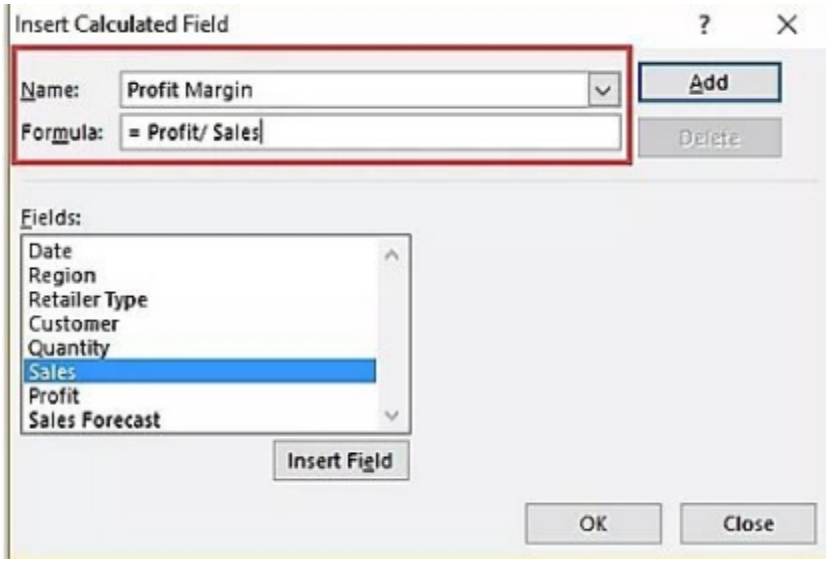
- Click on the option for **Calculated Fields**



In the resulting dialogue box:

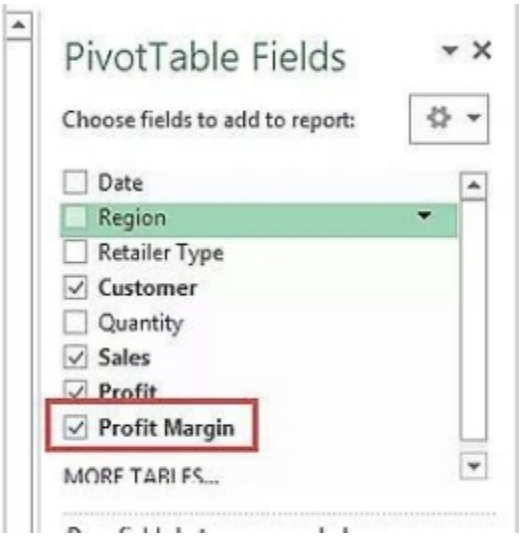
- Enter a name for the calculated field

- Enter a formula for the calculated field. The listed fields shown in the dialogue box can also be selected by doubleclicking on them



- Select the **Add** option when done

The resulting pivot table is then rendered to show the result of the calculated field.



This field also gets added to the list of fields for your pivot table.

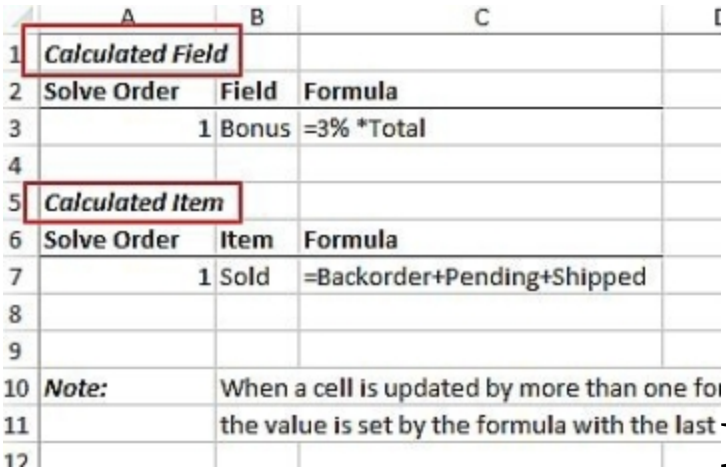
LISTING ALL FORMULAS IN A PIVOT TABLE

- Highlight any cell in the pivot table
- Navigate to the **Analyze** menu under the tools tab for Pivot Table

- Select the drop-down option for **Fields, Sets, and Items** from the group for **Calculations**

- Click on the option to **List your Formulas**

Excel immediately adds a new worksheet in your workbook on this selection. This new worksheet shows a list of all formulas in the pivot table.



	A	B	C
1	*Calculated Field*		
2	Solve Order	Field	Formula
3	1	Bonus	=3% *Total
4			
5	*Calculated Item*		
6	Solve Order	Item	Formula
7	1	Sold	=Backorder+Pending+Shipped
8			
9			
10	*Note:*	When a cell is updated by more than one fo	
11		the value is set by the formula with the last	
12			

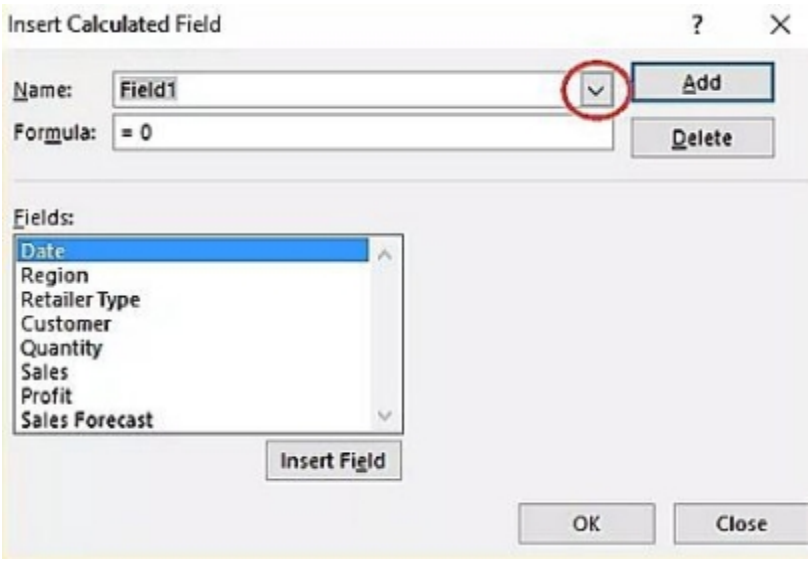
DELETING AND MODIFYING CALCULATED FIELDS AND ITEMS

- Select any cell containing data in the pivot table
- Navigate to the **Analyze** menu under the tools tab for Pivot Table

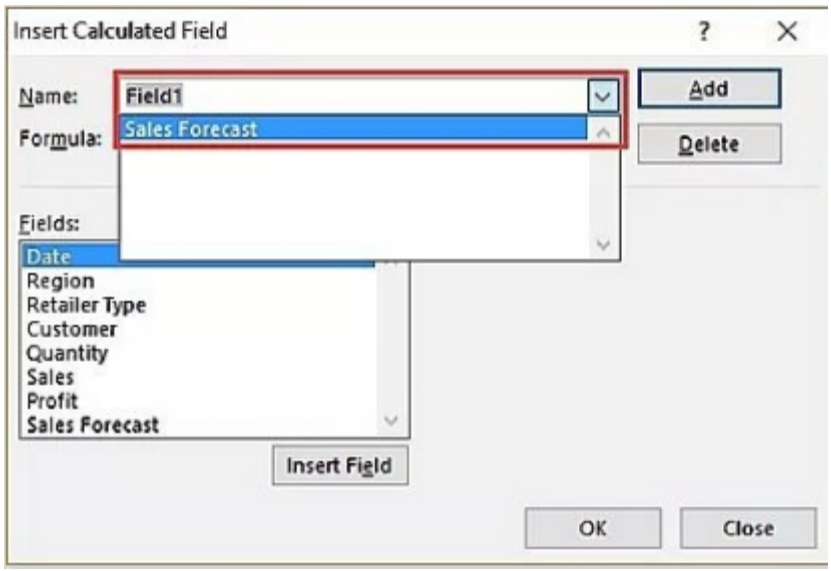
- Select the drop-down option for **Fields, Sets, and Items** from the group for **Calculations**

- Click on the option for **Calculated Fields** or **Calculated Items**
- In the resulting dialogue box, select the drop-down icon beside the

Name box to access the list of created calculated items or fields

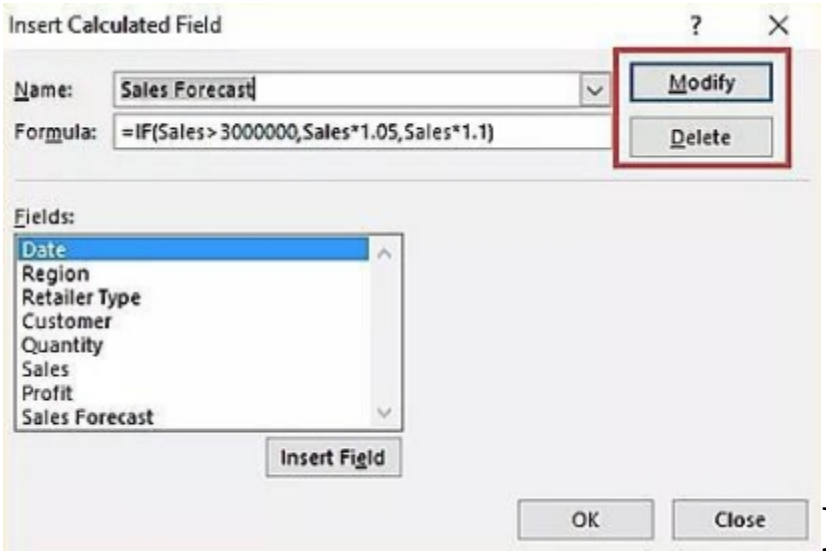


- Select the calculated field or item to be deleted or modified



For modification operation, edit the formula for the calculated field or item in the **Formula** box and then select the **Modify** button to save and effect your changes.

To delete the calculated item or field, select the **Delete** button after selecting the calculated field or item to be deleted.



EDITING HOW FORMULA ERROR MESSAGES ARE DISPLAYED

Just as in normal worksheets, errors occur in pivot tables and can be configured to show a certain value or message when they occur. You can as well completely hide them.

Configuring How Errors of #DIV/0! are Displayed

- Consider the pivot table below with the following errors:

Pivot Table - Sales Report

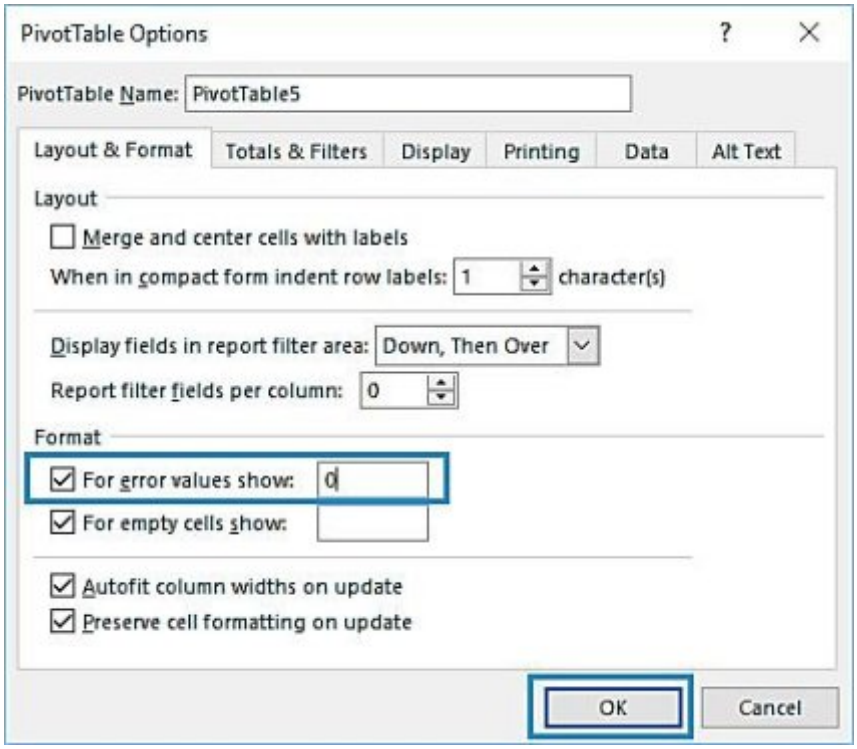
	Sum of Quantity	Sum of % of Total
⊟Store#1		
Chromebooks	20	8.73%
Laptops	84	36.68%
MacBooks	12	#DIV/0!
Store#1 Total	116	#DIV/0!
⊟Store#2		
Chromebooks	18	7.86%
Laptops	75	32.75%
MacBooks	20	8.73%
Store#2 Total	113	49.34%
Grand Total	**229**	**#DIV/0!**

- To configure how Excel displays these errors:
- Highlight any of the pivot table data cells and make a rightclick

•

Select the tab to access **Options** for the pivot table

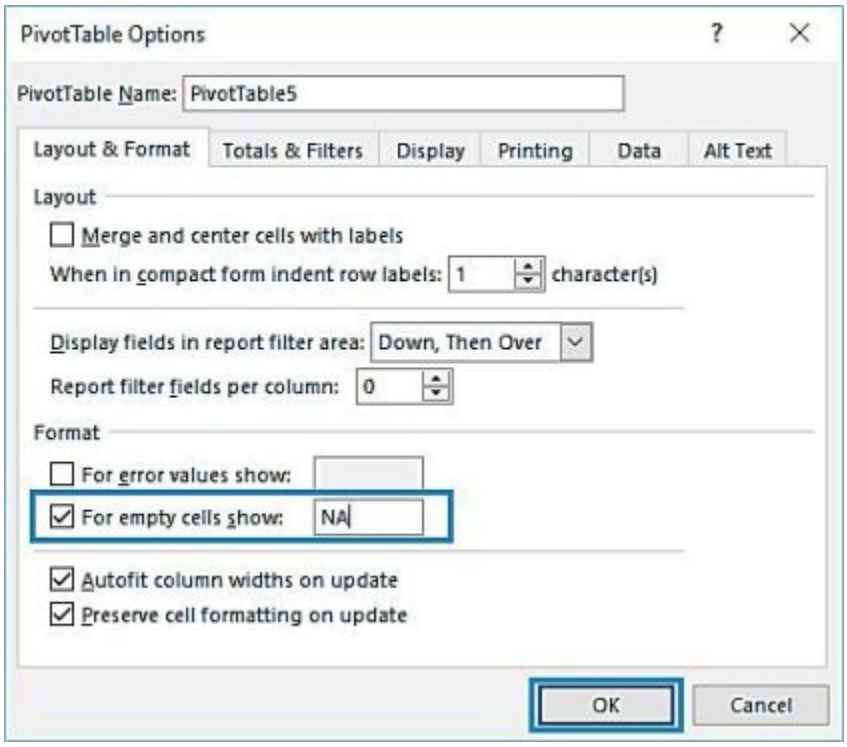
- In the **Options** dialogue box, navigate to the **Layout** menu
- Select the box for configuring how error values are shown
- Type in a **Space** to hide the error



- Select **OK**

Configuring How Errors of Blank Cells are Displayed

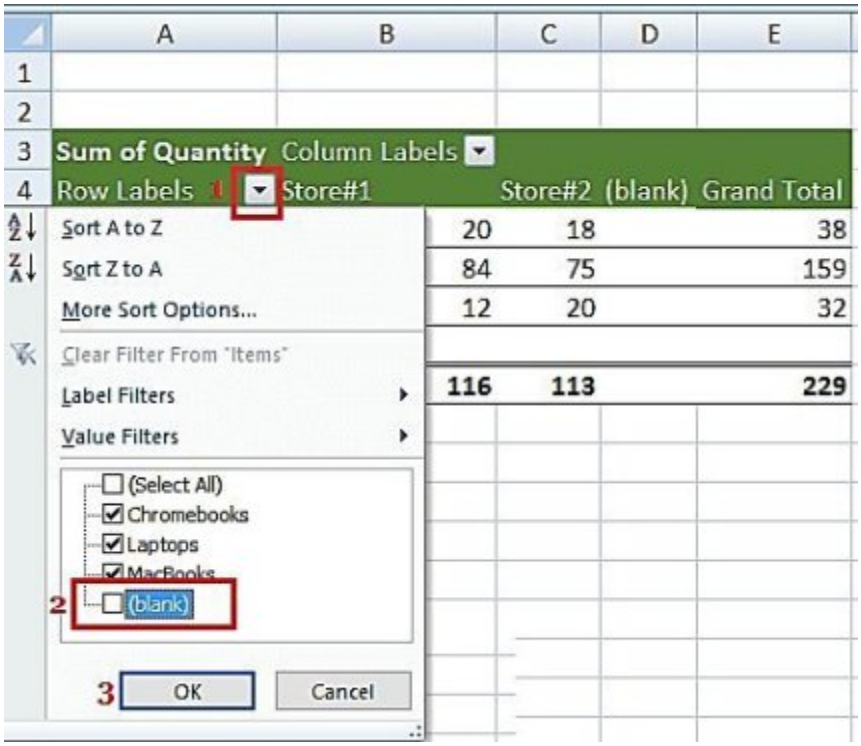
- Highlight any of the pivot table data cells and make a rightclick
- Select the tab to access **Options** for the pivot table
- In the **Options** dialogue box, navigate to the **Layout** menu
- Select the box for configuring how blank cells are displayed


PivotTable Options
PivotTable Name: PivotTable5
Layout & Format
Totals & Filters
Display
Printing
Data
Alt Text
Layout
Merge and center cells with labels
When in compact form indent row labels: 1 character(s)
Display fields in report filter area: Down, Then Over
Report filter fields per column: 0
Format
For error values show:
For empty cells show: NA
Autofit column widths on update
Preserve cell formatting on update
OK
Cancel

- Select **OK**

Hiding Blank Cells in Pivot Tables

- Select the drop-down icon beside the **Labels for Rows**
- Deselect the box for **Blank**



- Select **OK** to save the changes

It is advised that before you configure how errors are displayed in your pivot tables, you should first crosscheck your source data and formulas.

ADDING LOGIC FIELDS TO YOUR PIVOT TABLES

Logic fields can be added to your pivot tables using calculated fields. Logic fields use formulas with functions such as **THEN, IF,** etc.

Using the pivot table data below:

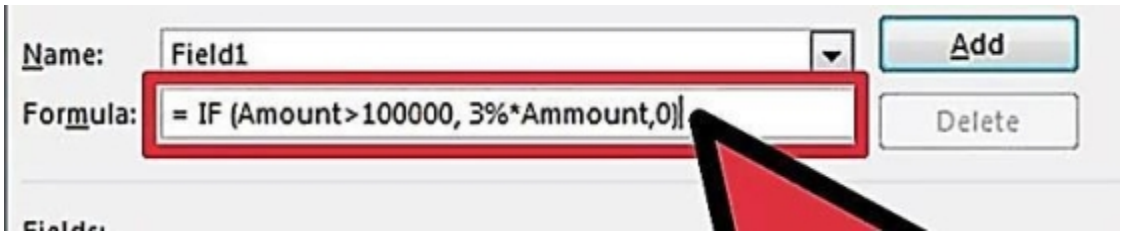
- Select any cell containing data in the pivot table
- Navigate to the **Analyze** menu under the tools tab for Pivot Table

- Select the drop-down option for **Fields, Sets, and Items** from the group for **Calculations**

- Click on the option for **Calculated Fields**

In the resulting dialogue box:

- Enter a name for the calculated field
- Enter a logic formula for the calculated field



- Select the **Add** option when done

Summary

Excel pivot tables allow you to add calculated fields and items that use values from your pivot data for their calculation. These calculated items or fields can be edited and deleted as explained in this chapter. Pivot tables also give you the flexibility of configuring how errors in the table are displayed using the **Options** menu for the pivot table. Calculation errors and blank cells can be either hidden or configured to show a certain message of your choice.

CHAPTER TWELVE

USING EXTERNAL FILES FOR CREATING PIVOT TABLES

Pivot tables can be created from imported or external files. They can serve as the data source of your pivot tables. Data can be imported from the following sources for your pivot table:

- A separate Excel workbook
- Microsoft Access database
- Microsoft SQL Server
- Analysis Services
- Windows Azure Marketplace
- OData Data Feed

Importing Data from a Separate Excel Workbook

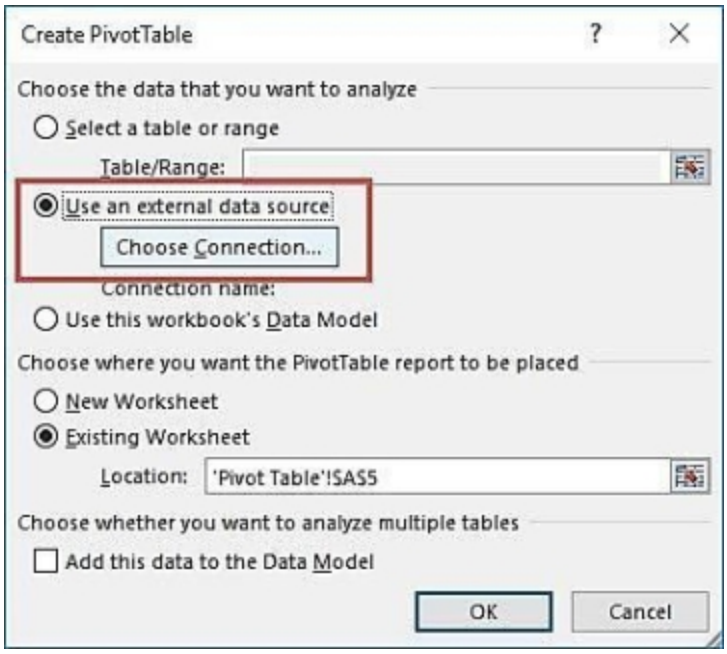
- In the workbook where the pivot table is to be created, navigate to the **Insert** menu

•

Select **Tables** and then the **PivotTable** option

- In the **PivotTable Creation** dialogue box, select the option for the pivot table to be created from an external source of connection

- Click on the button to **Choose a Connection**



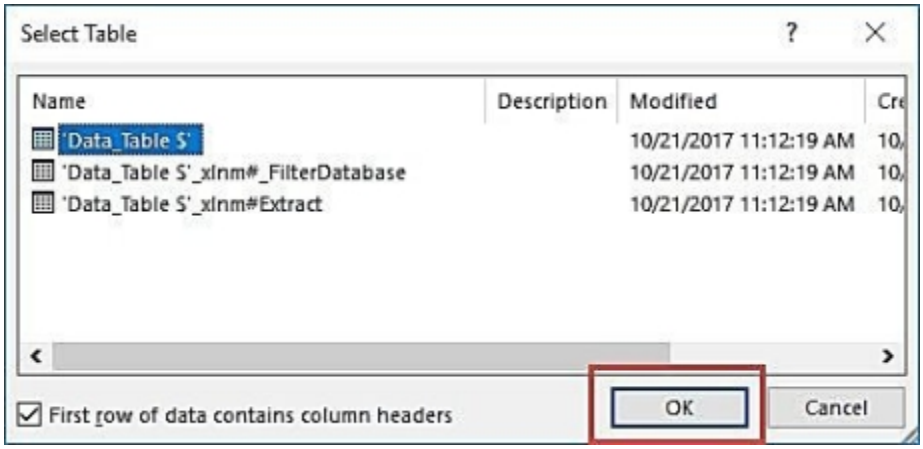
•

Select the option to **Browse** for additional sources

• This opens up your computer's **File Explorer.** From here, you can navigate to open required folders to select the source Excel workbook

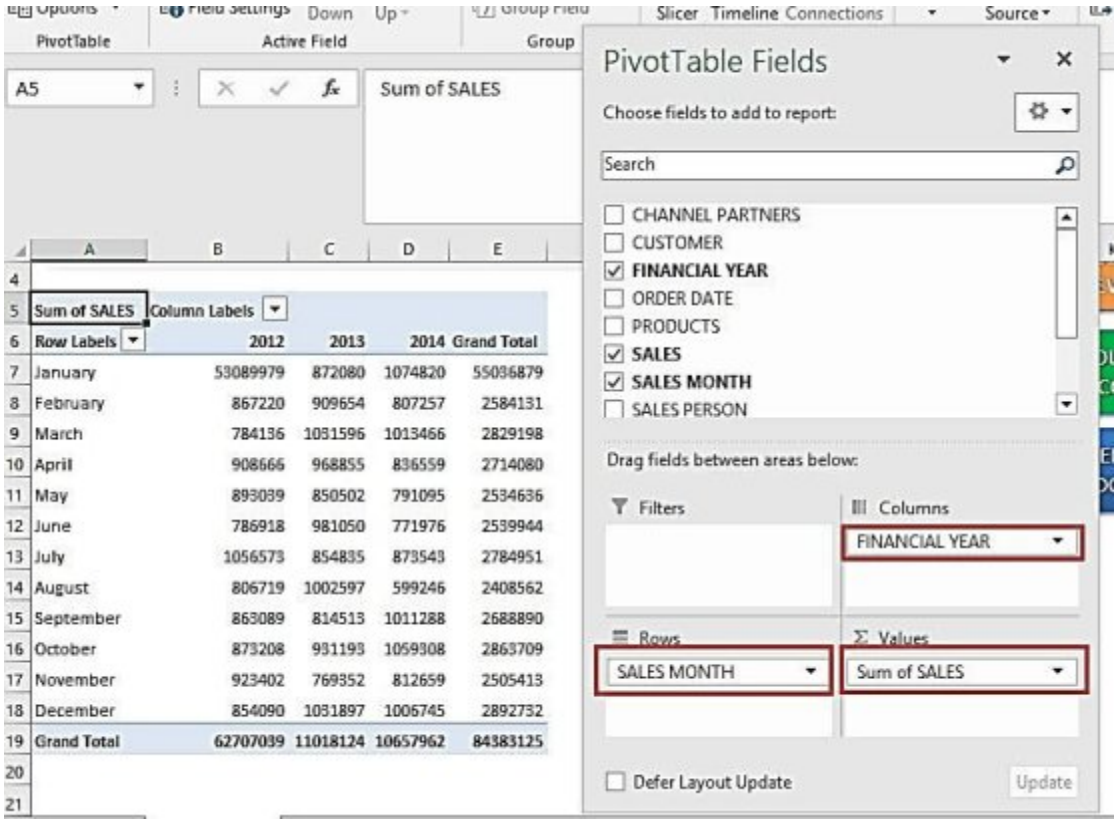
• Click on **Open** when selected

- Select the appropriate table option when the dialogue box for



Selecting Table comes up

- Select **OK** to close this dialogue box
- Select **OK** to close the **PivotTable Creation** dialogue box
- Place fields accordingly in their corresponding areas



The pivot table is then ready from this external data source.

Importing Data from Microsoft Access

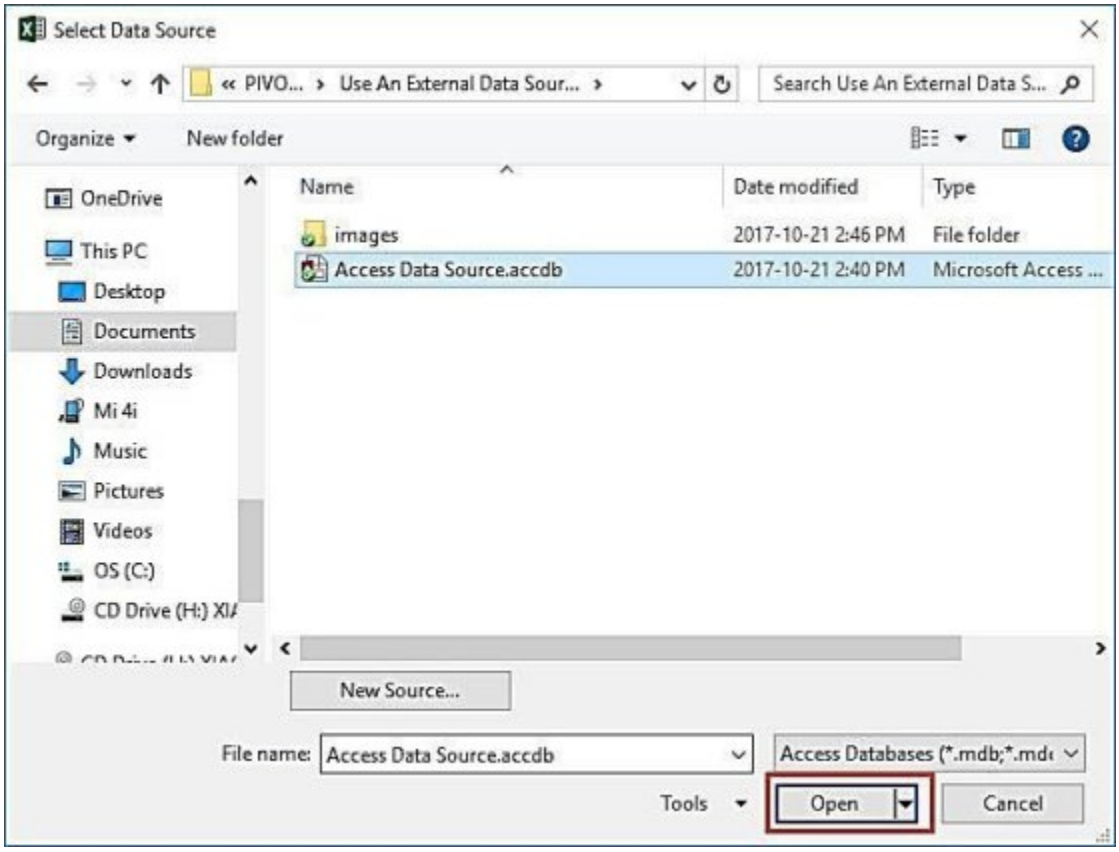
- In the workbook where the pivot table is to be created, navigate to the **Data** menu

- Click on the option for **Getting External Data**

•

Select **Access** from the available external sources of data

• This opens up your computer's **File Explorer.** From here, you can navigate to open required Access database folders to select the source Access file



- Click on **Open** when selected
- Select the **Report** option for the pivot table in the **Data Import**

dialogue box

- Select **OK**

•

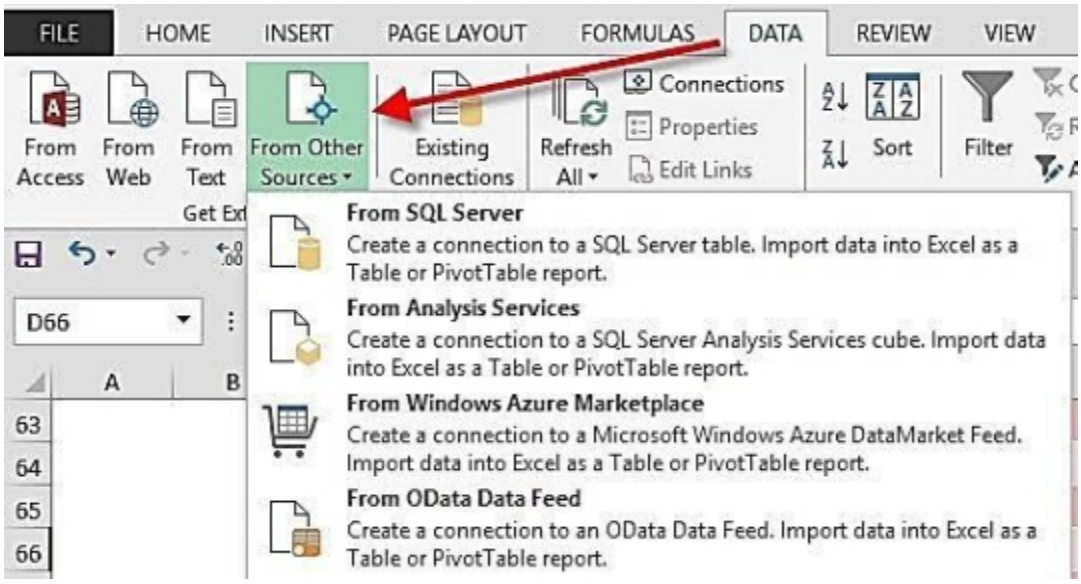
Place fields accordingly in their corresponding areas

The pivot table is then ready from this external data source. To use data from sources such as:

- Microsoft SQL Server
- Analysis Services
- Windows Azure Marketplace
- OData Data Feed

- Navigate to the **Data** menu and click on the option for **Getting External Data**

- Select the option to get data **From additional sources**

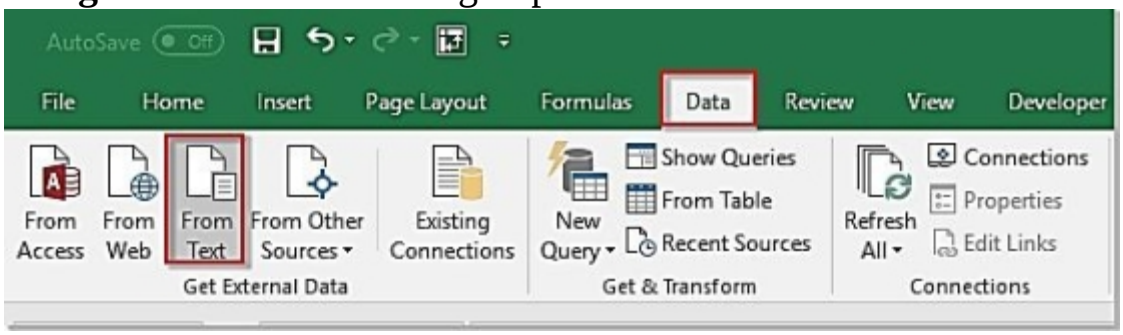


This selection shows these external locations which can then be selected and their corresponding dialogue boxes followed.

CREATING PIVOT TABLES FROM IMPORTED TEXT FILES

• In the workbook where the pivot table is to be created, navigate to the **Data** menu

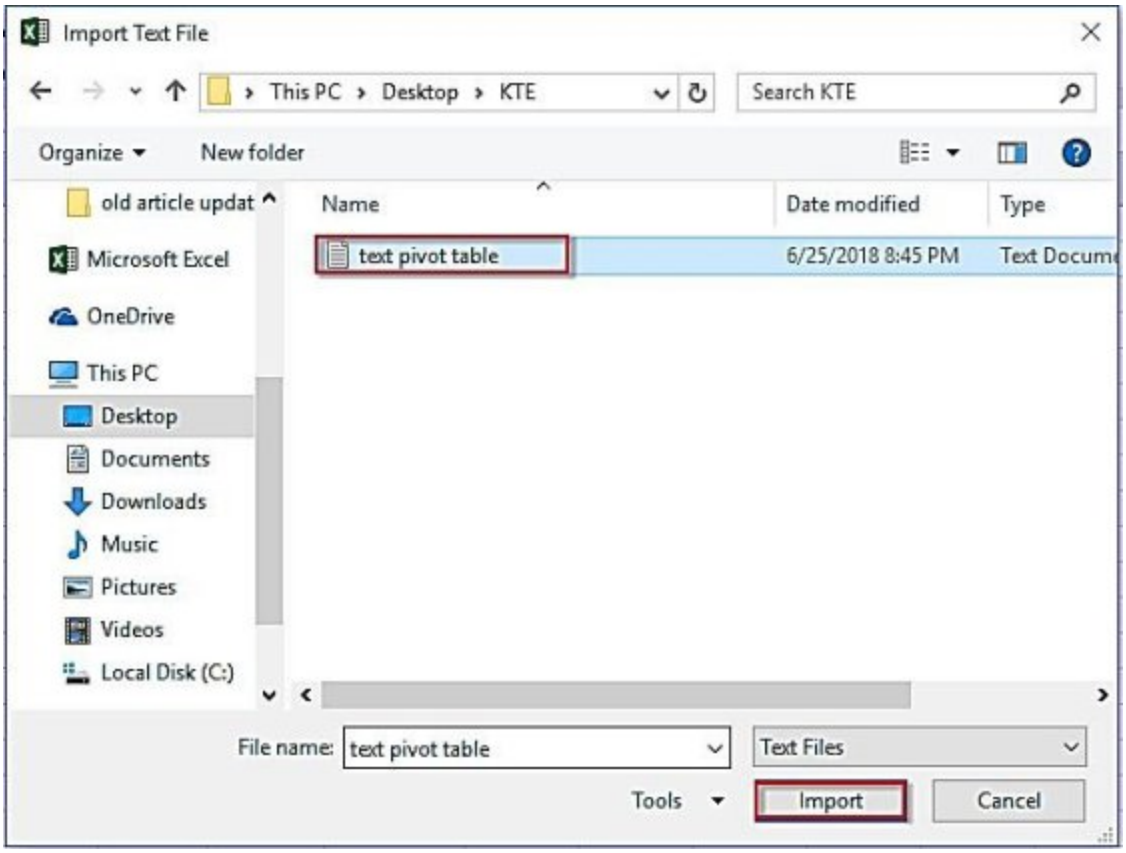
• Click on the option for creating the pivot table from a **Text** file in the **Getting External Data** menu group



•

Select **OK** in the resulting Microsoft Security dialogue box

• This opens up your computer's **File Explorer.** From here, you can navigate to open required folders to select the source Text file



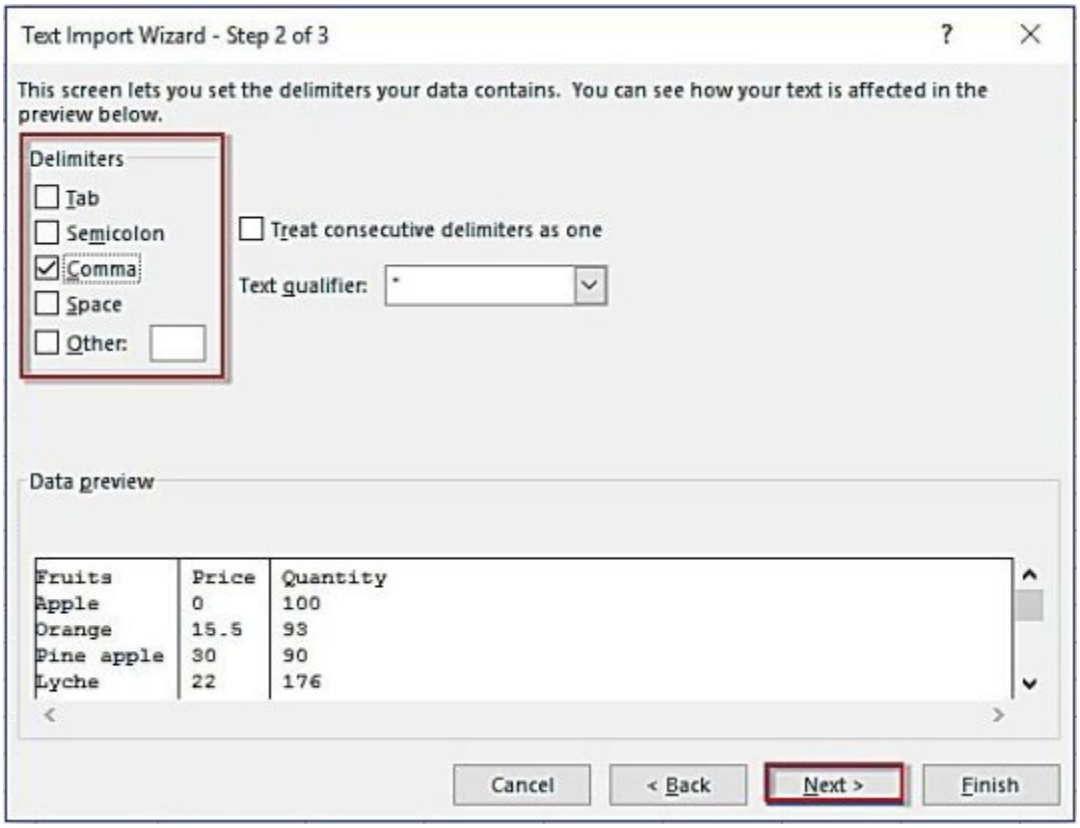
- Click on **Import** when selected

•

In the **Import Wizard for Text,** select the option for **Delimited**

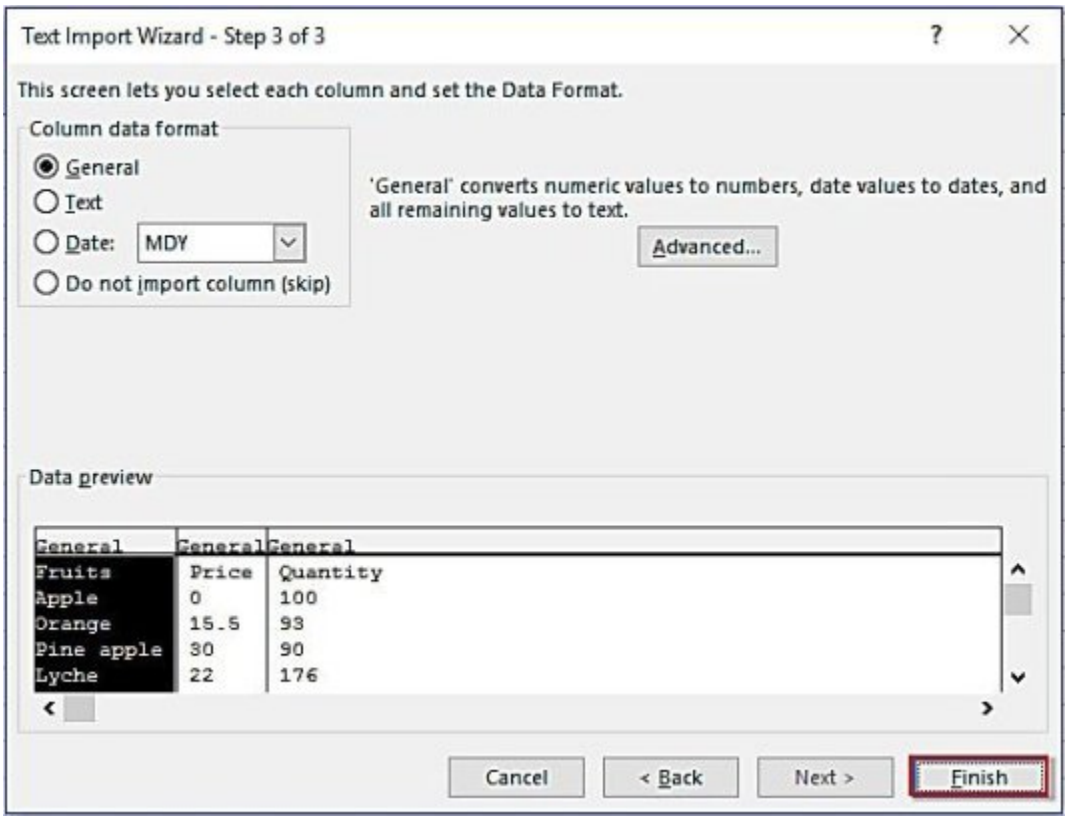
- Click **Next**

- In the next window, select the delimiter in your text file and click

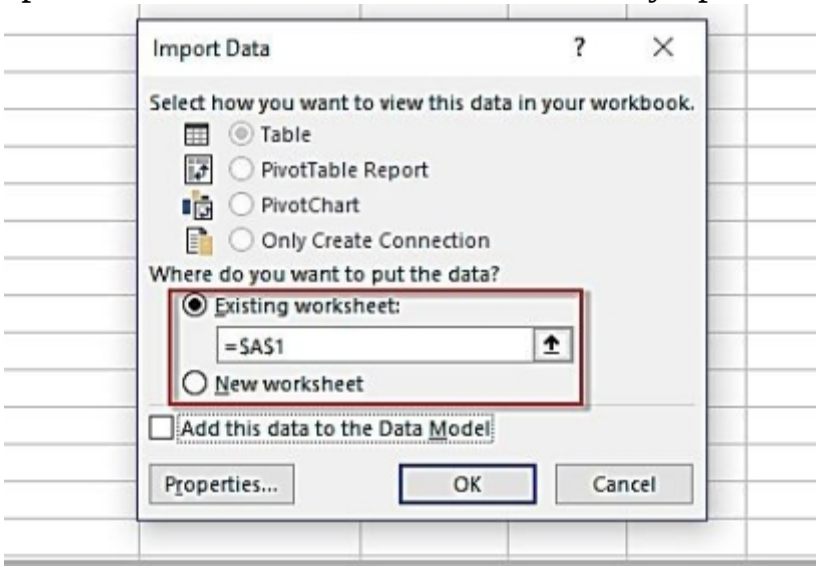


Next

- Select **Finish**


Text Import Wizard - Step 3 of 3
This screen lets you select each column and set the Data Format.
Column data format
General
Text
Date: MDY
Do not import column (skip)
'General' converts numeric values to numbers, date values to dates, and all remaining values to text.
Advanced...
Data preview
General General General
Fruits Price Quantity
Apple 0 100
Orange 15.5 93
Pine apple 30 90
Lyche 22 176
Cancel
< Back
Next >
Finish

• When in the **Data Import** dialogue box, select the option for the imported data to be created in the currently opened worksheet



• Select **OK**

This action completes the importation process of the text file, leaving the pivot table to be created.

• Navigate to the **Insert** menu and select **PivotTable**

• When in the **PivotTable Creation** dialogue box, select the option for the pivot table to be created in the currently opened worksheet.

• Place fields accordingly in their corresponding areas The pivot table is then ready from this external text data source.

CREATING PIVOT TABLES FROM NUMEROUS DATA SOURCES OR WORKBOOKS

This creation process requires **Power Query.** Ensure this add-on is installed in your Microsoft Excel application version.

- In the workbook where the pivot table is to be created, navigate to the **Data** menu

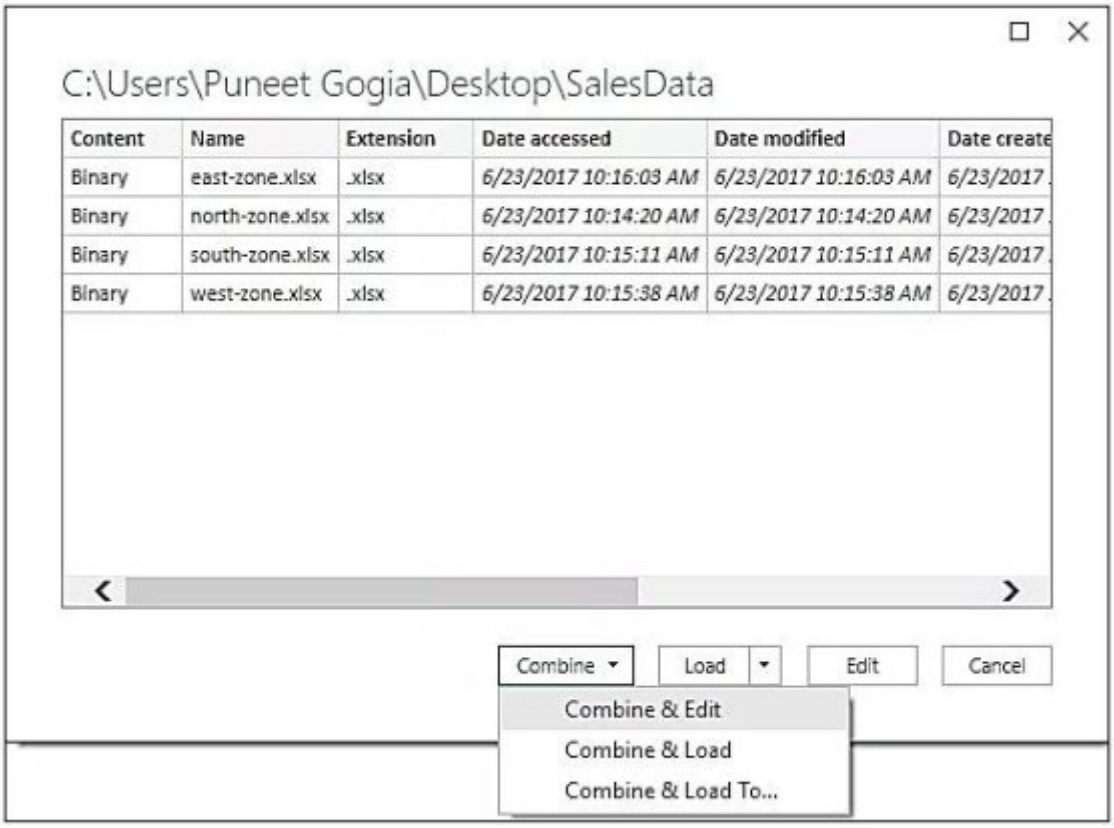
- Select the option for **Getting Transformation** and the **New Query**

•

Select the tab for creating **From a File** and then **From a Folder**

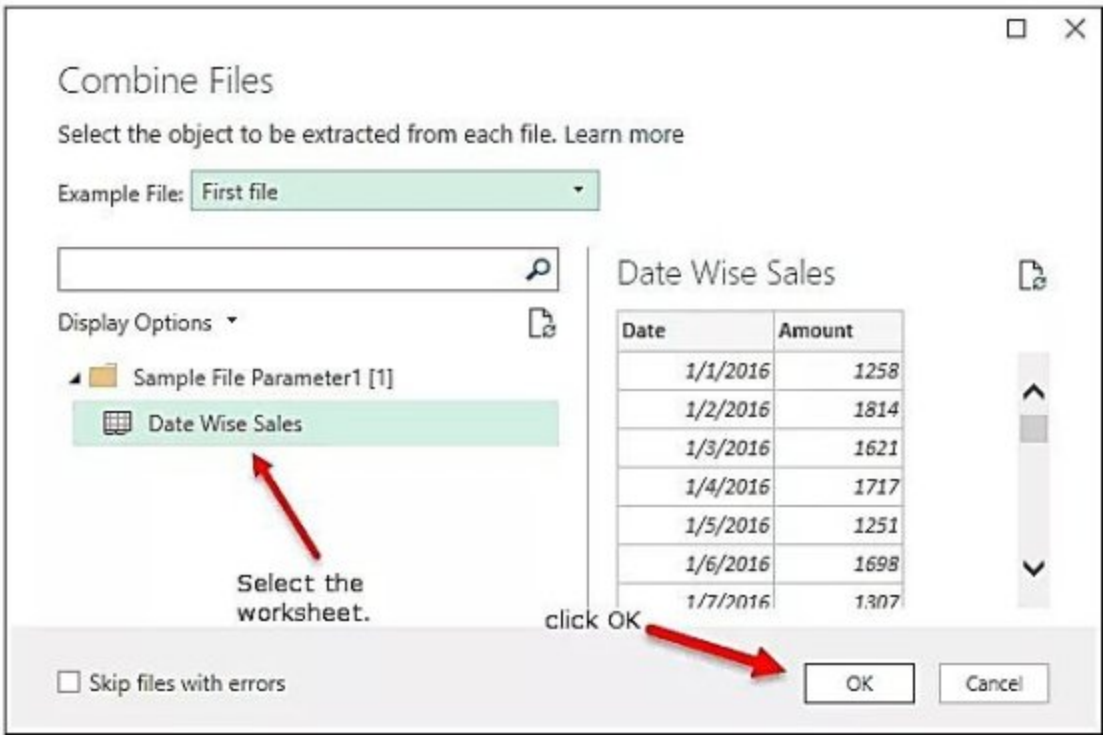
• In the **Folder** dialogue box, browse and select the folder containing all the files from which the pivot table would be created

• Select **OK** when done
• In the window for **Combining Files,** click on the **Combine** button

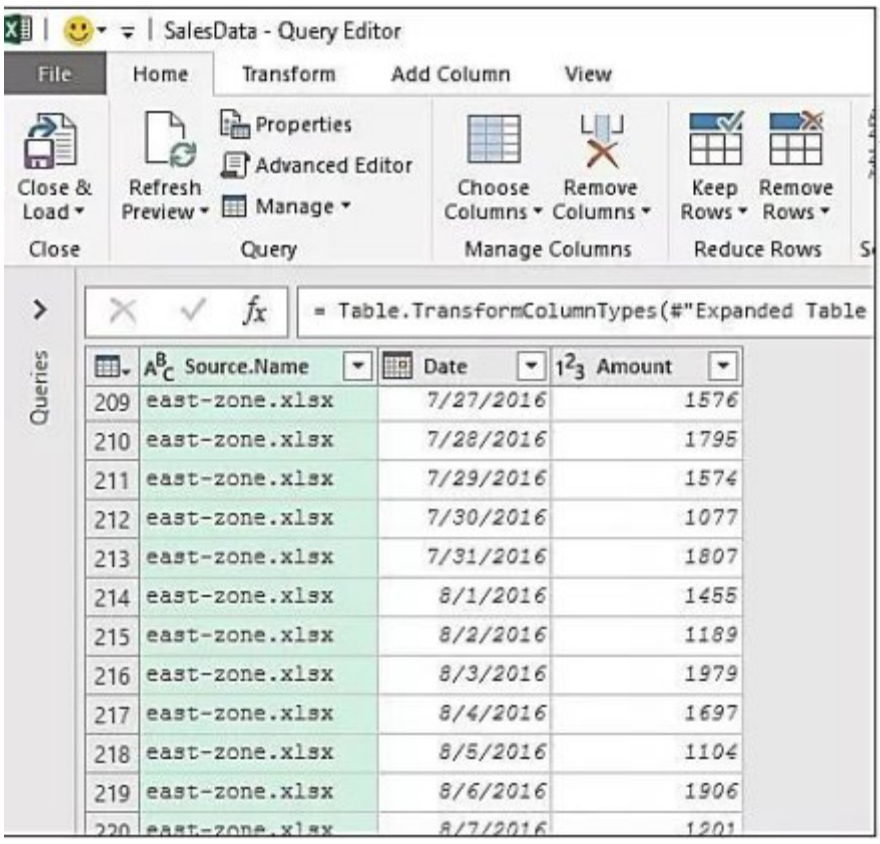


and select the **Combine and Edit** option

• Next, select the worksheet where all the data would be inserted and click **OK**



This action modifies the multiple data files in the **Editor for Power Query** as shown below:

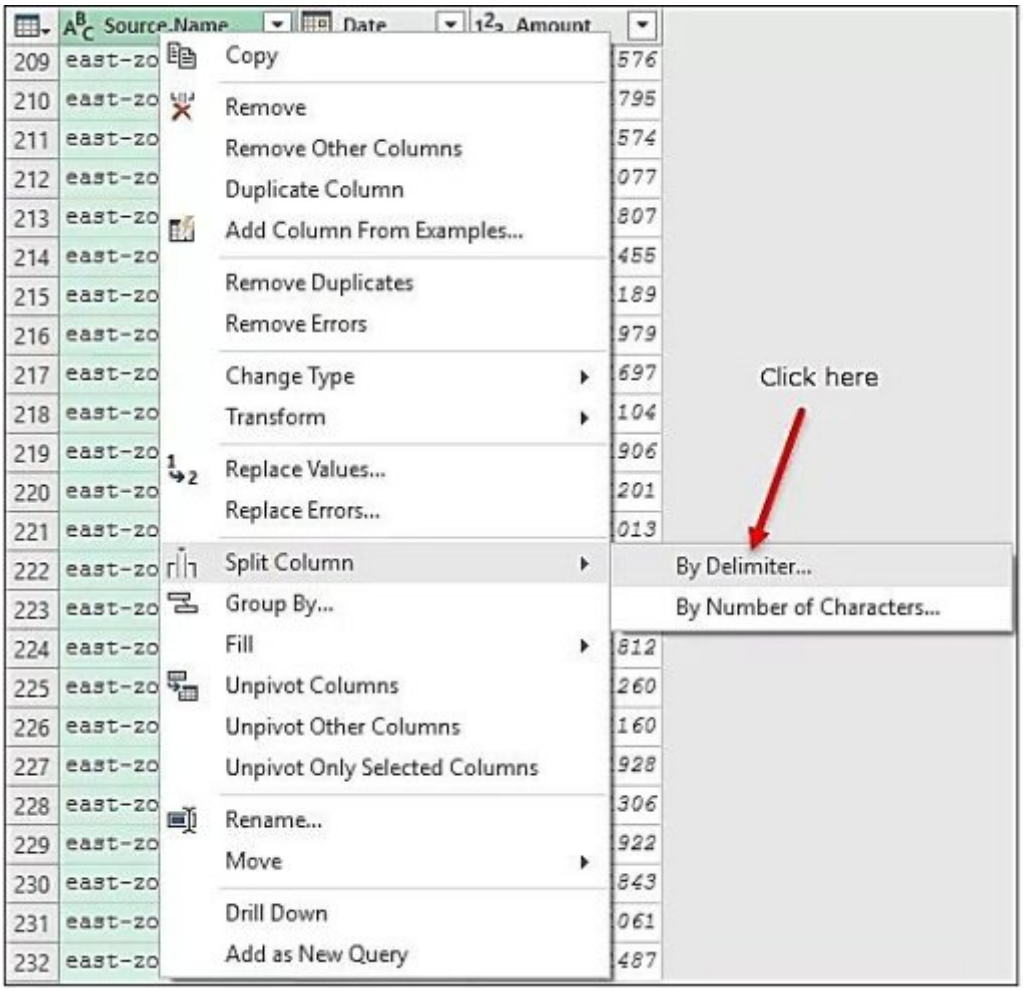


This data however needs to be formatted and prepared for use in a pivot table creation. For example, observe the column named **Source.name** in the illustration above that shows the source file of each data. This column is required to be removed.

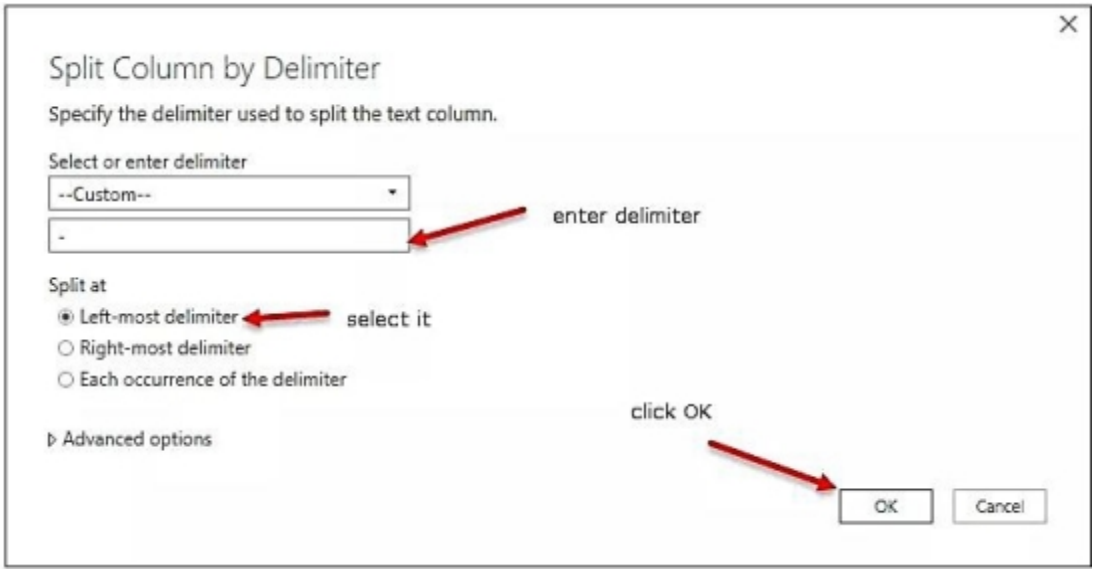
- Make a right-click on the **Source.name** column and select

the option for **Splitting the Column** on the resulting menu

- Select **Delimiter** from the next menu



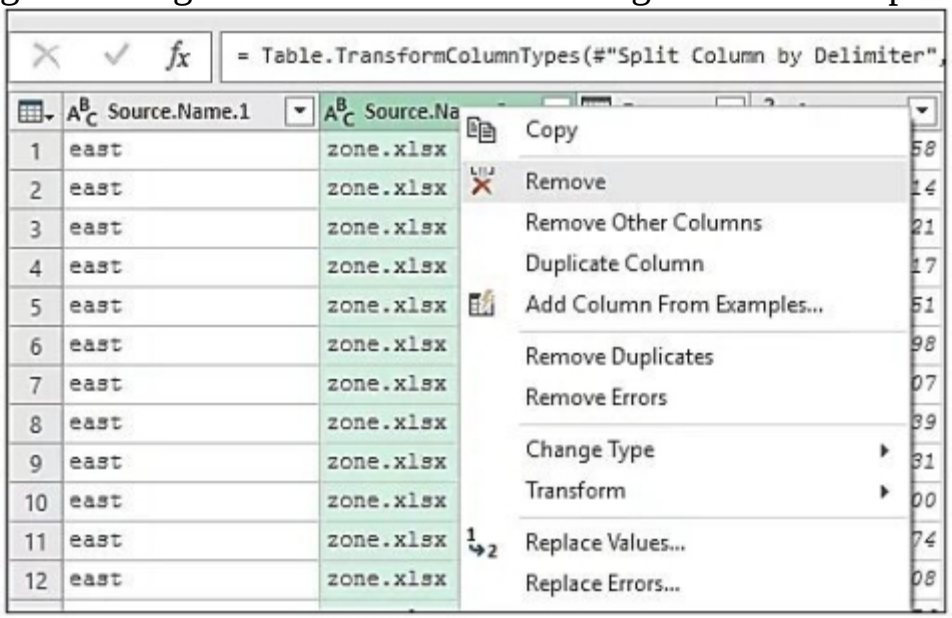
- When in the corresponding dialogue box:
- Choose **Custom** as the delimiter option
- Type in the “-” character as the delimiter
- Select the box for the leftmost delimiter option


Split Column by Delimiter
Specify the delimiter used to split the text column.
Select or enter delimiter
--Custom--
-
enter delimiter
Split at
Left-most delimiter
select it
Right-most delimiter
Each occurrence of the delimiter
click OK
Advanced options
OK
Cancel

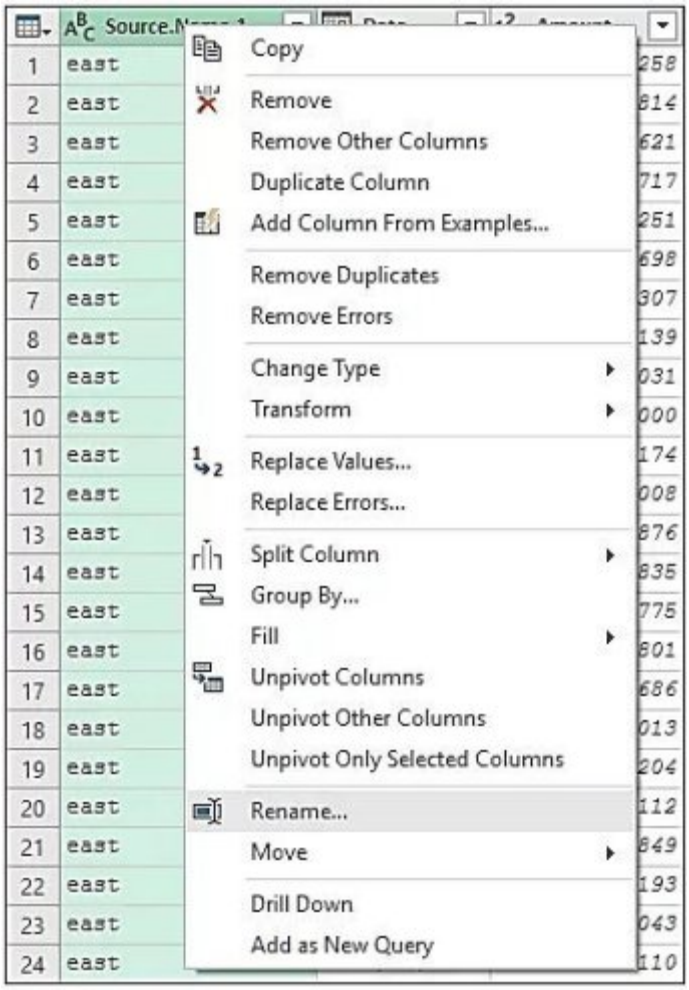
- Select **OK** to exit the dialogue box

The result of this split and delimiter operation is shown below

• You can now remove the next column having **zone.xlsx** data in it by right-clicking on the column and selecting the **Remove** option



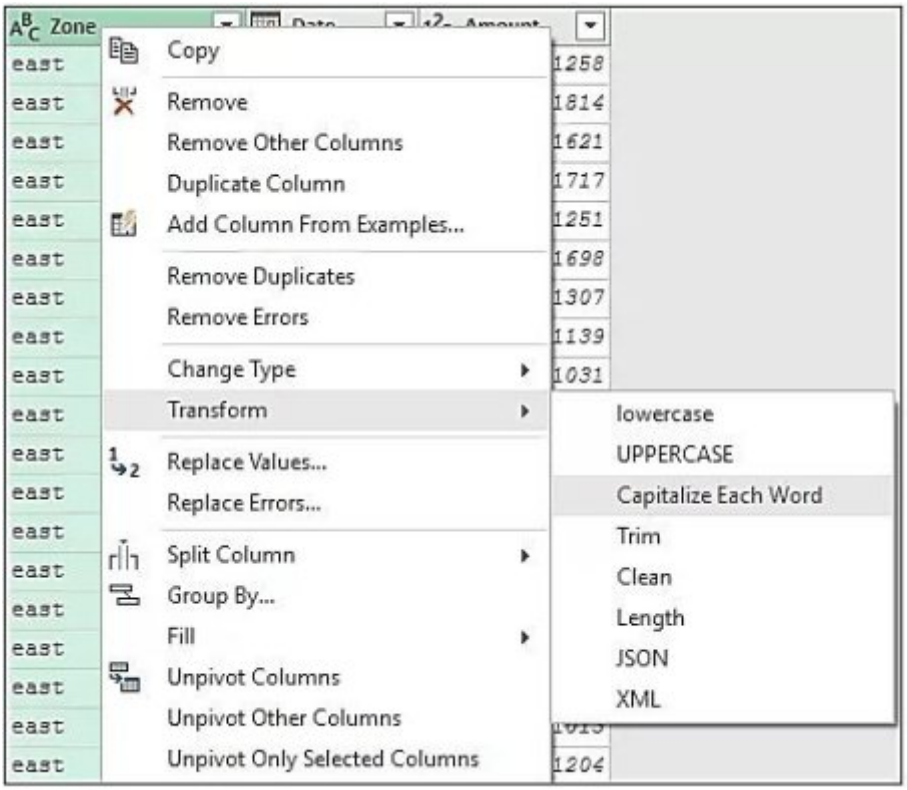
• Give the first column a new name by right-clicking on the column and selecting the **Rename** option



- To make the first character of that data in the newly named column capitalized:

- Select the column and make a right-click

- Select the **Transform** option and select the option for **Capitalizing Each Word**



This data from multiple files is now ready to be used to create a pivot table.

• Navigate to the ribbon menu and select the **Close and Load** option to close the **Editor for Power Query**

To insert a corresponding pivot table :

• Navigate to the **Insert** menu and select **PivotTable**

• When in the **PivotTable Creation** dialogue box, select the option for the pivot table to be created in the currently opened worksheet.

• Place fields accordingly in their corresponding areas The pivot table is then ready from this external text data source.

Refreshing Pivot Tables created from **Power Query** require you to use the **Refresh** button on the **Data** menu. This would initiate a refresh and update action on both the **Query (File Source)** and the **PivotTable.**

Points to Note When Creating Pivot Tables from Multiple File Sources

- Ensure all the files from which the pivot table would be created is in one folder

- Ensure all the files are in identical format
- Ensure the name of each file or worksheet is identical

- Ensure each file does not contain errors. The option for **Skipping Error Files** can be used if errors are found when combining the files.
- Ensure no workbook containing the worksheets to be combined is renamed.

Summary

Excel allows you to create pivot tables from external sources that you can import into your worksheet. Workbooks in your computer's File Explorer, files from Microsoft Access, or any database can all be imported after securing a connection to them. Microsoft Excel also has the feature of creating pivot tables from external Text files and multiple file sources or workbooks using the Editor for Power Query.

CHAPTER THIRTEEN

RECTIFYING DUPLICATE VALUE ENTRIES IN EXCEL PIVOT TABLES

Handling large data can result in data entries being duplicated in the data source. Duplicate data can be found and rectified in Excel pivot tables.

Finding and Rectifying Duplicate Data by Selecting the Data

Date	Sales Rep	Region	Amt
22/7/2020	Kathy	UK	654
22/7/2020	Claudia	Italy	874
23/7/2020	Kathy	UK	654
22/7/2020	Claudia	Italy	874
22/7/2020	Stella	France	852
23/7/2020	Kathy	UK	772
23/7/2020	Kathy	UK	654
22/7/2020	Claudia	Italy	874

Consider the table shown below with duplicate data entries:

- Create a pivot table using this data by navigating to the **Insert**

menu and selecting **PivotTable**

- When in the **PivotTable Creation** dialogue box, select the option for the pivot table to be created in the currently opened worksheet.
- Place fields accordingly in their corresponding areas as shown: To locate the duplicate data entries in the table:

- Highlight the pivot table
- Navigate to the **Home** menu and select **Conditional Formatting**

- In the drop-down menu, select the option for **Highlighting Rule of Cells**

•

Select the **Duplicating Values** option

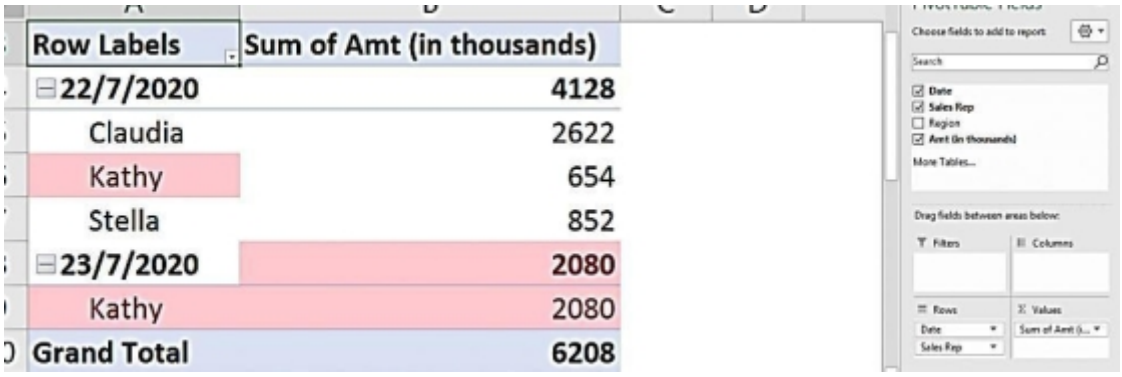
This launches the **Duplicate** dialogue box. In this dialogue box:

- Select the first drop-down arrow and choose **Duplicate**

- Select the second drop-down menu and configure the color with which the duplicate cells would be highlighted

- Select **OK**

Excel then highlights the cells having duplicate data entries

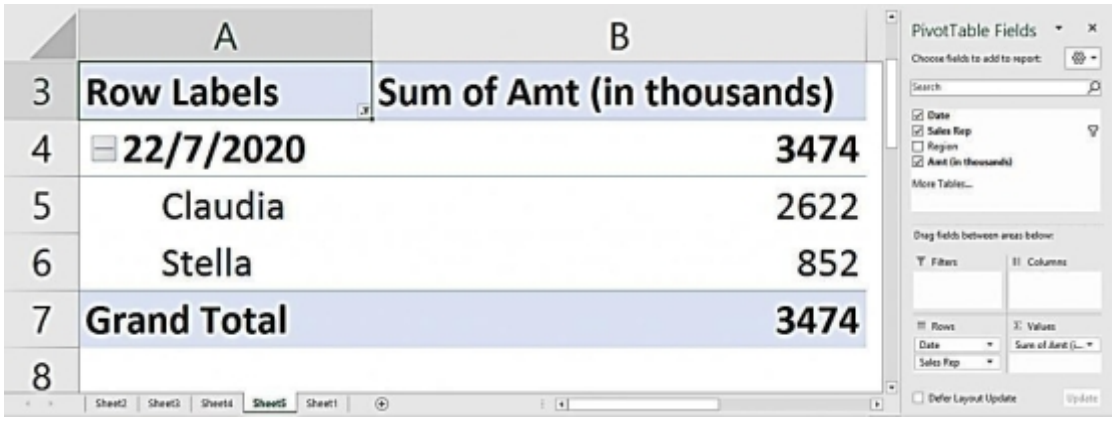


Row Labels	Sum of Amt (in thousands)
22/7/2020	4128
Claudia	2622
Kathy	654
Stella	852
23/7/2020	2080
Kathy	2080
Grand Total	6208

To rectify this duplicate entry:

- Click on the **Filter** icon beside **Labels for Rows** and
- Deselect the duplicate field

Note that this procedure would completely remove the field from the pivot table.



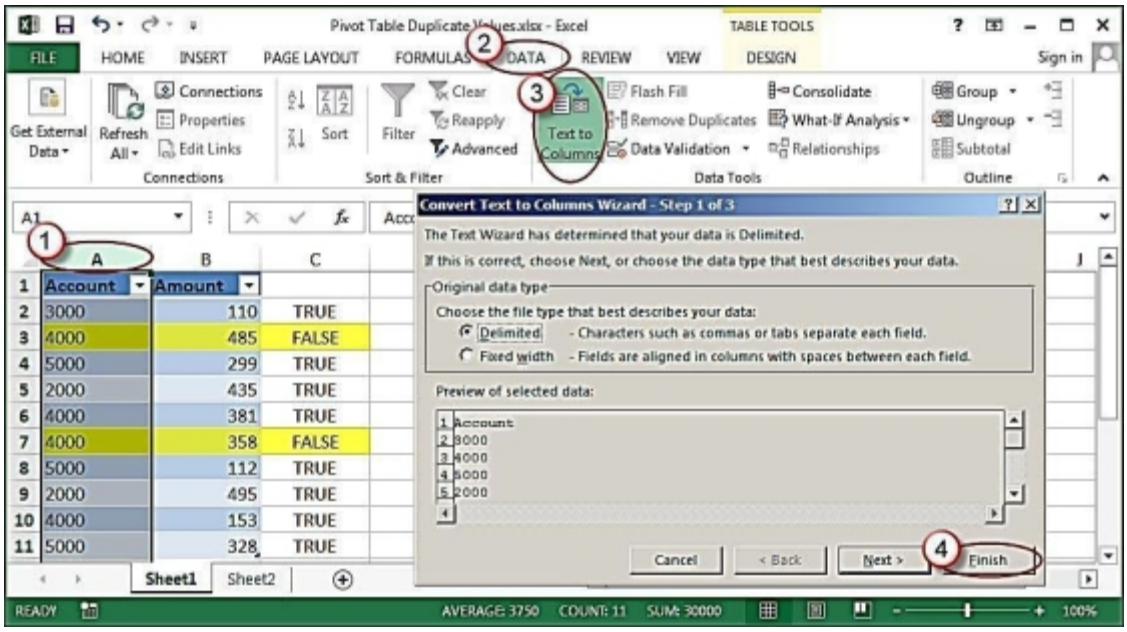
	A	B
3	Row Labels	Sum of Amt (in thousands)
4	22/7/2020	3474
5	Claudia	2622
6	Stella	852
7	Grand Total	3474
8		

Rectifying Duplicate Data from the Data Source

Another reason duplicate entries are seen in pivot tables is as a result of a single data having different formatting options. For example, data is entered as a number in one cell and as a text in another cell.

This can be rectified using the **Text to Column** setting.

- Highlight your data source
- Navigate to the **Data** menu and select the **Text to Column** option
- Choose **Delimited** as the type of data



- Select **Finish**

- On your pivot table, make a right-click on the table header and select the **Refresh** option

This action then removes and consolidates all duplicate data entries.

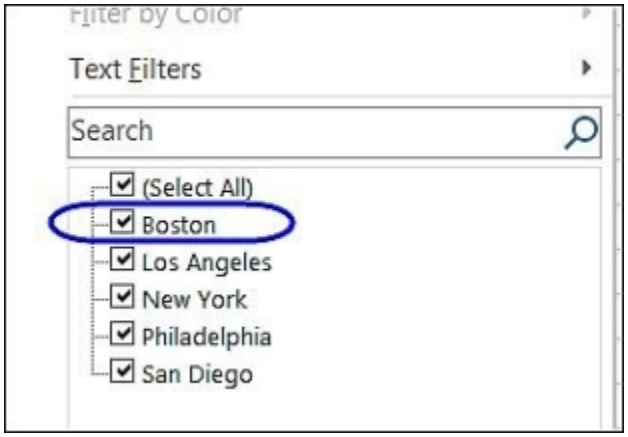
Locating and Rectifying Duplicate Data Using the LEN Function

The **LEN** function finds the number or length of characters entered in its argument. Looking at the pivot table example below, it would be observed that the record for the **Boston** region appears three times.

	A	B	C	D	E	F
1						
2	Region	East				
3						
4	Quantity	Categ				
5	City	Bars	Cookies	Crackers	Snacks	Grand Total
6	Boston	1621	2425	496	554	5096
7	Boston	84				84
8	Boston	23	90			113
9	New York	2575	1658	457	282	4972
10	Philadelphia	1860	1472	283	236	3851
11	Grand Total	6163	5645	1236	1072	14116

Using the **LEN** function to check if these data are similar, it was noticed that the result given by the **LEN** formula differs for each entry. Recall that the **LEN** function counts spaces as characters. To locate which of these data has spaces as its extra character would

require cleaning up the data source as explained in the previous section. You can also manually remove the excess space characters by erasing them in the source data. The filter drop-down menu in the labels for rows does not take spaces into account, so the **Boston** record appears as one in this list.



For large data, manually deleting these excess space characters may be time-consuming. The following steps provide an easier way out:

- First, filter the Excel source data table to show the records having duplicate entries

- Add a new column and name it appropriately as the column header

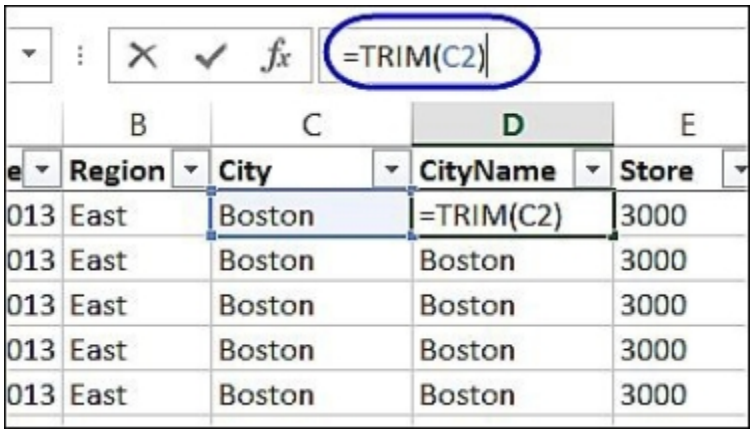
- In the cell below this new header, type in **BOSTON** with no extra space character
- Enter this data to the last row containing data by dragging down the cell fill handle
- Go to your pivot table, make a right-click on the table header and select the **Refresh** option
- Delete the initial field for **City** in the pivot table by making a right-click on the table header and selecting the **Remove** option
- Replace this removed field with the new column created in the data source table

Locating and Rectifying Duplicate Data Using the TRIM Function

The **TRIM** function removes excess space characters either at the end or in-between data entries. Using the Excel table below:

- First, filter the Excel source data table to show the records having duplicate entries

- Add a new column and name it appropriately as the column header
- In the cell below this new header, type in the formula syntax

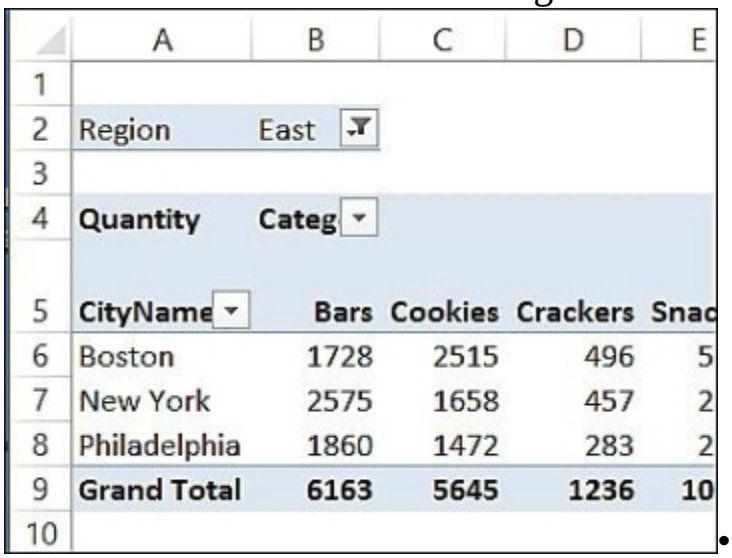


=TRIM(cell_reference)

• Enter this formula to the last row containing data by dragging down the cell fill handle

• Go to your pivot table, make a right-click on the table header and select the **Refresh** option

• Delete the initial field for **City** in the pivot table by making a right-click on the table header and selecting the **Remove** option

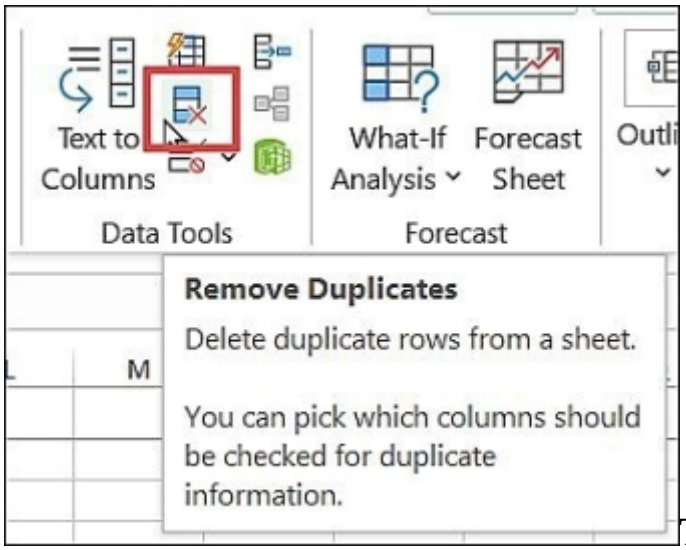


• Replace this removed field with the new column created in the data source table

Rectifying Duplicate Data Using the Option for Removing Duplicates

- Select the data with duplicate entries

- Navigate to the **Data** menu and select the option for **Removing Duplicates**



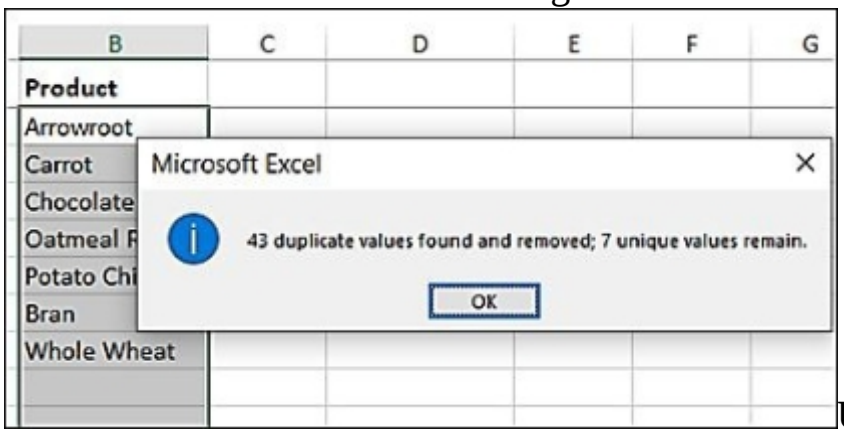
This launches the corresponding dialogue. In this dialogue box:

•

Select the column(s) having the duplicate data entries

- Select **OK**

Excel then returns a report message of the number of duplicate data removed. Select **OK** to exit the message box.



Using the COUNTIF Function for Locating Cells with Duplicate Data

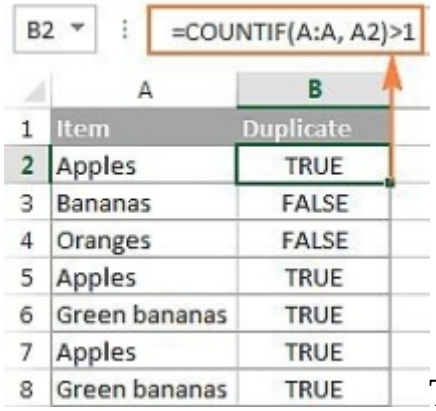
- For the data below, create a new column with an appropriate heading

- Enter the following formula syntax in the cell below this heading

=COUNTIF(cell_range, count_criteria)>1

- This formula would return **TRUE** for cells having values more than a count of **1.** Note that the **count_criteria** argument used has a duplicate entry

The formula returns results as shown below



	A	B
1	Item	Duplicate
2	Apples	TRUE
3	Bananas	FALSE
4	Oranges	FALSE
5	Apples	TRUE
6	Green bananas	TRUE
7	Apples	TRUE
8	Green bananas	TRUE

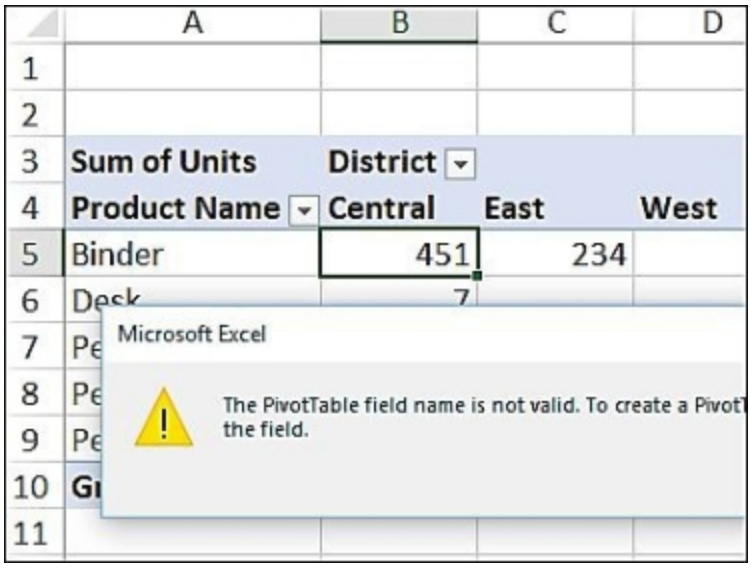
The filter option can then be used to deselect the duplicate values.

Summary

Duplicate data entries can make pivot table data unnecessarily large. These can be located and rectified using the methods explained in this chapter. Certain functions such as the **LEN, COUNTIF, and TRIM** functions for locating duplicate entries. Rectification of these duplicate data sometimes needs to be done from the data source and then refresh the pivot table. The **Filters, Removing Duplicates** dialogue box, and **Conditional Formatting** menu are used for removing duplicate data.

CHAPTER FOURTEEN

TROUBLESHOOTING AND RESOLVING COMMON ERRORS IN PIVOT TABLES Troubleshooting Field Name Errors



The error of a field name not being a valid error message appears when creating or refreshing pivot tables. The error occurs as a result of a wrong organization of the data source, for instance, if some

columns have no heading, it results in a field name error. Try any of the following procedures to fix the error:

- When creating pivot tables, in the **PivotTable Creation** dialogue box, ensure not to include blank cells or columns in the **Table Range** box
- In the data source from which the pivot table is created, check for hidden columns. If there are, include a heading to these columns
- Check for cells that are merged and separate them, then give each separated cell a heading
- Click on each column heading in the data source and check its content in the formula bar. Column headings may be longer than their allocated cell which may cause an overlap on another column heading.

Troubleshooting Overlapping Issues

This error message occurs when you have multiple pivot tables on one worksheet. If there are not adequate empty cells to accommodate these pivot tables, they then overlap and Excel throws an overlap error message. Fixing this error involves finding and locating the overlapping pivot table, but in cases of large data where numerous pivot tables have been created, locating the overlapping pivot table causing the problem may be difficult. In such cases, a macro can be used for getting a list of all created pivot tables in the workbook, along with their cell range or location, and their data sources.

3					
4	Quantity	Categ			
5	City	Bars	Cookies	Crackers	S
6	Boston	1621	2425	496	
7	Boston	84			
8	Boston	23	90		
9	New York	2575	1658	457	
10	Philadelphia	1860	1472	283	

Troubleshooting Duplicate Text Entries in Pivot Tables

These errors can be located and corrected using functions such as **LEN, TRIM,** and **COUNTIF.** Highlight cells containing duplicate text data entries and then delete them manually or filter them from view. More on solving this error were explained in Chapter Thirteen.

2			
3	Category	Product	UnitPrice
4	⊟Bars	⊟Banana	2.27
5		⊟Bran	1.87
6			1.87
7		⊟Carrot	1.77
8			1.77
9			1.77
10	⊟Cookies	⊟Arrowroot	2.18
11			2.18
12		⊟Chocolate Chip	1.87
13			1.87

Troubleshooting Duplicate Number Entries in Pivot Tables

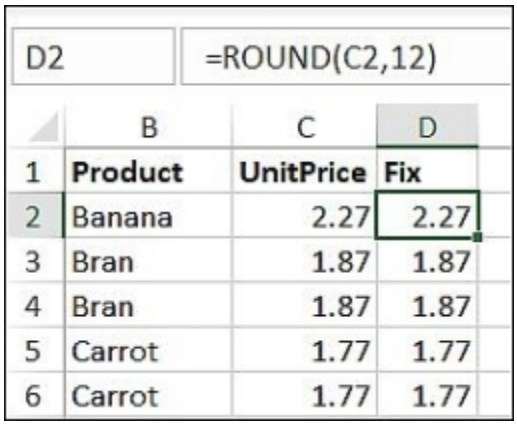
Duplicate number entries can be rectified using the **ROUND** function to configure numbers into similar decimal places. Using the Excel table below:

- First, filter the Excel source data table to show the records

having duplicate entries

- Add a new column and name it appropriately as the column header
- In the cell below this new header, type in the formula syntax

=ROUND(cell_reference, decimal_places)



D2	=ROUND(C2,12)		
	B	C	D
1	**Product**	**UnitPrice**	**Fix**
2	Banana	2.27	2.27
3	Bran	1.87	1.87
4	Bran	1.87	1.87
5	Carrot	1.77	1.77
6	Carrot	1.77	1.77

- Enter this formula to the last row containing data by dragging down the cell fill handle
- Go to your pivot table, make a right-click on the table header and select the **Refresh** option
- Delete the initial field in the pivot table by making a rightclick on the table header and selecting the **Remove** option
- Replace this removed field with the new column created in the data source table

Troubleshooting Refreshing Errors in Pivot Tables

Although pivot tables do not refresh automatically, you can, however, set your pivot tables to refresh when you open the workbook they are saved in.

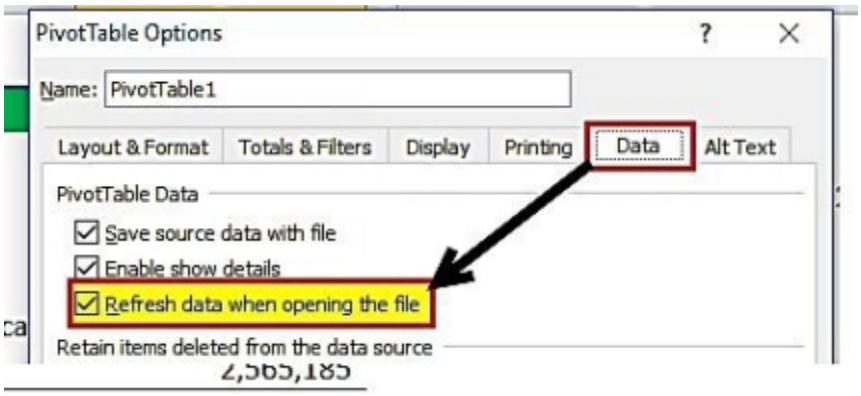
- Select any cell in the pivot table; navigate to the **Options**

menu from the **Tools for PivotTable** tab

•

Select the drop-down menu for **PivotTable** and select **Options**

- In the **Options** dialogue box, select the **Data** menu
- Select the box for refreshing the pivot table on opening the



workbook file

- Select **OK** to save the changes

Troubleshooting Refresh Actions Disrupting the PivotTable Layout

- Select any cell in the pivot table; navigate to the **Options** menu from the **Tools for PivotTable** tab

- Select the drop-down menu for **PivotTable** and select **Options**
- In the **Options** dialogue box, select the **Layout** menu

•

Select the box for preserving the table format on refresh

- Select **OK** to save the changes

Troubleshooting Pivot Tables not Displaying Data

- Select any cell in the pivot table and make a right-click
- Select the option for editing the **Settings of the Field** for the table
- Select the **Layout and Print** menu in the resulting dialogue box

- Select the box for displaying items without data
- Select **OK** to save the changes

Troubleshooting the Sum of Values Malfunction

The presence of empty cells in the selected data field makes Excel consider the field as a text field, therefore it uses **Count** as the summary function. Check your data source of empty cells within the said field and edit accordingly. Refresh your pivot table afterward.

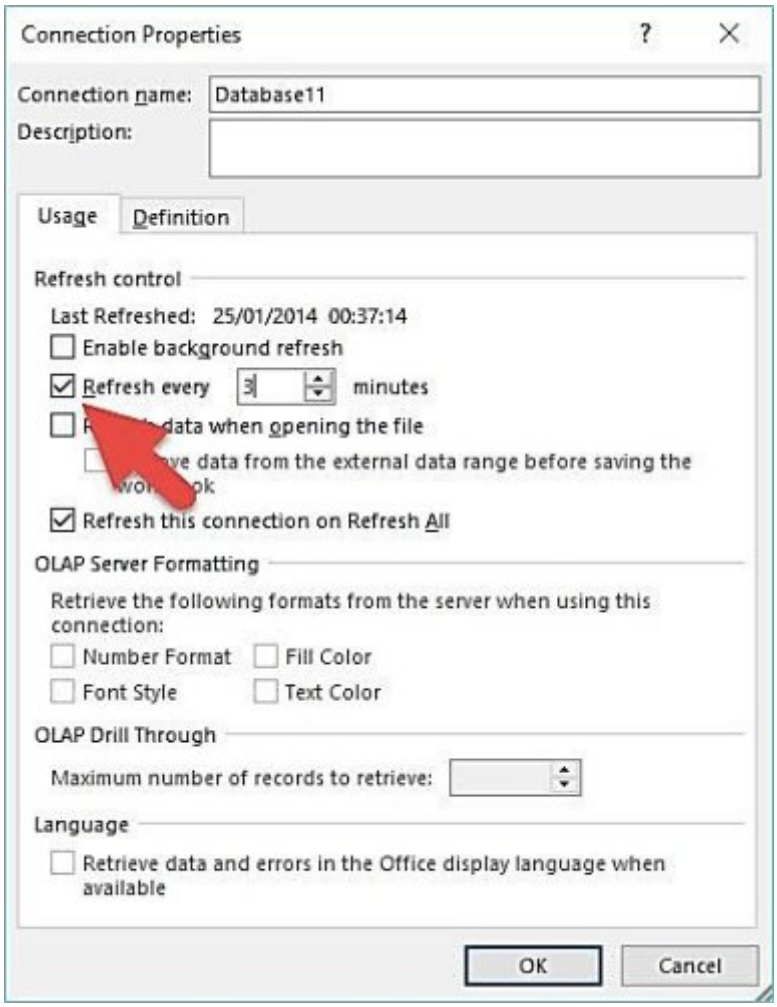
Cells formatted as texts, though containing numbers are also a cause of the **Sum** summary function not functioning. Check your data source and format the field to numbers. Refresh your pivot table afterward.

Automatically Refreshing Excel Pivot Tables after a Set Time When your pivot table is connected to external data, you can set the pivot table to refresh itself after a set time.

- Select the pivot table and navigate to the **Data** menu
- Select **Properties** in the **Connections** menu group

- This action launches the **Properties of the Connection** dialogue box
- Select the option for the pivot table to be refreshed at a specified time

- Enter a number value for minutes or use the down or up buttons



- Select **OK** to apply changes

Summary

However easy it may be to use Excel pivot tables, there are times errors are encountered. This chapter discussed how you can troubleshoot common errors in pivot tables. Errors of the name field, duplicate errors, the sum of value malfunctioning, pivot table refresh errors, etc. were examined. Pivot tables connected to an external data source can be set to refresh at a specific time in the **Connections** dialogue box to keep the table constantly updated.

CONCLUSION

Though Excel pivot tables and dashboards are robust and packed with functionalities, they are easy to navigate and use. Pivot tables alongside dashboards help include and display further data with features not present in the usual Excel tables from which they are created. With filters, summary functions, and slicers, users can create dynamic dashboards that show only selected data. Security measures are also made available for your pivot tables, dashboards, and data sources.