Part two of an Excel tutorial using the Alberta "Sunshine List" Data

After following the [first tutorial](), we should have a good grasp of how to import, sort, filter and do some basic math. These skills allows us to extract interesting information from the data that arms us with interesting questions, or possible story ideas.

Now it's time to go one step further by grouping the data for information such as the ministry of department that paid out the most severance in 2013 or, perhaps, the employee who received the highest salary increase from 2012 to 2012.

Please note that your Excel interfaces vary from PCs to Macs, depending on the version you're using. So before you proceed, take some time to figure out how to get your pivot table from the menu, and how to insert values into the table once you've placed the pivot table on a separate sheet. As we saw in class, Excel's help menu is a good place to start. As well, it's important to learn Excel's shortcut menus, knowledge that will save you time in the long run.

So let's get started.

1) Insert your pivot table.

A1 | f_x | Ministry

	D	E	F	G	H	I	J	
1	PositionClass	BaseSalary	CashBenefits	NonCashBenefits	Total Benefits	Benefit Percent of Base Salary	Total Salary	Sev
53	Senior Manager	$143,198	$0	$3,468	$3,468	2.4%	$146,666	
54	Senior Manager	$127,828	$0	$3,468	$3,468	2.7%	$131,296	
55	Senior Manager	$127,828	$0	$3,468	$3,468	2.7%	$131,296	
56	Senior Official	$274,105	$48,537	$3,428	$51,965	19.0%	$326,070	
57	Senior Official	$162,190	$35,000	$3,427	$38,427	23.7%	$200,617	
58	Scientific 4	$112,101	$0	$3,415	$3,415	3.0%	$115,516	
59	Senior Manager	$156,321	$1,250	$3,352	$4,602	2.9%	$160,922	
60	Senior Manager	$126,504	$1,250				106	
61	Senior Manager	$142,913	$1,250				515	
62	Senior Official	$160,511	$1,250				104	
63	Senior Official	$322,965	$58,581				850	
64	Executive Manager 1	$105,143	$29,837				284	
65	Senior Manager	$101,829	$1,250				148	
66	Senior Manager	$15,790	$14,241				859	$10
67	Senior Official	$139,003	$18,833				617	
68	Senior Official	$133,469	$21,003				138	
69	Senior Manager	$158,136	$1,250				007	
70	Senior Manager	$218,484	$44,240				219	
71	Engineering & Related Level 2	$102,722	$1,250				393	
72	Senior Official	$228,615	$7,969				001	
73	Senior Official	$226,248	$9,219				808	
74	Engineering & Related Level 2	$103,797	$0				083	
75	Senior Manager	$126,504	$18,582				327	
76	Manager	$102,740	$0	$2,156	$2,156	2.1%	$104,896	
77	Manager	$102,740	$10,788	$2,156	$12,944	12.6%	$115,684	
78	Senior Manager	$188,655	$0	$2,127	$2,127	1.1%	$190,782	
79	Manager	$101,676	$11,927	$2,062	$13,989	13.8%	$115,665	

Create PivotTable

Choose the data that you want to analyze

⦿ Select a table or range

Table/Range: WorkingCopy!$A$1:$K$6385

◯ Use an external data source

Choose Connection...

Connection name:

Choose where you want the PivotTable report to be placed

⦿ New Worksheet

◯ Existing Worksheet

Location:

OK | Cancel

2) When inserting a pivot table, it's common practice to insert it in a new worksheet. Remember, by default, Excel inserts to the left. So you once you've inserted the pivot table in a new worksheet, you might want to drag the worksheet tab to the right of the WorkingCopy worksheet before naming it.

3) Name the worksheet, "PivotTable_Severance"

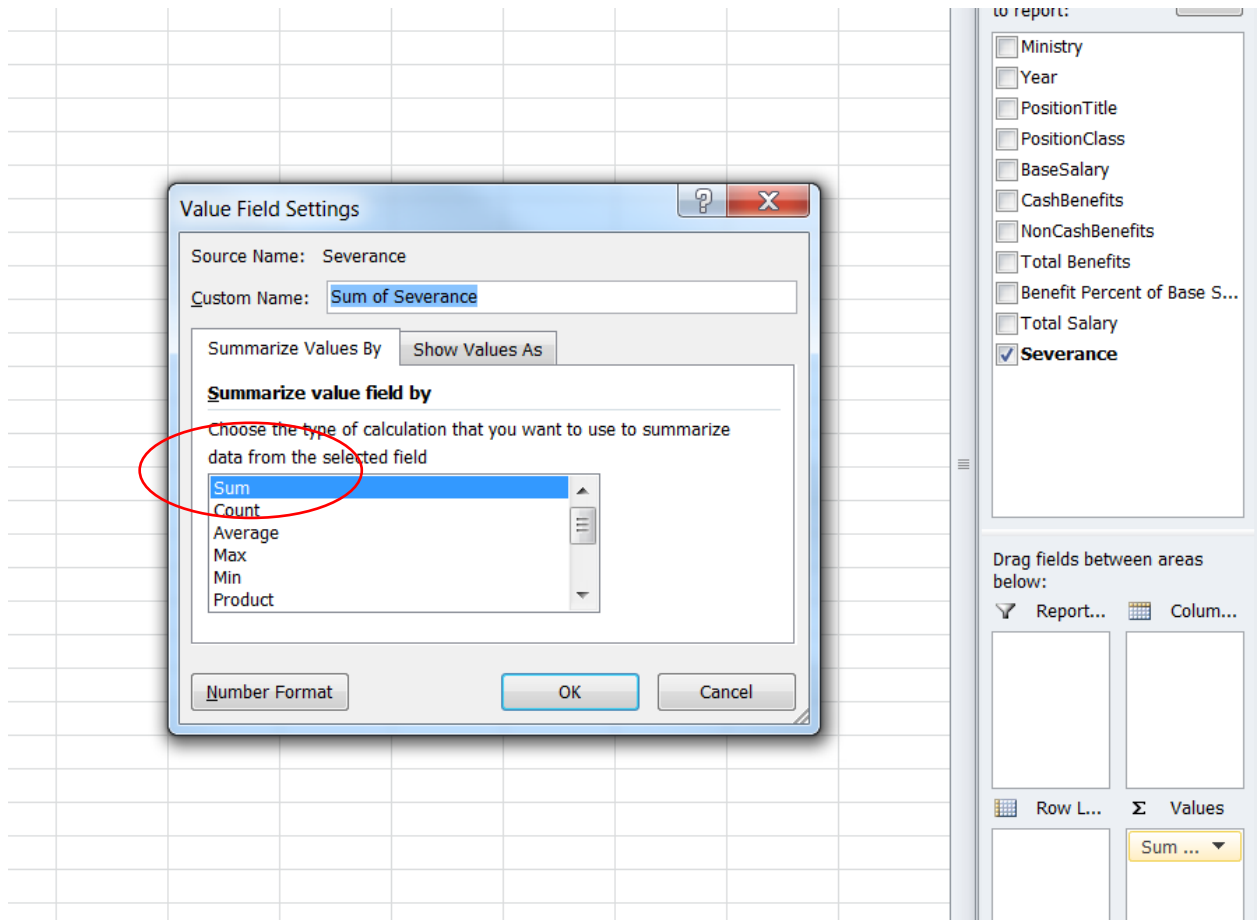4) Drag the "Severance" column into the pivot table's "Values" section.

5) You'll notice that the pivot table has "summed" the values, which is what we want it to do. If pivot table is not performing this calculation, then make sure it does by changing the value.

6) Using this version of Excel, you click on the downward arrow under the "Values" section in the screenshot above, and select the "Value Field Settings" option to produce the dialog box. As you can see in this case, Excel has already chosen the correct calculation. But there are other options in the menu such as COUNT, which counts the number of times a row or record is entered into the data base. (**NOTE:** Counting comes in handy when, for instance, you want to count the number of donors each provincial or federal political party attracted, rather than sum the values of the individual donations. It could be that a party had the highest number of donors, but raised less money than its nearest rival.). Now, returning to the pivot table in the screen shot above. What needs fixing, though, is the formatting. My numbers need to be formatted as currency, important when displaying the numbers on line (**NOTE:** Formatting is a task you will perform frequently. So it's important to learn the short-cut to your Formatting option, a dialogue box that contains options under various tabs such as formatting, alignment, text wrap, font style and colour, etc.)

7) Let's reformat the numbers as currency by selecting the "Number Format" tab.

8) Be sure to give it zero decimal places for no other reason than the extra decimal places can take up too much space, making the numbers too difficult to read.

9) You can see that Excel has converted the number to currency.
10) What the pivot table has done so far is sum all the severance payouts. In order to determine how much severance each ministry paid, we'll have to group the ministries in the pivot table's "Row" section. And then drag the "Year" column into the pivot table's "Year" section.

Sum of Severance	Column Labels		
Row Labels	2012	2013	Grand Total
Aboriginal Relations	$0	$0	$0
Agriculture and Rural Development	$200,211	$335,835	$536,046
Culture	$0	$0	$0
Education	$478,777	$0	$478,777
Energy	$97,868	$584,492	$682,359
Enterprise and Advanced Education	$130,079	$233,343	$363,421
Environment and Sustainable Resource Development	$0	$360,407	$360,407
Executive Council	$785,938	$130,084	$916,021
Health	$0	$66,118	$66,118
Human Services	$440,777	$54,688	$495,464
Infrastructure		$336,804	$336,804
Infrastructure	$48,304		$48,304
International and Intergovernmental Relations	$181,374	$314,484	$495,857
Justice and Solicitor General		$866,243	$866,243
Justice and Solicitor General	$65,039		$65,039
Municipal Affairs	$0	$235,236	$235,236
Service Alberta		$40,000	$40,000
Service Alberta	$0		$0
Tourism, Parks and Recreation	$105,464	$172,805	$278,269
Transportation	$155,344	$0	$155,344
Treasury Board and Finance	$0	$0	$0
Grand Total	$2,689,174	$3,730,537	$6,419,711

11) Not bad. But there's a bit of a problem. For some reason, the pivot table is counting "Infrastructure", "Justice and Solicitor General", and "Service Alberta" as separate entities. In other words, Excel doesn't realize that those ministries are the same in 2012 and 2013.

Whenever downloading data from the web, as we've done this instance, there are frequently problems such as unrecognizable characters (that is, imperceptible to the naked eye), which is probably what's happening in this case. If, for instance, the 2012 version of "Infrastructure" has an unrecognizable character in its name field, and the 2013 doesn't, Excel will consider them to separate, and group them as different ministries. Of course, we don't know which is which. What we want to do is make sure that each instance of the name field is identical (with or without the unrecognizable characters).

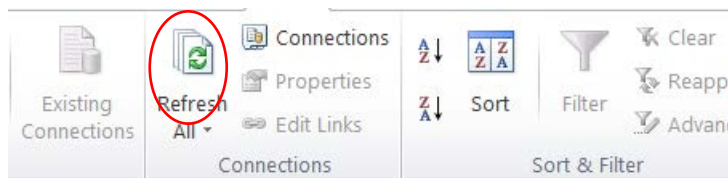12) To do this, let's return to the Working Copy worksheet, and filter the table for Infrastructure.

	A	B	C	D
1	Ministry	Year	PositionTitle	PositionClass
5	Infrastructure	2013	Deputy Minister, Infra.	Senior Official
22	Infrastructure	2012	Deputy Minister, Infra.	Senior Official
61	Infrastructure	2013	ADM, Capital Projects	Executive Manager 2
63	Infrastructure	2013	Strategic Executive Advisor	Executive Manager 2
88	Infrastructure	2013	Chief, Strategic Partn. Office	Executive Manager 2
101	Infrastructure	2012	ADM, Policy & Corp. Services	Executive Manager 2
125	Infrastructure	2013	ADM, Capital Projects	Executive Manager 2
138	Infrastructure	2012	ADM, Capital Projects	Executive Manager 2
187	Infrastructure	2012	ADM, Properties	Executive Manager 2
236	Infrastructure	2013	ADM,Corp. Strategies& Services	Executive Manager 2
444	Infrastructure	2013	Ex Dir, Project Services	Executive Manager 1
447	Infrastructure	2013	Ex Dir, Learn.Fac.& Alt. Proc.	Executive Manager 1
480	Infrastructure	2013	Ex Dir, Technical Services	Executive Manager 1
481	Infrastructure	2013	Ex Dir, Project Delivery	Executive Manager 1
538	Infrastructure	2012	Ex Dir, Health Facilities	Executive Manager 1
539	Infrastructure	2012	Ex Dir, Technical Services	Executive Manager 1
540	Infrastructure	2012	Ex Dir, Project Delivery	Executive Manager 1
541	Infrastructure	2012	Executive Director, Finance	Executive Manager 1
542	Infrastructure	2012	Executive Director, Finance	Executive Manager 1
595	Infrastructure	2012	Ex Dir, Project Services	Executive Manager 1
623	Infrastructure	2013	Ex Dir, Human Resources	Executive Manager 1
640	Infrastructure	2013	Senior Financial Officer	Executive Manager 1
713	Infrastructure	2013	ADM, Properties	Executive Manager 2
770	Infrastructure	2013	Ex Dir & Chief Info Officer	Executive Manager 1

13) Select A5.

	A	B	C	D	
1	Ministry	Year	PositionTitle	PositionClass	B
5	Infrastructure	2013	Deputy Minister, Infra.	Senior Official	$

14) Double click on A5's bottom right-hand corner so that this version of the Infrastructure spelling is copied for the remaining cells in the column.

15) Now return to the pivot table, and "refresh" it.

16) Scroll down to pivot table to Infrastructure. It now has one grouping for both years.

Sum of Severance	Column Labels		
Row Labels	2012	2013	Grand Total
Aboriginal Relations	$0	$0	$0
Agriculture and Rural Development	$200,211	$335,835	$536,046
Culture	$0	$0	$0
Education	$478,777	$0	$478,777
Energy	$97,868	$584,492	$682,359
Enterprise and Advanced Education	$130,079	$233,343	$363,421
Environment and Sustainable Resource Development	$0	$360,407	$360,407
Executive Council	$785,938	$130,084	$916,021
Health	$0	$66,118	$66,118
Human Services	$440,777	$54,688	$495,464
Infrastructure	$48,304	$336,804	$385,108
International and Intergovernmental Relations	$181,374	$314,484	$495,857
Justice and Solicitor General		$866,243	$866,243
Justice and Solicitor General	$65,039		$65,039
Municipal Affairs	$0	$235,236	$235,236
Service Alberta		$40,000	$40,000
Service Alberta	$0		$0
Tourism, Parks and Recreation	$105,464	$172,805	$278,269
Transportation	$155,344	$0	$155,344
Treasury Board and Finance	$0	$0	$0
Grand Total	$2,689,174	$3,730,537	$6,419,711

Choose fields to add to report:
- ☑ Ministry
- ☑ Year
- ☐ PositionTitle
- ☐ PositionClass
- ☐ BaseSalary
- ☐ CashBenefits
- ☐ NonCashBenefits
- ☐ Total Benefits
- ☐ Benefit Percent of Base S...
- ☐ Total Salary
- ☑ Severance

Drag fields between areas below:

Report... | Colum...
| | Year ▼ |

Row L... | Σ Values

17) Now do the same for the rest of the ministries with duplicate entries to produce a clean table.

Sum of Severance	Column Labels		
Row Labels	2012	2013	Grand Total
Aboriginal Relations	$0	$0	$0
Agriculture and Rural Development	$200,211	$335,835	$536,046
Culture	$0	$0	$0
Education	$478,777	$0	$478,777
Energy	$97,868	$584,492	$682,359
Enterprise and Advanced Education	$130,079	$233,343	$363,421
Environment and Sustainable Resource Development	$0	$360,407	$360,407
Executive Council	$785,938	$130,084	$916,021
Health	$0	$66,118	$66,118
Human Services	$440,777	$54,688	$495,464
Infrastructure	$48,304	$336,804	$385,108
International and Intergovernmental Relations	$181,374	$314,484	$495,857
Justice and Solicitor General	$65,039	$866,243	$931,283
Municipal Affairs	$0	$235,236	$235,236
Service Alberta	$0	$40,000	$40,000
Tourism, Parks and Recreation	$105,464	$172,805	$278,269
Transportation	$155,344	$0	$155,344
Treasury Board and Finance	$0	$0	$0
Grand Total	$2,689,174	$3,730,537	$6,419,711

18) Sort the "Grant Total" column in descending order.

Sum of Severance	Column Labels		
Row Labels	2012	2013	Grand Total
Justice and Solicitor General	$65,039	$866,243	$931,283
Executive Council	$785,938	$130,084	$916,021
Energy	$97,868	$584,492	$682,359
Agriculture and Rural Development	$200,211	$335,835	$536,046
International and Intergovernmental Relations	$181,374	$314,484	$495,857
Human Services	$440,777	$54,688	$495,464
Education	$478,777	$0	$478,777
Infrastructure	$48,304	$336,804	$385,108
Enterprise and Advanced Education	$130,079	$233,343	$363,421
Environment and Sustainable Resource Development	$0	$360,407	$360,407
Tourism, Parks and Recreation	$105,464	$172,805	$278,269
Municipal Affairs	$0	$235,236	$235,236
Transportation	$155,344	$0	$155,344
Health	$0	$66,118	$66,118
Service Alberta	$0	$40,000	$40,000
Culture	$0	$0	$0
Treasury Board and Finance	$0	$0	$0
Aboriginal Relations	$0	$0	$0
Grand Total	$2,689,174	$3,730,537	$6,419,711

19) The Justice and Solicitor General ministry paid out the highest amount of severance in 2012 to 2013, with a huge increase in 2013. That size of that increase from 2012 to 2013 is perhaps more interesting, so let's calculate the percent difference.

20) Select and copy the pivot table (NOT THE ENTIRE WORKSHEET, JUST THE TABLE ITSELF.)

Sum of Severance	Column Labels ▾		
Row Labels ↓	2012	2013	Grand Total
Justice and Solicitor General	$65,039	$866,243	$931,283
Executive Council	$785,938	$130,084	$916,021
Energy	$97,868	$584,492	$682,359
Agriculture and Rural Development	$200,211	$335,835	$536,046
International and Intergovernmental Relations	$181,374	$314,484	$495,857
Human Services	$440,777	$54,688	$495,464
Education	$478,777	$0	$478,777
Infrastructure	$48,304	$336,804	$385,108
Enterprise and Advanced Education	$130,079	$233,343	$363,421
Environment and Sustainable Resource Development	$0	$360,407	$360,407
Tourism, Parks and Recreation	$105,464	$172,805	$278,269
Municipal Affairs	$0	$235,236	$235,236
Transportation	$155,344	$0	$155,344
Health	$0	$66,118	$66,118
Service Alberta	$0	$40,000	$40,000
Culture	$0	$0	$0
Treasury Board and Finance	$0	$0	$0
Aboriginal Relations	$0	$0	$0
Grand Total	$2,689,174	$3,730,537	$6,419,711

21) Open a new worksheet, and use "Paste Special", and option that pastes the values, but not the formulas Excel uses to create the pivot table. (**NOTE:** We could have created a new column next to the pivot table for the percent differences, but then we wouldn't be able to sort the results in descending or ascending order. Copying the table, minus the formula that creates the pivot

table, allows us to do this)

	A	B	C	D
1	Sum of Severance	Column Labels		
2	Row Labels	2012	2013	Grand Total
3	Justice and Solicitor General	65039.43	866243.5	931282.89
4	Executive Council	785937.66	130083.8	916021.46
5	Energy	97867.71	584491.5	682359.21
6	Agriculture and Rural Development	200210.75	335834.8	536045.56
7	International and Intergovernmental Relations	181373.61	314483.7	495857.31
8	Human Services	440776.64	54687.53	495464.17
9	Education	478776.64	0	478776.64
10	Infrastructure	48304	336803.9	385107.92
11	Enterprise and Advanced Education	130078.87	233342.6	363421.47
12	Environment and Sustainable Resource Development	0	360407.2	360407.2
13	Tourism, Parks and Recreation	105464.18	172805.1	278269.29
14	Municipal Affairs	0	235235.8	235235.83
15	Transportation	155344.42	0	155344.42
16	Health	0	66117.72	66117.72
17	Service Alberta	0	40000	40000
18	Culture	0	0	0
19	Treasury Board and Finance	0	0	0
20	Aboriginal Relations	0	0	0
21	Grand Total	2689173.91	3730537	6419711.09

22) You can see that the paste special option not only strips away the formula behind the pivot table, but also the formatting for the numbers.

23) Rename the worksheet "SeveranceTable".

24) Re-format the numbers in columns B,C and D as currency.

Column Labels		
2012	2013	Grand Total
65039.43	866243.5	931282.89
785937.66	130083.8	916021.46
97867.71	584491.5	682359.21
200210.75	335834.8	536045.56
181373.61	31448	
440776.64	54687	
478776.64		
48304	33680	
130078.87	23334	
0	36040	
105464.18	17280	
0	23523	
155344.42		
0	66117	
0	400	
0		
0		
0		
2689173.91	37305	

Format Cells

| Number | Alignment | Font | Border | Fill | Protection |

Category:

General
Number
Currency
Accounting
Date
Time
Percentage
Fraction
Scientific
Text
Special
Custom

Sample

65039.43

General format cells have no specific number format.

OK   Cancel

	B	C	D	E	F	G	H	I	J	K
	Column Labels									
	2012	2013	Grand Total							
	65039.43	866243.5	931282.89							
	785937.66	130083.8	916021.46							
	97867.71	584491.5	682359.21							
	200210.75	335834.8	536045.56							
	181373.61	31448								
	440776.64	54687								
	478776.64									
	48304	33680								
	130078.87	23334								
nt	0	36040								
	105464.18	17280								
	0	23523								
	155344.42									
	0	66117								
	0	400								
	0									
	0									
	0									
	2689173.91	37305								

Format Cells

Number | Alignment | Font | Border | Fill | Protection

Category:
- General
- Number
- Currency
- Accounting
- Date
- Time
- Percentage
- Fraction
- Scientific
- Text
- Special
- Custom

Sample
$65,039

Decimal places: 0

Symbol: $

Negative numbers:
- -$1,234
- $1,234
- -$1,234
- -$1,234

Currency formats are used for general monetary values. Use Accounting formats to align decimal points in a column.

OK | Cancel

25)

26) Insert a space between the Grand Total row and the rest of the table.

	A	B	C	D
1	Sum of Severance	Column Labels		
2	Row Labels	2012	2013	Grand Total
3	Justice and Solicitor General	$65,039	$866,243	$931,283
4	Executive Council	$785,938	$130,084	$916,021
5	Energy	$97,868	$584,492	$682,359
6	Agriculture and Rural Development	$200,211	$335,835	$536,046
7	International and Intergovernmental Relations	$181,374	$314,484	$495,857
8	Human Services	$440,777	$54,688	$495,464
9	Education	$478,777	$0	$478,777
10	Infrastructure	$48,304	$336,804	$385,108
11	Enterprise and Advanced Education	$130,079	$233,343	$363,421
12	Environment and Sustainable Resource Development	$0	$360,407	$360,407
13	Tourism, Parks and Recreation	$105,464	$172,805	$278,269
14	Municipal Affairs	$0	$235,236	$235,236
15	Transportation	$155,344	$0	$155,344
16	Health	$0	$66,118	$66,118
17	Service Alberta	$0	$40,000	$40,000
18	Culture	$0	$0	$0
19	Treasury Board and Finance	$0	$0	$0
20	Aboriginal Relations	$0	$0	$0
21				
22	Grand Total	$2,689,174	$3,730,537	$6,419,711

27) As is usually the case with data, it's time for some cleaning. Delete the first row. Replace the "Row Labels" title with "Ministry". Delete the "Grand Total" column.

	A	B	C
1	Ministry	2012	2013
2	Justice and Solicitor General	$65,039	$866,243
3	Executive Council	$785,938	$130,084
4	Energy	$97,868	$584,492
5	Agriculture and Rural Development	$200,211	$335,835
6	International and Intergovernmental Relations	$181,374	$314,484
7	Human Services	$440,777	$54,688
8	Education	$478,777	$0
9	Infrastructure	$48,304	$336,804
10	Enterprise and Advanced Education	$130,079	$233,343
11	Environment and Sustainable Resource Development	$0	$360,407
12	Tourism, Parks and Recreation	$105,464	$172,805
13	Municipal Affairs	$0	$235,236
14	Transportation	$155,344	$0
15	Health	$0	$66,118
16	Service Alberta	$0	$40,000
17	Culture	$0	$0
18	Treasury Board and Finance	$0	$0
19	Aboriginal Relations	$0	$0
20			
21	Grand Total	$2,689,174	$3,730,537

28) We'll calculate the percent change in column D. So let's call it "Percent Change", and use the percent change formula (=(NEW NUMBER-OLD NUMBER)/OLD NUMBER), format the number as

percent, and then copy the formula to the bottom of the table.

	D2	▼	f_x =(C2-B2)/B2	

	A	B	C	D
1	Ministry	2012	2013	Percent Change
2	Justice and Solicitor General	$65,039	$866,243	1231.9%
3	Executive Council	$785,938	$130,084	-83.4%
4	Energy	$97,868	$584,492	497.2%
5	Agriculture and Rural Development	$200,211	$335,835	67.7%
6	International and Intergovernmental Relations	$181,374	$314,484	73.4%
7	Human Services	$440,777	$54,688	-87.6%
8	Education	$478,777	$0	-100.0%
9	Infrastructure	$48,304	$336,804	597.3%
10	Enterprise and Advanced Education	$130,079	$233,343	79.4%
11	Environment and Sustainable Resource Development	$0	$360,407	#DIV/0!
12	Tourism, Parks and Recreation	$105,464	$172,805	63.9%
13	Municipal Affairs	$0	$235,236	#DIV/0!
14	Transportation	$155,344	$0	-100.0%
15	Health	$0	$66,118	#DIV/0!
16	Service Alberta	$0	$40,000	#DIV/0!
17	Culture	$0	$0	#DIV/0!
18	Treasury Board and Finance	$0	$0	#DIV/0!
19	Aboriginal Relations	$0	$0	#DIV/0!
20				#DIV/0!
21	Grand Total	$2,689,174	$3,730,537	38.7%
22				

29) You'll notice the error messages in a number of rows Excel produces an error when you ask it to divide by zero. For the purposes of this exercise, let's only concern ourselves with ministries that paid out severances in 2012 and 2013. However, before we de-select the rows, or records, containing the error values, delete the error value just above the grand total number in cell D21. Remember, we always keep rows with totals, averages, sums, etc., separate from the table so

that value remains excluded with sorting.

Ministry	20	20	Percent Chang
Justice and Solicitor General	$65,039	$866,243	1231.9%
Executive Council	$785,938	$130,084	-83.4%
Energy	$97,868	$584,492	497.2%
Agriculture and Rural Development	$200,211	$335,835	67.7%
International and Intergovernmental Relations	$181,374	$314,484	73.4%
Human Services	$440,777	$54,688	-87.6%
Education	$478,777	$0	-100.0%
Infrastructure	$48,304	$336,804	597.3%
Enterprise and Advanced Education	$130,079	$233,343	79.4%
Environment and Sustainable Resource Development	$0	$360,407	#DIV/0!
Tourism, Parks and Recreation	$105,464	$172,805	63.9%
Municipal Affairs	$0	$235,236	#DIV/0!
Transportation	$155,344	$0	-100.0%
Health	$0	$66,118	#DIV/0!
Service Alberta	$0	$40,000	#DIV/0!
Culture	$0	$0	#DIV/0!
Treasury Board and Finance	$0	$0	#DIV/0!
Aboriginal Relations	$0	$0	#DIV/0!
Grand Total	$2,689,174	$3,730,537	38.7%

30) Now we can use the filter to de-select the rows with the percent change cells containing error values.

	A	B	C	D
1	Ministry	20	20	Percent Chang
2	Justice and Solicitor General	$65,039	$866,243	1231.9%
3	Executive Council	$785,938	$130,084	-83.4%
4	Energy	$97,868	$584,492	497.2%
5	Agriculture and Rural Development	$200,211	$335,835	67.7%
6	International and Intergovernmental Relations	$181,374	$314,484	73.4%
7	Human Services	$440,777	$54,688	-87.6%
8	Education	$478,777	$0	-100.0%
9	Infrastructure	$48,304	$336,804	597.3%
10	Enterprise and Advanced Education	$130,079	$233,343	79.4%
12	Tourism, Parks and Recreation	$105,464	$172,805	63.9%
14	Transportation	$155,344	$0	-100.0%
20				
21	Grand Total	$2,689,174	$3,730,537	38.7%

31) Sort the column D in descending order.

	A	B	C	D
1	Ministry	20	20	Percent Chan
2	Justice and Solicitor General	$65,039	$866,243	1231.9%
3	Infrastructure	$48,304	$336,804	597.3%
4	Energy	$97,868	$584,492	497.2%
5	Enterprise and Advanced Education	$130,079	$233,343	79.4%
6	International and Intergovernmental Relations	$181,374	$314,484	73.4%
7	Agriculture and Rural Development	$200,211	$335,835	67.7%
8	Tourism, Parks and Recreation	$105,464	$172,805	63.9%
9	Executive Council	$785,938	$130,084	-83.4%
10	Human Services	$440,777	$54,688	-87.6%
12	Education	$478,777	$0	-100.0%
14	Transportation	$155,344	$0	-100.0%
20				
21	Grand Total	$2,689,174	$3,730,537	38.7%

32) So the Justice and Solicitor General ministry's severance payments increased by 1231.9 percent from 2012 to 2013. This isn't a very conversational way of expressing the percent change. Let's use a ratio where we divide the old number into the new one. In this case, the 2012 number into the 2013 number.

33) Label cell E1 "Ratio", and plug in the NEW NUMBER/OLD NUMBER formula.

SUM   X ✓ ƒ✗ =C2/B2

	A	B	C	D	E
1	Ministry	20	20	Percent Chan	Ratio
2	Justice and Solicitor General	$65,039	$866,243	1231.9%	=C2/B2

34) Hit "Enter", re-format the value as a number with one decimal point, and copy the formula to the bottom.

	A	B	C	D	E
1	Ministry	20	20	Percent Chan	Ratio
2	Justice and Solicitor General	$65,039	$866,243	1231.9%	13.3
3	Infrastructure	$48,304	$336,804	597.3%	7.0
4	Energy	$97,868	$584,492	497.2%	6.0
5	Enterprise and Advanced Education	$130,079	$233,343	79.4%	1.8
6	International and Intergovernmental Relations	$181,374	$314,484	73.4%	1.7
7	Agriculture and Rural Development	$200,211	$335,835	67.7%	1.7
8	Tourism, Parks and Recreation	$105,464	$172,805	63.9%	1.6
9	Executive Council	$785,938	$130,084	-83.4%	0.2
10	Human Services	$440,777	$54,688	-87.6%	0.1
12	Education	$478,777	$0	-100.0%	0.0
14	Transportation	$155,344	$0	-100.0%	0.0
20					#DIV/0!
21	Grand Total	$2,689,174	$3,730,537	38.7%	1.4

35) Delete the error message in cell E20.

	A	B	C	D	E
1	Ministry ▾	20 ▾	20 ▾	Percent Chan ▾	Ratio
2	Justice and Solicitor General	$65,039	$866,243	1231.9%	13.3
3	Infrastructure	$48,304	$336,804	597.3%	7.0
4	Energy	$97,868	$584,492	497.2%	6.0
5	Enterprise and Advanced Education	$130,079	$233,343	79.4%	1.8
6	International and Intergovernmental Relations	$181,374	$314,484	73.4%	1.7
7	Agriculture and Rural Development	$200,211	$335,835	67.7%	1.7
8	Tourism, Parks and Recreation	$105,464	$172,805	63.9%	1.6
9	Executive Council	$785,938	$130,084	-83.4%	0.2
10	Human Services	$440,777	$54,688	-87.6%	0.1
12	Education	$478,777	$0	-100.0%	0.0
14	Transportation	$155,344	$0	-100.0%	0.0
20					
21	Grand Total	$2,689,174	$3,730,537	38.7%	1.4

36) Because we've already sorted the percent change column in descending order, there's need to do so for the values in column E.

37) So what we've done is use a ratio that allows us to express the percent change in more conversational terms. We can now say that the total severance payout for the Justice and Solicitor General ministry increase slightly more than 13 times or 13-fold, from 2012 to 2013. For Infrastructure, the increase was seven –fold, Energy six-fold, and so on. The increase in the overall payout was 38.7 percent, or almost 40 percent. You'll notice that I used the percent to express the overall percent change. That's because unless we can say that something doubled (100 percent) or tripled (200 percent), it makes more sense to use a percent, allowing is to say that that overall severance payout was 40 percent higher in 2013 compared to the previous year.

38) Why was the Justice and Solicitor General's percent change so high? For that matter, we could ask the same questions about the Infrastructure and Energy ministries.

39) Using the same methodology, let's create another pivot table to find out which employee's "Total Salary" increased the sharpest from 2012 to 2013. There's a nasty surprise, which we'll see in a minute.

40) To do so, let's return to the WorkingCopy worksheet, and turn off the filter (double clicking on the filter icon is one way to clear the filter) if it's still activated.

41) Because we don't have the employee names, we'll have to be creative. This means combining the information in the "Ministry", "Position Title" and "PositionClass" columns into a new column that can hopefully be grouped in a new pivot table. (**NOTE:** You can create many pivot tables in a single Excel workbook.)

42) Insert a column to the left of the BaseSalary column, and call it "Position_New".

43) We'll use the ampersand symbol (&), the character that Excel uses to combine the values in the three fields we've discussed.

	A	B	C	D	E	F
1	Ministry	Year	PositionTitle	PositionClass	Position_New	BaseSalary
2	Executive Council	2013	DM, Executive Council	Senior Official	=A2&C2&D2	$342,631

SUM — =A2&C2&D2

44) Hit the enter key to get the result, and expand the cell's width to see the result.

E2 — =A2&C2&D2

	A	B	C	D	E
1	Ministry	Year	PositionTitle	PositionClass	Position_New
2	Executive Council	2013	DM, Executive Council	Senior Official	Executive CouncilDM, Executive CouncilSenior Official

45) Hmmmm! Hard to read, isn't it?

46) We need to insert spaces and commas and spaces so the result reads "Executive Council, DM, Executive Council, Senior Official.

47) To do this, we must put a comma and space between quotation marks, as you can see in this formula.

SUM — =A2&", "&C2&", "&D2

	A	B	C	D	E	F
1	Ministry	Year	PositionTitle	PositionClass	Position_New	BaseSalary
2	Executive Council	2013	DM, Executive Council	Senior Official	=A2&", "&C2&", "&D2	$342,631

48) Now when you hit enter, the result will be easier to decipher.

E2 — =A2&", "&C2&", "&D2

	A	B	C	D	E	F
1	Ministry	Year	PositionTitle	PositionClass	Position_New	BaseS
2	Executive Council	2013	DM, Executive Council	Senior Official	Executive Council, DM, Executive Council, Senior Official	$342,

49) Copy the formula to the bottom, and be sure to use the vertical scroll bar to ensure the Excel has filled in all the cells.

E2 — =A2&", "&C2&", "&D2

	A	B	C	D	E
1	Ministry	Year	PositionTitle	PositionClass	Position_New
2	Executive Council	2013	DM, Executive Council	Senior Official	Executive Council, DM, Executive Council, Senior Official
3	Executive Council	2012	DM, Executive Council	Senior Official	Executive Council, DM, Executive Council, Senior Official
4	Health	2012	Deputy Minister	Senior Official	Health , Deputy Minister, Senior Official
5	Infrastructure	2013	Deputy Minister, Infra.	Senior Official	Infrastructure, Deputy Minister, Infra., Senior Official
6	Human Services	2012	DM Human Services	Senior Official	Human Services, DM Human Services, Senior Official
7	Human Services	2013	DM Human Services	Senior Official	Human Services, DM Human Services, Senior Official
8	Energy	2012	Deputy Minister, Energy	Senior Official	Energy, Deputy Minister, Energy, Senior Official
9	Municipal Affairs	2013	Deputy Minister	Senior Official	Municipal Affairs, Deputy Minister, Senior Official
10	Executive Council	2013	Public Service Commissioner	Senior Official	Executive Council, Public Service Commissioner, Senior Official
11	Aboriginal Relations	2013	Deputy Minister	Senior Official	Aboriginal Relations, Deputy Minister, Senior Official
12	Culture	2013	Deputy Minister	Senior Official	Culture, Deputy Minister, Senior Official
13	Justice and Solicitor General	2013	Deputy Solicitor General	Senior Official	Justice and Solicitor General, Deputy Solicitor General, Senior Official
14	Service Alberta	2013	Deputy Minister	Senior Official	Service Alberta, Deputy Minister, Senior Official
15	Tourism, Parks and Recreation	2013	Deputy Minister	Senior Official	Tourism, Parks and Recreation, Deputy Minister, Senior Official
16	Treasury Board and Finance	2013	Deputy Minister	Senior Official	Treasury Board and Finance, Deputy Minister, Senior Official
17	Environment and Sustainable Resour	2013	CEO Environmental Monitoring	Senior Official	Environment and Sustainable Resource Development, CEO Environme
18	Justice and Solicitor General	2012	Deputy Solicitor General	Senior Official	Justice and Solicitor General, Deputy Solicitor General, Senior Official
19	Culture	2012	Deputy Minister	Senior Official	Culture, Deputy Minister, Senior Official
20	Education	2012	Deputy Minister	Senior Official	Education, Deputy Minister, Senior Official
21	Aboriginal Relations	2012	Deputy Minister	Senior Official	Aboriginal Relations, Deputy Minister, Senior Official
22	Infrastructure	2012	Deputy Minister, Infra.	Senior Official	Infrastructure, Deputy Minister, Infra., Senior Official
23	International and Intergovernmental	2012	Deputy Minister	Senior Official	International and Intergovernmental Relations, Deputy Minister, Seni
24	Municipal Affairs	2012	Deputy Minister	Senior Official	Municipal Affairs, Deputy Minister, Senior Official
25	Tourism, Parks and Recreation	2012	Deputy Minister	Senior Official	Tourism, Parks and Recreation, Deputy Minister, Senior Official
26	Treasury Board and Finance	2012	Deputy Minister	Senior Official	Treasury Board and Finance, Deputy Minister, Senior Official
27	Environment and Sustainable Resour	2013	Deputy Minister	Senior Official	Environment and Sustainable Resource Development, Deputy Ministe
28	Environment and Sustainable Resour	2012	Deputy Minister	Senior Official	Environment and Sustainable Resource Development, Deputy Ministe

50) Now let's create a new pivot table. You might have to "refresh" the pivot table to make the new column appear.

	A	B	C	D
1				
2				
3	**Sum of Total Salary**	**Column Labels** ▾		
4	**Row Labels** ▾	**2012**	**2013**	**Grand Total**
5	Justice and Solicitor General, Barrister and Solicitor, Senior Manager	$18,434,021.2	$19,899,091.0	$38,333,112.2
6	Human Services, Senior Manager, Senior Manager	$5,534,243.1	$4,833,599.5	$10,367,842.6
7	Justice and Solicitor General, Barrister and Solicitor, Manager	$4,318,702.5	$5,594,950.8	$9,913,653.3
8	Human Services, Manager, Manager	$4,500,534.4	$4,869,360.6	$9,369,895.0
9	Justice and Solicitor General, Director, Senior Manager	$3,651,056.2	$4,318,020.2	$7,969,076.4
10	Justice and Solicitor General, Deputy Director, Manager	$2,357,786.7	$3,217,922.3	$5,575,709.1
11	Justice and Solicitor General, Legal Counsel, Senior Manager	$2,766,637.6	$2,767,885.5	$5,534,523.1
12	Agriculture and Rural Development, Branch Head, Senior Manager	$2,872,783.5	$2,480,026.6	$5,352,810.1
13	Infrastructure, Project Manager, Manager	$1,729,594.9	$3,000,290.5	$4,729,885.4
14	Human Services, Hearing Chair-Appeals Commiss, Senior Official	$2,325,011.0	$2,385,227.9	$4,710,238.8
15	Justice and Solicitor General, Executive Director, Executive Manager 1	$2,250,658.5	$2,191,498.7	$4,442,157.2
16	Infrastructure, Facilities Manager, Manager	$1,955,125.8	$1,985,891.6	$3,941,017.5
17	Agriculture and Rural Development, Executive Director, Executive Manager 1	$2,046,508.8	$1,249,247.2	$3,295,755.9
18	Transportation, Operations Manager, Senior Manager	$1,438,818.2	$1,549,532.0	$2,988,350.2
19	Infrastructure, Senior Project Manager, Senior Manager	$1,558,769.1	$1,413,749.0	$2,972,518.1
20	Human Services, Service Delivery Mgr, Manager	$1,442,745.7	$1,447,251.8	$2,889,997.5

51) Hmmmm! We have another problem to which I allude earlier. It turns out that there are many individuals with similar titles. Let me show you what I mean. If we return to the working copy worksheet, and filter for the new title in row five in the pivot table above, you'll get this result.

A1 ▾ fx Ministry

	A	B	C	D	E	F
1	Ministry ▾	Yea ▾	PositionTitle ▾	PositionClass ▾	Position_New ▾	BaseSal ▾
245	Justice and Solicitor General	2013	Barrister & Solicitor	Senior Manager	Justice and Solicitor General, Barrister & Solicitor, Senior Manager	$173,765
326	Justice and Solicitor General	2013	Barrister & Solicitor	Senior Manager	Justice and Solicitor General, Barrister & Solicitor, Senior Manager	$165,268
788	Justice and Solicitor General	2013	Barrister & Solicitor	Senior Manager	Justice and Solicitor General, Barrister & Solicitor, Senior Manager	$152,388
1153	Justice and Solicitor General	2013	Barrister & Solicitor	Senior Manager	Justice and Solicitor General, Barrister & Solicitor, Senior Manager	$161,221
6386						

52) There were four individuals in 2013 who occupied the same title. This is probably why the Alberta government didn't want to provide names in that csv file we downloaded in the first tutorial. So while we can create a new position column, we can't group it in a pivot table to figure out whose pay rose the fastest from 2012 to 2013. Still, these last few steps where we used the ampersand to combine values in a number of fields is still useful, because we'll be using this method to create address columns allowing us to use Google to create Fusion Tables.

53) Now that you've learned how to create a pivot table, think of other combinations and groupings you can use in new pivot tables. For instance, which ministries paid out the highest cash and non-case benefits?

54) Practice! Practice! Practice!