Lab 1 – Introduction to Excel

Lab 1 Quick View

- Each cell of excel has a letter column and a number row.
- Numbers are entered in cells by typing them and pressing enter.
- Formulas and equations are entered in cell starting with =
- Common formulas are:

=SUM(X:Y)	**Add all cells from cell X to cell Y**
=AVERAGE(X:Y)	**Calculate the average (mean) of cells X to Y**
=COUNT(X:Y)	**Count how many filled cells are between cells X and Y**
=VAR(X:Y)	**Calculate the sample variance of cells X to cells Y**
=STDEV(X:Y)	**Calculates the sample standard deviation of cells X to Y**

**Note: the (X:Y) of each formula can be filled out by clicking and dragging to highlight the cells you want to use.

- Text can be entered by typing and pressing enter. If the text would be considered a number or formula, it can be entered by typing ‘ first.
- Cells can be copied and moved using the copy command (Control+C), the cut command (Control+X) and the paste command (Control+P).
- Copied formulas will automatically change their cells unless “$” is used. For example:

=$A5	**The column A will not change when copied**
=A$5	**The row 5 will not change when copied**
=$A$5	**The column A will not change and the row 5 will not change when copied.**

- Cells can be formatted to change the look of the text, the size of the cell, borders and colour fill.
- Saving excel files to a USB drive is a good idea.

Note: Some versions of Excel do not accept the compatibility functions **VAR** and **STDEV**. In these cases, you can use **=VAR.S(X.Y)** and **=STDEV.S(X.Y)**.

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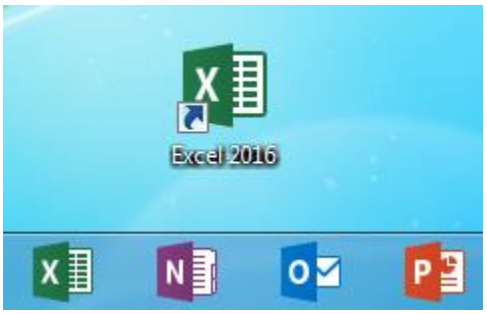
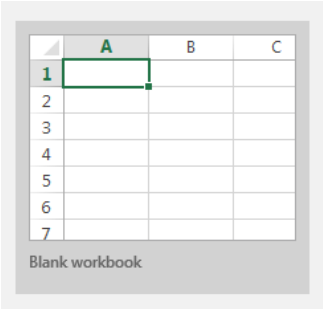
A) Opening Microsoft Excel

Depending on your computer and operating system, Microsoft Excel can usually be opened through the start button in the lower left. It is sometimes listed under programs, Microsoft Office and/or Office.

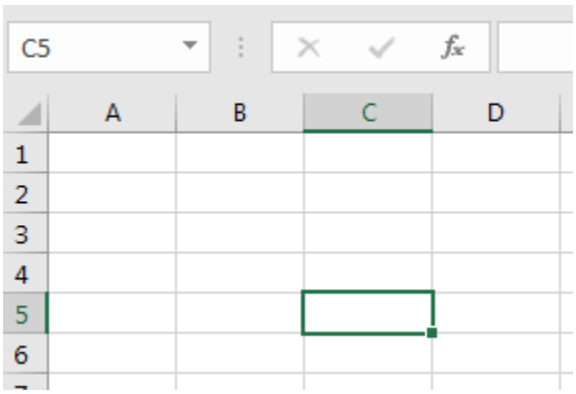
Alternately, you may be able to open Microsoft excel using a shortcut on your desktop or taskbar. If you are given options, choose "Blank Workbook".





B) Cells

An excel spreadsheet is made up of cells. The columns are given letters, and the rows are given numbers. If you click your mouse on the 5th row of column C, for example, you will highlight and be able to type in CELL C5.



Note that column C and row 5, and the cell you clicked on are highlighted. "C5" also appears in the top left above the cells. You can move between cells by clicking different cells, or by using the arrow keys.

C) Filling in cells

Three things can be entered into each cell: numbers, formulas and text.

- To enter a number, simply type the number (ie: 467.2 or 312) and press enter.
- To enter an equation, type "=" then the equation and press enter.
  Each equation will include numbers, cells, and math tools such as + (addition), - (subtraction), / (division), * (multiplication), ^ (exponents/powers) and brackets. (Normal math order of operations applies, so for example 2 + 3 * 4 = 14, since without

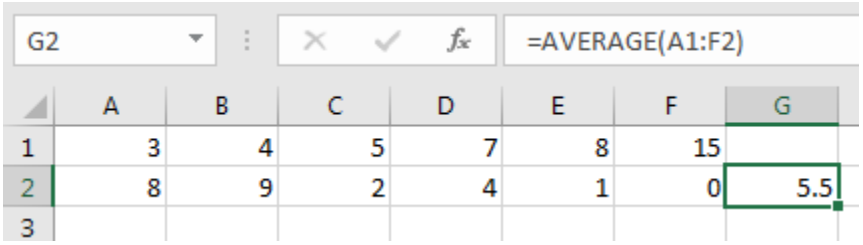
brackets, multiplication comes before addition.)
After the "=" you can also type a formula. Excel has hundreds of useful formulas (which can be found using the "help" option). Some formulas that you will use in this course are:

=SUM(X:Y)	Add all cells from cell X to cell Y
=AVERAGE(X:Y)	Calculate the average (mean) of cells X to Y
=COUNT(X:Y)	Count how many filled cells are between cells X and Y
=VAR(X:Y)	Calculate the sample variance of cells X to cells Y
=STDEV(X:Y)	Calculates the sample standard deviation of cells X to Y

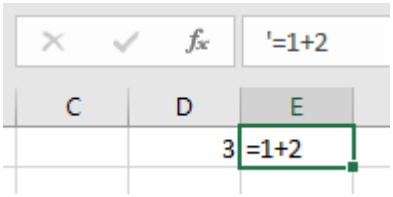
**Note: the (X:Y) of each formula can be filled out by clicking and dragging to highlight the cells you want to use.

Note: Some versions of Excel do not accept the compatibility functions **VAR** and **STDEV**. In these cases, you can use **=VAR.S(X.Y)** and **=STDEV.S(X.Y)**. These commands use identical background formulas. The **.S** indicates that we are using sample data, rather than population data.

After you enter the equation and hit enter, the answer appears in the cell. If you click on the cell again, you will notice that the "formula line" above the cells shows the equation you entered. You should enter CELLS instead of NUMBERS in formulas whenever possible. That way, if you change the numbers in the cells, the answers to all the equations will automatically recalculate.

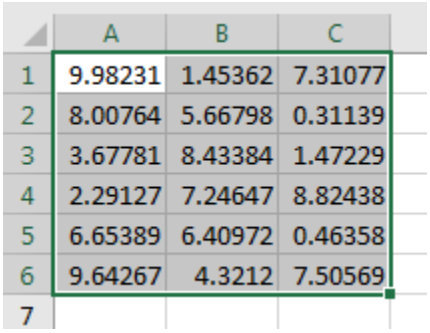


- To enter text, simply type the text and hit enter. If you want to enter text that would normally be interpreted as a number or formula (if it starts with a number, - or = for example), start the entry with ' .



D) Selecting, Copying, Cutting, and Pasting

To select more than one cell, simply click on the first or last cell to want to select, hold your mouse button down, then drag your mouse to highlight all cells you want to select before releasing the mouse button.



	A	B	C
1	9.98231	1.45362	7.31077
2	8.00764	5.66798	0.31139
3	3.67781	8.43384	1.47229
4	2.29127	7.24647	8.82438
5	6.65389	6.40972	0.46358
6	9.64267	4.3212	7.50569
7			

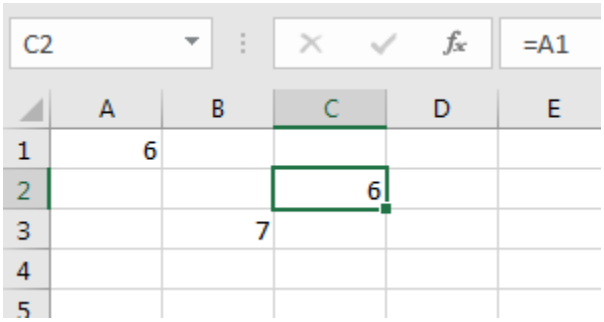
To **COPY** selected cells, press CONTROL+C, or right click a selection and choose "COPY", or select "COPY" under the "HOME" menu at the top of your screen. Your selected cells will still exist, but can now be pasted somewhere else.

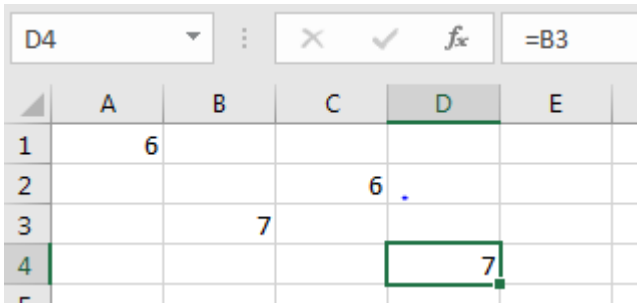
To **CUT** selected cells, press CONTROL+X, or right click a selection and choose "CUT", or select "CUT" under the "HOME" menu at the top of your screen. Your selected cells will **BE ERASED**, but can now be pasted somewhere else.

To **PASTE** selected cells, first click on a cell where you want the top left of the copied cells to start, then press CONTROL+V, or right click a cell and choose "PASTE", or select "PASTE" under the "HOME" menu at the top of your screen. Your copied or cut cells will now appear.

E) Pasting Formulas

If you copy and paste a formula, the new formula will automatically change which cells it refers to based on its new location. For example, if a formula in cell C2 originally referred to cell A1 (one cell above and two cells to the left), and you copied that formula into cell D4 it would now refer to cell B3 (one cell above and two cells to the left).





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Usually this feature is useful. If you want to calculate the average of many columns, you can use the =AVERAGE formula once, then copy that formula along the bottom of each column; the formula will automatically change each time.

If you DON'T want the cell letter or cell number to change, simply put a $ BEFORE it. For example:

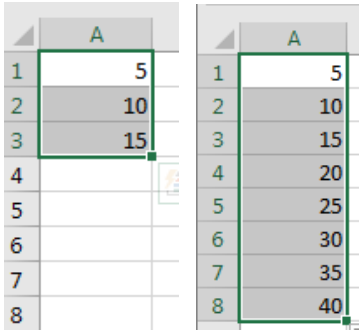
=$A5	The column A will not change when copied
=A$5	The row 5 will not change when copied
=$A$5	The column A will not change and the row 5 will not change when copied.

If you want to copy the ANSWERS to a formula, but not the formula itself, instead of selecting "PASTE", select "PASTE SPECIAL - VALUES" either by right-clicking or by using the PASTE option under the HOME menu.

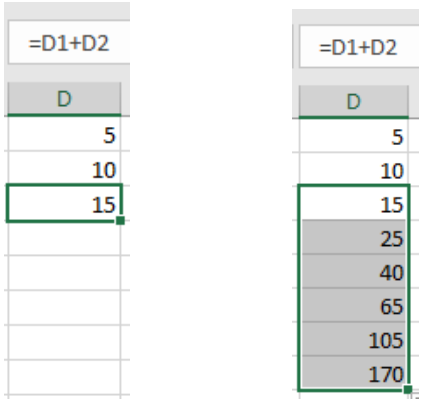
Advanced Skill – Fill Handle

When any cell or cells in excel is selected, there is a square in the bottom right corner of the cell(s) called the "fill handle". By clicking and dragging this small square, excel will attempt to fill in all the empty cells highlighted.

- If you start by selecting a pattern of numbers, excel will continue the pattern:



- If you start by selecting a formula, excel will copy the formula:



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F) Inserting or deleting row or columns

To insert a row or column, click on the LETTER or NUMBER of the old row or column you want the new row or column to come BEFORE, then right click and choose “INSERT.”

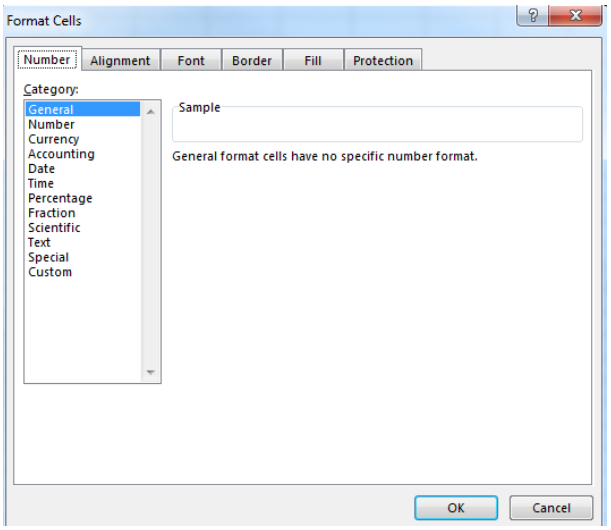
To delete a row or column, click on the LETTER or NUMBER of the old row or column you want to delete, then right click and choose “DELETE.”

G) Changing Column Width

To change column width (for example if you need more room for text), simply move your cursor to the right of the column letter until it changes to a vertical line with and arrow to each side, then click and drag until the column is the width you want. (Changing row height is similar.)

H) Formatting cells

To change the appearance of cells, select the cells you want to change, then right-click and choose “FORMAT CELLS”. (Most of these options can be also found under the “HOME” menu.)



- The NUMBER tab is useful to change your data into currency or to select the number of decimal places you want displayed.
- Under the ALIGNMENT tab, “Wrap Text” can be useful to fit text in one cell
- The FONT tab can change font.
- The BORDER tab can put boarders around and between individual cells. You should always pick this option before printing an excel file to make it readable.
- The FILL tab lets you put a background colour in the cells selected. This is useful if you want to highlight a cell or selection of cells to make it easier to read.

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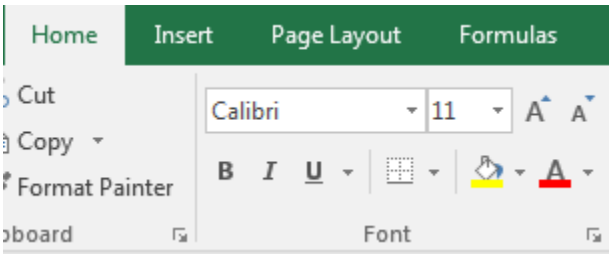
I) Changing fonts

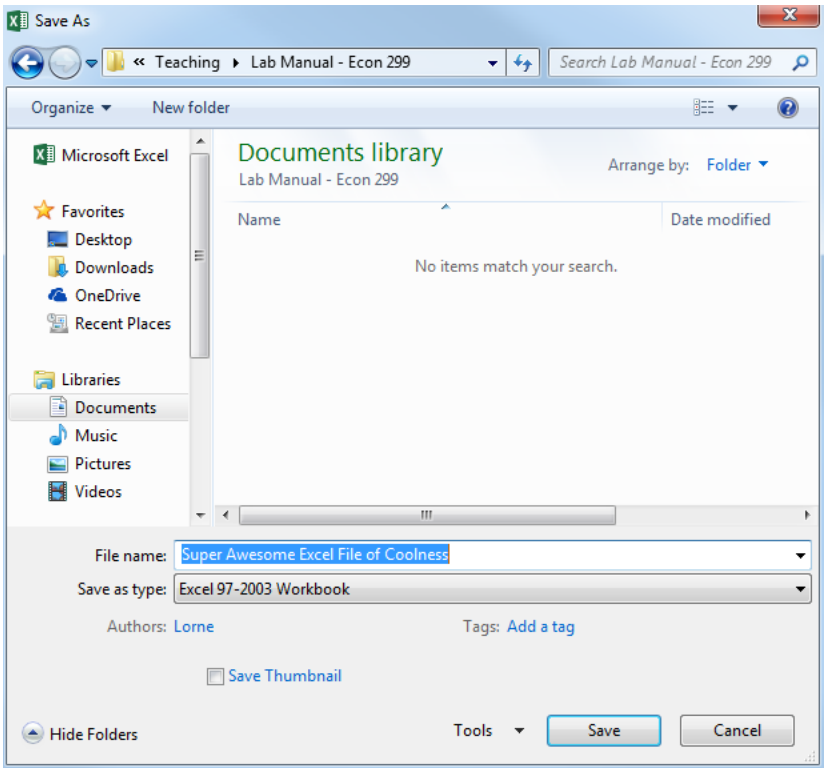
By selecting “Format Cells” or through the “Home” menu, you can change how text appears in one or more cells. To format multiple cells, simply click and drag to select the cells you want to format. The most common formats you will do will be to change the font, change the font size, bold your text, or underline your text.



J) Saving an excel file

To save an excel file, select “FILE” in the top menu, then “SAVE”. Choose the location to save the file, and type in an appropriate name. Make sure you are able to save your file to a USB drive, usually by choosing “browse”.

If you want to save an excel file so that it can be opened using much older versions of excel, select “FILE” in the top menu, then “SAVE AS”. Once you’ve chosen your save location, change “Save as type” to “Excel 97-2003 Workbook”.



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Econ 299 Practice Lab 1:

A) Copy or download the following list of prices and quantities:

	A	B	C	D	E
1	Year	Apples		Oranges	
2		Price	Quantity	Price	Quantity
3	2018	$1.12	930.00	$2.56	892
4	2019	$1.91	867.00	$2.89	994
5	2020	$1.44	845.00	$4.19	867
6	2021	$2.26	976.00	$2.86	902
7	2022	$2.42	990.00	$2.03	822
8					

B) Create a new row at the top and insert the title "Bob Econ's Farmer's Market".

C) Create a new column on the far left. In CELL A9 enter the text "AVERAGE" and in cell A10 enter the text "TOTAL".

D) Calculate the average prices and quantities and the total quantities. After entering the formulas for apples, copy and paste those formulas for oranges.

E) In G2 insert the text "Laspeyres Price Index. 100=2020." In G3 to I3 insert the text, Numerator, Denominator, and Price Index.

$$LPI_t = \frac{\sum P_t Q_b}{\sum P_b Q_b} 100$$

F) The LPI formula is listed above. Since the denominator (bottom of the division sign) never changes, we can calculate that first in row 6 by entering **=C$6*D$6+E$6*F$6**. The $'s make sure that the row number never changes as we copy the denominator formula for all years; we always refer to 2020 (the base year).

G) The numerator can be calculated in row 6 by entering **=C6*D$6+E6*F$6**. The $'s make sure that the row number never changes as we copy the numerator formula for all years; we always refer to the base year (2020) quantity.

H) After copying your numerator and denominator formulas to cover all years, calculate the price index in row 6 as simply **=G6/H6*100**, then copy to fill in the entire price index.

I) Next, we can calculate growth in fruit prices, or fruit inflation. In column J, enter the title "Fruit Inflation (%)" in the appropriate cell. Remember that the formula for growth is:

$$growth_{t,t-1} = \frac{(X_t - X_{t-1})}{X_{t-1}} 100\%$$

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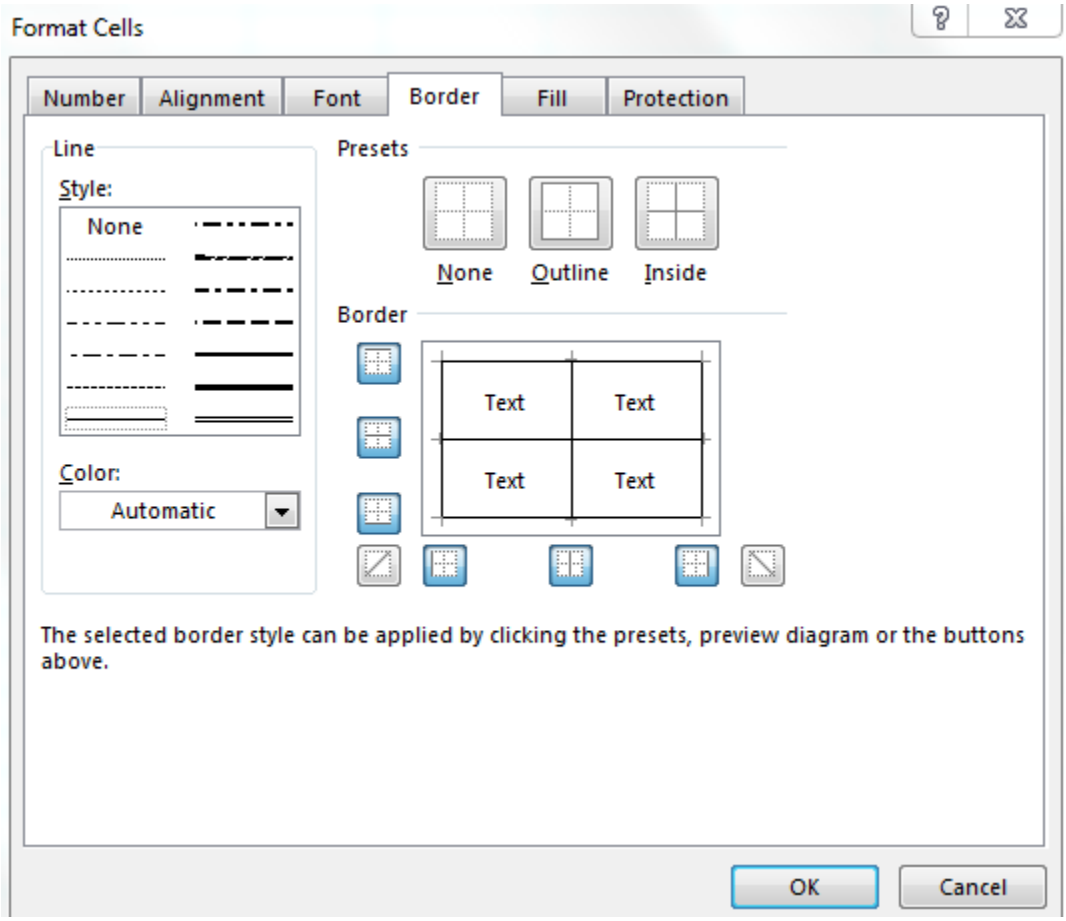
J) In column J, row 5 (since row 4 will be blank), input the formula **=(I5-I4)/I4*100** and copy and paste it as needed. Note that we use no $'s, as we want the cell references to always change as we paste the formula.

K) Below your calculations above, calculate average inflation by copying over the previous formula. Notice that the formula will automatically ignore row 4 since it is blank.

L) If you have not yet done so, change the width of the columns so the text fits into each cell. Format all the cells so that they show dollars or simple numbers, as needed. Bold and underline any titles.

M) Let's assume that you wanted to print this spreadsheet, and that inflation was the key item you were calculating. Select all the work you have done, and right click to choose "FORMAT CELLS". Under "Border", select Outline and Inside so that the grid is always shown. Next, under "Fill", choose a colour for the inflation entries only.



N) Finally, let's assume that you find out that your original data set had an error. Change quantity of apples in 2020 to read 854 (instead of 845). Notice how your spreadsheet automatically updates. This is why it is important to always use cell references whenever possible in excel.

O) Save your work on your USB drive.

Practice Lab 1 Answers:

	A	B	C	D	E	F	G	H	I	J
1	**Bob Econ's Farmer's Market**									
2		**Year**	**Apples**		**Oranges**		**Laspeyres Price Index (100=2020)**			
3			**Price**	**Quantity**	**Price**	**Quantity**	**Numerator**	**Denominator**	**Price Index**	**Fruit Inflation (%)**
4		2018	$1.12	930	$2.56	892	$3,177.96	$4,863.01	65.35	
5		2019	$1.91	867	$2.89	994	$4,142.90	$4,863.01	85.19	30.36
6		2020	$1.44	854	$4.19	867	$4,863.01	$4,863.01	100.00	17.38
7		2021	$2.26	976	$2.86	902	$4,408.50	$4,863.01	90.65	-9.35
8		2022	$2.42	990	$2.03	822	$3,823.94	$4,863.01	78.63	-13.26
9	AVERAGE		$1.83	923	$2.91	895				6.28
10	TOTAL			4617		4477				
11										
12										

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