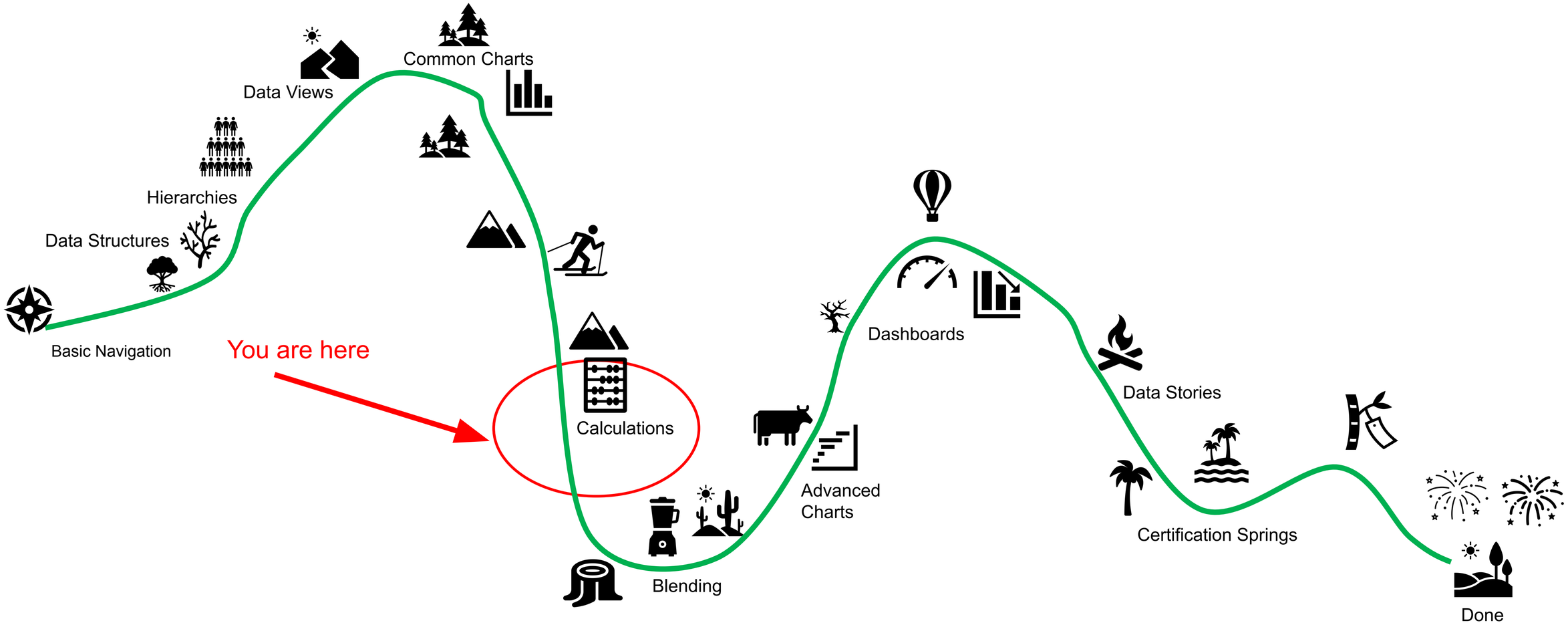
Tableau Module 8


Basic Navigation
Data Structures
Hierarchies
Data Views
Common Charts
You are here
Calculations
Blending
Advanced Charts
Dashboards
Data Stories
Certification Springs
Done

Module 8 Learning Outcomes

- Understand value of Table Calculation
- Create a Table Calculation
- Understand Pane Calculations
- Describe Different Table Calc Functions

Why Do We Need Table Calculations?

Frequently you will want to show information derived from your original data source, in addition to the original data

Year of Order Date	Quarter of Order Date	Sales	% Difference in ..	Moving Averag..
2014	Q1	74,448		74,448
	Q2	86,539	16.24%	80,493
	Q3	143,633	65.98%	101,540
	Q4	179,628	25.06%	121,062
2015	Q1	68,852	-61.67%	110,620
	Q2	89,124	29.44%	113,555
	Q3	130,260	46.16%	122,299
	Q4	182,297	39.95%	130,032
2016	Q1	93,237	-48.85%	112,754
	Q2	136,082	45.95%	126,200
	Q3	143,787	5.66%	137,133
	Q4	236,099	64.20%	158,301
2017	Q1	123,145	-47.84%	146,470
	Q2	133,764	8.62%	154,576
	Q3	196,252	46.71%	166,609
	Q4	280,054	42.70%	193,863

Derived data includes running average, difference from average, % change over time, difference from previous year, etc.

Difference From (previous)

- Absolute difference (this one - last one)

Percent Difference From (previous)

- (this one - last one)/(last one)

Percent From

- (this one)/(last one)

Percent of Total

- (this one)/SUM(all of them)

Rank

- Competition (1,2,2,4)
- Modified Competition (1,3,3,4)
- Dense (1,2,2,3)
- Unique (1,2,3,4)

Percentile

- All values normalized from 0% to 100%

Running Total

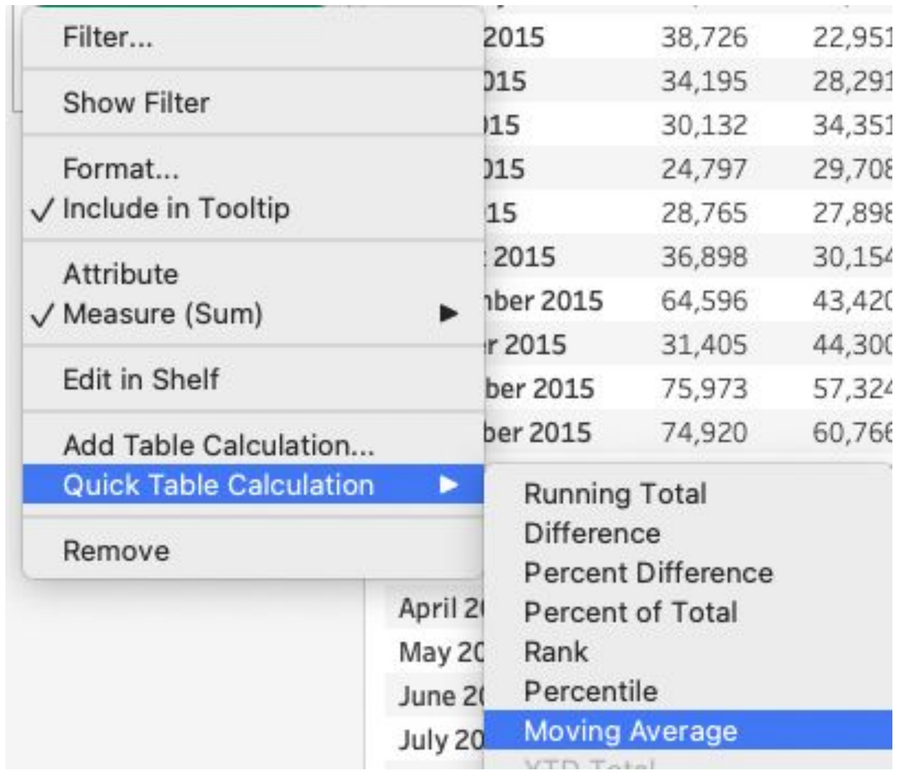
- Sum of current value and all previous values

Moving Calculation

- Calculated over a finite window of previous and/or next values
  - Sum
  - Avg
  - Min
  - Max

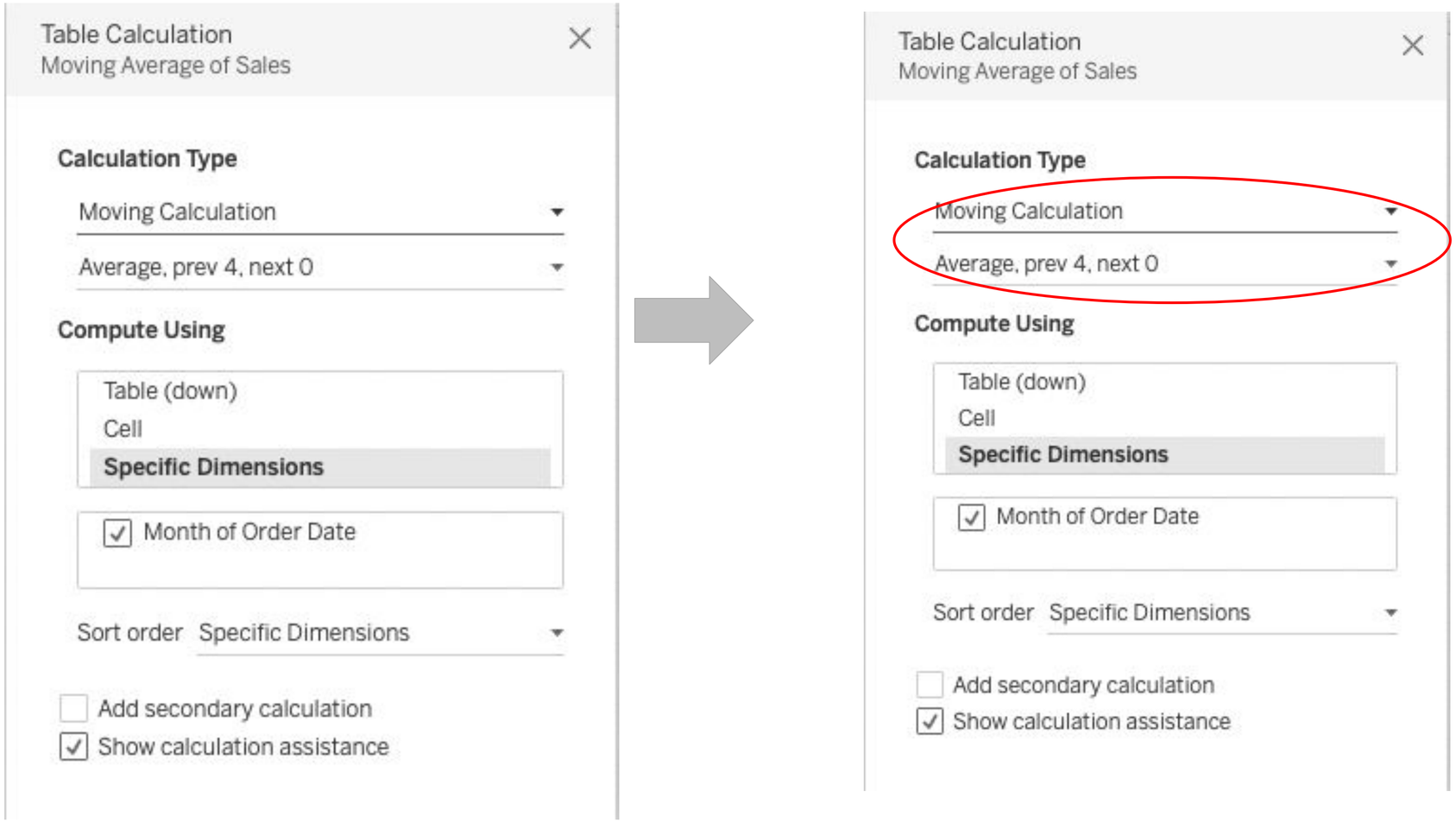
Editing a ‘Quick’ Table Calc

Month of Order..	
January 2014	14,237
February 2014	4,520
March 2014	55,691
April 2014	28,295
May 2014	23,648
June 2014	34,595
July 2014	33,946
August 2014	27,909
September 2014	81,777
October 2014	31,453
November 2014	78,629
December 2014	69,546
January 2015	18,174



Month of Order Date	Sales	Moving Average ..
January 2014	14,237	14,237
February 2014	4,520	9,378
March 2014	55,691	24,816
April 2014	28,295	29,502
May 2014	23,648	35,878
June 2014	34,595	28,846
July 2014	33,946	30,730
August 2014	27,909	32,150
September 2014	81,777	47,878
October 2014	31,453	47,047
November 2014	78,629	63,953

Editing a ‘Quick’ Table Calc



Creating Table Calculations

Table calculations rely on two concepts: addressing and partitioning

- **Partitioning defines the scope:** Breaks up the view into multiple partitions or sub-views.

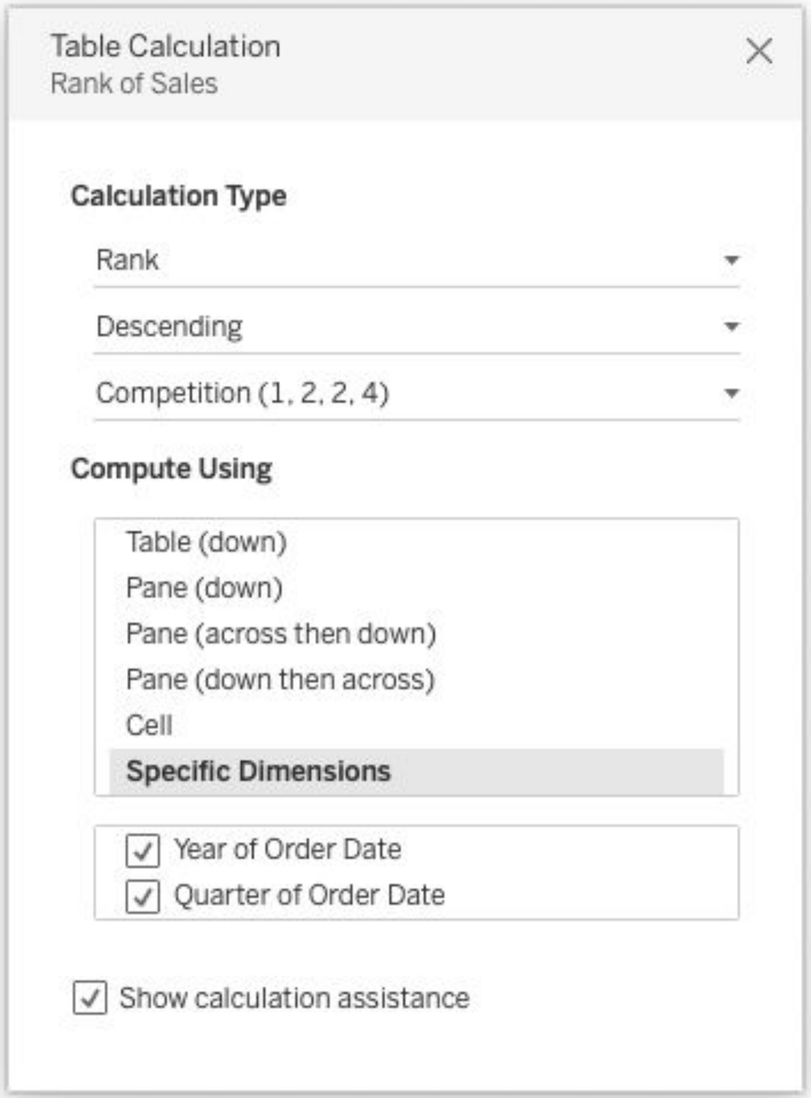
- **Addressing defines the direction:** Defines the "direction" that the calculation moves

Table

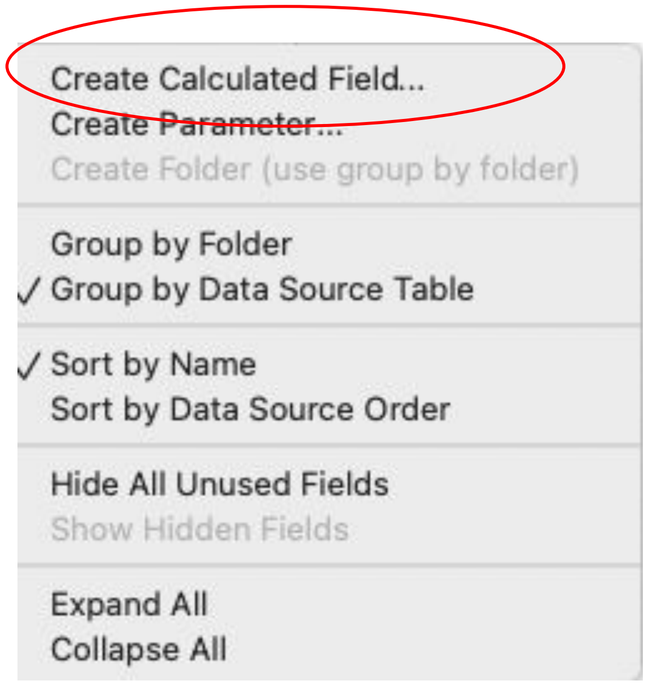
Pane

Cell

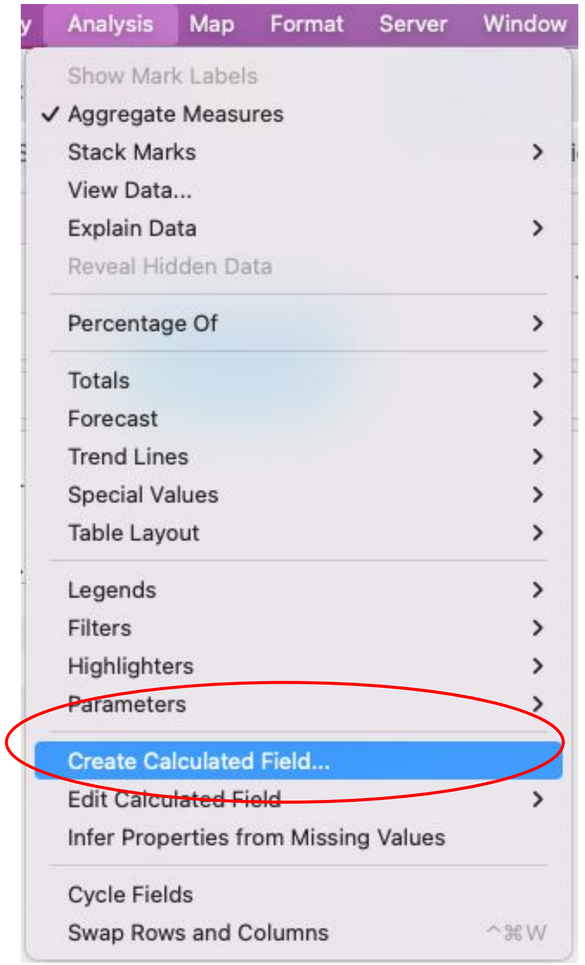
Year of Order Date	Quarter of Order Date	Sales	Rank of Sales al..
2014	Q1	74,448	15
	Q2	86,539	14
	Q3	143,633	7
	Q4	179,628	5
2015	Q1	68,852	16
	Q2	89,124	13
	Q3	130,260	10
	Q4	182,297	4
2016	Q1	93,237	12
	Q2	136,082	8
	Q3	143,787	6
	Q4	236,099	2
2017	Q1	123,145	11
	Q2	133,764	9
	Q3	196,252	3
	Q4	280,054	1



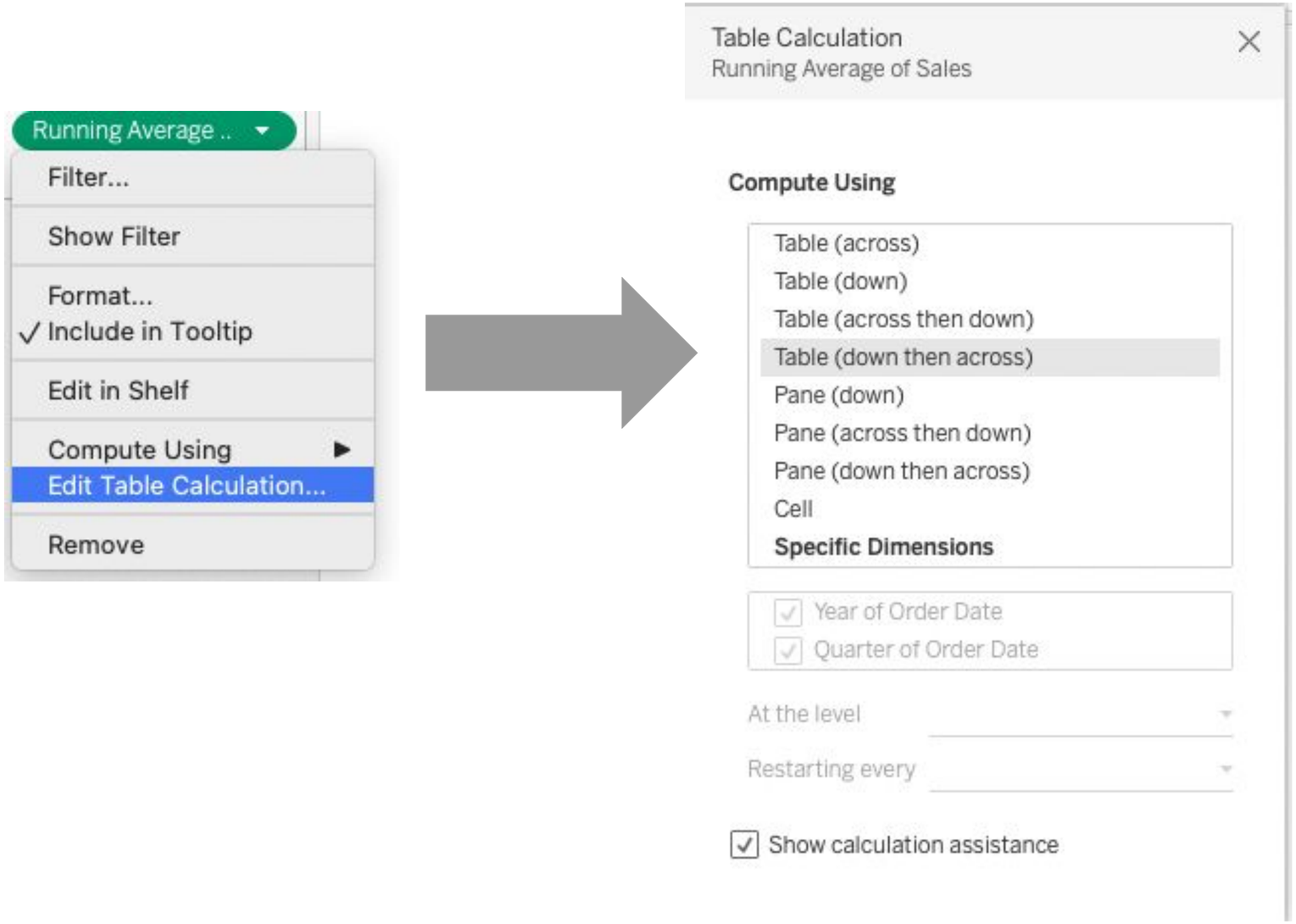
Creating Table Calculations



OR



Calculated Fields - Direction

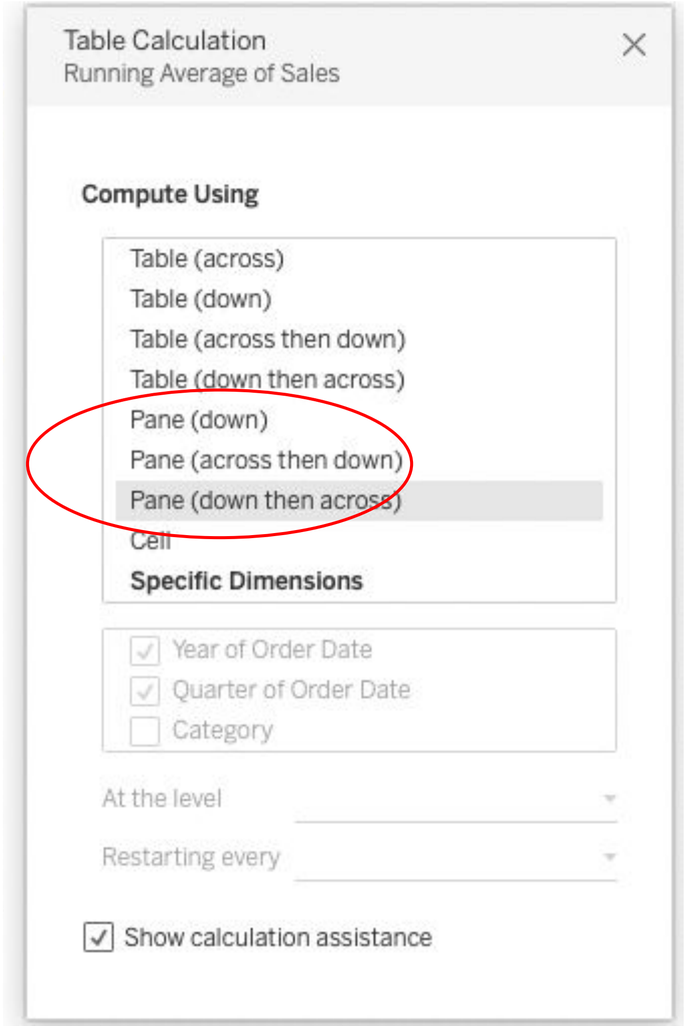


Calculated Fields - Direction

Year of Order Date	Quarter of Order Date	Sales	Running Averag..
2014	Q1	74,448	74,448
	Q2	86,539	80,493
	Q3	143,633	101,540
	Q4	179,628	121,062
2015	Q1	68,852	110,620
	Q2	89,124	107,037
	Q3	130,260	110,355
	Q4	182,297	119,348
2016	Q1	93,237	116,446
	Q2	136,082	118,410
	Q3	143,787	120,717
	Q4	236,099	130,332
2017	Q1	123,145	129,779
	Q2	133,764	130,064
	Q3	196,252	134,476
	Q4	280,054	143,575

	Order Date							
	Sales				Running Average of Sales along Year of Order Date, Quarter of Order Date			
Quarter of ..	2014	2015	2016	2017	2014	2015	2016	2017
Q1	74,448	68,852	93,237	123,145	74,448	110,620	116,446	129,779
Q2	86,539	89,124	136,082	133,764	80,493	107,037	118,410	130,064
Q3	143,633	130,260	143,787	196,252	101,540	110,355	120,717	134,476
Q4	179,628	182,297	236,099	280,054	121,062	119,348	130,332	143,575

Multiple Panes



			Category		
	Year of Ord..	Quarter of ..	Furnitu..	Office S..	Technol..
Sales	2014	Q1	22,656	14,529	37,263
		Q2	28,064	31,244	27,231
		Q3	41,958	53,924	47,751
		Q4	64,515	52,080	63,033
	2015	Q1	27,374	23,059	18,418
		Q2	27,565	32,320	29,239
		Q3	49,586	35,761	44,913
		Q4	65,993	46,093	70,211
	2016	Q1	24,349	29,441	39,447
		Q2	41,402	34,584	60,095
		Q3	52,815	45,148	45,825
		Q4	80,335	74,767	80,997
	2017	Q1	23,724	43,232	56,189
		Q2	45,032	45,721	43,011
		Q3	56,283	72,197	67,772
		Q4	90,348	84,946	104,759
Running Average of Sales along Pane (Down then Across)	2014	Q1	22,656	34,344	38,470
		Q2	25,360	33,828	37,346
		Q3	30,893	36,698	38,292
		Q4	39,298	38,621	40,354
	2015	Q1	27,374	38,716	36,241
		Q2	27,469	37,650	35,541
		Q3	34,842	37,380	36,393
		Q4	42,630	38,469	39,211
	2016	Q1	24,349	45,668	46,921
		Q2	32,876	43,821	48,238
		Q3	39,522	44,011	48,019
		Q4	49,725	47,855	50,767
	2017	Q1	23,724	51,724	57,519
		Q2	34,378	50,723	56,068
		Q3	41,680	53,791	57,132
		Q4	53,847	57,686	61,101

Multiple Panes

		Order Date							
		Sales				Running Average of Sales along Year of Order Date, Quarter of Order Date			
Category	Quarter of ..	2014	2015	2016	2017	2014	2015	2016	2017
Furniture	Q1	22,656	27,374	24,349	23,724	22,656	36,913	39,118	42,334
	Q2	28,064	27,565	41,402	45,032	25,360	35,355	39,346	42,526
	Q3	41,958	49,586	52,815	56,283	30,893	37,388	40,571	43,443
	Q4	64,515	65,993	80,335	90,348	39,298	40,964	43,884	46,375
Office Supplies	Q1	14,529	23,059	29,441	43,232	14,529	34,967	35,383	39,706
	Q2	31,244	32,320	34,584	45,721	22,886	34,526	35,304	40,136
	Q3	53,924	35,761	45,148	72,197	33,232	34,702	36,198	42,273
	Q4	52,080	46,093	74,767	84,946	37,944	36,126	39,412	44,940
Technology	Q1	37,263	18,418	39,447	56,189	37,263	38,739	41,945	47,739
	Q2	27,231	29,239	60,095	43,011	32,247	37,156	43,760	47,402
	Q3	47,751	44,913	45,825	67,772	37,415	38,264	43,948	48,760
	Q4	63,033	70,211	80,997	104,759	43,820	42,257	47,035	52,260

Table Down vs. Pane Down

Year of Order Date	Quarter of Order Date	Sales	Rank of Sales al..
2014	Q1	74,448	15
	Q2	86,539	14
	Q3	143,633	7
	Q4	179,628	5
2015	Q1	68,852	16
	Q2	89,124	13
	Q3	130,260	10
	Q4	182,297	4
2016	Q1	93,237	12
	Q2	136,082	8
	Q3	143,787	6
	Q4	236,099	2
2017	Q1	123,145	11
	Q2	133,764	9
	Q3	196,252	3
	Q4	280,054	1

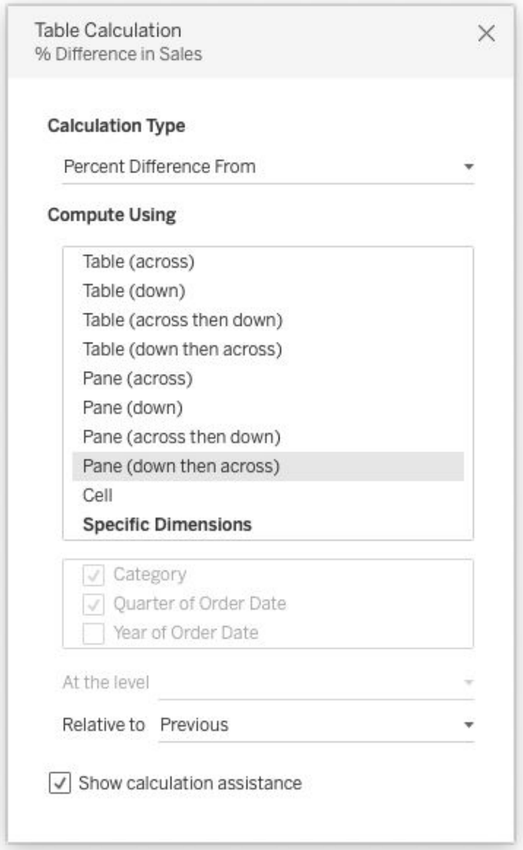
Table down

Year of Order Date	Quarter of Order Date	Sales	Rank of Sales al..
2014	Q1	74,448	4
	Q2	86,539	3
	Q3	143,633	2
	Q4	179,628	1
2015	Q1	68,852	4
	Q2	89,124	3
	Q3	130,260	2
	Q4	182,297	1
2016	Q1	93,237	4
	Q2	136,082	3
	Q3	143,787	2
	Q4	236,099	1
2017	Q1	123,145	4
	Q2	133,764	3
	Q3	196,252	2
	Q4	280,054	1

Pane down

Pane Down then Across

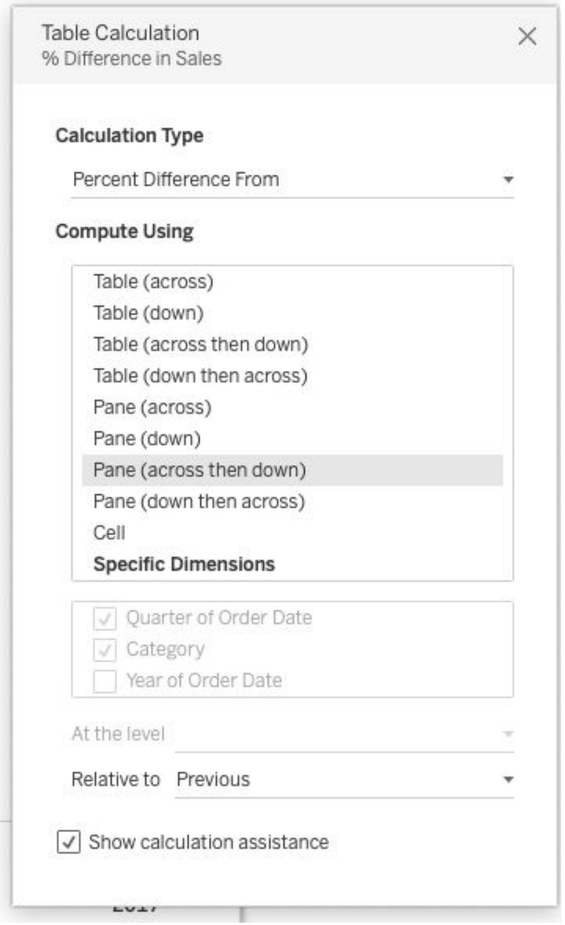
		Category					
		Sales			% Difference in Sales from the Previous along Pane (Down then Across)		
Year of Order Date	Quarter of Order Date	Furniture	Office Supplies	Technology	Furniture	Office Supplies	Technology
2014	Q1	22,656	14,529	37,263		-77.48%	-28.45%
	Q2	28,064	31,244	27,231	23.87%	115.05%	-26.92%
	Q3	41,958	53,924	47,751	49.51%	72.59%	75.35%
	Q4	64,515	52,080	63,033	53.76%	-3.42%	32.00%
2015	Q1	27,374	23,059	18,418		-65.06%	-60.04%
	Q2	27,565	32,320	29,239	0.70%	40.16%	58.75%
	Q3	49,586	35,761	44,913	79.89%	10.65%	53.60%
	Q4	65,993	46,093	70,211	33.09%	28.89%	56.33%
2016	Q1	24,349	29,441	39,447		-63.35%	-47.24%
	Q2	41,402	34,584	60,095	70.04%	17.47%	52.35%
	Q3	52,815	45,148	45,825	27.56%	30.54%	-23.75%
	Q4	80,335	74,767	80,997	52.11%	65.60%	76.75%
2017	Q1	23,724	43,232	56,189		-52.15%	-33.85%
	Q2	45,032	45,721	43,011	89.82%	5.76%	-23.45%
	Q3	56,283	72,197	67,772	24.98%	57.91%	57.57%
	Q4	90,348	84,946	104,759	60.52%	17.66%	54.58%



Pane Across then Down

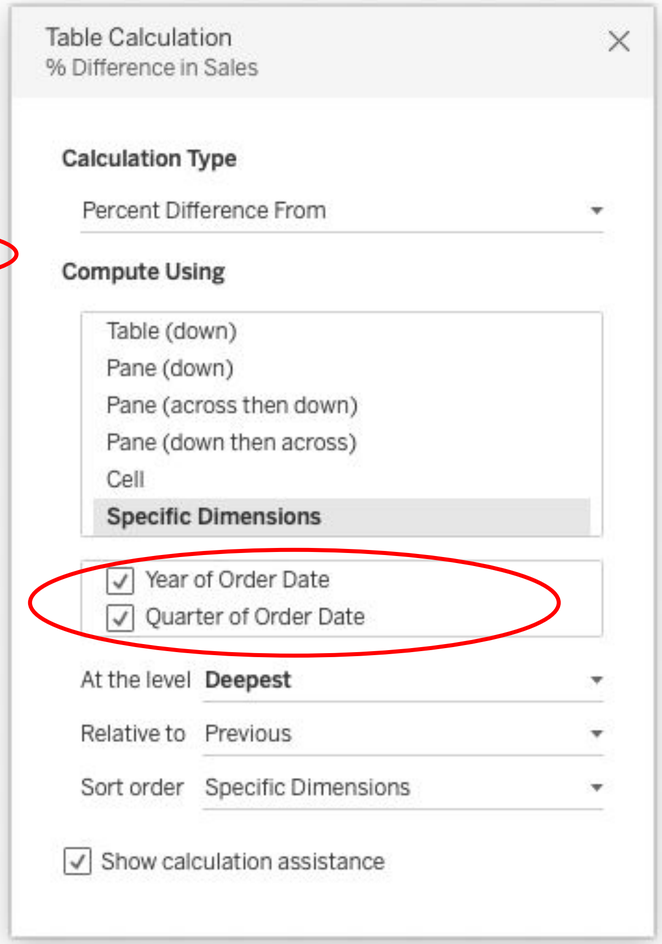
Year of Order Date	Quarter of Order Date	Sales			% Difference in Sales from the Previous along Pane (Across then Down)		
		Category					
		Furniture	Office Supplies	Technology	Furniture	Office Supplies	Technology
2014	Q1	22,656	14,529	37,263		-35.87%	156.48%
	Q2	28,064	31,244	27,231	-24.69%	11.33%	-12.84%
	Q3	41,958	53,924	47,751	54.08%	28.52%	-11.45%
	Q4	64,515	52,080	63,033	35.11%	-19.27%	21.03%
2015	Q1	27,374	23,059	18,418		-15.76%	-20.13%
	Q2	27,565	32,320	29,239	49.66%	17.25%	-9.53%
	Q3	49,586	35,761	44,913	69.59%	-27.88%	25.59%
	Q4	65,993	46,093	70,211	46.94%	-30.15%	52.32%
2016	Q1	24,349	29,441	39,447		20.91%	33.99%
	Q2	41,402	34,584	60,095	4.96%	-16.47%	73.76%
	Q3	52,815	45,148	45,825	-12.12%	-14.52%	1.50%
	Q4	80,335	74,767	80,997	75.31%	-6.93%	8.33%
2017	Q1	23,724	43,232	56,189		82.23%	29.97%
	Q2	45,032	45,721	43,011	-19.86%	1.53%	-5.93%
	Q3	56,283	72,197	67,772	30.86%	28.28%	6.13%
	Q4	90,348	84,946	104,75			

Category:
Quarter of Order Date:
Year of Order Date:

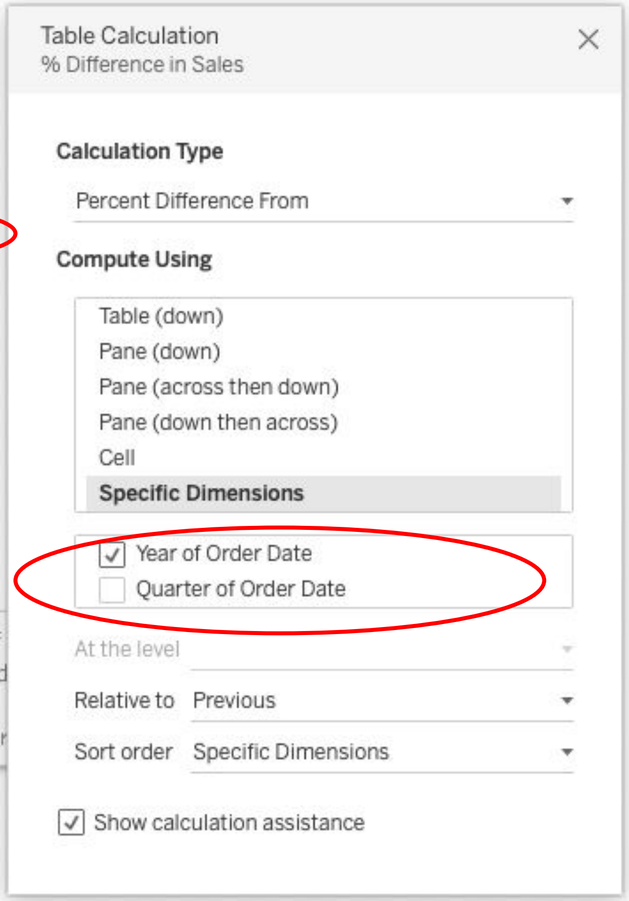


Specific Dimensions

Year of Order Date	Quarter of Order Date	Sales	% Difference in ..
2014	Q1	74,448	
	Q2	86,539	16.24%
	Q3	143,633	65.98%
	Q4	179,628	25.06%
2015	Q1	68,852	-61.67%
	Q2	89,124	29.44%
	Q3	130,260	46.16%
	Q4	182,297	39.95%
2016	Q1	93,237	-48.85%
	Q2	136,082	45.95%
	Q3	143,787	5.66%
	Q4	236,099	64.20%
2017	Q1	123,145	-47.84%
	Q2	133,764	8.62%
	Q3	196,252	46.71%
	Q4	280,054	42.70%



Year of Order Date	Quarter of Order Date	Sales	% Difference in ..
2014	Q1	74,448	
	Q2	86,539	
	Q3	143,633	
	Q4	179,628	
2015	Q1	68,852	-7.52%
	Q2	89,124	2.99%
	Q3	130,260	-9.31%
	Q4	182,297	1.49%
2016	Q1	93,237	35.42%
	Q2	136,082	52.69%
	Q3	143,787	10.39%
	Q4	236,099	29.51%
2017	Q1	123,145	32.08%
	Q2	133,764	-1.70%
	Q3	196,252	36.49%
	Q4	280,054	



Module 8 Challenge (part 1)

use superstore data

Year of Order Date	Quarter of Order Date	Category		
		Furnitu..	Office Supplies	Technol..
2011	Q1	22,656	14,529	37,263
	Q2	28,064	31,244	27,231
	Q3	41,958	53,924	47,751
	Q4	64,515	52,080	63,033
2012	Q1	27,374	23,059	18,418
	Q2	27,565	32,320	29,239
	Q3	49,586	35,761	44,913
	Q4	65,993	46,093	70,211
2013	Q1	24,021	29,441	39,134
	Q2	40,464	34,548	60,358
	Q3	53,558	45,182	45,875
	Q4	80,859	74,339	80,695
2014	Q1	23,428	43,411	52,057
	Q2	43,223	44,357	46,444
	Q3	58,389	73,431	68,613
	Q4	90,348	85,327	104,919

Year of Ord..	Quarter of ..	Accesso..	Applian..	Art	Binders	Bookc
2011	Q1	3,058	905	664	2,679	2,7
	Q2	3,909	3,726	1,542	9,634	1,7
	Q3	7,706	4,592	1,220	19,929	4,6
	Q4	10,342	6,090	2,632	11,245	10,9
2012	Q1	3,150	2,120	700	11,269	4,7
	Q2	4,600	6,611	1,568	11,218	3,2
	Q3	11,974	3,322	1,757	6,296	17,3
	Q4	20,800	11,189	2,212	8,670	13,2
2013	Q1	4,859	3,274	846	3,542	3,5
	Q2	7,204	4,327	1,432	4,688	2,8
	Q3	12,496	7,762	1,906	12,602	10,5
	Q4	17,337	10,687	1,726	28,653	9,3
2014	Q1	8,515	8,509	1,175	12,935	3,1
	Q2	10,742	6,416	2,277	10,308	10,7
	Q3	22,118	11,399	2,570	27,566	6,2
	Q4	18,571	16,602	2,892	22,178	9,8

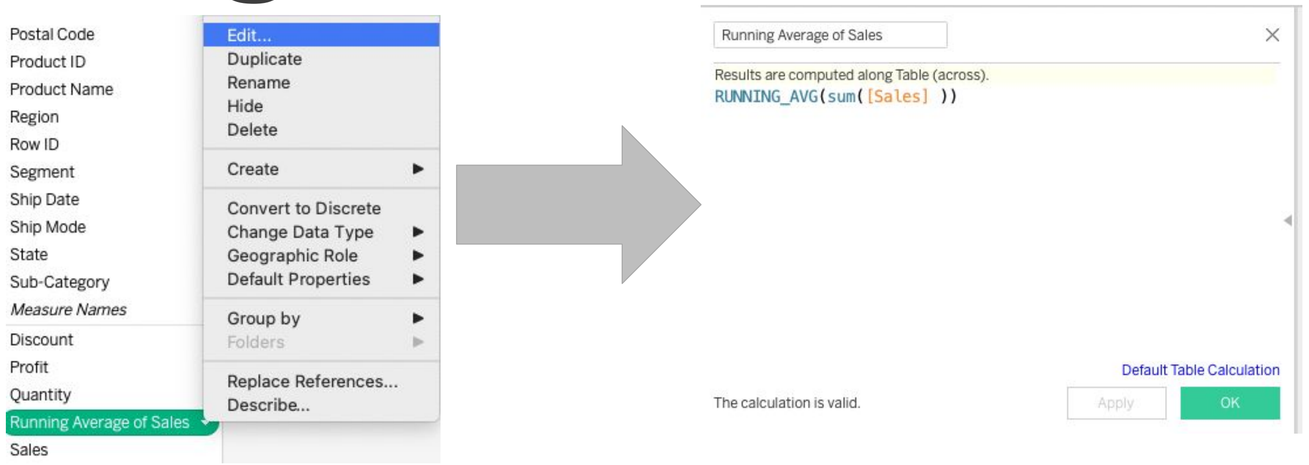
1. Create a table that shows sum of sales AND **the moving average of sales** (previous 4 values+currrent) for each category. Put category in columns and order date (year and quarter) in Rows

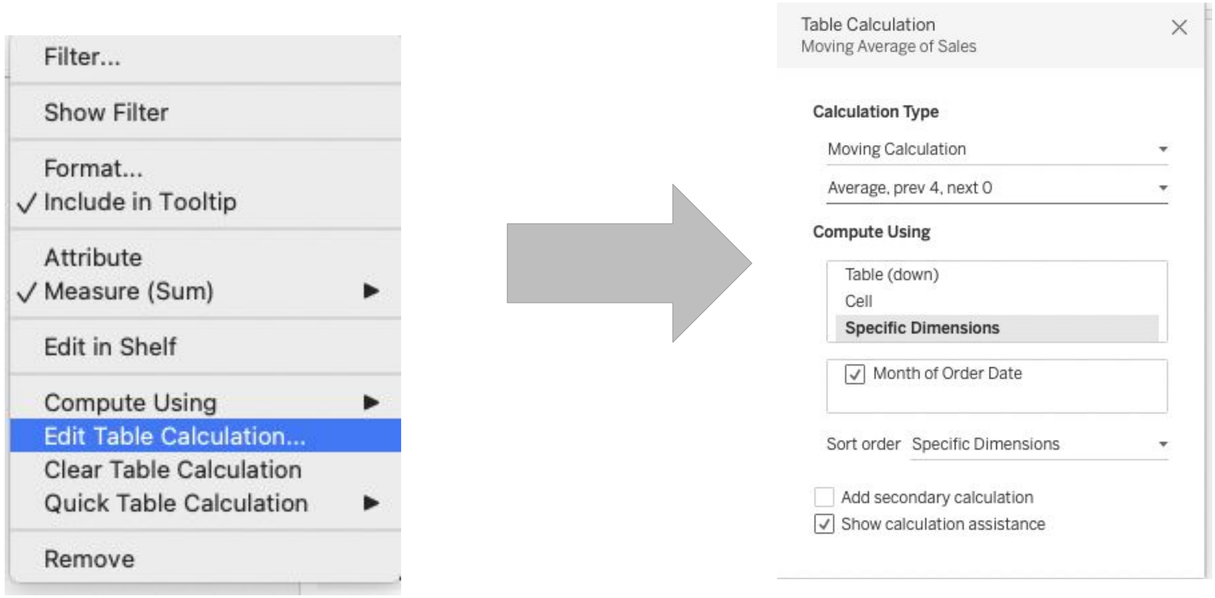
2. Edit the table calculation - change the direction to be ‘table down’ so that the calculation shows the moving average by category over several years

3. Create a **new** table that shows sum of profit and **running total** of ***profit*** with the subcategory in columns and order date (year and quarter) in rows.

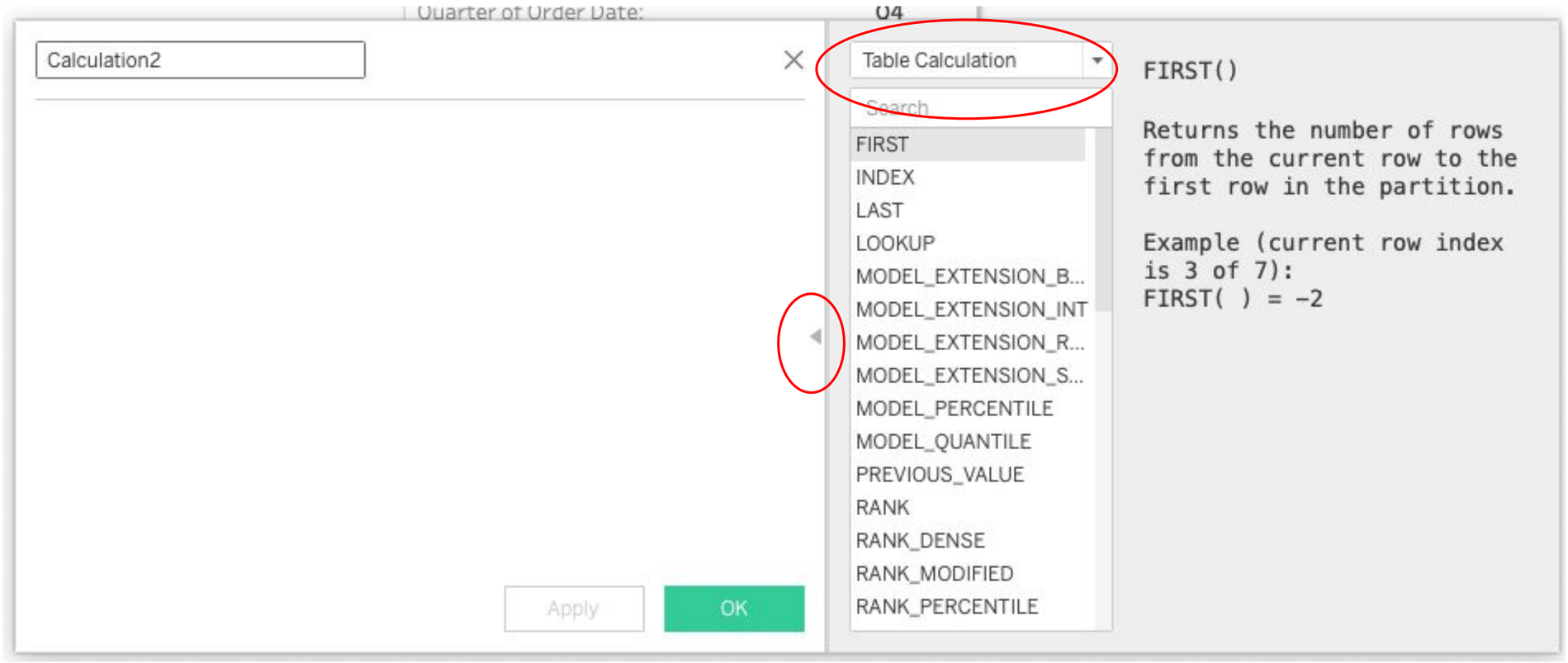
4. Change the direction to ‘pane down’ so that the calculation shows the sum per subcategory per year

Editing Table Calculations

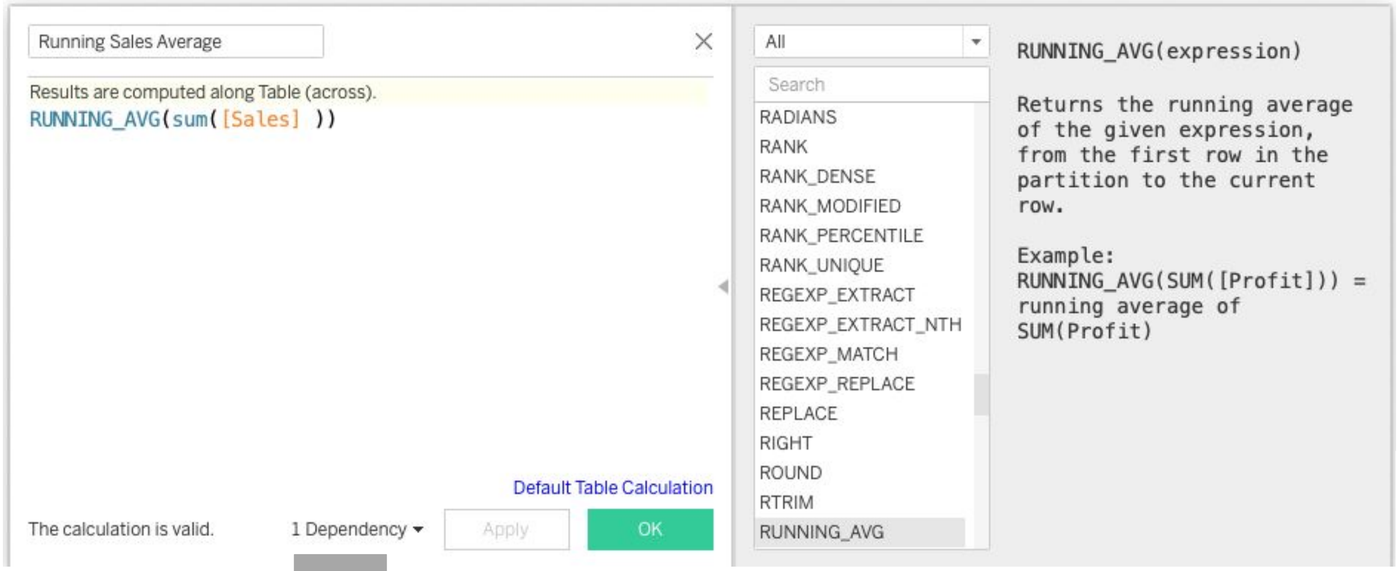




Calculated Fields - Expanded View

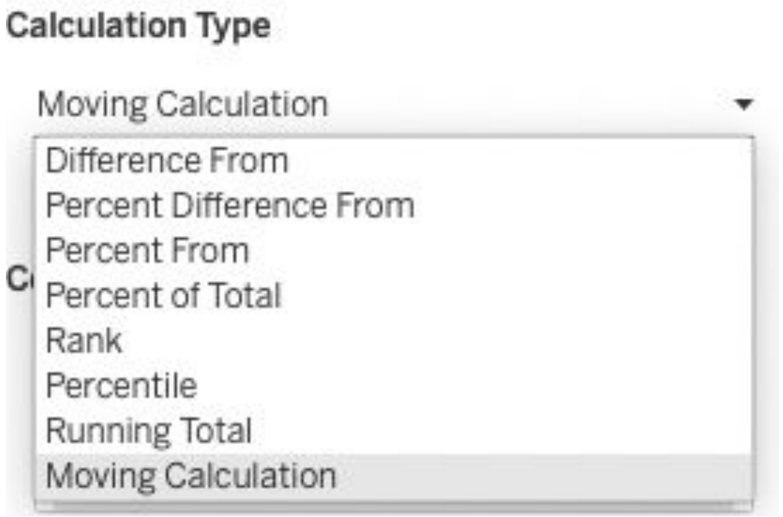


Calculated Fields - Expanded View



		Order Date			
	Quarter of ..	2014	2015	2016	2017
Sales	Q1	74,448	68,852	93,237	123,145
	Q2	86,539	89,124	136,082	133,764
	Q3	143,633	130,260	143,787	196,252
	Q4	179,628	182,297	236,099	280,054
Running Sales Average along Table (Down then Across)	Q1	74,448	110,620	116,446	129,779
	Q2	80,493	107,037	118,410	130,064
	Q3	101,540	110,355	120,717	134,476
	Q4	121,062	119,348	130,332	143,575

Table Calculations Types

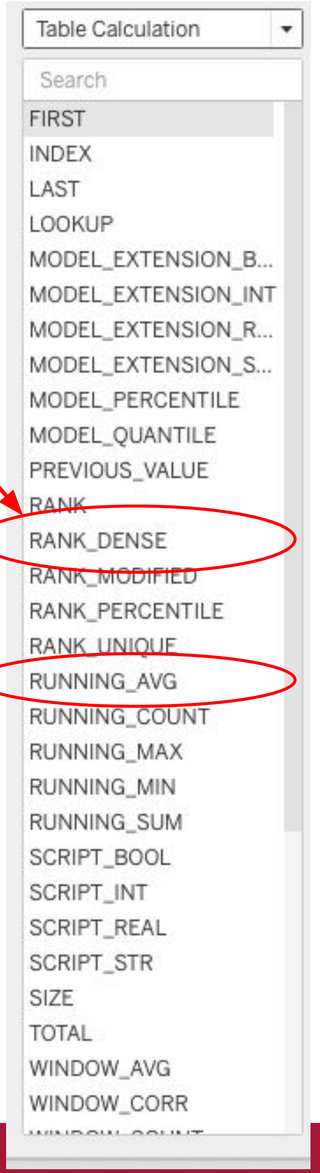


Types of Table Calculations

- **Difference from calculation** - will compute the difference between current values and another value for each field on the marks card of your visualization.
- **Moving calculation** - for each mark in your view, a moving calculation will determine the values for a mark in the view and will perform an aggregate (sum, min, max, avg) function across the specified number of values before or after the current value.
- **Percent difference from calculation** - will compute the difference between your current value and then another value in your table. This will show as a percentage for each mark that is in your visual.
- **Percent from calculation** - will calculate a value as a percentage of another value, for each mark in your visual.
- **Percent of total calculation** - will calculate based on each mark in your view and will compute that value as a percentage of all the values in the current partition.
- **Percentile calculation** - will be calculated for each mark in the view and a percentile rank will be computed for each value in a partition.
- **Rank calculation** - will compute a rank table calculation for each mark value in the view within a partition.
- **Running total calculation** (does not have to be a total, i.e., sum, average, min, or max) - for each mark in your view, a running total calculation will aggregate values cumulatively in a partition.

Table Calculations Functions

Year of Order Date	Sales	Difference from Last	Running Average Sales	Ranked Sales along Table (Do..
2014	484,247		484,247	3
2015	470,533	-13,715	477,390	4
2016	609,206	138,673	521,329	2
2017	733,215	124,010	574,300	1



Useful (Table) Calculated Fields

LOOKUP(SUM([Sales]),-1)

Previous value

RUNNING_AVG(sum([Sales]))

Running average since the beginning of time

WINDOW_AVG(SUM([Sales]),-4,0)

Moving Average with window

INDEX()

RANK (SUM([Sales]))

RUNNING and WINDOW

RUNNING_AVG(sum([Sales]))

Running average since the beginning of time

WINDOW_AVG(SUM([Sales]),-4,0)

Moving Average with window

-4	127
-3	150
-2	266
-1	164
0	176

Current Value

LOOKUP()

LOOKUP(SUM([Sales]),0) - LOOKUP(SUM([Sales]),-1)

Change since previous

LOOKUP(SUM([Sales]),-4)

4 values ago

LOOKUP(SUM([Sales]),-12)

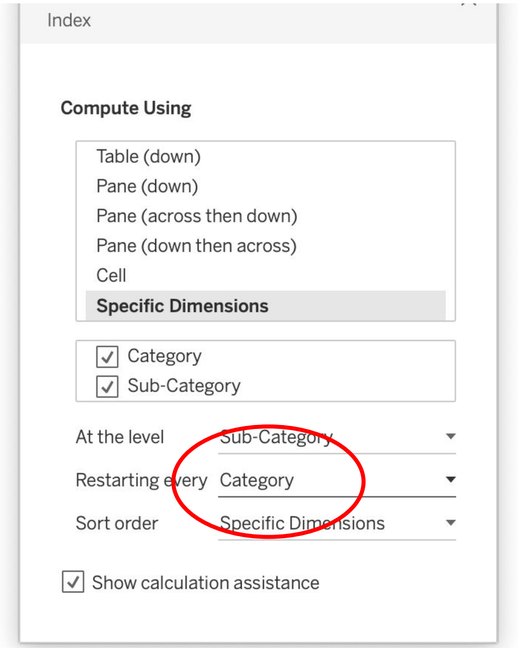
12 values ago

INDEX()

Index () current row of partition

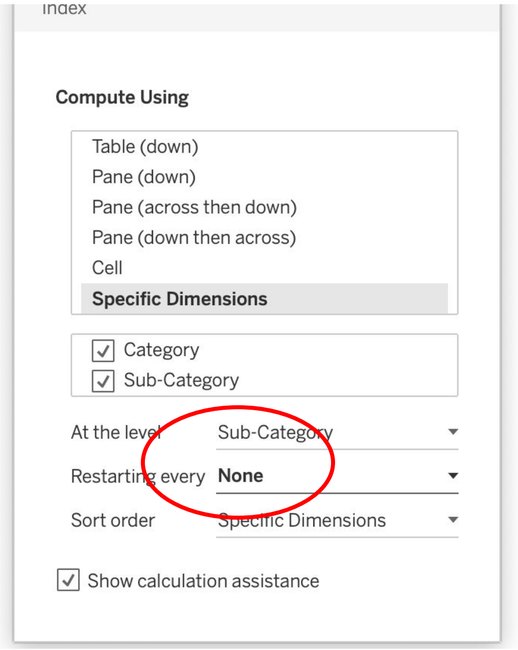
Partition by subcategory

Category	Sub-C..	Index along C..	Sales
Furniture	Chairs	1	328,449
	Tables	2	206,966
	Bookcases	3	114,880
	Furnishings	4	91,705
Office Supplies	Storage	1	223,844
	Binders	2	203,413
	Appliances	3	107,532
	Paper	4	78,479
	Supplies	5	46,674
	Art	6	27,119
	Envelopes	7	16,476
	Labels	8	12,486
	Fasteners	9	3,024
Technology	Phones	1	330,007
	Machines	2	189,239
	Accessories	3	167,380
	Copiers	4	149,528



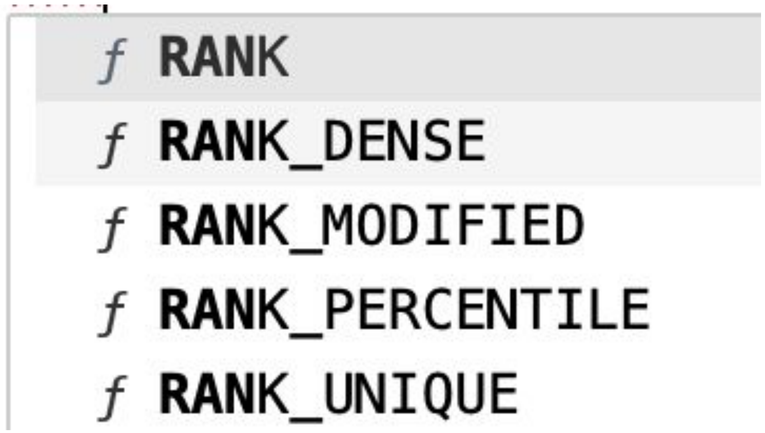
Partition across the whole table

Category	Sub-C..	Index along C..	Sales
Furniture	Chairs	1	328,449
	Tables	2	206,966
	Bookcases	3	114,880
	Furnishings	4	91,705
Office Supplies	Storage	5	223,844
	Binders	6	203,413
	Appliances	7	107,532
	Paper	8	78,479
	Supplies	9	46,674
	Art	10	27,119
	Envelopes	11	16,476
	Labels	12	12,486
	Fasteners	13	3,024
Technology	Phones	14	330,007
	Machines	15	189,239
	Accessories	16	167,380
	Copiers	17	149,528

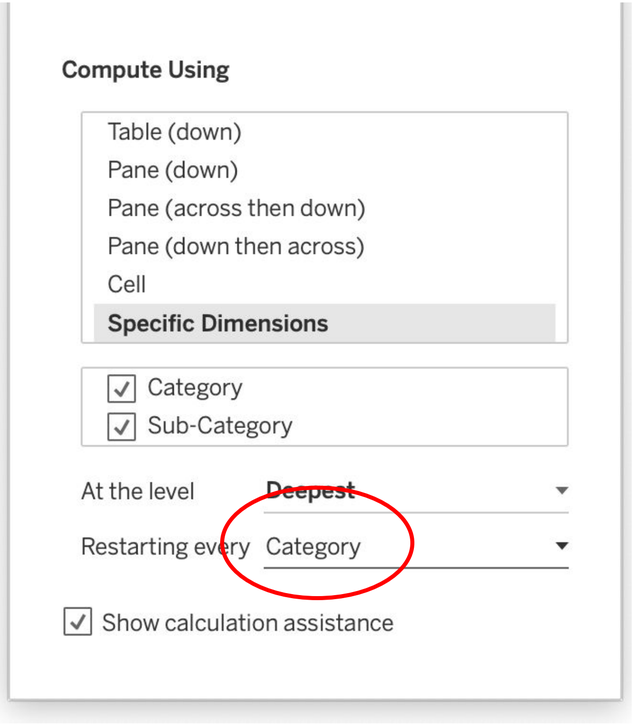


RANK()

RANK(SUM([Sales]))



Category	Sub-C..	Rank along C..	Sales
Furniture	Chairs	1	328,449
	Tables	2	206,966
	Bookcases	3	114,880
	Furnishings	4	91,705
Office Supplies	Storage	1	223,844
	Binders	2	203,413
	Appliances	3	107,532
	Paper	4	78,479
	Supplies	5	46,674
	Art	6	27,119
	Envelopes	7	16,476
	Labels	8	12,486
	Fasteners	9	3,024
Technology	Phones	1	330,007
	Machines	2	189,239
	Accessories	3	167,380
	Copiers	4	149,528



Top subcategory (by sales) for each category??

Simply using top n filter won’t work!

Create a RANK calculation

Edit table calculation -> reset for each category (or pane down)

Change filter to use top n by rank (create filter from shelf)

Module 8 Challenge (Part 2)

use superstore data

1. Create calculated fields for “running average”, and “moving average (last 5 months + this month)” of sales
2. Create a line chart (viz) with sales by month, along with the running average and moving average on the same chart

3. Create a calculated field for “last year’s sales by quarter”
4. Create a year-over-year line chart. Show the sum of profit by quarter on one line, and the sales from the same quarter in the previous year on another line