User exploration

1. Basic operation example

1.1 Group 1

In the cellset, there is some inventory information of liquor， The record of liquor is already sorted by type. In this case, it is required to group them by type, as shown in the below cellset：

0	1		A	B	C	D	E	F
1-		1	Type	Liquor	Stock			
	1	2	Brandy	Hennessy	783			
	1	3	Brandy	Conjure	583			
	1	4	Brandy	Chatelle	665			
	1	5	Brandy	St Remy	135			
	1	6	Cordials	Drambuie	84			
	1	7	Cordials	Baileys	434			
	1	8	Cordials	Kahlua	220			
	1	9	Gin	Gilbeys	278			
	1	10	Gin	Gordons	287			
	1	11	Whisky	Dewar's	215			
	1	12	Whisky	Chivas	43			

The operation procedure is given below:

1) Select the cell of type, for example A10

2) On any record of liquor to perform the grouping operation

0	1	2		A	B	C	D	E	F
1-			1	Type	Liquor	Stock			
	1-		2	Brandy					
		1	3	Brandy	Hennessy	783			
		1	4	Brandy	Conjure	583			
		1	5	Brandy	Chatelle	665			
		1	6	Brandy	St Remy	135			
	1-		7	Cordials					
		1	8	Cordials	Drambuie	84			
		1	9	Cordials	Baileys	434			
		1	10	Cordials	Kahlua	220			
	1-		11	Gin					
		1	12	Gin	Gilbeys	278			
		1	13	Gin	Gordons	287			
	1-		14	Whisky					
		1	15	Whisky	Dewar's	215			
		1	16	Whisky	Chivas	43			

After grouping, a new level of type is added. The grouping row of this type will be added

before each type.

1.2 Group 2

This calculation cellset records the average temperature of a region of each month in a year,the temperature record of each month is arranged unorderedly,and they are required to be grouped by quarter.

0	1		A	B	C	D	E	F
1-		1	**Quarter**	**Month**	**High(°F)**	**Low(°F)**		
	1	2	**1**	**1**	**69**	**50**		
	1	3	**1**	**3**	**71**	**53**		
	1	4	**2**	**4**	**73**	**55**		
	1	5	**4**	**10**	**79**	**60**		
	1	6	**3**	**8**	**85**	**66**		
	1	7	**4**	**11**	**73**	**54**		
	1	8	**4**	**12**	**68**	**49**		
	1	9	**3**	**9**	**84**	**65**		
	1	10	**3**	**7**	**84**	**65**		
	1	11	**2**	**5**	**75**	**59**		
	1	12	**1**	**2**	**69**	**51**		
	1	13	**2**	**6**	**79**	**62**		

The operation procedure is given below:

1) Select the cell of quarter, for example A7.

2) On any temperature record to perform the grouping operation.

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		
	1-		2	1					
		1	3	1	1	69	50		
		1	4	1	3	71	53		
		1	5	1	2	69	51		
	1-		6	2					
		1	7	2	4	73	55		
		1	8	2	5	75	59		
		1	9	2	6	79	62		
	1-		10	3					
		1	11	3	9	84	65		
		1	12	3	7	84	65		
		1	13	3	8	85	66		
	1-		14	4					
		1	15	4	10	79	60		
		1	16	4	11	73	54		
		1	17	4	12	68	49		

Before grouping, the rows at the same level will be sorted according to the cell values in the selected cells in ascending order.

1.3 Dismantle Master Row

Open the grouped temperature data cellset in the **Group2 1.2** again,then, dismantle the grouping row of each quarter as required. The cellset will be as shown below：

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		
	1-		2	1					
		1	3	1	1	69	50		
		1	4	1	3	71	53		
		1	5	1	2	69	51		
	1-		6	2					
		1	7	2	4	73	55		
		1	8	2	5	75	59		
		1	9	2	6	79	62		
	1-		10	3					
		1	11	3	9	84	65		
		1	12	3	7	84	65		
		1	13	3	8	85	66		
	1-		14	4					
		1	15	4	10	79	60		
		1	16	4	11	73	54		
		1	17	4	12	68	49		

The operation procedure is given below:

1) Select any cell, for example C14

2) In the grouping row to dismantle the master row

0	1		A	B	C	D	E	F
1-		1	Quarter	Month	High(°F)	Low(°F)		
	1	2	1	1	69	50		
	1	3	1	3	71	53		
	1	4	1	2	69	51		
	1	5	2	4	73	55		
	1	6	2	5	75	59		
	1	7	2	6	79	62		
	1	8	3	9	84	65		
	1	9	3	7	84	65		
	1	10	3	8	85	66		
	1	11	4	10	79	60		
	1	12	4	11	73	54		
	1	13	4	12	68	49		

Dismantling the master row, in which the grouping level can be deleted, can be regarded as the reverse operation of grouping. One thing to note is that the row of data in each group will be arranged in their original order in the group. If the positions of each row have changed in the sorting before grouping, then it is unrevertable.

1.4 Calculation in a Same Row

The calculation cellset has recorded the data of some soccer team in a soccer match, and grouped them according to the group to which the team belongs.In this case, it is required to calculate the points of each team based on the scores of group round robin with 3 points for a win and 1 point for a loss.

0	1	2		A	B	C	D	E	F
1-			1	Group	Team	W	D	L	
	1-		2	Group B					
		1	3	Group B	ARG	3	0	0	
		1	4	Group B	GRE	1	0	2	
		1	5	Group B	KOR	1	1	1	
		1	6	Group B	NGR	0	1	2	
	1-		7	Group G					
		1	8	Group G	BRA	2	1	0	
		1	9	Group G	CIV	1	1	1	
		1	10	Group G	POR	1	2	0	
		1	11	Group G	PRK	0	0	3	

In this case, it is required to calculate the points of each team based on the scores of group round robin with 3 points for a win and 1 point for a loss.

1) input the expression =C3*3+D3 in F3

0	1	2		A	B	C	D	E	F
1-			1	Group	Team	W	D	L	
	1-		2	Group B					
		1	3	Group B	ARG	3	0	0	9
		1	4	Group B	GRE	1	0	2	3
		1	5	Group B	KOR	1	1	1	4
		1	6	Group B	NGR	0	1	2	1
	1-		7	Group G					
		1	8	Group G	BRA	2	1	0	7
		1	9	Group G	CIV	1	1	1	4
		1	10	Group G	POR	1	2	0	5
		1	11	Group G	PRK	0	0	3	0

All expressions in the homocells will be set and modified at the same time. The expression will auto-adjust in each homocell according to the position.

1.5 Aggregate Calculation

In the calculation cellset, the salary data of employees from each department of a company is recorded, and the data is grouped by department. In the desired grouping row, make statistics on the number of employees in each department, and total their salaries.

0	1	2		A	B	C	D	E	F
1-			1	Department	Name	Gender	Salary		
	1-		2	Finance					
		1	3	Finance	Ashley	Female	11000		
		1	4	Finance	Daniel	Male	10000		
	1-		5	R&D					
		1	6	R&D	Alexis	Female	5000		
		1	7	R&D	Megan	Female	10000		
		1	8	R&D	Victoria	Female	7000		
		1	9	R&D	Jacob	Male	16000		
	1-		10	Sale					
		1	11	Sale	Samantha	Female	6500		
		1	12	Sale	Jonathan	Male	8000		

In the desired grouping row, make statistics on the number of employees in each department, and total their salaries.

1) Type in the expression ={B11}.count() in B10.
2) 2) The expression ={D11}.sum() in D10.

0	1	2		A	B	C	D	E	F
1-			1	Department	Name	Gender	Salary		
	1-		2	Finance	2		21000		
		1	3	Finance	Ashley	Female	11000		
		1	4	Finance	Daniel	Male	10000		
	1-		5	R&D	4		38000		
		1	6	R&D	Alexis	Female	5000		
		1	7	R&D	Megan	Female	10000		
		1	8	R&D	Victoria	Female	7000		
		1	9	R&D	Jacob	Male	16000		
	1-		10	Sale	2		14500		
		1	11	Sale	Samantha	Female	6500		
		1	12	Sale	Jonathan	Male	8000		

The corresponding homocells in the grouping row will be set and modified at the same time. The expression will be auto-adjusted in multiple homocells depending on its positions.

1.6 Calculation Across Row

In the calculation cellset esCalc_e05.gex, there is some population data of some cities arranged in descending order. To calculate the population difference of the current city and the next ranking city.

0	1		A	B	C	D	E	F
1-		1	City	Population	State			
	1	2	New York	8250567	New York			
	1	3	Los Angeles	3849368	California			
	1	4	Chicago	2873326	Illinois			
	1	5	Houston	2144491	Texas			
	1	6	Phoenix	1512986	Arizona			
	1	7	Philadelphia	1448396	Pennsylvania			
	1	8	San Antonio	1296682	Texas			
	1	9	San Diego	1256951	California			
	1	10	Dallas	1232940	Texas			
	1	11	San Jose	929936	California			

To calculate the population difference of the current city and the next ranking city

1) Type in the expression =B2-B3 in the D2.

0	1		A	B	C	D	E	F
1-		1	City	Population	State			
	1	2	New York	8250567	New York	4401199		
	1	3	Los Angeles	3849368	California	976042		
	1	4	Chicago	2873326	Illinois	728835		
	1	5	Houston	2144491	Texas	631505		
	1	6	Phoenix	1512986	Arizona	64590		
	1	7	Philadelphia	1448396	Pennsylvania	151714		
	1	8	San Antonio	1296682	Texas	39731		
	1	9	San Diego	1256951	California	24011		
	1	10	Dallas	1232940	Texas	303004		
	1	11	San Jose	929936	California	929936		

All expressions in the homocells will be set and modified at the same time. The expression will auto adjust according to the position.

1.7 Normal Sorting

In the calculation cellset, the information of players in a soccer team is recorded，In this case, it is required to sort by weight descendingly.

0	1		A	B	C	D	E	F
1-		1	Name	HT	WT	Age		
	1	2	Jim Hope	6'4	240	21		
	1	3	David Owen	6'4	230	27		
	1	4	Todd Hunter	6'2	225	27		
	1	5	Derek Jones	6'3	195	28		
	1	6	Joe Malan	6'5	235	19		
	1	7	Ivan Shaw	5'11	170	29		
	1	8	Paul Kelvin	6'2	220	26		
	1	9	Carl Coffey	6'2	215	21		
	1	10	Max Conan	5'4	180	19		
	1	11	John Buck	6'3	230	22		
	1	12	Van Gill	6'3	235	27		
	1	13	Victor Will	6'1	230	23		

In this case, it is required to sort by weight descendingly.

1) Select any cell of weight, for example C4, to sort in descending order.

0	1		A	B	C	D	E	F
1-		1	Name	HT	WT	Age		
	1	2	Jim Hope	6'4	240	21		
	1	3	Joe Malan	6'5	235	19		
	1	4	Van Gill	6'3	235	27		
	1	5	David Owen	6'4	230	27		
	1	6	John Buck	6'3	230	22		
	1	7	Victor Will	6'1	230	23		
	1	8	Todd Hunter	6'2	225	27		
	1	9	Paul Kelvin	6'2	220	26		
	1	10	Carl Coffey	6'2	215	21		
	1	11	Derek Jones	6'3	195	28		
	1	12	Max Conan	5'4	180	19		
	1	13	Ivan Shaw	5'11	170	29		

Because you cannot simply compare the character strings in the data when comparing the height, you should convert the height to the value in inches and then sort.

2) add the expression =int(left(B2,1))*12+int(mid(B2,3)) in E2

0	1		A	B	C	D	E	F
1-		1	Name	HT	WT	Age		
	1	2	Jim Hope	6'4	240	21	76	
	1	3	Joe Malan	6'5	235	19	77	
	1	4	Van Gill	6'3	235	27	75	
	1	5	David Owen	6'4	230	27	76	
	1	6	John Buck	6'3	230	22	75	
	1	7	Victor Will	6'1	230	23	73	
	1	8	Todd Hunter	6'2	225	27	74	
	1	9	Paul Kelvin	6'2	220	26	74	
	1	10	Carl Coffey	6'2	215	21	74	
	1	11	Derek Jones	6'3	195	28	75	
	1	12	Max Conan	5'4	180	19	64	
	1	13	Ivan Shaw	5'11	170	29	71	

3) Then, select E2 again and sort ascendingly. Sort the information of team player by height ascendingly.

0	1		A	B	C	D	E	F
1-		1	Name	HT	WT	Age		
	1	2	Max Conan	5'4	180	19	64	
	1	3	Ivan Shaw	5'11	170	29	71	
	1	4	Victor Will	6'1	230	23	73	
	1	5	Todd Hunter	6'2	225	27	74	
	1	6	Paul Kelvin	6'2	220	26	74	
	1	7	Carl Coffey	6'2	215	21	74	
	1	8	Van Gill	6'3	235	27	75	
	1	9	John Buck	6'3	230	22	75	
	1	10	Derek Jones	6'3	195	28	75	
	1	11	Jim Hope	6'4	240	21	76	
	1	12	David Owen	6'4	230	27	76	
	1	13	Joe Malan	6'5	235	19	77	

1.8 Sort the Grouping Row

Reopen the **Group1 1.1**, group the liquor inventory information cellset,Although the cellset will be sorted automatically in ascending order before grouping, it is required to sort by type in descending order in this case.

0	1	2		A	B	C	D	E	F
1-			1	Type	Liquor	Stock			
	1-		2	Brandy					
		1	3	Brandy	Hennessy	783			
		1	4	Brandy	Conjure	583			
		1	5	Brandy	Chatelle	665			
		1	6	Brandy	St Remy	135			
	1-		7	Cordials					
		1	8	Cordials	Drambuie	84			
		1	9	Cordials	Baileys	434			
		1	10	Cordials	Kahlua	220			
	1-		11	Gin					
		1	12	Gin	Gilbeys	278			
		1	13	Gin	Gordons	287			
	1-		14	Whisky					
		1	15	Whisky	Dewar's	215			
		1	16	Whisky	Chivas	43			

Although the cellset will be sorted automatically in ascending order before grouping, it is required to sort by type in descending order in this case.

1) To do this, select any cell of type, for example A11, in the grouping row to sort descendingly.

0	1	2		A	B	C	D	E	F
1-			1	Type	Liquor	Stock			
	1-		2	Whisky					
		1	3	Whisky	Dewar's	215			
		1	4	Whisky	Chivas	43			
	1-		5	Gin					
		1	6	Gin	Gilbeys	278			
		1	7	Gin	Gordons	287			
	1-		8	Cordials					
		1	9	Cordials	Drambuie	84			
		1	10	Cordials	Baileys	434			
		1	11	Cordials	Kahlua	220			
	1-		12	Brandy					
		1	13	Brandy	Hennessy	783			
		1	14	Brandy	Conjure	583			
		1	15	Brandy	Chatelle	665			
		1	16	Brandy	St Remy	135			

Sort on the grouping row and the record in each group will be moved along with the grouping row.

1.9 Normal Filter

Let's reconsider the calculation cellset in which the salary data of employees in each department of a company is recorded and grouped by department. In this case, it is required to only keep the female employee information in this cellset.

0	1	2		A	B	C	D	E	F
1-			1	Department	Name	Gender	Salary		
	1-		2	Finance					
		1	3	Finance	Ashley	Female	11000		
		1	4	Finance	Daniel	Male	10000		
	1-		5	R&D					
		1	6	R&D	Alexis	Female	5000		
		1	7	R&D	Megan	Female	10000		
		1	8	R&D	Victoria	Female	7000		
		1	9	R&D	Jacob	Male	16000		
	1-		10	Sale					
		1	11	Sale	Samantha	Female	6500		
		1	12	Sale	Jonathan	Male	8000		

1) Select and filter on C3 to only keep the row at the same level of which the homocell value is same to the C3 value. In this way, you can only keep the female information.

0	1	2		A	B	C	D	E	F
1-			1	Department	Name	Gender	Salary		
	1-		2	Finance					
		1	3	Finance	Ashley	Female	11000		
	1-		4	R&D					
		1	5	R&D	Alexis	Female	5000		
		1	6	R&D	Megan	Female	10000		
		1	7	R&D	Victoria	Female	7000		
	1-		8	Sale					
		1	9	Sale	Samantha	Female	6500		

1.10 Filter after Adding Expression

Open the calculation cellset in which the box office information of some movies is stored.In this case, it is required to only keep the movie whose box offices are higher than $200,000,000.

0	1		A	B	C	D	E	F
1-		1	Title	Studio	Total Gross			
	1	2	Cars 2	BV	191452396			
	1	3	Fast Five	Uni.	209837675			
	1	4	Hangover	WB	254464305			
	1	5	Harry Potter	WB	381011219			
	1	6	Mission	Par.	209397903			
	1	7	Pirates	BV	241071802			
	1	8	Sherlock	WB	186848418			
	1	9	Thor	Par.	181030624			
	1	10	Transformers	P/DW	352390543			
	1	11	Twilight Saga	Sum.	281287133			

In this case, it is required to only keep the movie whose box offices are higher than $200,000,000.

1) Judge if any records of box movie meet the requirement in column D.

2) Then filter by setting the expression =C2>200000000 in D2.

0	1		A	B	C	D	E	F
1-		1	Title	Studio	Total Gross			
	1	2	Cars 2	BV	191452396	false		
	1	3	Fast Five	Uni.	209837675	true		
	1	4	Hangover	WB	254464305	true		
	1	5	Harry Potter	WB	381011219	true		
	1	6	Mission	Par.	209397903	true		
	1	7	Pirates	BV	241071802	true		
	1	8	Sherlock	WB	186848418	false		
	1	9	Thor	Par.	181030624	false		
	1	10	Transformers	P/DW	352390543	true		
	1	11	Twilight Saga	Sum.	281287133	true		

3) Select and filter on D3 to only keep the row at the same level of which the homocell value is same to the D3 value. In this way, you can keep the movie information whose box office meets the requirement.

0	1		A	B	C	D	E	F
1-		1	Title	Studio	Total Gross			
	1	2	Fast Five	Uni.	209837675	true		
	1	3	Hangover	WB	254464305	true		
	1	4	Harry Potter	WB	381011219	true		
	1	5	Mission	Par.	209397903	true		
	1	6	Pirates	BV	241071802	true		
	1	7	Transformers	P/DW	352390543	true		
	1	8	Twilight Saga	Sum.	281287133	true		

2. Comprehensive example

2.1 Age Computation and Sorting in Groups

Based on the below esCalc grid holding some employee data, group these employees by gender, and sort the employee age in each group descendingly by the resulting employee age.

0	1		A	B	C	D	E	F
1-		1	NAME	GENDER	STATE	BIRTHDAY	DEPT	
	1	2	Rebecca Moore	F	California	1974-11-20	R&D	
	1	3	Ashley Wilson	F	New York	1980-07-19	Finance	
	1	4	Emily Smith	F	Texas	1985-03-07	HR	
	1	5	Matthew Johnson	M	California	1984-07-07	Sales	
	1	6	Megan Wilson	F	California	1979-04-19	Marketing	
	1	7	Victoria Davis	F	Texas	1983-12-07	HR	
	1	8	Ryan Johnson	M	Pennsylvania	1976-03-12	R&D	
	1	9	Jacob Moore	M	Texas	1974-12-16	Sales	
	1	10	Jessica Davis	F	New York	1980-09-11	Sales	
	1	11	Daniel Davis	M	Florida	1982-05-14	Finance	
	1	12	Alyssa Wilson	F	Florida	1977-12-24	Sales	
	1	13	Christopher Hernandez	M	Florida	1979-06-27	Production	

Operations are given below:

1) Group employee statistics by gender, select B2 to group, and sort before grouping

0	1	2		A	B	C	D	E	F
1-			1	NAME	GENDER	STATE	BIRTHDAY	DEPT	
	1-		2		F				
		1	3	Rebecca Moore	F	California	1974-11-20	R&D	
		1	4	Ashley Wilson	F	New York	1980-07-19	Finance	
		1	5	Emily Smith	F	Texas	1985-03-07	HR	
		1	6	Megan Wilson	F	California	1979-04-19	Marketing	
		1	7	Victoria Davis	F	Texas	1983-12-07	HR	
		1	8	Jessica Davis	F	New York	1980-09-11	Sales	
		1	9	Alyssa Wilson	F	Florida	1977-12-24	Sales	
	1-		10		M				
		1	11	Matthew Johnson	M	California	1984-07-07	Sales	
		1	12	Ryan Johnson	M	Pennsylvania	1976-03-12	R&D	
		1	13	Jacob Moore	M	Texas	1974-12-16	Sales	
		1	14	Daniel Davis	M	Florida	1982-05-14	Finance	
		1	15	Christopher Hernandez	M	Florida	1979-06-27	Production	

2) Compute the age of each employee, and fill the formula =age(D3) in F3

0	1	2		A	B	C	D	E	F
1-			1	NAME	GENDER	STATE	BIRTHDAY	DEPT	
	1-		2		F				
		1	3	Rebecca Moore	F	California	1974-11-20	R&D	39
		1	4	Ashley Wilson	F	New York	1980-07-19	Finance	33
		1	5	Emily Smith	F	Texas	1985-03-07	HR	28
		1	6	Megan Wilson	F	California	1979-04-19	Marketing	34
		1	7	Victoria Davis	F	Texas	1983-12-07	HR	30
		1	8	Jessica Davis	F	New York	1980-09-11	Sales	33
		1	9	Alyssa Wilson	F	Florida	1977-12-24	Sales	36
	1-		10		M				
		1	11	Matthew Johnson	M	California	1984-07-07	Sales	29
		1	12	Ryan Johnson	M	Pennsylvania	1976-03-12	R&D	37
		1	13	Jacob Moore	M	Texas	1974-12-16	Sales	39
		1	14	Daniel Davis	M	Florida	1982-05-14	Finance	31
		1	15	Christopher Hernandez	M	Florida	1979-06-27	Production	34

3) Select F3 and sort descendingly. The records in every group will be sorted.

0	1	2		A	B	C	D	E	F
1-			1	NAME	GENDER	STATE	BIRTHDAY	DEPT	
	1-		2		F				
		1	3	Rebecca Moore	F	California	1974-11-20	R&D	39
		1	4	Alyssa Wilson	F	Florida	1977-12-24	Sales	36
		1	5	Megan Wilson	F	California	1979-04-19	Marketing	34
		1	6	Ashley Wilson	F	New York	1980-07-19	Finance	33
		1	7	Jessica Davis	F	New York	1980-09-11	Sales	33
		1	8	Victoria Davis	F	Texas	1983-12-07	HR	30
		1	9	Emily Smith	F	Texas	1985-03-07	HR	28
	1-		10		M				
		1	11	Jacob Moore	M	Texas	1974-12-16	Sales	39
		1	12	Ryan Johnson	M	Pennsylvania	1976-03-12	R&D	37
		1	13	Christopher Hernandez	M	Florida	1979-06-27	Production	34
		1	14	Daniel Davis	M	Florida	1982-05-14	Finance	31
		1	15	Matthew Johnson	M	California	1984-07-07	Sales	29

2.2 Statistics by group

This esCalc grid records the average temperature of a certain place in a year. Now, we need to collect the statistics on the average temperatures of the place in each month, each quarter and the whole year.

0	1		A	B	C	D	E	F
1-		1	Quarter	Month	High(°F)	Low(°F)		
	1	2	1	1	69	50		
	1	3	1	3	71	53		
	1	4	2	4	73	55		
	1	5	4	10	79	60		
	1	6	3	8	85	66		
	1	7	4	11	73	54		
	1	8	4	12	68	49		
	1	9	3	9	84	65		
	1	10	3	7	84	65		
	1	11	2	5	75	59		
	1	12	1	2	69	51		
	1	13	2	6	79	62		

Operations are given below:

1) Sort the data by month ascendingly

0	1		A	B	C	D	E	F
1-		1	Quarter	Month	High(°F)	Low(°F)		
	1	2	1	1	69	50		
	1	3	1	2	69	51		
	1	4	1	3	71	53		
	1	5	2	4	73	55		
	1	6	2	5	75	59		
	1	7	2	6	79	62		
	1	8	3	7	84	65		
	1	9	3	8	85	66		
	1	10	3	9	84	65		
	1	11	4	10	79	60		
	1	12	4	11	73	54		
	1	13	4	12	68	49		

2) Group by quarter:

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		
	1-		2	1					
		1	3	1	1	69	50		
		1	4	1	2	69	51		
		1	5	1	3	71	53		
	1-		6	2					
		1	7	2	4	73	55		
		1	8	2	5	75	59		
		1	9	2	6	79	62		
	1-		10	3					
		1	11	3	7	84	65		
		1	12	3	8	85	66		
		1	13	3	9	84	65		
	1-		14	4					
		1	15	4	10	79	60		
		1	16	4	11	73	54		
		1	17	4	12	68	49		

3) In the column E following the record of each month, set the formula to compute the average temperature of each month. To do so, set the formula =(C3+D3)/2 in E3

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		
	1-		2	1					
		1	3	1	1	69	50	59.5	
		1	4	1	2	69	51	60.0	
		1	5	1	3	71	53	62.0	
	1-		6	2					
		1	7	2	4	73	55	64.0	
		1	8	2	5	75	59	67.0	
		1	9	2	6	79	62	70.5	
	1-		10	3					
		1	11	3	7	84	65	74.5	
		1	12	3	8	85	66	75.5	
		1	13	3	9	84	65	74.5	
	1-		14	4					
		1	15	4	10	79	60	69.5	
		1	16	4	11	73	54	63.5	
		1	17	4	12	68	49	58.5	

4) In the column F of grouping rows in a quarter, compute the average temperature of each quarter. To do so, set the formula =round({E3}.avg(),2) in F2; and set the formula =round({E3}.avg(),2) in F1 to compute the average temperature of the whole year.

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		66.58
	1-		2	1					60.5
		1	3	1	1	69	50	59.5	
		1	4	1	2	69	51	60.0	
		1	5	1	3	71	53	62.0	
	1-		6	2					67.17
		1	7	2	4	73	55	64.0	
		1	8	2	5	75	59	67.0	
		1	9	2	6	79	62	70.5	
	1-		10	3					74.83
		1	11	3	7	84	65	74.5	
		1	12	3	8	85	66	75.5	
		1	13	3	9	84	65	74.5	
	1-		14	4					63.83
		1	15	4	10	79	60	69.5	
		1	16	4	11	73	54	63.5	
		1	17	4	12	68	49	58.5	

Similarly, you can compute the highest and lowest temperatures and other data alike of each quarter or whole year.

5) Compute the difference between the average temperature of each month and that of the previous month. To do so, set the formula =E17-E16 in F17.

0	1	2		A	B	C	D	E	F
1-			1	Quarter	Month	High(°F)	Low(°F)		66.58
	1-		2	1					60.5
		1	3	1	1	69	50	59.5	59.5
		1	4	1	2	69	51	60.0	0.5
		1	5	1	3	71	53	62.0	2.0
	1-		6	2					67.17
		1	7	2	4	73	55	64.0	2.0
		1	8	2	5	75	59	67.0	3.0
		1	9	2	6	79	62	70.5	3.5
	1-		10	3					74.83
		1	11	3	7	84	65	74.5	4.0
		1	12	3	8	85	66	75.5	1.0
		1	13	3	9	84	65	74.5	-1.0
	1-		14	4					63.83
		1	15	4	10	79	60	69.5	-5.0
		1	16	4	11	73	54	63.5	-6.0
		1	17	4	12	68	49	58.5	-5.0

2.3 Ranking computation

There is some order data in the esCalc grid. Let's find out the data of clients whose total amount of orders ranking among the top 3.

0	1		A	B	C	D	E	F
1-		1	OrderId	Client	SellerId	Amount	OrderDate	
	1	2	9	JAYB	14	17400.0	2011-11-12	
	1	3	12	QUICK	11	21200.0	2011-11-13	
	1	4	13	HL	12	21400.0	2011-11-21	
	1	5	14	JAYB	1	7644.0	2011-11-16	
	1	6	21	DILRT	5	16900.0	2011-11-29	
	1	7	24	FHYBR	8	11800.0	2011-11-24	
	1	8	25	JAYB	17	23400.0	2011-11-29	
	1	9	38	DILRT	12	18300.0	2011-12-15	
	1	10	47	DILRT	17	27200.0	2011-12-24	
	1	11	53	DILRT	5	10400.0	2011-12-26	
	1	12	56	FHYBR	18	26600.0	2011-12-26	
	1	13	70	JAYB	17	6664.0	2011-11-16	
	1	14	72	JAYB	3	6566.0	2011-11-18	

1) Group the order data based on the client name by selecting B2 and then grouping.

0	1	2		A	B	C	D	E	F
1-			1	OrderId	Client	SellerId	Amount	OrderDate	
	1-		2		DILRT				
		1	3	21	DILRT	5	16900.0	2011-11-29	
		1	4	38	DILRT	12	18300.0	2011-12-15	
		1	5	47	DILRT	17	27200.0	2011-12-24	
		1	6	53	DILRT	5	10400.0	2011-12-26	
	1-		7		FHYBR				
		1	8	24	FHYBR	8	11800.0	2011-11-24	
		1	9	56	FHYBR	18	26600.0	2011-12-26	
	1-		10		HL				
		1	11	13	HL	12	21400.0	2011-11-21	
	1-		12		JAYB				
		1	13	9	JAYB	14	17400.0	2011-11-12	
		1	14	14	JAYB	1	7644.0	2011-11-16	
		1	15	25	JAYB	17	23400.0	2011-11-29	
		1	16	70	JAYB	17	6664.0	2011-11-16	
		1	17	72	JAYB	3	6566.0	2011-11-18	
	1-		18		QUICK				
		1	19	12	QUICK	11	21200.0	2011-11-13	

2) Compute the total amount of order for each client by setting the formula ={D3}.sum() in D2

0	1	2		A	B	C	D	E	F
1-			1	OrderId	Client	SellerId	Amount	OrderDate	
	1-		2		DILRT		72800.0		
		1	3	21	DILRT	5	16900.0	2011-11-29	
		1	4	38	DILRT	12	18300.0	2011-12-15	
		1	5	47	DILRT	17	27200.0	2011-12-24	
		1	6	53	DILRT	5	10400.0	2011-12-26	
	1-		7		FHYBR		38400.0		
		1	8	24	FHYBR	8	11800.0	2011-11-24	
		1	9	56	FHYBR	18	26600.0	2011-12-26	
	1-		10		HL		21400.0		
		1	11	13	HL	12	21400.0	2011-11-21	
	1-		12		JAYB		61674.0		
		1	13	9	JAYB	14	17400.0	2011-11-12	
		1	14	14	JAYB	1	7644.0	2011-11-16	
		1	15	25	JAYB	17	23400.0	2011-11-29	
		1	16	70	JAYB	17	6664.0	2011-11-16	
		1	17	72	JAYB	3	6566.0	2011-11-18	
	1-		18		QUICK		21200.0		
		1	19	12	QUICK	11	21200.0	2011-11-13	

3) Sort by the total amount of client order descendingly. To do so, select D2 and sort descendingly.

0	1	2		A	B	C	D	E	F
1-			1	OrderId	Client	SellerId	Amount	OrderDate	
	1-		2		DILRT		72800.0		
		1	3	21	DILRT	5	16900.0	2011-11-29	
		1	4	38	DILRT	12	18300.0	2011-12-15	
		1	5	47	DILRT	17	27200.0	2011-12-24	
		1	6	53	DILRT	5	10400.0	2011-12-26	
	1-		7		JAYB		61674.0		
		1	8	9	JAYB	14	17400.0	2011-11-12	
		1	9	14	JAYB	1	7644.0	2011-11-16	
		1	10	25	JAYB	17	23400.0	2011-11-29	
		1	11	70	JAYB	17	6664.0	2011-11-16	
		1	12	72	JAYB	3	6566.0	2011-11-18	
	1-		13		FHYBR		38400.0		
		1	14	24	FHYBR	8	11800.0	2011-11-24	
		1	15	56	FHYBR	18	26600.0	2011-12-26	
	1-		16		HL		21400.0		
		1	17	13	HL	12	21400.0	2011-11-21	
	1-		18		QUICK		21200.0		
		1	19	12	QUICK	11	21200.0	2011-11-13	

4) In the column F of the grouping row, determine if ranking of the client is among the top 3. To do so, add a formula =#<=3 in F2

0	1	2		A	B	C	D	E	F
1-			1	OrderId	Client	SellerId	Amount	OrderDate	
	1-		2		DILRT		72800.0		true
		1	3	21	DILRT	5	16900.0	2011-11-29	
		1	4	38	DILRT	12	18300.0	2011-12-15	
		1	5	47	DILRT	17	27200.0	2011-12-24	
		1	6	53	DILRT	5	10400.0	2011-12-26	
	1-		7		JAYB		61674.0		true
		1	8	9	JAYB	14	17400.0	2011-11-12	
		1	9	14	JAYB	1	7644.0	2011-11-16	
		1	10	25	JAYB	17	23400.0	2011-11-29	
		1	11	70	JAYB	17	6664.0	2011-11-16	
		1	12	72	JAYB	3	6566.0	2011-11-18	
	1-		13		FHYBR		38400.0		true
		1	14	24	FHYBR	8	11800.0	2011-11-24	
		1	15	56	FHYBR	18	26600.0	2011-12-26	
	1-		16		HL		21400.0		false
		1	17	13	HL	12	21400.0	2011-11-21	
	1-		18		QUICK		21200.0		false
		1	19	12	QUICK	11	21200.0	2011-11-13	

5) At last, perform filtering to remove the unqualified client data by selecting F2 and then filtering.

0	1	2		A	B	C	D	E	F
1-			1	OrderId	Client	SellerId	Amount	OrderDate	
	1-		2		DILRT		72800.0		true
		1	3	21	DILRT	5	16900.0	2011-11-29	
		1	4	38	DILRT	12	18300.0	2011-12-15	
		1	5	47	DILRT	17	27200.0	2011-12-24	
		1	6	53	DILRT	5	10400.0	2011-12-26	
	1-		7		JAYB		61674.0		true
		1	8	9	JAYB	14	17400.0	2011-11-12	
		1	9	14	JAYB	1	7644.0	2011-11-16	
		1	10	25	JAYB	17	23400.0	2011-11-29	
		1	11	70	JAYB	17	6664.0	2011-11-16	
		1	12	72	JAYB	3	6566.0	2011-11-18	
	1-		13		FHYBR		38400.0		true
		1	14	24	FHYBR	8	11800.0	2011-11-24	
		1	15	56	FHYBR	18	26600.0	2011-12-26	

2.4 Compute ranking at anytime

There are some employee data in the esCalc grid. Let's compute the salary ranking of these employees. In the table, data may change so that you may need to update the ranking whenever the change is made.

0	1		A	B	C	D	E	F
1-		1	NAME	GENDER	STATE	DEPT	WAGE	
	1	2	Rebecca Moore	F	California	R&D	7000	
	1	3	Ashley Wilson	F	New York	Finance	11000	
	1	4	Emily Smith	F	Texas	HR	9000	
	1	5	Matthew Johnson	M	California	Sales	7000	
	1	6	Megan Wilson	F	California	Marketing	16000	
	1	7	Victoria Davis	F	Texas	HR	11000	
	1	8	Ryan Johnson	M	Pennsylvania	R&D	9000	
	1	9	Jacob Moore	M	Texas	Sales	11000	
	1	10	Jessica Davis	F	New York	Sales	3000	
	1	11	Daniel Davis	M	Florida	Finance	13000	
	1	12	Alyssa Wilson	F	Florida	Sales	12000	
	1	13	Christopher Hernandez	M	Florida	Production	7000	

Operations are given below:

1) Compute the rankings of each employee. Fill the formula ==\{E2\}.ranki(E2) in F2, and remember to start with two equal signs

0	1		A	B	C	D	E	F
1-		1	NAME	GENDER	STATE	DEPT	WAGE	
	1	2	Rebecca Moore	F	California	R&D	7000	9
	1	3	Ashley Wilson	F	New York	Finance	11000	4
	1	4	Emily Smith	F	Texas	HR	9000	7
	1	5	Matthew Johnson	M	California	Sales	7000	9
	1	6	Megan Wilson	F	California	Marketing	16000	1
	1	7	Victoria Davis	F	Texas	HR	11000	4
	1	8	Ryan Johnson	M	Pennsylvania	R&D	9000	7
	1	9	Jacob Moore	M	Texas	Sales	11000	4
	1	10	Jessica Davis	F	New York	Sales	3000	12
	1	11	Daniel Davis	M	Florida	Finance	13000	2
	1	12	Alyssa Wilson	F	Florida	Sales	12000	3
	1	13	Christopher Hernandez	M	Florida	Production	7000	9

2) Modify the salary of Jacob Moore. For example, change E9 to 18000. You may find that the ranking data in column F is also changed accordingly:

0	1		A	B	C	D	E	F
1-		1	NAME	GENDER	STATE	DEPT	WAGE	
	1	2	Rebecca Moore	F	California	R&D	7000	9
	1	3	Ashley Wilson	F	New York	Finance	11000	5
	1	4	Emily Smith	F	Texas	HR	9000	7
	1	5	Matthew Johnson	M	California	Sales	7000	9
	1	6	Megan Wilson	F	California	Marketing	16000	2
	1	7	Victoria Davis	F	Texas	HR	11000	5
	1	8	Ryan Johnson	M	Pennsylvania	R&D	9000	7
	1	9	Jacob Moore	M	Texas	Sales	18000	1
	1	10	Jessica Davis	F	New York	Sales	3000	12
	1	11	Daniel Davis	M	Florida	Finance	13000	3
	1	12	Alyssa Wilson	F	Florida	Sales	12000	4
	1	13	Christopher Hernandez	M	Florida	Production	7000	9

In the esCalc, the formula starting with single equal sign "=" only compute once on inputting or modifying. Then, the existing data will not be affected when the data is modified or the row is changed in the future. To get the computing result change with the data variation at any time, the formula starting with double equal signs "==" must be used.

2.5 Compute the longest consecutive rising days of a certain stock

There are some data of a certain stock in the esCalc grid. Now, we need to compute the longest consecutive rising days.

	1		A	B	C	D	E	F
1		1	SID	DATE	CLOSING			
	1	2	601988	2009-02-02	2.84			
	1	3	601988	2009-02-03	2.81			
	1	4	601988	2009-02-04	2.55			
	1	5	601988	2009-02-05	2.57			
	1	6	601988	2009-02-06	2.43			
	1	7	601988	2009-02-09	2.25			
	1	8	601988	2009-02-10	2.46			
	1	9	601988	2009-02-11	2.22			
	1	10	601988	2009-02-12	2.36			
	1	11	601988	2009-02-13	2.48			
	1	12	601988	2009-02-16	2.57			
	1	13	601988	2009-02-17	2.64			
	1	14	601988	2009-02-18	2.7			
	1	15	601988	2009-02-19	2.92			
	1	16	601988	2009-02-20	3.03			
	1	17	601988	2009-02-23	2.81			
	1	18	601988	2009-02-24	2.86			
	1	19	601988	2009-02-25	3.07			
	1	20	601988	2009-02-26	3.3			
	1	21	601988	2009-02-27	3.47			

Operations are given below:

1) Compute if the closing price of the stock is rising in a certain day. The stock in the first day is regarded as rising. To do so, fill the formula =C21>C20 in D21.

	1		A	B	C	D	E	F
1		1	SID	DATE	CLOSING			
	1	2	601988	2009-02-02	2.84	true		
	1	3	601988	2009-02-03	2.81	false		
	1	4	601988	2009-02-04	2.55	false		
	1	5	601988	2009-02-05	2.57	true		
	1	6	601988	2009-02-06	2.43	false		
	1	7	601988	2009-02-09	2.25	false		
	1	8	601988	2009-02-10	2.46	true		
	1	9	601988	2009-02-11	2.22	false		
	1	10	601988	2009-02-12	2.36	true		
	1	11	601988	2009-02-13	2.48	true		
	1	12	601988	2009-02-16	2.57	true		
	1	13	601988	2009-02-17	2.64	true		
	1	14	601988	2009-02-18	2.7	true		
	1	15	601988	2009-02-19	2.92	true		
	1	16	601988	2009-02-20	3.03	true		
	1	17	601988	2009-02-23	2.81	false		
	1	18	601988	2009-02-24	2.86	true		
	1	19	601988	2009-02-25	3.07	true		
	1	20	601988	2009-02-26	3.3	true		
	1	21	601988	2009-02-27	3.47	true		

2) Compute the total consecutive rising days to each day. If the stock keeps rising that day, then plus 1 to the total consecutive rising days. Otherwise, reset it to 0. To do so, fill the formula =if(D21,E20+1,0) in E21.

	1		A	B	C	D	E	F
1		1	SID	DATE	CLOSING			
	1	2	601988	2009-02-02	2.84	true	1	
	1	3	601988	2009-02-03	2.81	false	0	
	1	4	601988	2009-02-04	2.55	false	0	
	1	5	601988	2009-02-05	2.57	true	1	
	1	6	601988	2009-02-06	2.43	false	0	
	1	7	601988	2009-02-09	2.25	false	0	
	1	8	601988	2009-02-10	2.46	true	1	
	1	9	601988	2009-02-11	2.22	false	0	
	1	10	601988	2009-02-12	2.36	true	1	
	1	11	601988	2009-02-13	2.48	true	2	
	1	12	601988	2009-02-16	2.57	true	3	
	1	13	601988	2009-02-17	2.64	true	4	
	1	14	601988	2009-02-18	2.7	true	5	
	1	15	601988	2009-02-19	2.92	true	6	
	1	16	601988	2009-02-20	3.03	true	7	
	1	17	601988	2009-02-23	2.81	false	0	
	1	18	601988	2009-02-24	2.86	true	1	
	1	19	601988	2009-02-25	3.07	true	2	
	1	20	601988	2009-02-26	3.3	true	3	
	1	21	601988	2009-02-27	3.47	true	4	

3) Compute the longest consecutive rising days. To do so, fill the formula ={E2} max() in E1.

	1		A	B	C	D	E	F
1		1	SID	DATE	CLOSING		7	
	1	2	601988	2009-02-02	2.84	true	1	
	1	3	601988	2009-02-03	2.81	false	0	
	1	4	601988	2009-02-04	2.55	false	0	
	1	5	601988	2009-02-05	2.57	true	1	
	1	6	601988	2009-02-06	2.43	false	0	
	1	7	601988	2009-02-09	2.25	false	0	
	1	8	601988	2009-02-10	2.46	true	1	
	1	9	601988	2009-02-11	2.22	false	0	
	1	10	601988	2009-02-12	2.36	true	1	
	1	11	601988	2009-02-13	2.48	true	2	
	1	12	601988	2009-02-16	2.57	true	3	
	1	13	601988	2009-02-17	2.64	true	4	
	1	14	601988	2009-02-18	2.7	true	5	
	1	15	601988	2009-02-19	2.92	true	6	
	1	16	601988	2009-02-20	3.03	true	7	
	1	17	601988	2009-02-23	2.81	false	0	
	1	18	601988	2009-02-24	2.86	true	1	
	1	19	601988	2009-02-25	3.07	true	2	
	1	20	601988	2009-02-26	3.3	true	3	
	1	21	601988	2009-02-27	3.47	true	4	

2.6 Prepare Test Data

There are some blank records in the below esCalc grid. Now, we need to prepare the test data in the blank rows. Generate the sequence number of product and then the unit price and purchase quantity to compute the total price. In which, the unit price of product is between 1 and 100 yuan with two places of decimal. The purchase quantity is an integer between 1 and 1000.

0	1		A	B	C	D	E	F
1-		1	ID	Unit Price	Quantity	Total Price		
	1	2						
	1	3						
	1	4						
	1	5						
	1	6						
	1	7						
	1	8						
	1	9						
	1	10						
	1	11						

Operations are given below:

1) Firstly, generate the product number. Just compute based on their sequence numbers of homocells by filling the formula =# in A2.

0	1		A	B	C	D	E	F
1-		1	ID	Unit Price	Quantity	Total Price		
	1	2	1					
	1	3	2					
	1	4	3					
	1	5	4					
	1	6	5					
	1	7	6					
	1	8	7					
	1	9	8					
	1	10	9					
	1	11	10					

2) Since the total price can be computed with unit price and purchase quantity, let's start the computation with inputting the computational formula of total price. To do so, fill in the formula ==B2*C2 in D2. In this case, two equal signs are used to compute at any time.

0	1		A	B	C	D	E	F
1-		1	ID	Unit Price	Quantity	Total Price		
	1	2	1					
	1	3	2					
	1	4	3					
	1	5	4					
	1	6	5					
	1	7	6					
	1	8	7					
	1	9	8					
	1	10	9					
	1	11	10					

3) Generate the unit price of product randomly by filling the formula =int(rand(9900))/100+1 in B2.

0	1		A	B	C	D	E	F
1-		1	ID	Unit Price	Quantity	Total Price		
	1	2	1	39.26				
	1	3	2	16.57				
	1	4	3	23.98				
	1	5	4	63.66				
	1	6	5	4.37				
	1	7	6	33.19				
	1	8	7	3.36				
	1	9	8	43.9				
	1	10	9	51.55				
	1	11	10	73.61				

4) Lastly, generate the quantity randomly. Fill the formula =int(rand(1000))+1 into B2. Once completed, the total price of each item will be computed at the same time (Please notice that rand(1000) will generate the integer between 0~999 randomly)

0	1		A	B	C	D	E	F
1-		1	ID	Unit Price	Quantity	Total Price		
	1	2	1	39.26	156	6124.56		
	1	3	2	16.57	968	16039.76		
	1	4	3	23.98	273	6546.54		
	1	5	4	63.66	131	8339.46		
	1	6	5	4.37	373	1630.01		
	1	7	6	33.19	169	5609.11		
	1	8	7	3.36	899	3020.64		
	1	9	8	43.9	94	4126.6		
	1	10	9	51.55	693	35724.15		
	1	11	10	73.61	609	44828.49		

2.7 Compute Proportion and Ranking

In the below esCalc grid, there are population data of some cities. Now, you need to make statistics on the population proportion taken by each city to the total population of these cities, and the proportion and ranking in the respective state.

0	1		A	B	C	D	E	F
1-		1	CITY	POPULATION	STATE			
	1	2	Buffalo	276059	NY			
	1	3	Hialeah	217141	FL			
	1	4	Jacksonville	794555	FL			
	1	5	Miami	404048	FL			
	1	6	New York	8084316	NY			
	1	7	Orlando	220186	FL			
	1	8	Rochester	208123	NY			
	1	9	St. Petersburg	248098	FL			
	1	10	Tampa	332888	FL			
	1	11	Yonkers	197852	NY			

Operations are given below:

1) Because the population proportion taken by each city to the total population is irrelevant to the State that the city belongs to, the computation can be handled in advance. To do so, firstly, compute the total population in D1 by filling in the formula ={B2}.sum() in it.

0	1		A	B	C	D	E	F
1-		1	CITY	POPULATION	STATE	10983266		
	1	2	Buffalo	276059	NY			
	1	3	Hialeah	217141	FL			
	1	4	Jacksonville	794555	FL			
	1	5	Miami	404048	FL			
	1	6	New York	8084316	NY			
	1	7	Orlando	220186	FL			
	1	8	Rochester	208123	NY			
	1	9	St. Petersburg	248098	FL			
	1	10	Tampa	332888	FL			
	1	11	Yonkers	197852	NY			

2) Compute the population proportion of each city to the total population by filling the formula =round(B2/D1,4) in D2

0	1		A	B	C	D	E	F
1-		1	CITY	POPULATION	STATE	10983266		
	1	2	Buffalo	276059	NY	0.0251		
	1	3	Hialeah	217141	FL	0.0198		
	1	4	Jacksonville	794555	FL	0.0723		
	1	5	Miami	404048	FL	0.0368		
	1	6	New York	8084316	NY	0.7361		
	1	7	Orlando	220186	FL	0.02		
	1	8	Rochester	208123	NY	0.0189		
	1	9	St. Petersburg	248098	FL	0.0226		
	1	10	Tampa	332888	FL	0.0303		
	1	11	Yonkers	197852	NY	0.018		

3) Group the data by State.

0		1		A	B	C	D	E	F
1-			1	CITY	POPULATION	STATE	10983266		
	1-		2			FL			
		1	3	Hialeah	217141	FL	0.0198		
		1	4	Jacksonville	794555	FL	0.0723		
		1	5	Miami	404048	FL	0.0368		
		1	6	Orlando	220186	FL	0.02		
		1	7	St. Petersburg	248098	FL	0.0226		
		1	8	Tampa	332888	FL	0.0303		
	1-		9			NY			
		1	10	Buffalo	276059	NY	0.0251		
		1	11	New York	8084316	NY	0.7361		
		1	12	Rochester	208123	NY	0.0189		
		1	13	Yonkers	197852	NY	0.018		

4) Similarly, we can directly compute the proportion instead of compute the total population first. For example, to compute the population proportion of each city to the total population of the respective state, just fill the formula =round(B3/{B3}.sum(),4) in E3.

0		1		A	B	C	D	E	F
1-			1	CITY	POPULATION	STATE	10983266		
	1-		2			FL			
		1	3	Hialeah	217141	FL	0.0198	0.0979	
		1	4	Jacksonville	794555	FL	0.0723	0.3584	
		1	5	Miami	404048	FL	0.0368	0.1823	
		1	6	Orlando	220186	FL	0.02	0.0993	
		1	7	St. Petersburg	248098	FL	0.0226	0.1119	
		1	8	Tampa	332888	FL	0.0303	0.1502	
	1-		9			NY			
		1	10	Buffalo	276059	NY	0.0251	0.0315	
		1	11	New York	8084316	NY	0.7361	0.9222	
		1	12	Rochester	208123	NY	0.0189	0.0237	
		1	13	Yonkers	197852	NY	0.018	0.0226	

5) Compute the population ranking of each city in their respective state. The result is the same no matter the ranking by the population or proportion. We may check it out by filling the formula ={B3}.ranki(B3) in F3.

0		1		A	B	C	D	E	F
1-			1	CITY	POPULATION	STATE	10983266		
	1-		2			FL			
		1	3	Hialeah	217141	FL	0.0198	0.0979	6
		1	4	Jacksonville	794555	FL	0.0723	0.3584	1
		1	5	Miami	404048	FL	0.0368	0.1823	2
		1	6	Orlando	220186	FL	0.02	0.0993	5
		1	7	St. Petersburg	248098	FL	0.0226	0.1119	4
		1	8	Tampa	332888	FL	0.0303	0.1502	3
	1-		9			NY			
		1	10	Buffalo	276059	NY	0.0251	0.0315	2
		1	11	New York	8084316	NY	0.7361	0.9222	1
		1	12	Rochester	208123	NY	0.0189	0.0237	3
		1	13	Yonkers	197852	NY	0.018	0.0226	4

2.8 Link relative ratio and year-over-year comparison

There are sales data of 2011, 2012, and 2013 in the esCalc grid, as shown below. Compute the growth ratio of current quarter compared with the previous quarter, and with the same quarter of the previous year.

0	1		A	B	C	D	E	F
1-		1	Year	Season	Amount			
	1	2	2011	1	117700			
	1	3	2011	2	121900			
	1	4	2011	3	127200			
	1	5	2011	4	135000			
	1	6	2012	1	138600			
	1	7	2012	2	137600			
	1	8	2012	3	138200			
	1	9	2012	4	145400			
	1	10	2013	1	144600			
	1	11	2013	2	140300			
	1	12	2013	3	136300			
	1	13	2013	4	141900			

Operations are given below:

1) Group by year. To do so, select A2 and group.

0	1	2		A	B	C	D	E	F
1-			1	Year	Season	Amount			
	1-		2	2011					
		1	3	2011	1	117700			
		1	4	2011	2	121900			
		1	5	2011	3	127200			
		1	6	2011	4	135000			
	1-		7	2012					
		1	8	2012	1	138600			
		1	9	2012	2	137600			
		1	10	2012	3	138200			
		1	11	2012	4	145400			
	1-		12	2013					
		1	13	2013	1	144600			
		1	14	2013	2	140300			
		1	15	2013	3	136300			
		1	16	2013	4	141900			

2) Compute the link relative growth ratio by filling the formula =round((C16-C15)/C15,4) into D16.

0	1	2		A	B	C	D	E	F
1-			1	Year	Season	Amount			
	1-		2	2011					
		1	3	2011	1	117700			
		1	4	2011	2	121900	0.0357		
		1	5	2011	3	127200	0.0435		
		1	6	2011	4	135000	0.0613		
	1-		7	2012					
		1	8	2012	1	138600	0.0267		
		1	9	2012	2	137600	-0.0072		
		1	10	2012	3	138200	0.0044		
		1	11	2012	4	145400	0.0521		
	1-		12	2013					
		1	13	2013	1	144600	-0.0055		
		1	14	2013	2	140300	-0.0297		
		1	15	2013	3	136300	-0.0285		
		1	16	2013	4	141900	0.0411		

3) Compute the year-over-year growth by filling the formula =round((C16-C11)/C11,4) into D16

0	1	2		A	B	C	D	E	F
1-			1	Year	Season	Amount			
	1-		2	2011					
		1	3	2011	1	117700			
		1	4	2011	2	121900	0.0357		
		1	5	2011	3	127200	0.0435		
		1	6	2011	4	135000	0.0613		
	1-		7	2012					
		1	8	2012	1	138600	0.0267	0.1776	
		1	9	2012	2	137600	-0.0072	0.1288	
		1	10	2012	3	138200	0.0044	0.0865	
		1	11	2012	4	145400	0.0521	0.077	
	1-		12	2013					
		1	13	2013	1	144600	-0.0055	0.0433	
		1	14	2013	2	140300	-0.0297	0.0196	
		1	15	2013	3	136300	-0.0285	-0.0137	
		1	16	2013	4	141900	0.0411	-0.0241	