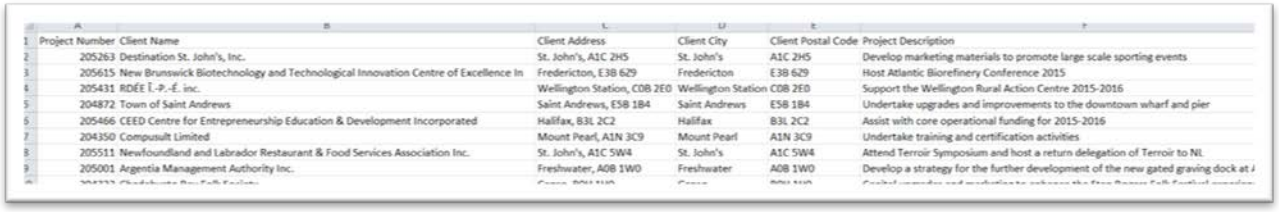
Pivot Table Tutorial

We've done a lot of work with the Atlantic Canada Opportunities ACOA data. Filtering and sorting allowed us to spot potentially interesting loans and grants. A pivot table is generated from your original table, and turns a large range of raw data into a useful interactive summary table with a few clicks of your mouse. The summaries make is easier to analyze your data which can contain newsworthy patterns worth pursuing. Summarizing allows you to ask questions of your data: Who got the most? Who got the least? In the case of the ACOA data that we'll continue to use for this tutorial, we might want to know what institution received the highest number of grants, or whether the grants increased or decreased over the course of several years.

A pivot table requires that your data is in the form of a rectangular database, which can be stored in the same worksheet as the original table, a separate worksheet (the preferred option), or a different workbook. Generally speaking, the data in the original table consist of:

1. Data: Contains a value (a contribution amount) or data (a date) that can be summarized;
2. Category: Describes the data. For instance, in the case of the ACOA data, the type of contribution (a loan or grant), the category of recipient (a university, college or publicly-traded company), or reason for the contribution (to organize a conference, or to conduct a specific kind of research).
3. Consistency: Each row in the original table must contain the same information, as you can see in this sample screen shot of the ACOA dataset below. Having each row contain the same data, allows the pivot table to summarize the information by grouping, summing and counting. If the original tab is not laid out like the ACOA screen shot, creating a pivot table is less straight forward, meaning that you might have to re-arrange the data, a task easily done in Excel. So taking into account the original table's

structure is a very important point that is worth remembering. It's also the reason why we say that the ability to create a pivot table is not automatic.



Project Number	Client Name	Client Address	Client City	Client Postal Code	Project Description
205263	Destination St. John's, Inc.	St. John's, A1C 2H5	St. John's	A1C 2H5	Develop marketing materials to promote large scale sporting events
205615	New Brunswick Biotechnology and Technological Innovation Centre of Excellence In	Fredericton, E3B 6Z9	Fredericton	E3B 6Z9	Host Atlantic Biorefinery Conference 2015
205431	RDÉE Î.-P.-É. inc.	Wellington Station, C0B 2E0	Wellington Station	C0B 2E0	Support the Wellington Rural Action Centre 2015-2016
204872	Town of Saint Andrews	Saint Andrews, E5B 1B4	Saint Andrews	E5B 1B4	Undertake upgrades and improvements to the downtown wharf and pier
205466	CEED Centre for Entrepreneurship Education & Development Incorporated	Halifax, B3L 2C2	Halifax	B3L 2C2	Assist with core operational funding for 2015-2016
204350	Compusult Limited	Mount Pearl, A1N 3C9	Mount Pearl	A1N 3C9	Undertake training and certification activities
205511	Newfoundland and Labrador Restaurant & Food Services Association Inc.	St. John's, A1C 5W4	St. John's	A1C 5W4	Attend Terroir Symposium and host a return delegation of Terroir to NL
205001	Argentia Management Authority Inc.	Freshwater, A0B 1W0	Freshwater	A0B 1W0	Develop a strategy for the further development of the new gated graving dock at A

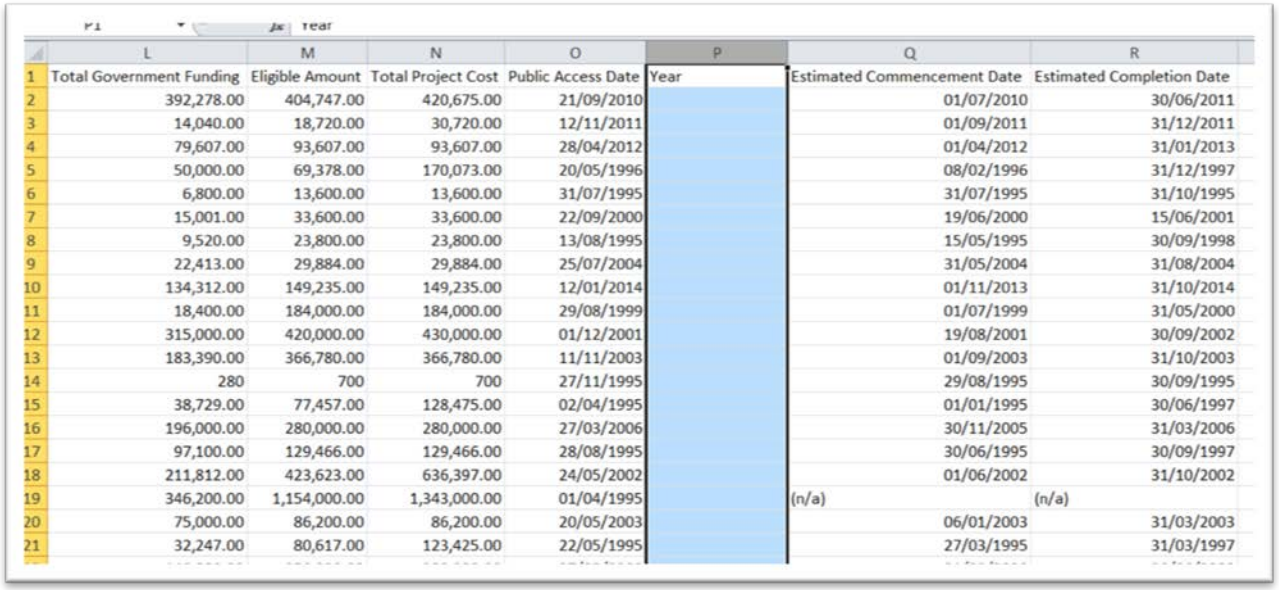
The textbook covers pivot tables on pages 87 to 95. Take note of one minor drawback: the pivot table doesn't automatically update if you change the data in the original table. However, with a single click of the "refresh" button forces the pivot table to update itself with the latest data.

You don't always have to use pivot tables. However, in many, if not most instances, they come in handy. Because pivot tables only summarize the information, you'll have to either return to the original table for details, or click on the category of interest to produce a new table that contains the specific information for that category.

Let's get started.

1. Visit the federal government's open data site to download the most recent ACOA table. You'll also notice that there is a "Data Dictionary" that can be opened as an HTML file in a new table. The dictionary, or "readme" file as it is called in other instances, should accompany any dataset you download. Without an explanation of the information in the columns, working the data becomes pointless, unless the descriptions are self-explanatory, which in ACOA's case, many are. At any rate, it's good practice to read the dictionary or readme file once you've downloaded the data. If anything is unclear, then it's worth calling the institution in question for clarification. The federal government's commitment to open data, which it equates with open government, allows for this kind of feedback. However, some institutions take their time getting back to you. So it's best to make sure to you give yourself plenty of time – at least a week – and make sure you're not on deadline.

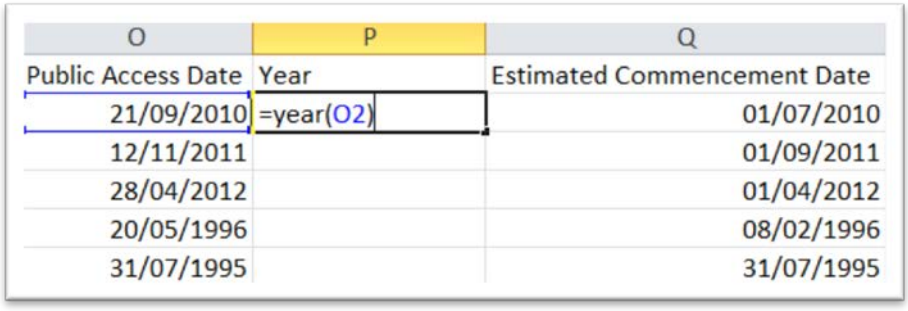
2. Download the CSV file, move it from your download folder to a special one that you've created for this tutorial, open the file, paste the website's URL into the first available cell in the first row, save the table as an EXCEL FILE, create a copy and work from that one. NOTE: It is crucial that you save the csv file as an Excel file. Because a csv file does not allow for multiple worksheets, which means that everything that you've created in addition to the original table will be lost.
3. Readjust the width of the columns to allow you to see all the contents and get rid of the hash tags (#######) in the columns containing numbers. The hash tags are Excel's way of telling you that the number column needs more space.
4. Name your worksheet. And be sure to name the subsequent worksheets you create, an important step, especially when you've created an Excel workbook with multiple worksheets.
5. Use your horizontal scroll bar to navigate to the date columns. We will create a "Year" column, which allows the pivot table to group the information by year. To do this, we will need to insert a new column to the right of column O, and label it.



	L	M	N	O	P	Q	R
1	Total Government Funding	Eligible Amount	Total Project Cost	Public Access Date	Year	Estimated Commencement Date	Estimated Completion Date
2	392,278.00	404,747.00	420,675.00	21/09/2010		01/07/2010	30/06/2011
3	14,040.00	18,720.00	30,720.00	12/11/2011		01/09/2011	31/12/2011
4	79,607.00	93,607.00	93,607.00	28/04/2012		01/04/2012	31/01/2013
5	50,000.00	69,378.00	170,073.00	20/05/1996		08/02/1996	31/12/1997
6	6,800.00	13,600.00	13,600.00	31/07/1995		31/07/1995	31/10/1995
7	15,001.00	33,600.00	33,600.00	22/09/2000		19/06/2000	15/06/2001
8	9,520.00	23,800.00	23,800.00	13/08/1995		15/05/1995	30/09/1998
9	22,413.00	29,884.00	29,884.00	25/07/2004		31/05/2004	31/08/2004
10	134,312.00	149,235.00	149,235.00	12/01/2014		01/11/2013	31/10/2014
11	18,400.00	184,000.00	184,000.00	29/08/1999		01/07/1999	31/05/2000
12	315,000.00	420,000.00	430,000.00	01/12/2001		19/08/2001	30/09/2002
13	183,390.00	366,780.00	366,780.00	11/11/2003		01/09/2003	31/10/2003
14	280	700	700	27/11/1995		29/08/1995	30/09/1995
15	38,729.00	77,457.00	128,475.00	02/04/1995		01/01/1995	30/06/1997
16	196,000.00	280,000.00	280,000.00	27/03/2006		30/11/2005	31/03/2006
17	97,100.00	129,466.00	129,466.00	28/08/1995		30/06/1995	30/09/1997
18	211,812.00	423,623.00	636,397.00	24/05/2002		01/06/2002	31/10/2002
19	346,200.00	1,154,000.00	1,343,000.00	01/04/1995		(n/a)	(n/a)
20	75,000.00	86,200.00	86,200.00	20/05/2003		06/01/2003	31/03/2003
21	32,247.00	80,617.00	123,425.00	22/05/1995		27/03/1995	31/03/1997

6. As you can see in the screenshot, we're calling the column "Year".

7. We will use the year function, a spreadsheet task that pulls the year out of a date.



O	P	Q
Public Access Date	Year	Estimated Commencement Date
21/09/2010	=year(O2)	01/07/2010
12/11/2011		01/09/2011
28/04/2012		01/04/2012
20/05/1996		08/02/1996
31/07/1995		31/07/1995

8. Hit enter.

O	P	Q
Public Access Date	Year	Estimated Commencement Date
21/09/2010	02/07/1905	01/07/2010
12/11/2011		01/09/2011
28/04/2012		01/04/2012
20/05/1996		08/02/1996
31/07/1995		31/07/1995
22/09/2000		19/06/2000
13/08/1995		15/05/1995

9. As Excel produces this odd number because it doesn't know how to interpret a date that only contains a year. So we must reformat the information as either a "number" with no decimal places, or as "general".

P	Q
Year	Estimated Commencement Date
2010	01/07/2010
	01/09/2011
	01/04/2012
	08/02/1996
	31/07/1995
	19/06/2000
	15/05/1995
	31/05/2004
	01/11/2013
	01/07/1999

10.
11. That's better. Now copy the formula to the bottom of the column.
12. Before we create the pivot table, let's reformat the columns with the dollar amounts as currency with no decimal places. We can also do this in the

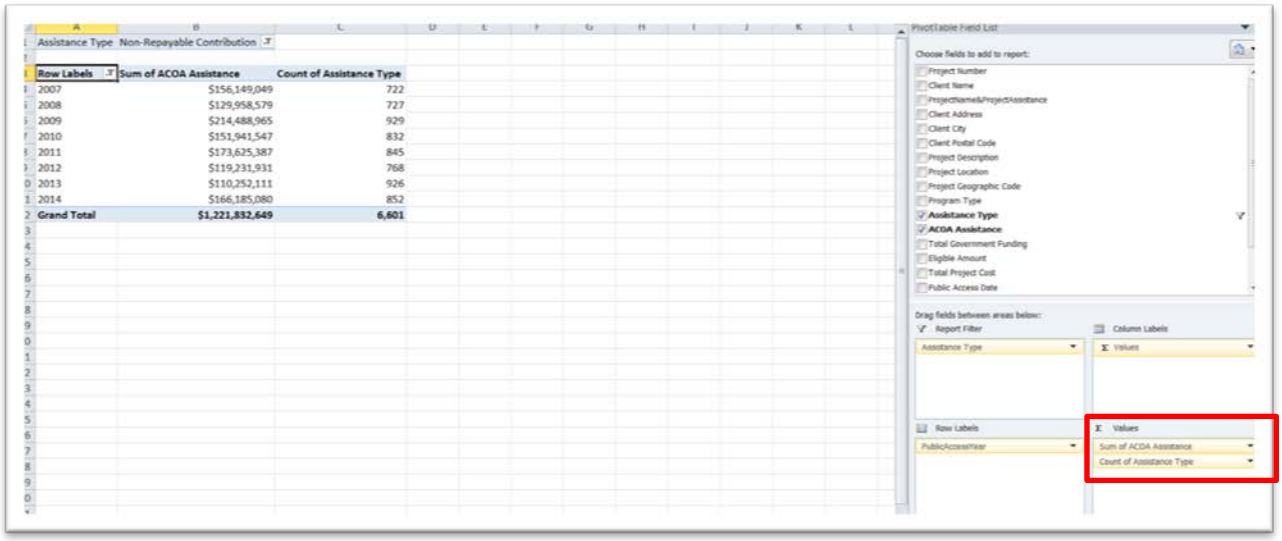
pivot table, but it is always good practice to properly format your numbers as an initial step when dealing with any dataset.

13. Now we're ready to create the pivot table.
14. Place your cursor inside the table, and go to the "Insert" category on the menu Ribbon at the top for those using a PC, and to the "Data" portion of the Ribbon for Mac users. If you're on a Mac, be sure to use the "manual" option, as opposed to the automatic.
15. Clicking on the appropriate tab produces a dialog box which identifies the cell range. Please pay attention to the cell references in the range, which are anchored by dollar signs, to ensure that the whole table is selected. If not, then you'll have to manually adjust the references to ensure that you've captured the entire table. You will have the option of creating the pivot table in a separate worksheet – which is Excel's default option – or the same worksheet. Unless there is a specific reason, you always want to choose the default option.
16. The pivot table, described in pages 87 to 94 of Computer-Assisted Reporting, contains a field list to right and the table to the left. You populate the table, by clicking or dragging the fields from the list into one of the four boxes at the bottom.
17. You can group and summarize the information many ways. Let's see how much in non-repayable loans ACOA meted out from 2007 to 2014. To do this, do the following: group the Year column we created in the Row Label box; SUM the ACOA Assistance in the "Values" box, and use the "Assistance

Type" as your Report Filter.

	A	B
1	Assistance Type	Non-Repayable Contribution
2		
3	**Row Labels**	**Sum of ACOA Assistance**
4	2007	$156,149,049
5	2008	$129,958,579
6	2009	$214,488,965
7	2010	$151,941,547
8	2011	$173,625,387
9	2012	$119,231,931
10	2013	$110,252,111
11	2014	$166,185,080
12	**Grand Total**	**$1,221,832,649**

18. So in this table, we used the filter (the funnel to the right of "Row Labels") to select the years from 2007 to 2014. We SUMMED the ACOA assistance, and filtered our pivot table for Non-Repayable Contributions. So we know that between 2007 and 2014 (it's always best to compare full years, which is why we filtered out 2015) ACOA handed out $1.2 billion dollars in non-repayable contributions. But how many individual contributions made up those yearly totals? To answer that question, we can drag the ACOA Assistance into the "Values" section for a second time, COUNT each time a dollar amount was handed out, and be sure to format the number as a number with no decimal points and the 1000s separator.



19. So between 2007 and 2014, ACOA handed out 6,601 non-repayable contribution grants for a total of $1.2 billion dollars.
20. Be sure to name your worksheet.
21. Now that you've got the hang of it, create two more pivot tables that summarize the information in different ways.