Module 1. Introduction To Microsoft Excel



Data has become an interesting part of every organization and company. It is needed to derive business insights and make informed decisions that will increase the productivity and revenue of the business. However, the ability to do these depends on two main factors: the ability to analyze the data using different technical tools and software and the ability to understand patterns and make essential decisions.

While the latter tends towards critical thinking and soft skills, the former pretty much deals with tools and software to analyze the data. In fact, transforming, analyzing, and organizing data using relevant tools and software is the first step to transforming raw data into a state where it can drive decision-making and enhance productivity and outcome. And when it comes to transforming, analyzing, and organizing data, a few tools provide these functions effectively, one of which is Microsoft Excel.

In fact, Microsoft Excel is arguably the most common tool for analyzing and organizing data. However, that’s not all. MS Excel has loads of other functions that apply to every organization,

company, and business, both small and large. We will cover all of these functions and uses, but let's set the ball rolling with some important definitions.

1.1. What is Microsoft Excel?



Summary of Excel 2019 - Beginner

Simply, Microsoft Excel is a spreadsheet program, a collection of columns and rows that form a table, used for recording and analyzing statistical and numerical data. MS Excel helps you perform different operations like calculations, pivot tables, graph tools, and macro programming, among many others.

It is compatible with multiple OS like Windows, macOS, Android, and iOS. Microsoft Excel consists of 1048576 rows and 16384 columns; a row and column together make a cell. Each cell has an address defined by column name and row number example, A1, D2, etc. This is also known as a cell reference.

1.2. Why Should You Learn Microsoft Excel?

Basically, everyone deals with numbers, either directly or indirectly. You have expenses to pay for, income to calculate, and other things to account for. For you to spend wisely and

productively, you need to track and monitor your spending. You need to know your income vs. expenditure. Microsoft Excel is your go-to tool when you want to record, analyze, and organize numerical data. Moreso, having basic knowledge of Excel is gradually becoming one of the requirements in job interviews, especially if you are applying for roles ranging from accountant to receptionist, human resources to administration departments, etc. You will need proficiency in Microsoft Excel.

The benefits of Microsoft Excel cuts across different sectors, companies, industries, businesses, and even students need it in their daily activities and endeavors. Basic knowledge of Excel is now very important in our world today; that's a firm truth. Hence, it is imperative you have proficiency in Microsoft Excel, and to help you achieve that, we will walk you through a stepwise guide to understanding the functions and features of this powerful tool.

Whether you are completely new to Excel or have a little grasp of some of its functions and features and would like to expand your knowledge of it, this carefully curated guide will provide you with the basic knowledge you need to know using some examples.

Let's get right to it!

1.3. How to Open Microsoft Excel?

If you have a computer and run different programs/software on it, then you can run Microsoft Excel. Follow these simple steps below:

- Click on the start menu
- Then All Programs
- The next step is to click on MS Office
- Then finally, choose the MS Excel option

Alternatively, you could as well just click on the start button, scroll down to where you have Excel, and click on it. If you have created a shortcut on your desktop, double-click, and you will have your program running.

Do note that for the sake of this guide, we will talk mainly about Microsoft Excel 2019

Once you have loaded the Excel following any of the listed steps above; you should have something like this Figure below:

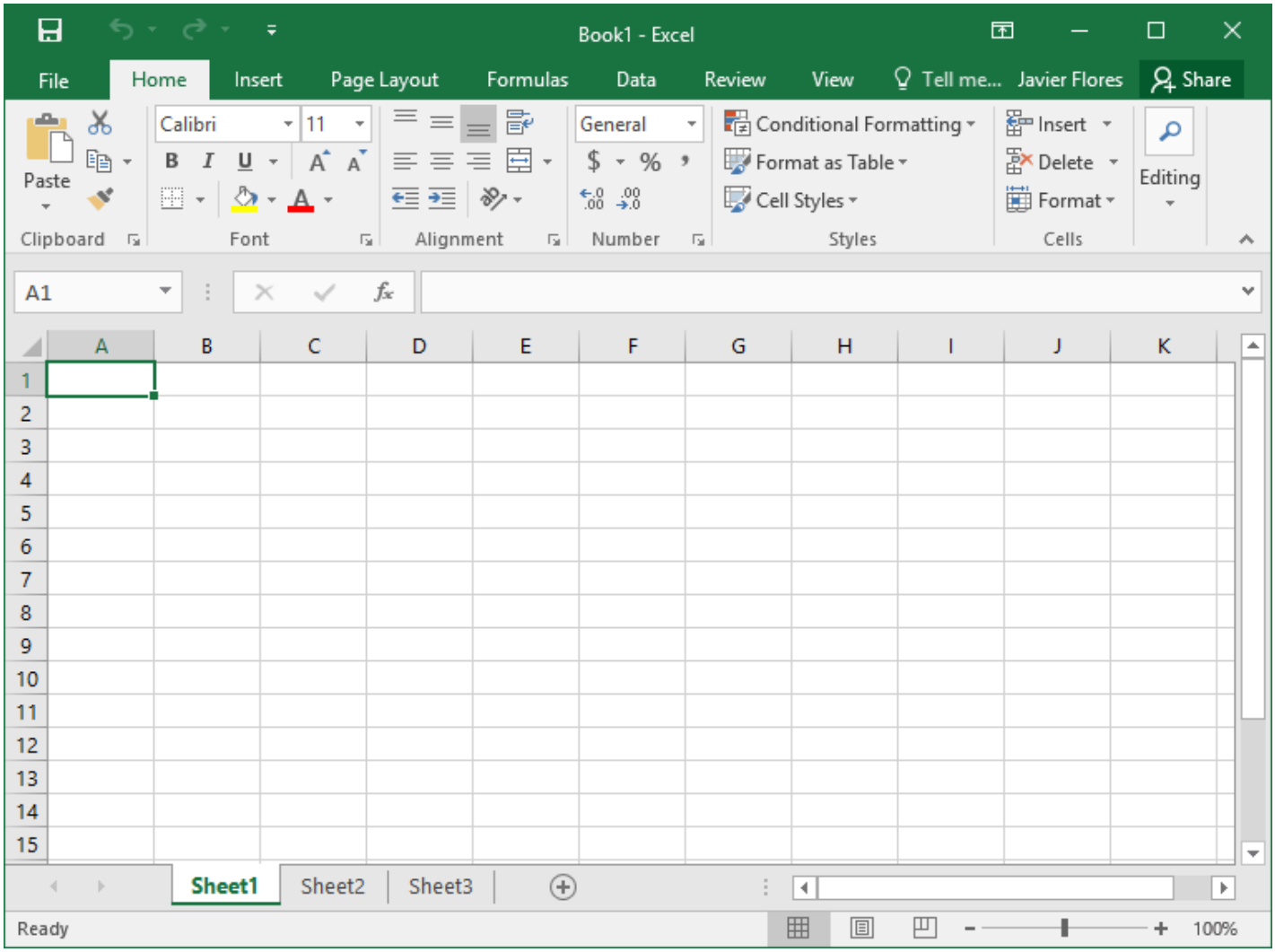


Figure 1. Getting Started with Excel

If you see that page, then you have successfully loaded Microsoft Excel. Remember, a spreadsheet is a collection of rows and columns that form a table. We will discuss rows and columns shortly.

From the Figure above, rows are in numbers, and columns are in alphabets. Let's move on!

1.4. Understanding Microsoft Excel Window Component

Now, before we dive into the details of the window components, there are three most important components that you must understand first. They are:

1. **Cell**

Simply, a cell is the smallest but the most powerful part of a spreadsheet. A cell is where you input your data by pasting or typing. Data are not always numbers or texts. They can be dates, figures, or signs. It all depends on the kind of project you are working on.

A cell can be customized to suit your project. You can adjust the fonts, background, borders, size, etc. Also, every cell has unique attributes that differentiate it from other cells; this is called cell address. Cell address contains its column and row number. For instance, if a cell is on the fourth row and column A, then that cell address is A4.

2. **Worksheet**

A worksheet, also called a spreadsheet, comprises different individual cells that contain data, which can be a value, formula, text, figures, etc. A worksheet also has an invisible draw layer, which holds diagrams, charts, and Figures. You can have multiple worksheets in a workbook (details below) and access them by clicking the tab at the bottom of the workbook window. From Figure 1.2 below, arrow 11 points to the worksheet tabs.

3. **Workbook**

A workbook is a separate file like every other application. It contains multiple worksheets; hence, a workbook can also be a collection of single or multiple worksheets. In a workbook, you can delete, add, and hide worksheets. Similarly, you can change the order of the worksheets within the book.

In summary, a workbook contains one or more spreadsheets. A spreadsheet is made up of individual cells. A cell is the smallest unit or component that carries your data and is identified by cell address. Clear enough, yeah? Let’s continue.

For a better understanding of the Microsoft Excel window, it's important you know all the major components. This will help you navigate well and smoothly.

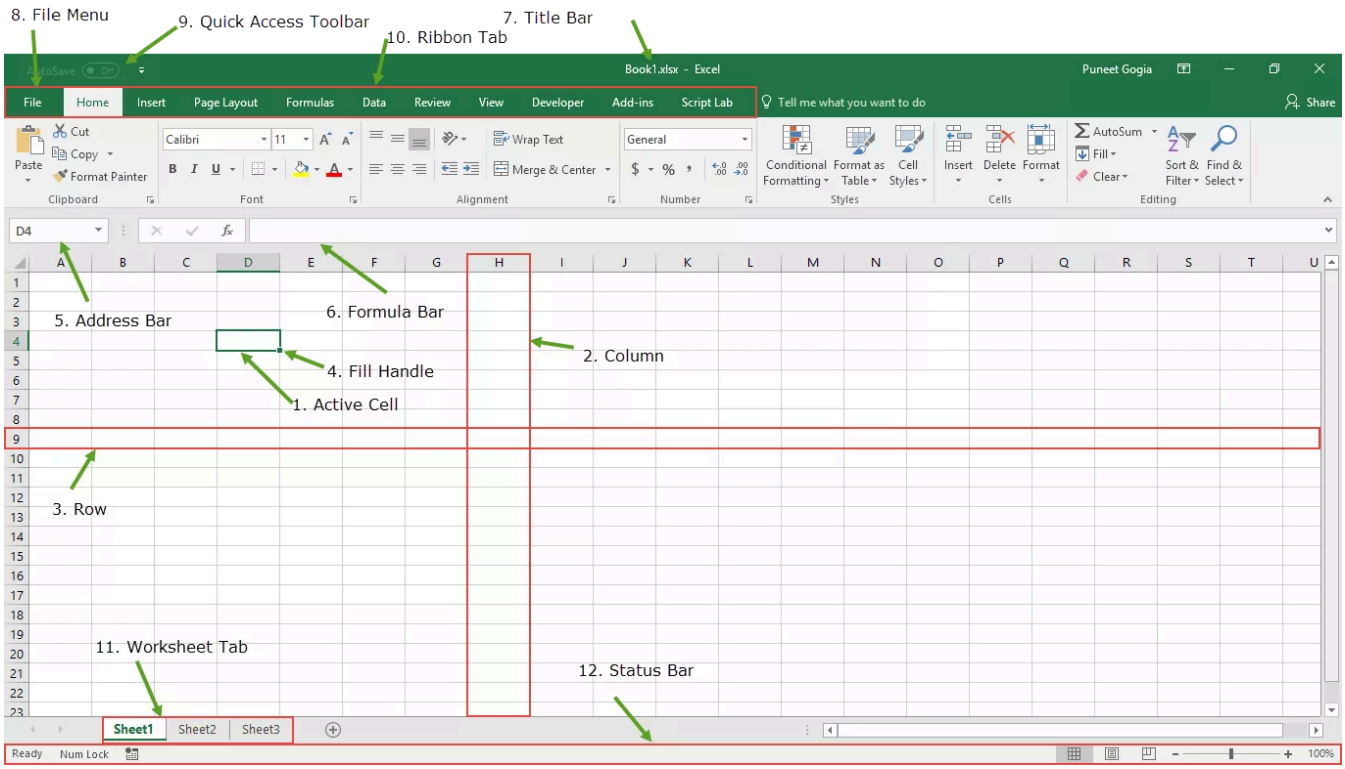


Figure 1.2. [Introduction to Microsoft Excel | Basics Knowledge + Components + Examples]

Active Cell: An active cell is a cell that is currently selected. An active cell will be highlighted, and the cell address will be displayed in the address bar. From Figure 1.2 above, the active cell is D4, highlighted in green. Simply click on it or use your arrow buttons to activate a cell. To edit a cell, double-click on it or click on the F2 button on your keyboard.

Columns: A column is a set of cells arranged vertically in alphabets. Every spreadsheet contains 16384 columns, and every individual column has its unique alphabet for identification. To select a column, simply click on the header.

Rows: A row is a set of cells arranged horizontally in numbers. Every spreadsheet contains 1048576 rows, and every row has a unique numeric identifier. A single click on the row number will select that row.

Address Bar: The address shows the address of the active cell. For instance, if you click on the cell on the seventh row under column G, the address of the cell in the bar will be G7. If you select multiple cells, the address bar will display the address of the first cell you selected.

Formula Bar: The formula bar shows an active cell's content. It is below the input bar, below the ribbon. You can also use the formula bar to enter a formula in a cell.

Title Bar: The title bar tells you the name of your workbook and the application name ("Microsoft Excel.")

File Menu: The file menu, like all other applications, houses several options, such as Save, Save As, Open, New, Print, Excel Options, Share, etc. More like a simple menu.

Quick Access Toolbar: A toolbar is a quick access to your frequently used options. Similarly, you can add your favorite options to the quick access toolbar for easier access.

Ribbon: Since Microsoft Excel 2007, all the options menu has been replaced with ribbons. Ribbon tabs are a bunch of specific tools which house other options.

Worksheet Tab: This tab shows you all the worksheets available in the workbook. Every new workbook has three worksheets: Sheet1, Sheet2, and Sheet3. The sheet names can be changed to fit the project you are working on. For example, Sheet1 can be changed to something like Daily Expenses, Monthly Budget, etc.

You can move to any of the sheets by clicking on the preferred sheet number from the worksheet tab.

Status Bar: This thin bar is located at the bottom of the Excel window. It gives you instant help once you start working in Excel.

1.5. Understanding Microsoft Excel Ribbon.

Excel comes with loads of features and functions, and the bulk of these are found in the Ribbon. The ribbon simply provides an alternative way to commands in Excel. In Excel, a command is an action that users perform. For instance, creating a new workbook is a command, like printing a document, copying, pasting, etc.

This Ribbon is usually found in the upper area of the Excel screen that contains many tabs running across the top. Figure 1.4 gives a clear picture of how to access the Ribbon.

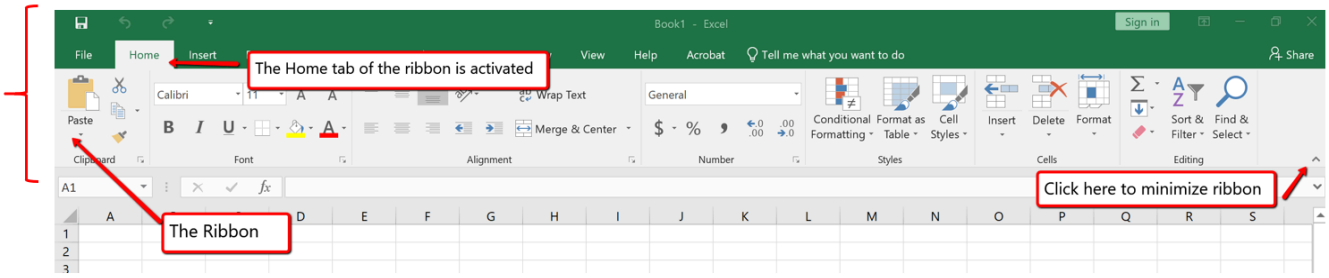


Figure 1.3 [1.1 Overview of Microsoft Excel – Beginning Excel 2019]

Now that you can access the Ribbon, let's discuss the major items in the Ribbon, as shown in Figure 1.4 below. The items in this Ribbon might vary depending on the version of Excel you are using and whether you are using a Mac or a Windows system.

However, we will discuss the items common to almost all the versions of Excel, at least from 2007 on Windows, and highlight the differences in Mac where necessary.

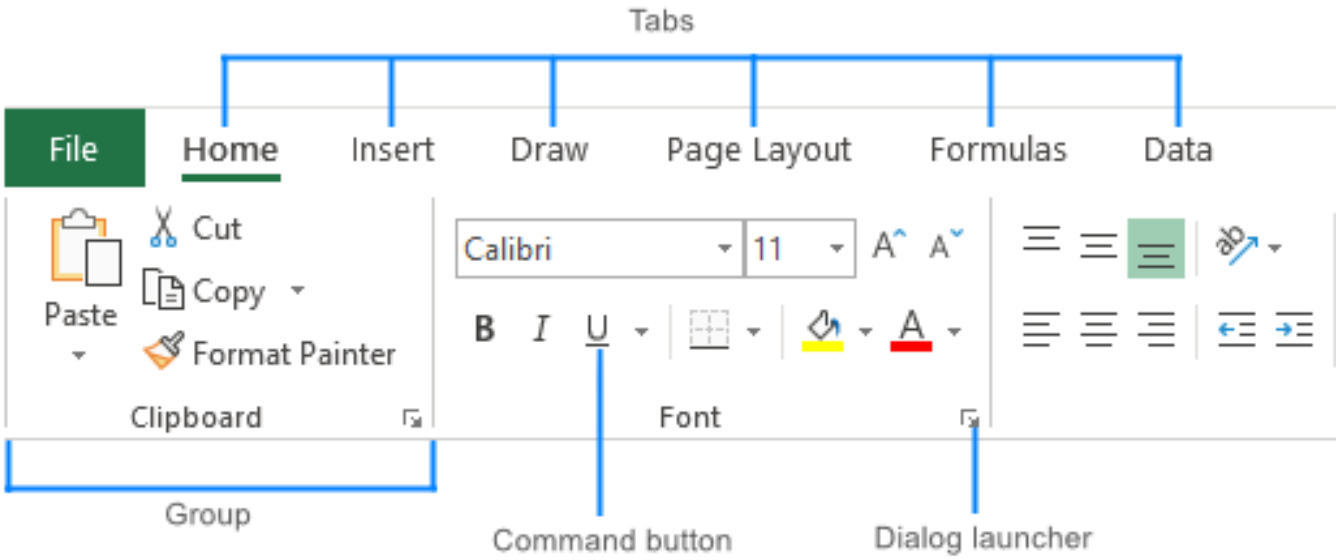


Figure 1.4 [Excel ribbon: quick guide for beginners]

- **File:** A click on the File option takes you backstage, where you can access essential file-related commands and Excel options. The File tab replaced the Office button in the Excel 2007 version. The File tab helps you manage different functions, including opening, saving, closing, printing, and importing files from other sources.

  Tip: In Excel for Mac, the File menu does not appear as a ribbon. Instead, the File menu appears in the Application Menu Bar.

- **Home:** The Home ribbon houses items for copying, pasting, sorting, conditional formatting, font size, color, number type, and lots more. All these functions help in effectively performing several calculations.

- **Insert:** As the name implies, this ribbon contains items for adding different objects, such as Figures, Pivot Tables, charts, hyperlinks, equations, special symbols, headers, footers, etc., into the worksheet.

- **Draw:** This ribbon gives you access to different drawing tools. You can draw with your mouse, digital pen, or finger, depending on the type of system you are using.

- **Page Layout:** The Page Layout ribbon manages the appearance of your worksheet, both printed and onscreen. This tool gives you access to theme settings, object aligning, page margins, gridlines, page sizes, etc.

- **Formulas:** The Formula ribbon provides you with tools for performing effective calculations, inserting functions, defining names, name manager, financial, logical, text, date & time, lookup & reference, error checking and math & trigonometry.

- **Data:** The Data tab contains options for importing and connecting with external databases. You can also access sort, filter, remove, duplicate, data visualization, consolidation, group, and ungroup functions on this menu.

- **Review:** On the Review tab, you can make comments for your colleagues, check spellings, track changes, smart lookup, translate, protect and control who has access to your worksheet and workbooks.

- **View:** The View menu allows you to customize how your spreadsheets appear on your screen. You have access to functions, such as displaying grid lines between cells, toggling the formula bar and headings, and more. More so, the View menu allows you to record macros. Recording macros simply means recording all the steps and processes involved in performing a task so that you can replicate it without errors.

  Tip: Use the Freeze Top Row or Freeze First Column; they will stay put while you scroll through page and page numbers.

- **Help:** The menu is only available in Excel 2019 version and Office 365. This menu helps you contact Microsoft support, suggest features, send feedback, get access to training videos, etc.

- **Developer:** The developer tab gives you access to advanced features such as ActiveX, VBA macros, Form controls, and XML commands. One of the impressive features of Excel is the ability to collaborate on spreadsheets. Basically, this means one or more persons can be working on the same spreadsheet at the same time. The Developer tab is where this happens.

- **Add-ins:** This tab only appears only when you open an older workbook or load an add-in that customizes the toolbars or menu.

1.5.1. How to Hide Ribbon in Excel

Sometimes, the ribbon can take up a lot of space on your worksheet, especially if you use a laptop with a small screen. In such cases, you can minimize or, better still, hide the ribbon. Pressing the Ctrl+F1 shortcut will collapse the ribbon. Similarly, you can hide the ribbon completely by clicking on the ribbon display option located at the upper right corner of the Excel window, followed by a click on the ‘Auto-hide Option’ as seen in Figure 1.5. below:

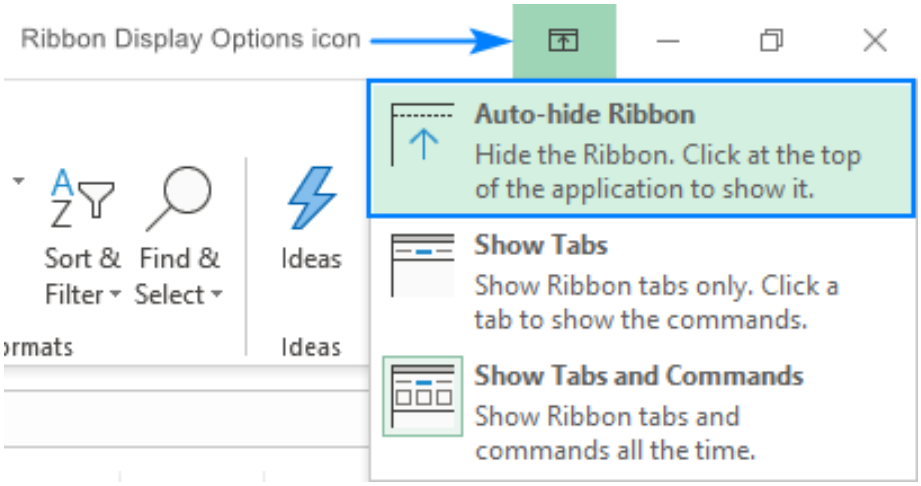


Figure 1.5. Excel ribbon: quick guide for beginners

1.5.2. How to Unhide Ribbon in Excel

If you want to bring back your Ribbon, simply follow the same steps. Meaning press Ctrl+F1, and you will have your Ribbon back. Or, if the entire ribbon is missing, click on the display icon at the top right corner of your window and then click on the "Show Tab and Command" option. As seen in Figure 1.6 below:

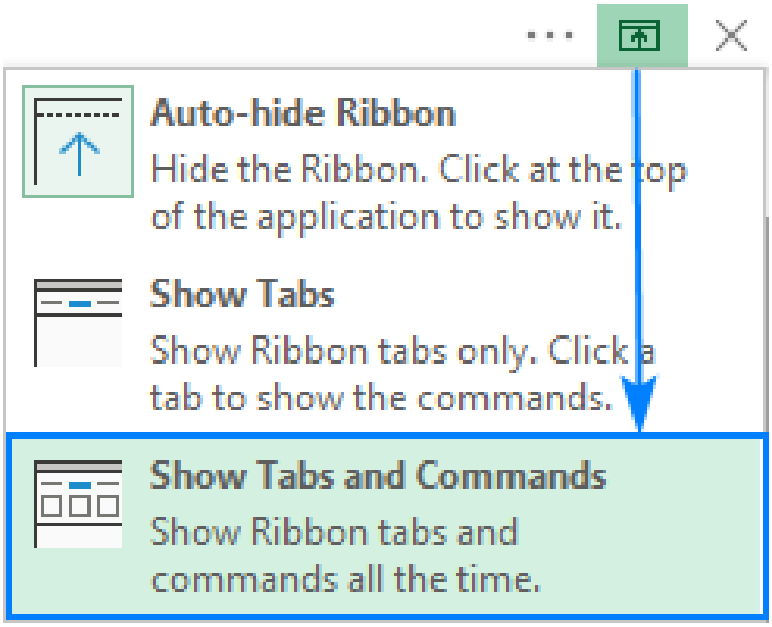


Figure 1.6 - Excel ribbon: quick guide for beginners

Module 2. Sorting and Filtering

With the massive rows and columns of Excel, you can work with a very large set of data. However, it can easily become difficult to identify data that match a specific description or requirements. To avoid this problem, excel has the sort and filter tool to help you organize, arrange and customize data to meet specific requirements and descriptions. This way, your spreadsheet is more convenient and comfortable to work with.

Although the sorting and filtering tools perform almost the same function, they do it in different ways. In this module, you'll learn how to sort and filter Excel table data based on a condition and format.

2.1. What is Sorting?

Essentially, sorting means putting in an order. It means you are grouping similar data together. It could be by numbers, texts, dates, alphabets, etc. Sorted data is easy and simple to read. You can easily notice patterns, spot errors, and compare when the data is sorted.

There are quite a number of ways records or data can be sorted. For example, the information in a database, in Figure 1.6 below, could be sorted in a number of ways, including

Customers

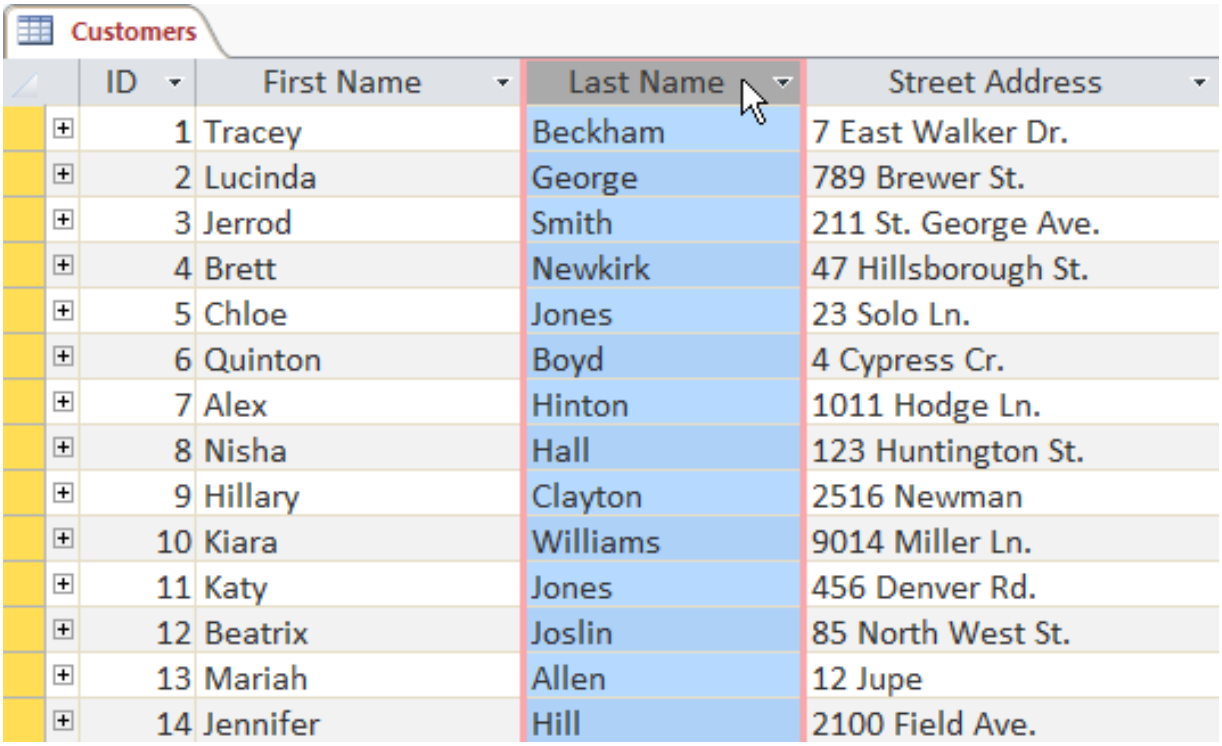
ID	First Name	Last Name	Street Address
1	Tracey	Beckham	7 East Walker Dr.
2	Lucinda	George	789 Brewer St.
3	Jerrod	Smith	211 St. George Ave.
4	Brett	Newkirk	47 Hillsborough St.
5	Chloe	Jones	23 Solo Ln.
6	Quinton	Boyd	4 Cypress Cr.
7	Alex	Hinton	1011 Hodge Ln.
8	Nisha	Hall	123 Huntington St.
9	Hillary	Clayton	2516 Newman
10	Kiara	Williams	9014 Miller Ln.
11	Katy	Jones	456 Denver Rd.
12	Beatrix	Joslin	85 North West St.
13	Mariah	Allen	12 Jupe
14	Jennifer	Hill	2100 Field Ave.

Figure 1.6. Access 2016: Sorting and Filtering Records

- Orders can be sorted by the first or last names of the customers.
- Order could also be sorted by name, city, or zip code where they live

Moreso, sorting can be done in either ascending or descending order. Ascending order will arrange your numerical data from the smallest to the largest and your alphabet from A to Z. Descending order will arrange your numerical data from the largest to the smallest and your alphabet from Z to A.

For instance, the ID number sort in Figure 1.6 above is in ascending order, explaining why the lowest ID numbers appear first. To discuss sorting properly, we will work with the customer data set, as seen in Figure 1.7. The data represents a list of customers and the amount of revenue made from each sale.



Customers

ID	First Name	Last Name	Street Address
1	Tracey	Beckham	7 East Walker Dr.
2	Lucinda	George	789 Brewer St.
3	Jerrod	Smith	211 St. George Ave.
4	Brett	Newkirk	47 Hillsborough St.
5	Chloe	Jones	23 Solo Ln.
6	Quinton	Boyd	4 Cypress Cr.
7	Alex	Hinton	1011 Hodge Ln.
8	Nisha	Hall	123 Huntington St.
9	Hillary	Clayton	2516 Newman
10	Kiara	Williams	9014 Miller Ln.
11	Katy	Jones	456 Denver Rd.
12	Beatrix	Joslin	85 North West St.
13	Mariah	Allen	12 Jupe
14	Jennifer	Hill	2100 Field Ave.

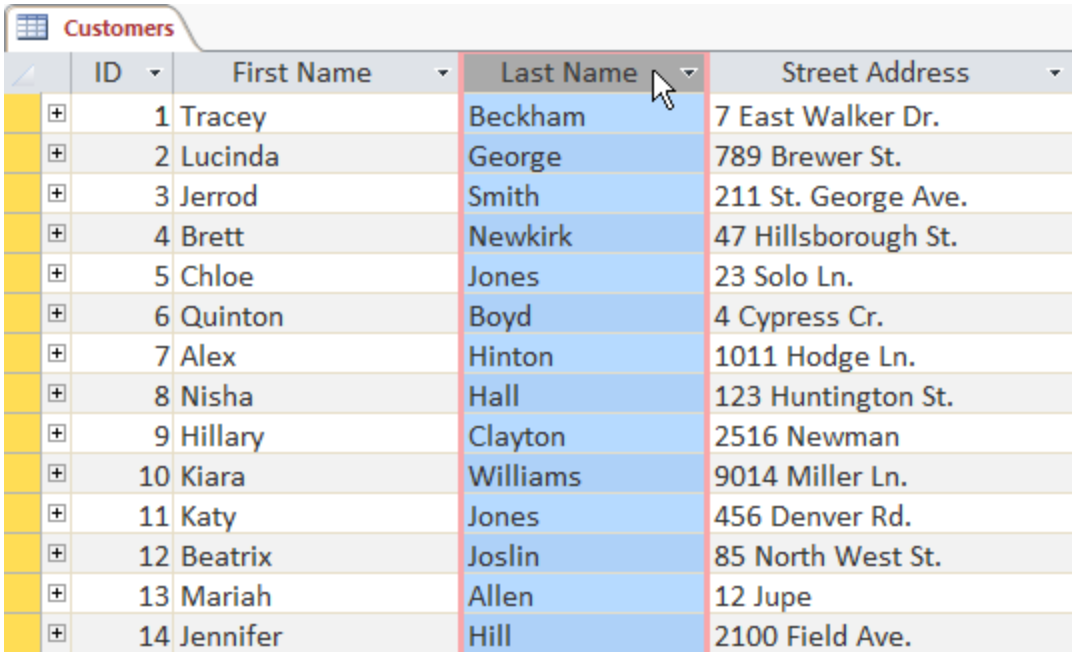
Figure 1.7. Access 2016: Sorting and Filtering Records

It’s noteworthy that you use headers at the top of each column. This is important for sorting, especially when you want to make changes to the column you are working on. Basically, ensure your columns have headers.

Excel's sorting functionality is handy even when you only have a few rows. Excel 2019 will make sure that you can sort values and identify the ones that have the biggest revenue instead of eyeing values and choosing the best one based on your own personal assessment. This allows you to view a list of revenue figures based on the highest value or lowest value.

Let’s get right on to sorting your data.

1. The first step is to highlight the cells in our spreadsheet. Make sure you include the column headers because Excel uses them as part of the sort function. Here, we want to sort the ‘Last Name column.



Customers

ID	First Name	Last Name	Street Address
1	Tracey	Beckham	7 East Walker Dr.
2	Lucinda	George	789 Brewer St.
3	Jerrod	Smith	211 St. George Ave.
4	Brett	Newkirk	47 Hillsborough St.
5	Chloe	Jones	23 Solo Ln.
6	Quinton	Boyd	4 Cypress Cr.
7	Alex	Hinton	1011 Hodge Ln.
8	Nisha	Hall	123 Huntington St.
9	Hillary	Clayton	2516 Newman
10	Kiara	Williams	9014 Miller Ln.
11	Katy	Jones	456 Denver Rd.
12	Beatrix	Joslin	85 North West St.
13	Mariah	Allen	12 Jupe
14	Jennifer	Hill	2100 Field Ave.

Figure 1.7a. Sorting - https://edu.gcfglobal.org/en/access2016/sorting-and-filtering-records/1/

2. Click on the Data menu, and scroll to the sort option.

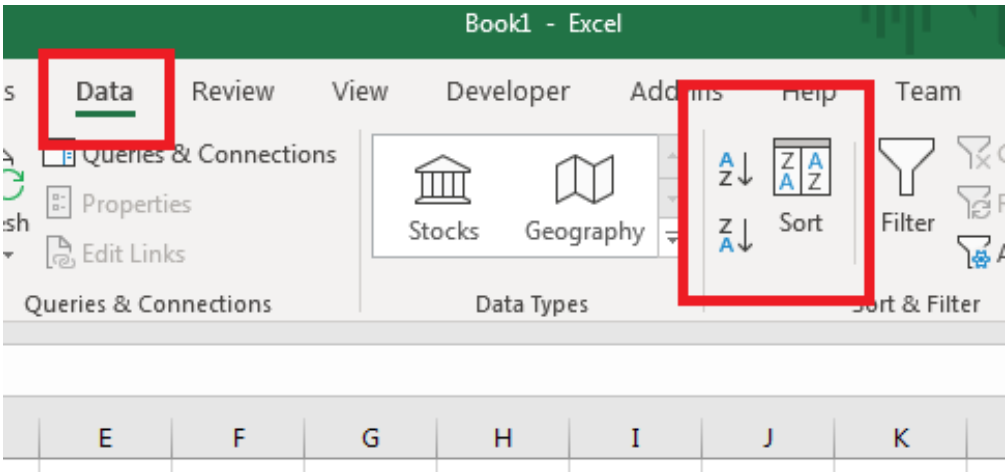


Figure 1.7b. How to Sort and Filter Data in Excel 2019

3. Select the order you want, either ascending A-Z or descending Z-A. For this instance, let's choose an ascending order. After clicking on that, your selected column should look like Figure 1.7c below:



Figure 1.7c Access 2016: Sorting and Filtering Records

You can select any of the other columns by simply following the steps above. Moreso, you can access your sorting tool from the Home tab on your window.

Do this by simply clicking on the Home menu, and locating the sort icon as seen in Figure 1.7d below:

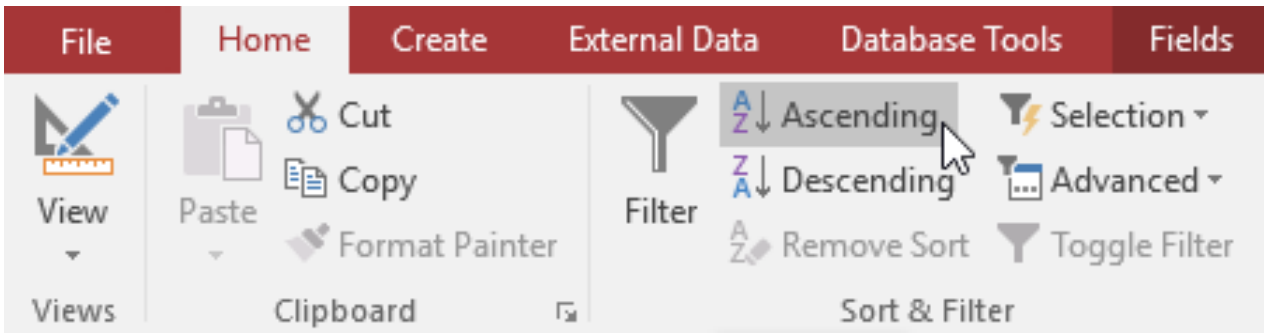


Figure 1.7d. Access 2016: Sorting and Filtering Records

To remove the sort, simply click on 'Remove Sort' from the Home menu.

Microsoft Excel is designed to perform a much more complex sorting than the ascending and descending sort option. Excel identifies textual values and numbers, a set of dates, etc.

For example, if you have a set of data containing revenue sales, Excel can detect the data type, and sort cells based on numeric values of the data, Moreso, if you have cells formatted as dates, by default, Excel knows that these values should be ordered in chronological order.

To explain this, we will use a set of data with 20 rows



Figure 1.8.

1. The first step, as said earlier, is to highlight the column you want to sort in your spreadsheet. And ensure you include the column header in the highlight.

2. Click on the Data menu once, and click on the sort icon. Note, you are not clicking on the ascending and descending arrows. Instead, you are clicking on the sort box, as seen in the Figure below.

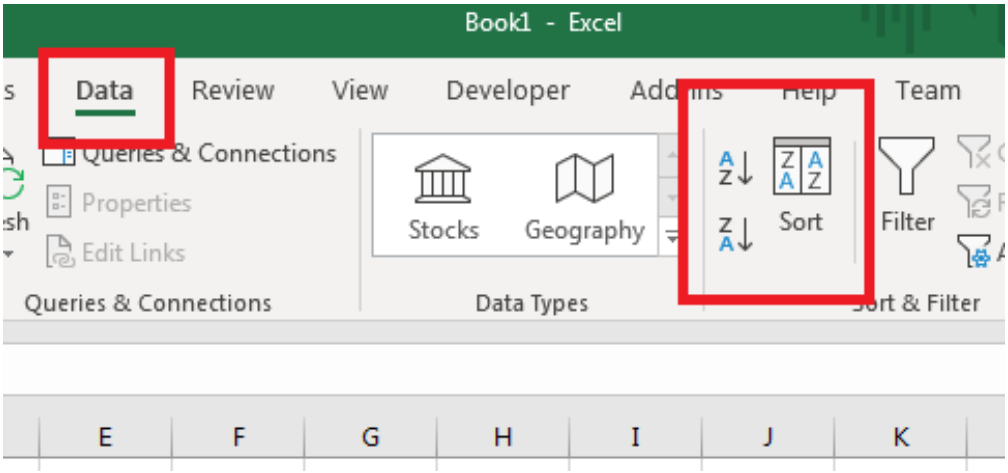


Figure 1.8a. How to Sort and Filter Data in Excel 2019

3. After clicking on the sort box, you should have a drop-down that looks like the Figure below;

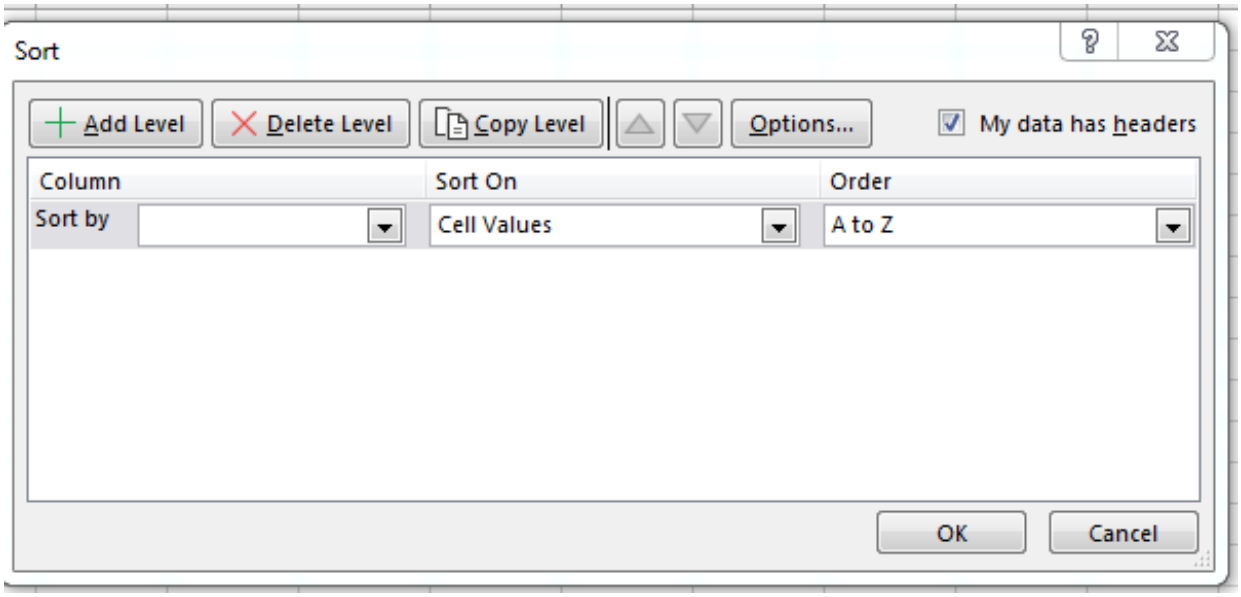


Figure 1.8b. How to create a custom sort when a regular sort won't do in Excel | TechRepublic

If you have this dropdown box, then you can move on to the next stage. If not, kindly go through the steps again. Moving on, from this Figure 1.8b above, there are three dropdown boxes; **'Sort by,' 'Cell values,**' and '**A to Z.'**

- The **"Sort by"** option contains headers for all the columns in the spreadsheet. Since our dataset only contains two headers, customer and revenue, clicking on the **'Sort by**' dropdown will display customer and revenue headers. If your dataset doesn't have headers, Excel will list the column letter labels. However, if your dataset contains several columns, it can be pretty difficult to sort the dataset.

- The **"Sort On"** essentially deals with what you want to sort in the column you highlighted. Is it the cell values, cell colors, font color, etc? By default, it is always on **"Cell values,"** which means that the value is used for the sort. That is the usual configuration, but you can also sort on cell color or font color, depending on the project you are working on. This is useful when you set conditional formatting, which is covered in the next section.

- The **"Order"** dropdown simply deals with the order you want your data sorted; if you want to sort data in ascending or descending order. The **"A to Z"** option means that you want to sort data in ascending order. The **"Z to A"** option means that you want to sort data in descending order.

For the dataset we are working on, let's sort by the revenue column and leave others to default; The **'Sort on'** on cell values and the **'Order'** in ascending order. Customize this and click on **'OK.'** You will have something like the Figure below:



	A	B	C	D
1	Customer	Revenue		
2	Jacob	$ 12.00		
3	Maci	$ 13.00		
4	Kim	$ 24.00		
5	Brad	$ 44.00		
6	Sally	$ 63.00		
7	William	$ 76.00		
8	Christine	$ 86.00		
9	Mark	$ 123.00		
10	John	$ 234.00		
11	Michelle	$ 324.00		
12	Joe	$ 324.00		
13	Greg	$ 345.00		
14	Toby	$ 432.00		
15	Ethel	$ 432.00		
16	Rick	$ 555.00		
17	Brittany	$ 656.00		
18	Jennifer	$ 765.00		
19	Kelly	$5,423.00		
20	Tyler	$7,345.00		
21	Eric	$7,657.00		
22				
23				

Figure 1.8c

You will notice that the names still match the revenue values. This is because the Sort tool of Microsoft Excel is designed to align data, even though you are working on sorting just a single column of your dataset.

You can decide to sort the dataset by customer names and maybe change the order of the customer names; the columns will still be aligned with the values.

2.2. What is Filtering?

If you are working on a particular column in a very large dataset, it can be pretty difficult and confusing to navigate through different columns that you don't immediately need. Figurine works on the 100th column of a dataset containing over a thousand columns. You will have to move through columns to get to the 100th column you are working on. Well, with the filtering tool, it doesn't always have to be like that.

Essentially, the filter tool allows you to see the dataset you want to see at a particular time. It sets some sort of criteria for the data you want to display, searches through the dataset for all the records that meet the search criteria and then hides the ones that don't meet the criteria temporarily.

The main benefit of filtering your dataset is to enhance productivity by allowing you to focus on specific group data. It prevents distractions from data you do not need at the moment. For instance, if you have a database containing information on customers, you can filter it only to display information about living in a particular state, country, region, etc. Or you could filter to display information of customers between a certain range or customers that buy a particular product. It all depends on what you are working on.

Viewing a filtered data set is far more convenient and easy to work with than looking for it in a large table. Below are the steps to create a simple filter:

1. Click the **drop-down arrow** next to the field you want to filter by. In this guide, we want to see a list of customers who live in a certain city so that we will filter by city. See Figure 1.9 below



Customers

ID	First Name	Last Name	Street Address	City	State
102	Theodore	Achi	120 Baker St.	Raleigh	NC
195	Kris	Ackerman	1311 Coretta Scott Way	Raleigh	NC
78	Michiko	Akiwana	901 Glenwood Ave.	Raleigh	NC
188	Nathan	Albee	76-C Meadowview Ln.	Raleigh	NC
13	Mariah	Allen	12 Jupe	Raleigh	NC
37	Carol	Allenson	3201 Glenwood Ave. Unit A	Raleigh	NC
38	Zoey	Altman	817 Hillsborough St. Apt E1	Raleigh	NC
163	Franz	Angelou	291 Hinton St.	Raleigh	NC
87	Robert	Armisen	21 MLK Blvd.	Chapel Hill	NC
47	Hakim	Auden	921 Dawson St.	Raleigh	NC
129	Yann	Augerot	88 Carolina Rd.	Raleigh	NC
40	Vig	Aurelio	53 Pine St.	Raleigh	NC

Figure 1.9. Access 2016: Sorting and Filtering Records

2. A drop-down menu with a checklist will appear. Only checked items will be included in the filtered results. By clicking **Select All**, you will either select or deselect everything at

once. For this guide, we'll deselect everything except **Cary**. This is because that is the city we want to see in our spreadsheet.

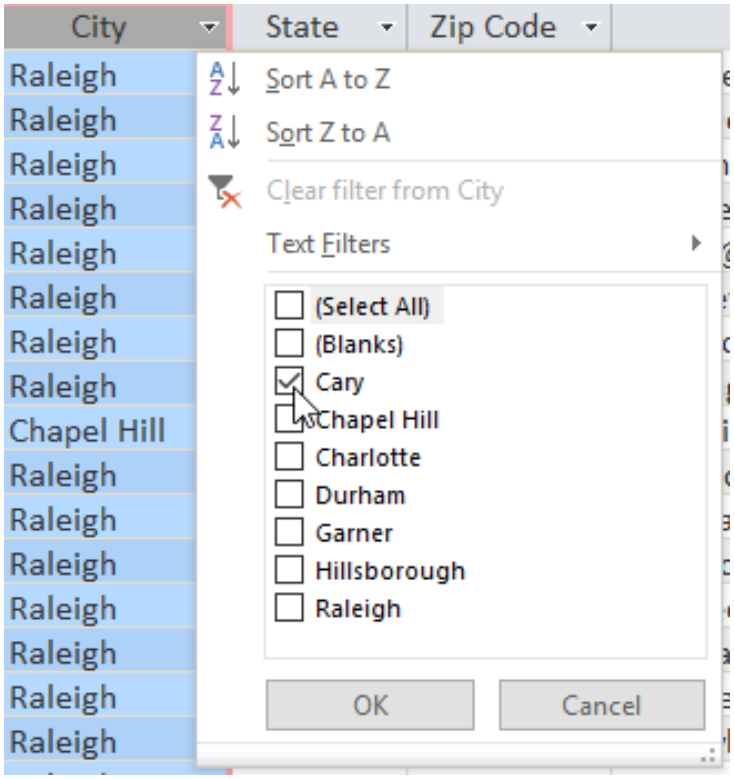


Figure 1.9a. Access 2016: Sorting and Filtering Records

3. Once you have deselected other cities except for Cary, click **OK** to apply the filter. Our customer table will look like the Figure below:

Customers

ID	First Name	Last Name	Street Address	City	State
2	Lucinda	George	789 Brewer St.	Cary	NC
88	Don	Hamm	1221 Coretta Scott Way	Cary	NC
201	Tyrese	Hanlon	31 Crispus Ct. Apt B	Cary	NC
7	Alex	Hinton	1011 Hodge Ln.	Cary	NC
105	Dwyane	James	4221 Basil Ct.	Cary	NC
11	Katy	Jones	456 Denver Rd.	Cary	NC
75	Katharine	Kellerman	76 Murphy Ave.	Cary	NC
150	Brigit	Sigrudsdatter	55 Cameron Ct.	Cary	NC
120	Jacek	Slobodowski	7 Greene St.	Cary	NC
137	Kle'Aija	White	911 Oregon Tr.	Cary	NC
198	Alex	Yuen	8 Marcus Ln.	Cary	NC

Figure 1.9b. [Access 2016: Sorting and Filtering Records]

4. If you are done with the filtered data and want to bring back the complete dataset, simply remove the filter. To do this, from your Home menu, locate the **Sort & Filter** icon at the top right end of your window, then click on **"Clear"**

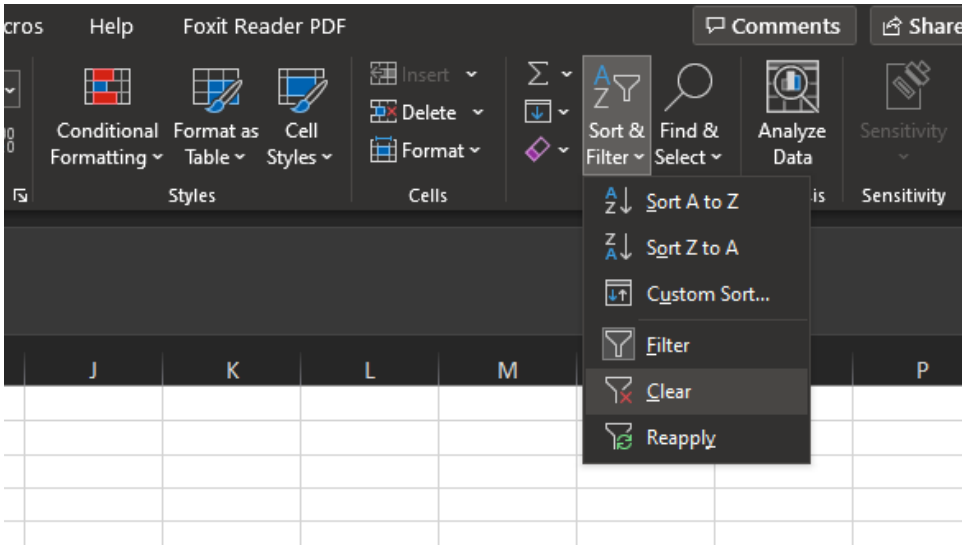


Figure 1.9c

2.3. Creating a Filter From a Selection

To filter by selection simply means to choose a particular data from your table and search for similar or dissimilar data to it from your entire data set. For example, let's say you have a dataset and want to search for all products containing a particular word, you could simply look for a particular product that contains the word and then create a filter with that selection.

Creating a filter with a selection comes in handy if you are working with a field that contains many items. It makes your work a lot more convenient than simply setting up a filter. Below are the options to create a filter with selection:

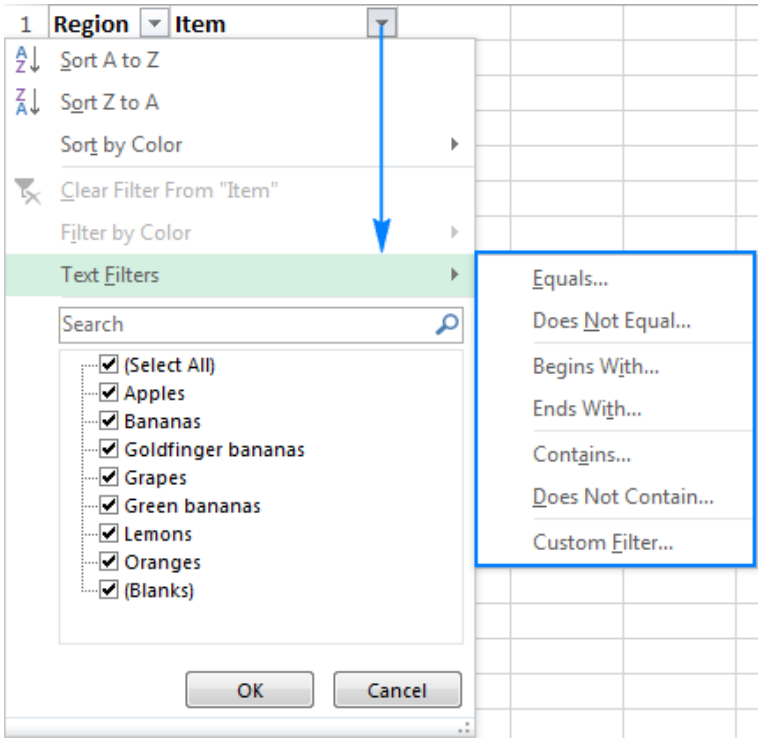


Figure 1.10. Excel Filter: How to add, use and remove

- **Contains:** This type of filter includes only records with cells that contain the selected data or word.
- **Does Not Contain:** It includes all records except for those with cells that contain the selected data.
- **Ends With.** End With includes only records whose data for the selected field ends with the search term.
- **Does Not End With.** It includes all records except for those whose data for the selected field ends with the search term.
- **Equal:** Contains a specific text or character.
- **Not Equal**: Does not contain a specific word or character.

For instance, let's filter out the rows containing 'Banana' in the dataset below. The steps below will guide you through creating a filter from the word:

	A	B	C	D	E
1	**Region**	**Item**	**Order date**	**Amount**	**Status**
2	South	Grapes	16-May-16	$310	Delivered
3	North	Goldfinger bananas	2-Jul-16	$255	Delivered
4	North	Apples	11-Apr-16	$260	In transit
5	South	Oranges	10-Apr-16	$285	Delivered
6	West	Green bananas	10-May-16	$260	Delivered
7	East	Lemons	18-May-16	$335	Awaiting payment
8	West	Oranges	14-Jun-16	$255	In transit
9	East	Apples	4-Jun-16	$280	Delivered
10	North	Goldfinger bananas	7-Apr-16	$280	Cancelled
11	West	Lemons	11-Apr-16	$255	Delivered

1.10a. Excel Filter: How to add, use and remove

- From your Home menu, locate your **Sort & Filter** icon and then click on the word '**Filter**'

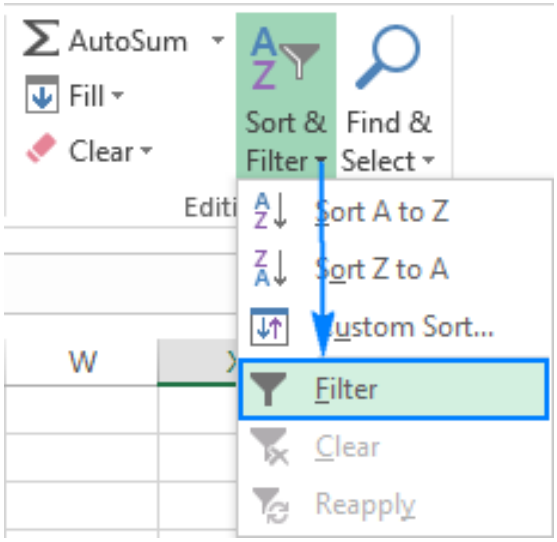


Figure 1.10b. Excel Filter: How to add, use and remove

- From the drop-down arrow in the sort & filter column, click on the **Filter** icon as seen in Figure 1.10 above.

- Select the desired filter from the drop-down menu (**Does Not Contain**… in this example).

- You should see a Custom AutoFilter dialog box, and from there, type in the text in the empty box to the right.
- Press the "**Enter**" key, and click **OK**.

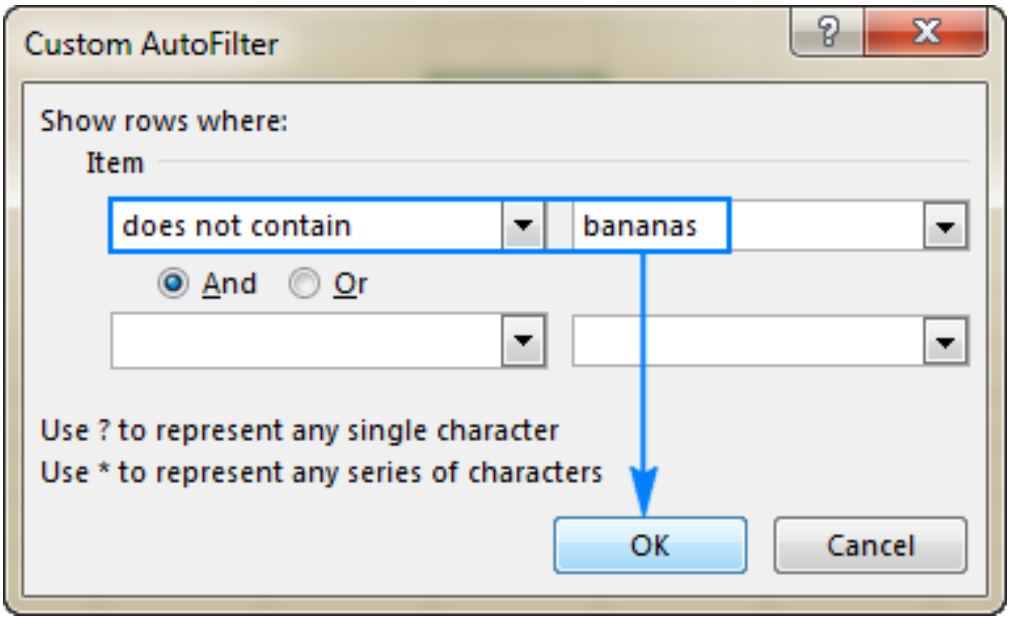


Figure 1.10c. Excel Filter: How to add, use and remove

By clicking **'OK',** all the rows containing Green bananas and Goldfinger bananas, will be hidden. You can do this for filter options, including **'Equal'**, **'Not Equal,' etc.**

Moreso, you can filter a column with two criteria. To do this, following the above steps, find your way to the Custom Autofilter dialog box in Figure 1.10c above. From there, follow these simple steps below:

- The **And** and **Or** radio buttons determine whether you want both or either criterion to be true. **And** means both criteria should be true, while **OR** means either criterion should be true. For this example, we want to filter for rows that contain either Bananas or Lemon.
- Select your preferred operator, between **And and Or**, for the second criterion. Enter your text in the second box to the right. Your dialog box should look like the Figure below:

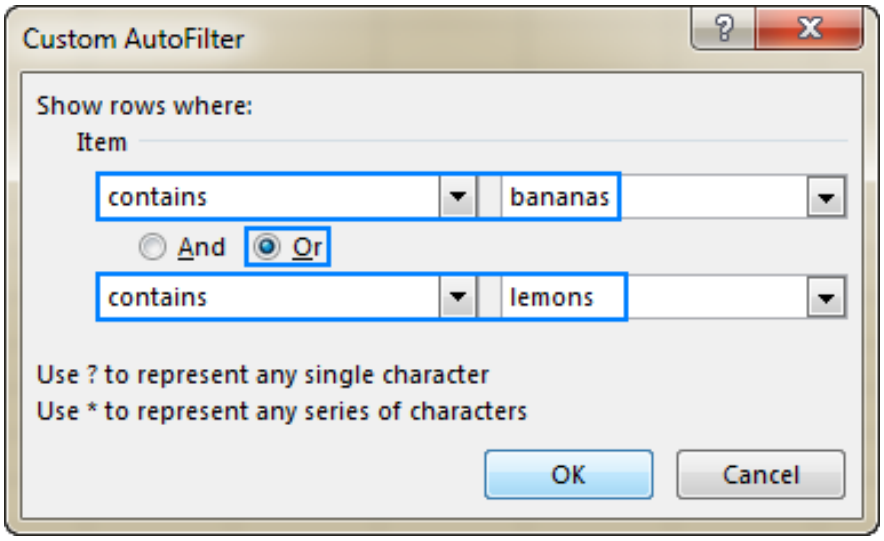


Figure 1.10d. Excel Filter: How to add, use and remove

- By clicking **'OK',** you will have rows containing **Bananas** and **Apple.**

2.4. Filtering Using Wildcards Suggestions

In Excel, if you want to filter for a particular data and you don't remember the exact search word or maybe you want to filter for rows with similar words, you can create filters using wildcards words.

Wildcard characters	**Description**	**Examples.**
?	Matches any single character	Gr?y finds "grey" and "gray"
* (asterisk)	Matches any sequence of characters	Mid* finds "Mideast" and "Midwest"
~ (tilde) followed by *, ?, or ~	Allows filtering cells that	What~? finds "what?"

	contain a real question mark, asterisk, or tilde.	

2.5. How To Filter Numbers

Also, Excel allows you to filter and manipulate numeric values in a dataset using the **Number Filters.** Below are some of the available Number filter options:

- You can filter out numbers equal or not equal to a specific numerical data.
- Similarly, you can filter numbers, greater than, less than or between a set of numbers.
- Excel also allows you to filter the first 10 or last 10 numbers.
- Cells can also be filtered with numbers that are above average or below average.

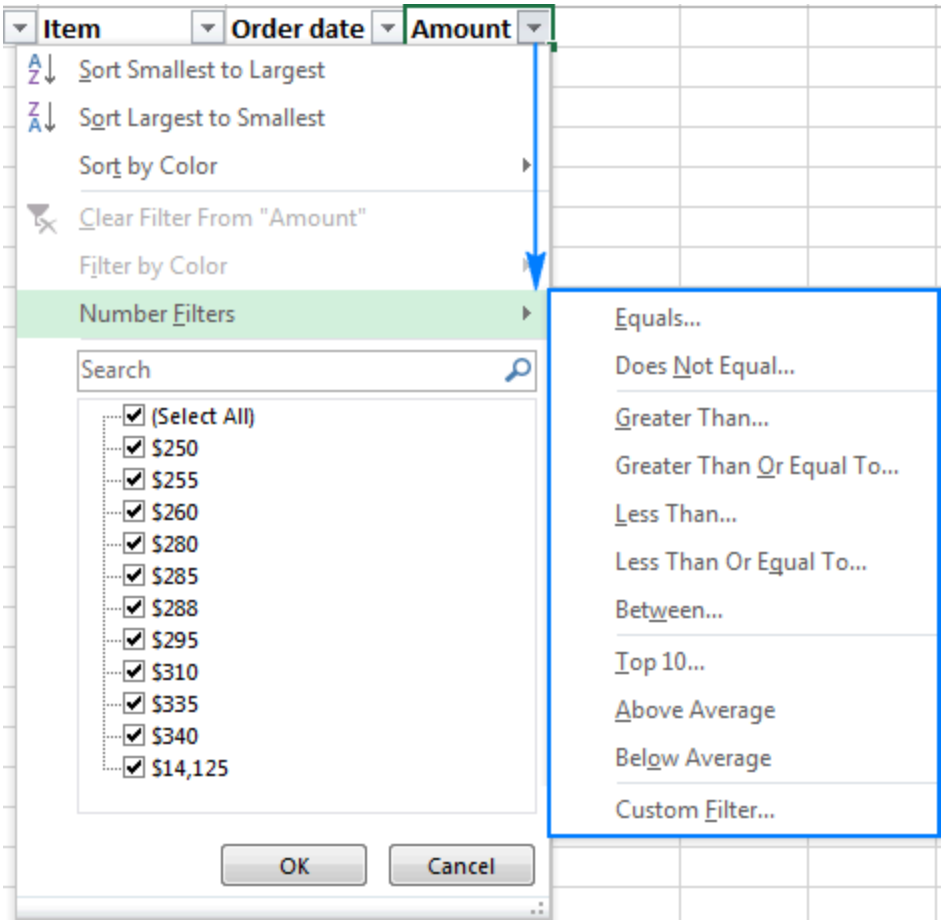


Figure 1.11. Excel Filter: How to add, use and remove

For instance, from our dataset, we can create a filter that shows only orders between $250 and $300. Follow the steps below:

- Click the auto filter arrow in the **'Amount'** column header and point to Number Filters.
- Choose an appropriate comparison operator from the list, **Between**… in this example, as seen in Fig 1.11 above
- In the Custom AutoFilter dialog box, enter the lower bound and upper bound values. Excel, by default, suggests using **"Greater than or equal to"** and **"Less than or equal to"** comparison operators. You can change them to **"Greater than"** and **"Less than"** if you don't want the threshold values to be included.

Ensure your Custom Autofilter dialog box looks like the figure below:

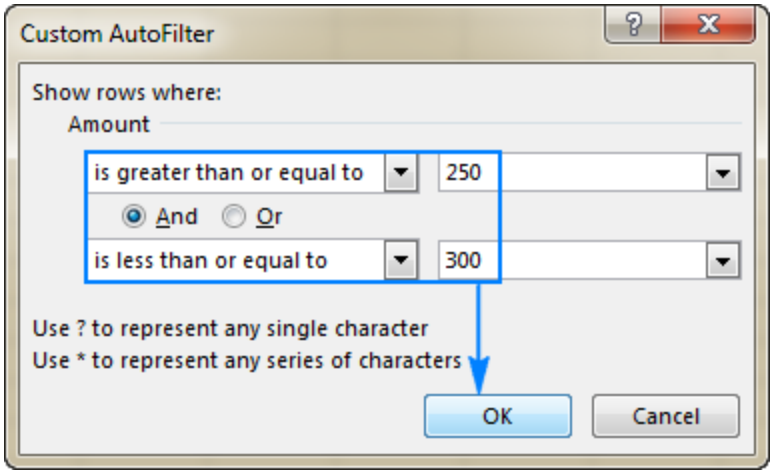


Figure 1.11a. Excel Filter: How to add, use and remove

❖ Click **OK.** Your data table should look like this

	Region	Item	Order date	Amount
3	North	Goldfinger bananas	2-Jul-16	$255
4	North	Apples	11-Apr-16	$260
5	South	Oranges	10-Apr-16	$285
6	West	Green bananas	10-May-16	$260
8	West	Oranges	14-Jun-16	$255
9	East	Apples	4-Jun-16	$280
10	North	Goldfinger bananas	7-Apr-16	$280
11	West	Lemons	11-Apr-16	$255
12	East	Goldfinger bananas	22-May-16	$250

Figure 1.11b. Excel Filter: How to add, use and remove

2.6. How to Filter Dates

Another impressive filter option in Excel is the Date Filter. This option affords you an incredible way of filtering your dataset for a particular date, and duration very quickly.

Automatically, Excel filters all dates in a particular column by the order of years, months, and days. You can adjust this by clicking the plus or minus sign next to a particular group. Also, you can filter out or hide a particular year from your dataset.

Similarly, with Excel's Date Filter, you can hide or display data for a given day, month, quarter, year, between two dates, before or after a specific date, etc. Check the figure below for all the available Date Filter options in Excel:

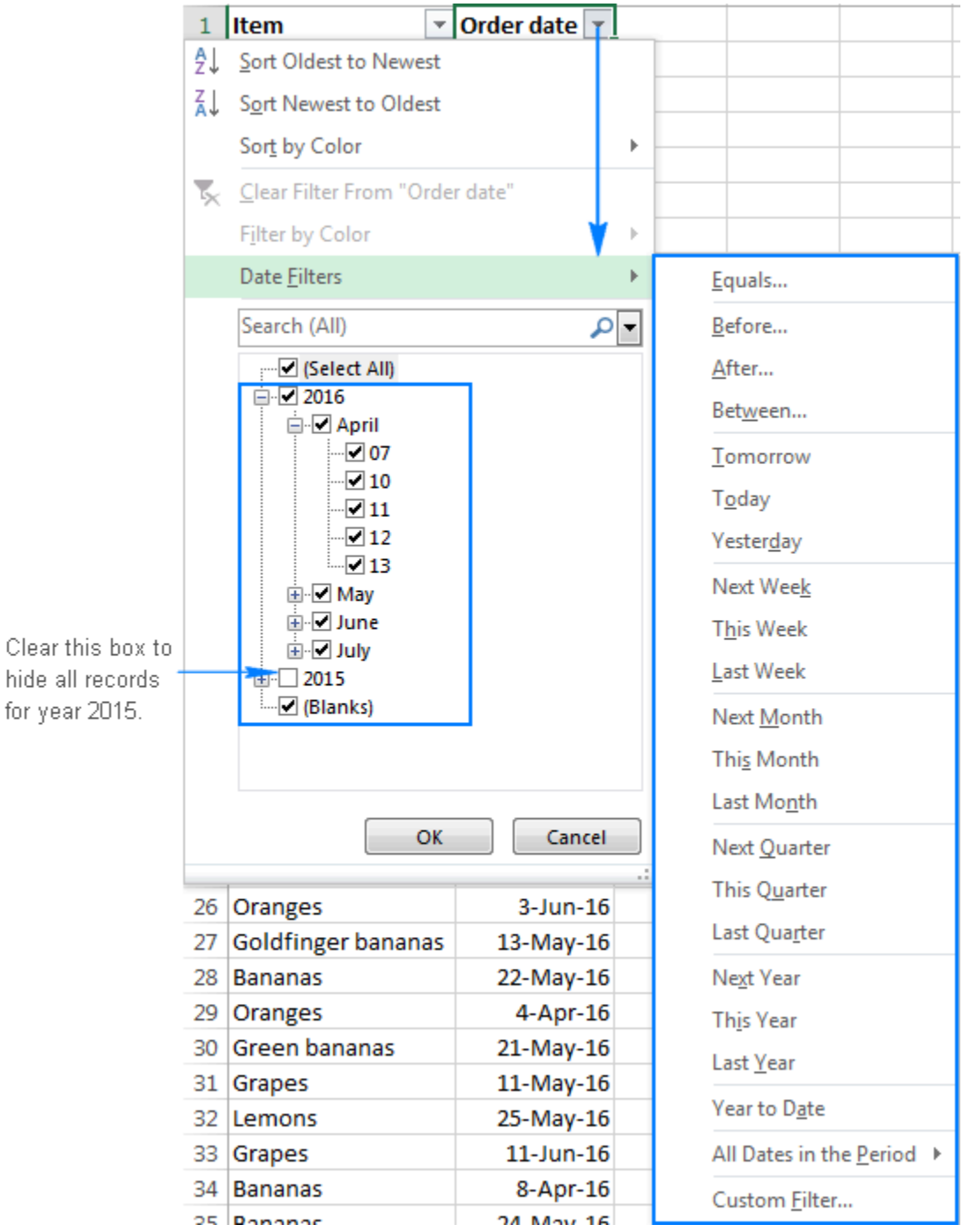


Figure 1.12. [Excel Filter: How to add, use and remove]

Usually, Excel's Date Filters work with a single click. For instance, a single click on the **'This Week'** from the Date Filter will display rows containing records for the current week. However, for advanced filter options, such as **Equals**, **Before**, **After**, **Between operato**r, or **Custom Filter**, a Custom Autofilter dialog box will pop up.

For instance, to display all items for the first 10 days of April 2016, click **Between…** and configure the filter in this way:

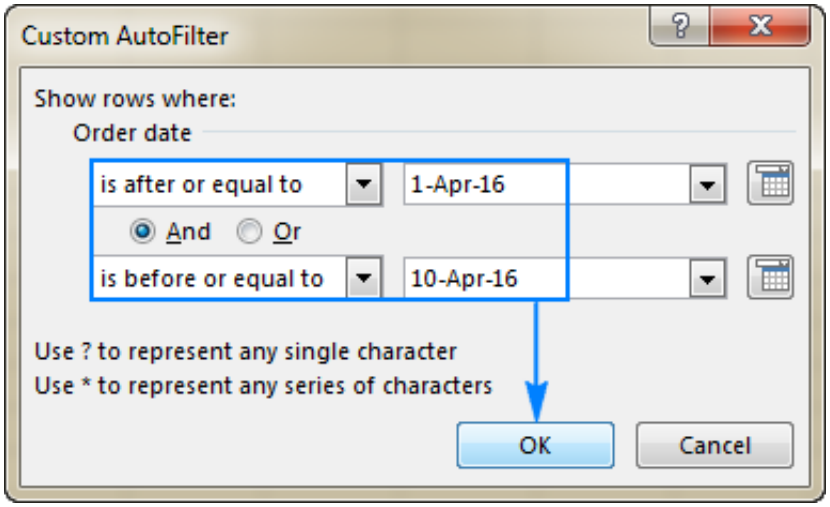


Figure 1.12a. Excel Filter: How to add, use and remove

Click on **OK,** and you will see the result showing the data between 1-Apr-2016 and 10-Apr-2016. There are other filter options in Microsoft Excel, such as the Color Filter, Cell values Filter, etc. But for the sake of this guide, this is where we will stop on the Filter tools in Microsoft Excel.

Module 3. Formatting Data

In Microsoft Excel, and pretty much every spreadsheet program, raw data can be very dull, confusing, and a lot difficult to read and understand. Don't forget the primary purpose of analyzing, organizing, and transforming data is to derive insights and drive decision-making. But if the data cannot be analyzed or transformed due to the inability to read the data, the sole purpose of the process is lost. To avoid this, we format our data.

Formatting is used to make data look more appealing, descriptive, and easy to read. It helps you understand patterns and find meaning in the worksheet seamlessly. A spreadsheet with good formatting will draw your attention to the most important cells easily. Essentially, you must format your data after entering it into a spreadsheet in order to make labels visually appealing, and numbers seem more descriptive of what they represent.

In Excel, you can format a cell or range before or after inputting your data. If your format your cells before typing in the data, anything you type in the cell will automatically appear in your chosen format. Preferably, you should format it after inputting your data. There are different types of formatting you can do in Excel. Let's discuss some of the most common ones:

3.1. Formatting Numbers in Excel

Excel comes with a handful of templates to format your numerical data so they can appear in a particular way. For instance, if you type two zero multiple point numbers into a "General" formatted cell, Excel automatically truncates the extra zeros and leaves the integer. Go ahead and try on your spreadsheet; type in '15.00' in a cell and hit **'Enter'** on your keyboard.

Notice that Excel leaves out the decimal point and the two zeros. You change this format to include the decimal point and the two zeros b:

- From your "**Home Menu,"**
- Locate the **Number** box,
- Click on the arrow. You should see a dropdown list as seen in the Figure below:

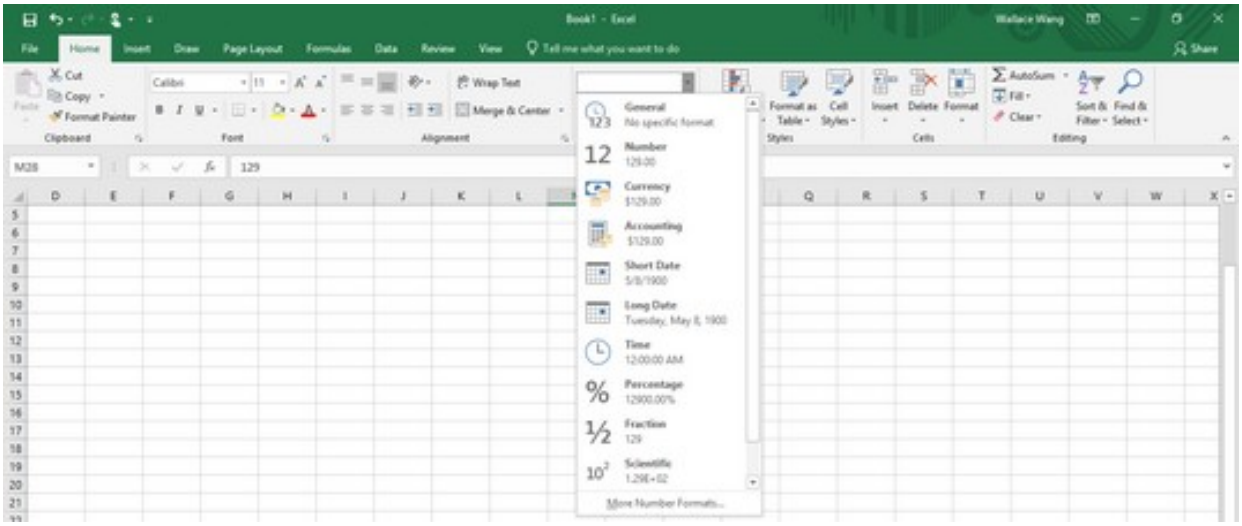


Figure 1.13. Excel 2019 Formatting: Numbers and Labels - dummies

This dropdown list is an array of options to format your numbers. For our example, we want our number to show the decimal point and two zeros, click on the **Number** option.

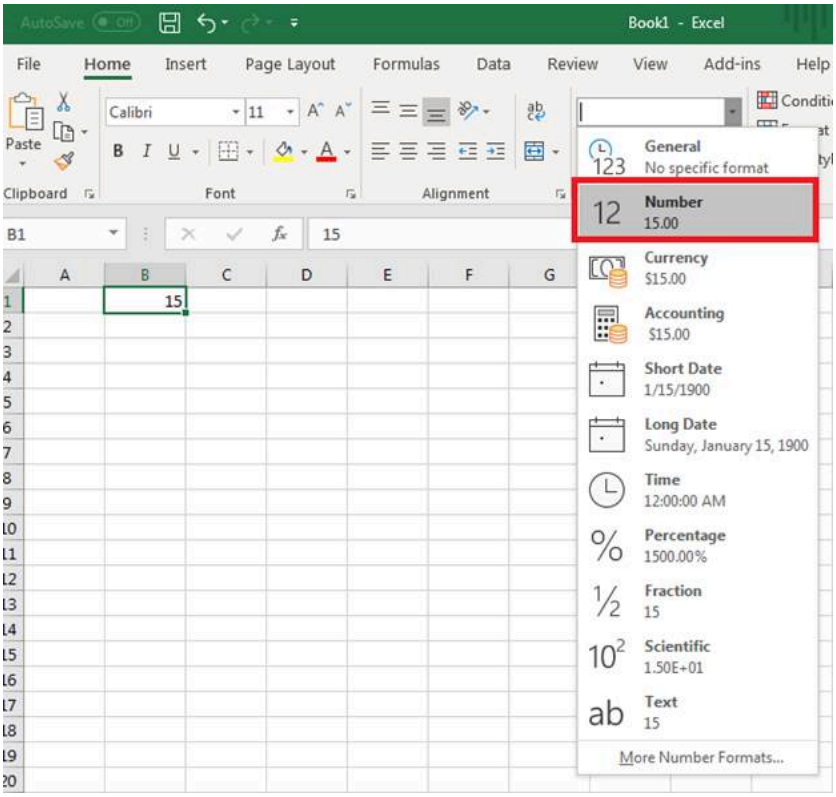


Figure 1.13a. How to Format Cells and Data in Excel 2019

Your value should look like this:

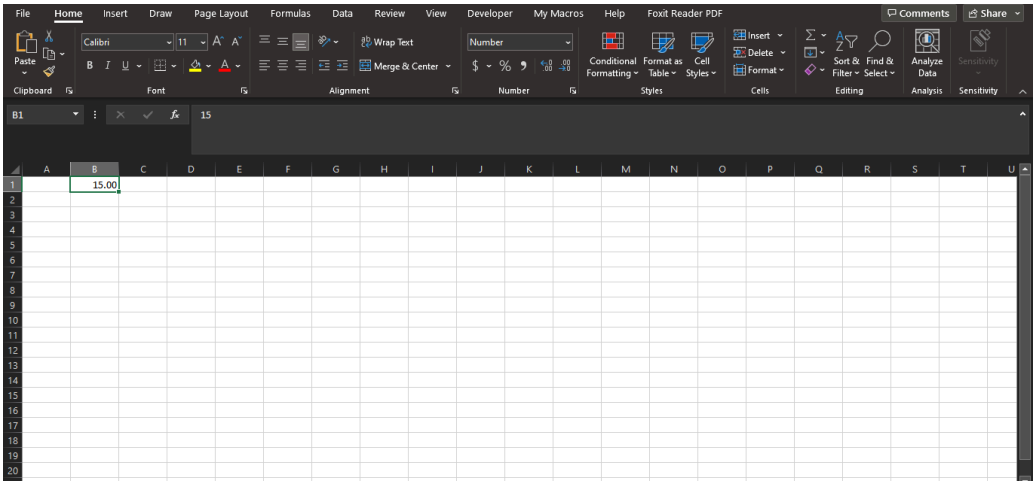


Figure 1.13b

Also, you can add your preferred currency to the numerical data. You can do this by following this simple step:

- From the dropdown list, as seen in Figure 1.13a above, click on the **Currency** option and you should have something like the figure below:

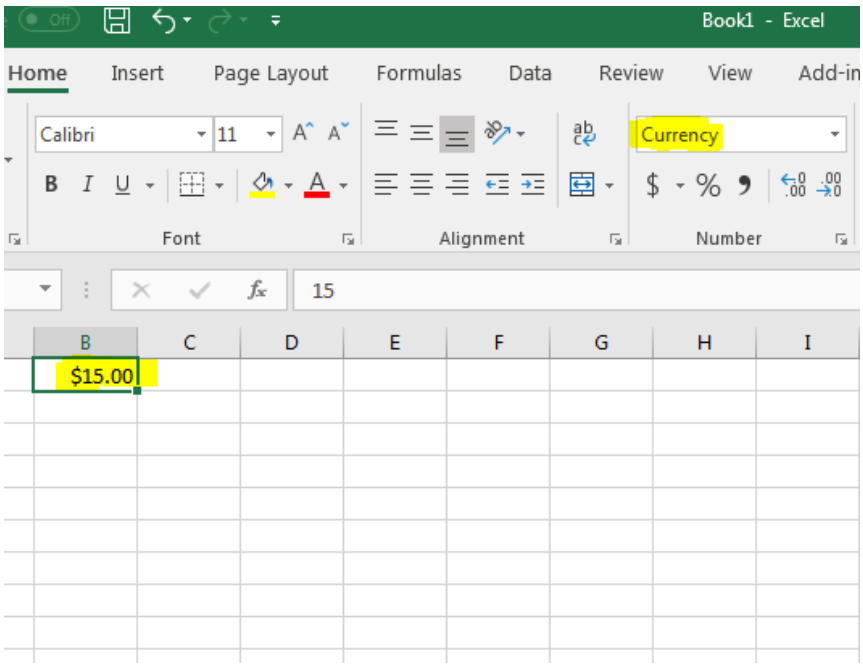


Figure 1.13c. [How to Format Cells and Data in Excel 2019]

Just right beneath the **Currency** in Figure 1.13c above, a click on the '**$**' will show the available currencies, in case you need to access a different currency. Also, you can switch between the various templates option from the dropdown to view results and changes in the numerical format.

Further, you can also design a custom template for your project. In Figure 1.13a above, a click on the last option on the dropdown list, **'More Number Option',** will open a new window with various categories. Click on the **Custom** option and customize your template.

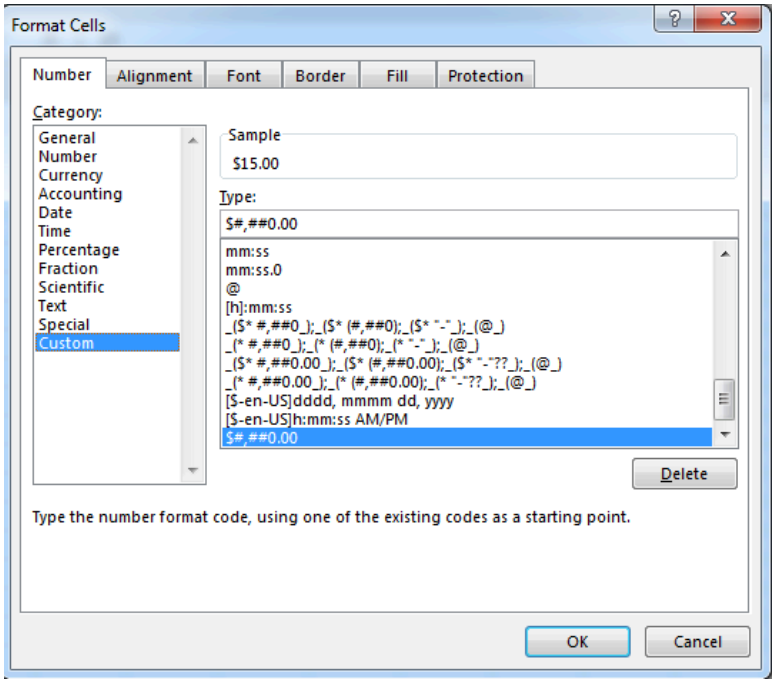


Figure 1.13d. [How to Format Cells and Data in Excel 2019]

3.2. Cell Styles

Some people like making their cells more attractive by adding colors. In fact, colorizing the cells makes it easy to separate and organize data. If you belong to that category of persons, Excel 2019 has several template formats so that you don't have to worry about coming up with an attractive layout for your spreadsheet.

❖ From your **Home Menu**, locate **Cell Styles** and click on it. You should see a dropdown box with several preset colors.

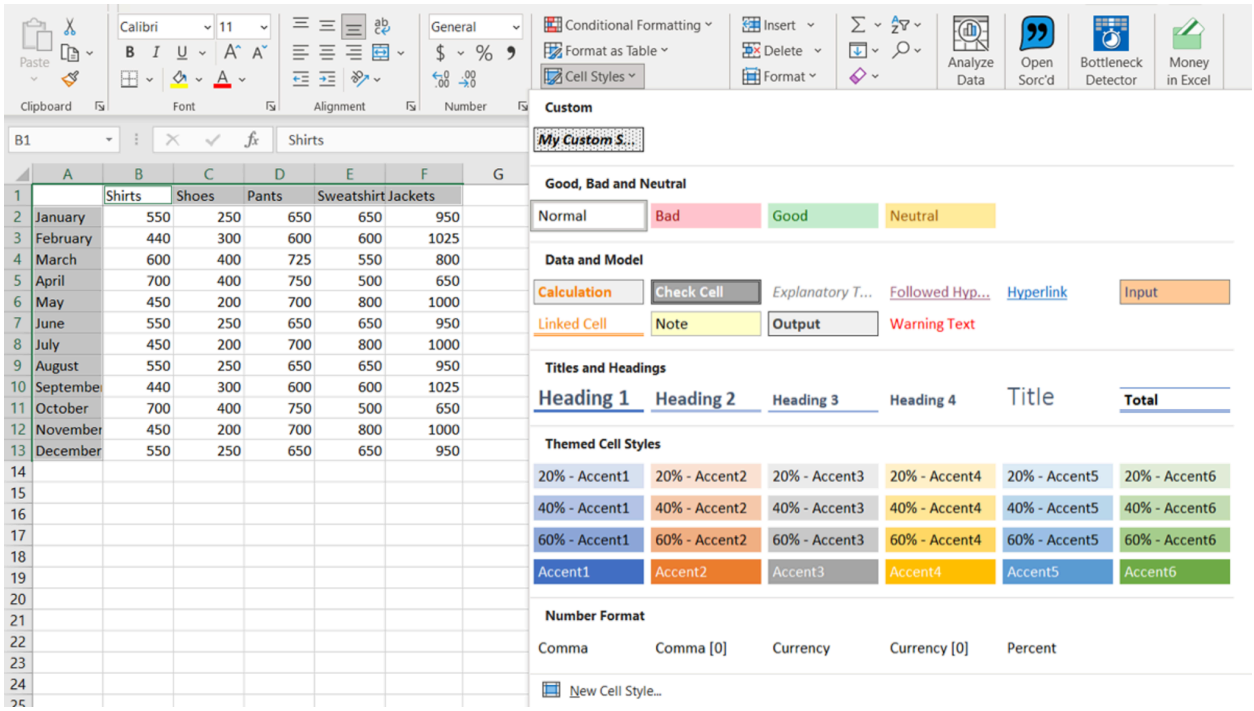


Figure 1.14. [How to Use and Create Cell Styles in Microsoft Excel]

By clicking on any of the preset colors, the selected cell will, as well as the fonts, colors, and background colors, will update to the new selection. Also, you can select multiple cells and update them to your preferred color selection. If you make a mistake and highlight too many cells or select the wrong style, remember that you can always click the "Undo" (arrow pointing to the left) on the top quick bar in Excel. Or just press Ctrl+Z on your keyboard to Undo any changes made.

3.3. Font Styles

Excel has a default font and font size for every newly created worksheet, but you can choose your preferred font styles. Simply locate your **Font Styles** from your **Home Menu.**

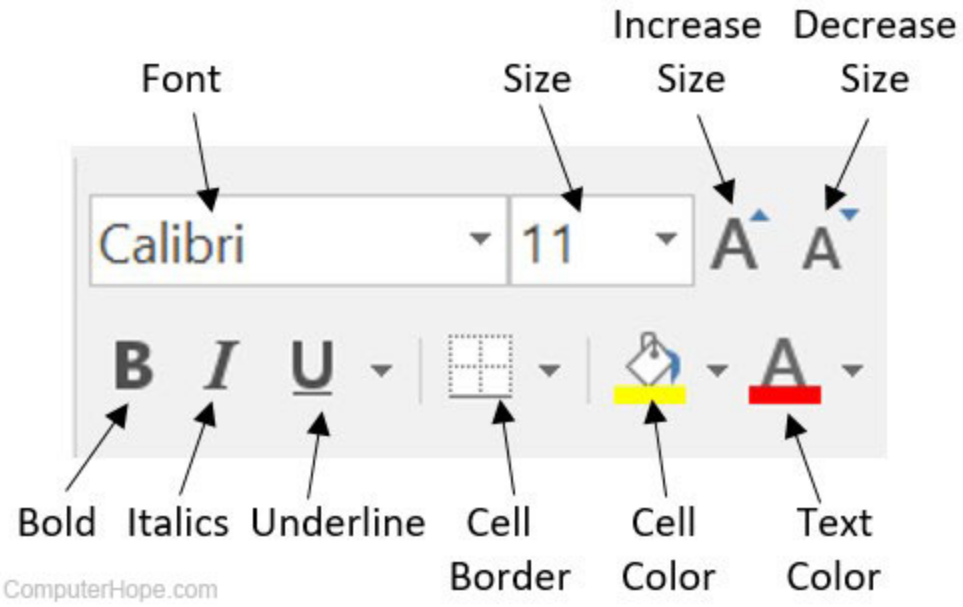


Figure 1.14. [How to change the font color, size, or type in Excel]

As seen in the Figure above, the default font for Excel is Calibri, and the Font Size, 11. By clicking on the dropdown arrow, you will see other available fonts to choose from. Similarly, by clicking on the dropdown arrow of the **Font Size,** you can adjust the size of your fonts. Do note that only the selected cell will be updated.

Additionally, you can apply your desired font style to the entire spreadsheet. You do this by highlighting all the cells in the spreadsheet, using the triangle icon above the first row and the left of the "A" column. See the figure below:

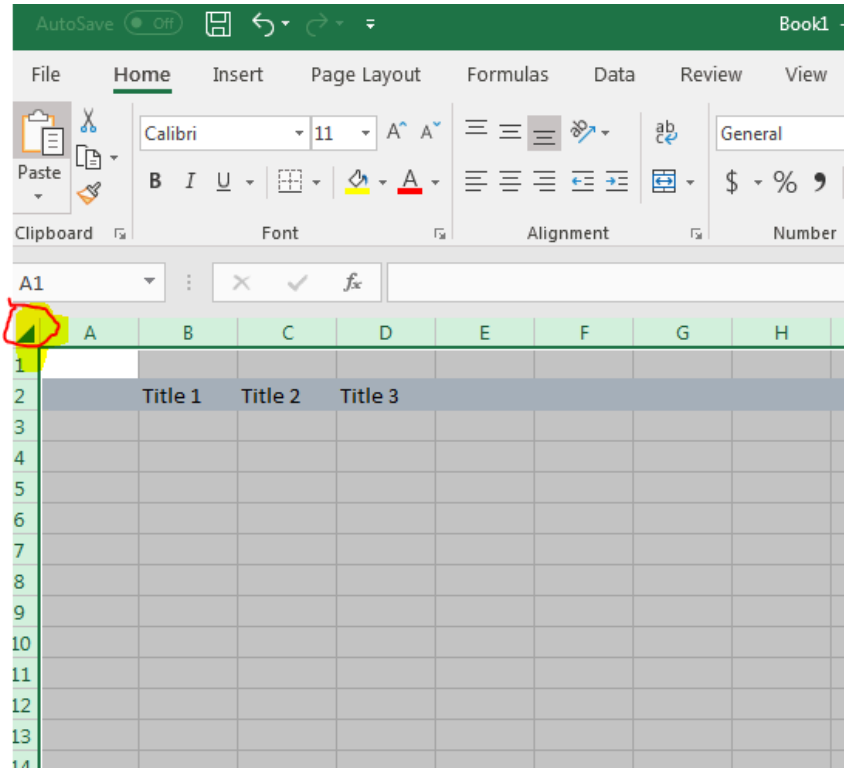


Figure 1.15. How to Format Cells and Data in Excel 2019

Once the cells have been highlighted, go on to choose your preferred font and font size options. Also, in the **"Font"** category, you see several other font style options. The **"B"** icon bolds font in selected cells. The **"I"** changes the font to italicized. The **"U"** icon underlines text stored in a cell. Check all three boxes to apply underlined, bold, and italic styles to cells.

Finally, on the Font styles, the bucket icon and the **"A"** icon with an underline are used to change the background color of a cell and text color, respectively. The text color icon comes in red by default. This means highlighting a text and clicking on the icon changes the font color to red. However, there are other colors to choose from. Click on the dropdown arrow close to the **"A"** to select other colors. Similarly, you can customize the color or pick a shade of a specific color by simply clicking on the **"More Color"** option in the dropdown box.

The paint bucket allows you to choose the background color for a cell. It works just like the font color dropdown. A click on the dropdown button will show you a list of colors to choose from. The "More colors" option in the paint bucket tool also allows you to select a custom color or a variation of an existing color. All chosen cells' backgrounds are updated by clicking color.

3.4. Text Alignment.

Text alignment deals with how the content of the cells is aligned with the edges of the cell. Text alignment allows for a better and clearer view of data in the workbook. In Excel 2019, below the alignment section located:

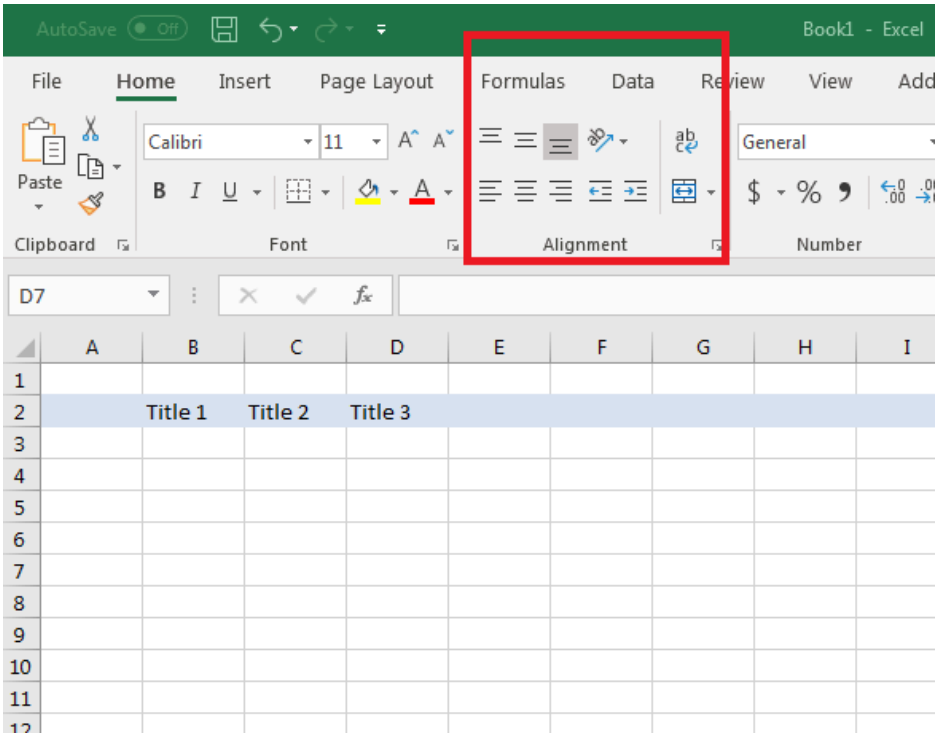


Figure 1.16. How to Format Cells and Data in Excel 2019

Alignment can be done vertically and horizontally. The first row controls the vertical alignment. Vertical alignment options are the top, middle, and bottom of the cell. While the second row of buttons controls the horizontal alignment. Toggle between these buttons and see how they affect your data.

Formatting cells make your worksheet attractive and presentable. With the formatting tools of Microsoft Excel, you have impressive features at your disposal to play around with.

Module 4. Functions and Formulas

Arguably, the main reason Microsoft Excel is considered the most powerful and versatile spreadsheet program is its ability to carry out several functions and operations. It is designed to make it much easier, quicker, and better.

Excel's engineering and math-solving capacity, which allows you to perform different complex operations in just a twinkle, is impressive and superbly mind-blowing. Moreso, by typing a bunch of formulas in a cell, you can calculate the weighted average and compound interest, optimize your budget, minimize costs, and lots more. Excel is a tool that makes your business and life easier.

There are over 400+ Excel functions and loads of formulas, and we cannot possibly discuss everything in this guide. However, we can discuss some of the basic and commonly used functions and formulas in Excel. Let's start with defining what functions and formulas are.

Formulas: Formulas are a bunch of mathematical expressions for calculating the values of a cell. Formulas largely drive all the operations and functions in Excel. For instance, **=B1+B2+B3+B4** is a formula that sums up the values of cells B1-B4.

Functions: Functions, conversely, are existing predefined formulas in Excel. Functions follow a particular order to perform a specific calculation using specific values. An example of a function will be **=SUM(B1:B4)**. This function sums up the values of cells B1-B4. Instead of writing out the formulas one by one, which probably could take forever, Excel provides an easier way.

All available Excel functions are stored in the Function Library. Click on the **Formula Tab.**

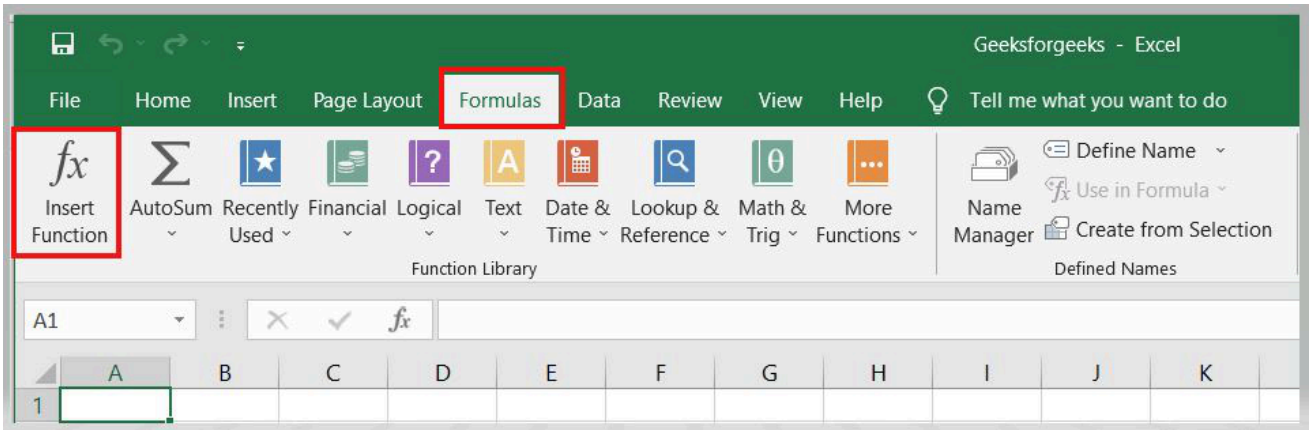


Figure 1.17. [Basic Excel Formulas and Functions - GeeksforGeeks]

We said earlier that there are over 400+ Excel functions, and this number keeps increasing as the version of Excel goes higher. Learning all the functions is almost impossible, and in fact, you don't have to. Well, at least not now. However, there are some basic functions that you must know as a beginner or an intermediate.

4.1. 10 Basic Excel Functions

Tips: Open Excel on your computer, type in a couple of numerical data in about four or more cells, and carry out the functions using the data.

Every function name must be preceded by the **equal (=)** sign. For example, if you want to the sum function:

- You will press **=Sum.** See the figure below:

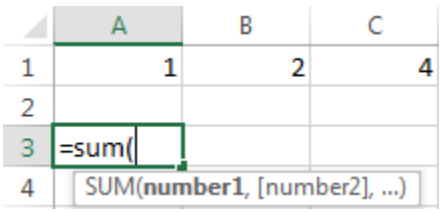


Figure 1.17a. [Basic Excel formulas & functions with examples]

Also, you don't necessarily have to type in uppercase. Once you hit the **ENTER** button or click on your preferred function with your mouse, Excel automatically changes it to uppercase. Below are ten basic Excel functions you should know:

1. **SUM**

The **SUM** function of Excel is one of the most commonly used functions in a spreadsheet. The **SUM** function essentially allows you to add up two or more values, in addition to arithmetic. The function appears like this:

SUM(number1, [number2], …)

To use your SUM formula, it must at least include one value. Note that, in Excel, an argument or query enclosed in [square brackets] is optional. Also, if your query looks like this:

=SUM(A2:A6) - it means to sum up values in cells A2 to A6.

=SUM(A2, A6) - this query only adds up values in cells A2 and A6. Take note of this!

Go ahead and use this formula with the values on your spreadsheet in this format: =SUM(value 1, value 2,…..). In the example, we use the **SUM** function to calculate the sum of the prices of the fruit.

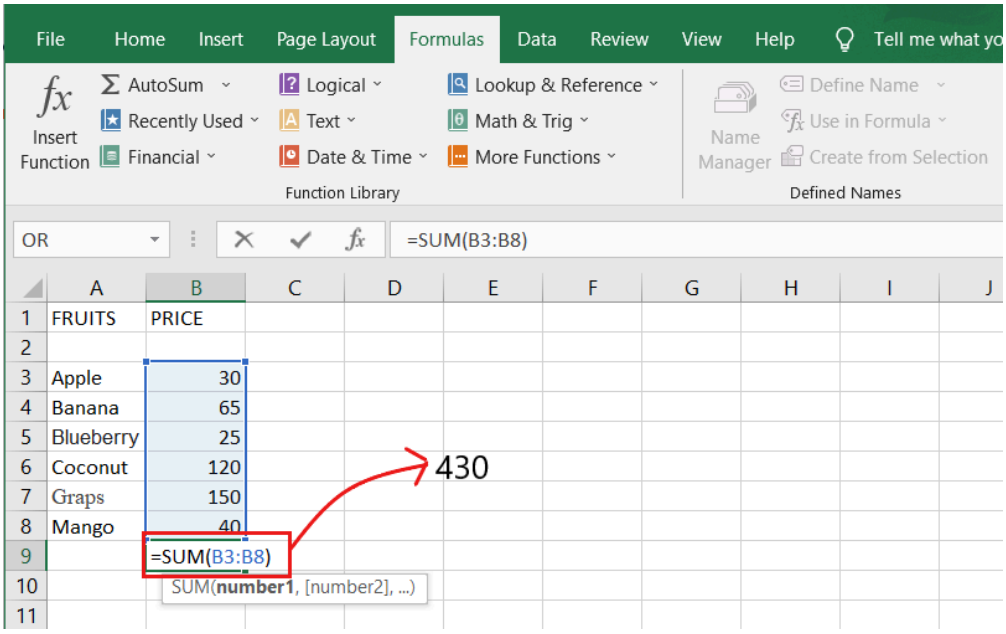


Figure 1.17b. Basic Excel Formulas and Functions - GeeksforGeeks

2. **Subtraction**

Unlike the **SUM** function, the **SUBTRACTION** feature is not a function. Instead, it is a formula. It essentially does the basic subtraction arithmetic. To use this formula, enter the cell you want to subtract in this format:

=SUM(Value 1, -Value 2)

By appending a negative sign to **Value 2,** it will subtract it from the sum of **Value 1.**

For instance, look at this figure below:

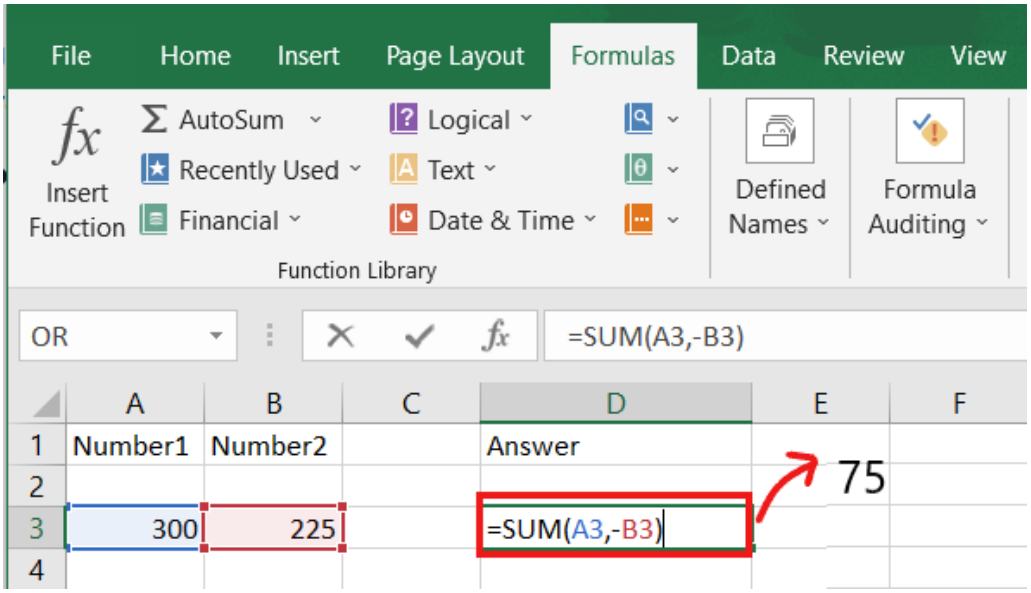


Figure 1.17c. Basic Excel Formulas and Functions - GeeksforGeeks

To subtract the value in cell A3 from the value in cell B3, our query will look like this: **=SUM(A3, -B3).** This would perform (300 + -225), returning a value of 75 in the D3 cell. Try this out with the values in your worksheet.

3. **Multiplication**

In Excel, there is no predefined function for multiplication. To do this, simply enter the cells you need to multiply in this format below:

=Value 1* Value 2

In Microsoft Excel, the asterisk (*) sign is used as the multiplication sign. See the figure below:

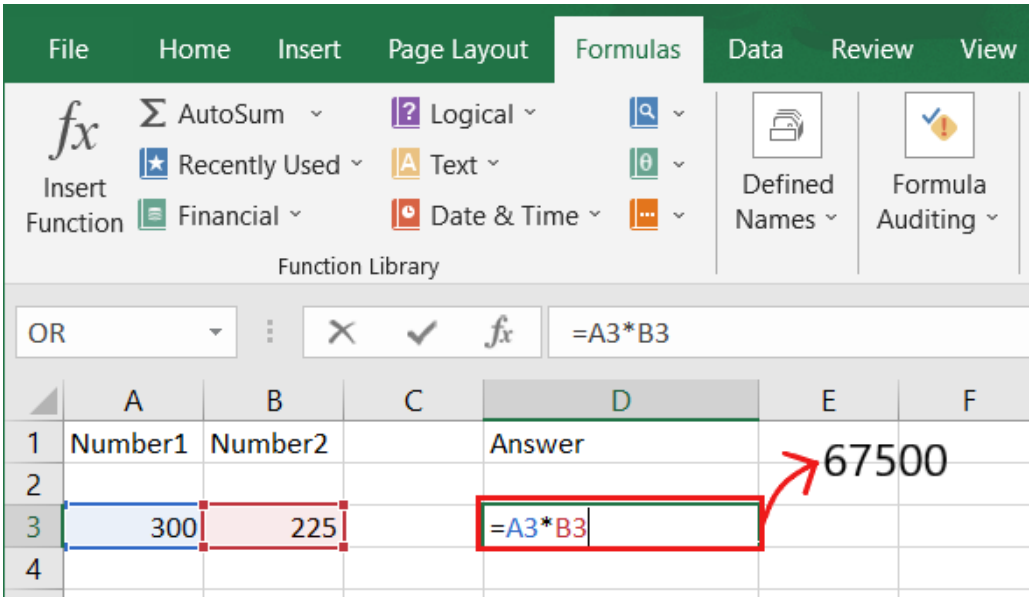


Figure 1.17d. [Basic Excel Formulas and Functions - GeeksforGeeks]

To multiply the values in cells A3 and B3 above, simply type in your query in this format: **=A3*B3** and press the **ENTER** button.

4. **Division**

The forward slash sign **(/)** is used as the division sign in Excel. Simply enter the values in this format:

=A3/B3

Using the example we have been working with, to divide the value in the cell A3 by the value in cell B3, our query will look like this: **=A3/B3**. See the figure below:

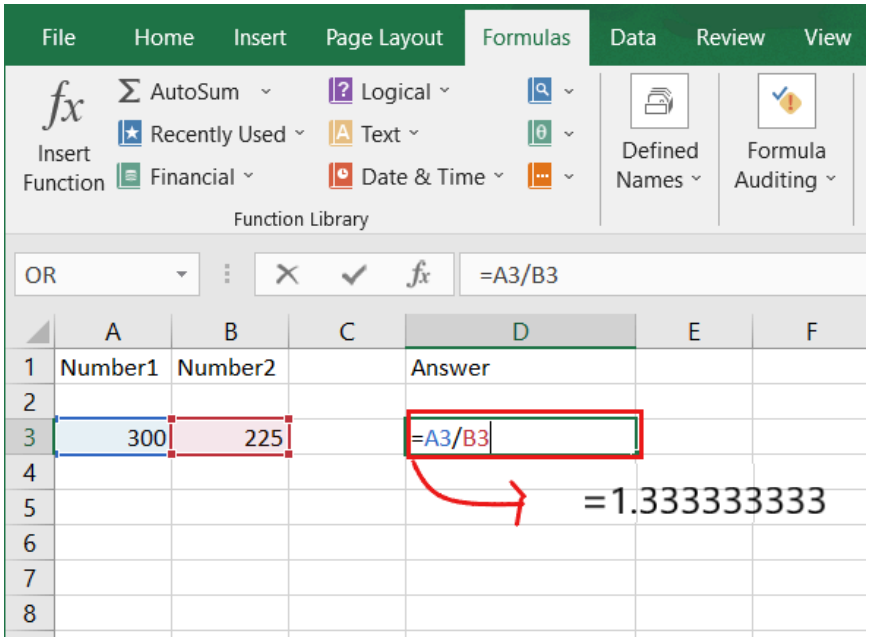


Figure 1.17e. [Basic Excel Formulas and Functions - GeeksforGeeks]

You can carry out division from any place on your spreadsheet. Just highlight an empty cell, enter the equal sign, and select the values you want to divide. Ensure you separate them by a forward slash **(/).**

5. Average

As the name implies, the **AVERAGE** function of Excel finds the average of numbers. You can also call it arithmetic. It has a similar syntax to the **SUM** function.

AVERAGE(number1, [number2], …)

Remember what we said about the square brackets. This means **number2** in the syntax above is optional. However, the AVERAGE function is usually used for a group of numbers. See the figure below:

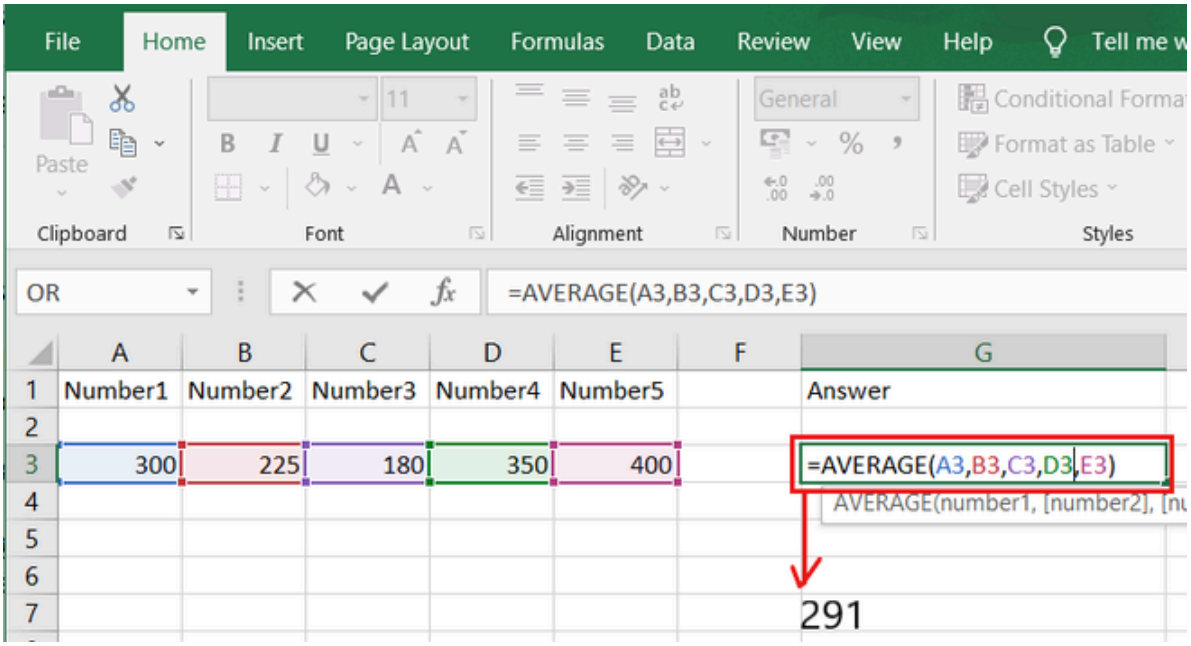


Figure 1.17f. [Basic Excel Formulas and Functions - GeeksforGeeks]

To find the average of cells A3 to E3, your query will be in this format: **=AVERAGE(A3,B3,C3,D3,E3).** Pressing the **ENTER** button will give you 291.

6. **MAX & MIN.**

The **MAX and MIN** functions do exactly what their names suggest; they find the maximum and the minimum values in a group of numbers. Their syntax looks like this:

MIN(number1, [number2], …)

MAX(number1, [number2], …)

For instance, let's find the **MAX & MIN** of the set of numbers in this data table below:

	A	B	C	D	E	F	G
1	**Item**	**Qty.**		**Max**	3	=MAX(B2:B6)	
2	Apples	1		**Min**	1	=MIN(B2:B6)	
3	Oranges	2					
4	Lemons	3					
5	Oranges	2					
6	Apples	3					

Figure 1.17g. Basic Excel formulas & functions with examples

To do that; our query will look like this for the largest value: **=MAX(B2:B6)** and like this for the smallest: **=MIN(B2:B6).** Try this with the data in your spreadsheet; find the largest and smallest values using the **MAX and MIN** functions.

7. COUNT & COUNTA

If you have a large set of data with columns and rows running into several hundred, and you want to know the number of cells containing numerical values, this can be pretty difficult to do with your hands. It consumes energy and time.

With the **COUNT** function in Excel, you don't have to count with your hands again. This function allows you to count the number of cells containing numerical data, numbers in a large dataset. It gives you your value in a heartbeat.

COUNT(value1, [value2], …)

Similarly, the **COUNTA** function in Excel gives you the number of all the cells that are not blank in a dataset. Regardless of what you have in the cells, signs, symbols, dates, time, text, errors, and logical values, among others, as long as they are not blank, the COUNTA function counts all these cells and returns with the value.

COUNTA (value1, [value2], …)

For instance, consider the data in this figure below:

	A	B	C	D	E	F	G
1	**Item**	**Qty.**		**Number count**	5	=COUNT(B:B)	
2	Apples	1		**Non-blank count**	6	=COUNTA(B:B)	
3	Oranges	2					
4	Lemons	3					
5	Oranges	2					
6	Apples	3					

Figure 1.17h. Basic Excel formulas & functions with examples

To find the number of cells containing numerical data, our query will look like this: **=COUNT(B:B),** and to get the number of all the cells that are not blank in column B, your syntax will look like this: **=COUNTA(B:B.)**

8. IF

The IF function is one of the logical tests in Microsoft Excel. Essentially, this function is used to ask Excel to perform a certain condition, and give a result if the condition is met, or maybe perform another operation if the condition is met.

IF(logical_test, [value_if_true], [value_if_false])

For instance, see the figure below:

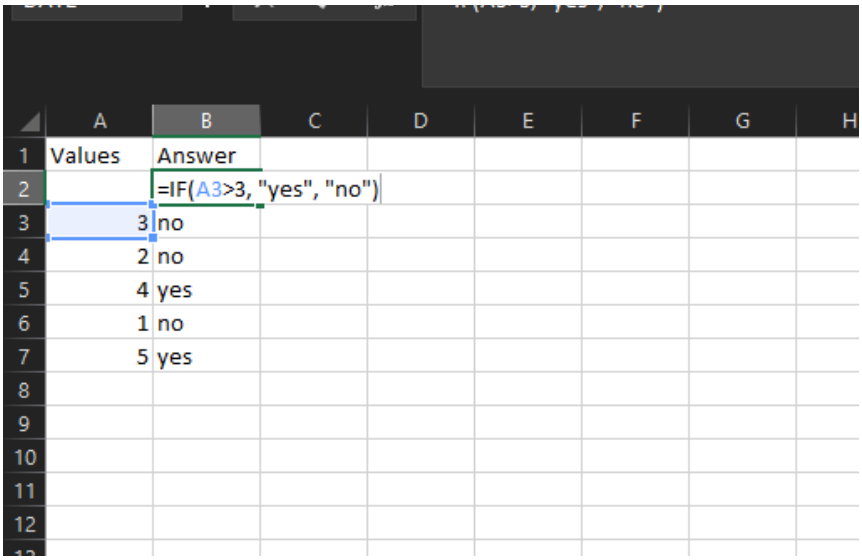


Figure 1.17i

Say you want to know the figures that are greater than three in column A, you can use the **IF** function to quickly do this. Your query will look like this: **IF(A3>3, "yes", "No"]).** Let's break it down:

- The logical test is **A3>3**
- The Value_if_true is **"Yes"** (Note that the **Yes** is in quotes)
- The value_if_false is **"No"** (The quotation marks are essential.)

Excel will run the query and return a result very quickly, as seen in Fig1.17i above.

9. TRIM

It's a common occurrence to have extra spaces in your text while inputting your data on the spreadsheet. These extra spaces can cause some of the formulas in Excel to return errors. Hence, your data must be free of extra space. Doing this manually can be very challenging, especially if you are working on a large dataset.

However, with the **TRIM** function in Excel, you can do this seamlessly. The **TRIM** function will remove extra spaces from your data table. The syntax looks like this:

TRIM(text)

Let's consider the figure below:

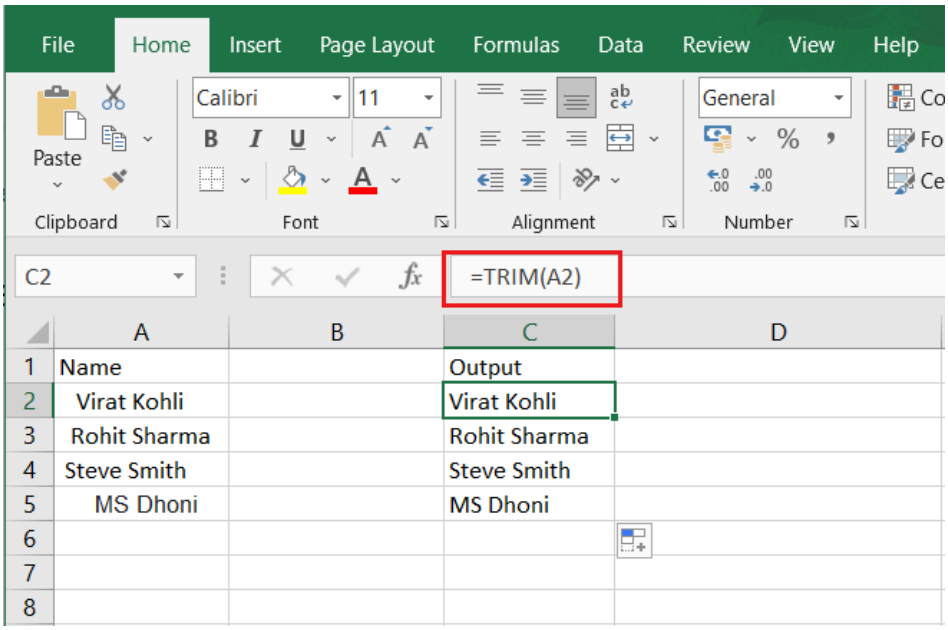


Figure 1.17j. [Basic Excel Formulas and Functions - GeeksforGeeks]

To remove the extra spaces in column A, simply use the **TRIM** function: **=TRIM(A2).** Note that the function only eliminated extra spaces in the cells, but left a single space character between words.

10. DATE

The **DATE** function in Excel will return a date based on the values entered in the parentheses, including values from other cells. The **DATE** syntax looks like this:

=DATE(year, month, day)

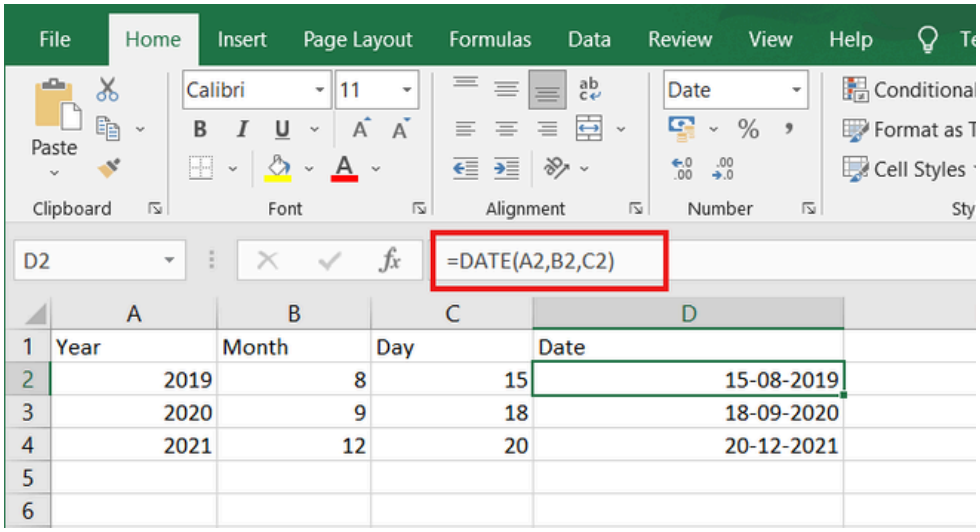


Figure 1.17k. [Basic Excel Formulas and Functions - GeeksforGeeks]

To get the date from that data in the Year, Month, and Day columns, simply input this query: **=DATE(A2,B2,C2).**

Similarly, you can get the current date and time anytime you open your Excel without having to manually update it.

=TODAY() to insert today's date in a cell

=NOW() to insert the current date and time in a cell

Tip: It's a lot more difficult and time-consuming typing the same formula into different cells. Don't do that! Once you have typed your formula into a particular cell, you can simply copy the formula to adjacent cells that dragging the **Fill Handle.** The **Fill Handle** is a small square close to the right-hand corner of a cell. See the figure below:

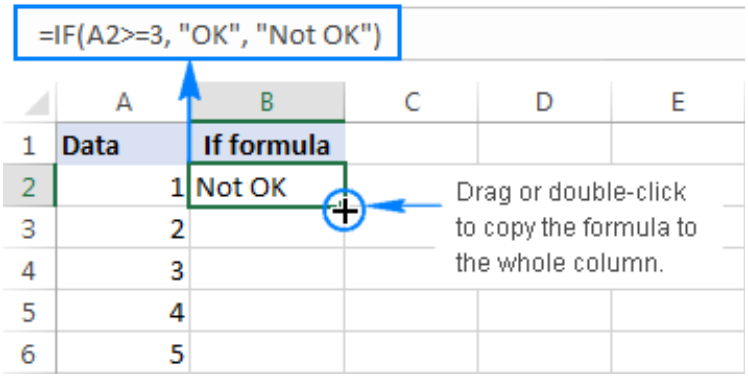


Figure 1.17l. [Basic Excel Formulas and Functions - GeeksforGeeks]

Place your mouse close to that edge, and drag the **Fill Handle** to the adjacent cells to fill your preferred cells. Also, if you want to fill the entire column with the same formula, simply place your mouse close to the edge of the cell, as seen in Figure 1.17l above, and double-click the plus(+) sign. However, pay attention to the cell references.

That's how far we can go on some basic Excel functions and formulas. This is not exhaustive as there are loads of other functions and formulas in Excel. However, this is a good way to start. You will learn and know as you proceed in your learning.

The most important thing, however, is practice. Ensure you have Excel open on your system, and try all the functions and formulas we have discussed in this module. Try multiple examples on each of the functions before moving on to the next.

We have explained the steps in the most basic format to avoid confusion. Follow the steps gradually, alongside the figure references. Now, let's talk about something more interesting; Data Visualization with charts.

Module 5. Visualizations With Charts On Excel

In our world today, the importance of data can no longer be overemphasized. It is one of the most abundant and valuable resources businesses and organizations have at their disposal to drive business decisions. Before insights can be gleaned from data to drive decisions, it must have gone through the analysis, and, of course, visualization.

Fortunately, Microsoft Excel, being a versatile and powerful tool, can perform both operations. Although there are loads of tools designed specifically for data visualization, Microsoft Excel provides an amazing platform to do this also.

In simple terms, data visualization is the representation or depiction of data ina graphical format. Humans are visual creatures. We tend to appreciate what we see more, especially if they come in an appealing form. Visualization makes it easy to read data, spot patterns, and ultimately, make informed decisions.

Microsoft Excel provides different options to visualize data, and that's what we will talk about in this last module. So, let's start with the different types of visualization features in Excel.

5.1. Types of Visualization Charts In Excel

Excel provides users with different types of visualization charts, including

- Pie charts
- Bar charts
- Histograms
- Area charts
- Scatter plots.

You can always choose any of the listed charts depending on the kind of dataset you are working on, and what you intend to achieve. If you have a large or complex dataset, there are more advanced charts you can use for illustration. Examples include:

- Timelines
- Gantt charts
- Heat maps
- Highlight tables
- Bullet graphs

5.2. Steps for Data Visualization in Excel

The steps to creating charts in Excel are pretty much simple and straightforward. However, how impressive the visualization largely depends on the users. For better understanding, we will list out the steps and go on to visualize data using different datasets as well as different visualization charts. Below are the steps:

- Open Excel on your computers and enter or select the data you want to visualize.
- Click on the **INSERT** tab, locate the **Chart** box and choose your most preferred charts from the available options.
- Preferably, click on several charts to see how they visualize your data and choose the best option.
- It's possible you don't find your preferred charts from Chart Box. If you need to see more charts, click on **Recommended Charts**, and then click on **All Charts**
- The **Chart Elements**, **Chart Styles**, and **Chart Filters** buttons are there to help add details, such as labels, titles, and axis, and customize your charts.
- A single click anywhere on the chart will pop up **Chart Tools** for further design and formatting.

The most effective way to learn is with examples and hands-on projects. Let's look at a couple of examples.

	A	B
1	**Student Name**	**Marks**
2	Arjun	90
3	Bheema	83
4	Sahadev	45
5	Karna	80
6	Dhruva	60
7	Pandu	75
8		
9		

Figure 1.18. Data Visualization in Excel - GeeksforGeeks

If you type in the data in Figure 1.18 above in your spreadsheet and simply press the **F11** function key, you will have a column chart like the figure below:

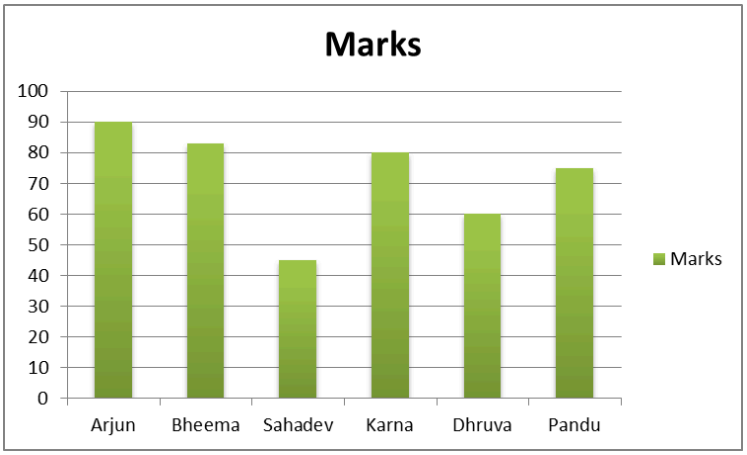


Figure 1.18a. Data Visualization in Excel - GeeksforGeeks

This also can be done if your dataset has multiple columns. Just enter your data and press the **F11** function key.

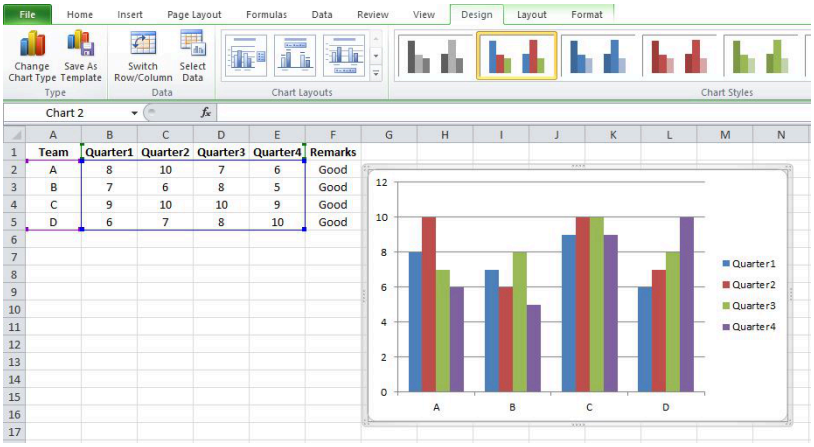


Figure 1.18a. Data Visualization in Excel - GeeksforGeeks

In addition, you can adjust your charts to make them clearer, or maybe change the title of your charts, add labels, horizontal and vertical grid lines to your charts, etc, by clicking the "**Chart Design**" tab from your **Insert Menu.**

Furthermore, you can also format your chart. This provides you with several options for filling your charts with shadow effects, Styles borders, Border colors, patterns, and solid colors, among many others. To do this, click on the **Format** tab from your **Insert Menu**.

There is no almost no end to what you can visualize with Excel. This spreadsheet program is very powerful. Attempting to cover all the details of chart visualization in Excel is near impossible. What we have done is provide you with some basic steps to guide your way through creating your first set of charts.

Proficiency comes with time and consistent practice. Play around with all the tools and see how they affect your charts.

5.3. New Visualization Charts

The functionalities of Excel keep increasing by version. The 2019 and the succeeding versions of Microsoft Excel have updated visualization charts. A very good example is the **Sunburst Chart.** See the figure below.

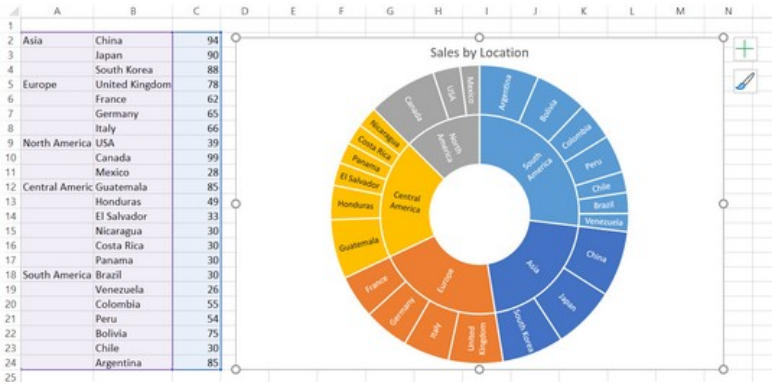


Figure 1.18b. [5 New Charts to Visually Display Data in Excel 2019 - dummies]

A single glance at it and you wouldn't be wrong to call it a donut chart, but it's not. It's a blend of a pie chart and a donut chart. A somewhat kind of multilevel hierarchical chart. So if you have a set of data arranged in a form hierarchy, this is your best chart for visualization.

To create this **Sunburst Chart**, follow these simple steps below:

- ❖ Arrange your data in a hierarchical order on the spreadsheet.

- Select the entire data range, including labels.
- From your **Insert Menu**, click on **Hierarchy Chart**, and then **Sunburst**.
- Remember you can format the chart to suit your project. You have all of these formatting tools in the **Design Tab.**

Another visualization feature is the **Waterfall Chart.** Creating a visualization that shows the cumulative effects of negative or positive values over a long period of time used to be a very long process. However, with a Waterfall **Chart**, you can easily create that in a heartbeat.

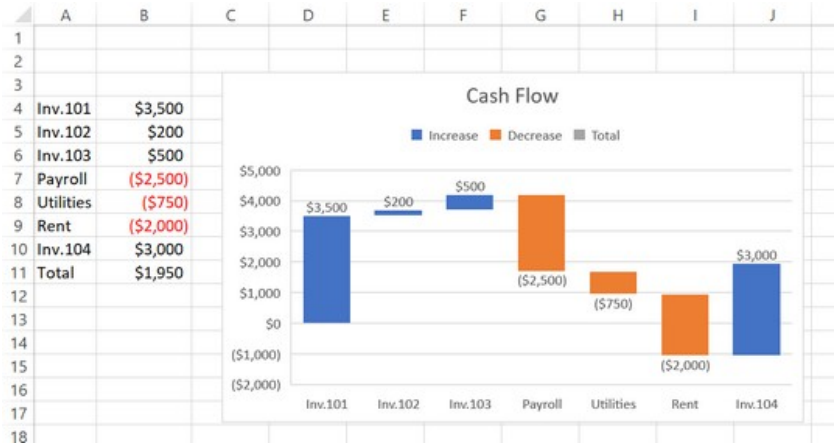


Figure 1.18c. [5 New Charts to Visually Display Data in Excel 2019 - dummies]

This **Waterfall Chart** is particularly perfect for visualizing the cumulative effects of values such as credits or debits to an account. The following steps will help you create a **Waterfall Chart** in Excel:

- Select the data to be visualized
- From your **Insert Tab,** click on **Waterfall,** Funnel, Stock, Surface, or Radar Chart
- Click on Waterfall
- Format the chart as it pleases.

However, ensure that your data is in the same order you want it on the chart.

Finally, another one of the new visualization features and tools in Excel is the **Map Chart.** Data labels for states, provinces, countries and postal codes are recognized by Excel's Map Chart,

which then displays the relevant map and sets the information there. With this chart, you can now easily create a map with your numerical data.

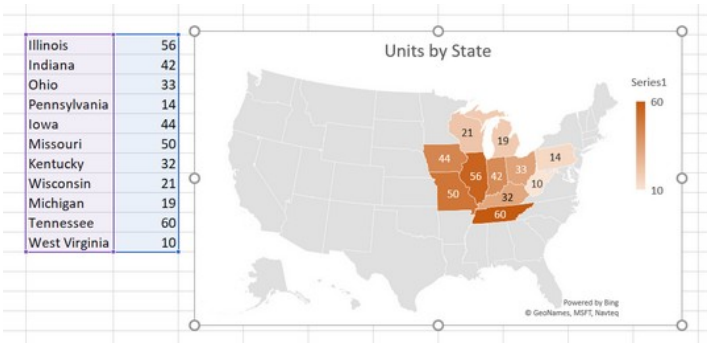


Figure 1.18d. [5 New Charts to Visually Display Data in Excel 2019 - dummies]

To create this map:

- Fill in your data with country or state names
- Select the data you want to chart.
- Click on the **Filled Map** tab from your **Insert Menu**
- Resize and format as needed.

There are other new visualization features to chart your data, such as the Box and Whisker Chart, Funnel Charts, etc. They all are applicable to different visualization needs. And they can all be found in the Chart tab from your **Insert Menu**.

Let's consider some tips to create a good and compelling visualization in Excel.

5.4. Tips for Creating Visualization In Excel

The core purpose of visualization of data with charts is to spot patterns, derive insights and drive decision-making. Although this part of data processing relies more on the creativity of the user, there are a couple of tips that can make your visualization come out clean, clear and catchy. Let's get to it.

1. **Choose the right charts**

The foundation of having a good visualization is choosing the right and most appropriate charts. This is very important. To choose the right visualization, you should consider the:

- The type of data you're working on,
- The size of the data, and
- Your target audience.

Essentially you need to understand how these charts work, and you can do so by trying out all the charts with the data and see which fits best. Even if your data is accurate, but your visualization is a bit skewed, or it looks muddled up, it can affect the understanding of your target audience.

Also, your target audience should determine how simple or complex your visualization will look. Complex illustrations could negatively impact how you display the information, and that will tell on the understanding of your audience.

The best way to go about this is always to make your visualization appealing, with the major trends highlighted. This will foster easier and better understanding.

2. **Eliminate irrelevant data.**

You should not include all the data in your spreadsheet in your charts. If it's not important, it should not be in your visualization. Remember that the quality of your visualization is as good as that of your data. Hence, take some time to carefully clean the data to remove irrelevant and inaccurate data.

If this is not done properly, not only will it affect the integrity of your visualization, but also it may lead to making wrong decisions that could negatively impact your business.

3. **Context is key.**

When you are presenting to your audience, whether the stakeholders, board of directors, supervisors, or whoever makes up your audience, you must help them make sense of the visualization by adding context.

Context is essential. It makes your audience understand your point better. When you add details to the heatmap, pie charts, bar charts, or any of the visualization charts you choose, they relate to it better. It drives home your point more accurately.

For instance, a heatmap showing the frequency of an infection during a specific period is not good enough to drive your point. Instead, consider adding more details, such as the period of this study, where the data is collected, the infectious rate compared with other common diseases, what each color means, etc.

This will help your audience interpret and understand the information you are passing across. Don't just say it's bad. Tell us how bad it is compared with known indicators. Your color system must be well explained. Your audience wants to know what each color represents.

4. Tell A Story

There is no good visualization without a good story. In fact, your data, through patterns and trends, is telling a story. It's your job not only to understand that story but also to tell the story. Hence, if you want to design a compelling visualization, tell a story.

Your visualization should clearly illustrate the patterns and trends and present facts and findings in a simple way for your audience to understand. Don't just throw in all lines, figures, and all in your visualization. Be intentional about what story they are telling.

Telling a story makes your visualization interesting and engaging and fosters data-driven decision-making. Hence, always remember to tell a good story with your visualization.

Conclusion

Skills in Microsoft Excel are definitely one of the most sought-after in the world today. Business owners and industry leaders want to break into new markets, start a new product, expand their reach, and ultimately make more money. All of these decisions must be backed by facts and data.

Hence, the ability to use Microsoft Excel to analyze, organize, and transform data into actionable insights will make you outstanding among many. Building proficiency in this versatile tool is a huge move.

However, it starts with learning. It begins with building a strong foundation. Fortunately, this guide will provide you with that much-needed strong foundation. Although this guide is not exhaustive, we have covered the basics. Further learning will rest on the strong foundation this guide has provided.

Try your hands on all that we have discussed in this guide. Ensure you get them before moving on to another. Practice consistently, and in no time, you will become a force to reckon with.

Happy Learning!