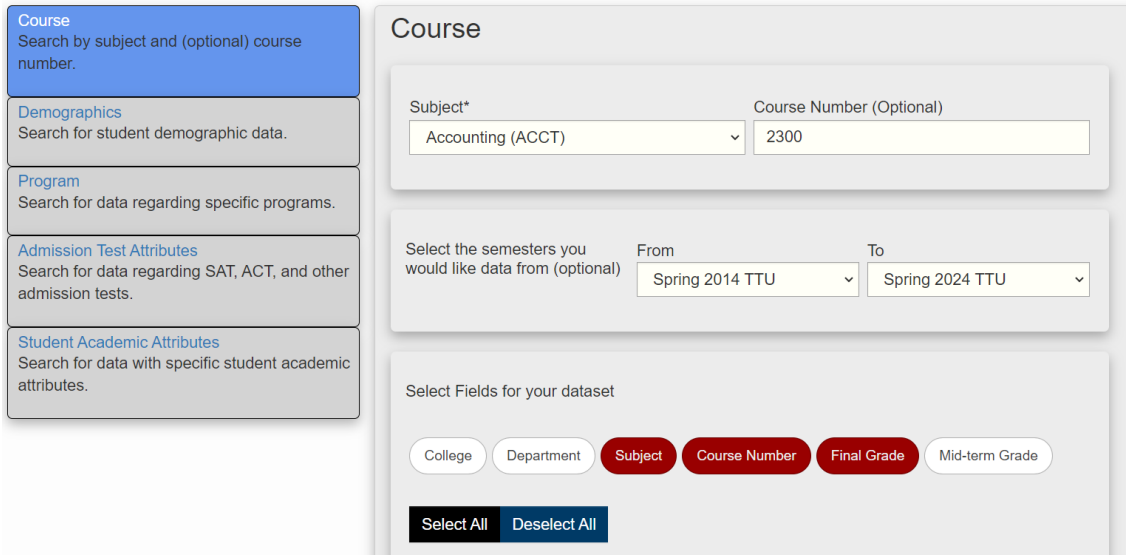
Tutorial: Use Excel to Analyze a Single Course Over Time

In this example, we are looking at course data for the last ten (10) years. This tutorial will show you how to do the following:

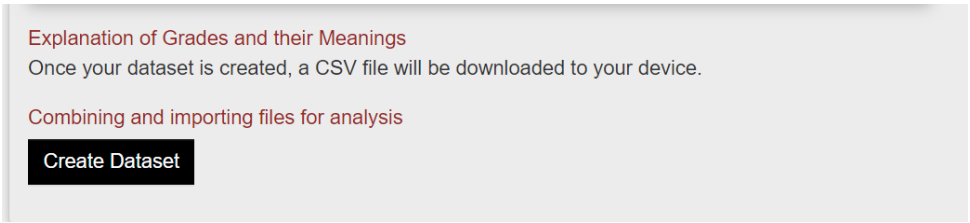
a. Identify duplicate data (i.e. students that retook a course)
b. Make a dataset that only shows unique values for analysis.
c. Create pivot tables and charts to review and analyze data.

Step 1 - Download dataset from Red Raider Registry

A. To start, select the course and select the Subject and Course Number that will be analyzed. Then select the time period. For this example, the dates are for courses that occurred in the last ten (10) years.

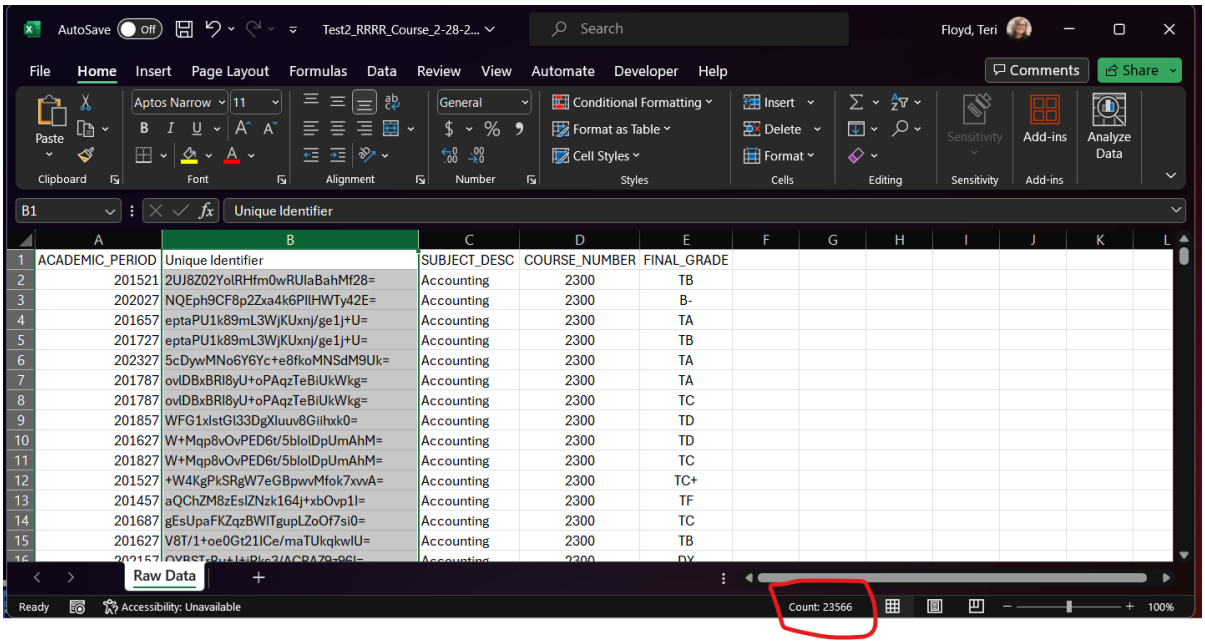


B. Download the data and save the .csv file



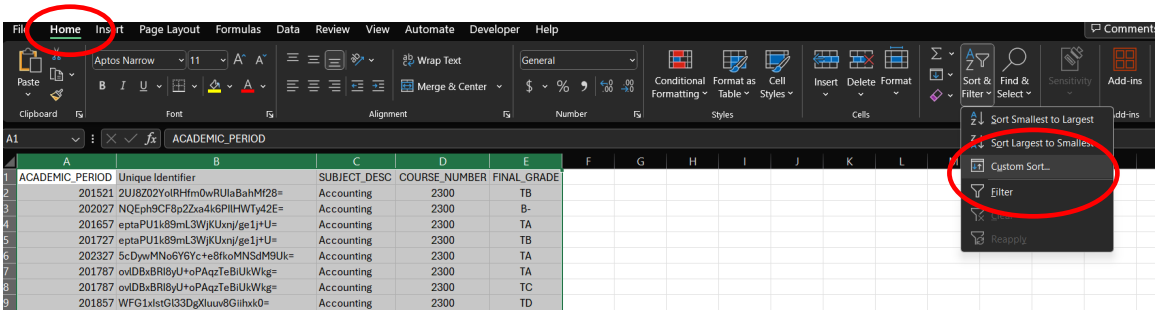
Step 2- Review Dataset and Prepare Data for Analysis

a. Review the row count. Click on column B to see how many rows were counted. In this example, there is a count of 23,566 rows. This indicates that there are 23,566 student records.



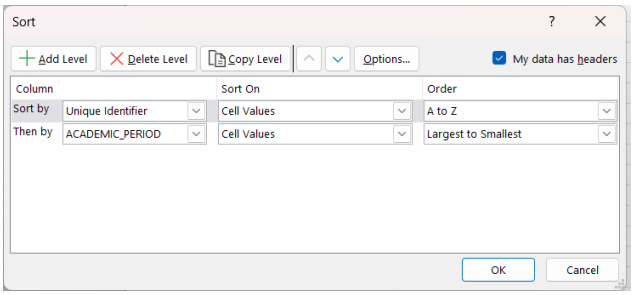
	A	B	C	D	E
1	ACADEMIC_PERIOD	Unique Identifier	SUBJECT_DESC	COURSE_NUMBER	FINAL_GRADE
2	201521	2UJ8Z02YolRHfm0wRUlaBahMf28=	Accounting	2300	TB
3	202027	NQEph9CF8p2Zxa4k6PIlHWTy42E=	Accounting	2300	B-
4	201657	eptaPU1k89mL3WjKUxnj/ge1j+U=	Accounting	2300	TA
5	201727	eptaPU1k89mL3WjKUxnj/ge1j+U=	Accounting	2300	TB
6	202327	5cDywMNo6Y6Yc+e8fkoMNSdM9Uk=	Accounting	2300	TA
7	201787	ovlDBxBRI8yU+oPAqzTeBiUkWkg=	Accounting	2300	TA
8	201787	ovlDBxBRI8yU+oPAqzTeBiUkWkg=	Accounting	2300	TC
9	201857	WFG1xlstGl33DgXluuv8Giihxk0=	Accounting	2300	TD
10	201627	W+Mqp8vOvPED6t/5blolDpUmAhM=	Accounting	2300	TD
11	201827	W+Mqp8vOvPED6t/5blolDpUmAhM=	Accounting	2300	TC
12	201527	+W4KgPkSRgW7eGBpwvMfok7xvvA=	Accounting	2300	TC+
13	201457	aQChZM8zEsIZNzk164j+xbOvp1I=	Accounting	2300	TF
14	201687	gEsUpaFKZqzBWITgupLZoOf7si0=	Accounting	2300	TC
15	201627	V8T/1+oe0Gt21ICe/maTUkqkwIU=	Accounting	2300	TB

b. To identify students that have retaken a course, it is important to sort the data. Select all columns in the worksheet and then select Home > Editing > Sort & Filter > Custom Sort.



	A	B	C	D	E
1	ACADEMIC_PERIOD	Unique Identifier	SUBJECT_DESC	COURSE_NUMBER	FINAL_GRADE
2	201521	2UJ8Z02YolRHfm0wRUlaBahMf28=	Accounting	2300	TB
3	202027	NQEph9CF8p2Zxa4k6PIlHWTy42E=	Accounting	2300	B-
4	201657	eptaPU1k89mL3WjKUxnj/ge1j+U=	Accounting	2300	TA
5	201727	eptaPU1k89mL3WjKUxnj/ge1j+U=	Accounting	2300	TB
6	202327	5cDywMNo6Y6Yc+e8fkoMNSdM9Uk=	Accounting	2300	TA
7	201787	ovlDBxBRI8yU+oPAqzTeBiUkWkg=	Accounting	2300	TA
8	201787	ovlDBxBRI8yU+oPAqzTeBiUkWkg=	Accounting	2300	TC
9	201857	WFG1xlstGl33DgXluuv8Giihxk0=	Accounting	2300	TD

c. Sort by unique identifier (A to Z) and academic period in descending order (largest to smallest).



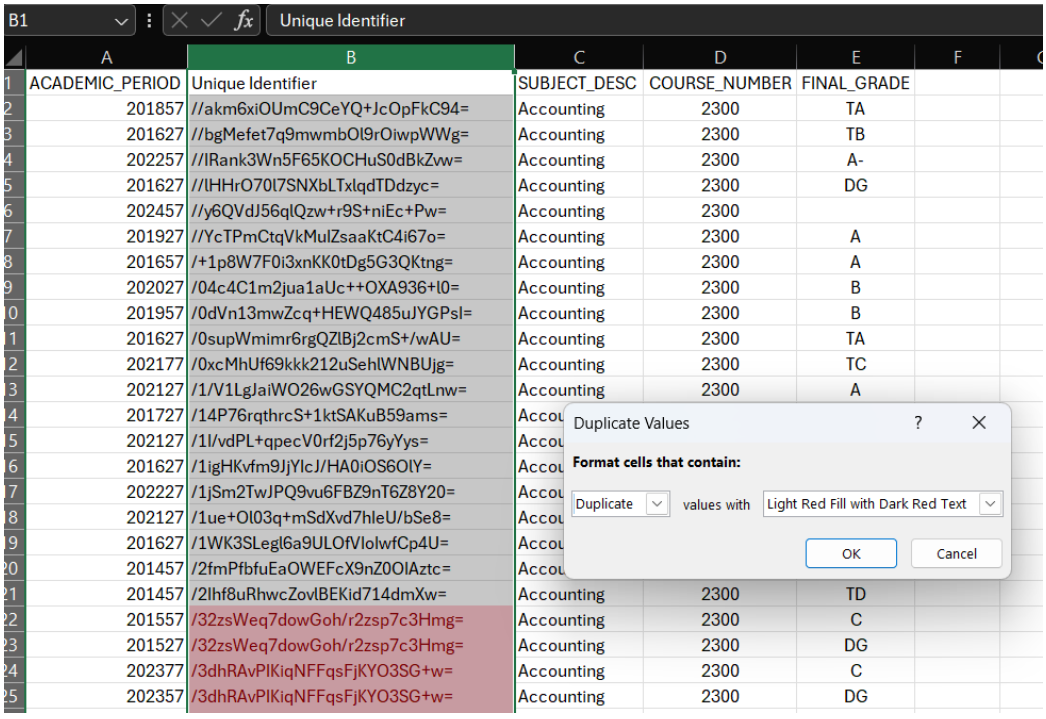
d. The data is now displayed in the proper order to identify duplicate values (repeat students) and when they took the course (most recent shows first).

Step 3- Identify Duplicates in the Data Set

A. Select the Unique Identification column. Then use conditional formatting to identify duplicate values.

B. Select Home > Conditional Formatting > Highlight Cells Rules > Duplicate Values

C. Highlight the duplicates in the sheet and select OK.

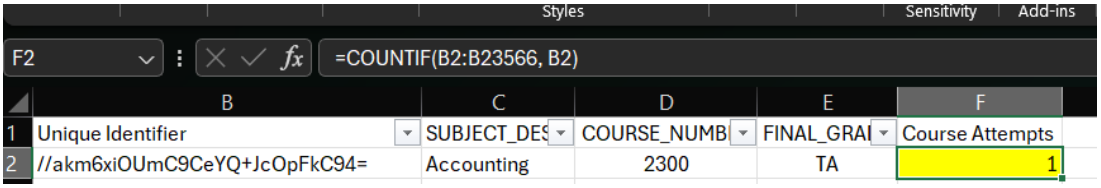


	A	B	C	D	E	F
1	ACADEMIC_PERIOD	Unique Identifier	SUBJECT_DESC	COURSE_NUMBER	FINAL_GRADE	
2	201857	//akm6xiOUmC9CeYQ+JcOpFkC94=	Accounting	2300	TA	
3	201627	//bgMefet7q9mwmbOl9rOiwpWWg=	Accounting	2300	TB	
4	202257	//IRank3Wn5F65KOCHuS0dBkZvw=	Accounting	2300	A-	
5	201627	//lHHrO70l7SNXbLTxlqdTDdzyc=	Accounting	2300	DG	
6	202457	//y6QVdJ56qlQzw+r9S+niEc+Pw=	Accounting	2300		
7	201927	//YcTPmCtqVkMulZsaaKtC4i67o=	Accounting	2300	A	
8	201657	/+1p8W7F0i3xnKK0tDg5G3QKtng=	Accounting	2300	A	
9	202027	/04c4C1m2jua1aUc++OXA936+l0=	Accounting	2300	B	
10	201957	/0dVn13mwZcq+HEWQ485uJYGPsl=	Accounting	2300	B	
11	201627	/0supWmimr6rgQZlBj2cmS+/wAU=	Accounting	2300	TA	
12	202177	/0xcMhUf69kkk212uSehlWNBUjg=	Accounting	2300	TC	
13	202127	/1/V1LgJaiWO26wGSYQMC2qtLnw=	Accounting	2300	A	
14	201727	/14P76rqthrcS+1ktSAKuB59ams=	Accou			
15	202127	/1l/vdPL+qpecV0rf2j5p76yYys=	Accou			
16	201627	/1igHKvfm9JjYlcJ/HA0iOS6OlY=	Accou			
17	202227	/1jSm2TwJPQ9vu6FBZ9nT6Z8Y20=	Accou			
18	202127	/1ue+Ol03q+mSdXvd7hleU/bSe8=	Accou			
19	201627	/1WK3SLegl6a9ULOfVlolwfCp4U=	Accou			
20	201457	/2fmPfbfuEaOWEFcX9nZ0OIAztc=	Accou			
21	201457	/2Ihf8uRhwcZovlBEKid714dmXw=	Accounting	2300	TD	
22	201557	/32zsWeq7dowGoh/r2zsp7c3Hmg=	Accounting	2300	C	
23	201527	/32zsWeq7dowGoh/r2zsp7c3Hmg=	Accounting	2300	DG	
24	202377	/3dhRAvPIKiqNFFqsFjKYO3SG+w=	Accounting	2300	C	
25	202357	/3dhRAvPIKiqNFFqsFjKYO3SG+w=	Accounting	2300	DG	

Step 4 – Use COUNTIF Function

a. The COUNTIF Function allows a user to count the number of times a Unique Identifier appears in the data set. Since the data was sorted by Unique Identifier and Academic Period (descending) the data will indicate the maximum number of attempts first.

b. Create a new column (Course Attempts) that will indicate the number of times a unique id took the course and enter the COUNTIF formula.



	B	C	D	E	F
1	Unique Identifier	SUBJECT_DES	COURSE_NUMB	FINAL_GRAI	Course Attempts
2	//akm6xiOUmC9CeYQ+JcOpFkC94=	Accounting	2300	TA	1

c. If you are on Excel 365 you may use =COUNTIFS(range, range)

201627	/1WK3SLegl6a9ULOfVIolwfCp4U=	Accounting	2300	B	1
201457	/2fmPfbfuEaOWEFcX9nZ0OlAztc=	Accounting	2300	B	1
201457	/2Ihf8uRhwcZovlBEKid714dmXw=	Accounting	2300	TD	1
201557	/32zsWeq7dowGoh/r2zsp7c3Hmg=	Accounting	2300	C	2
201527	/32zsWeq7dowGoh/r2zsp7c3Hmg=	Accounting	2300	DG	1
202377	/3dhRAvPIKiqNFFqsFjKYO3SG+w=	Accounting	2300	C	3
202357	/3dhRAvPIKiqNFFqsFjKYO3SG+w=	Accounting	2300	DG	2
202327	/3dhRAvPIKiqNFFqsFjKYO3SG+w=	Accounting	2300	DG	1

d. Values >1 in this column indicate the number of times a course was attempted by a student.

Step 5 – Remove Duplicate Values

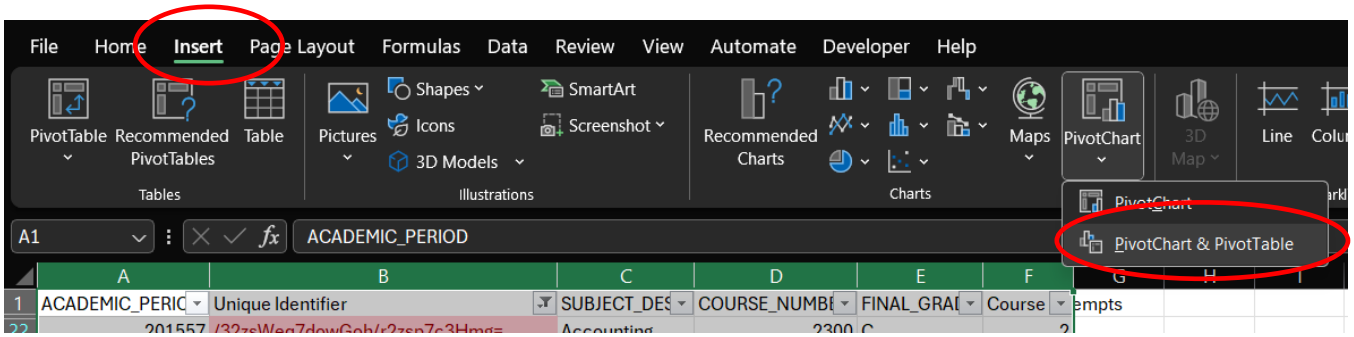
Please see the How to Guide on Removing Duplicates.

Step 6 – Create a Pivot Table and Pivot Chart

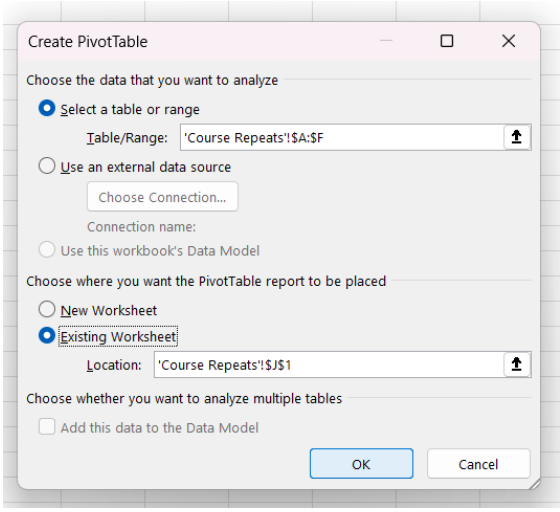
Pivot tables and pivot charts are an excellent way to analyze large datasets. In this example, we will make both a pivot table and pivot chart to analyze the course attempts of each term over the last 10 years.

a. Highlight the data in the new tab that was created from Step 5 above.

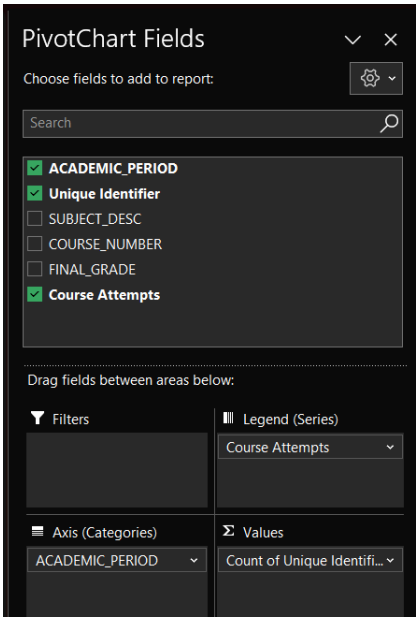
b. Insert a pivot chart and table by clicking on Insert tab on the ribbon.
   i. Insert > Charts > Pivot Chart > PivotChart & PivotTable



ii. Select From Table/Range and place the pivot table in a new worksheet. Select OK.

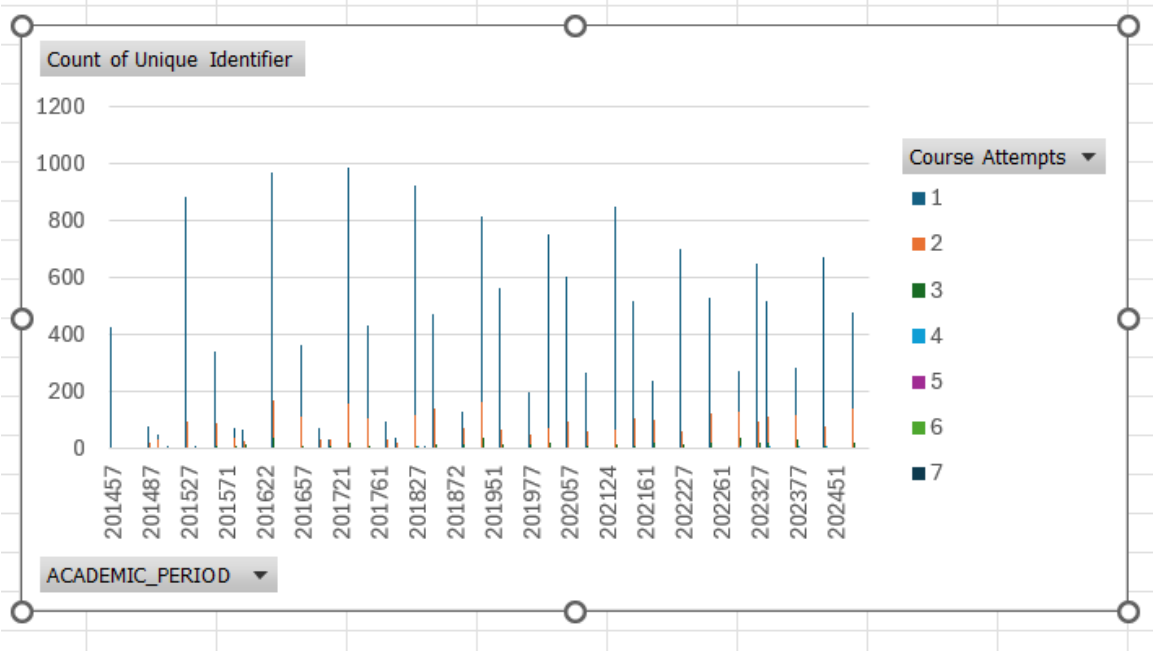


iii. Select how the data will be displayed in the pivot table. For this example, we are looking at the total number of times students took the course.



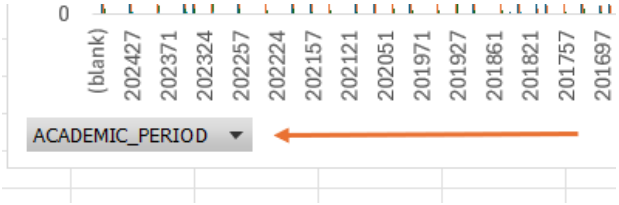
ii. The data is now displayed in the existing worksheet as a pivot table and pivot chart.

Count of Unique Identifier	Column Labels							
Row Labels	1	2	3	4	5	6	7	(blank)	Grand Tota
201457	426	6	1						43
201471		1							
201477	6								6
201481	2								2
201487	76	21							97
201497	49	33	2						84
201521	10	2							12
201522	2								2
201527	882	95	5						982
201551	10								10
201552	3								3
201557	343	87	8	1					439
201571	4								4
201587	73	39	11						123
201597	66	26	15	2					109
201621	4								4
201622	3								3

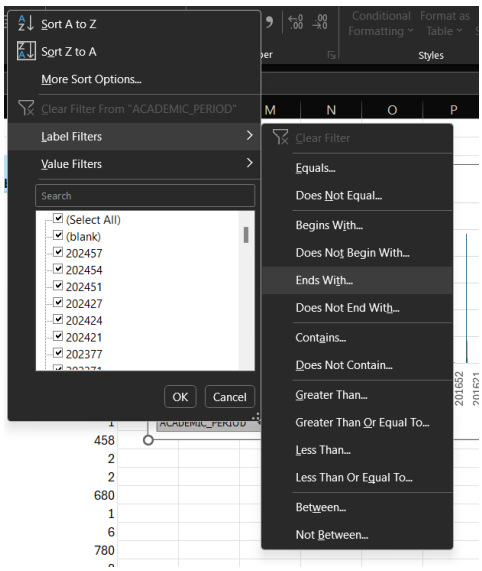


Step 7 – Use Built-in Filters to Analyze Trends

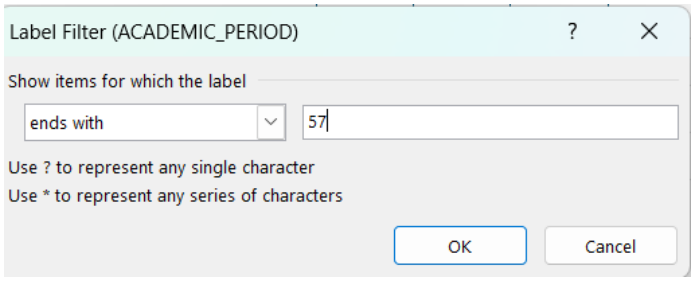
a. Analyze the courses that occurred in the Spring over the past 10 years. For this example, we will use the built-in filters in the chart.



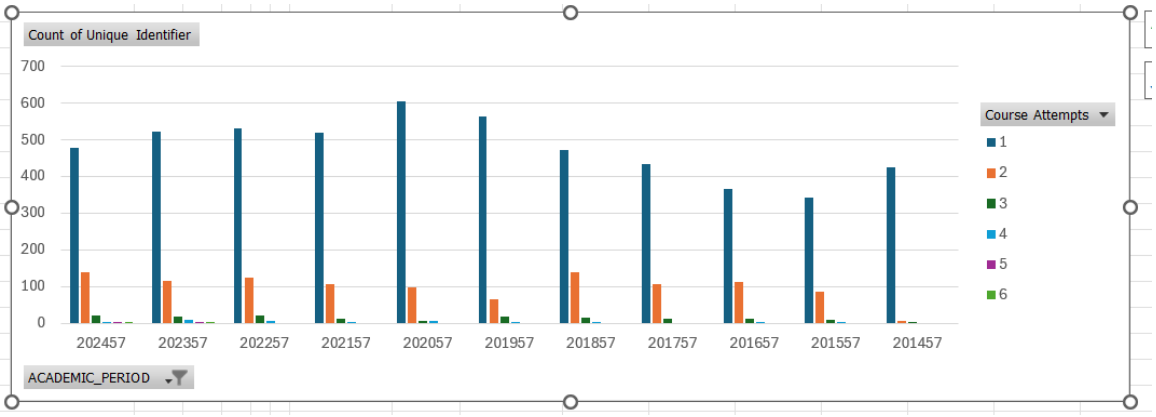
b. Click on the ACADEMIC_PERIOD filter. Select Label Filter > Ends With



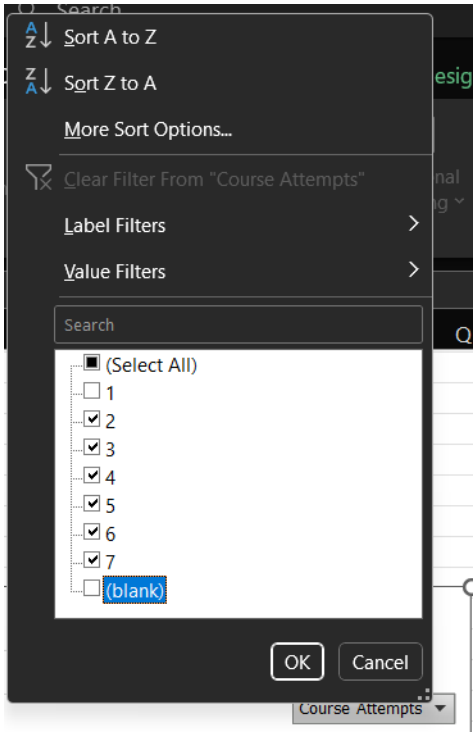
c. All TTU Spring terms end with a “57” so we will enter 57 in the search field.



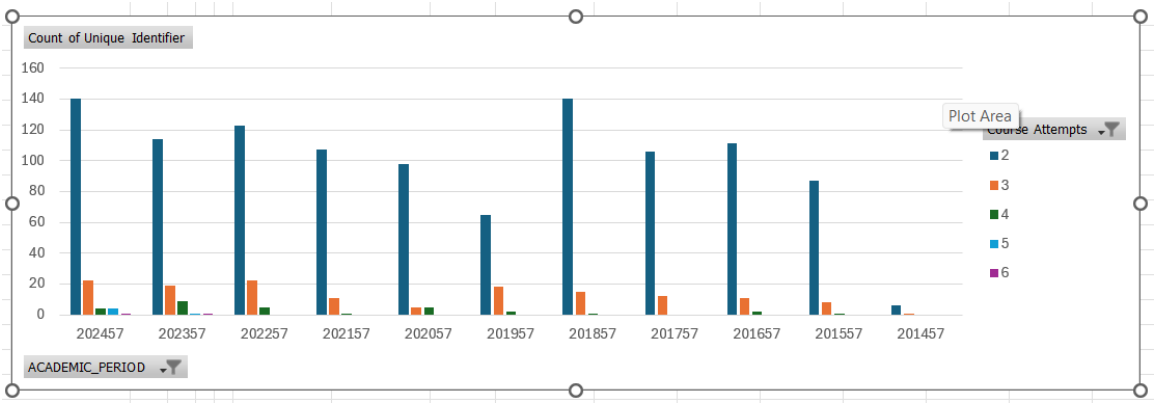
d. Now our chart only shows results for Fall over the past 10 years.



e. We can also filter the Course Attempts to show all attempts > 1.



f. Now we see all multiple attempts.



Step 8 – Merge the Course Data with Demographic Data

a. Follow the instructions on how to merge two spreadsheets into one. https://appserv.itts.ttu.edu/RedRaiderResearchRegistry/helpdocs/Use%20Power%20Query%20To%20Combine%20Spreadsheets.pdf
b. Now we can analyze the data using demographic data by creating additional pivot tables.
c. Here are some examples of various ways to use a Pivot Chart and Table for analysis:

Analysis by Gender

Count of Unique Identifier	Column Labels							
Row Labels	1	2	3	4	5	6	7	Grand Total
F	5466	980	158	31	4	1		6640
M	9833	2024	378	60	13	3	1	12312
N	8							8
Grand Total	**15307**	**3004**	**536**	**91**	**17**	**4**	**1**	**18960**

Is an International Student

Count of Unique Identifier	Column Labels							
Row Labels	1	2	3	4	5	6	7	Grand Total
N	15008	2970	533	91	17	4	1	18624
Y	303	34	3					340
(blank)	148	5						153
Grand Total	**15459**	**3009**	**536**	**91**	**17**	**4**	**1**	**19117**