Lecture Note #2: Excel Basics Continued

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
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

Figure 2: Row Height = 18.2

While there is no clear consensus on what the best row height should be on any given document, a nice rule of thumb is to use anywhere between 1.5 ~ 1.7 times of your font size. That is, if you have a font size of 12, a nice range for your row height would be between 18 and 20.4. However, this is highly dependent on the purpose of the document, the intended reader, and whether the document is intended to be printed on paper, etc.

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

Adjusting the Height of a Row

The easiest way to adjust the height of a single row would be to first left click on the row number of which you wish to adjust the height, and then right click on the row number to pull up a menu as depicted in figure 3

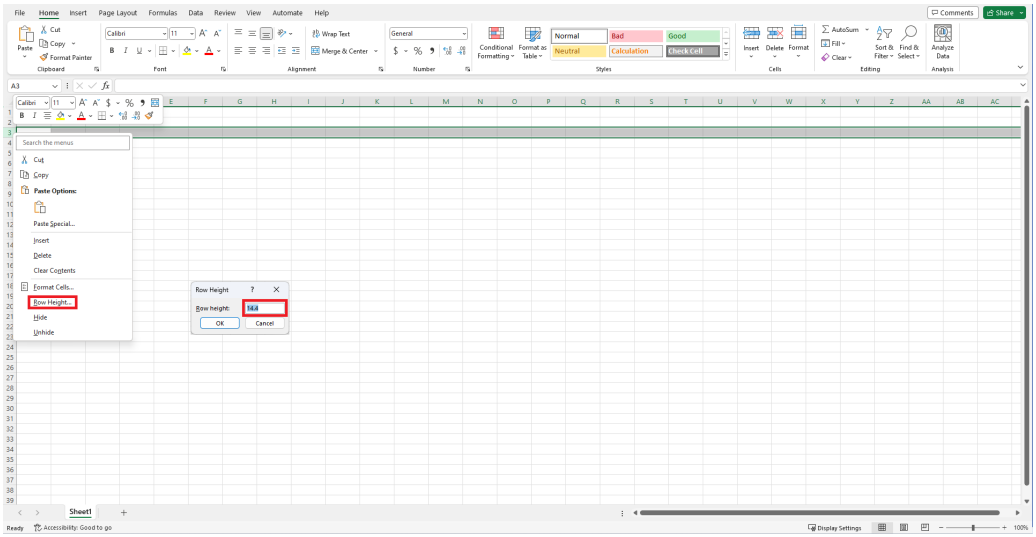


Figure 3: Adjusting the height of row 3

Adjusting the Height of Multiple Rows

To adjust the row height of multiple rows, left click on the first row you wish to include, press down the `Shift` key, and left click the final row you wish to change, then release the `Shift` key. Then right click on any of the row numbers you selected, and then go through the same steps as changing the height of one row.

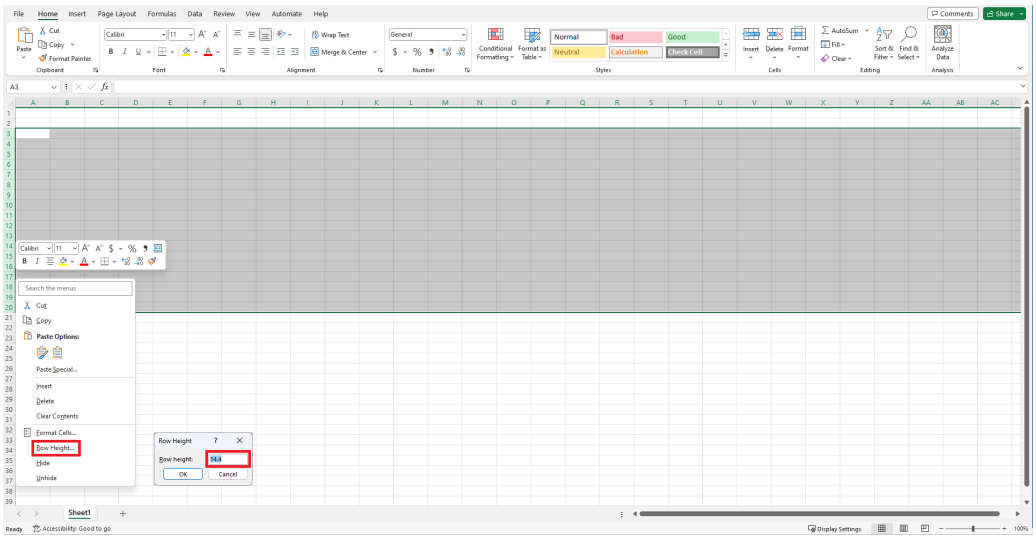


Figure 4: Adjusting the height of rows 3 to 20

Adjusting the Height of All Rows

In Excel, left clicking the top left hand corner shown in figure 5 will allow you to choose all cells in the sheet. Once you selected all cells, you can adjust the height of all rows by then right clicking on any of the row numbers, and then go through the same steps as changing the height of one row.

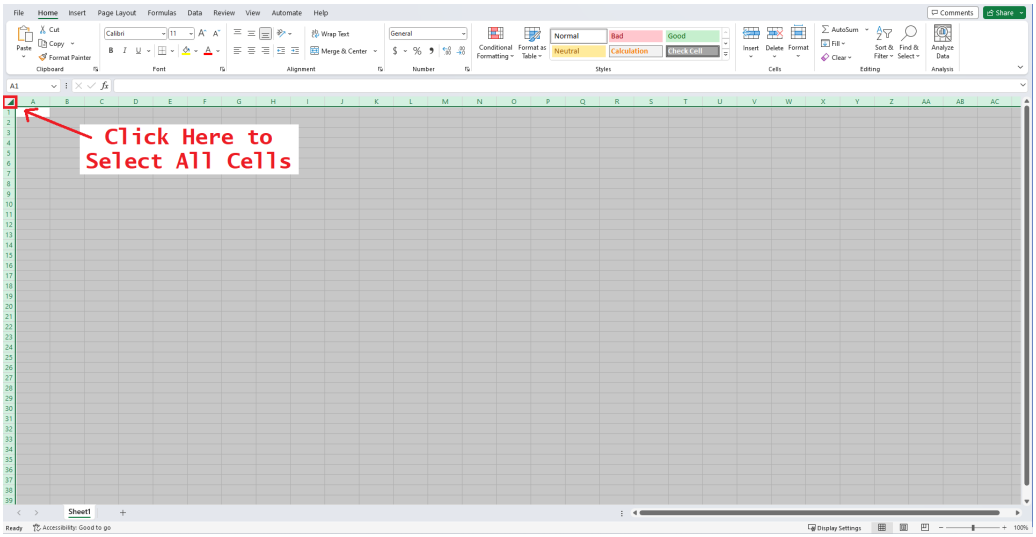


Figure 5: Selecting all cells

Width of Columns?

Similar to the height of rows, the width of each column may need to be adjusted to match the length of the information stored in a given cell. Similar to the case with rows, there is no one correct rule to obey when it comes to determining the width of any column. Feel free to test out various widths, but do make sure that all information in the column are readily visible.

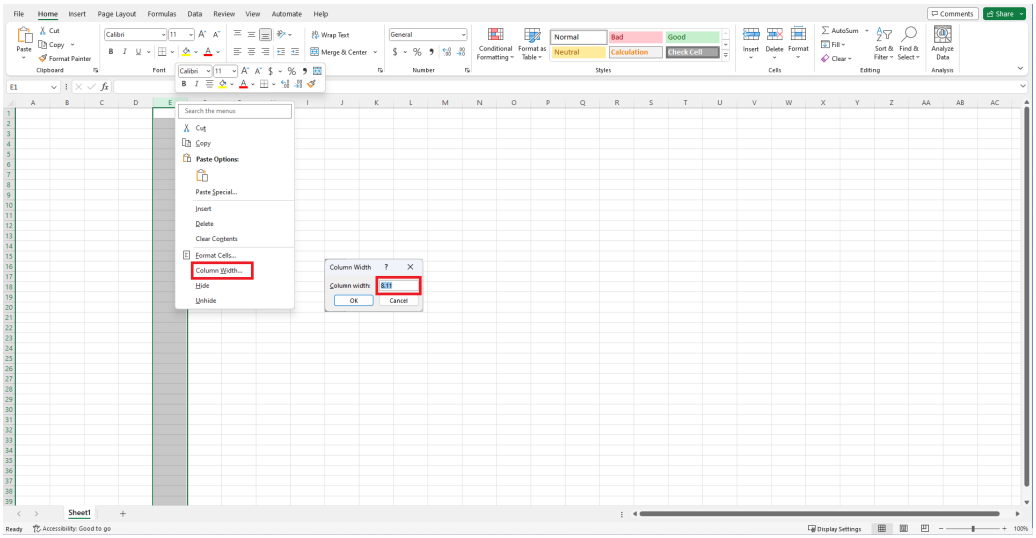


Figure 6: Adjusting the width of column E

Automatic Adjustments

When in doubt of an appropriate width or height for any given columns or rows, there is a way to get Excel to select one for you. If you find 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 ("bottom" of row) as displayed in figure 7. The mouse cursor should change its shape, and once you doubleclick, Excel will take a look at all elements in the column (row), and adjust the width (height) to fit all content neatly.

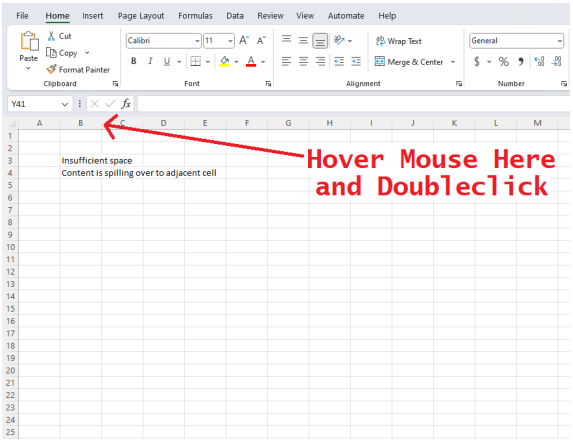


Figure 7: Narrow columns

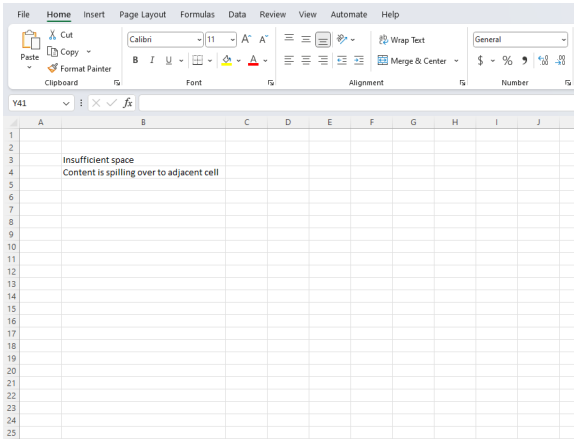


Figure 8: Column width adjusted

Topic 2. Making Use of the Status Bar

The status bar is located on the bottom of your spreadsheet. You can find the location in figure 9. When a range of numerical data is selected, the status bar offers provides you with three statistics regarding your selected numbers by default: the average, the count, and the sum.

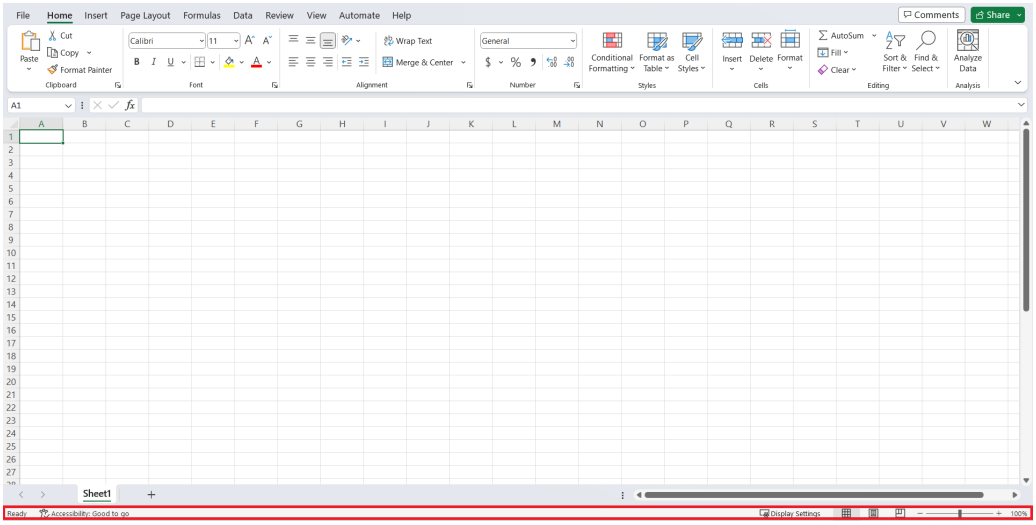
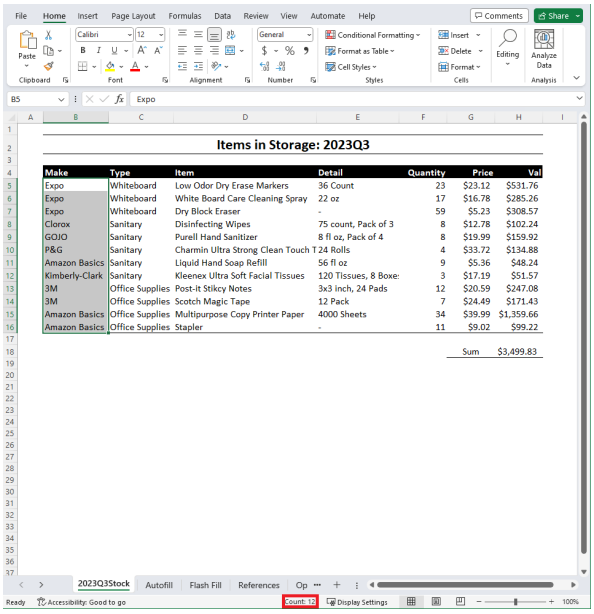


Figure 9: Status bar

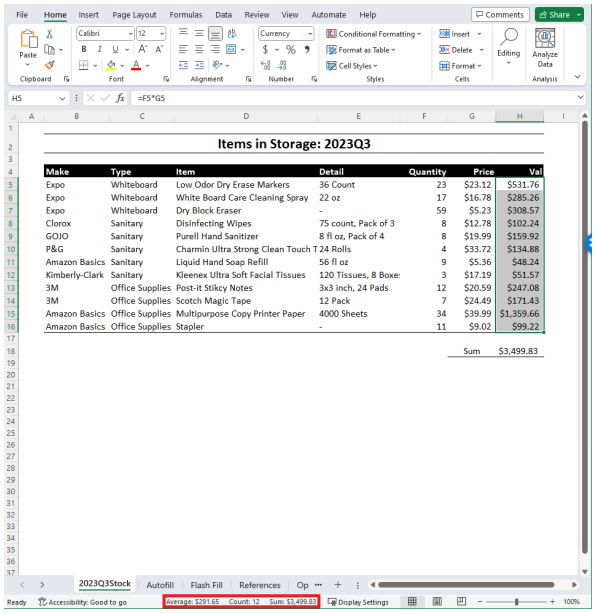
Mistakes are all too common when it comes to dealing with a data and tables, and having some quick calculations being given in real-time could prove incredibly useful. That being said, if the amount of information you are given is very large, it would be a better idea to rely on functions or pivot tables.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



Items in Storage: 2023Q3

Make	Type	Item	Detail	Quantity	Price	Val
Expo	Whiteboard	Low Odor Dry Erase Markers	36 Count	23	$23.12	$531.76
Expo	Whiteboard	White Board Care Cleaning Spray	22 oz	17	$16.78	$285.26
Expo	Whiteboard	Dry Block Eraser	-	59	$5.23	$308.57
Clorox	Sanitary	Disinfecting Wipes	75 count, Pack of 3	8	$12.78	$102.24
GOJO	Sanitary	Purell Hand Sanitizer	8 fl oz, Pack of 4	8	$19.99	$159.92
P&G	Sanitary	Charmin Ultra Strong Clean Touch T	24 Rolls	4	$33.72	$134.88
Amazon Basics	Sanitary	Liquid Hand Soap Refill	56 fl oz	9	$5.36	$48.24
Kimberly-Clark	Sanitary	Kleenex Ultra Soft Facial Tissues	120 Tissues, 8 Boxe:	3	$17.19	$51.57
3M	Office Supplies	Post-it Stikcy Notes	3x3 inch, 24 Pads	12	$20.59	$247.08
3M	Office Supplies	Scotch Magic Tape	12 Pack	7	$24.49	$171.43
Amazon Basics	Office Supplies	Multipurpose Copy Printer Paper	4000 Sheets	34	$39.99	$1,359.66
Amazon Basics	Office Supplies	Stapler	-	11	$9.02	$99.22
				Sum		$3,499.83

Figure 10: Text Only



Items in Storage: 2023Q3

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Expo	Whiteboard	White Board Care Cleaning Spray	22 oz	17	$16.78	$285.26
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Amazon Basics	Sanitary	Liquid Hand Soap Refill	56 fl oz	9	$5.36	$48.24
Kimberly-Clark	Sanitary	Kleenex Ultra Soft Facial Tissues	120 Tissues, 8 Boxe:	3	$17.19	$51.57
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3M	Office Supplies	Scotch Magic Tape	12 Pack	7	$24.49	$171.43
Amazon Basics	Office Supplies	Multipurpose Copy Printer Paper	4000 Sheets	34	$39.99	$1,359.66
Amazon Basics	Office Supplies	Stapler	-	11	$9.02	$99.22
				Sum		$3,499.83

Figure 11: Numbers Only

Please open the `2023Q3Stock` sheet of the `BUSI201-LEC02-Workbook.xlsx` workbook. Selecting a region with text data will return only the count information - how many items there are in the given region. Try this out by selecting the cells `B5:B16` as shown in figure 10. To select cells `B5:B16`, left click cell `B5`, drag the mouse cursor while holding down the left mouse button to cell `B16`, and then release the left mouse button.

Meanwhile, if you select a region with numerical data, the status bar will return three values. The first is the count: the number of items included in the region. The second is the average value of the numbers in the selected region. Third, the sum of all values included in the region. Try this out by selecting the cells `H5:H16` as shown in figure 13.

If you select a mix of text and numbers, the status bar will show you the average of the numbers, sum of the numbers, but the count of all cells with any type of data. Therefore you should be careful when selecting a region when relying on the numbers given by the status bar.[2]

Adding Min / Max to the Status Bar

In practice, the average, the count, and the sum are all quite important statistics. However, you often need to find the minimum and maximum value of all cells. We can add these statistics to the status bar as well. Right clicking on the status bar, you will find the menu depicted in figure 12. After selecting `Minimum` and `Maximum`, we can see that these two values now show up on the status bar alongside the count, sum, and average values we had by default.

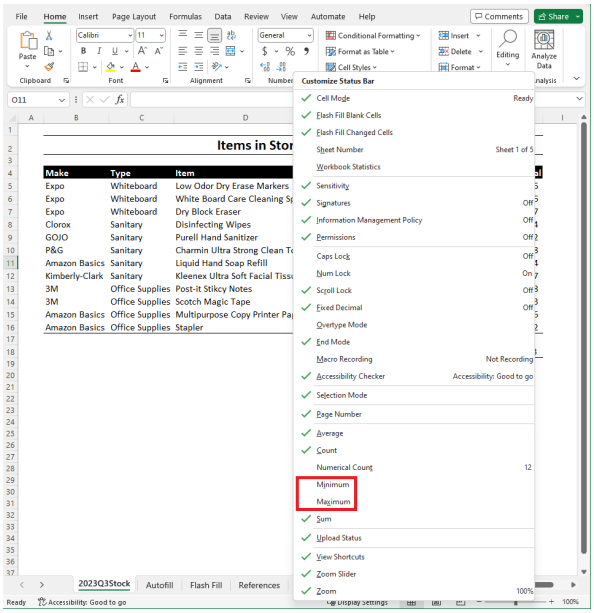

Figure 12: Adding items to status bar

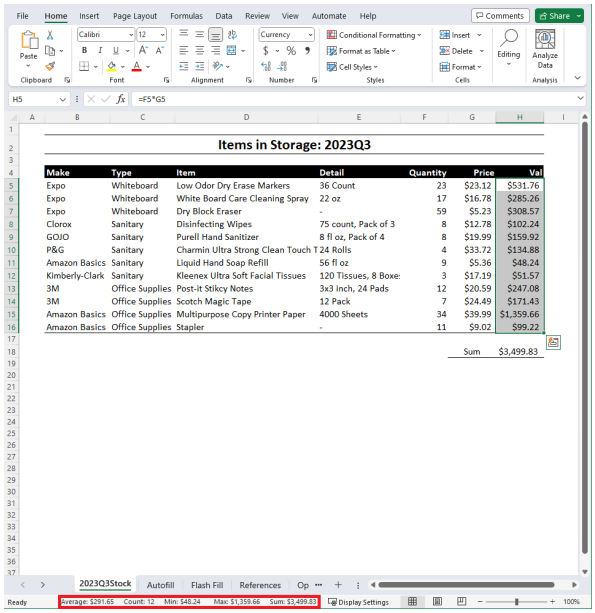

Figure 13: New items in status bar

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

Topic 3. Navigating Between Worksheets

Basic Methods

Suppose that you are in charge of a firm's office supplies, where you must record and keep track of essential office supplies at the beginning of each quarter. You may have a workbook filled with worksheets like `2023Q3Stock` in `BUSI201-LEC02-Workbook.xlsx`. Now, suppose that you want to navigate between those worksheets to find tables dating back a few quarters.

When there are a handful of sheets in a workbook, moving between worksheets is a trivial matter. One can simply left click on the sheet name located just above the status bar. For instance, in our workbook `BUSI201-LEC02-Workbook.xlsx`, you would most likely be able to see the names of all worksheets, and you can left click on any of them to instantly open up the spreadsheet you want.

You may also navigate between adjacent worksheets by using the hotkey `ctrl`+`pageup` to move to the prior sheet, or `ctrl`+`pagedown` to move to the next sheet. Holding down the hotkeys will land you on the first and final worksheet respectively.

However, an actual real-world list would be much longer, with more detail, and you may have dozens of sheets dating back a few years. Or, if the worksheet names are sufficiently long, only a few worksheets would hinder your ability to simply find and click on the worksheet of choice. Then what can we do about this situation?

The Activate Worksheet Window

The most "powerful" way that we can move between worksheets is to use the `Activate` option. Right clicking the boxed region in figure 14 will pull up the `Activate` window that displays the full list of worksheets included in the workbook.

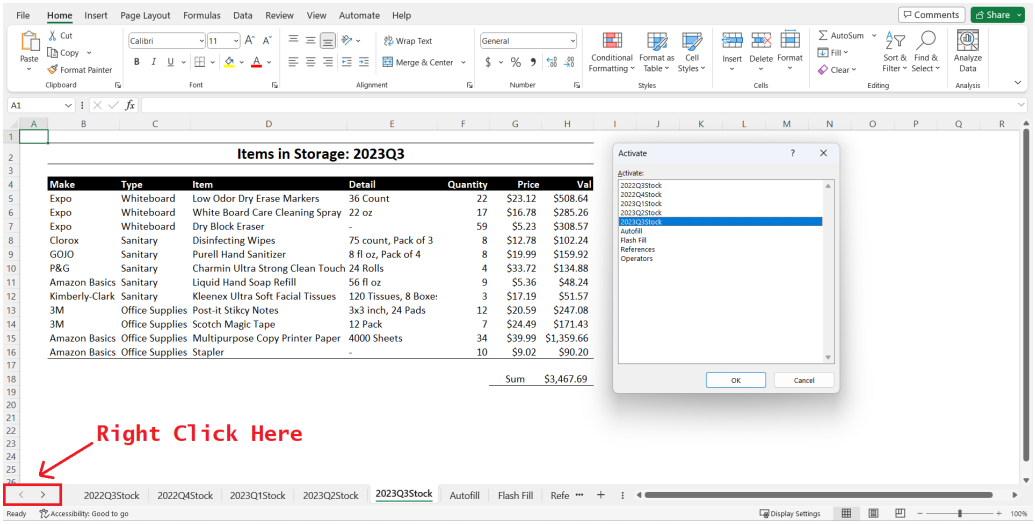

Figure 14: Using the activate window

“Naming” Specific Cells

Suppose you know that you would be returning to a specific cell repeatedly while working on a certain workbook. Then, instead of navigating to the worksheet, and finding the specific cell, you can simply give a name to that cell, and return to that specific cell quite easily.

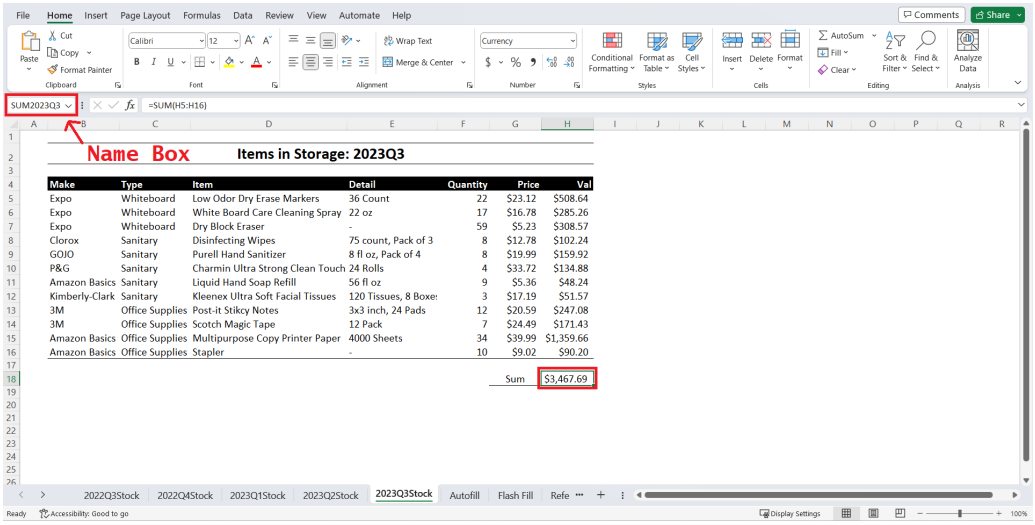

Figure 15: Using the name box

In the left hand top corner, you will find the “Name Box”. Select and left click a cell that you wish to name, then give the cell a name by changing the value in the name box. In this example, we are renaming cell `H18` as `SUM2023Q3`. You can now navigate away from this worksheet, but easily return to this cell by typing in `sum2023q3` in the name box from any worksheet.

Note that the naming here does not distinguish between uppercase letters and lowercase letters, hence `sum2023q3` returning us to the cell named `SUM2023Q3`. Another rule to keep in mind is that we cannot give a cell a name that starts with a number, so `2023Q3SUM` is not an option. We may also not have any spaces in a cell name, so `SUM 2023Q3` is not allowed. Finally, you can’t name a cell that is reserved for the system, which include the default cell addresses of Excel such as `A1` or `CN235`.

Topic 4. Finding and Replacing

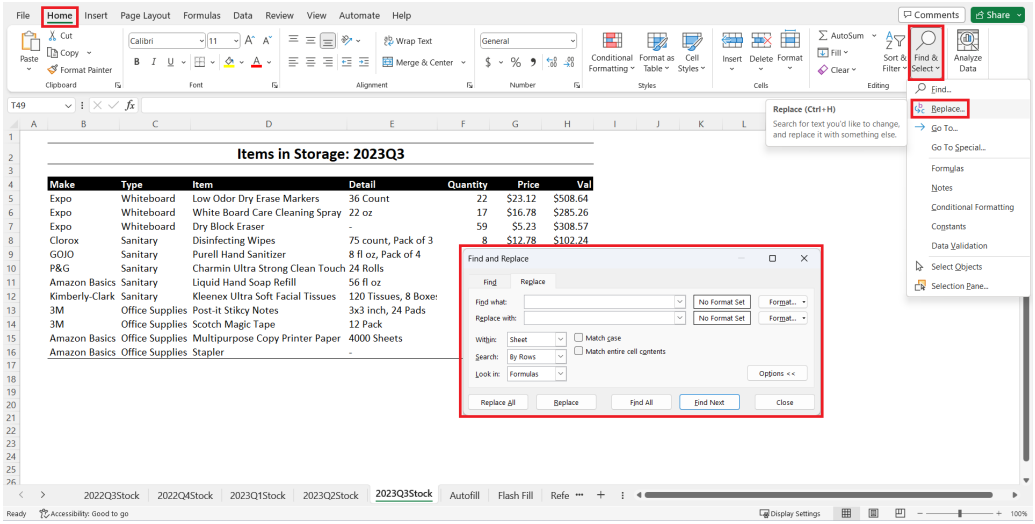

Figure 16: Find and replace

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`.

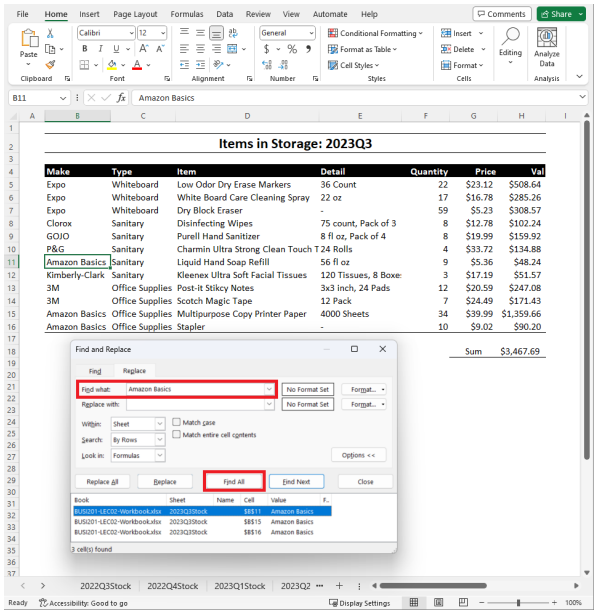

Figure 17: Finding Amazon Basic

Please open the `2023Q3Stock` sheet of `BUSI201-LEC02-Workbook.xlsx`. We will now try finding all values of `Amazon Basics` that show up on this specific worksheet. You can acheive this by accessing the "Find and Replace" tool, typing `Amazon Basics` next to "Find what", and clicking on "Find All". As seen in figure 17, all instances of `Amazon Basics` will be listed in the "Find and Replace" window.

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

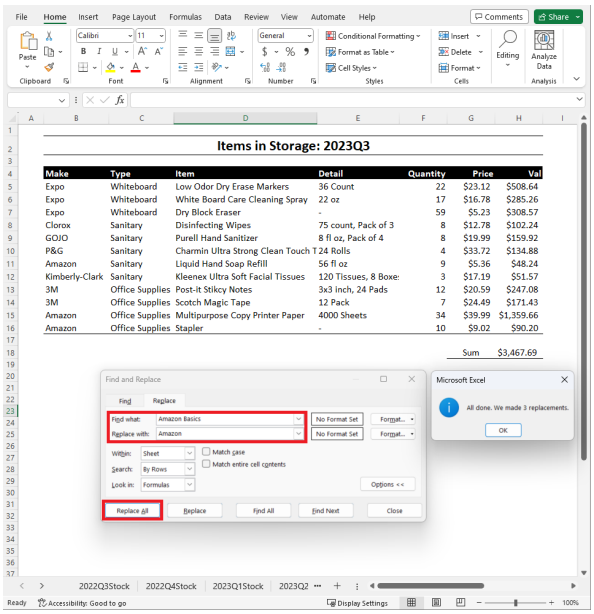

Figure 18: Replacing Amazon Basic to Amazon

Now suppose that we wanted to change `Amazon Basics` to a more consice `Amazon`. In this specific example, it would be an easy task as we only have three cases, but for a large dataset, finding and changing each occurrence will become quite tedious work. Using the "Find and Replace" function, we can also easily execute such task.

In this specific case, you can type in `Amazon Basics` next to "Find what", and `Amazon` into "Replace with", and click on "Replace All." Then, you can see a notification from Excel similar to figure 18 telling you that all three `Amazon Basics` has been changed into `Amazon`.

One word of caution before we move onto our next topic: you never want to press "Replace All" prematurely. As you may have noticed by glancing at figure 18, Excel won't tell you which cells it changes, but simply that it executed your command. It is best practice to first click on "Find All", go through the list to verify that Excel is only going to change the items you intend to change, and then go forth with "Replace All."

Find and Replace Options

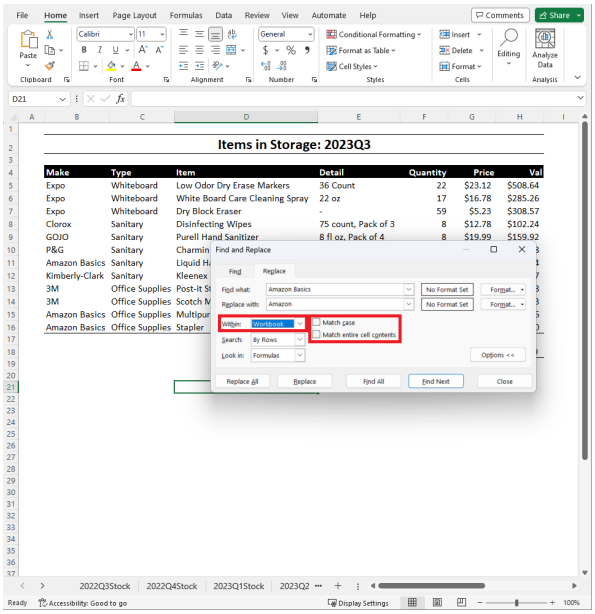

Figure 19: Replacing Across Sheets

In the previous example, we examined how we can find and replace certain values within a given worksheet. But if we are trying to replace `Amazon Basics` to `Amazon` not only for 2023Q3, but also for all other quarters, we need to change the value in "Within" to `Workbook`. By changing the search range from the specific worksheet to the entire workbook, we can now switch all occurrences of `Amazon Basics` to `Amazon`.

Some other options to consider are the "Match Case" option and "Match Entire Cell Contents" options.

Find and Replace Formats

This "Find and Replace" function also allows you to choose cells that share a specific format such as font, font size, or cell color, and switch it out to a new format. Consider the worksheet `2023Q3Stock` from workbook `BUSI201-LEC02-Workbook.xlsx`. Suppose that you want to change the cell color of the row containing the variable names in sheet `2023Q3Stock` to dark gray instead of black.

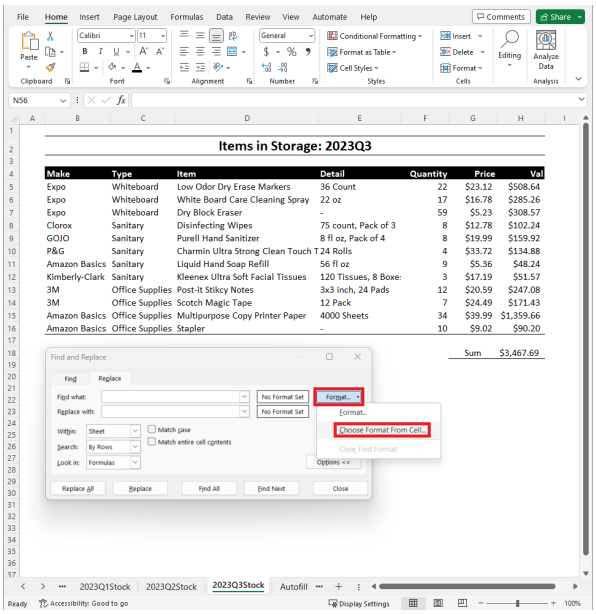

Figure 20: Selecting the cells to change

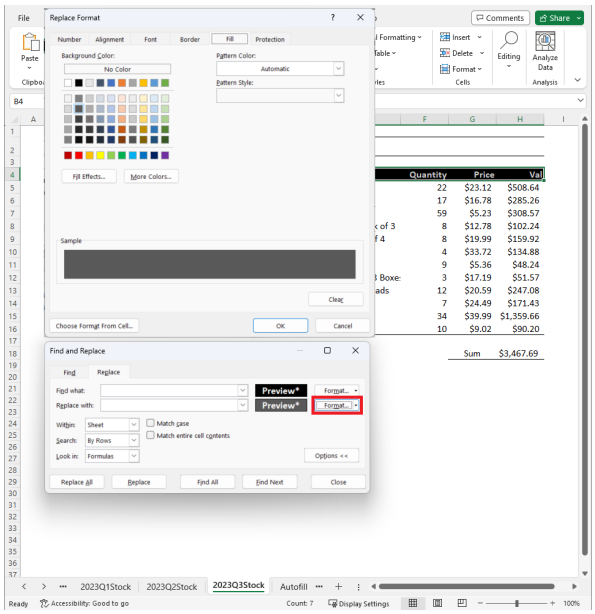

Figure 21: Target format

Pull up the "Find and Replace" window to match figure 20, and then select `Choose format from Cell`, and select the cells that you wish to change. Then select the replacement format as shown in figure 21. In this case, we only change the cell background color, but you can change a wide range of formats such as font, font size, cell number format, alignment, border, etc.

Topic 5. Autofill

Excel's autofill function works by attempting to figure out a pattern existing in the given data, and then extending the rule to automatically fill out empty cells accordingly. Please open sheet `Autofill` in the workbook `BUSI201-LEC02-Workbook.xlsx` for some exercises. The following is a brief overview of some of the rules that Excel obeys when it autofills 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

Once you autofill some portion of the spreadsheet, you should be given the chance to review some autofill options used in the process. This option will appear as seen in figures 22 and 23. The exact options given to you may differ based on the type (format) of data that Excel autofilled, and figure 23 depicts the options when the autofilled cells were deemed to be dates.

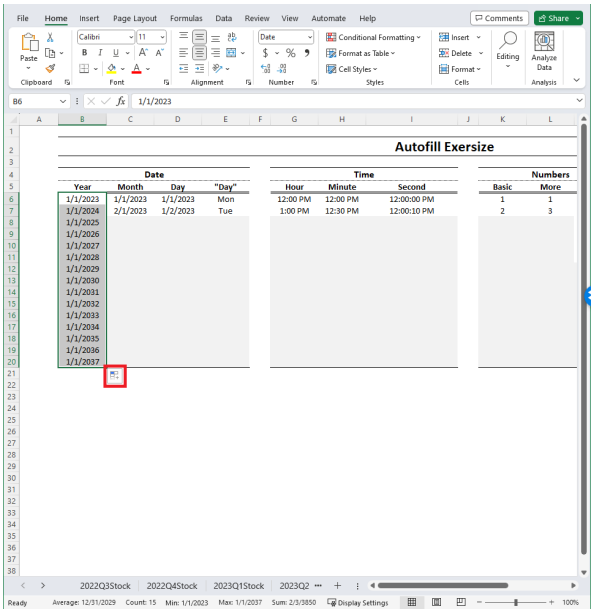

Figure 22: Accessing autofill options

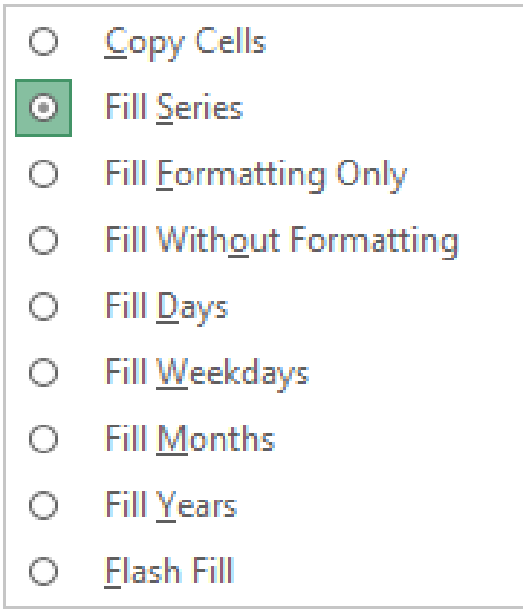

Figure 23: Example of autofill options

Custom Lists

While Excel has a list of some useful autofill patterns, sometimes you might find yourself in a situation where you have some patterns that you frequently use. Perhaps you encounter a situation where you prepare weekly incident reports regarding accidents or complaints from consumers. Then you might want to have Excel fill out some cells automatically as a part of your report.

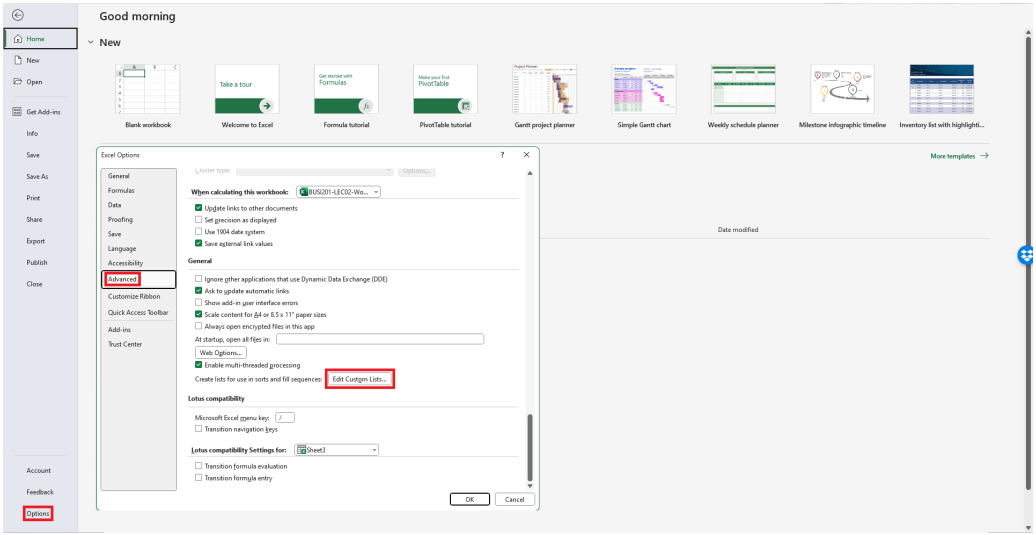

Figure 24: Navigate to custom lists

Navigate to `File` > `Options` > `Advanced`. Scroll down until you find `Edit Custom Lists`. Here you should be able to add your own custom list that will show up during future autofills. See figure 25 for an application of a custom list.

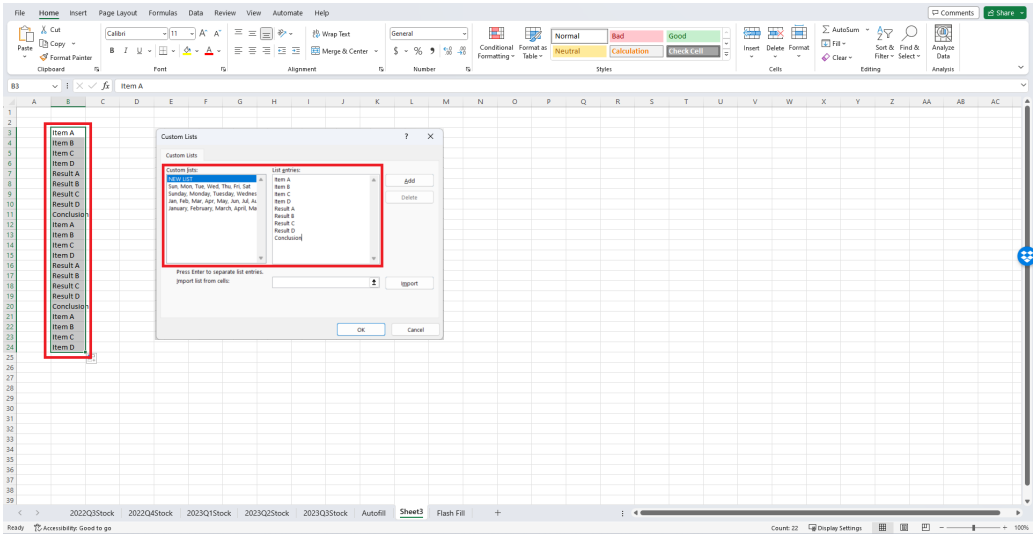

Figure 25: Applying custom lists

Topic 6. Flash Fill

Flash fill is an Excel function somewhat similar to autofill in the sense that it provides some convenience to the user by attempting to recognize patterns in the existing data to automatically filli out some cells. Please open sheet `Flash Fill` in the workbook `BUSI201-LEC02-Workbook.xlsx`, which is a list of the Business and Economics faculty at Monmouth. Suppose we want to extract the first and last names, login ID, office number, and phone extension information. An easy way to acheive this goal is to use a form of autofill, flash fill.

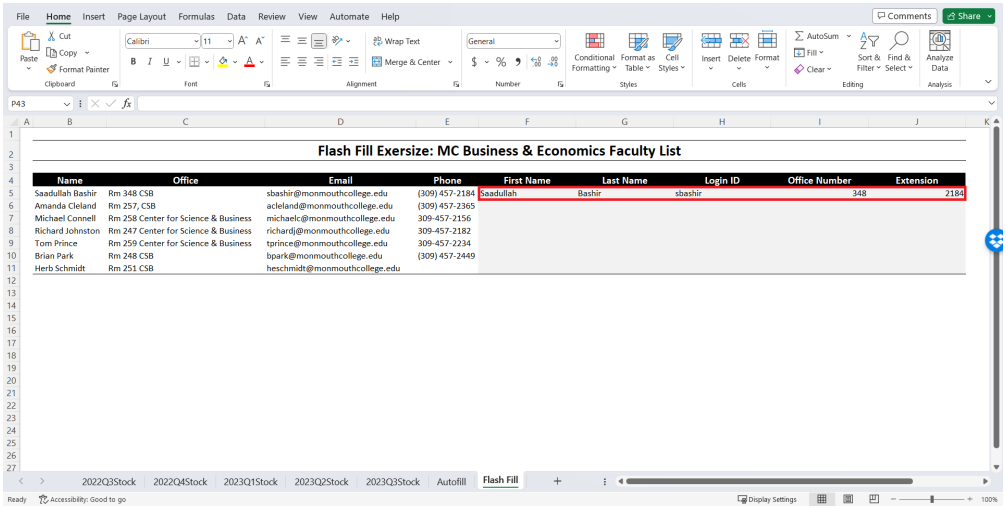

Figure 26: Flash fill setup

To set up for the flash fill, you must first manually fill out the first row. Excel will use this information to infer the pattern that it should use to fill out the remaining rows. Once the first row is complete, select a cell that is directly below the first row, and use the hotkey `ctrl`+`E`. In figure 27, we can see that flash fill does a good job in extracting the first names.

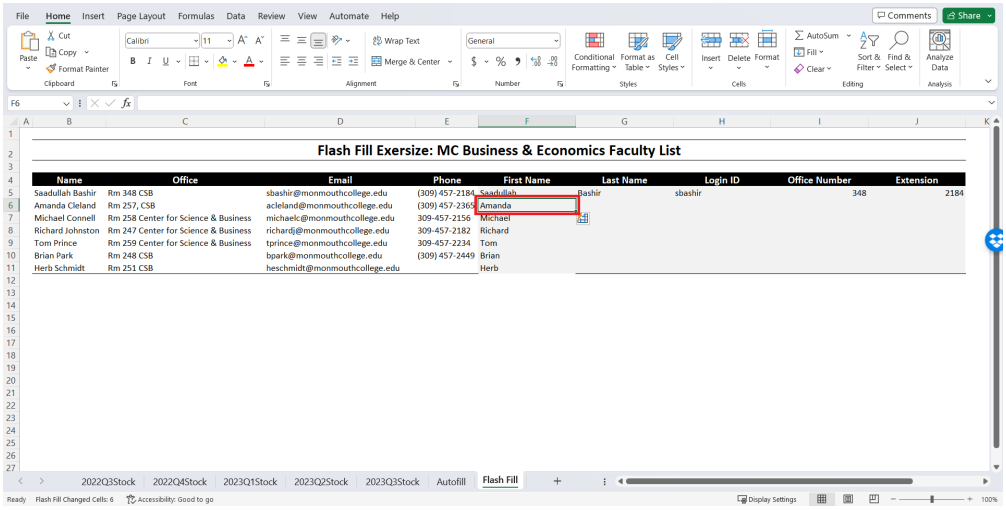

Figure 27: Flash filled second row