Lecture Note #2: Excel Basics

BUSI 201: Business Data Analysis

Fall 2023

Topic 1. Heights and Widths

Row Height

As we covered last session, the default font size in Excel is 11, which corresponds to a default row height of 14~18.[1] While there is no clear consensus, it is often advantegeous to adjust the height of the rows. Please take some time to compare the two tables below. The figure to the left is set to the default row height of 14.4, and to its right is the same table with the row height adjusted to 18.2.

STATE	TOP CROPS				
	#1	#2	#3	#4	#5
US-AZ	COTTON	WHEAT	LETTUCE	BARLEY	MELONS
US-CA	COTTON	HAY & HAYLAGE	WHEAT	GRAPES	RICE
US-FL	ORANGES	SUGARCANE	PEANUTS	GRAPEFRUIT	SOYBEANS
US-GA	COTTON	SOYBEANS	PEANUTS	CORN	WHEAT
US-ID	WHEAT	BARLEY	POTATOES	HAY & HAYLAGE	SUGARBEETS
US-IL	CORN	SOYBEANS	WHEAT		
US-IN	CORN	SOYBEANS	WHEAT		
US-KS	WHEAT	SORGHUM	CORN	SOYBEANS	HAY & HAYLAGE
US-KY	SOYBEANS	CORN	WHEAT	TOBACCO	
US-MI	CORN	SOYBEANS	WHEAT	HAY & HAYLAGE	BEANS
US-NC	SOYBEANS	CORN	WHEAT	CORN	TOBACCO
US-NJ	SOYBEANS	CORN	WHEAT	SWEET CORN	POTATOES
US-NY	HAY & HAYLAGE	CORN	WHEAT	SOYBEANS	OATS
US-OH	SOYBEANS	CORN	WHEAT	HAY & HAYLAGE	OATS
US-OR	WHEAT	BARLEY	POTATOES	OATS	CORN
US-PA	CORN	HAY & HAYLAGE	SOYBEANS	WHEAT	OATS
US-TN	SOYBEANS	CORN	COTTON	WHEAT	SORGHUM
US-TX	COTTON	WHEAT	SORGHUM	HAY & HAYLAGE	CORN
US-WA	WHEAT	BARLEY	HAY & HAYLAGE	POTATOES	CORN
US-WI	CORN	HAY & HAYLAGE	SOYBEANS	OATS	WHEAT
MX-AGU	CORN	BEANS	ALFALFA	GUAVA	OATS
MX-BCN	WHEAT	COTTON	ALFALFA	BARLEY	SORGHUM
MX-CHH	CORN	OATS	BEANS	ALFALFA	COTTON
MX-CHP	CORN	COFFEE	BEANS	GRASS	COCOA
MX-CMX	CORN	OATS	CACTUS	BEANS	BROCCOLI
MX-COA	GRASS	CORN	SORGHUM	COTTON	OATS
MX-COL	GRASS	LEMON	COCONUT	CORN	SUGARCANE
MX-DUR	BEANS	CORN	OATS	SORGHUM	ALFALFA
MX-GRO	CORN	COCONUT	GRASS	COFFEE	MANGO
MX-GUA	CORN	SORGHUM	WHEAT	BEANS	ALFALFA
MX-HID	CORN	BARLEY	BEANS	ALFALFA	COFFEE
MX-JAL	CORN	GRASS	SORGHUM	SUGARCANE	WHEAT
MX-MEX	CORN	OATS	GRASS	BARLEY	WHEAT
MX-MIC	CORN	SORGHUM	AVOCADO	GRASS	WHEAT
MX-MOR	CORN	SORGHUM	SUGARCANE	BEANS	TOMATO
MX-NAY	BEANS	CORN	SORGHUM	GRASS	SUGARCANE
MX-NLE	GRASS	CORN	SORGHUM	WHEAT	ORANGES

Figure 1: Row Height = 14.4

STATE	TOP CROPS				
	#1	#2	#3	#4	#5
US-AZ	COTTON	WHEAT	LETTUCE	BARLEY	MELONS
US-CA	COTTON	HAY & HAYLAGE	WHEAT	GRAPES	RICE
US-FL	ORANGES	SUGARCANE	PEANUTS	GRAPEFRUIT	SOYBEANS
US-GA	COTTON	SOYBEANS	PEANUTS	CORN	WHEAT
US-ID	WHEAT	BARLEY	POTATOES	HAY & HAYLAGE	SUGARBEETS
US-IL	CORN	SOYBEANS	WHEAT		
US-IN	CORN	SOYBEANS	WHEAT		
US-KS	WHEAT	SORGHUM	CORN	SOYBEANS	HAY & HAYLAGE
US-KY	SOYBEANS	CORN	WHEAT	TOBACCO	
US-MI	CORN	SOYBEANS	WHEAT	HAY & HAYLAGE	BEANS
US-NC	SOYBEANS	CORN	WHEAT	CORN	TOBACCO
US-NJ	SOYBEANS	CORN	WHEAT	SWEET CORN	POTATOES
US-NY	HAY & HAYLAGE	CORN	WHEAT	SOYBEANS	OATS
US-OH	SOYBEANS	CORN	WHEAT	HAY & HAYLAGE	OATS
US-OR	WHEAT	BARLEY	POTATOES	OATS	CORN
US-PA	CORN	HAY & HAYLAGE	SOYBEANS	WHEAT	OATS
US-TN	SOYBEANS	CORN	COTTON	WHEAT	SORGHUM
US-TX	COTTON	WHEAT	SORGHUM	HAY & HAYLAGE	CORN
US-WA	WHEAT	BARLEY	HAY & HAYLAGE	POTATOES	CORN
US-WI	CORN	HAY & HAYLAGE	SOYBEANS	OATS	WHEAT
MX-AGU	CORN	BEANS	ALFALFA	GUAVA	OATS
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MX-CHH	CORN	OATS	BEANS	ALFALFA	COTTON
MX-CHP	CORN	COFFEE	BEANS	GRASS	COCOA
MX-CMX	CORN	OATS	CACTUS	BEANS	BROCCOLI
MX-COA	GRASS	CORN	SORGHUM	COTTON	OATS
MX-COL	GRASS	LEMON	COCONUT	CORN	SUGARCANE
MX-DUR	BEANS	CORN	OATS	SORGHUM	ALFALFA
MX-GRO	CORN	COCONUT	GRASS	COFFEE	MANGO

Figure 2: Row Height = 18.2

While there isn't a definitive consensus on the ideal row height for a given document, a useful rule of thumb is to aim for around 1.5~1.7 times your font size. For instance, with a font size of 12, a suitable range for your row height would be between 18 and 20.4. Nevertheless, this guideline heavily relies on factors such as the document's purpose, target audience, and whether it's intended for paper printing, among other considerations.

[1] The specifics depend on your version of Excel, the resolution and size of your display, etc.

Adjusting the Height of a Row

The simplest method to adjust the height of a single row would be to start by left-clicking on the row number that you want to modify. Next, right-click on the same row number to bring up a menu, as illustrated in Figure 3.

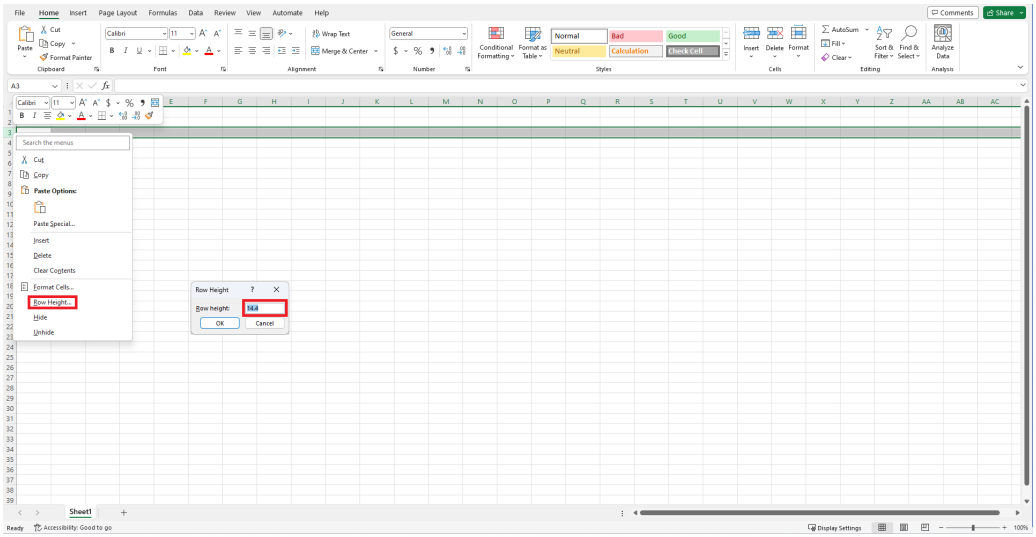


Figure 3: Adjusting the height of row 3

Adjusting the Height of Multiple Rows

To modify the row height for multiple rows, follow these steps: left-click on the first row you want to include, hold down the `Shift` key, and then left-click on the last row you want to adjust. After that, release the `Shift` key. Next, right-click on any of the selected row numbers and proceed with the same steps as you would when changing the height of a single row.

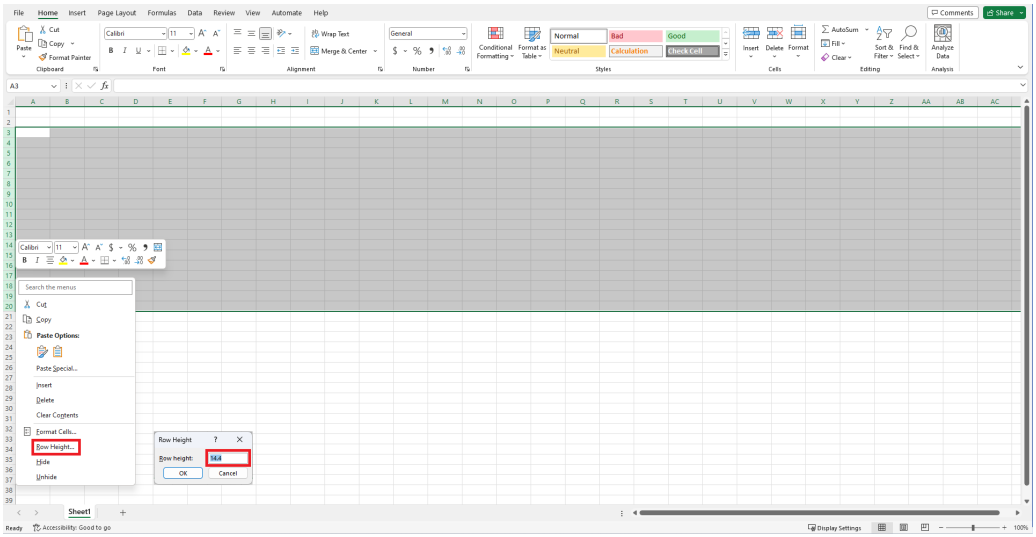


Figure 4: Adjusting the height of rows 3 to 20

Adjusting the Height of All Rows

In Excel, left-clicking on the top left-hand corner, as shown in Figure 5, will enable you to select all cells in the sheet. Once you have selected all cells, you can adjust the height of all rows by right-clicking on any of the row numbers and then following the same steps as you would for changing the height of a single row.

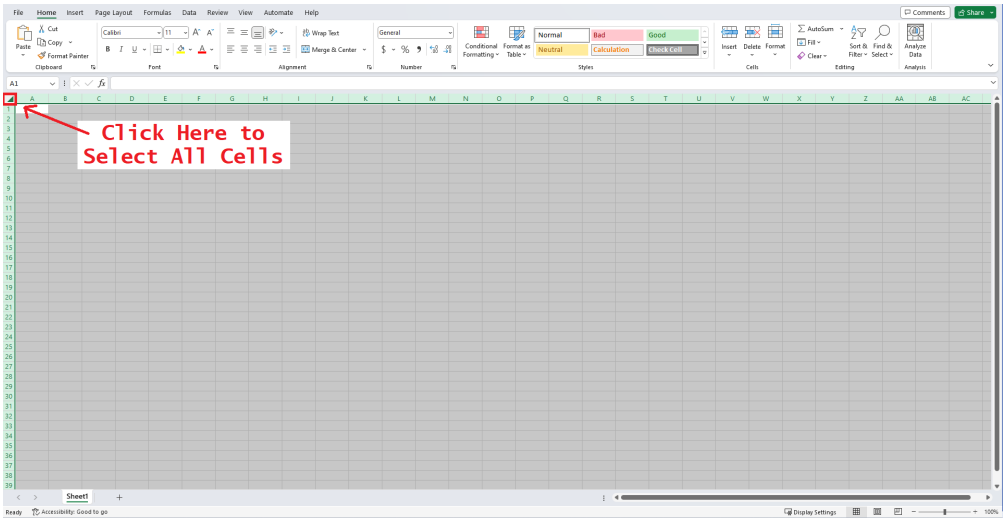


Figure 5: Selecting all cells

Width of Columns?

Similar to adjusting row heights, the width of each column may need to be modified to accommodate the length of the information stored in specific cells. As with rows, there is no definitive rule to follow when determining the width of a column. Feel free to experiment with different widths, but ensure that all the information in the column remains easily visible.

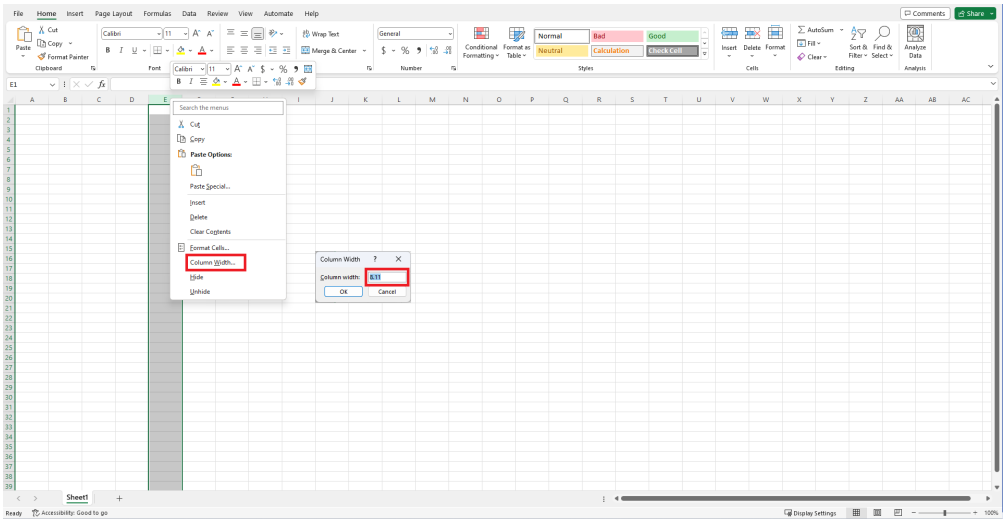


Figure 6: Adjusting the width of column E

Automatic Adjustments

If you're uncertain about the appropriate width or height for specific columns or rows, there's a way to let Excel make the selection for you. If you encounter a column (or row) that is too narrow (or short) to display all of its content, you can hover your mouse over the "end" of the column (or the "bottom" of the row) as shown in Figure 7. The mouse cursor should change its shape, and when you double-click, Excel will examine all the elements in the column (or row) and adjust the width (or height) to neatly fit all the content.

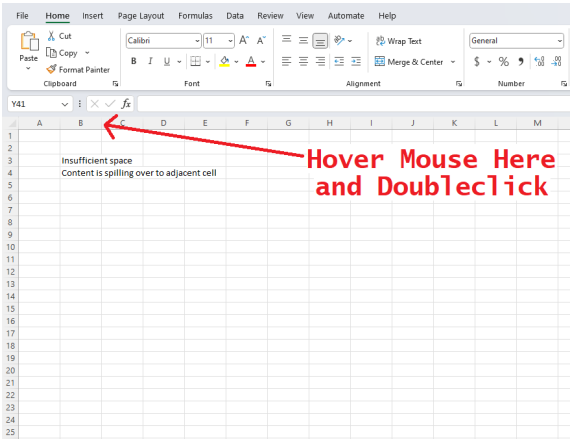


Figure 7: Narrow columns

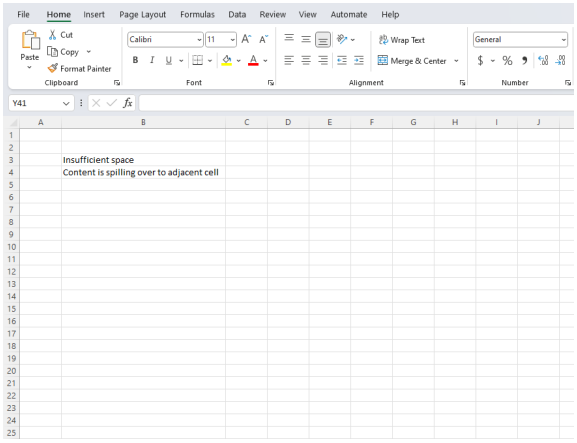


Figure 8: Column width adjusted

Topic 2. Making Use of the Status Bar

The status bar is situated at the bottom of your spreadsheet, as depicted in Figure 9. When you select a range of numerical data, the status bar provides you with three default statistics for your selected numbers: the average, the count, and the sum.

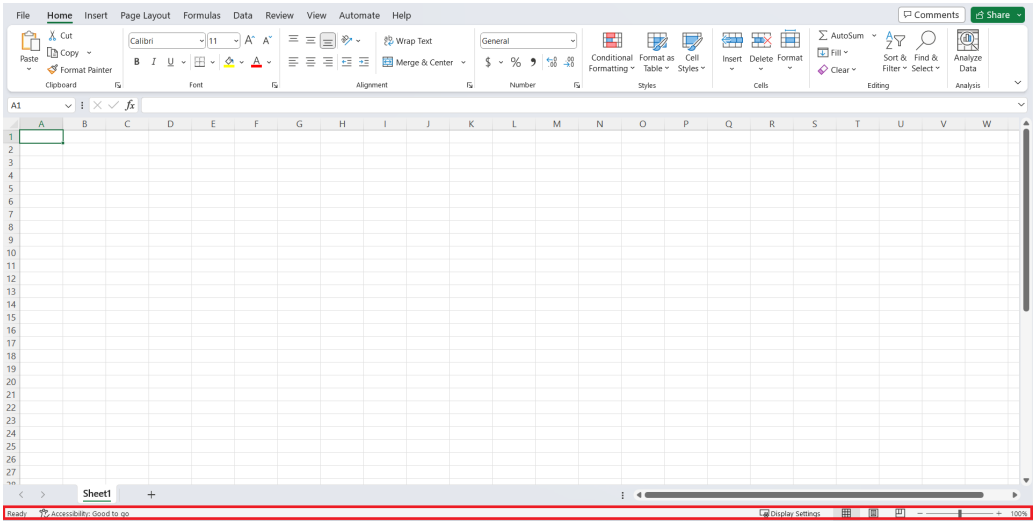


Figure 9: Status bar

Mistakes are all too common when dealing with data and tables, and having quick calculations provided in real-time could prove incredibly useful. That being said, if you're dealing with a large amount of information, it's a better idea to rely on functions or pivot tables. However, using the status bar can be far more convenient when the dataset is small.

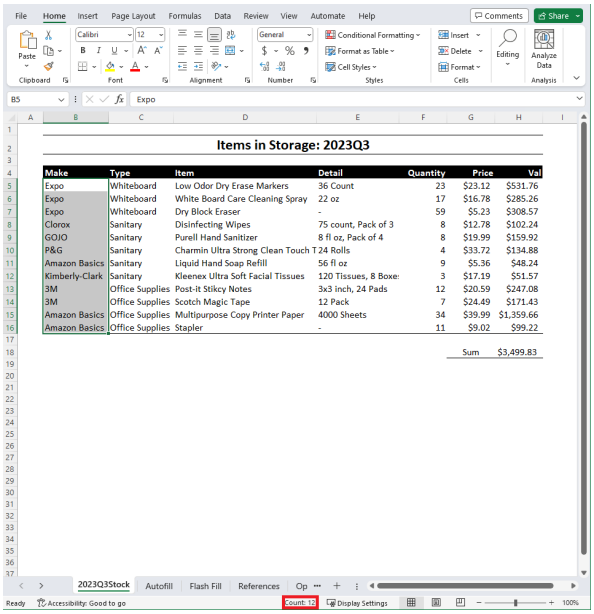


Figure 10: Text Only

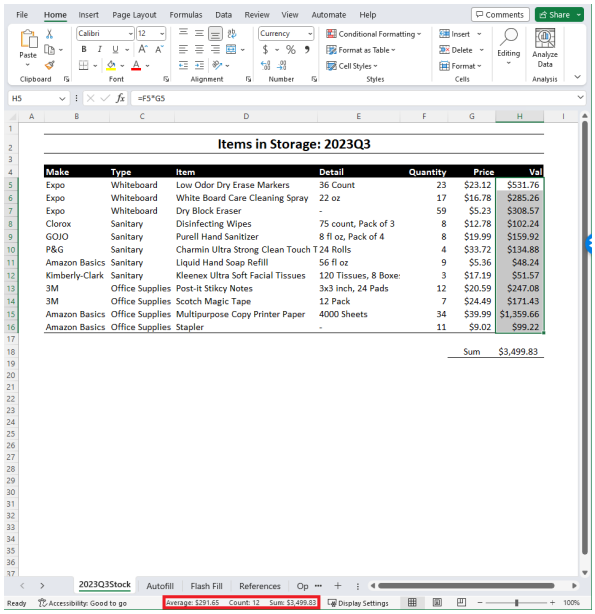


Figure 11: Numbers Only

Please open the `2023Q3Stock` sheet of the `BUSI201-LEC02-Workbook.xlsx` workbook. When you select a region containing text data, only the count information is returned, indicating the number of items in the given region. Try this by selecting cells `B5:B16`, as shown in Figure 10. To do this, left-click on cell `B5`, then drag the mouse cursor while holding down the left mouse button to cell `B16`, and finally release the left mouse button.

On the other hand, if you select a region with numerical data, the status bar will display three values. First is the count: the number of items included in the region. Second is the average value of the numbers in the selected region. Third is the sum of all values included in the region. Experiment with this by selecting cells `H5:H16`, as shown in Figure 13.

If you choose a mixture of text and numbers, the status bar will show you the average and sum of the numbers, but it will display the count of all cells containing any type of data. Hence, exercise caution when interpreting the numbers provided by the status bar.[2]

Adding Min / Max to the Status Bar

In practice, the average, count, and sum are all significant statistics. Nevertheless, you often need to determine the minimum and maximum values across all cells. These statistics can also be added to the status bar. Right-clicking on the status bar will bring up the menu depicted in Figure 12. After selecting `Minimum` and `Maximum`, you will notice that these two values now appear on the status bar alongside the default count, sum, and average values.

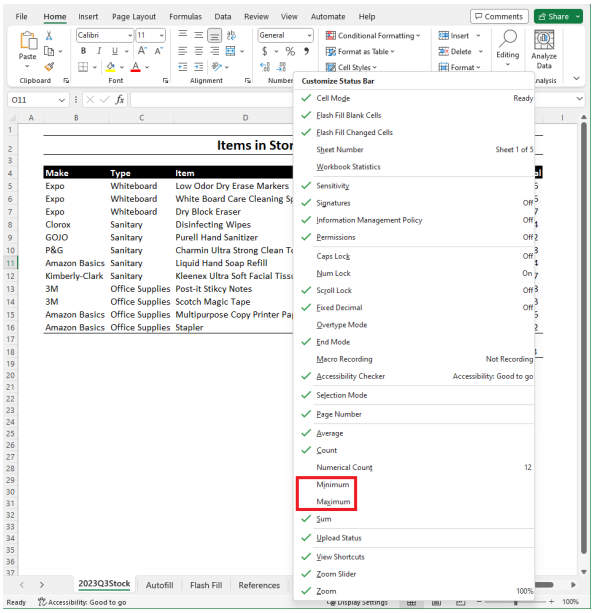


Figure 12: Adding items to status bar

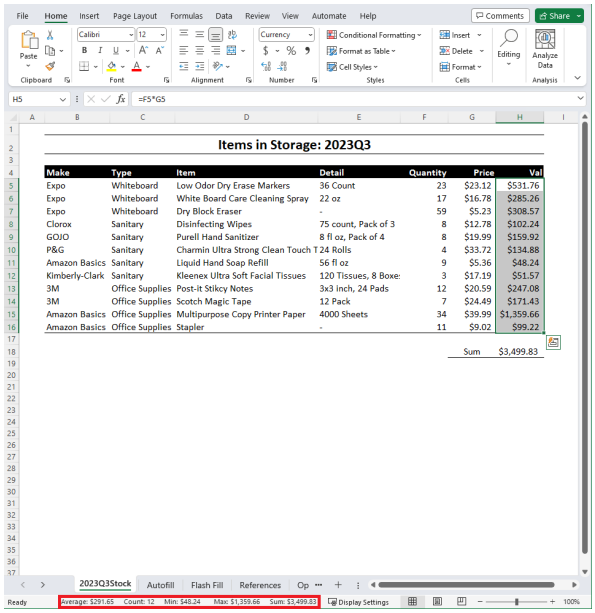


Figure 13: New items in status bar

[2] There is a workaround where you can add a "numerical count" that reports the count of numerical items.

Topic 3. Navigating Between Worksheets

Basic Methods

Suppose you're responsible for managing a firm's office supplies, where you need to record and track essential items at the beginning of each quarter. You might have a workbook with worksheets like `2023Q3Stock` in `BUSI201-LEC02-Workbook.xlsx`. Now, let's say you want to navigate among these worksheets to locate tables from a few quarters back.

When dealing with a small number of sheets in a workbook, moving between worksheets is straightforward. You can simply left-click on the sheet name located just above the status bar. For example, in our workbook `BUSI201-LEC02-Workbook.xlsx`, you would likely see the names of all worksheets, and clicking on any of them would immediately open the desired spreadsheet.

You can also navigate between adjacent worksheets using the hotkeys `ctrl`+`pageup` to move to the previous sheet or `ctrl`+`pagedown` to move to the next sheet. Holding down the hotkeys will take you to the first and last worksheets, respectively.

However, in a real-world scenario, the list of worksheets could be much longer and more detailed, with dozens of sheets spanning several years. If worksheet names are sufficiently long, locating and clicking on the desired worksheet might become challenging. What can be done in such situations?

The Activate Worksheet Window

The most "powerful" method for navigating between worksheets is to use the `Activate` option. Right-clicking the boxed region shown in Figure 14 will bring up the `Activate` window, which displays the complete list of worksheets included in the workbook.

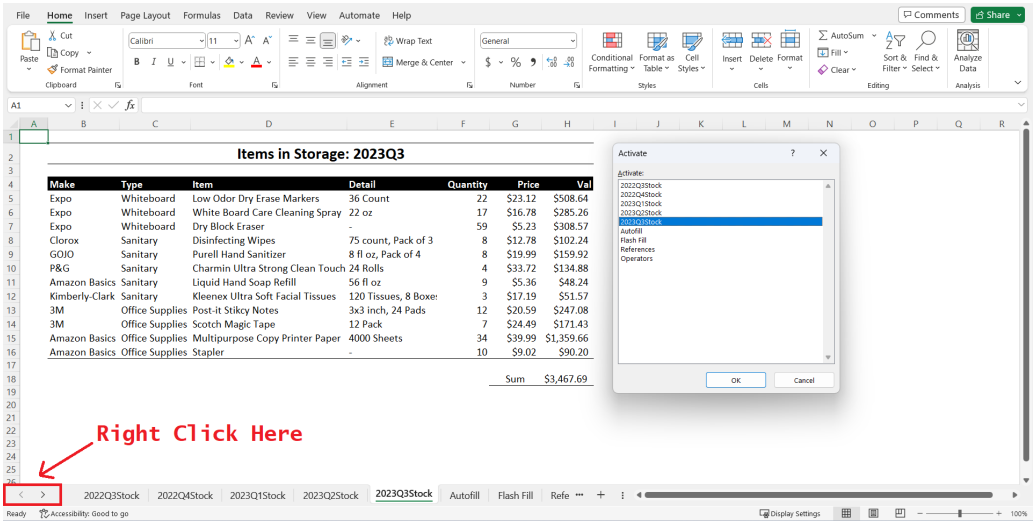


Figure 14: Using the activate window

“Naming” Specific Cells

Suppose you anticipate frequently revisiting a particular cell while working on a specific workbook. In that case, rather than navigating through the worksheet to locate the cell, you can assign a name to that cell. This will enable you to easily return to that specific cell whenever needed.

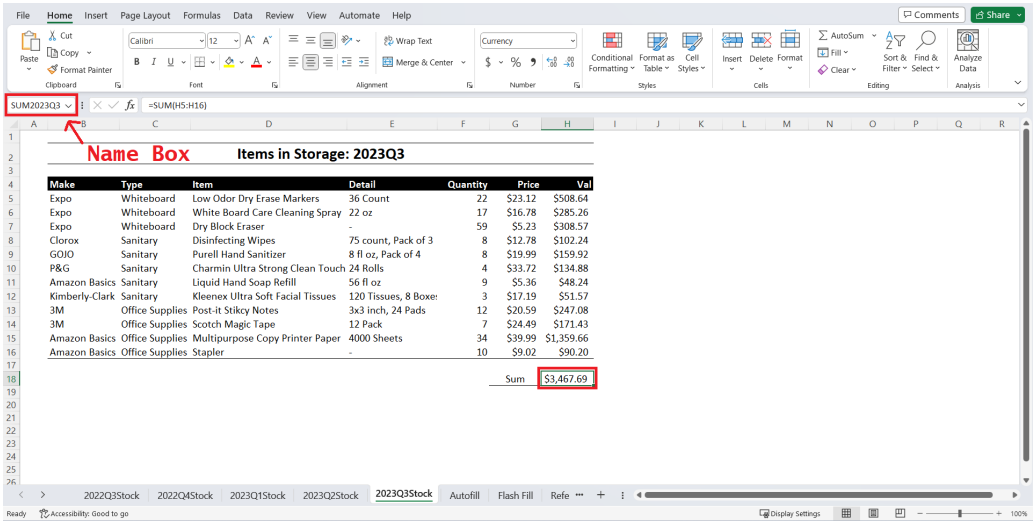


Figure 15: Using the name box

In the top left corner, you’ll find the ”Name Box.” To assign a name to a cell, select the cell and left-click on it. Then, modify the value in the Name Box to give the cell a name. In this example, we are renaming cell `H18` as `SUM2023Q3`. Once you’ve done this, you can navigate to other worksheets, and easily return to the named cell by typing `sum2023q3` into the Name Box.

Note that cell naming is case-insensitive, meaning that `sum2023q3` will take you to the cell named `SUM2023Q3`. Additionally, there are rules to follow when assigning names to cells. Names cannot start with a number, so `2023Q3SUM` is not a valid option. Similarly, names cannot contain spaces, so `SUM 2023Q3` is not allowed. Lastly, you cannot name a cell that is reserved by the system, including default cell addresses like `A1` or `CN235`.

Topic 4. Finding and Replacing

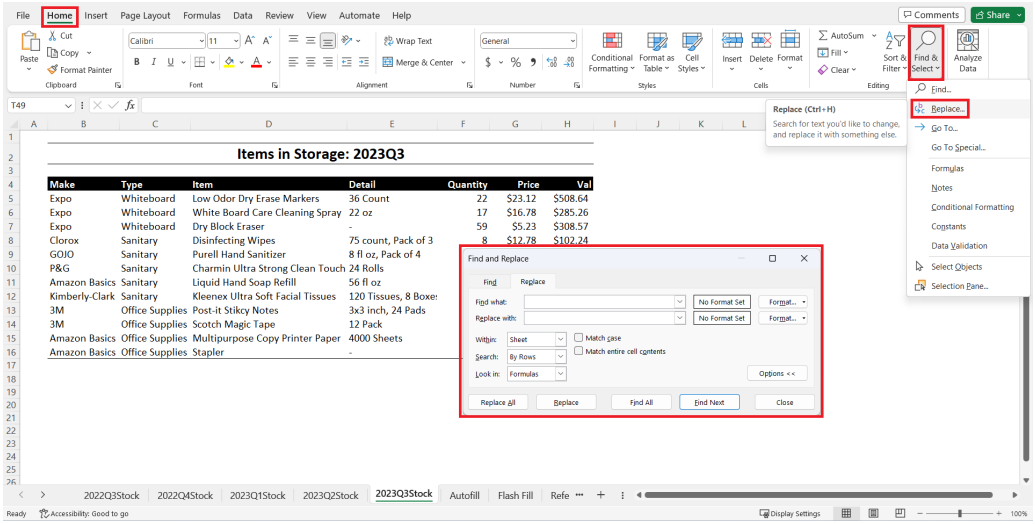


Figure 16: Find and replace

Find and Replace Values

The more information each worksheet contains, it becomes increasingly difficult to locate cells containing specific information. We will learn of more efficient methods later in the semester, but for now we will explore another powerful tool, `Find and Replace`. To access this function, navigate to `Home` > `Find&Select` > `Replace`. If you are on PC, you can also use the hotkey `crtl`+`H`.

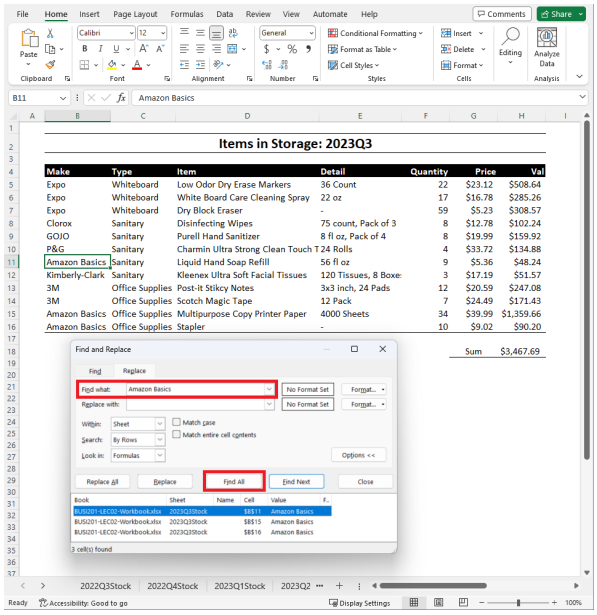


Figure 17: Finding Amazon Basic

Please open the `2023Q3Stock` sheet in `BUSI201-LEC02-Workbook.xlsx`. We will now attempt to locate all occurrences of `Amazon Basics` on this specific worksheet. You can achieve this by using the "Find and Replace" tool, typing `Amazon Basics` next to "Find what," and clicking on "Find All." As shown in Figure 17, all instances of `Amazon Basics` will be listed in the "Find and Replace" window.

By clicking on the items in the "Find and Replace" window, you can navigate between each occurrence of `Amazon Basics`. I encourage you to try this with other items as well.

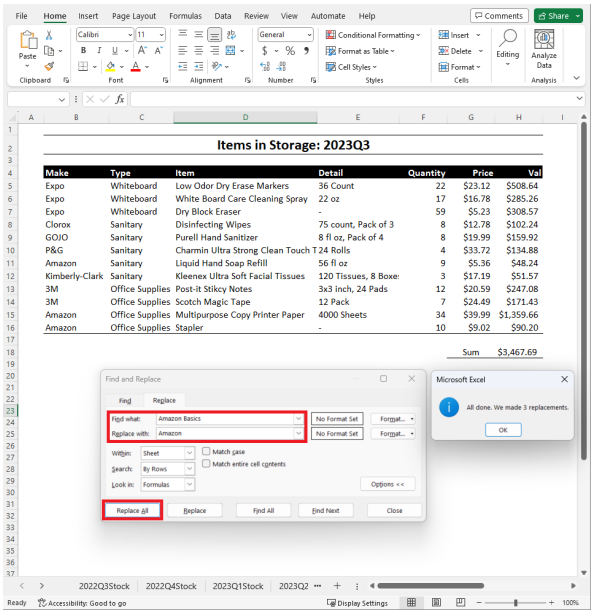


Figure 18: Replacing Amazon Basic to Amazon

Now, let's say we want to change `Amazon Basics` to the more concise term `Amazon`. In this specific example, this task is simple since we only have three instances to change. However, for a large dataset, manually finding and changing each occurrence would become a tedious process. Thankfully, the "Find and Replace" function can help us accomplish this task efficiently.

In this particular case, you can input `Amazon Basics` next to "Find what," and `Amazon` in the "Replace with" field. Afterward, click on "Replace All." Excel will then display a notification similar to Figure 18, indicating that all three instances of `Amazon Basics` have been changed to `Amazon`.

One word of caution before we move on to our next topic: you should never press "Replace All" prematurely. As you may have observed in Figure 18, Excel doesn't provide details about which cells it changes; it only confirms that it carried out the command. The best practice is to initially click on "Find All," review the list to ensure that Excel is only targeting the items you intend to change, and then proceed with "Replace All."

Find and Replace Options

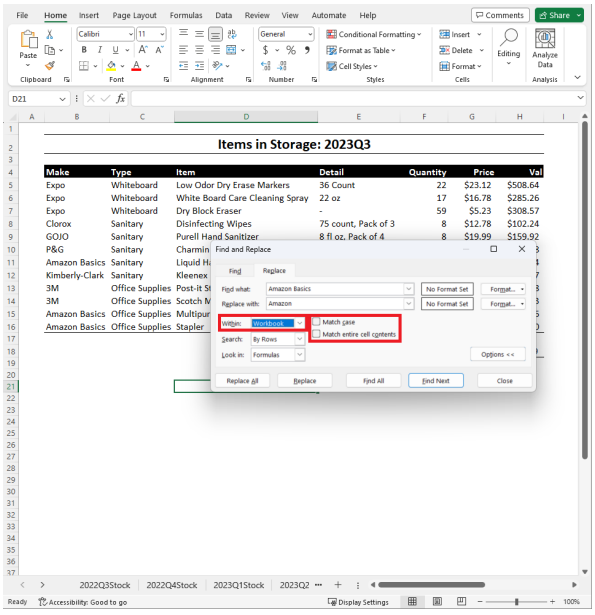


Figure 19: Replacing Across Sheets

In the previous example, we explored how to find and replace specific values within a given worksheet. However, if we want to replace instances of `Amazon Basics` with `Amazon` not only for 2023Q3 but also for all other quarters, we need to adjust the value in the "Within" field to `Workbook`. By changing the search scope from the individual worksheet to the entire workbook, we can update all occurrences of `Amazon Basics` to `Amazon`.

Additionally, there are other options worth considering, such as the "Match Case" and "Match Entire Cell Contents" options.

Find and Replace Formats

This "Find and Replace" function also provides the capability to select cells that share a specific format, such as font, font size, or cell color, and replace it with a new format. Let's consider the worksheet `2023Q3Stock` in the workbook `BUSI201-LEC02-Workbook.xlsx`. Imagine that you wish to change the cell color of the row containing variable names in the sheet `2023Q3Stock` to dark gray instead of black.

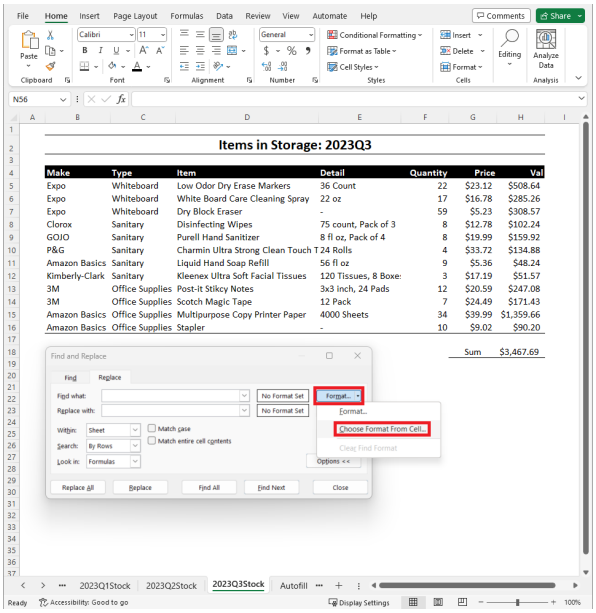


Figure 20: Selecting the cells to change

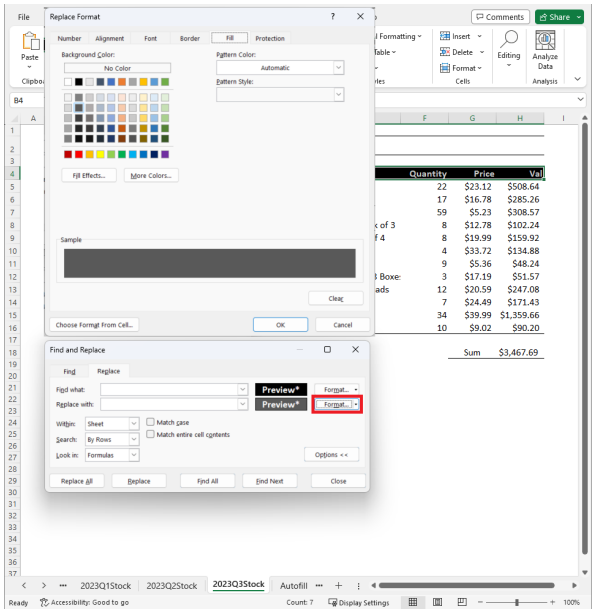


Figure 21: Target format

Open the "Find and Replace" window to match the setup shown in Figure 20. Then, choose `Choose format from Cell` and select the cells you want to modify. Afterward, select the replacement format, as illustrated in Figure 21. In this instance, we're altering the cell background color; however, you have the ability to modify various formats such as font, font size, cell number format, alignment, borders, and more.

Topic 5. Autofill

Excel's autofill function operates by analyzing the data to identify any existing patterns and then applying that pattern to automatically populate empty cells. Please open the `Autofill` sheet in the workbook `BUSI201-LEC02-Workbook.xlsx` to practice. Below is a brief summary of some of the rules that Excel follows when autofilling cells:

	Select Single Cell		Select Multiple Cells	
	Drag	Drag + ctrl	Drag	Drag + ctrl
Text	Repeat Same Value(s)			
Number	Repeat Value	Increasing by 1	Recognize Pattern	Repeat Selected Values
Date	Increasing by 1 day	Repeat Same Value	Recognize Pattern	Repeat Selected Values
Time	Increasing by 1 hour	Repeat Same Value	Recognize Pattern	Repeat Selected Values
Text + Number	Last Number Increases by 1	Repeat Same Value	Recognize Pattern	Repeat Selected Values

After autofilling a section of the spreadsheet, you should have the opportunity to review certain autofill options that were applied during the process. This option will appear, as shown in Figures 22 and 23. The specific options presented may vary depending on the type (format) of data that Excel autofilled. Figure 23 illustrates the options presented when the autofilled cells are recognized as dates.

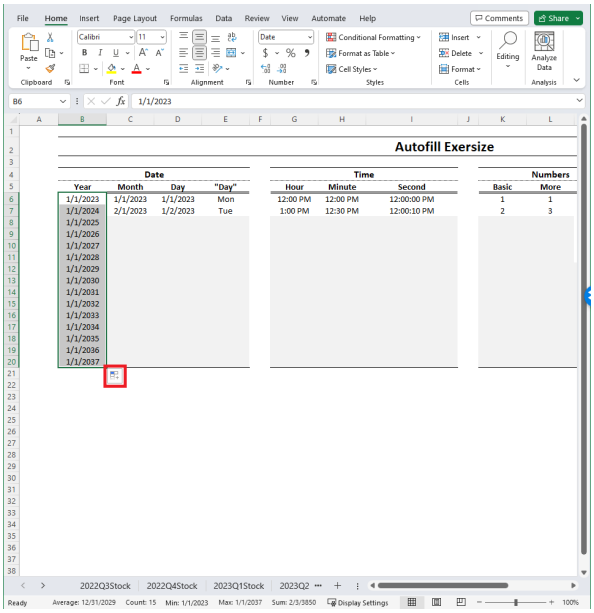


Figure 22: Accessing autofill options

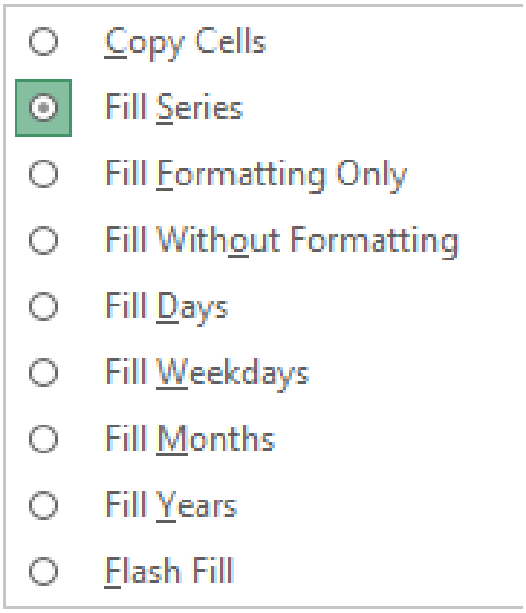


Figure 23: Example of autofill options

Custom Lists

While Excel provides a range of useful autofill patterns, there may be instances where you frequently use certain custom patterns. For example, imagine you regularly create weekly incident reports detailing accidents or consumer complaints. In such cases, you might want Excel to automatically populate certain cells as part of your report.

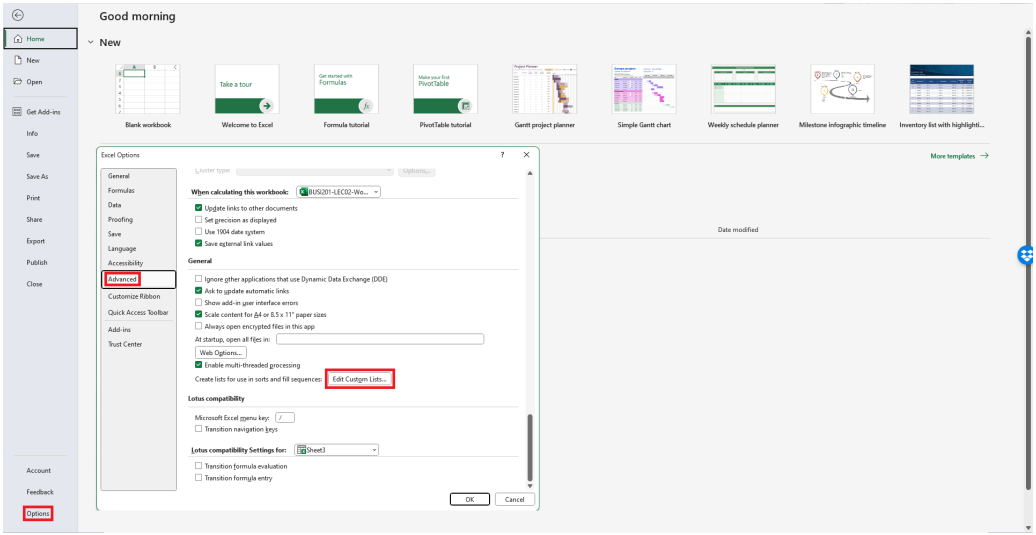


Figure 24: Navigate to custom lists

To achieve this goal, navigate to `File` > `Options` > `Advanced`. Scroll down until you locate `Edit Custom Lists`. Here, you can add your own custom list that will be available for future autofills. Figure 25 demonstrates the application of a custom list.

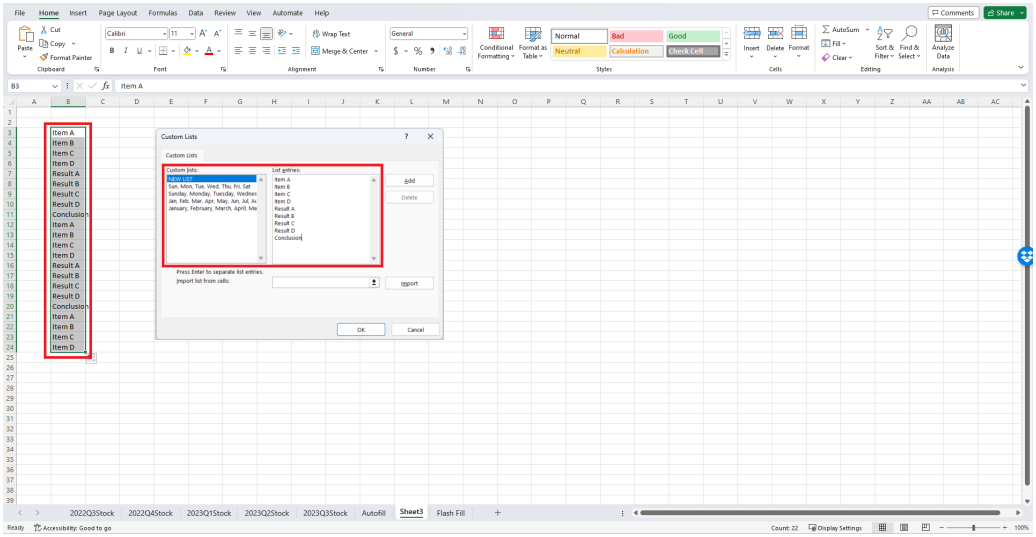
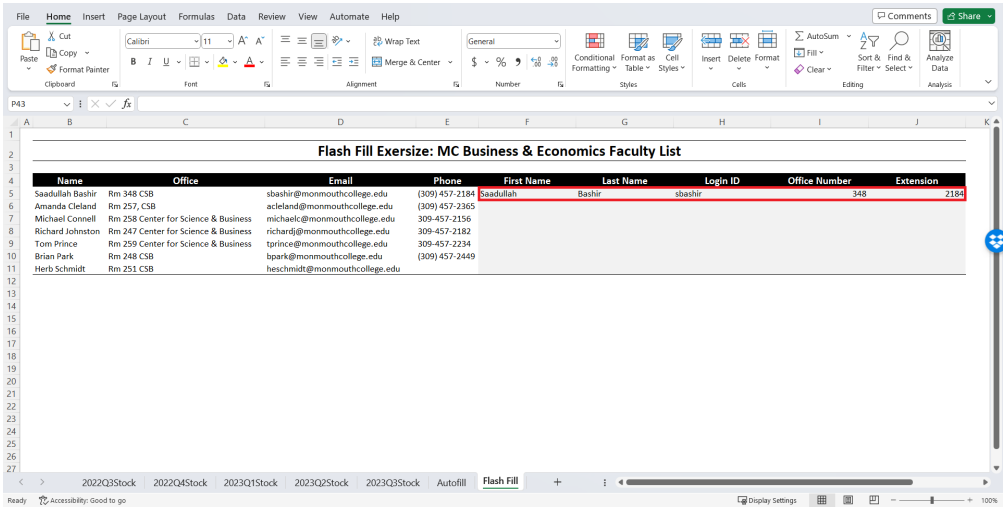


Figure 25: Applying custom lists

Topic 6. Flash Fill

Flash Fill is an Excel function that bears some similarity to autofill, as it offers user convenience by attempting to recognize patterns in existing data and automatically filling out certain cells. To practice this feature, please open the `Flash Fill` sheet in the workbook `BUSI201-LEC02-Workbook.xlsx`, which contains a list of the Business and Economics faculty at Monmouth University. Let's say we want to extract information like first and last names, login IDs, office numbers, and phone extensions. A straightforward method to achieve this is through a variation of autofill, known as flash fill.

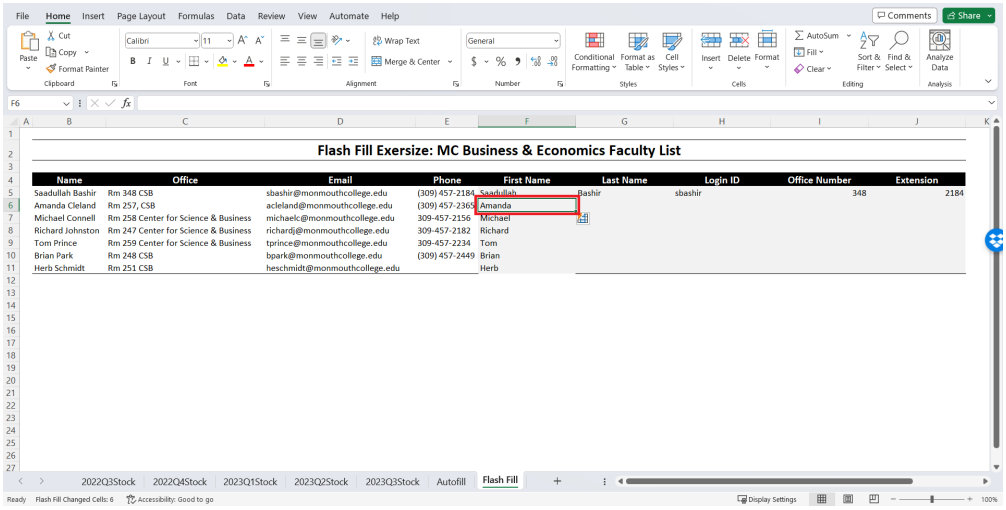


Flash Fill Exersize: MC Business & Economics Faculty List

Name	Office	Email	Phone	First Name	Last Name	Login ID	Office Number	Extension
Saadullah Bashir	Rm 348 CSB	sbashir@monmouthcollege.edu	(309) 457-2184	Saadullah	Bashir	sbashir	348	2184
Amanda Cleland	Rm 257, CSB	acleland@monmouthcollege.edu	(309) 457-2365					
Michael Connell	Rm 258 Center for Science & Business	michaelc@monmouthcollege.edu	309-457-2156					
Richard Johnston	Rm 247 Center for Science & Business	richardj@monmouthcollege.edu	309-457-2182					
Tom Prince	Rm 259 Center for Science & Business	tprince@monmouthcollege.edu	309-457-2234					
Brian Park	Rm 248 CSB	bpark@monmouthcollege.edu	(309) 457-2449					
Herb Schmidt	Rm 251 CSB	heschmidt@monmouthcollege.edu						

Figure 26: Flash fill setup

To initiate flash fill, you first need to manually fill out the (at least the) first row. Excel will utilize this information to deduce the pattern it should apply to fill out the remaining rows. Once the first row is completed, select a cell directly below the first row and use the hotkey `ctrl`+`E`. In Figure 27, you can observe that flash fill effectively extracts the first names.



Flash Fill Exersize: MC Business & Economics Faculty List

Name	Office	Email	Phone	First Name	Last Name	Login ID	Office Number	Extension
Saadullah Bashir	Rm 348 CSB	sbashir@monmouthcollege.edu	(309) 457-2184	Saadullah	Bashir	sbashir	348	2184
Amanda Cleland	Rm 257, CSB	acleland@monmouthcollege.edu	(309) 457-2365	Amanda				
Michael Connell	Rm 258 Center for Science & Business	michaelc@monmouthcollege.edu	309-457-2156	Michael				
Richard Johnston	Rm 247 Center for Science & Business	richardj@monmouthcollege.edu	309-457-2182	Richard				
Tom Prince	Rm 259 Center for Science & Business	tprince@monmouthcollege.edu	309-457-2234	Tom				
Brian Park	Rm 248 CSB	bpark@monmouthcollege.edu	(309) 457-2449	Brian				
Herb Schmidt	Rm 251 CSB	heschmidt@monmouthcollege.edu		Herb				

Figure 27: Flash filled second row