

Basic Excel Workshop
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1 Introduction

This guide has been designed to accompany the Basic Excel workshop at the Barnard Empirical Reasoning Center. The workshop requires no experience with Excel or other spreadsheet applications, and is meant to introduce participants to the interface and capabilities of Microsoft Excel.

The topics covered in this workshop include:

- Important Terminology
- Navigation
- Data Organization
- Data Formatting
- Basic Calculations

2 Important Terminology

Excel is a spreadsheet software that is used to organize and analyze tabular data. That is, data are entered as a table with rows and columns.

1. Rows are identified by row numbers.
2. Columns are identified by column letters.
3. Cells are identified by the row-column combination.

In the figure below, cell E4 is selected, in column E and row 4.

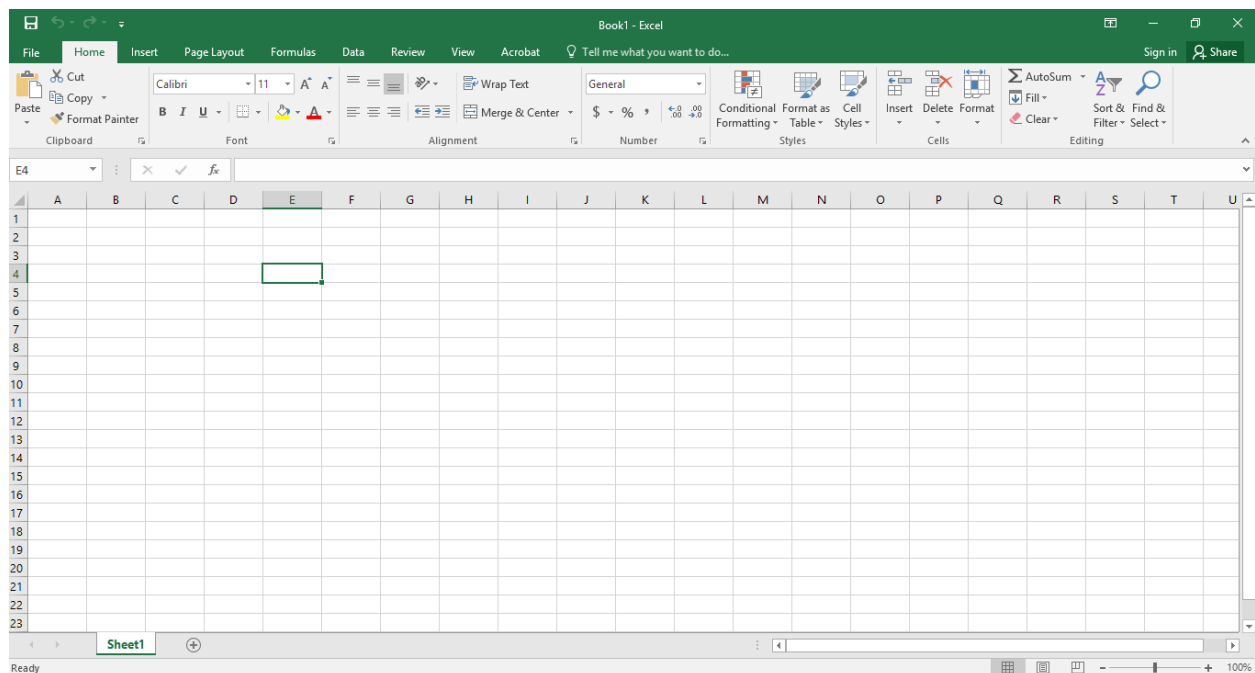


Figure 1: Excel's Interface

Workbooks can contain multiple 'sheets,' sort of like different pages of a document. Sheets can contain a large amount of data, but it can be helpful to use separate sheets when working with larger datasets.

Excel's tools are organized into 'ribbons,' much like other Microsoft Office applications. When opening Excel, you will normally begin in the 'Home' ribbon, but you can easily navigate between ribbons by clicking on them at the top of the page. In this workshop, we'll go over some of the built-in tools in the different ribbons.

3 Navigation

3.1 Moving Between Sheets

To move between sheets, navigate to the bottom of your excel window. There, you'll see a box labeled "Sheet1" with a plus sign next to it.



Figure 2: Adding a sheet

Here is where you can navigate between sheets, add sheets, rename sheets, and remove them. To add a sheet, simply click on the plus sign. A new sheet will be created, and will automatically be called "Sheet2." To rename a sheet, double click on its name or right click and select "Rename." Sheet names have a character limit, so keep them as concise as possible. To delete a sheet, right click and select "Delete." Note that deleting a sheet cannot be undone.

3.2 Selection

In Excel, something is always selected, normally a cell. When a single cell is selected, its border is dark green. Any type of range can be selected. To select a rectangular range of cells, click and hold in the center of the cell you'd like to begin at, and drag to the cell you'd like to end at, where you can release the mouse. The selected range will be grey, surrounded by a dark green border.

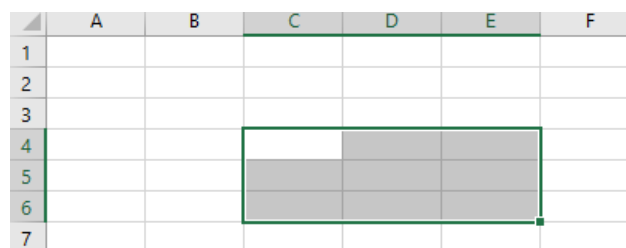


Figure 3: A selected range

You can also select an entire column, by clicking on the column letter at the top of your worksheet. To select a range of columns, click and drag.

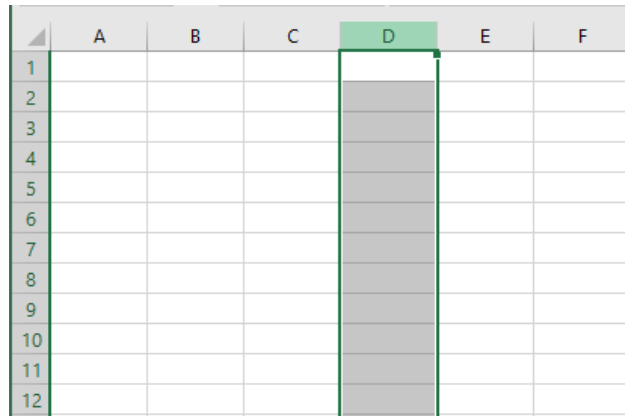


Figure 4: A selected column

To select an entire row, click on the row number on the left side of the worksheet. To select a range of rows, click and drag. Be careful when selecting a row to click in the center of the row number. If you click to high or low on the row label, you may accidentally resize the row instead of selecting it.

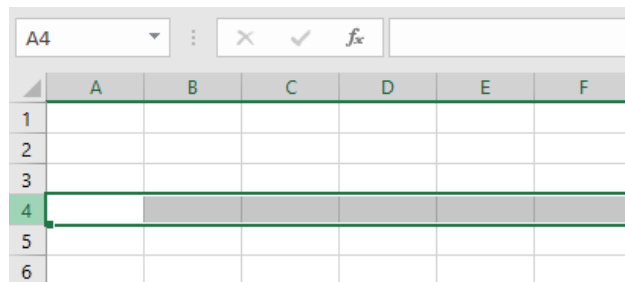


Figure 5: A selected row

3.3 Ribbons

Most of Excel's capabilities can be accessed using the ribbons at the top of a document. We'll go over some of the most commonly used ribbon capabilities, and where to find them.

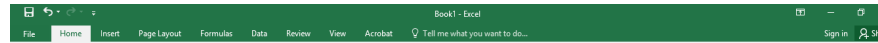


Figure 6: Excel's ribbons

The 'home' ribbon is Excel's default ribbon, and will be familiar to those who have used other Microsoft Office applications. Any cell text formatting can be done in the home ribbon. For example, the home ribbon is where a user can change the number type of a cell. You may want to change your number type if you're working with dates, currencies, or percentages. You can also change the number of decimal places in this part of the home section.

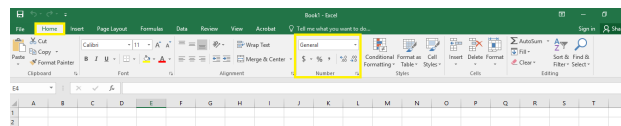


Figure 7: Formatting numbers in the 'home' ribbon

The 'insert' ribbon contains two of the most common Excel capabilities: charts and pivot tables. This is where you can insert a blank chart, or select data to create a chart from, and also where pivot tables can be created. We cover charts in our Introductory Excel workshop and pivot tables in our Intermediate Excel workshop.

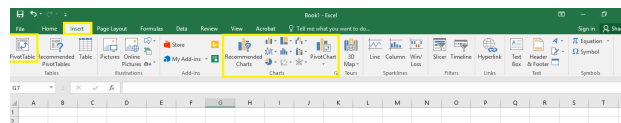


Figure 8: Pivot tables and charts in the 'insert' ribbon

The 'data' ribbon is useful for exploring and analyzing your data. The first step many users will take is to sort and filter their data, especially when working with a larger dataset. We will go over more of these capabilities in more advanced workshops.

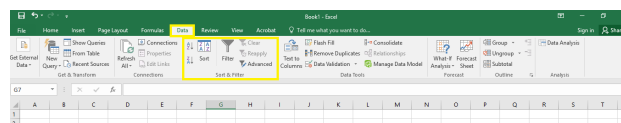


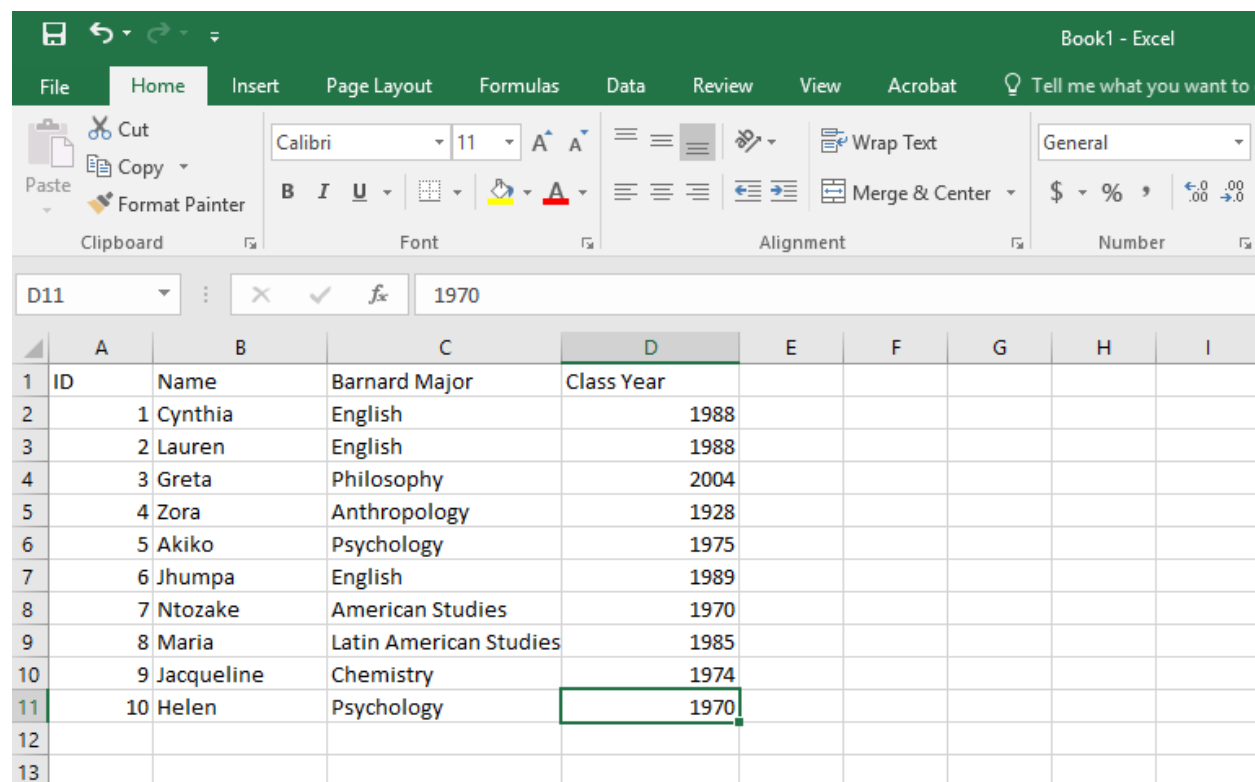
Figure 9: Sort and filter in the 'data' ribbon

4 Working with Data

4.1 Data Organization

Convention is to organize your data with observations as rows and variables as columns. We will create an example dataset to demonstrate how to set up your own data, but when working with a workbook generated by someone else, the data will generally also be setup in this way.

In general, it's good to add an ID field that is unique to each observation. The ID does not need to be numeric as it is here, but could instead be a combination of numbers and letters (like a uni) or some other unique identifier. We use IDs here because it's possible that an alum could have graduated from Barnard in the same year as someone else with the same first name and major.



	A	B	C	D	E	F	G	H	I
1	ID	Name	Barnard Major	Class Year					
2	1	Cynthia	English	1988					
3	2	Lauren	English	1988					
4	3	Greta	Philosophy	2004					
5	4	Zora	Anthropology	1928					
6	5	Akiko	Psychology	1975					
7	6	Jhumpa	English	1989					
8	7	Ntozake	American Studies	1970					
9	8	Maria	Latin American Studies	1985					
10	9	Jacqueline	Chemistry	1974					
11	10	Helen	Psychology	1970					
12									
13									

Figure 10: An example dataset of Barnard alumnae, similar to the one generated in this workshop

4.2 Data Formatting

Formatting text in Excel is very similar to formatting in Microsoft Word. Ranges, rows, and columns can all be selected and formatted. Formatting and text styling in Excel is normally used to make a spreadsheet more readable and organized. In this example, we'll style the top row of our spreadsheet, our variable names, to make them stand out.

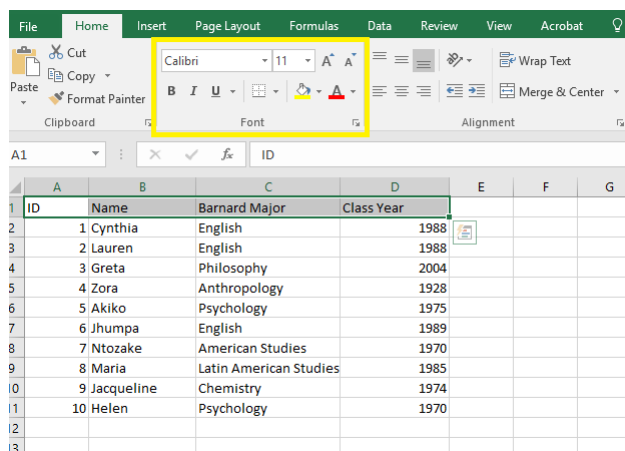


Figure 11: Select the top row to style the cell text using the 'home' ribbon

Once the variable names are selected, we can edit in the home ribbon. Start by making the text bold by clicking on the "B" icon. Turn the background of the cells dark blue by selecting the paint can icon. That makes it difficult to see the black text, so we'll turn the text white using the colorful "A" icon. The end result should look like the figure below.

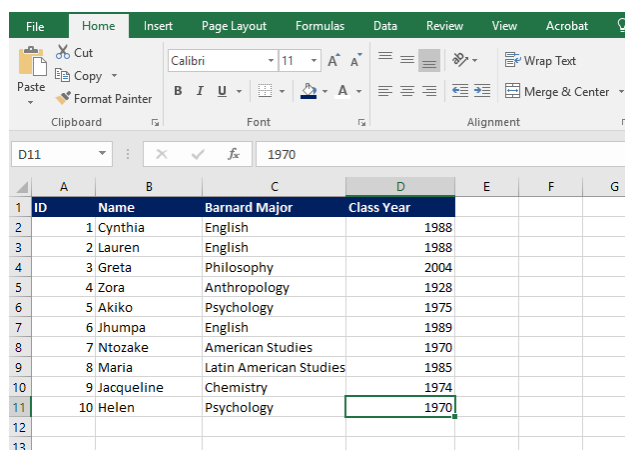


Figure 12: The final formatted result

When working with a large dataset, it can be difficult to keep track of different variables once you've scrolled past the top row. To make your spreadsheets easier to navigate, we can use the "freeze panes" function in the 'view' ribbon. This will allow us to freeze the variable names so that they appear even after we've scrolled past the first row.

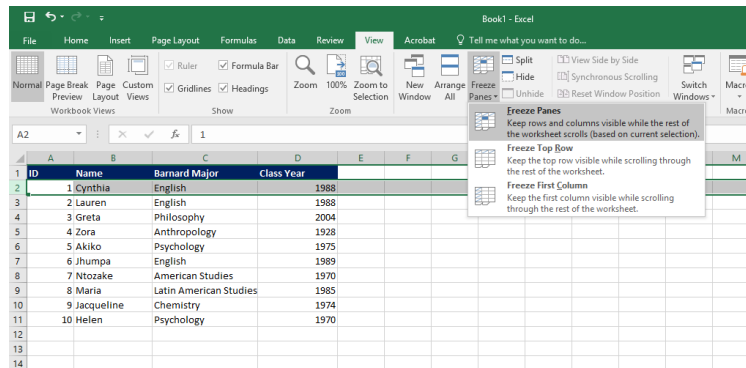


Figure 13: Freeze panes in the 'view' ribbon

Begin by selecting the entire second row by clicking on the row label "2" to the left. Then navigate to the 'view' ribbon and select freeze panes. Select freeze panes from the dropdown. As you can see below, if you scroll down after freezing, the top row will stay at the top, even as the rows directly below are hidden. This can be disorienting, but you can always check where you are in the spreadsheet using the row indices on the left. In this example, it's clear that we're not seeing some rows, because the row index goes from "1" to "6."

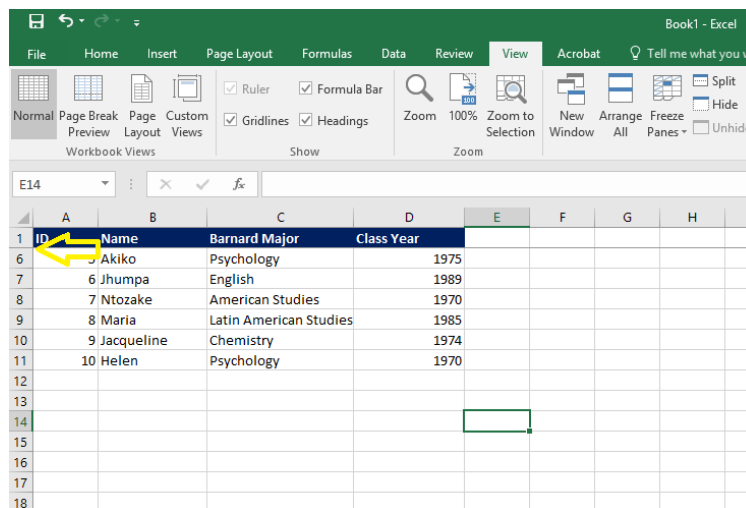


Figure 14: Scrolling down after freezing the top row

5 Basic Calculations

5.1 Finding an Average

One of the most commonly used functions in Excel is the 'average' function. In this example, we'll find the average Barnard class year of the alumnae in our small sample dataset. For common functions like this one, Excel has built in functions, that are usually called something simple like "average," "sum," "median," or "count."

To begin calculating the average class year, select a blank cell to the right of your data and type "Average Class Year." We will put our formula in an adjacent cell. To calculate anything in Excel, we will always begin with an equals sign (=). To calculate the average class year, in a blank cell, type "=AVERAGE(D2:D11)".

AVERAGE is the name of the function - it does not need to be in all caps but if you begin typing the word 'average,' after an equals sign, Excel will give you the option to automatically populate the cell with the AVERAGE formula. D2:D11 is the cell range for which we are calculating an average; the colon represents the word "thru" in Excel. So in this case, we're telling excel to calculate the average of cells D2 thru D11.

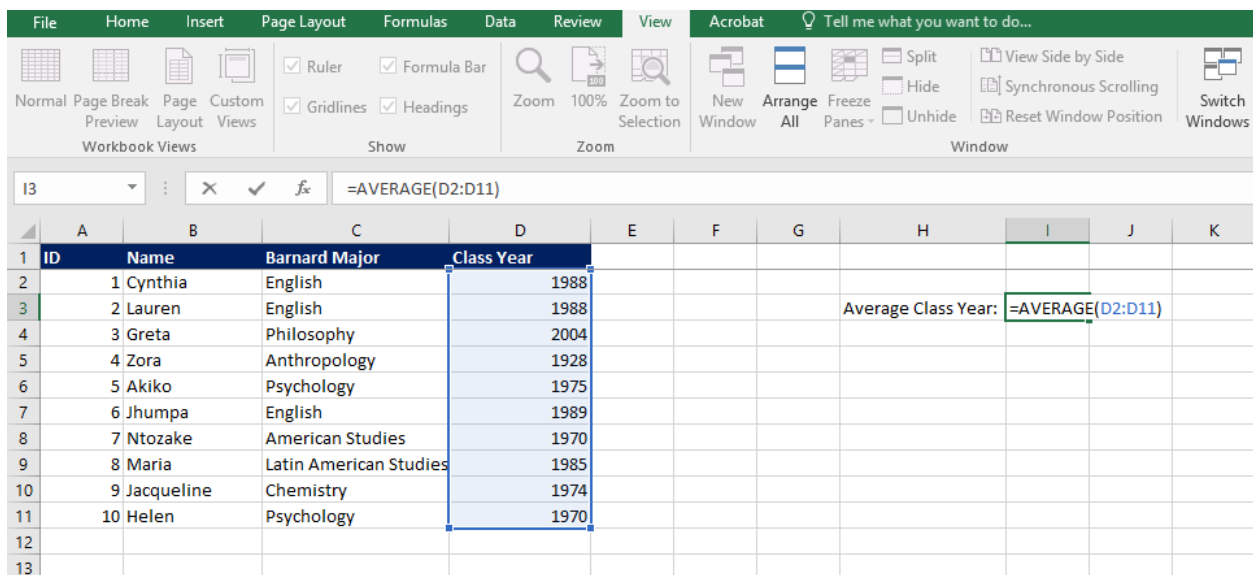


Figure 15: Calculating the average class year

When you've finished writing your function, hit enter, and you should see the cell populate with the average class year of the alumnae in your spreadsheet.

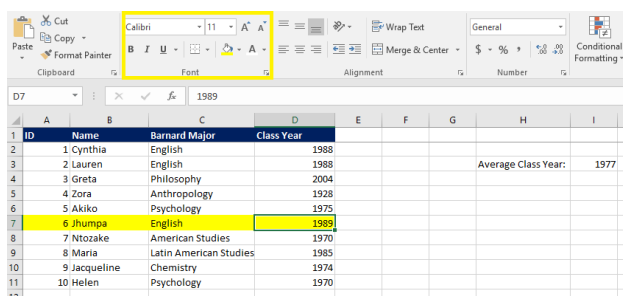
Average Class Year:	1977
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Figure 16: Final average result

5.2 Math in Excel

Sometimes, the calculation you want to perform does not require a function such as "average" or "median," but simply subtraction, addition, or multiplication. In this case, we'd like to calculate the reunion year for a particular alumna in 2019.

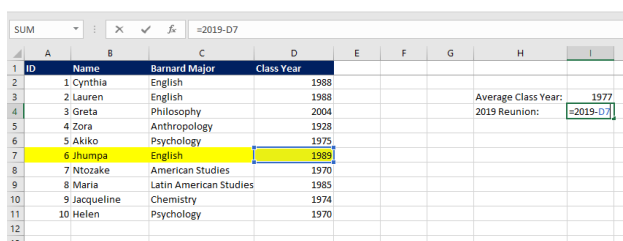
We'll start by selecting a particular alum from the sheet and highlighting that row yellow, to make it stand out. This is not necessary for the calculation, but can be helpful when trying to showcase a specific observation. In this case, Jhumpa Lahiri is highlighted, and we will calculate her reunion year for 2019.



ID	Name	Barnard Major	Class Year
1	Cynthia	English	1988
2	Lauren	English	1988
3	Greta	Philosophy	2004
4	Zora	Anthropology	1928
5	Akiko	Psychology	1975
6	Jhumpa	English	1989
7	Ntozake	American Studies	1970
8	Maria	Latin American Studies	1985
9	Jacqueline	Chemistry	1974
10	Helen	Psychology	1970

Figure 17: Select and highlight a specific observation (alumna)

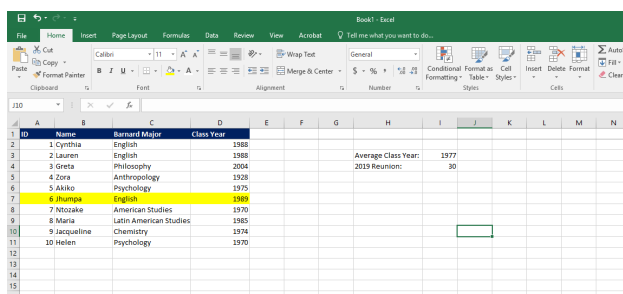
To calculate how many years between Jhumpa Lahiri's graduation year and 2019, we will again begin with an equals sign. After the equals sign, excel is expecting either a built-in function (such as 'average'), or math operators. In this case, we only need to subtract the class year from the number 2019. Our formula should be "=2019-D7".



ID	Name	Barnard Major	Class Year	
1	Cynthia	English	1988	
2	Lauren	English	1988	
3	Greta	Philosophy	2004	Average Class Year: 1977
4	Zora	Anthropology	1928	2019 Reunion: =2019-D7
5	Akiko	Psychology	1975	
6	Jhumpa	English	1989	
7	Ntozake	American Studies	1970	
8	Maria	Latin American Studies	1985	
9	Jacqueline	Chemistry	1974	
10	Helen	Psychology	1970	

Figure 18: A formula to calculate Jhumpa Lahiri's 2019 reunion year

After pressing enter, you will see that 2019 will be Jhumpa Lahiri's thirtieth Barnard reunion!



ID	Name	Barnard Major	Class Year	
1	Cynthia	English	1988	
2	Lauren	English	1988	
3	Greta	Philosophy	2004	Average Class Year: 1977
4	Zora	Anthropology	1928	2019 Reunion: 30
5	Akiko	Psychology	1975	
6	Jhumpa	English	1989	
7	Ntozake	American Studies	1970	
8	Maria	Latin American Studies	1985	
9	Jacqueline	Chemistry	1974	
10	Helen	Psychology	1970	