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Download and Revise the Shelflist Data

Download the first dataset

- Navigate to the **Excel for Library Projects** libguide, <https://link.mnsu.edu/minitex-excel>.
 - Click on the tab, Project 2: The Weeding Report
 - In the box, Project 2 Resources, click on the link **Shelflist sample data** to open
 - Click on File, Save As, Download a Copy.
 - After opening the downloaded copy, enable editing, then save your copy wherever you prefer as Project2_Practice.

Format the worksheet to improve legibility

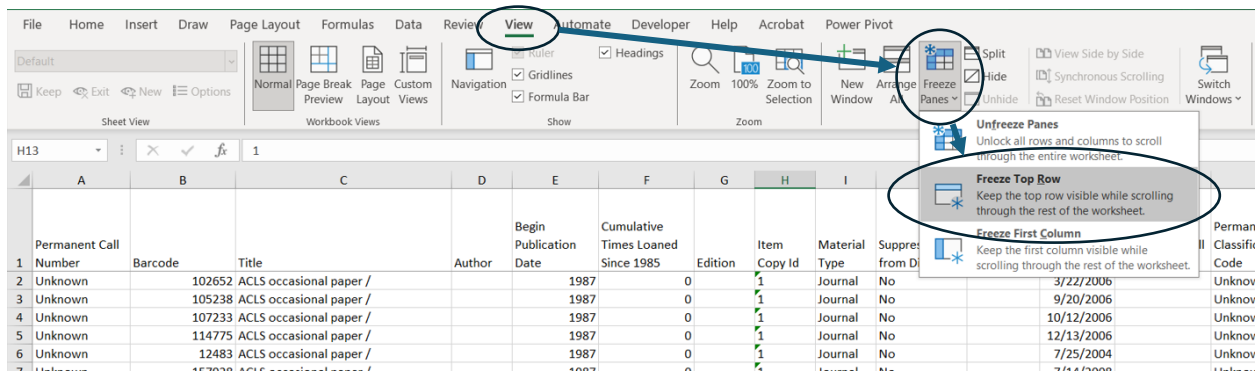
- After opening a new data set, I usually re-size the columns, the top row, and apply 'wrap text' to the top row, as I demonstrated in the first session.
- To save us some time, I've already taken these steps.
- I have also put the columns in a useful order.
- When working with new data downloads, we almost always need to complete these basic formatting steps to improve the legibility of the data, so please review Project 1 if these steps are unfamiliar.

Investigate and refine the data

- The data included here is real, but I've only included a list of items for the call numbers M to N in my library's General Collection.
 - There are some strange entries near the top, which we'll handle in a moment. These have Permanent Call Number "Unknown."
 - The rest of the list is already sorted in proper order for a shelflist. This is important. If we change the shelflist order, we'll need to put it back in order.

Freeze Panes

- In a real project, we might spend time investigating the data to make sure we understand it. Today, we'll pretend we already understand the data for the most part, but we might want to scroll through it anyway to check it out.
- To make the data easier to read as we scroll through it, let's use a feature called Freeze Panes. Basically, this allows us to pin columns or rows so that we don't lose sight of them while scrolling.
 - Go to the View tab and click Freeze Panes.
 - For now, let's just freeze the top row.



Hide Columns

- As we review the data for this project, we might see there are columns we don't need right now, but we might want to retain them because they could be useful later. Instead of deleting these columns as we did in Project 1, we'll hide them today.
 - Highlight columns G:J, right click and select Hide.

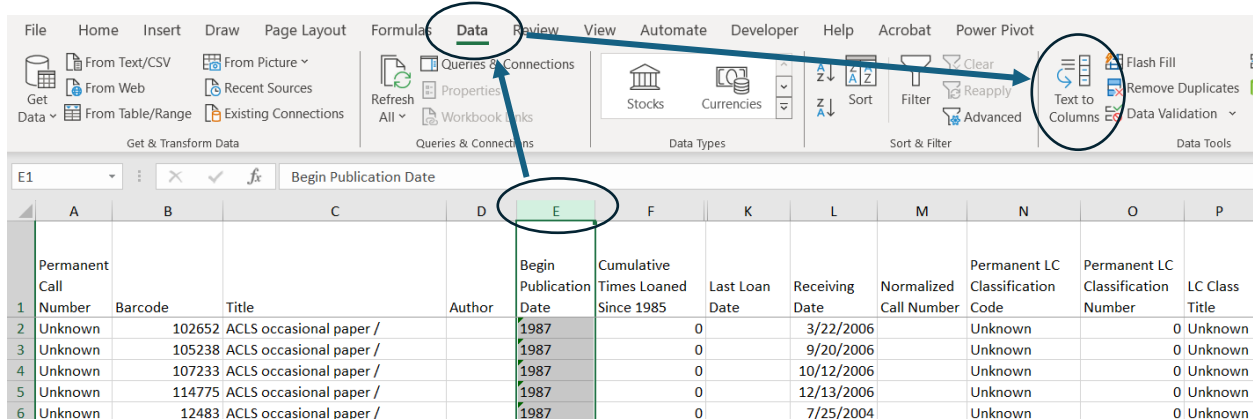
Numbers stored as text

- There are small green triangles in the corners of the cells in column E. These indicate there is a possible error. There could be a variety of errors indicated by the green triangles, but in this case, we're seeing the error indicator because there are numbers in the column stored as text.

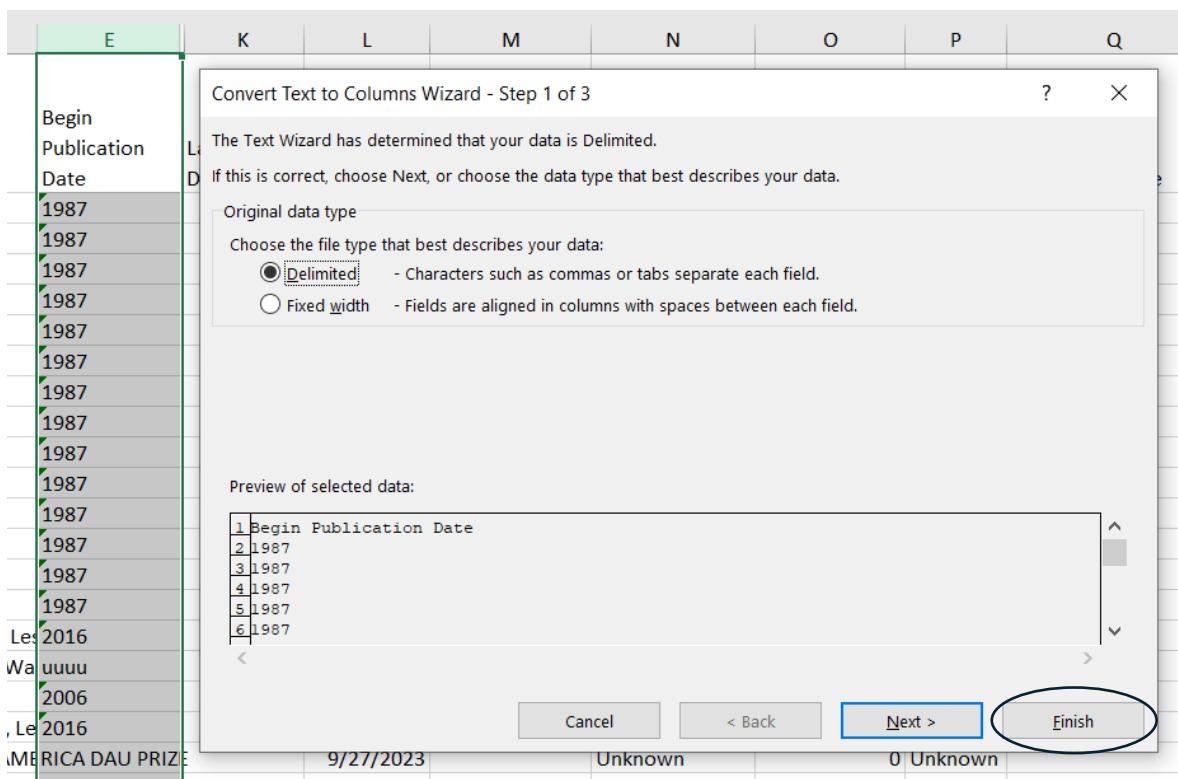
	A	B	C	D	E	F	K	L
	Permanent Call				Begin Publication	Cumulative		
1	Number	Barcode	Title	Author	Date	Times Loaned Since 1985	Last Loan Date	Receiving Date
2	Unknown	102652	ACLS occasional paper /		1987	0		3/22/2006
3	Unknown	105238	ACLS occasional paper /		1987	0		9/20/2006
4	Unknown	107233	ACLS occasional paper /		1987	0		10/12/2006
5	Unknown	114775	ACLS occasional paper /		1987	0		12/13/2006
6	Unknown	12483	ACLS occasional paper /		1987	0		7/25/2004

- If we click on the cells, Excel will offer to help us clean these up, but we can take a quicker, more systematic approach if we want to convert the text to actual numbers.
 - This is helpful when we want the numbers to behave as numbers in Excel, so that we can do math with the values or use functions such as Max(), which can find the maximum value in a lookup_array.
- We don't really need to address these errors today, because they are harmless, but if we want the data to look clean, we can handle them all systematically.
 - Click on the column letter E.

- On the menu bar, click on the Data tab.
- In the Data Tools box, click on Text to Columns.



- Don't worry about using the wizard right now. Just click Finish.



- The text has now been converted to numbers.
 - NOTE: Only the true numbers have been converted to numbers. Some calls include letters. These could not be converted to numbers.

- (By the way, Text to Columns can be used in other ways. If the content of cells in a column is structured, Text to Columns can be a powerful tool for breaking the contents of the cells into separate columns. If we have time later in the series, we'll circle back to explore this functionality.)

Use the Len() function to check data values for an expected length

- At my library, all valid items have 14 digit bar codes. As a first step in this project, we should set aside any items that don't have 14 digit bar codes. We'll cut these from the data to investigate later or send to an appropriate colleague to investigate. Let's start by checking the bar codes systematically based on their length.
 - Insert a temporary column to the right of Barcode.
 - Let's use the column heading, Barcode Check.
 - In cell C2, we'll use the Len() function to count how many characters are in the barcodes in column B.
 - [Click here to learn more about the Len\(\) function.](#)
 - The Len() function takes just one argument. In this case, we'll enter a cell reference to count the number of characters in the cell.
 - In cell C2, enter =LEN(B2)

	A	B	C	D	E	F
	Permanent Call	Barcode	Barcode Check	Title	Author	Begin Publication Date
1	Unknown	102652		ACLS occasional paper /		1987
2	Unknown	105238		ACLS occasional paper /		1987
3	Unknown	107233		ACLS occasional paper /		1987
4	Unknown	114775		ACLS occasional paper /		1987

- The only thing we know about the bar code is that it should be 14 digits long. If the bar code is not 14 digits long, then we need to identify all such cases so that we can sort them into a group to remove them from our data.
- Let's combine the Len() function with the If() function. We saw the If() function in the last section of the first project, but some of you couldn't stick around for the demonstration, so I'll re-introduce the If() function here.
 - [Click here to learn more about the If\(\) function.](#)

- We'll use 3 arguments for the If() function, separated by commas. The If() function will check if the first argument is True, then, if the first argument is True, it will perform (or return) the second argument, otherwise (else), if the first argument is False, it will perform (or return) the third argument.
- =IF(logical_test,result_if_true,result_if_false)
- In cell C2, revise the function as follows

=IF(LEN(B2)=14,1,0)

- The combined function might be most easily understood by translating it to English. "If the length of the barcode in B2 is equal to 14 characters, then return a 1; otherwise, return a 0."
- Thus, if the Barcode Check data value is 1, we can presume the barcode is valid. If the Barcode Check is 0, we know definitely the barcode is invalid.
- To copy the calculation down to the other cells in the column, double-click on the little square in the bottom-right corner of cell C2. Excel will autofill the column and automatically update the cell references, as we've seen before.
- Copy & paste as values.

Sort, then copy & paste a list with hidden columns

- Let's prepare a worksheet where we'll paste the rows of data with invalid barcodes.
 - Add a worksheet and rename it "Invalid Barcodes." We covered how to add worksheets and re-name them in session 1.

24	Unknown	1368443	0	Cronicas c
25	Unknown	441904	0	DEBUSSY:
26	Unknown	79489	0	DEVELOPI

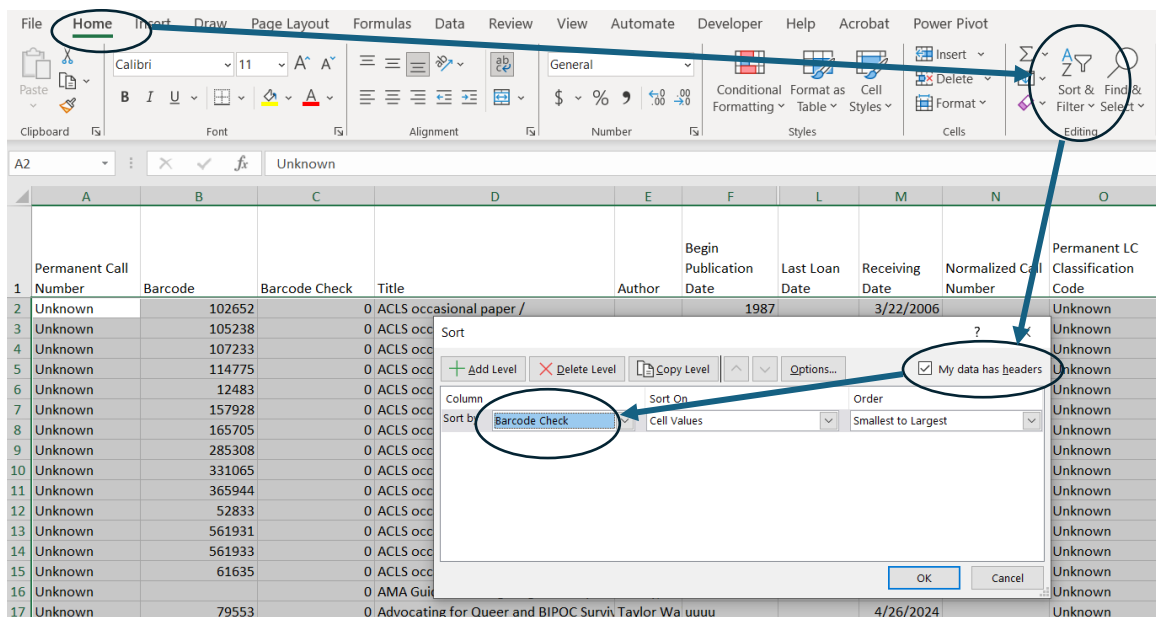
Sheet1 Invalid Barcode (+)

- Let's also copy and paste the column headings from Sheet1 to the Invalid Barcodes worksheet.
 - In Sheet1, highlight the column headings. Click on cell A1, then hold down the Shift key and the Control key, then click the right arrow. This should highlight all the column headings. (shift + ctrl + ->)
 - Right-click to copy the highlighted cells or use the keyboard shortcut, ctrl + c.
 - Click on the Invalid Barcodes worksheet and click on the cell A1. You can right click to paste or use the keyboard shortcut, ctrl + v.
 - Notice how the hidden columns have been copied and unhidden.
- Sort the Sheet1 data on Barcode Check.

- As we saw in session 1, to sort we must first highlight all the column letters for columns with data.
- On the Home tab, click on Sort & Filter.
- Click on Custom Sort.
- Make sure “My data has headers” is checked.
- Sort ascending on Barcode Check
- NOTE: We should be careful how we sort the shelflist. The shelflist was pre-sorted in Alma Analytics on the normalized call number. It’s already in the correct shelflist order (with a few exceptions). We can sort on Barcode Check without disrupting the original order, except to remove the invalid items. If we sort on any other field, we will disrupt the original order. To fix it, we would need to re-sort on normalized call number, or undo any erroneous sorts with the magical keyboard shortcut, ctrl + z.
 - If we sorted on the regular call number, as it appears on the book spine, Excel would not sort as we might expect. To sort on the regular call number, or what Alma Analytics calls the Permanent Call Number, we would need to break it into parts, then sort on those as a multi-level sort:

M80 .W47 2002	----->	M	80	W	47	2002
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- We won’t have time to learn how to break a call number into parts today, so let’s stick to sorting on Barcode Check only.



- Instead of sorting, we could have also used a filter, but by sorting, we’ve prepared the data so that we can easily copy and paste the rows with invalid bar codes to the Invalid Items worksheet AND we can delete those rows from Sheet1 efficiently.

- ## Use the CountIf() to count the frequency of a selected data value

- | | A | B | C | D | E | F | K | L | M | N | O | P | Q | R |
|---|-------------|----------------|---------------------------|-------------------|------------------------|------------------------------------|----------------|----------------|------------------------|----------------------------------|------------------------------------|--------------------|-------------------|---|
| | | | | | Begin Publication Date | Cumulative Times Loaned Since 1985 | Last Loan Date | Receiving Date | Normalized Call Number | Permanent LC Classification Code | Permanent LC Classification Number | LC Class Title | LC Subclass Title | |
| 1 | Number | Barcode | Title | Author | | | | | | | | | | |
| 2 | M6 .B3 1989 | 30101008739484 | Organ recital. | Ballard, Kevin J. | 1989 | 3 | 2/13/2009 | 3/16/1990 | 0m 6 b3 1989 | M | 6 Music | Instrumental music | 2077 | |
| 3 | M6 .K7 1996 | 30101014263552 | Program notes / | Krumholz, Sandr | 1996 | 1 | 9/21/2015 | 10/14/1996 | 0m 6 k7 1996 | M | 6 Music | Instrumental music | | |
| 4 | M6 .S3 1991 | 30101010970358 | Program notes on a maste | Schulz, Christine | 1991 | 3 | 9/29/2015 | 2/4/1992 | 0m 6 s3 1991 | M | 6 Music | Instrumental music | | |
| 5 | M6 .S4 1994 | 30101012682076 | Program notes for a gradu | Shih, Doris Chi-n | 1994 | 0 | 6/4/2015 | 11/4/1994 | 0m 6 s4 1994 | M | 6 Music | Instrumental music | | |

- What if we want to apply multiple criteria to the CountIf() function? We could use the Countifs() function!
- Let's find out how many items are in NA that have never been checked out using the Countifs() function.

- Click here to learn more about the Countifs() function.
- The Countifs() function can take many arguments in the form (criteria_range1, criteria,criteria_range2,criteria2, etc.).
- I'll temporarily add this function on the Valid Items worksheet, below the CountIf() function we already tried.
 - In cell R3, enter =COUNTIFS(N:N,"NA",F:F,"="&0)
 - For the first criteria_range and criteria, we've used the same values as previously. For the second criteria_range, we are checking Cumulative Times Loaned Since 1985 for any values equal to 0.
 - NOTE how criteria2 is written. We can't simply use =0, we must put the equals sign in quotation marks ("="), then add an ampersand (&), then the value we're checking again (0)
- I can see there are 396 items with the LC Code NA which have never been checked out.
- Let's delete the CountIf() function in R2. We used the function only because we were curious about the size of the shelflist we are creating – and so that we could learn about CountIf(). 😊

Make a copy of the selected range we are working on today

- Let's presume we only want to work on the NA items today. Generally speaking, this is not an approach I'd take. Instead, I'd create a report for an entire location code, then, if folks want to work with LC Code ranges within the location, I'd just abridge the report for their purposes. This saves me time. It's faster to create one base report, then slice it up as needed, rather than to create multiple reports upon request.
- I typically like to keep back-up copies of my data in case my data gets corrupted. I can do this by saving backup files, but I also keep backups within my workbooks, if it makes sense to do so. Thus, I'll copy only my items with the LC Code NA to a new worksheet, then I'll perform my next steps only on the NA Items.
 - Create a third worksheet named "NA Valid Items" to the left of Valid Items. If we click on the worksheet Valid Items, then click + to create a worksheet, the new worksheet will appear to the right of Valid Items. Drag and drop the new worksheet to the left of Valid Items.
 - Filter the Valid Items worksheet on Permanent LC Classification Code, NA.

Permanent Call	Barcode	Title	Author	Begin Publication	Cumulative Times Loaned Since	Last Loan Date	Receiving Date	Normalized Call	Permanent LC Classification Code	Permanent LC Classification Number
1	Number	Barcode	Title	Author	Date	1985				
2	M6 .B3 1989	30101008739484	Organ recital.	Ballard, Kevin J.	1989	3	2/13/2009			6
3	M6 .K7 1996	30101014263552	Program notes /	Krumholz, Sandi	1996	1	9/21/2015			6
4	M6 .S3 1991	30101010970358	Program notes on a maste	Schulz, Christine	1991	3	9/29/2015			6
5	M6 .S4 1994	30101012682076	Program notes for a gradu	Shih, Doris Chi-f	1994	0	6/4/2015			6
6	M6 .S4 1994	30101013153846	Program notes for a gradu	Shih, Doris Chi-f	1994	0	6/4/2015			6
7	M6 .S4 1994	30101013221007	Program notes for a gradu	Shih, Doris Chi-f	1994	7	11/8/2015			6
8	M10 .B3 2001	30101018371849	Johann Sebastian Bach's D	Bach, Johann Se	2001	1	5/19/2023			10
9	M20 .A5 1984	30101002836054	A graduate recital in piano	Annexstad, Jane	1984	3	6/23/2011			20
10	M20 .B6 1993	30101011974250	Program notes for a gradu	Bohmbach, Vivi	1993	9	2/26/2009			20
11	M20 .B7x	30101005190319	A master's recital in piano	Breckenridge, Jc	1977	4	4/10/2012			20
12	M20 .F7x	30101005190327	A master's recital in piano	French, George.	1979	7	10/27/2011			20
13	M20 .K3x 1968	30101005190335	Piano recital by Patricia	Kaminski.	1968	1	6/23/2011			20
14	M20 .M3	30101005190350	Graduate piano recital.	Massie, Rebecca	1984	9	6/23/2011			20
15	M20 .M33 2002	30101018346528	Program notes for a gradu	McDougald, Jen	2002	2	8/1/2016			20
16	M20 .V4x 1969	30101005190368	Piano recital by Rev. Rod	olfo Villanueva.	1969	0	8/1/2016			20
17	M21 .R37x 1980	30101005190384	Program notes for a maste	Ratanapoti, Thiti	1980	2	11/7/2012			21
18	M70 .H37x	30101005190392	A clarinet master's recital	/ Hermann, Kaye	1979	2	6/23/2011			70
19	M73 .L4 1990	30101010123313	Program notes for a clarini	Lecklider, Steve	1990	5	5/21/2018			73
20	M80 .W47 2002	30101018346064	A master's recital with pro	Westberg, Andri	2002	1	10/20/2011			80
21	M90 .H84x	30101018932061	A bass trombone master's	Hughes, James E	1980	1	9/20/2016			90
22	M229 .S4x	30101005190475	Recital : violoncello /	Skobba, Daryl Si	1976	0	6/23/2011			229
23	M255 .J6x 1971	30101005190517	Horn recital by Eric Alan	Johnson.	1971	0	6/23/2011			255
24	M276 .M4x 1974	30101005190533	Classical guitar recital by	James Patrick Mci	1974	1	6/23/2011			276
25	M320 .W4x 1974	30101005190541	Clarinet recital by Richard	P. Weber.	1970	4	6/23/2011			320
26	M370 .S4x 1973	30101005190608	Horn recital by David Wal	ter Schuler	1973	2	6/23/2011			370

- Copy and paste the NA Items to the NA Valid Items worksheet.
 - You can use the column letters to highlight the data to copy.
 - After the data is highlighted, copy it, ctrl + c.
 - Click on cell A1 of the NA Valid Items worksheet, then paste, ctrl + v.
- Notice that we've pasted only the filtered data AND only the columns that were not hidden. This is the expected behavior of Excel when copying filtered data – it's just important to know about this so that you're not surprised.
 - If we wanted to copy and keep the hidden columns, we would have had to unhide them before copying.
 - By the way, as I mentioned before, I would not normally take the approach here. I wouldn't filter for a single LC Code and, if I did, I would unhide my columns so I would be able to retain them in case they are useful later. The reason I'm taking this approach today is demonstrate how the Excel filter works in this situation.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Receiving Date	Normalized Call Number	Permanent LC Classification Code	Permanent LC Classification Number	LC Class Title	LC Subclass Title
2	NA9 .A47	#####	Architecture; forms		1954	2	#####	#####	0na 9 a47	NA		9 Architectu	General
3	NA9 .W6	#####	World architecture.		1964	2	#####	#####	0na 9 w6	NA		9 Architectu	General
4	NA9 .W6	#####	World architecture.		1964	0		#####	0na 9 w6	NA		9 Architectu	General
5	NA9 .W6	#####	World architecture.		1964	3	#####	#####	0na 9 w6	NA		9 Architectu	General
6	NA21 .F6 1	#####	Four great makers of		1970	13	#####	#####	0na!21 f6	NA		21 Architectu	General
7	NA25 .P48	#####	Some arch Pevsner, N		1972	1	#####	#####	0na!25 p4	NA		25 Architectu	General
8	NA27 .G58	#####	Building up Goldberge		2009	0	4/8/2010	#####	0na!27 g5	NA		27 Architectu	General
9	NA31 .F55	#####	The Pengu Fleming, Jc		1966	3	#####	#####	0na!31 f5	NA		31 Architectu	General
10	NA31 .H32	#####	Dictionary of architec		2000	1	9/2/2011	#####	0na!31 h3	NA		31 Architectu	General

- After pasting, we must re-size the columns.
- As we proceed to next steps, we'll work only on the NA Valid Items worksheet. We'll leave the Valid Items worksheet alone, but we could back up to it as necessary.

Identify weeding candidates

- Today, we will be applying weeding criteria based on the Receiving Date and the Last Loan Date only.
 - If an item was received more than 10 years ago and was never checked out, then it will be marked as a candidate for weeding. If an item has not been checked out in over 20 years, then again, it will be marked as a candidate for weeding.
- Once we've identified a preliminary set of weeding candidates, we'll check the list against a set of items in a retention plan, so that we don't accidentally weed those items.

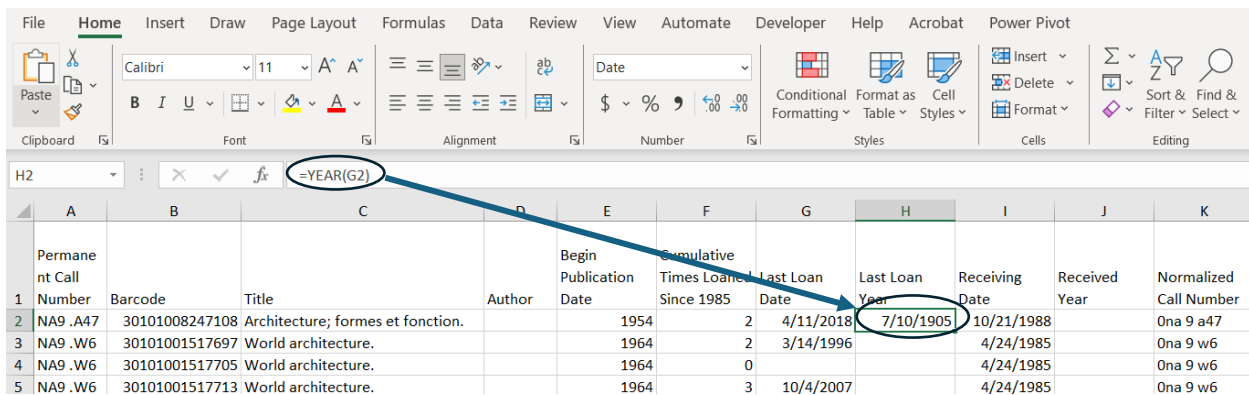
Calculate how long it has been since the item was last loaned and received

- We'll start by adding columns to convert the Last Loan Date and the Receiving Date to Year only.
 - Create a column to the right of Last Loan Date.
 - Remember: When we insert a new column, it will appear to the left of the highlighted column, so we'll highlight column H, Receiving Date, then right click on Insert.

- NOTE: When the column is inserted, it will copy the formatting of the highlighted column.
 - The new blank column will be column H
 - Add a column heading, "Last Loan Year"
- Create a column to the right of Receiving Date
 - The new blank column will be column J
 - Add a column heading, "Received Year"

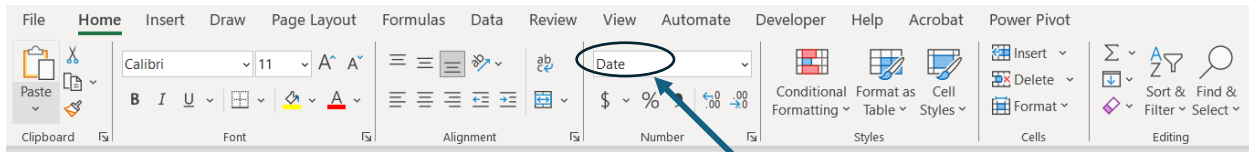
Use the Year() function

- Next, convert the dates to years only.
 - If a date is stored as a date in Excel, then we can use the Year() function to convert the date to year only.
 - [Click here to learn more about the Year\(\) function.](#)
 - There is just one argument, the date we want to convert to a year.
 - Let's start with Last Loan Year. In cell H2, enter =YEAR(G2)



	A	B	C	D	E	F	G	H	I	J	K
	Permanent Call	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Receiving Date	Received Year	Normalized Call Number
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	7/10/1905	10/21/1988		Ona 9 a47
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996		4/24/1985		Ona 9 w6
4	NA9 .W6	30101001517705	World architecture.		1964	0			4/24/1985		Ona 9 w6
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007		4/24/1985		Ona 9 w6

- Oh no, what happened? Why hasn't the Year() function worked correctly?
 - The problem is that all the cells in the Last Loan Year column, except the column heading, are formatted as dates, so Excel is extracting the year from Last Loan Date, then converting the year, as 4 digits, back into a date format.



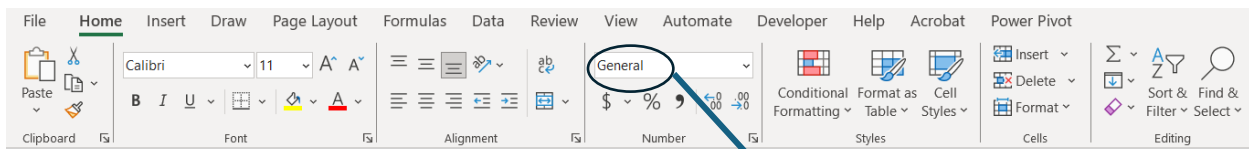
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Clipboard Font Alignment Number Styles Cells Editing

H2 =YEAR(G2)

	A	B	C	D	E	F	G	H	I	J	K
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Receiving Date	Received Year	Normalized Call Number
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	7/10/1905	10/21/1988		Ona 9 a47
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996		4/24/1985		Ona 9 w6
4	NA9 .W6	30101001517705	World architecture.		1964	0			4/24/1985		Ona 9 w6
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007		4/24/1985		Ona 9 w6

- When we created the new columns, Excel copied the exact formatting from the columns we highlighted and then applied that formatting to the new columns.
- This problem is especially confusing because the column heading is already formatted as General, but the column data values are formatted differently, as Date.
 - We can easily fix the problem by re-formatting cell H2 as General.



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Clipboard Font Alignment Number Styles Cells Editing

H2 =YEAR(G2)

	A	B	C	D	E	F	G	H	I	J	K
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Receiving Date	Received Year	Normalized Call Number
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	10/21/1988		Ona 9 a47
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996		4/24/1985		Ona 9 w6
4	NA9 .W6	30101001517705	World architecture.		1964	0			4/24/1985		Ona 9 w6
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007		4/24/1985		Ona 9 w6

- When we double-click on the square in the bottom right corner of H2, it will autofill the rest of the column with both the Year() function and the General format.
 - But there's another problem. If the Last Loan Date value was blank, Excel is converting the blank to the year 1900.

	A	B	C	D	E	F	G	H
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996
4	NA9 .W6	30101001517705	World architecture.		1964	0		1900
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007
6	NA21 .F6 1	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002

- We need to use the If() function to manage these blanks.
 - If the Last Loan Date is blank, instead of converting to a year, let's have the function return the value 9999.
 - Revise the function in cell H2, =IF(G2="",9999,YEAR(G2))
 - If the value in G2 is blank (represented by 2 quotation marks with nothing between them), return the value 9999; otherwise, return the year.
 - Double-click on the square in the bottom right corner of H2 to autofill the column.

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=IF(G4="",9999,YEAR(G4))

	A	B	C	D	E	F	G	H	
	Permanent Call	Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year
1	NA9 .A47	30101008247108	Architecture; formes et fonction.			1954	2	4/11/2018	2018
2	NA9 .W6	30101001517697	World architecture.			1964	2	3/14/1996	1996
3	NA9 .W6	30101001517705	World architecture.			1964	0		9999
4	NA9 .W6	30101001517713	World architecture.			1964	3	10/4/2007	2007
5	NA21 .F6 1	30101001517929	Four great makers of modern architecture: Gro			1970	13	11/17/2002	2002

- Copy and paste as values.
- Let's repeat the process for Received Year.
 - In cell J2, enter =YEAR(I2)
 - Change the format of cell J2 to General.
 - Autofill the column.
 - In this case, there are no blanks to manage, although we can see there are many items with a Received Year of 1985. We might infer that the library first started using an automated system in 1985
 - Copy and paste as values

Calculate the numbers of years since...

- We need to add 2 more columns. These will be used to calculate the number of years since the Last Loan Year and the Received Year.
 - Create a column to the right of Last Loan Year.
 - The new blank column will be column I
 - Add a column heading, "Years Since Last Loan"
 - Create a column to the right of Received Year
 - The new blank column will be column L
 - Add a column heading, "Years Since Received"

- Let's start by calculating the Years Since Last Loan
 - In cell I2, we'll combine an If() function with some math, =IF(H2=9999,9999,2024-H2)
 - "If the value in H2 equals 9999, return 9999; otherwise, subtract the value in H2 from 2024."

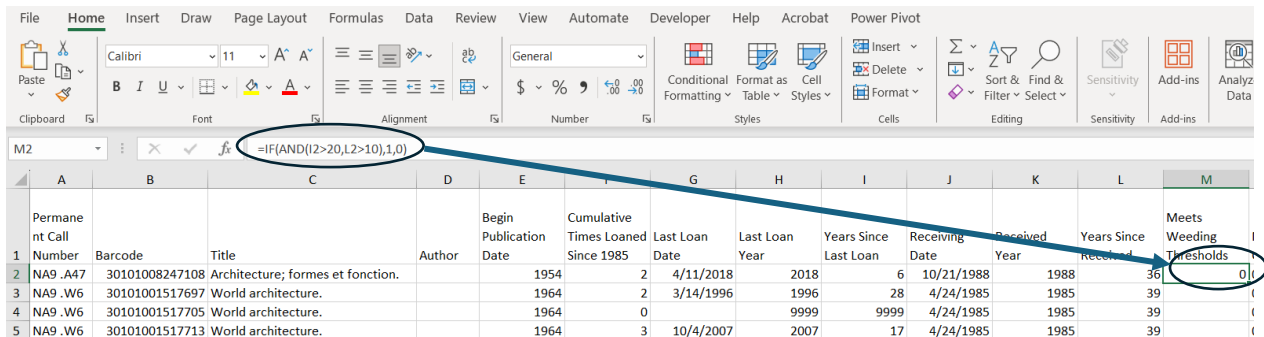
	A	B	C	D	E	F	G	H	I	J	K
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988
2	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996		4/24/1985	1985
3	NA9 .W6	30101001517705	World architecture.		1964	0		9999		4/24/1985	1985
4	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007		4/24/1985	1985

- Autofill the column.
 - Copy and paste as values
- Now calculate the Years Since Received
 - We don't need an If() function for this calculation because we didn't need to use a special value to replace any blanks among the Receiving Dates
 - In cell L2, enter =2024-K2
 - Autofill the column
 - Copy and paste as values

Apply the weeding criteria using the And() function

- As previously noted, our goal is to mark any item as a weeding candidate if the item was received more than 10 years ago and was never checked out, or if the item has not been checked out in over 20 years.
- We can do this pretty easily by using an If() function to look at both the Years Since Last Loan AND the Years Since Received.
- Within the If() function, we'll be using an And() function.
 - Excel provides a variety of logical functions. We've already learned about If(), but there are many more, such as Not(), And(), and Or(). These should be conceptually familiar to library workers as Boolean operators. Using combinations of logical functions, we can accomplish a lot with Excel. [See this overview of logical functions in Excel.](#)
 - [Click here to learn more about the And\(\) function.](#)

- The And() function will allow us to use more than one argument for the logical test in the If() function.
 - It might be easiest understand how the And() function works by using it first, then translating it to English.
- Let's start by adding a column to the right of Years Since Received. We'll name this new column M as "Meets Weeding Thresholds"
- In cell M2, enter =IF(AND(I2>20,L2>10),1,0)



	A	B	C	D	E	F	G	H	I	J	K	L	M
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0
2	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	0
3	NA9 .W6	30101001517705	World architecture.		1964	0		9999	9999	4/24/1985	1985	39	0
4	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	17	4/24/1985	1985	39	0

- Believe it or not, this simple combined function is all we need.
- Let's translate the combined function before I talk about why it works: "If the Years Since Last Loan is greater than 20 AND if the Years Since Received is greater than 10, then return the value 1; otherwise, return the value 0."
 - In this case, the 1 indicates "yes, this item does meet the weeding thresholds, whereas the 0 indicates "no, this item does not meet the weeding thresholds."
- Let me break this down further:
 - "If an item was received more than 10 years ago and was never checked out, then it will be marked as a candidate." -> Because we replaced blank Last Loan Years with 9999, these will be greater than 20. If they were also received more than 10 years ago, then they'll be marked as weeding candidates.
 - "If an item was received more than 20 years ago and has not been checked out in at least 20 years, then again, it will be marked as a candidate." -> Really, the important thing here is that these items were not checked out in the past 20 years. For an item to have a last loan year more than 20 years ago, it MUST have been received more than 20 years ago.
 - One aspect of using Excel as effectively as possible is to get a handle on how to apply logic to the data.
- Autofill the column

- Notice that we can check the bottom of the screen to see how many initial weeding candidates there are. This is one of the reasons I use 1s and 0s in my If() functions.

1/27/2020	2020	4	0	0na#
11/13/2017	2017	7	0	0na#
1/11/2018	2018	6	0	0na#
11/6/2017	2017	7	0	0na#
4/12/2021	2021	3	0	0na#
12/12/2003	2003	21	1	0na#

Average: 0.511314366 Count: 2077 Sum: 1062

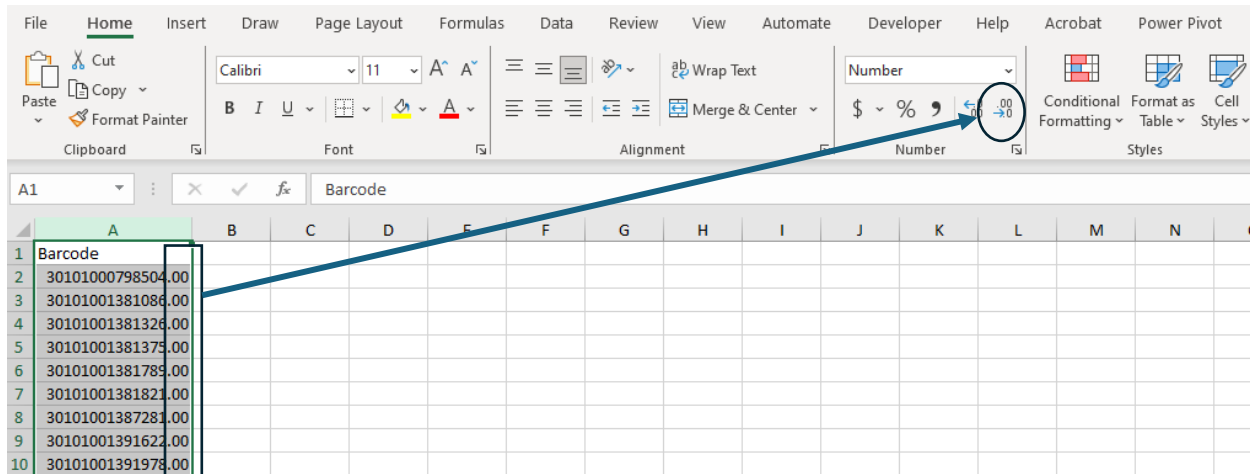
- Copy and paste as values

Check the weeding candidates against a retention list

- At our library, we are part of a collection collaboration and we have committed to retain certain items. We don't want to weed these items accidentally, so we must check any shelflist with weeding candidates against a list of Retention Plan items.
- We'll start by adding a new column to the right of Meets Weeding Threshold. Name this new column N as "Retention Commitment"
- Now add a new worksheet to the right of NA Valid Items. Name this worksheet "Retention Plan"

Download and add the second dataset

- Navigate to the **Excel for Library Projects** libguide, <https://link.mnsu.edu/minitex-excel>.
 - Click on the tab, Project 2: The Weeding Report
 - In the box, Project 2 Resources, click on the link **Retention Plan sample data** to open
 - Click on File, Save As, Download a Copy.
 - After opening the downloaded copy, enable editing, then copy the data to the worksheet Retention Plan
 - When you paste the data into Project2_Practice, the barcodes might be converted to scientific notation.
 - If you right-click and paste as value, the numbers will be converted to scientific notation.
 - If you paste using the keyboard shortcut, ctrl + v, the numbers will (probably) not be converted to scientific notation.
 - To convert scientific notation to regular numbers: highlight the column by clicking on column letter A, then select the format Number. You may also need to remove any extra zeroes after a decimal point.



Check the shelflist against the retention plan using Index(Match)

- Some people couldn't use the Xlookup() function during session 1 because they are using an older version of Excel.
- Instead of using an Xlookup() function today to compare the 2 lists, we'll use a combination of 2 functions, Index() and Match(). Used together, these are typically referred to as Index(Match), where the Match() function is nested inside the Index() function. Index(Match) can do some things Xlookup() can't, so it's worth knowing.
 - Index(Match) can be substituted for Xlookup() and can be used in the same way we learned to use Xlookup().
 - The Vlookup() function can also substitute for Xlookup(), but Vlookup() is not as flexible.
 - [Click here to learn more about the Index\(\) function.](#)
 - =INDEX(return_array,row_number)
 - Returns the value in the return array at the row number.
 - [Click here to learn more about the Match\(\) function.](#)
 - =MATCH(lookup_value,lookup_array,type_of_match)
 - Match can return a row number or a column number. Given how we're using Index and Match today, it will return the row number. We are only concerned with exact matches, so we'll use a 0 for type_of_match.
 - The Match() function can also be used powerfully on its own.
 - Combined: =INDEX(return_array,MATCH(lookup_value,lookup_array,0))
 - [See a longer explanation of Index\(\) and Match\(\)](#)
- Let's start with the Match() function alone
 - In cell N2, enter =MATCH(B2,'Retention Plan'!A:A,0)
 - The first result is an error. That's fine – that just means there isn't a match. We could check to make sure the function is working by autofilling the rest of the column.

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N24 =MATCH(B24,'Retention Plan'!A:A,0)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment
1														
2	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0	#N/A
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	1	#N/A
4	NA9 .W6	30101001517705	World architecture.		1964	0		9999	9999	4/24/1985	1985	39	1	#N/A
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	17	4/24/1985	1985	39	0	#N/A
6	NA21 .F61	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002	22	4/24/1985	1985	39	1	#N/A
7	NA25 .P48	30101001517911	Some architectural writers of the niri Pevsner, N		1972	1	12/8/1989	1989	35	4/24/1985	1985	39	1	#N/A
8	NA27 .G58	30101021297759	Building up and tearing down : reflex Goldberge		2009	0	4/8/2010	2010	14	1/28/2010	2010	14	0	#N/A
9	NA31 .F55	30101001517903	The Penguin dictionary of architectu Fleming, Jc		1966	3	1/28/1993	1993	31	4/24/1985	1985	39	1	#N/A
10	NA31 .H32	30101018330175	Dictionary of architecture & construction /		2000	1	9/2/2011	2011	13	4/17/2002	2002	22	0	#N/A
11	NA31 .H56	30101003046208	Illustrated dictionary of historic architecture /		1983	0	4/11/2012	2012	12	10/4/1985	1985	39	0	#N/A
12	NA31 .S86	30101001517895	The classical language of architectur Summerso		1966	5	4/28/2004	2004	20	4/24/1985	1985	39	0	#N/A
13	NA31 .W2	30101001800895	A short dictionary of architecture, in Ware, Dor		1953	2	4/15/1991	1991	33	5/8/1985	1985	39	1	#N/A
14	NA31 .W4	30101001517887	The architecture book / White, Noi		1976	7	4/3/2003	2003	21	4/24/1985	1985	39	1	#N/A
15	NA31 .Z34	30101001517879	Dictionary of architecture and buildi Zboirski, A		1963	0		9999	9999	4/24/1985	1985	39	1	#N/A
16	NA31 .Z48	30101001517861	The modern language of architectur Zevi, Brunc		1978	3	12/13/2002	2002	22	4/24/1985	1985	39	1	#N/A
17	NA40 .G74	30101022008908	The great builders /		2011	1	5/19/2017	2017	7	2/11/2013	2013	11	0	#N/A
18	NA40 .M2	30101005489257	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	#N/A
19	NA40 .M2	30101005489265	Macmillan encyclopedia of architects /		1982	0	3/18/2010	2010	14	7/31/1987	1987	37	0	#N/A
20	NA40 .M2	30101005489273	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	#N/A
21	NA40 .M2	30101005489281	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	#N/A
22	NA50 .P6x	30101001518349	Popular architecture /		1974	0		9999	9999	4/24/1985	1985	39	1	#N/A
23	NA55 .N39	30101001518356	New Haven, a guide to architecture Brown, Eli		1976	1	7/6/2008	2008	16	4/24/1985	1985	39	1	#N/A
24	NA100 .B5	30101001517853	The politics of architecture : a persp Bleeker, S		1981	2	5/9/1994	1994	30	4/24/1985	1985	39	1	98
25	NA105 .C6	30101001517846	Deuxième Colloque sur l'étude de la Conferenc		1969	0		9999	9999	4/24/1985	1985	39	1	#N/A

- Upon scrolling through the results, we can see we're getting valid results.
 - We'll see in a moment that these errors are meaningful. When there is an error, it indicates there is no match from the item on the shelflist to the items listed in the Retention Plan. We'll use these errors in a moment to return a more meaningful result.
- Let's revise the function in N2, so that the Match() function is inside an Index() function.
 - =INDEX('Retention Plan'!A:A,MATCH(B2,'Retention Plan'!A:A,0))
 - Autofill the column
 - Notice that the combined Index(Match) function is now returning a valid result in the cases where there are matches, although the barcode number is again being converted to scientific notation.

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N24 =INDEX("Retention Plan"!A:A,MATCH(B24,'Retention Plan'!A:A,0))

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment
1														
2	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0	#N/A
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	1	#N/A
4	NA9 .W6	30101001517705	World architecture.		1964	0		1999	9999	4/24/1985	1985	39	1	#N/A
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	17	4/24/1985	1985	39	0	#N/A
6	NA21 .F61	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002	22	4/24/1985	1985	39	1	#N/A
7	NA25 .P48	30101001517911	Some architectural writers of the nri Pevsner, N		1972	1	12/8/1989	1989	35	4/24/1985	1985	39	1	#N/A
8	NA27 .G58	30101021297759	Building up and tearing down : reflex Goldberge		2009	0	4/8/2010	2010	1	1/28/2010	2010	14	0	#N/A
9	NA31 .F55	30101001517903	The Penguin dictionary of architectu Fleming, Jc		1966	3	1/28/1993	1993	31	4/24/1985	1985	39	1	#N/A
10	NA31 .H32	30101018330175	Dictionary of architecture & construction /		2000	1	9/2/2011	2011	13	4/7/2002	2002	22	0	#N/A
11	NA31 .H56	30101003046208	Illustrated dictionary of historic architecture /		1983	0	4/11/2012	2012	12	10/4/1985	1985	39	0	#N/A
12	NA31 .S86	30101001517895	The classical language of architectur Summerso		1966	5	4/28/2004	2004	20	4/24/1985	1985	39	0	#N/A
13	NA31 .W2	30101001800895	A short dictionary of architecture, in Ware, Dor		1953	2	4/15/1991	1991	33	5/8/1985	1985	39	1	#N/A
14	NA31 .W4	30101001517887	The architecture book / White, Noi		1976	7	4/3/2003	2003	21	4/24/1985	1985	39	1	#N/A
15	NA31 .Z34	30101001517879	Dictionary of architecture and buildi Zboirski, A		1963	0		1999	9999	4/24/1985	1985	39	1	#N/A
16	NA31 .Z48	30101001517861	The modern language of architectur Zevi, Brunc		1978	3	12/13/2002	2002	22	4/24/1985	1985	39	1	#N/A
17	NA40 .G74	30101022008908	The great builders /		2011	1	5/19/2017	2017	7	2/11/2013	2013	11	0	#N/A
18	NA40 .M2	30101005489257	Macmillan encyclopedia of architects /		1982	0		1999	9999	7/31/1987	1987	37	1	#N/A
19	NA40 .M2	30101005489265	Macmillan encyclopedia of architects /		1982	0	3/18/2010	2010	14	7/31/1987	1987	37	0	#N/A
20	NA40 .M2	30101005489273	Macmillan encyclopedia of architects /		1982	0		1999	9999	7/31/1987	1987	37	1	#N/A
21	NA40 .M2	30101005489281	Macmillan encyclopedia of architects /		1982	0		1999	9999	7/31/1987	1987	37	1	#N/A
22	NA50 .P6K	30101001518349	Popular architecture /		1974	0		1999	9999	4/24/1985	1985	39	1	#N/A
23	NA55.N39	30101001518356	New Haven, a guide to architecture Brown, Eli		1976	1	7/6/2008	2008	16	4/24/1985	1985	39	0	#N/A
24	NA100 .B5	30101001517853	The politics of architecture : a persp Bleecker, S		1981	2	5/9/1994	1994	30	4/24/1985	1985	39	1	3.0101E+13
25	NA105 .C6	30101001517846	Deuxième Colloque sur l'étude de la Conferenc		1969	0		1999	9999	4/24/1985	1985	39	1	#N/A

- Let's not worry about the scientific notation. Honestly, we didn't really need to return the barcode for our purposes right now, but I wanted to demonstrate how to use Index(Match) to return a result just like we formerly used Xlookup().

Learn the IsError() function

- Let's try the IsError() function. The IsError() function checks an expression, in this case our combined Index(Match) function, for an error. If there is an error, IsError() will return the result True. If there is no error, IsError() will return the result False.
 - [Click here to learn more about the IsError\(\) function.](#)
 - =ISERROR(INDEX('Retention Plan'!A:A,MATCH(B2,'Retention Plan'!A:A,0)))
 - Autofill the column

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N24														
=ISERROR(INDEX('Retention Plan'!A:A,MATCH(B24,'Retention Plan'!A:A,0)))														
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment
1	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0	TRUE
2	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	1	TRUE
3	NA9 .W6	30101001517705	World architecture.		1964	0		9999	9999	4/24/1985	1985	39	1	TRUE
4	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	17	4/24/1985	1985	39	0	TRUE
5	NA21 .F61	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002	22	4/24/1985	1985	39	1	TRUE
6	NA25 .P48	30101001517911	Some architectural writers of the nri Pevsner, N		1972	1	12/8/1989	1989	35	4/24/1985	1985	39	1	TRUE
7	NA27 .G58	30101021297759	Building up and tearing down : reflex Goldberge		2009	0	4/8/2010	2010	14	1/24/2010	2010	14	0	TRUE
8	NA31 .F55	30101001517903	The Penguin dictionary of architectu Fleming, Jc		1966	3	1/28/1993	1993	31	4/24/1985	1985	39	1	TRUE
9	NA31 .H32	30101018330175	Dictionary of architecture & construction /		2000	1	9/2/2011	2011	13	4/17/2002	2002	22	0	TRUE
10	NA31 .H56	30101003046208	Illustrated dictionary of historic architecture /		1983	0	4/11/2012	2012	12	10/4/1985	1985	39	0	TRUE
11	NA31 .S86	30101001517895	The classical language of architectur Summerso		1966	5	4/28/2004	2004	20	4/24/1985	1985	39	0	TRUE
12	NA31 .W2	30101001800895	A short dictionary of architecture, in Ware, Dor		1953	2	4/15/1991	1991	33	5/8/1985	1985	39	1	TRUE
13	NA31 .W4	30101001517887	The architecture book / White, Noi		1976	7	4/3/2003	2003	21	4/24/1985	1985	39	1	TRUE
14	NA31 .Z34	30101001517879	Dictionary of architecture and buildi Zboirski, A		1963	0		9999	9999	4/24/1985	1985	39	1	TRUE
15	NA31 .Z48	30101001517861	The modern language of architectur Zevi, Brunc		1978	3	12/13/2002	2002	22	4/24/1985	1985	39	1	TRUE
16	NA40 .G74	30101022008908	The great builders /		2011	1	5/19/2017	2017	7	2/11/2013	2013	11	0	TRUE
17	NA40 .M2	30101005489257	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	TRUE
18	NA40 .M2	30101005489265	Macmillan encyclopedia of architects /		1982	0	3/18/2010	2010	14	7/31/1987	1987	37	0	TRUE
19	NA40 .M2	30101005489273	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	TRUE
20	NA40 .M2	30101005489281	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	TRUE
21	NA50 .P6x	30101001518349	Popular architecture /		1974	0		9999	9999	4/24/1985	1985	39	1	TRUE
22	NA55 .N39	30101001518356	New Haven, a guide to architecture Brown, Eli		1976	1	7/6/2008	2008	16	4/24/1985	1985	39	0	TRUE
23	NA100 .B5	30101001517853	The politics of architecture : a persp Bleecker, S		1981	2	5/9/1994	1994	30	4/24/1985	1985	39	1	FALSE
24	NA105 .C6	30101001517846	Deuxième Colloque sur l'étude de la Conferenc		1969	0		9999	9999	4/24/1985	1985	39	1	TRUE

- TRUE indicates there is an error, which resulted because there was no match between the item on the shelflist and the items in the Retention Plan. FALSE indicates there is no error, so there IS a match to the Retention Plan.
- Let's revise the function so that it returns a result that is more meaningful. If there is no match to the Retention Plan, let's return a 0, where 0 indicates no match. If there is a match to the Retention Plan, let's return a 1, where 1 indicates the item is on the Retention Plan. We'll use our handy If() function again.
 - =IF(ISERROR(INDEX('Retention Plan'!A:A,MATCH(B2,'Retention Plan'!A:A,0))),0,1)
 - Autofill the column

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Permane nt Call	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment
1	Number													
2	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0	0
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	1	0
4	NA9 .W6	30101001517705	World architecture.		1964	0		9999	9999	4/24/1985	1985	39	1	0
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	11	4/24/1985	1985	39	0	0
6	NA21 .F61	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002	22	4/24/1985	1985	39	1	0
7	NA25 .P48	30101001517911	Some architectural writers of the nli Pevsner, N		1972	1	12/8/1989	1989	35	4/24/1985	1985	39	1	0
8	NA27 .G58	30101021297759	Building up and tearing down : reflex Goldberge		2009	0	4/8/2010	2010	14	1/28/2010	2010	14	0	0
9	NA31 .F55	30101001517903	The Penguin dictionary of architectu Fleming, Jc		1966	3	1/28/1993	1993	31	4/24/1985	1985	39	1	0
10	NA31 .H32	30101018330175	Dictionary of architecture & construction /		2000	1	9/2/2011	2011	13	4/17/2002	2002	22	0	0
11	NA31 .H56	30101003046208	Illustrated dictionary of historic architecture /		1983	0	4/11/2012	2012	12	10/4/1985	1985	39	0	0
12	NA31 .S86	30101001517895	The classical language of architectur Summerso		1966	5	4/28/2004	2004	20	4/24/1985	1985	39	0	0
13	NA31 .W2	30101001800895	A short dictionary of architecture, in Ware, Dor		1953	2	4/15/1991	1991	33	5/8/1985	1985	39	1	0
14	NA31 .W4	30101001517887	The architecture book / White, Noi		1976	7	4/3/2003	2003	21	4/24/1985	1985	39	1	0
15	NA31 .Z34	30101001517879	Dictionary of architecture and buildi Zboirski, A		1963	0		9999	9999	4/24/1985	1985	39	1	0
16	NA31 .Z48	30101001517861	The modern language of architectur Zevi, Brunc		1978	3	12/13/2002	2002	22	4/24/1985	1985	39	1	0
17	NA40 .G74	30101022008908	The great builders /		2011	1	5/19/2017	2017	7	2/11/2013	2013	11	0	0
18	NA40 .M2	30101005489257	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	0
19	NA40 .M2	30101005489265	Macmillan encyclopedia of architects /		1982	0	3/18/2010	2010	14	7/31/1987	1987	37	0	0
20	NA40 .M2	30101005489273	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	0
21	NA40 .M2	30101005489281	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	0
22	NA50 .P6x	30101001518349	Popular architecture /		1974	0		9999	9999	4/24/1985	1985	39	1	0
23	NA55.N39	30101001518356	New Haven, a guide to architecture Brown, Eli		1976	1	7/6/2008	2008	16	4/24/1985	1985	39	0	0
24	NA100 .B5	30101001517853	The politics of architecture : a persp Bleecker, S		1981	2	5/9/1994	1994	30	4/24/1985	1985	39	1	0
25	NA105 .C6	30101001517846	Deuxième Colloque sur l'Étude de la Conferenc		1969	0		9999	9999	4/24/1985	1985	39	1	0

- Copy & paste as values
- Because we're relying on the error from the Match() function to make meaning, we didn't really need the Index() function in this case, but I hope it's useful for you to know an alternative to Xlookup().

Alternative logic using the IsNumber() function

- We could have relied on a different kind of logical test by using the IsNumber() function. Like the Match() function, many other Excel functions are designed to return a number, so the IsNumber() function can be very helpful across a range of cases.
 - We could have written our combined function differently and more straightforward.
 - Starting with =MATCH(B2,'Retention Plan'!A:A,0)
 - We could have proceeded to =ISNUMBER(MATCH(B2,'Retention Plan'!A:A,0))
 - In this case, TRUE indicates a match, while FALSE indicates no match, so the logic is more straightforward.

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N24 =ISNUMBER(MATCH(B24,'Retention Plan'!A:A,0))

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment
1														
2	NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0	FALSE
3	NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1991	1996	28	4/24/1985	1985	39	1	FALSE
4	NA9 .W6	30101001517705	World architecture.		1964	0		9999	9999	4/24/1985	1985	39	1	FALSE
5	NA9 .W6	30101001517713	World architecture.		1964	3	10/4/2007	2007	17	4/24/1985	1985	39	0	FALSE
6	NA21 .F61	30101001517929	Four great makers of modern architecture: Gro		1970	13	11/17/2002	2002	22	4/24/1985	1985	39	1	FALSE
7	NA25 .P48	30101001517911	Some architectural writers of the nir Pevsner, N		1972	1	12/8/1989	1989	35	4/24/1985	1985	39	1	FALSE
8	NA27 .G58	30101021297759	Building up and tearing down : reflex Goldberge		2009	0	4/8/2010	2010	14	1/28/2010	2010	14	0	FALSE
9	NA31 .F55	30101001517903	The Penguin dictionary of architectu Fleming, Jc		1966	3	1/28/1993	1993	31	4/24/1985	1985	39	1	FALSE
10	NA31 .H32	30101018330175	Dictionary of architecture & construction /		2000	1	9/2/2011	2011	15	4/17/2002	2002	22	0	FALSE
11	NA31 .H56	3010103046208	Illustrated dictionary of historic architecture /		1983	0	4/11/2012	2012	12	10/4/1985	1985	39	0	FALSE
12	NA31 .S86	30101001517895	The classical language of architectur Summerso		1966	5	4/28/2004	2004	20	4/24/1985	1985	39	0	FALSE
13	NA31 .W2	30101001800895	A short dictionary of architecture, in Ware, Dor		1953	2	4/15/1991	1991	33	5/8/1985	1985	39	1	FALSE
14	NA31 .W4	30101001517887	The architecture book / White, Noi		1976	7	4/3/2003	2003	21	4/24/1985	1985	39	1	FALSE
15	NA31 .Z34	30101001517879	Dictionary of architecture and buildi Zboirski, A		1963	0		9999	9999	4/24/1985	1985	39	1	FALSE
16	NA31 .Z48	30101001517861	The modern language of architectur Zevi, Brunc		1978	3	12/13/2002	2002	22	4/24/1985	1985	39	1	FALSE
17	NA40 .G74	30101022008908	The great builders /		2011	1	5/19/2017	2017	7	2/11/2013	2013	11	0	FALSE
18	NA40 .M2	30101005489257	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	FALSE
19	NA40 .M2	30101005489265	Macmillan encyclopedia of architects /		1982	0	3/18/2010	2010	14	7/31/1987	1987	37	0	FALSE
20	NA40 .M2	30101005489273	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	FALSE
21	NA40 .M2	30101005489281	Macmillan encyclopedia of architects /		1982	0		9999	9999	7/31/1987	1987	37	1	FALSE
22	NA50 .P6x	30101001518349	Popular architecture /		1974	0		9999	9999	4/24/1985	1985	39	1	FALSE
23	NA55 .N39	30101001518356	New Haven, a guide to architecture Brown, Eli		1976	1	7/6/2008	2008	16	4/24/1985	1985	39	0	FALSE
24	NA100 .B5	30101001517853	The politics of architecture : a persp Bleecker, S		1981	2	5/9/1994	1994	30	4/24/1985	1985	39	1	TRUE
25	NA105 .C6	30101001517846	Deuxième Colloque sur l'étude de la Conferenc		1969	0		9999	9999	4/24/1985	1985	39	1	FALSE

- Finally, we'd revise the combined function, =IF(ISNUMBER(MATCH(B2,'Retention Plan'!A:A,0)),1,0)
 - If there is a match to the Retention Plan, let's return a 1. If there is no match to the Retention Plan, let's return a 0.
 - This logic is more straightforward than the first version.

Mark the final list of weeding candidates

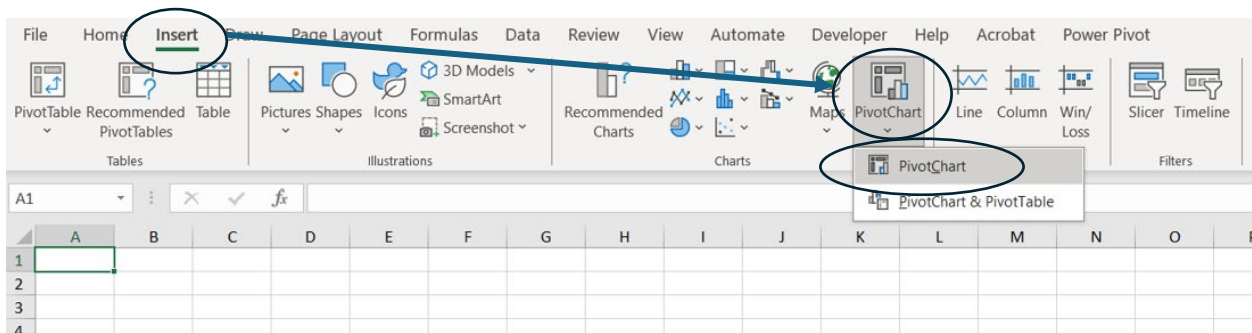
- We need one more column to combine the information we've produced.
 - To the right of Retention Commitment, insert a new column. Name this new column O as "Meets Weeding Thresholds & Not on Retention Plan"
 - Let's write out in English what we want to accomplish here: "If the value in Meets Weeding Threshold = 1 (yes) AND if the value in Retention Commitment = 0 (not on retention plan), then return a 1; otherwise, return a 0."
 - In cell O2, enter =IF(AND(M2=1,N2=0),1,0)
 - Because we've used the If() function so much, I hope it is getting easier to read. This combined function is exactly equivalent to the English version above.

Permanent Call Number	Barcode	Title	Author	Begin Publication Date	Cumulative Times Loaned Since 1985	Last Loan Date	Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Comments	Meets Weeding Thresholds & Not on Retention Plan
NA9 .A47	30101008247108	Architecture; formes et fonction.		1954	2	4/11/2018	2018	6	10/21/1988	1988	36	0		0
NA9 .W6	30101001517697	World architecture.		1964	2	3/14/1996	1996	28	4/24/1985	1985	39	1		0
NA9 .W6	30101001517705	World architecture		1964	0				4/24/1985	1985	30	1		0

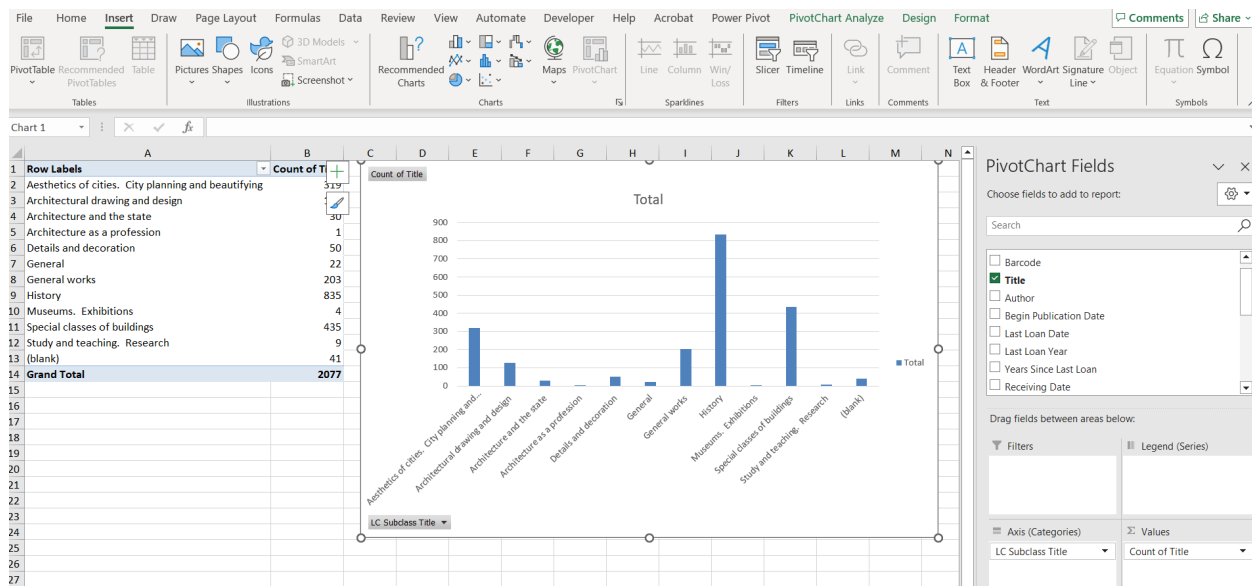
- Autofill the column
- Copy & paste as values

(For fun and learning) Analyze the shelvest with a pivot chart

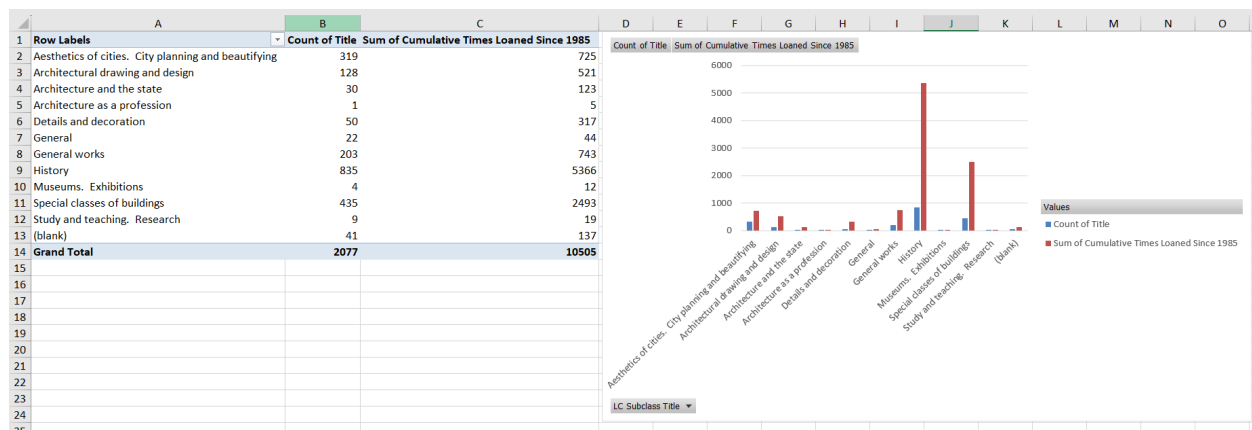
- Let's analyze the data on the NA Shelflist using a pivot chart. This step isn't really necessary for the project, but I want to show you how easy it is to create pivot charts to summarize our data.
- Create a worksheet to the right of NA Valid Items and rename it as "NA Shelflist Analysis"
 - Click on cell A1 to anchor our pivot table and pivot chart.
 - On the menu bar, click on the Insert tab.
 - Click on Pivot Chart



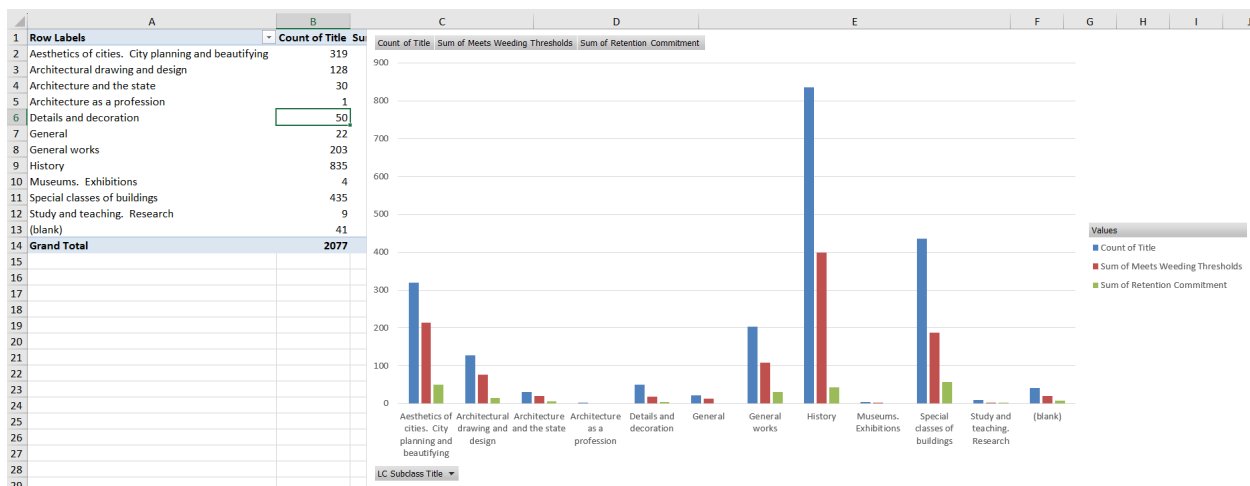
- Enter the worksheet and range just as we did for Project 1.
 - 'NA Valid Items'!\$A:\$T
- Now, we can play around with the chart.
 - To start, we could count items by LC Subclass Title.
 - Enter LC Subclass Title as the row & Title as the value. The pivot table and chart will count the titles.



- We could add other fields to the values to get a sense of how much we might weed this area.
- Try adding Cumulative Times Loaned Since 1985. This will provide a sense of the popularity of the subclasses in NA.



- Try other experiments. For values, you could remove Cumulative Times Loaned Since 1985, then add Meets Weeding Thresholds, Retention Commitment, and/or Meets Weeding Thresholds & Not on Retention Plan.
 - You can see another reason why I like to use 1s and 0s. They can be used in charts quite readily.

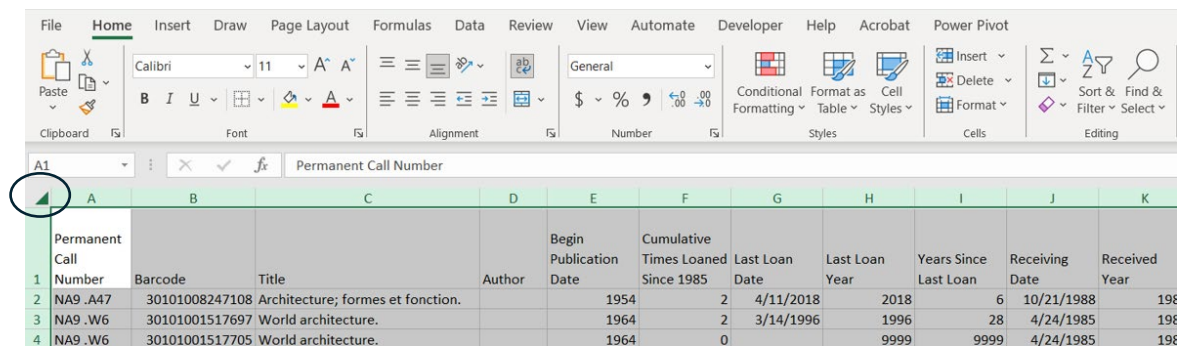


Format the report so it is easy to read

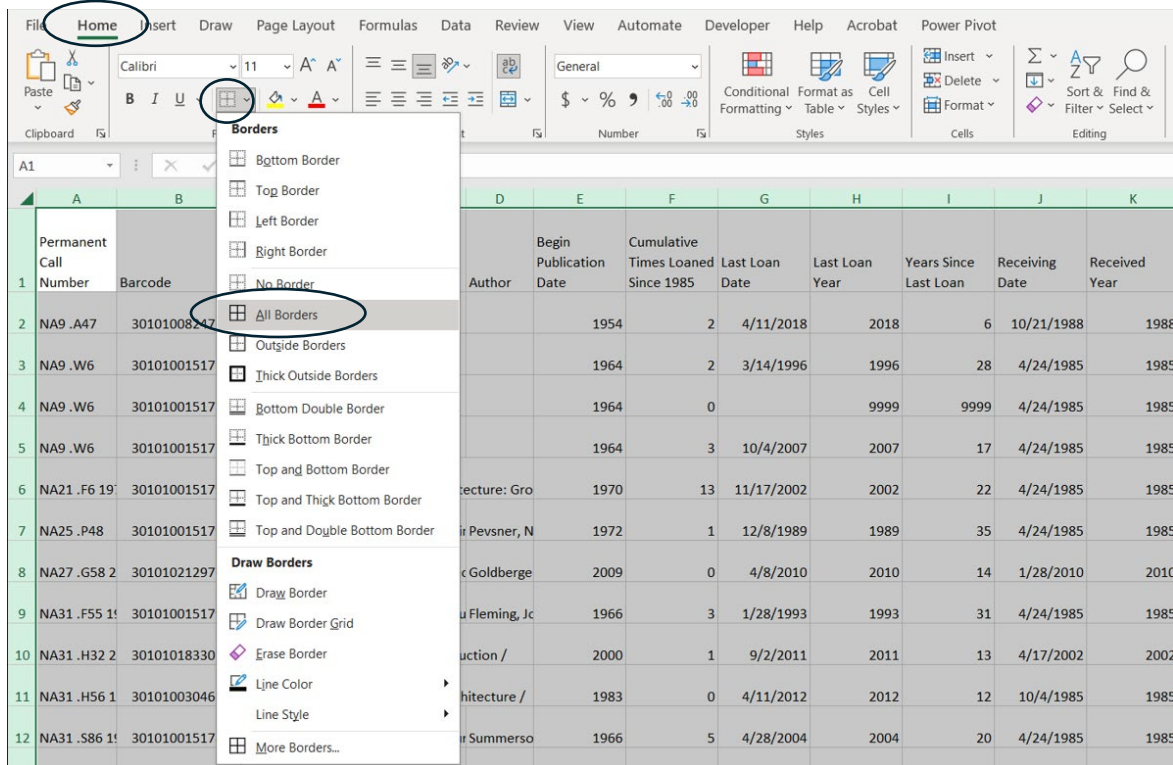
- I'm not sure I'll have time to cover the following content during the demonstration, but you might want to try these steps on your own.

Quick, 'universal' changes to row height and column width

- To change the formatting for an entire worksheet quickly, we can highlight the entire worksheet by clicking on the square at the juncture of column letter A and row number 1.

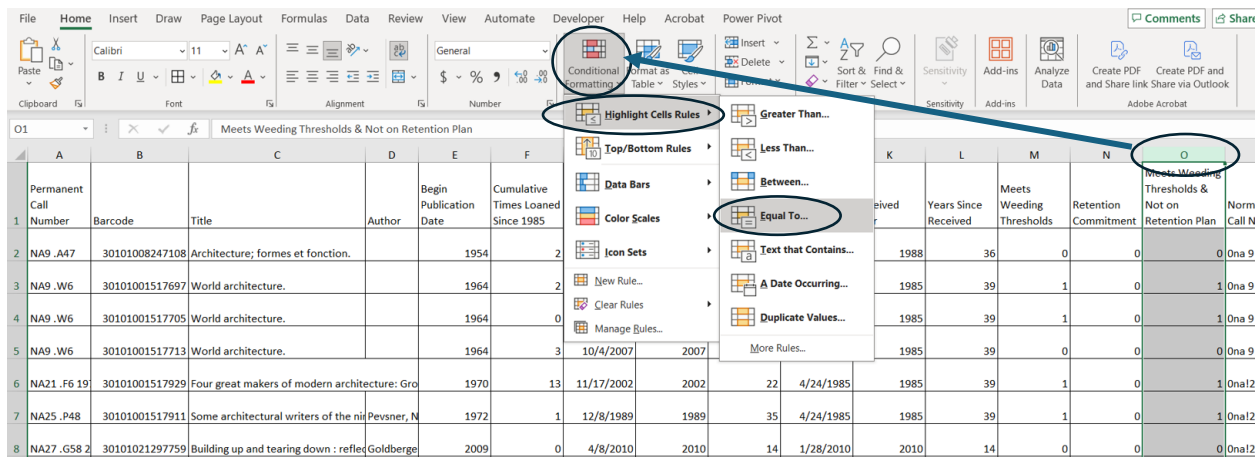


- Now, we could resize rows or columns universally simply by resizing one of the highlighted rows or columns.
- We could also add cell borders.
 - On the Home tab, in the Font box, click on Borders, then select All Borders.



Apply conditional formatting to draw attention to specific values

- If we want to draw attention to specific values, we can highlight them by applying conditional formatting.
 - First, highlight the column where you want to apply conditional formatting.
 - On the Home tab, in the Styles box, click on Conditional Formatting -> Highlight Cells Rules -> Equal To, then change the value to 1.



H	I	J	K	L	M	N	O	
Last Loan Year	Years Since Last Loan	Receiving Date	Received Year	Years Since Received	Meets Weeding Thresholds	Retention Commitment	Meets Weeding Thresholds & Not on Retention Plan	Norm Call N
						0	0	0 Ona 9
						1	0	1 Ona 9
						1	0	1 Ona 9
						0	0	0 Ona 9
2002	22	4/24/1985	1985	39	1	0	1	1 Ona12
1989	35	4/24/1985	1985	39	1	0	1	1 Ona12
2010	14	1/28/2010	2010	14	0	0	0	0 Ona12
1993	31	4/24/1985	1985	39	1	0	1	1 Ona13
2011	13	4/17/2002	2002	22	0	0	0	0 Ona13

- Of course, we could make many other changes to formatting, but I wanted to show you just the basics to get you started with conditional formatting.