Quick Table calculations

- Percent of Total `SUM([Sales])/TOTAL(SUM([Sales]))`
- Percent of Difference `(ZN(SUM([Sales]))-LOOKUP(ZN(SUM([Sales])),-1))/ABS(LOOKUP(ZN(SUM([Sales])),-1))`
- Rank `RANK(SUM([Sales]))`
- percentile of each month (compare to highest month) `RANK_PERCENTILE(SUM([Sales]))`
- 3-period moving average `WINDOW_AVG(SUM([Sales]),-2,0)` (n-1)
- Running Sum restarting each year `RUNNING_SUM(SUM([Sales]))` △ specific dimension restarting every "year of date"
- Year over year growth (YoY) △ at the level "year of date" same as percent of difference
- Compound Growth Rate (CAGR) `POWER(ZN(SUM(Csales))/LOOKUP(ZN(SUM(Csales)),FIRST()),ZN(1/(INDEX()-1)))-1`

$$CAGR = \left(\frac{\text{Ending Value}}{\text{Beginning Value}}\right)^{\frac{1}{n}} - 1$$

(Ending Value / Beginning Value; n)

Addressing & Partitioning

- `FIRST()`: first cell in partition
- `LAST()`: last cell in partition
- `INDEX()`: position in partition
- `SIZE()`: number of cells in partition
- `TOTAL(expression)`: the total of expression in partition
- `LOOKUP(expression, offset)`: value of expression in target
- `PREVIOUS_VALUE(expression)`: value of expression in previous cell

- Rank of the cell
  - RANK
  - RANK_DENSE(expression, ['asc' | 'desc'])
  - RANK_MODIFIED(expression, ['asc' | 'desc'])
  - RANK_PERCENTILE(expression, ['asc' | 'desc'])
  - RANK_UNIQUE(expression, ['asc' | 'desc'])
- from first to current cell
  - RUNNING_AVG(expression)
  - RUNNING_COUNT(expression)
  - RUNNING_MAX(expression)
  - RUNNING_MIN(expression)
  - RUNNING_SUM(expression)
- function of expression within defined window
  - WINDOW_AVG(expression, [start, end])
  - WINDOW_CORR(expression, [start, end])
  - WINDOW_COUNT(expression, [start, end])
  - WINDOW_COVAR(expression1, expression2 [start, end])
  - WINDOW_COVARP(expression1, expression2 [start, end])
  - WINDOW_MEDIAN(expression, [start, end])
  - WINDOW_MAX(expression, [start, end])
  - WINDOW_MIN(expression, [start, end])
  - WINDOW_PERCENTILE(expression, [start, end])
  - WINDOW_STDEV(expression, [start, end])
  - WINDOW_STDEVP(expression, [start, end])
  - WINDOW_SUM(expression, [start, end])
  - WINDOW_VAR(expression, [start, end])
  - WINDOW_VARP(expression, [start, end])

Level of detail (LOD)

- FIXED: calculates values using specified dimensions, independent of other dimensions in the view
- INCLUDE: Adds specified dimensions to those already in the view
- EXCLUDE: Removes specified dimensions from the context of the view, simplifying the level of detail within which calculations are performed

`{ FIXED [Dimension1], [Dimension2], ... : AGG([Measure]) }`

- Dimensions over which the calculation is fixed
- Aggregation function (e.g., SUM(), AVG(), MIN(), MAX(), etc)

example:

	A	B	C
1	Segment	Product	Sales
2	Consumer	Product A	$ 4.00
3	Consumer	Product A	$ 2.00
4	Consumer	Product B	$ 5.00
5	Corporate	Product A	$ 5.00
6	Corporate	Product A	$ 6.00
7	Corporate	Product B	$ 3.00
8	Home Office	Product A	$ 6.00
9	Home Office	Product A	$ 4.00
10	Home Office	Product B	$ 7.00

Columns: Measure Names
Rows: Segment

Average Sales by Segment

Segment	Avg. Sales	Avg of Sales by Product
Consumer	$3.67	$5.50
Corporate	$4.67	$7.00
Home Office	$5.67	$8.50

Average sales by product
Product A:
(4+2+5+6+6+4)/6
27/6 = $4.50

Product B: (5+3+7)/3 = $5.00

Average sales by segment
Consumer: (4+2+5)/3 = $3.67
Corporate: (5+6+3)/3 = $4.67
Home Ofc: (6+4+7)/3 = $5.67

Product A sales by segment:
Consumer: 4+2 = $6
Corporate: 5+6 = $11
Home Office: 6+4 = $10

Product B sales by segment
Consumer: $5
Corporate: $3
Home Office: $7

Average sales by product for each segment:
Consumer: (6+5)/2 = $5.50
Corporate: (11+3)/2 = $7.00
Home Office: (10+7)/2 = $8.50

Q10 Indexing Four Dimensions

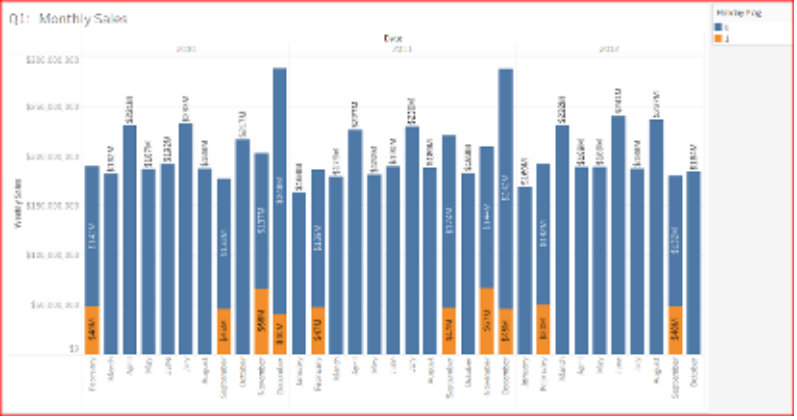
		Marital Status / Occupation								
		Divorced			Never-married			Widowed		
Sex	Education	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales
Female	Bachelors	1	6	11	1	6	11	1	6	11
	Doctorate	2	7	12	2	7	12	2	7	12
	HS-grad	3	8	13	3	8	13	3	8	13
	Masters	4	9	14	4	9	14	4	9	14
	Some-college	5	10	15	5	10	15	5	10	15
Male	Bachelors	1	6	11	1	6	11	1	6	11
	Doctorate	2	7	12	2	7	12	2	7	12
	HS-grad	3	8	13	3	8	13	3	8	13
	Masters	4	9	14	4	9	14	4	9	14
	Some-college	5	10	15	5	10	15	5	10	15

Q11 Indexing Four Dimensions

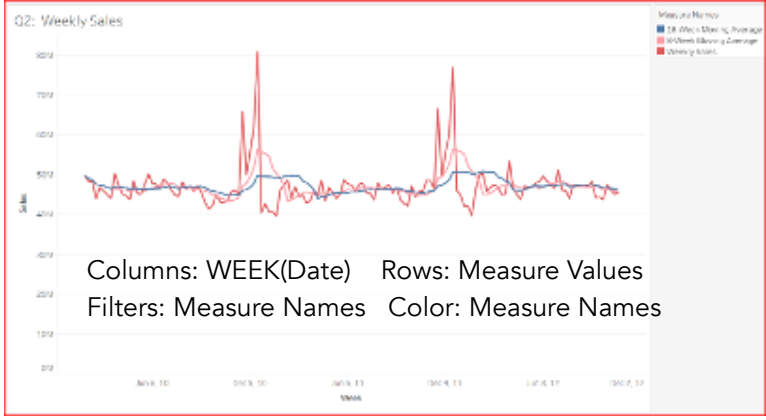
		Marital Status / Occupation								
		Divorced			Never-married			Widowed		
Sex	Education	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales
Female	Bachelors	1	13	25	2	14	26	3	15	27
	HS-grad	4	16	28	5	17	29	6	18	30
	Masters	7	19	31	8	20	32	9	21	33
	Some-college	10	22	34	11	23	35	12	24	36
Male	Bachelors	1	13	25	2	14	26	3	15	27
	HS-grad	4	16	28	5	17	29	6	18	30
	Masters	7	19	31	8	20	32	9	21	33
	Some-college	10	22	34	11	23	35	12	24	36

Q12 Indexing Four Dimensions

		Marital Status / Occupation								
		Divorced			Never-married			Widowed		
Sex	Education	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales	Exec-managerial	Prof-specialty	Sales
Female	Bachelors	1	1	1	6	6	6	11	11	11
	Doctorate	2	2	2	7	7	7	12	12	12
	HS-grad	3	3	3	8	8	8	13	13	13
	Masters	4	4	4	9	9	9	14	14	14
	Some-college	5	5	5	10	10	10	15	15	15
Male	Bachelors	1	1	1	6	6	6	11	11	11
	Doctorate	2	2	2	7	7	7	12	12	12
	HS-grad	3	3	3	8	8	8	13	13	13
	Masters	4	4	4	9	9	9	14	14	14
	Some-college	5	5	5	10	10	10	15	15	15

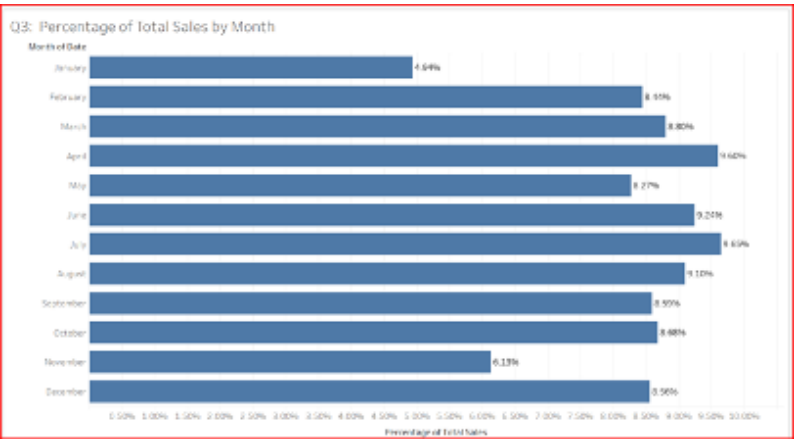


Columns: YEAR(Date), MONTH(Date) Rows: SUM(Weekly Sales)
Color: HOLIDAY FLAG Label/Text: SUM(Weekly Sales)

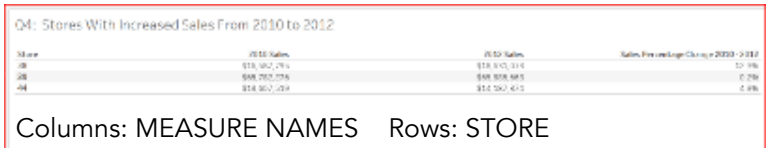


Columns: WEEK(Date) Rows: Measure Values
Filters: Measure Names Color: Measure Names

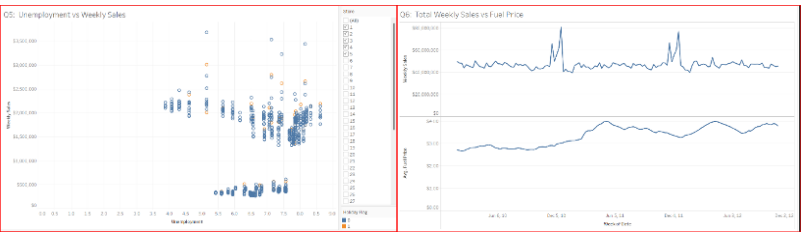
Measure Values: 16-Week Moving Average, 8-Week Moving Average, SUM(Weekly Sales)
8-Week Moving Average: WINDOW_AVG(SUM([Weekly Sales]), -7, 0)
16-Week Moving Average: WINDOW_AVG(SUM([Weekly Sales]), -15, 0)
Checked: Week of Date (for both fields)



Columns: Percentage of Total Sales Rows: MONTH(Date)
Label/Text: Percentage of Total Sales
SUM([Weekly Sales]) / TOTAL(SUM([Weekly Sales]))
CHECKED: Month of Date

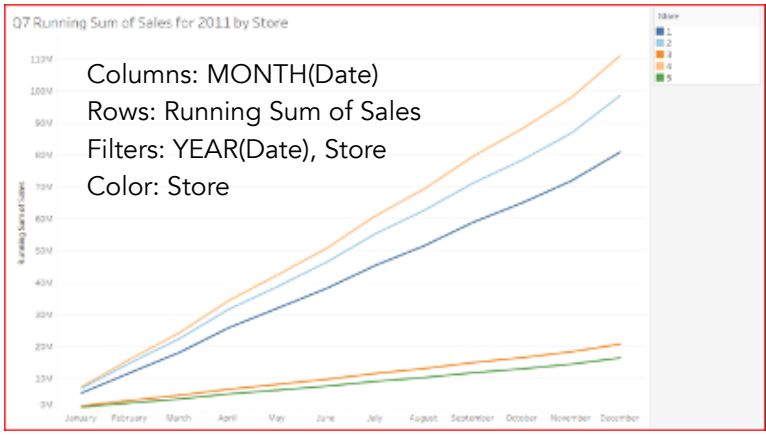


Columns: MEASURE NAMES Rows: STORE
Filters: MEASURE NAMES, AGG(Sales Percentage Change)
Label/Text: MEASURE VALUES
Measure Values: SUM(2010 Sales), SUM(2012 Sales), AGG(Sales Percentage Change 2010-2012)
2010 Sales: IF YEAR([Date])=2010 THEN [Weekly Sales] ELSE 0 END
2012 Sales: IF YEAR([Date])=2012 THEN [Weekly Sales] ELSE 0 END
Sales Percentage Change 2010-2012:
(SUM([2012 Sales])-SUM([2010 Sales]))/SUM([2010 Sales])



Columns: UNEMPLOYMENT
Rows: WEEKLY SALES
Filters: STORE
Color: HOLIDAY FLAG

Columns: WEEK(Date)
Rows: SUM(Weekly Sales), AVG(Fuel Price)



Columns: MONTH(Date)
Rows: Running Sum of Sales
Filters: YEAR(Date), Store
Color: Store

Running sum of Sales: RUNNING_SUM(SUM([Weekly Sales]))
Checked: MONTH of DATE, Unchecked: STORE

Q8 Average Income by Sex and Education

Sex	Education	Avg. Annual Income	Rank of Average Income
Female	Bachelors	38,042	9
	Doctorate	58,700	4
	HS-grad	32,792	12
	Masters	48,199	7
	Prof-school	50,433	5
	Some-college	32,804	11
Male	Bachelors	50,257	6
	Doctorate	61,029	1
	HS-grad	37,941	10
	Masters	56,075	3
	Prof-school	60,707	2
	Some-college	40,323	8

Columns: Measure Names Rows: Sex, Education
Filters: Education, Measure Names Label/Text: Measure Values
Measure Values: AVG(Annual Income), Rank of Average Income
RANK(AVG([Annual Income]) Checked: Sex Education (order doesn't matter)

Q9 Average Income by Sex, Education, and Marital Status

Sex	Education	Marital Status	Avg. Annual Income	Rank of Average Income
Female	Bachelors	Divorced	36,723	8
		Never-married	32,301	12
		Separated	35,616	9
		Widowed	34,639	11
	Doctorate	Divorced	55,968	1
		Never-married	52,081	2
		Separated	46,428	3
		Widowed	39,940	4
	Masters	Divorced	39,320	5
		Never-married	37,764	7
		Separated	37,840	6
		Widowed	35,548	10
Male	Bachelors	Divorced	42,298	9
		Never-married	35,898	12
		Separated	38,532	11
		Widowed	54,345	5
	Doctorate	Divorced	62,336	2
		Never-married	44,824	8
		Separated	60,270	3
		Widowed	64,768	1
	Masters	Divorced	46,361	6
		Never-married	39,199	10
		Separated	57,104	4
		Widowed	47,437	7

Columns: Measure Names Rows: Sex, Education, Marital Status
Filters: Education, Measure Names, Marital Status
Label/Text: Measure Values
Measure Values: AVG(Annual Income), Rank of Average Income