Using Pivot Tables and Using Simple Functions to

Analyze Salary Data

There was a time when Ontario was one of the few jurisdictions to provide <u>public access</u> to the salaries of public-sector employees earning more than \$100,000 a year. We can debate whether that constitutes an exorbitant wage in expensive markets such as Vancouver and Toronto, especially when you factor in other variables such as inflation. Still, this disclosure is welcome. An increasing number of jurisdictions are following Ontario's lead.

In Canada's largest province, the list is released at the end of each fiscal year (March) and typically leads to stories about the highest paid employee.

Getting this data into a spreadsheet allows us to become more ambitious, which is what we will do in this tutorial.

What you will learn in this tutorial

Download three years worth of data.

Reformat 2019 data using paste special.

Merge tables in the master file.

Use concatenate function to combine last and first names.

Create new columns that calculate total salary and taxable benefits as percent of total salary.

Create pivot table that compares institutions with the highest number employees on the list and how the totals compare year-to-year.

Use paste special to create a table for calculating percent difference.

Downloading data

Go to the Ontario's <u>Public sector salary disclosure</u> site. Take a few minutes to examine the contents. As we discussed in the <u>first tutorial</u> <u>involving the Global COVID-19 data</u>, it's always advisable to study what you are about to download.

The explanation begins with the "Overview".

The names, positions, salaries and total taxable benefits of pub \$100,000 or more in a calendar year. Search the 2019 disclosure	olic sector employees paid
	Related
On this page	Public sector salary disclosure
2. Public sector salary disclosure for 1996 to 2019	background and FAQ
3. 2019 Reporting	
Overview	
The Public Sector Salary Disclosure Act, 1996 makes Ontario's public sector more open and accountable to taxpayers. The act requires organizations that receive public funding from the Province of Ontario to make public, by March 31 each year, the names, positions, salaries and total taxable benefits of employees paid \$100,000 or more in the previous calendar year.	
The act applies to organizations such as:	

Among other things, you'll notice that the disclosure tables go all the way back to 1996, ideal for ambitious folks who want to take a deeper dive to, for instance, judge the progress Ontario's public sector has

made in hiring and promoting more women to executive positions. The archive also makes it possible track hiring at universities, colleges, school boards, hospitals and municipalities.

Let's begin by downloading the 2019 data.

Select the blue "Search the 2019 disclosure" tab you can see in the screen grab above.

Next, you'll see a preview page with three formats available for download.

Public se seconde	Public sector salary disclosure 2019: all sectors and seconded employees Information on all public sector employees who were paid \$100,000 or more in 2019 and are subject to the <i>Public Sector Salary Disclosure Act</i> .								
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Colleges	Abbas	Sadiq	\$111,442.39	\$68.16					
Colleges	Abboud	Nadim	\$114,484.25	\$114.44					
Colleges	Agate	Jeffery	\$135,651.25	\$256.22					
Colleges	Alexander	Doug	\$111,442.97	\$114.44					
Colleges	Alexander	Tamra	\$107,906.18	\$68.16					

The preview table allows you to see what you're about to download, as well as conduct an online search for a specific name. While online searches are useful, downloading the entire dataset is usually a better way to go.

Under the "Download data" section, you'll notice three datatypes: Spreadsheets; CSV (comma separated value); and JSON (a file format that stands for <u>J ava Script O bject Notation</u>.)

Download the spreadsheet version.

Save it in the folder you have created for this exercise.

Before downloading files for the previous two years, open the 2019 table.

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Colleges	Anderson	Michael	\$116,723.41	\$114.44 A	Igonquin	College	Of App	lied Arts an	nd Technol	Professor			2019
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Colleges	Aubin	Tim	\$102,618.69	\$68.16 A	Igonquin (College	Of App	lied Arts an	nd Technol	Professor			2019
Colleges	Austen	Peggy	\$113,041.77	\$116.63 A	Igonquin (College	Of App	lied Arts an	nd Technol	Associate D	irector Developm	ent	2019
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Colleges	Belisle	Jean (John)	\$108,557,75	\$114.44 A	Igonquin (College	Of App	lied Arts an	nd Technol	Professor			2019

This table contains some formatting that we will want to get rid of using the paste-special option we learned in the <u>second tutorial</u>.

Select and copy the entire table.

Open a new worksheet.

Use the paste special.



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3	Colleges	Abboud	Nadim	114484.3	114.44	Algonquir	Professor	2019			
1	Colleges	Agate	Jeffery	135651.3	256.22	Algonquir	Associate	2019			
5	Colleges	Alexander	Doug	111443	114.44	Algonquir	Professor	2019			
5	Colleges	Alexander	Tamra	107906.2	68.16	Algonquir	Professor	2019			
7	Colleges	Ali	Sabah	111443	114.44	Algonquir	Professor	2019			
3	Colleges	Almuhtad	Wahab	114395.5	114.44	Algonquir	Professor	2019			
)	Colleges	Anderson	Daniel	113026.6	68.16	Algonquir	Professor	2019			
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1	Colleges	Anderson	Jeremy	111443	114.44	Algonquir	Professor	2019			
2	Colleges	Anderson	Michael	116723.4	114.44	Algonquir	Professor	2019			
3	Colleges	Atkinson	Michelle	107665.3	114.44	Algonquir	Professor	2019			
4	Colleges	Aubin	Jerry	119655.6	68.16	Algonquir	Professor	2019			
5	Colleges	Aubin	Tim	102618.7	68.16	Algonquir	Professor	2019			
6	Colleges	Austen	Peggy	113041.8	116.63	Algonquir	Associate	2019			
7	Colleges	Ayala	Carolina	111443	388.44	Algonquir	Professor	2019			
8	Colleges	Ayoub	Fadi	111443	114.44	Algonquir	Professor	2019			
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Adjust the column widths and scroll to the bottom to make sure you have all the data.

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Colleges		Agate	Jeffery	135651.25	256.22	Algonquin College	Of Applied Art	s and Technology	
Colleges		Alexander	Doug	111442.97	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Alexander	Tamra	107906.18	68.16	Algonquin College	Of Applied Art	s and Technology	
Colleges		Ali	Sabah	111443	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Almuhtadi	Wahab	114395.46	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Anderson	Daniel	113026.61	68.16	Algonquin College	Of Applied Art	s and Technology	
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Colleges		Anderson	Jeremy	111443	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Anderson	Michael	116723.41	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Atkinson	Michelle	107665.32	114.44	Algonquin College	Of Applied Art	s and Technology	
Colleges		Aubin	Jerry	119655.6	68.16	Algonquin College	Of Applied Art	s and Technology	
Colleges		Aubin	Tim	102618.69	68.16	Algonquin College	Of Applied Art	s and Technology	
Colleges		Austen	Peggy	113041.77	116.63	Algonquin College	Of Applied Art	s and Technology	
Colleges		Ayala	Carolina	111443	388.44	Algonquin College	Of Applied Art	s and Technology	
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Colleges		Bakogeorge	Michael	135082.69	256.22	Algonquin College	Of Applied Art	s and Technology	
Colleges		Ball	Karen	122922.96	206.94	Algonquin College	Of Applied Art	s and Technology	
Colleges		Banks	Joseph	114394.48	114.44	Algonquin College	Of Applied Art	s and Technology	

Return to the salary discosure website, and to the main page that we saw on page two of the tutorial.

Public sector salary disclosure									
The names, positions, salaries and total taxable benefits of public sector employees paid									
\$100,000 or more in a calendar year.									
Search the 2019 disclosure									
On this page	Related								
1. Overview	Public sector salary disclosure								
2. Public sector salary disclosure for 1996 to 2019	background and FAQ								
3. 2019 Reporting									
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Overview The Public Sector Salary Disclosure Act, 1996 makes Ontario's public sector more open and accountable to taxpayers. The act requires organizations that receive public funding from the Province of Ontario to make public, by March 31 each year, the names, positions, salaries and total taxable benefits of employees paid \$100,000 or more in the previous calendar year.									
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municipalities

Scroll down to the disclosure tables ("all sectors and seconded employees").

Public sector salary disclosure for 1996 to 2019

Public sector employees who were paid \$100,000 or more and organizations with no salaries to disclose in each calendar year.

2019 salary disclosure

- all sectors and seconded employees
- organizations with no salaries over \$100,000

2018 salary disclosure

- all sectors and seconded employees
- changes, additions and deletions to the initial publication
- organizations with no salaries over \$100,000

2017 salary disclosure

- all sectors and seconded employees
- changes, additions and deletions to the initial publication
- organizations with no salaries over \$100,000

You'll also notice that for 2018 and the previous years, there's an option to download a table that contains "changes, additions and

deletions to the initial publication."

leletions to t	m for the 2018 public he March 27, 2019 rel	: sector salary disc ease.	losure includes ch	anges, additions and
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Typically, we would have to use the information in this table to update the material in the main table. If we were building a master table beyond this tutorial, that's exactly what we'd have to do. To save time, we will skip this crucial verification step. It was worth noting before going any further.

Download the 2018 data.

Public sector salary disclosure for 1996 to 2019

Public sector employees who were paid \$100,000 or more and organizations with no salaries to disclose in each calendar year.

2019 salary disclosure

- all sectors and seconded employees
- organizations with no salaries over \$100,000

2018 salary disclosure

- all sectors and seconded employees
- changes, additions and deletions to the initial publication
- organizations with no salaries over \$100,000

2017 salary disclosure

- all sectors and seconded employees
- changes, additions and deletions to the initial publication
- organizations with no salaries over \$100,000

A	B	C	D	E	F	G	Н	
Sector	Last Name	First Name	Salary Paid	Taxable Benefits	Employer	Job Title	Calendar Year	
Colleges	Jensen	Cheryl	\$ 337,533.24	\$ 3,408.12	Algonquin College	President	2018	
Colleges	Brule	Claude	\$ 230,976.76	\$ 374.96	Algonquin College	Senior Vice President Academic	2018	
Colleges	Wotherspoon	Doug	\$ 230,788.38	\$ 186.58	Algonquin College	Vice President Innovation and Strategy	2018	
Colleges	Mcnair	Duane	\$ 221,744.64	\$ 366.12	Algonquin College	Vice President Finance and Administration	2018	
Colleges	Stanbra	Laura	\$ 221,744.64	\$ 366.12	Algonquin College	Vice President Student Services	2018	
Colleges	Anderson	Scott	\$ 194,628.02	\$ 331.04	Algonquin College	Executive Director Communications Marketing External R	2018	
Colleges	Mclester	Ronald	\$ 191,833.46	\$ 161.82	Algonquin College	Executive Director Truth Reconciliation Indigenization	2018	
Colleges	Pollock	Lois	\$ 177,265.71	\$ 273.41	Algonquin College	Chief Digital Officer	2018	
Colleges	Leduc	Mark	\$ 169,073.33	\$ 310.33	Algonquin College	Executive Director Academic Operations and Planning	2018	
Colleges	Frederick	Catherine	\$ 168,347.03	\$ 131.30	Algonquin College	Vice President Human Resources	2018	
Colleges	Mccutcheon	Diane	\$ 166,846.12	\$ 188.64	Algonquin College	Vice President Human Resources	2018	
Colleges	Schonewille	Todd	\$ 164,726.07	\$ 304.41	Algonquin College	Director Physical Resources	2018	
Colleges	Janzen	Christopher	\$ 163,593.81	\$ 293.89	Algonquin College	Dean Faculty Technology and Trades	2018	
Colleges	Foulds	Barbara	\$ 160,742.83	\$ 137.91	Algonquin College	Dean Faculty Health Public Safety and Community Studie	2018	
Colleges	Tosh	Marlene	\$ 160,044.73	\$ 0.00	Algonquin College	Chair Speciality Nursing Programs and Contract Training	2018	
Colleges	Devey	Patrick	\$ 159,588.61	\$ 137.19	Algonquin College	Dean Centre for Continuing and Online Learning	2018	
Colleges	Kyte	James Gregory	\$ 158,873.70	\$ 290.78	Algonquin College	Dean School of Hospitality and Tourism	2018	
Colleges	Davies	Karen	\$ 158,873.70	\$ 290.78	Algonauin College	Dean Algonquin College In The Ottawa Valley	2018	

Thankfully, this table is in a more conventional format, as are all the tables for the previous years.

Close this file and repeat the same process for 2017.

Merge tables in master file

Now we have three years' worth of data, we can create a master file.

This is possible because the table for each year contains the identical structure: identical column names in the same order.

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2 Colleges Jensen Cheryl \$337,533.24 \$3,408.12 Algonquin College President
3 Colleges Brue Claude \$230,976.76 \$374.96 Algonquin College Senior Vice President A
4 Colleges Wotherspoon Doug \$ 230,788.38 \$ 186.58 Algonquin College Vice President Innovation
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s Colleges Ann Song Ho S114,331,63 S51,57 (Shendan College Institute of Techni Visualization Researcher - Part-Time Faculty 2017
The second

The columns are Sector: Last Name; First Name; Salary Paid; Taxable Benefits; Employer; Job Title.

If the tables were dissimilar, merging them to create a master file would be impossible without additional work.

Keep all three tables open.

Open a fourth Excel file and call it something like "MasterSalaries_2017-2019."

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Copy and paste the 2019 file into the worksheet of the fourth, newly named Excel file.

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Colleges	Abboud	Nadim	114484 25	114.44	Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Agate	leffery	135651.25	256.22	2 Algonquin College Of Applied Arts and Technology	Associate Director Student Support Services	2019	
Colleges	Alexander	Doug	111447.97	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Alexander	Tamra	107906.15	68.16	6 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Ali	Sabah	111443	114.44	4 Algonguin College Of Applied Arts and Technology	Professor	2019	
Colleges	Almuhtadi	Wahab	114395.46	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Anderson	Daniel	113026.61	68.16	6 Algonguin College Of Applied Arts and Technology	Professor	2019	
Colleges	Anderson	lan	111443	106.5	9 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Anderson	Jeremy	111443	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Anderson	Michael	116723.41	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Atkinson	Michelle	107665.32	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Aubin	Jerry	119655.6	68.10	6 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Aubin	Tim	102618.65	68.16	6 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Austen	Peggy	113041.77	116.63	3 Algonquin College Of Applied Arts and Technology	Associate Director Development	2019	
Colleges	Ayala	Carolina	111443	388.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Ayoub	Fadi	111443	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Bakogeorge	Michael	135082.69	256.22	2 Algonquin College Of Applied Arts and Technology	Chair Culinary Programs	2019	
Colleges	Ball	Karen	122922.96	206.94	4 Algonquin College Of Applied Arts and Technology	Chair Nursing Studies	2019	
Colleges	Banks	Joseph	114394.48	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Barney	Victoria	115980.92	114.44	4 Algonquin College Of Applied Arts and Technology	Professor	2019	
Colleges	Baron	Cat	111441	60.14	a Alasansi in Callege Of Applied Arts and Technology	Destauras	2010	

Be sure to readjust the column widths either manually with your cursor, or selecting column in question, right-clicking to obtain your short-cut menu and readjusting the width to a more manageable length of 30 to 50 characters.

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ts	Employer	
68.16	Algonquin College Of Applied Arts and Technology	
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91.98	Algonquin College Of Applied Arts and Technology	
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Employer	Job Title
.16 Algonquin College Of Applied Arts and Technology	Professor
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.63 Algonquin College Of Applied Arts and Technology	Associate Director Development
.44 Algonquin College Of Applied Arts and Technology	Professor
.44 Algonquin College Of Applied Arts and Technology	Professor
.22 Algonquin College Of Applied Arts and Technology	Chair Culinary Programs
.94 Algonquin College Of Applied Arts and Technology	Chair Nursing Studies
.44 Algonquin College Of Applied Arts and Technology	Professor
.44 Algonquin College Of Applied Arts and Technology	Professor
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Scroll to the bottom to ensure you have all the data.

73 Universities	Zimmerman	Brett A	156335.82	842.52	York University	Associate Professor	2019	
74 Universities	Zoidl	Georg R	226479.06	1104.16	York University	Professor	2019	
75 Universities	Zryd	Michael	171004.6	910.84	York University	Associate Professor	2019	
76 Universities	Zumbansen	PeerC	193639.44	1104.16	York University	Professor	2019	
77 Universities	Zwick	Detlev	256491.58	1104.16	York University	Associate Dean / Associate Professor	2019	
78 Universities	Zylberberg	Joel	146093.4	701.64	York University	Assistant Professor / Canada Research Chair	2019	
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Return to the 2018 table, copy that table – minus the column titles because we already have them – and place your cursor on cell A166978.

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66975 Universities	Zryd	Michael	171004.6	910.84	York University
66976 Universities	Zumbansen	Peer C	193639.44	1104.16	York University
66977 Universities	Zwick	Detlev	256491.58	1104.16	York University
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6971 Universities	Zhuang	Kai	111413.38	188.84 York University E	ducational Developer / Course Director	2019
6972 Universities	Zikic	Jelena	219753.06	1039.04 York University A	Associate Professor	2019
6973 Universities	Zimmerman	Brett A	156335.82	842.52 York University A	Associate Professor	2019
6974 Universities	Zoidl	Georg R	226479.06	1104.16 York University P	Professor	2019
6975 Universities	Zryd	Michael	171004.6	910.84 York University A	Associate Professor	2019
6976 Universities	Zumbansen	Peer C	193639.44	1104.16 York University P	Professor	2019
6977 Universities	Zwick	Detlev	256491.58	1104.16 York University A	Associate Dean / Associate Professor	2019
6978 Universities	Zylberberg	Joel	146093.4	701.64 York University A	Assistant Professor / Canada Research Chair	2019
6979 Colleges	Jensen	Cheryl	337533.2	3408.12 Algonquin College F	President	2018
6980 Colleges	Brule	Claude	230976.8	374.96 Algonquin College S	Senior Vice President Academic	2018
6981 Colleges	Wotherspoon	Doug	230788.4	186.58 Algonquin College	Vice President Innovation and Strategy	2018
6982 Colleges	Mcnair	Duane	221744.6	366.12 Algonquin College	Vice President Finance and Administration	2018
6983 Colleges	Stanbra	Laura	221744.6	366.12 Algonquin College	Vice President Student Services	2018
6984 Colleges	Anderson	Scott	194628	331.04 Algonquin College E	Executive Director Communications Marketing Exte	2018
6985 Colleges	Mclester	Ronald	191833.5	161.82 Algonquin College E	Executive Director Truth Reconciliation Indigenization	2018
6986 Colleges	Pollock	Lois	177265.7	273.41 Algonquin College 0	Chief Digital Officer	2018
6987 Colleges	Leduc	Mark	169073.3	310.33 Algonquin College E	Executive Director Academic Operations and Plan	2018
6988 Colleges	Frederick	Catherine	168347	131.3 Algonauin College	Vice President Human Resources	2018
6989 Colleges	Mccutcheon	Diane	166846.1	188.64 Algonquin College	Vice President Human Resources	2018
6990 Colleges	Schonewille	Todd	164726.1	304.41 Algonauin College	Director Physical Resources	2018
6991 Colleges	Janzen	Christopher	163593.8	293 89 Algonguin College	Dean Faculty Technology and Trades	2018
6992 Colleges	Foulds	Barbara	160742.8	137.91 Algonquin College	Dean Faculty Health Public Safety and Community	2018
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Scroll to the bottom of the 2018 data to repeat your verification.

Paste the 2017 table at the bottom of your merged (2019 and 2018 so far) table using the same techniques.

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sso Universities	Zoidl	Georg R	211344.3	1228.56 York University	Professor	2018
351 Universities	Zryd	Michael	161067	987.24 York University	Associate Professor	2018
352 Universities	Zumbansen	Peer C	104358.5	614.28 York University	Professor	2018
353 Universities	Zwick	Detlev	237181.2	1228.56 York University	Associate Dean / Associate Professor	2018
354 Colleges	Abiscott	Alexa	\$197,073.24	\$2,033.69 Sheridan College Institute of Technology	and Advanced Learn General Counsel And Information Privacy Officer	2017
355 Colleges	Ahn	Song Ho	\$114,331.63	\$51.57 Sheridan College Institute of Technology	\$51.57 Sheridan College Institute of Technology and Advanced Learn Visualization Researcher - Part-Time Faculty	
356 Colleges	Aitken	Sharon	\$118,650.76	\$1,250.00 Sheridan College Institute of Technology	\$1,250.00 Sheridan College Institute of Technology and Advanced Learn Director Development and Campaign	
357 Colleges	Ali	Shirook	\$104,398.32	\$101.50 Sheridan College Institute of Technology	and Advanced Learn Professor	2017
358 Colleges	Allcott	Austin Micha	\$124,307.70	\$1,264.54 Sheridan College Institute of Technology	and Advanced Learn Dean	2017
359 Colleges	Andrews	Greg	\$100,208.66	\$62.88 Sheridan College Institute of Technology	and Advanced Learn Professor	2017
360 Colleges	Angelini	Paul	\$105,838.90	\$62.88 Sheridan College Institute of Technology	and Advanced Learn Professor	2017
361 Colleges	Armstrong	John	\$101,696.02	\$101.50 Sheridan College Institute of Technology	and Advanced Learn Professor	2017
262 Callanae	Athingon	Susan	6424 044 40	E4 500 E4 Charidan Callana Institute of Tanhaalama	and Advanced Learn Manager Communications And Media Delations	2017

You should have 450262 rows of salary data, almost half a million rows. Save the table, calling the first worksheet something like "Salaries_2017-19." (NOTE: character limits mean we must be economical when naming worksheets.) Also be sure to save as you go.

0257 Universities	Zoric	Terezia	\$132,909.96	\$223.80	University of Toronto	Associate Professor of Education, Teaching Stream	2017
0258 Universities	Zovkic	lva	\$104,927.39	\$201.36	University of Toronto	Assistant Professor of Psychology	2017
0259 Universities	Zuberi	Daniyal	\$158,128.98	\$20,631.84	University of Toronto	Associate Professor of Social Work and Associate Professor	2017
0260 Universities	Zuliani	Elisa	\$309,732.66	\$448.14	University of Toronto	Professor of Accounting	2017
0261 Universities	Zuniga-Pflucker	Juan Carlos	\$223,714.97	\$223.80	University of Toronto	Professor and Chair, Immunology	2017
0262 Universities	Zweig	David	\$343,913.54	\$15,999.66	University of Toronto	Professor and Chair of Management	2017
0263							
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In the first two tutorials, you learned how to use sorting, filtering and simple observation to interview the data to determine what you have and what you don't have. Take the time to do this before moving on to the next step.

Use concatenate function to combine first and last name

Before we get this into a pivot table, we'll use a concatenate function to combine the last and first names in columns B and C into a new column.

Insert a new column and call it something like "New Name"

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Sector	Last Name	First Name	New Name	Salary Paid	Taxable Benefits	Employer				Job T	itle
Colleges	Abbas	Sadiq		111442.39	68.16	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Abboud	Nadim		114484.25	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Agate	Jeffery		135651.25	256.22	Algonquin	College Of App	lied Arts	and Technology	Asso	ciate Director Stu
Colleges	Alexander	Doug		111442.97	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Alexander	Tamra		107906.18	68.16	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Ali	Sabah		111443	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Almuhtadi	Wahab		114395.46	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Anderson	Daniel		113026.61	68.16	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Anderson	lan		111443	106.9	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Anderson	Jeremy		111443	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Anderson	Michael		116723.41	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Atkinson	Michelle		107665.32	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Aubin	Jerry		119655.6	68.16	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Aubin	Tim		102618.69	68.16	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Austen	Peggy		113041.77	116.63	Algonquin	College Of App	lied Arts	and Technology	Asso	ciate Director Dev
Colleges	Ayala	Carolina		111443	388.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor
Colleges	Avoub	Fadi		111443	114.44	Algonquin	College Of App	lied Arts	and Technology	Profe	essor

We'll use the concatenate operator "&" to combine the names with the formula <<=B2&", "&C2>>

Let's translate this formula: Take B2 and combine it (&) with a comma and space which we will put in between quotation marks (", ") and

combine C2.

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2	Colleges	Abbas		Sadig	=B2&", "&C2	111442.39
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4	Colleges	Agate		Jeffery		135651.25
5	Colleges	Alexander		Doug		111442.97
6	Colleges	Alexander		Tamra		107906.18
7	Colleges	Ali		Sabah		111443
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3	Colleges	Abboud		Nadim		114484.25	
4	Colleges	Agate		Jeffery		135651.25	
5	Colleges	Alexander		Doug		111442.97	
6	Colleges	Alexander		Tamra		107906.18	
7	Colleges	Ali		Sabah		111443	
8	Colleges	Almuhtadi		Wahab		114395.46	
9	Colleges	Anderson		Daniel		113026.61	

Copy the formula to bottom of the column and adjust the column length.

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2	Colleges	Abbas	Sadiq	Abbas, Sadiq	111442.39	68.16	Algonquin College Of Apr
3	Colleges	Abboud	Nadim	Abboud, Nadim	114484.25	114.44	Algonquin College Of App
4	Colleges	Agate	Jeffery	Agate, Jeffery	135651.25	256.22	Algonquin College Of Apr
5	Colleges	Alexander	Doug	Alexander, Doug	111442.97	114.44	Algonquin College Of Apr
6	Colleges	Alexander	Tamra	Alexander, Tamra	107906.18	68.16	Algonquin College Of Apr
7	Colleges	Ali	Sabah	Ali, Sabah	111443	114.44	Algonquin College Of Apr
8	Colleges	Almuhtadi	Wahab	Almuhtadi, Wahab	114395.46	114.44	Algonquin College Of Apr
9	Colleges	Anderson	Daniel	Anderson, Daniel	113026.61	68.16	Algonquin College Of Apr
10	Colleges	Anderson	lan	Anderson, Ian	111443	106.9	Algonquin College Of Apr
11	Colleges	Anderson	Jeremy	Anderson, Jeremy	111443	114.44	Algonquin College Of Apr
12	Colleges	Anderson	Michael	Anderson, Michael	116723.41	114.44	Algonquin College Of Apr
13	Colleges	Atkinson	Michelle	Atkinson, Michelle	107665.32	114.44	Algonquin College Of Apr
14	Colleges	Aubin	Jerry	Aubin, Jerry	119655.6	68.16	Algonquin College Of Apr
15	Colleges	Aubin	Tim	Aubin, Tim	102618.69	68.16	Algonquin College Of Apr
	C-11	A	D	Austan Dear	440044 77	110 00	Alessenia Calless of Ass

We'll now create a column that adds the Salary Paid to Taxable Benefits for a total salary.

Add a column to the right of Taxable Benefits and use the addition operator "+" to obtain your total.

	E	F	G	
	Salary Paid	Taxable Benefits	Total Salary	Employer
1	111442.39	68.16	=E2+F2	Algonquin College Of App
	114484.25	114.44		Algonquin College Of App
	135651.25	256.22		Algonquin College Of App
	111442.97	114.44		Algonquin College Of App
	107906.18	68.16		Algonquin College Of App
	111443	114.44		Algonquin College Of App
	114395.46	114.44		Algonquin College Of App
	113026.61	68.16		Algonquin College Of Ann

Copy the formula to the bottom of the column and format the numbers as currency with no decimal places.

Clipb	board	ועי Fo	ont קו	Alignment	12	Number	R1	Styles
G2	•	$\times \checkmark f_x$ =	E2+F2					
	A	В	с	D	E	F	G	н
1 Sector		Last Name	First Name	New Name	Salary Paid	Taxable Benefits	Total Salary	Employer
2 College	25	Abbas	Sadiq	Abbas, Sadiq	111442.39	68.16	\$111,511	Algonquin College Of Applied Arts and
3 College	25	Abboud	Nadim	Abboud, Nadim	114484.25	114.44	\$114,599	Algonquin College Of Applied Arts and
4 College	25	Agate	Jeffery	Agate, Jeffery	135651.25	256.22	\$135,907	Algonquin College Of Applied Arts and
5 College	25	Alexander	Doug	Alexander, Doug	111442.97	114.44	\$111,557	Algonquin College Of Applied Arts and
6 College	25	Alexander	Tamra	Alexander, Tamra	107906.18	68.16	\$107,974	Algonquin College Of Applied Arts and
7 College	25	Ali	Sabah	Ali, Sabah	111443	114.44	\$111,557	Algonquin College Of Applied Arts and
8 College	25	Almuhtadi	Wahab	Almuhtadi, Wahab	114395.46	114.44	\$114,510	Algonquin College Of Applied Arts and
9 College	25	Anderson	Daniel	Anderson, Daniel	113026.61	68.16	\$113,095	Algonquin College Of Applied Arts and
0 College	25	Anderson	lan	Anderson, Ian	111443	106.9	\$111,550	Algonquin College Of Applied Arts and
1 College	25	Anderson	Jeremy	Anderson, Jeremy	111443	114.44	\$111,557	Algonquin College Of Applied Arts and
2 College	25	Anderson	Michael	Anderson, Michael	116723.41	114.44	\$116,838	Algonquin College Of Applied Arts and
3 College	25	Atkinson	Michelle	Atkinson, Michelle	107665.32	114.44	\$107,780	Algonquin College Of Applied Arts and
4 College	25	Aubin	Jerry	Aubin, Jerry	119655.6	68.16	\$119,724	Algonquin College Of Applied Arts and
5 College	25	Aubin	Tim	Aubin, Tim	102618.69	68.16	\$102,687	Algonquin College Of Applied Arts and
			-				\$102,007	

Good.

Now let's create a new column which calculates the taxable benefit as a percent of the total salary.

Insert a new column, and divide the taxable benefit by the total salary. Reformat with as a percent with two decimal places.

	F	G	Н	
id	Taxable Benefits	Total Salary	Taxable Benefit Percent	Employer
2.39	68.16	\$111,511	=F2/G2	Algonquin College Of Appli
4.25	114.44	\$114,599		Algonquin College Of Appli
1.25	256.22	\$135,907		Algonquin College Of Appli
2.97	114.44	\$111,557		Algonquin College Of Appli
6.18	68.16	\$107,974		Algonquin College Of Appli
1443	114.44	\$111,557		Algonquin College Of Appli
5.46	114.44	\$114,510		Algonquin College Of Appli
6.61	68.16	\$113,095		Algonquin College Of Appli
1443	106.9	\$111,550		Algonquin College Of Appli
1443	114.44	\$111.557		Algonauin College Of Appli

	G	н	
efits	Total Salary	Taxable Benefit Percent	Employer
68.16	\$111,511	0.06%	Algonquin Colle
114.44	\$114,599	0.10%	Algonquin Colle
256.22	\$135,907	0.19%	Algonquin Colle
114.44	\$111,557	0.10%	Algonquin Colle
68.16	\$107,974	0.06%	Algonquin Colle
114.44	\$111,557	0.10%	Algonquin Colle
114.44	\$114,510	0.10%	Algonquin Colle
68.16	\$113,095	0.06%	Algonquin Colle
106.9	\$111,550	0.10%	Algonquin Colle
114.44	\$111,557	0.10%	Algonquin Colle
114.44	\$116,838	0.10%	Algonquin Colle
114.44	\$107,780	0.11%	Algonquin Colle
68.16	\$119,724	0.06%	Algonquin Colle
68.16	\$102,687	0.07%	Algonquin Colle
116.63	\$113,158	0.10%	Algonquin Colle
388.44	\$111,831	0.35%	Algonquin Colle
114.44	\$111,557	0.10%	Algonquin Colle
256.22	\$135,339	0.19%	Algonquin Colle
	A100 100	A 470/	Al

It's time to perform some analysis.

Filter the table for the year 2019. Sort the "Total Salary" column to see who earned the most.

Then sort the "Taxable Benefit Percent" column in descending order. You'll be surprised at some of the results.

Before we even get into a pivot table, the new columns we've created in this master table for the three years now convey a lot more information that takes us beyone the typical, who earned the most in 2019. We can filter for universities, and professors to see which institutions are doling out the most cash. Simply filtering and sorting on the main table produces useful, and perhaps newsworthy information.

Now you can use the pivot table to determine what's happening at the institutional level.

Create pivot table that compares institutions with the most employees on the list and how those numbers compare year-to-year

Each row in our original table is an employee. The master table filtered for 2019, contains 166,977 rows. Or put another way, 166,977 public-sector employees who earned more than \$100,000 that year.

Let's create a pivot table to provide a closer look.

We can use the pivot table to group (Rows) the employees, count (values) them, and subdivide (Columns) by year.

 Taxable Benefits Employer Job Title Calendar Year Total Salary Taxable Benefit Percent More Tables 	
Drag fields between areas bel	ow:
▼ Filters	III Columns
	Calendar Year 💌
Rows	Σ Values
	Count of Employer 💌

	А	В	С	D	E	F	G	н	I.	
1										
2										
3		Column Labels 💌								
4		2017	2018	2019	Grand Total					
5	Count of Employer	131,909	151,375	166,977	450,261					
6										
7										
8										
9										
10										
11										

We can see that the 2019 number corresponds with the filtered number in the main table.

It's also clear that the number of employees on the list has been increasing, an additional piece of information that pivot table has just provided.

Now we can subdivide the table by employer (yes, we can count on the employer field and group it in another section of the pivot table) and

filter it for the one we want.

Taxable Benefits Employer	
Calendar Year	
Total Salary	
Taxable Benefit P	ercent
More Tables	
Drag fields between	areas below:
Drag fields between	areas below:
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Drag fields between	areas below:
Trag fields between	areas below:
Trag fields between	areas below: III Columns Calendar Year
Trag fields between	areas below: III Columns Calendar Year
Drag fields between	areas below: III Columns Calendar Year Σ Values
Drag fields between a Filters Rows Employer	areas below: IIII Columns Calendar Year Calendar Year ∑ Values Count of Employer

Let's do that for Humber.

5 * 1 × ✓ Å 6																		
A	8	с	D	E	F	6	н	1	J	к	ι	м	N	0	P	PivotTable Fields		÷)
															-	Protrable Fields		
Count of Employer	Column Labels															Choose fields to add to report:		(2)
Row Labels	2017	2018	2019 (Grand Tota	a													
2021 Canada Games Host Society Inc	1017	1	5	orana rote	6											Search		
2021633 Ontario Inc (O/A Finishing Trades Institute of Ontario)			3		3											Sector		
360Kids Support Services		1	2		3											Last Name		
Abilities Centre	1	1	2		4											First Name		
AbleLiving Services Inc	1	1	1		3											New Name		
Abrigo Centre		1	1		2											Salary Paid		
Access Alliance Multicultural Health And Community Services	6	8	8	2	2											Taxable Benefits		
Access Community Services Incorporated	1	1			2											✓ Employer		
Access For Parents and Children In Ontario			1		1											Job Title		
Access Independent Living Services	1	1	1		3											Calendar Year		
Accessibility Directorate of Ontario		32		3	2											Total Salary		
Accessibility Directorate of Ontario / Direction générale de l'accessibilité pour l'Ontario	26			2	6											Taxable Benefit Percent		
Accessible Community Counselling And Employment Services (ACCES)	9	10	12	3	1											More Tables		
Acclaim Health And Community Care Services	7	5	12	2	4													
Accommodation Info & Support Inc	1				1													
Accommodation Info and Support Inc		1	1		2													
Across Boundaries	1				1											Drag fields between areas belo	7965	
Addiction and Mental Health Services - KFLA	4	4			8													
Addiction Services Of Thames Valley	1	1	1		3											T Filters	III Columns	
Addiction Services Of York Region	1	1	2		4												Calendar Year	*
Addictions And Mental Health Ontario	1		1		2													
Addictions And Mental Health Services - Hastings Prince Edward	2	2	3		7													
Advanced Education and Skills Development		190		19	0													
Advanced Education and Skills Development / Enseignement supérieur et de la Formation	162			16	2													
Advent Health Care Corporation		2	2		4													
Adventure Place	2	3	4		9											-		
Advertising Review Board		2			2											= Rows	2: Values	
Advertising Review Board			2		2											Employer *	Count of Employer	л т
Advertising Review Board / Commission de révision de la publicité	3				3													
Affiliated Services For Children and Youth Inc	1	1	1		3													

Filter the Row Label for Humber.

ount of Employer		Column Labels -			
low Labels		- 2017	2058	2019 Grand T	otal
021 Canada Games Host Society Inc. 021633 Ontario Inc (O/A Finishing Trades Ins 06Kidd Support Services biblitise Centre biblitise Centre coress Alliance Multicultural Health And Con occess Alliance Multicultural Health And Con occess Alliance Multicultural Health And Con occess Community Services Incorporated cores Community Services Incorporated coress Independent Using Services occessibility Directorate of Ontario Coressibility Directorate Of Tom Region Iddiction Services Of Tom Region Iddictions And Mental Health Services - Hact Idvanced Education and Skills Development Idvancia Education and Skills Development	South to 2 S	berlend nology and Advanced Lee am riend And Clarington Catho riend and Clarington Catho	> ×	5 3 2 1 1 8 1 1 1 2 1 2 1 3 2 4	6 3 3 4 3 2 2 2 2 2 2 2 2 2 2 2 2 3 3 3 2 2 5 3 3 2 2 5 3 3 2 2 5 3 3 2 2 2 2
duarticing Review Board			-	2	2
duarticing Review Roard / Commission de n		CK Ca	ncel		-
Miliated Services For Children and Youth Inc.					-
Fahans Ukomen's Councelling and interaction	Community Support Organization				-
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	А	В	С	D	E	F	G
1							
2							
3	Count of Employer	Column Labels 💌					
4	Row Labels 🗸 🖓	2017	2018	2019	Grand Total		
5	Humber College Institute Of Technology and Advanced Learning	244	560	624	1,428		
6	Grand Total	244	560	624	1,428		
7							
8							
9							
10							
11							
	1						

The number of Humber employees on the list is growing. If you wanted to see all the employees on list, click on any of the totals to see the underlying data that will be presented in a separate, formatted worksheet with drop-down menus.

Clear the Row Label Filter to return to the complete pivot table we've just created.

5 * : × × \$= 6						-
A	В	с	D	E	F	G
Count of Employer	Column Labels 🔻					
Row Labels	- 2017	2018	2019	Grand Total		
2021 Canada Games Host Society Inc		1	5	6		
2021633 Ontario Inc (O/A Finishing Trades Institute of Ontario)			3	3		
360Kids Support Services		1	2	3		
Abilities Centre	1	1	2	4		
AbleLiving Services Inc	1	1	1	3		
Abrigo Centre		1	1	2		
Access Alliance Multicultural Health And Community Services	6	8	8	22		
Access Community Services Incorporated	1	1		2		
Access For Parents and Children In Ontario			1	1		
Access Independent Living Services	1	1	1	3		
Accessibility Directorate of Ontario		32		32		
Accessibility Directorate of Ontario / Direction générale de l'accessibilité pour l'Ontario	26			26		
Accessible Community Counselling And Employment Services (ACCES)	9	10	12	31		
Acclaim Health And Community Care Services	7	5	12	24		
Accommodation Info & Support Inc	1			1		
Accommodation Info and Support Inc		1	1	2		
Across Boundaries	1			1		
Addiction and Mental Health Services - KFLA	4	4		8		
Addiction Services Of Thames Valley	1	1	1	3		
Addiction Services Of York Region	1	1	2	4		
Addictions And Montal Health Ontario	1		1	2		

Sort the Grand Total in descending order.

et From From Table/ Recent Existing a ~ Text/CSV Web Range Sources Connections All ~ B Edit Links Get & Transform Data Oueries & Connections Sort & Filter	Advanced	Text to Columns	Flash Re Fill Dup	move plicates V a	Data Cons alidation ~ Data Tools	solidate
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Count of Employer	Column	Labels 🔻				
Row Labels		2017	2018	2019	Grand Total	
Ontario Power Generation		7.878	7.919	8.043	23.840	
City Of Toronto		5,872	6,188	6,806	18,866	
City Of Toronto - Police Service		4,828	4,963	4,876	14,667	
University Of Toronto		3,738	4,037	4,342	12,117	
Foronto District School Board		2,579	3,337	3,743	9,659	
City Of Toronto - Toronto Transit Commission		2,632	2,734	3,033	8,399	
City Of Ottawa		2,115	2,484	3,251	7,850	
Community Safety and Correctional Services		28	6,399		6,427	
Community Safety and Correctional Services / Sécurité communautaire et Services correctionnels		6,210			6,210	
Regional Municipality Of Peel Police Services		1,645	1,784	1,842	5,271	
/ork University		1,681	1,691	1,850	5,222	
City Of Hamilton		1,569	1,761	1,849	5,179	
Ontario Provincial Police			5	5,062	5,067	
Jniversity Of Waterloo		1,450	1,556	1,676	4,682	
Jniversity Of Ottawa		1,496	1,530	1,595	4,621	
Peel District School Board		1,240	1,303	2,051	4,594	
/ork Region District School Board		1,038	1,491	2,050	4,579	
Foronto Catholic District School Board		1,083	1,389	1,773	4,245	
Attorney General			2,032	2,196	4,228	
Regional Municipality Of Durham		1,285	1,388	1,529	4,202	
Regional Municipality Of York Police Services		1,305	1,398	1,467	4,170	
University Of Western Ontario		1,358	1,375	1,396	4,129	
City Of Ottawa - Police Services		1,302	1,326	1,375	4,003	
Ryerson University		1,201	1,280	1,363	3,844	
City Of Mississauga		1,048	1,363	1,381	3,792	

Sorting the Grand Total in descending order, we can easily see how some of the top employers stack up. Ontario Power Generation, City of Toronto, City of Toronto Police Service (interesting because of the defund the police campaign), University of Toronto, etc. have all seen an increase in numbers.

To compare more of the major employers and calculate the rate at which the employees are growing, let's use the paste special.

Use paste special to create a table for calculating percent difference

Copy the pivot table, go to a new worksheet and use the paste special option.

e Home	Insert Page Layout Fo	rmulas Dat	a Review
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	A	в	С	D	E	F	G	н	T	J	к	L	м
	Count of EC	Column Lab	els										
	Row Label	2017	2018	2019	Grand Total								
	Ontario Po	7878	7919	8043	23840								
	City Of To	5872	6188	6806	18866								
	City Of To	4828	4963	4876	14667								
	University	3738	4037	4342	12117								
	Toronto D	2579	3337	3743	9659								
0	City Of To	2632	2734	3033	8399								
1	City Of Ot	2115	2484	3251	7850								
2	Communi	28	6399		6427								
3	Communi	6210			6210								
1	Regional I	1645	1784	1842	5271								
5	York Unive	1681	1691	1850	5222								
5	City Of Ha	1569	1761	1849	5179								
7	Ontario Pro	vincial Po	5	5062	5067								
3	University	1450	1556	1676	4682								
9	University	1496	1530	1595	4621								
)	Peel Distr	1240	1303	2051	4594								
I	York Regic	1038	1491	2050	4579								
2	Toronto C	1083	1389	1773	4245								
3	Attorney G	eneral	2032	2196	4228								
4	Regional M	1285	1388	1529	4202								
5	Regional M	1305	1398	1467	4170								
5	University	1358	1375	1396	4129								
7	City Of Ot	1302	1326	1375	4003								
B	Ryerson U	1201	1280	1363	3844								
9	City Of Mi	1048	1363	1381	3792								
0	McMaster	1203	1256	1300	3759								

Time for some clean-up. Delete first three rows.

Rename column A "Employer"

Delete the Grand Total column (E) and the Grand Total row (2473).

Create a new column "Percent Diff 2017-2019".

Get & Transform Data	Queries & Co	onnections		Sort & Filter					
E1 \checkmark : \times \checkmark $f_{\rm sc}$ Percent Diff 2017-2019									
A	В	С	D	E	F				
1 Employer	2017	2018	2019 F	Percent Diff 2017-2019					
2 Ontario Power Generation	7878	7919	8043						
3 City Of Toronto	5872	6188	6806						
4 City Of Toronto - Police Service	4828	4963	4876						
5 University Of Toronto	3738	4037	4342						
6 Toronto District School Board	2579	3337	3743						
7 City Of Toronto - Toronto Transit Commission	2632	2734	3033						
8 City Of Ottawa	2115	2484	3251						
9 Community Safety and Correctional Services	28	6399							
10 Community Safety and Correctional Services / Sécurité co	6210								
11 Regional Municipality Of Peel Police Services	1645	1784	1842						
12 York University	1681	1691	1850						
13 City Of Hamilton	1569	1761	1849						
14 Ontario Provincial Police		5	5062						
15 University Of Waterloo	1450	1556	1676						
16 University Of Ottawa	1496	1530	1595						
17 Peel District School Board	1240	1303	2051						
18 York Region District School Board	1038	1491	2050						
19 Toronto Catholic District School Board	1083	1389	1773						
20 Attorney General		2032	2196						

We'll use the formula for percent increase (generically: =(NEW NUMBER-OLD NUMBER)/OLD NUMBER)). We put the numbers in brackets because Excel will perform that caculation before dividing.

()a	E LE L L L L L L L L L L L L L L L L L	Refresh 🗈 Prope All ~ [] Edit Li	rties inks	1	Z Sort Filter & Adva	ply → L Text nced Colun		
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32	32 \checkmark : \checkmark \checkmark f_x =(D2-B2)/B2							
	А	В	С	D	E	F		
	Employer	2017	2018	2019	Percent Diff 2017-2019			
	Ontario Power Generation	7878	7919	8043	=(D2-B2)/B2			
	City Of Toronto	5872	6188	6806				
	City Of Toronto - Police Service	4828	4963	4876				
	University Of Toronto	3738	4037	4342				
	Toronto District School Board	2579	3337	3743				
_	City Of Taranta Taranta Transit Commission	2622	1224	2022				

	Get & Transform Data	Queries & Connections			Sort & Filter		
E2	2 ▼ : × ✓ f _x =(D2-B2)/B2						
	A	В	С	D	E	F	
1	Employer	2017	2018	2019	Percent Diff 2017-2019		
2	Ontario Power Generation	7878	7919	8043	0.020944402		
3	City Of Toronto	5872	6188	6806			
4	City Of Toronto - Police Service	4828	4963	4876			
5	University Of Toronto	3738	4037	4342			
6	Toronto District School Board	2579	3337	3743			
7	City Of Toronto - Toronto Transit Commission	2632	2734	3033			
8	City Of Ottawa	2115	2484	3251			
2			C000				

Reformat the number as a percent with on decimal place and copy the formula to the bottom of the row.

F	× Format Painter B I U × H × 2 × A ×	= = -	≡ ±= ±=	🔛 Mer	ge & Center × \$ × %	2
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E2	2 ▼ : × ✓ <i>f</i> x =(D2-B2)/B2					
4	A	В	С	D	E	F
1	Employer	2017	2018	2019	Percent Diff 2017-2019	
2	Ontario Power Generation	7878	7919	8043	0.021	
3	City Of Toronto	5872	6188	6806		
4	City Of Toronto - Police Service	4828	4963	4876		
5	University Of Toronto	3738	4037	4342		
6	Toronto District School Board	2579	3337	3743		
7	City Of Toronto - Toronto Transit Commission	2632	2734	3033		
8	City Of Ottawa	2115	2484	3251		
9	Community Safety and Correctional Services	28	6399			
10	Community Safety and Correctional Services / Sécurité co	6210				
11	Regional Municipality Of Peel Police Services	1645	1784	1842		
11	Regional Municipality of Peel Police Services	1045	1/04	1042		

Get & Transform Data	Queries & Co	onnections		Sort & Filter		
▼ : × ✓ f _x Percent Diff 2017-20)19					
А	В	С	D	E	F	G
Employer 🔹	20 👻	20 💌	20 💌	Percent Diff 2017-2019 💌		
Ontario Power Generation	7878	7919	8043	2.1%		
City Of Toronto	5872	6188	6806	15.9%		
City Of Toronto - Police Service	4828	4963	4876	1.0%		
University Of Toronto	3738	4037	4342	16.2%		
Toronto District School Board	2579	3337	3743	45.1%		
City Of Toronto - Toronto Transit Commission	2632	2734	3033	15.2%		
City Of Ottawa	2115	2484	3251	53.7%		
Community Safety and Correctional Services	28	6399		-100.0%		
Community Safety and Correctional Services / Sécurité co	6210			-100.0%		
Regional Municipality Of Peel Police Services	1645	1784	1842	12.0%		
York University	1681	1691	1850	10.1%		
City Of Hamilton	1569	1761	1849	17.8%		
Ontario Provincial Police		5	5062	#DIV/0!		
University Of Waterloo	1450	1556	1676	15.6%		
University Of Ottawa	1496	1530	1595	6.6%		
Peel District School Board	1240	1303	2051	65.4%		
York Region District School Board	1038	1491	2050	97.5%		
Toronto Catholic District School Board	1083	1389	1773	63.7%		
Attorney General		2032	2196	#DIV/0!		
Regional Municipality Of Durham	1285	1388	1529	19.0%		
Regional Municipality Of York Police Services	1305	1398	1467	12.4%		
University Of Western Ontario	1358	1375	1396	2.8%		
City Of Ottawa - Police Services	1302	1326	1375	5.6%		
Ryerson University	1201	1280	1363	13.5%		
City Of Mississauga	1048	1363	1381	31.8%		
McMaster University	1203	1256	1300	8.1%		
University Health Network	1009	1205	1242	23.1%		

Dividing by zero produces an error message (#DIV/0!). Use the filter to de-select the error message.

Sort the new column in descending order to see which employer had the fastest growth rate.

	4828	A↓ Sort Largest to Smallest	
	3738	Sort by Color >	
	2579	V Char Eller Same Diff 1017 . "	
	2632	- 15 Clear Fritter From Percent Din 2017	
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		☑ 2.426	
	1285	₹ 2.500	
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	1358	- 2.667	
	1302	- 3.000	
	1201	3.356	
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	958	67,000	
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Sort column E in descending order.

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E2 ▼ : × √ f _x =(D2-B2)/B2				
	P	6	D	
Employer	20 -	20 -	20 -	Percent Diff 2017-2019
Treasury Board Secretariat	20 -	1202	771	77000.0%
Education	1	567	609	60800.0%
Ontario Court Of Justice	4	609	616	15300.0%
Local Health Integration Network - Toronto Central	1	61	68	6700.0%
Nog-da-win-da-min Family And Community Services	1	9	12	1100.0%
Vector Institute	3	13	23	666.7%
Township Of Wellesley	1	6	7	600.0%
Upper Thames River Conservation Authority	1	1	7	600.0%
Chatham Kent Family Health Team	1	4	6	500.0%
1 Canadian Mental Health Association-Simcoe County Bran	1	2	6	500.0%
2 Keewaytinook Okimakanak Northern Chiefs Council	2	6	10	400.0%
3 Fred Victor Centre	1	6	5	400.0%
5 City Of London - London Convention Centre Corporation	1	2	5	400.0%
5 Algoma District School Board	101	144	440	335.6%
7 St. Francis Memorial Hospital	2	6	8	300.0%
B Carefirst Seniors And Community Services Association	1	4	4	300.0%
Township Of Mapleton	1	3	4	300.0%
1 Associated Youth Services Of Peel	1	3	4	300.0%
2 Children's Mental Health Services (Serving Children And F	1	2	4	300.0%
3 Seven Generations Education Institute	1	1	4	300.0%
4 Ontario Institute For Regenerative Medicine	1	1	4	300.0%
5 Matawa First Nations Management	1	1	4	300.0%
5 Municipality Of South Huron	1	1	4	300.0%
7 The Ontario Community Centre For The Deaf Inc	1		4	300.0%
B Carleton Place And District Memorial Hospital	3	8	11	266.7%
Children's Aid Society Of The District Of Sudbury-Manitou	7	19	25	257.1%
Niagara North Family Health Team	2	5	7	250.0%
1 Dilico Anishinabek Family Care	2	4	7	250.0%

You can use the filters to compare some of the larger employers. Let's take Humber, Ryerson and Sheridan for instance.

A1	• : \times \checkmark $f_{\rm x}$ Employer					
	A	В	С	D	E	F
1	Employer ,T	20 🔻	20 👻	20 🔻	Percent Diff 2017-2019	
75	Sheridan College Institute Of Technology and Advanced Learning	203	526	557	174.4%	
30	Humber College Institute Of Technology and Advanced Learning	244	560	624	155.7%	
74	Ryerson University	1201	1280	1363	13.5%	
170						
471						
170						

Sheridan grew the fastest.

There are many ways to perform value-added analysis using many of the techniques we have learned in this tutorial that take us beyond the tried and true "who earned the most of all employers."

The spreadsheet is a powerful tool, which forms the bedrock (for nonprogrammers, at least) for data-driven stories.