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Hands on questions are 4 points each

Knowledge based questions are generally 1 point each, but the multiselect question is worth two points.

Calculations, Questions 1-7

Hands-on Calculations Q 1 of 4

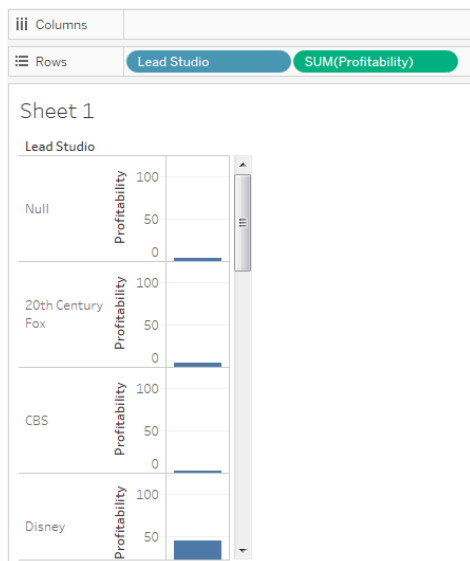
1. Answer the question using this data:

<https://public.tableau.com/s/sites/default/files/media/HollywoodsMostProfitableStories.csv>.

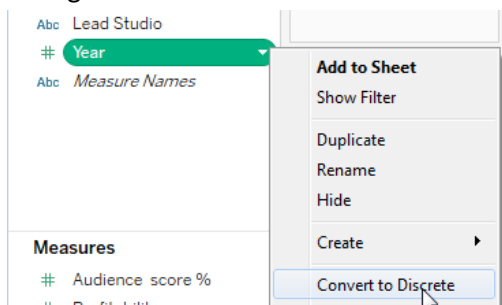
For films where Disney was not the lead studio, what was the % decrease in profitability from 2010 to 2011?

- A. 55.3%
- B. 7.2%
- C. 11.59%
- D. 86.28%

Add Lead Studio and Profitability to the view:



Change “Year” to discrete:



Add year to the view. The view should be a text table.

Pages

Filters

Marks

T

Automatic

Color

Size

T

Text

Detail

Tooltip

T

SUM(Profitabil..

Columns

Year

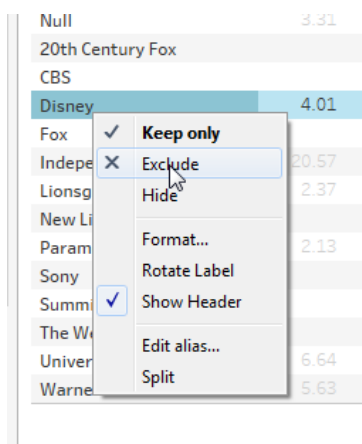
Rows

Lead Studio

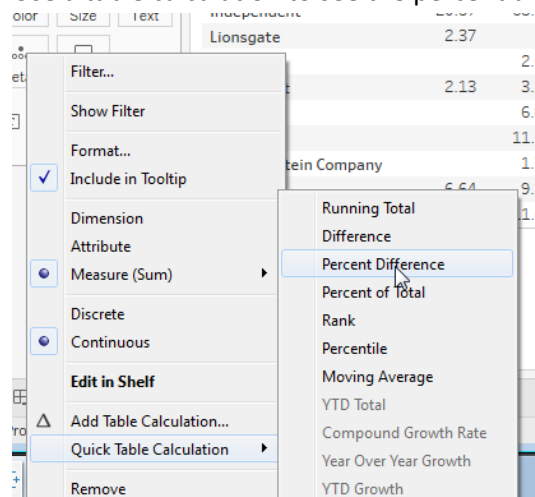
Sheet 1

	Year				
Lead Studio	2007	2008	2009	2010	2011
Null	3.31				
20th Century Fox					5.06
CBS				2.20	
Disney	4.01	25.81	7.87	1.37	5.39
Fox		15.36	8.10	3.62	
Independent	20.57	68.57	7.54	5.08	16.71
Lionsgate	2.37			1.25	
New Line		2.07			
Paramount	2.13	3.21	2.60	2.44	
Sony		6.00		4.60	8.74
Summit		11.56	14.20	6.13	
The Weinstein Company		1.75		1.09	0.83
Universal	6.64	9.23	9.03	1.72	
Warner Bros.	5.63	11.03	10.95	8.38	2.54

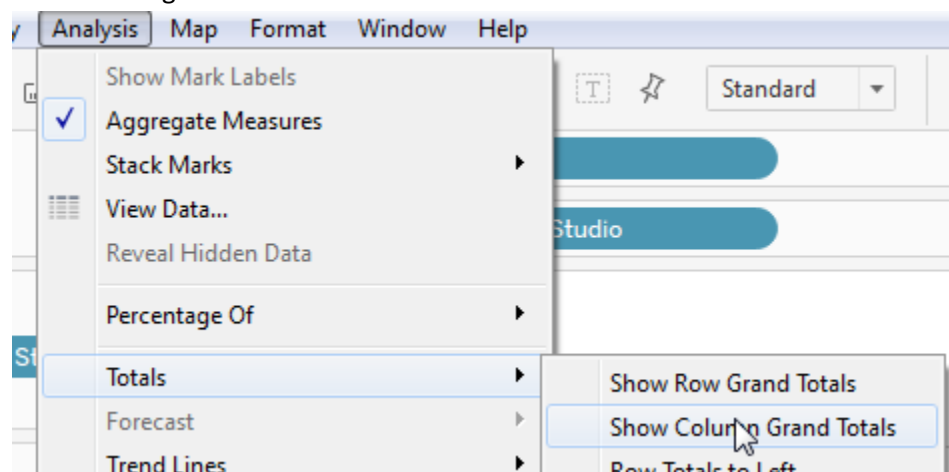
Exclude Disney:



Use a table calculation to see the percent difference:



Add column grand totals:



View should now look like this... excluding those with lead studio of Disney, there was a 7.2% drop in 2011.

The image shows a Tableau interface with a pivot table. The Columns shelf contains 'Year' and the Rows shelf contains 'Lead Studio'. The Marks card is set to 'SUM(Profit)' with a green pill. The table shows profit percentages for various studios from 2007 to 2011. The Grand Total for 2011 is -7.2%.

Lead Studio	2007	2008	2009	2010	2011
Null		-100.0%			
20th Century Fox					
CBS					-100.0%
Fox			-47.3%	-55.3%	-100.0%
Independent	233.4%	-89.0%	-32.6%	228.8%	
Lionsgate		-100.0%			-100.0%
New Line			-100.0%		
Paramount	50.6%	-19.0%	-6.1%	-100.0%	
Sony			-100.0%		90.2%
Summit		22.8%	-56.8%	-100.0%	
The Weinstein Company			-100.0%		-24.2%
Universal	39.1%	-2.2%	-81.0%	-100.0%	
Warner Bros.	96.0%	-0.7%	-23.5%	-69.7%	
Grand Total	216.9%	-59.3%	-30.4%		-7.2%

Hands-on Calculations Q 2 of 4

2. Answer using the Top Baby Names By State data:

<https://public.tableau.com/s/sites/default/files/media/TopBabyNamesbyState.csv>

For boys born between 2000 and 2012, the most common first letter for the top name by state was:

- A. W
- B. M
- C. J
- D. D

Get the first letter with this calculation:

The image shows a Tableau calculation editor window titled 'First letter'. The calculation entered is `left([Top Name],1)`. The window includes an 'Apply' button and an 'OK' button. A status message at the bottom says 'The calculation is valid.'

Filter on Gender = M and year between 2000 and 2012:

General Wildcard Condition Top

☒ Select from list ☐ Custom value list ☐ Use all

Enter search text

☐ F
☒ M

All None ☐ Exclude

Summary
Field: [Gender]
Selection: Selected 1 of 2 values
Wildcard: All
Condition: None
Limit: None

Reset OK Cancel Apply

Filter [Year]

Range of values At least At most Special

Range of values

2,000 2,012

1910 2012

Show: Only Relevant Values ☐ Include Null Values

Reset OK Cancel Apply

Double-click Number of Records to add it to the view:

Pages	Columns
	Rows
	First letter

Filters

Year

Gender: M

Marks

Automatic

Color Size Text

Detail Tooltip

SUM(Number..

Sheet 1

First letter	
A	30
B	1
C	2
D	12
E	62
I	1
J	272
L	21
M	137
N	8
O	1
R	7
S	1
W	108

Hands-on Calculations Q 3 of 4

3. Answer this using the SuperStore data.

Find the total sales value for all product categories for customers who ordered office furniture.

- A. 3,864,069
- B. 8,119,645
- C. 2,258,326
- D. 2,786,637

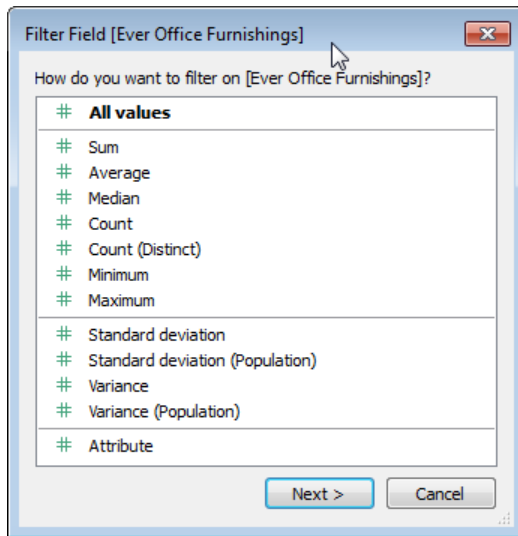
Ever|Office Furnishings

```
{fixed [Customer Name] :
max(if [Product Sub-Category]
= "Office Furnishings" then 1 else 0 end)}
```

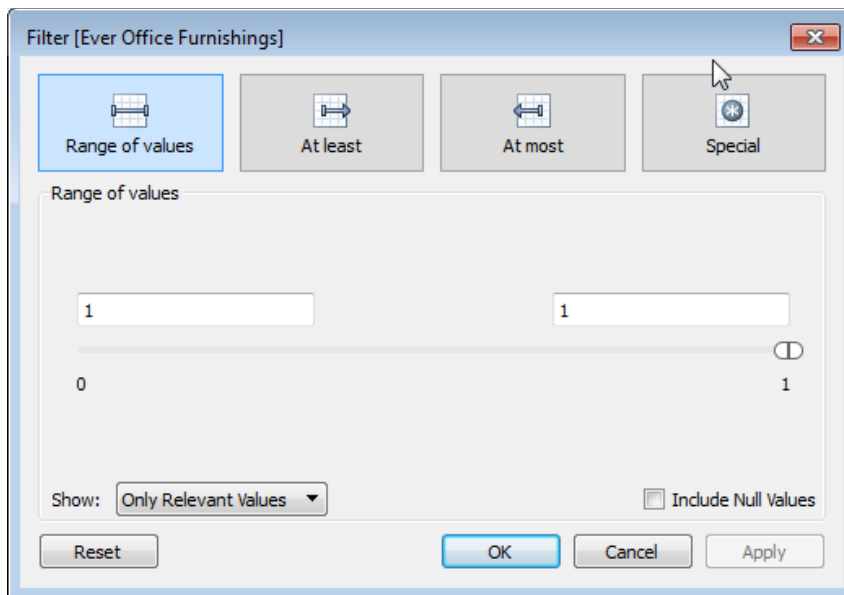
This calculation is a little tricky. Here's how it works:

- E. The fixed function means we are looking at all rows for the customer name.
- F. We are taking the max value of the if statement. This if will return a 1 if we purchase office furnishings.
- G. So, if we the customer had any rows where they purchased office furnishings then the MAX function returns a 1, so all of the rows for that customer have a 1.

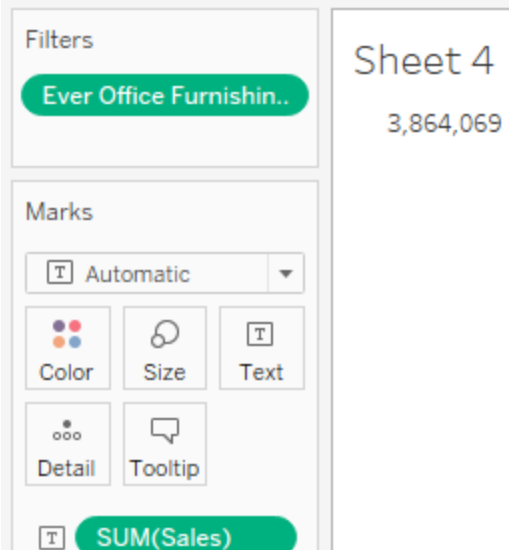
Once we have this, we can filter on Ever Office Furnishings = 1 to limit to customer who ever purchased office furnishings:



If the value is 1, then the customer purchased Office Furnishings



then add Sales to the view:

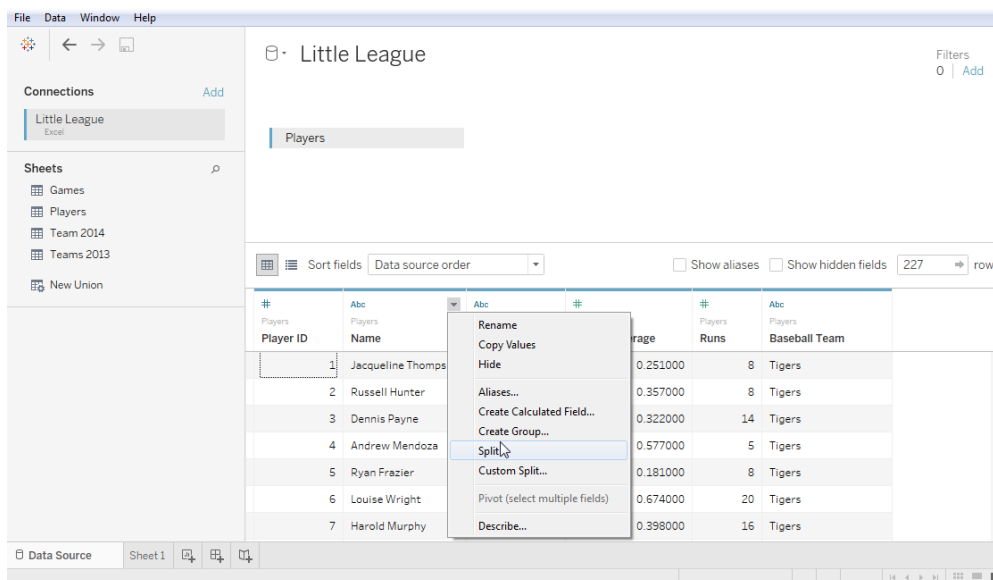


Hands-on Calculations Q 4 of 4

4. Answer this question with the [Little League](#) data. How many players have the first name “Anna”

- A. 1
- B. 2**
- C. 3
- D. 4

Split the name field to get first and last name:



Add Number of Records and Name – Split1 to the view. You see two records with the name Anna.

Pages Columns Rows Name - Split 1

Filters

Marks Automatic Color Size Text Detail Tooltip SUM(Number ..

Sheet 1

Name - Spli...	
Aaron	2
Adam	1
Alan	2
Albert	2
Amanda	1
Amy	1
Andrea	1
Andrew	1
Angela	1
Anna	1
Anne	1
Annie	1
Anthony	1
Antonio	3

Keep Only Exclude Name - Split 1: Anna Number of Records: 2

5. Knowledge-based: The AVG function does not treat null values as zeros. Rather, the AVG function ignores null values. (TRUE)

Calculation1

Aggregate

Enter search text

ATTR
AVG
COUNT
COUNTD
EXCLUDE
FIXED
INCLUDE
MAX
MEDIAN
MIN
PERCENTILE
STDEV
STDEVP
SUM
VAR

AVG(expression)

Returns the average of all the values in the expression. AVG can be used with numeric fields only. Null values are ignored.

Example: AVG([Profit])

Apply OK

6. (NEW) HANDS-ON Question

Using the Players sheet, what percent of pitchers and catchers had a batting average above 0.300 and had fewer than 10 runs?

36.54%

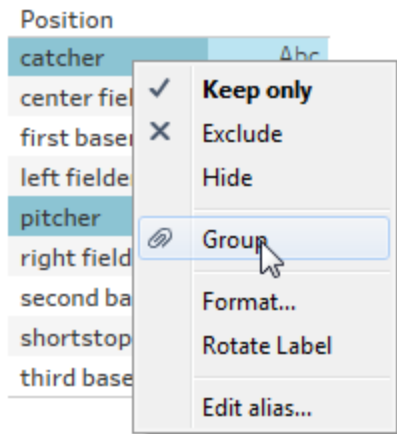
63.46%

19.23%

80.77%

80.23%

Group catcher and pitcher:



Create a calculation for batting avg > .3 and runs < 10:

Bats > 0.3 and < 10 runs

×

[Batting Average]>.3 and [Runs]<10

◀

The calculation is valid.

Sheets Affected ▾

Apply

OK

Now add a formula to count the distinct players:

Players

×

countd([Player ID])

◀

The calculation is valid.

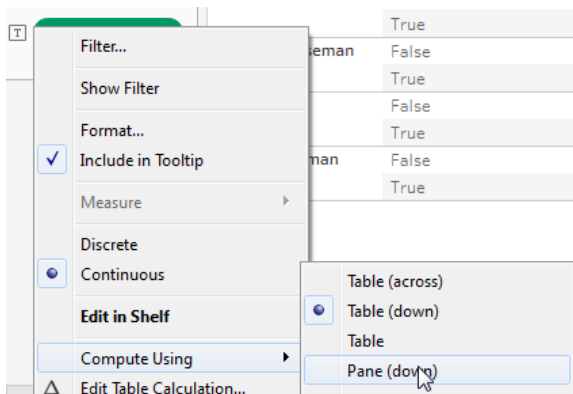
Apply

OK

Add this to the view:

Pages	Columns	
Filters	Rows	Position (group) Bats > 0.3 and < 10 ru..
Marks	Sheet 1	
Automatic	Position (gr.. Bats > 0.3 and < 10 runs	
Color	catcher & pitcher	False 42
Size	center	True 10
Text	fielder	False 18
Detail	first baseman	True 7
Tooltip	left fielder	False 24
AGG(Players)	right fielder	True 1
	second baseman	False 19
	shortstop	True 6
	third baseman	False 16
		True 9
		False 20
		True 5
		False 20
		True 5
		False 21
		True 4

Add a % of total table calculation, and calculate Pane(down) to get the % of the catchers & pitchers with avg > .3 and Runs < 10:



19.23% of pitchers and catchers have avg > .3 and Runs < 10

Pages

Filters

Marks

Automatic

Color

Size

T

Text

Detail

Tooltip

T

AGG(Player..)

Columns

Rows

Position (group)

Bats > 0.3 and < 10 ru..

Sheet 1

Position (gr... Bats > 0.3 and < 10 runs

catcher & pitcher	False	80.77%
	True	19.23%
center fielder	False	72.00%
	True	28.00%
first baseman	False	96.00%
	True	4.00%
left fielder	False	76.00%
	True	24.00%
right fielder	False	64.00%
	True	36.00%
second baseman	False	80.00%
	True	20.00%
shortstop	False	80.00%
	True	20.00%
third baseman	False	84.00%
	True	16.00%

7. Knowledge-based: An aggregated calculation can be multiplied by a non-aggregated constant (TRUE).

“Constant terms in an expression act as aggregated or disaggregated values as appropriate. For example: `SUM(Price*7)` and `SUM(Price)*7` are both valid expressions.” [source](#)

Data Connections, Questions 8 - 14

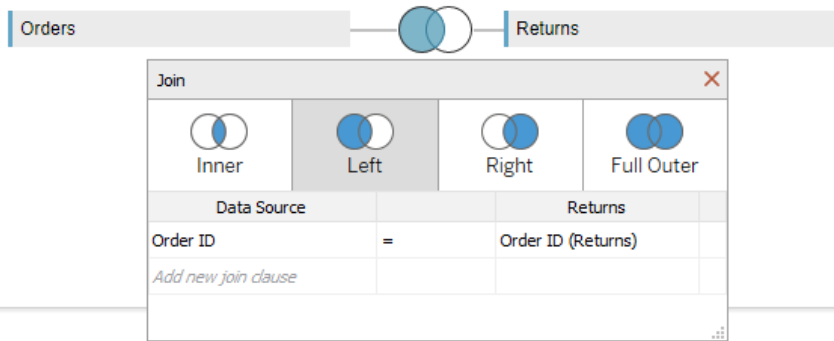
Hands-on Question 1 of 5

8. Answer this question using the Superstore data. Which order priority was associated with the highest proportion of returned orders?
- A. Critical
 - B. High
 - C. Medium
 - D. Low
 - E. Unspecified

Create a left join using Order ID in the join clause. An inner join would drop items that are not in the Returns data, causing all of the items that were not returned to be excluded.

Orders+ (Sample-Superstore-Subset-Excel)

Orders is made of 2 tables. ⓘ



Create a calculated field to determine the proportion of orders returned:

Proportion of Orders Returned

```
countd([Order ID (Returns)]) / countd([Order ID])
```

Create a text table with Order Priority and the calculated field:

Pages	Columns
	Order Priority
Filters	Rows
Marks	Sheet 1
Automatic	Order Priority
Color	Critical 0.010117
Size	High 0.013554
Text	Low 0.008410
Detail	Medium 0.010998
Tooltip	Not Specified 0.003912
AGG(Proportion of Orders Returned)	

High has 13.5% of orders returned, a larger proportion than any other order priority.

9. Use [this data](#) to answer the following question. New England consists of the following states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont. Which year saw the greatest increase in adults on probation in New England?
- A. 1998
 - B. 2002**
 - C. 2009
 - D. 2011

Select “Use the data interpreter”

The screenshot shows the Power BI interface. On the left, the 'Connections' pane lists 'corpop11' as an Excel connection. Below it, the 'Sheets' pane shows 'Use Data Interpreter' with a tooltip that says 'Data Interpreter might be able to clean your Excel workbook.' The main view displays a table with columns labeled 'corpop11' and rows of data. The table has 9 columns and 3 rows of data, with the first column being a header and the subsequent columns containing numerical values.

Highlight all the columns except the first one, and right-click, and select Pivot:

The screenshot shows a table with columns labeled 'corpop11' and rows of data. A right-click context menu is open over the table, with the 'Pivot' option highlighted. The table has 9 columns and 8 rows of data, with the first column being a header and the subsequent columns containing numerical values. The context menu options include 'Rename', 'Copy Values', 'Hide', 'Create Calculated Field...', 'Pivot', and 'Merge Mismatched Fields'.

Rename as “State,” “Year” and “Population”

Abc corpop11 F1	Abc Pivot Pivot Field Names	# Pivot Pivot Field Values
Alabama/4	1977	10,404
Alaska	1977	846
Arizona	1977	

Result:

Abc corpop11 State	Abc Pivot Year	# Pivot Population
Alabama/4	1977	10,404
Alaska	1977	846
Arizona	1977	null
Arkansas	1977	545

Highlight **all six** New England states, then select Keep Only:

Automatic	Northeast/2	Abc
Size	Ohio	Abc
Text	Oklahoma/9	Abc
Tooltip	Oregon	Abc
	Pennsylvania/4,5,6	Abc
	Rhode Island	Abc
	South Carolina/10	Abc
	South Dakota	Abc
	South/3	Abc
	State/2,3	Abc
	Tennessee	Abc
	Texas	Abc
	U.S. total/2,3	Abc
	Utah	Abc
	Vermont	Abc
	Virginia/5	Abc
	Washington/4	Abc
	West	Abc
	West Virginia	Abc

Your view should now look like this:

Filters

State

Marks

Automatic

Color Size Text

Sheet 1

State	
Connecticut	Abc
Maine	Abc
Massachusetts/4,5	Abc
New Hampshire	Abc
Rhode Island	Abc
Vermont	Abc

Add Year and Population to the view and include the totals, so that you see the population for New England each year.

Pages

Columns State

Rows Year

Filters

State

Marks

Automatic

Color Size Text

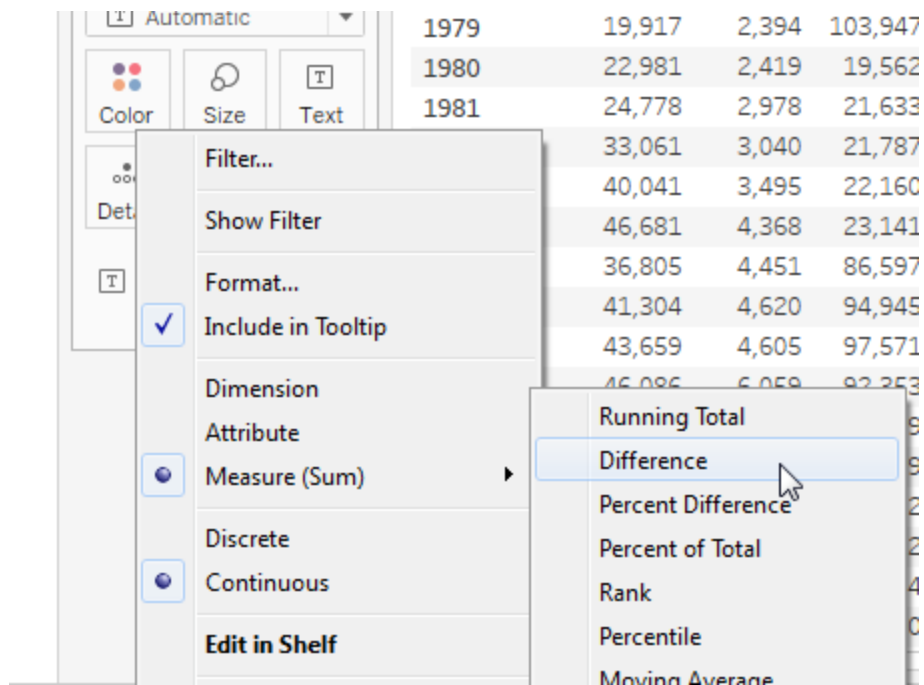
Detail Tooltip

SUM(Population)

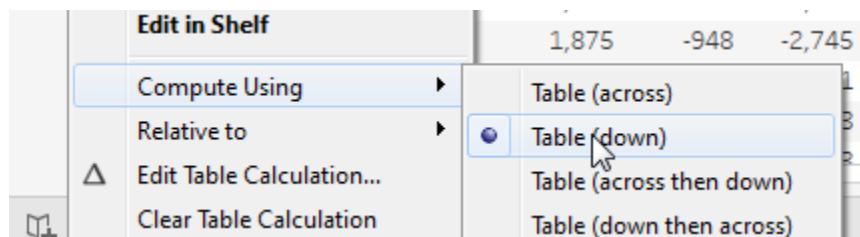
Sheet 1

Year	State						Grand T..
	Connec..	Maine	Massac..	New Ha..	Rhode I..	Vermont	
1977	17,136	2,348	98,661	1,891	4,080	2,476	126,592
1978	17,189	2,489	114,633	1,936	4,895	2,653	143,795
1979	19,917	2,394	103,947	1,721	5,111	2,670	135,760
1980	22,981	2,419	19,562	1,663	5,501	3,100	55,226
1981	24,778	2,978	21,633	2,261	6,049	3,400	61,099
1982	33,061	3,040	21,787	2,263	6,501	4,227	70,879
1983	40,041	3,495	22,160	2,323	6,495	4,264	78,778
1984	46,681	4,368	23,141	3,126	7,147	4,736	89,199
1985	36,805	4,451	86,597	3,096	7,536	5,298	143,783
1986	41,304	4,620	94,945	3,583	8,174	5,529	158,155
1987	43,659	4,605	97,571	2,827	8,181	5,593	162,436
1988	46,086	6,059	92,353	2,948	9,824	5,966	163,236
1989	42,842	6,851	88,529	2,991	12,231	5,399	158,843
1990	46,640	7,549	72,459	3,146	15,366	5,912	151,072
1991/1	47,523	6,943	54,172	4,126	16,138	5,636	134,538
1992	48,567	8,942	48,312	4,104	15,585	6,034	131,544
1993	50,904	8,712	47,154	4,125	16,186	6,058	133,139
1994	53,453	8,638	46,670	4,323	18,179	6,676	137,939

Click on Sum(Population), then click Table Calculation, and select Difference.



Select Table(Down)



View should now look like this. The largest increase occurred in 2002.

Pages

Columns: State

Rows: Year

Filters: State

Marks: SUM(Population)

Sheet 1

Year	Connec..	Maine	Massac..	New Ha..	Rhode I..	Vermont	Grand T..
1995	1,054	3	-2,990	24	671	646	-592
1996	1,471	-888	1,178	67	1,596	137	3,561
1997	11	-575	1,572	462	-798	227	899
1998	-989	-225	137	299	1,401	1,319	1,942
1999	70	571	-300	-1,546	704	194	-307
2000	-7,434	264	-1,034	0	-831	132	-8,903
2001	1,716	1,151	-1,114	36	3,837	-65	5,561
2002	1,632	507	87,200	37	1,155	830	91,361
2003	1,208	409	35,145	285	15	-286	36,776
2004	1,875	-948	-2,745	298	156	-79	-1,443
2005	-1,232	-855	4,241	330	-172	-798	1,214

10. Answer this question with Teams 2014 and Games worksheets on the [Little League](#) data. The Games data includes information on games played in 2015, including showing the team that won each game. Which team had the biggest increase in winning games between 2014 and 2015?
- A. Lightning
 - B. Knights
 - C. Bears
 - D. Ninjas

To answer this question we need to do a **BLEND** rather than a join. The reason for this – the Games worksheet has one row for each game that was won or lost, while the Teams 2014 worksheet has a single row per team. If you join the two tables by team, you will duplicate the data in the Teams 2014 worksheet. To avoid this, we blend the two worksheets, using the Games worksheet as our primary datasource.

Create a connection to Games:

Games (Little League)

Games

Click the black arrow and select New Data Source:

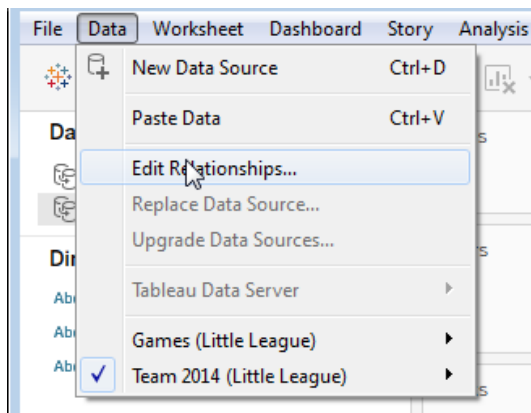


Add Team 2014:

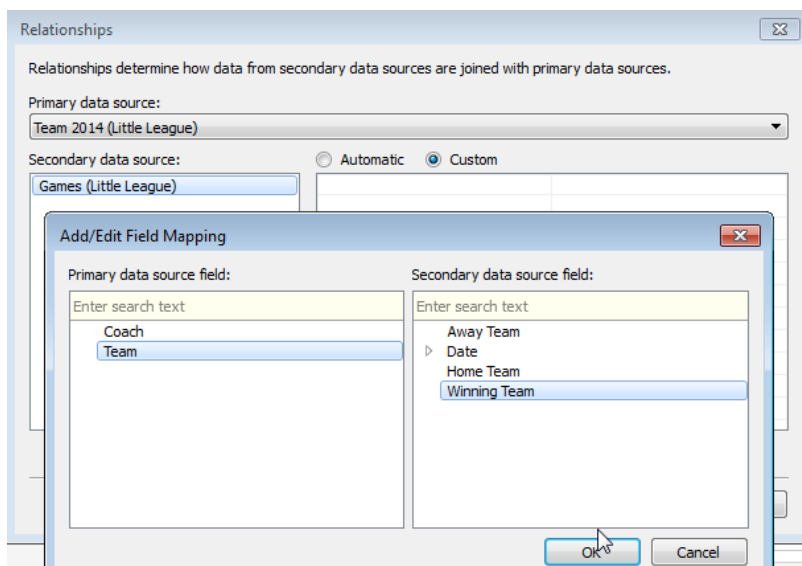
Team 2014 (Little League)

Team 2014

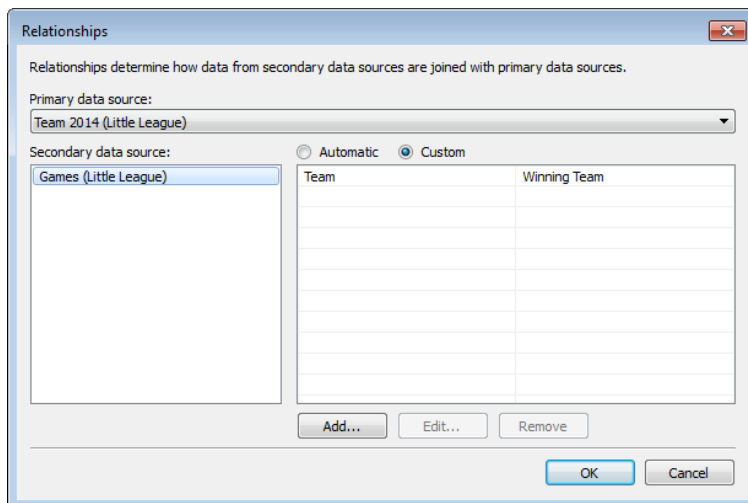
Select Data and then Edit Relationships:



Select the “Custom” radio button, click “Add,” then select “Team” and “Winning Team”



Your relationships should look like this:

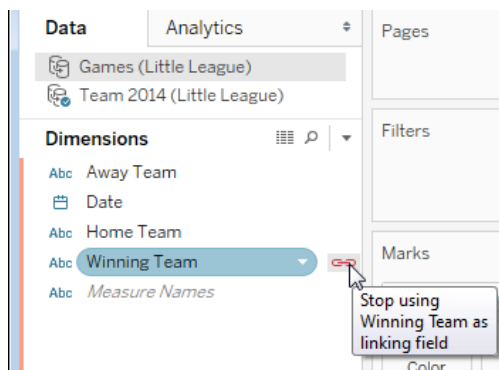


From Games data, add Winning Team and Number of records to see how many wins each team had in 2015:

The screenshot shows the Tableau interface. On the left, the 'Marks' card has 'SUM(Number of Records)' selected. The 'Columns' shelf has 'Winning Team'. The main view displays a table with the following data:

Winning Team	Number of Records
Badgers	46
Bears	57
Falcons	46
Knights	44
Lightning	45
Lions	41
Ninjas	52
Tigers	53

If you switch to Games, you should see that “Winning Team” is now the linking field.



Switch to the Team 2014 data, and add Games Won in 2014:

Sheet 1

Winning Team	Games Won in 2014	Number of Records
Badgers	17.00	46.00
Bears	24.00	57.00
Falcons	28.00	46.00
Knights	36.00	44.00
Lightning	16.00	45.00
Lions	26.00	41.00
Ninjas	16.00	52.00
Tigers	43.00	53.00

Now we just need the difference:

2015 Wins - 2014 Wins

Team 2014 (Little League)

×

SUM([Games (Little League)].[Number of Records])
-
sum([Games Won in 2014])

Add the calculation to the view. You'll see the Ninja's had the biggest improvement in games won in 2015 compared to 2014:

Sheet 1

Winning Team	Games Won in 2014	Number of Records	2015 Wins - 2014 Wins
Badgers	17.00	46.00	29.00
Bears	24.00	57.00	33.00
Falcons	28.00	46.00	18.00
Knights	36.00	44.00	8.00
Lightning	16.00	45.00	29.00
Lions	26.00	41.00	15.00
Ninjas	16.00	52.00	36.00
Tigers	43.00	53.00	10.00


11. Answer this question with the Teams 2013 and Teams 2014 worksheets on the [Little League](#) data.
- Which team had the biggest *decrease* in games won from 2013 to 2014?
- A. Lions

B. Bears

C. Tigers

D. Lightning

Both Teams 2013 and Teams 2014 have a single row per team. Each row shows how many games were won for that year. So we will simply join the two datasets.

 Team 2014+ (Little League)

Team 2014

Teams 2013

Join

×

Inner
 Left
 Right
 Full Outer

Data Source

Teams 2013

Coach

=

Coach (Teams 2013)

Add new join clause

Show alias

☐

Grid

Table

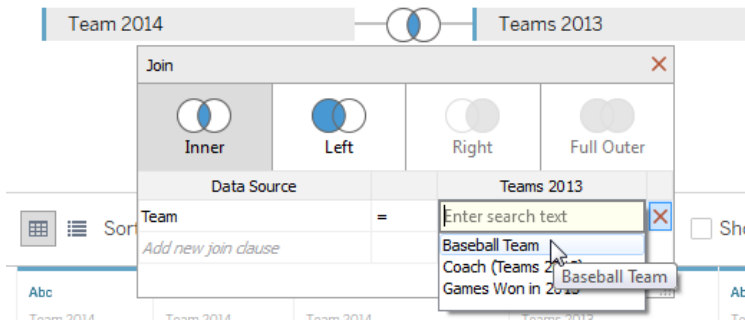
Sort

Abc

Abc

The default join is by Coach. But since the coach can change from one year to the next, we want to join instead on the name of the team:

Team 2014+ (Little League)



Data Source page now looks like this:

Team 2014		Teams 2013	
Team		Baseball Team	
Team 2014		Teams 2013	
Team	Coach	Games Won in 2014	Games Won in 2013
Badgers	Jim	17	17
Bears	Tom	24	23
Falcons	Ryan	28	28
Knights	Sally	36	39
Lightning	Susan	16	16
Lions	Nina	26	29
Ninjas	Hannah	16	17

Add the Team name, the games won in 2014, and the games won in 2013 to the view. Then add this calculation:

Games Won 2014 - Games Won 2013

$[Games\ Won\ in\ 2014] - [Games\ Won\ in\ 2013]$

Here is the final view, with the Knights and the Lions both winning three fewer games in 2014 than they did in 2013.

Pages

Columns: Baseball Team

Rows: Measure Names

Filters: Measure Names

Marks: Automatic

Color, Size, Text, Detail, Tooltip

Measure Values: SUM(Games Won 20..), SUM(Games Won in ..), SUM(Games Won in ..)

Sheet 1

	Baseball Team							
	Badgers	Bears	Falcons	Knights	Lightni..	Lions	Ninjas	Tigers
Games Won 2014 - Games..	0.00	1.00	0.00	-3.00	0.00	-3.00	-1.00	1.00
Games Won in 2013	17.00	23.00	28.00	39.00	16.00	29.00	17.00	42.00
Games Won in 2014	17.00	24.00	28.00	36.00	16.00	26.00	16.00	43.00

12. (NEW) HANDS-ON Question

Using the Best Buy data, what was the month and year with the largest absolute increase in average Open value from the same month in the prior year?

January 2015

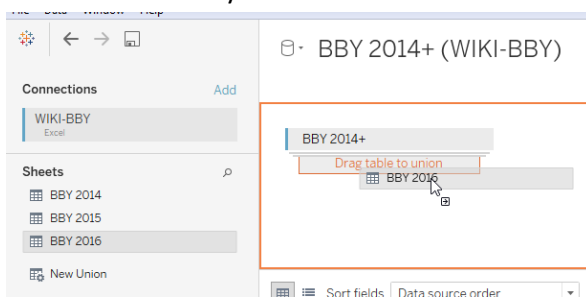
January 2016

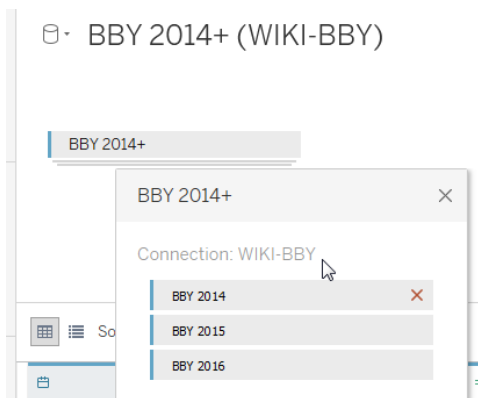
March 2016

March 2015

None of the above

Combine all three years of data with a UNION.





Merge the three date fields – “Date 2015,” Date 2014” and “Date”

#	BBY 2014+ Split Ratio	#	BBY 2014+ Adj. Open	#	BBY 2014+ Adj. High	#	BBY 2014+ Adj. Low	#	BBY 2014+ Adj. Close	#	BBY 2014+ Adj. Volume	BBY 2014+ Date - 2015	BBY 2014+ null	BBY 2014+ Table Name
	1	37.1182	37.2983	36.2075	36.7956	3,882,585	1/2/2015							BBY 2015
	1	36.5395	36.7198	35.7901	35.8471	4,827,670	1/5/2015							BBY 2015
	1	35.7332	36.0273	34.7562	35.5245	6,754,661	1/6/2015							BBY 2015
	1	36.8810	37.2510	36.7145	37.0992	8,428,739	1/8/2015							BBY 2015
	1	36.5775	37.2984	36.5680	37.0802	8,116,956	1/12/2015							BBY 2015

Now create a view with the Year of the merged date field as a column, and the Month of the merged date field as a row. Add the average Open value to the view:

Pages

Columns: YEAR(Merged Date)

Rows: MONTH(Merged Date)

Filters

Marks: Automatic

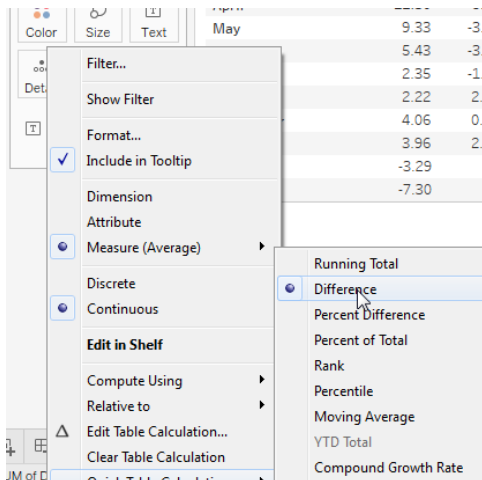
Color, Size, Text, Detail, Tooltip

AVG(Open)

Sheet 1

Month of Merged Date	2014	2015	2016
January	31.41	36.66	28.19
February	24.69	37.77	29.21
March	26.00	40.04	32.68
April	25.74	37.04	32.02
May	26.06	35.39	31.69
June	28.93	34.36	30.50
July	30.79	33.14	31.70
August	30.16	32.37	35.32
September	33.08	37.15	37.93
October	32.06	36.02	38.93
November	36.19	32.90	
December	37.78	30.48	

Now use a table calculation to show the difference in average Open value from the same month in the prior year:



Result shows biggest increase in March 2015:

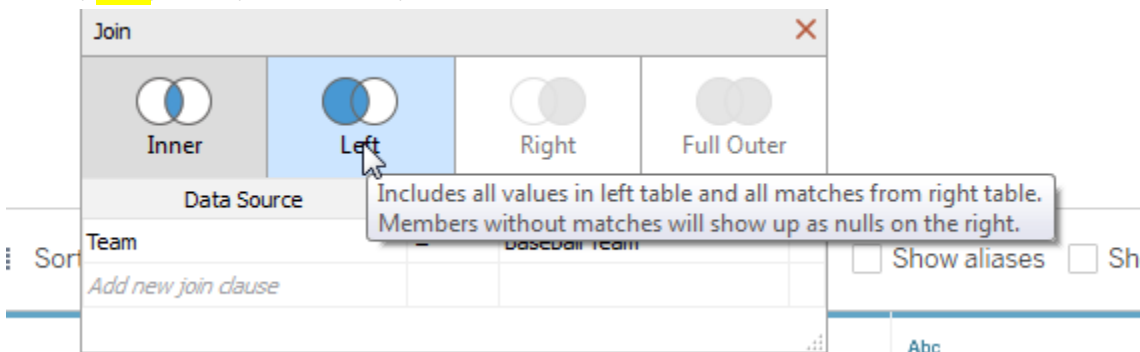
Columns: YEAR(Merged Date)
Rows: MONTH(Merged Date)

Sheet 1

	Year of Merged Date		
Month of M..	2014	2015	2016
January		5.25	-8.48
February		13.08	-8.56
March		14.03	-7.36
April		11.30	-5.02
May		9.33	-3.70
June		5.43	-3.86
July		2.35	-1.44
August		2.22	2.95
September		4.06	0.78
October		3.96	2.92
November		-3.29	
December		-7.30	

13. Knowledge-based: When using a _____ join the result is a table that contains all values from the left table and corresponding matches from the right table.

INNER, LEFT, RIGHT, FULL OUTER, BLEND



14. Knowledge-based: If you see duplicate data after doing a join you can do the following:

Combine the tables using a cross database join rather than a standard join

Add a duplicate filter to your data

Change the join condition

Change to a full outer join

Explanation: There is no option to filter duplicates. A full outer join can still include duplicates if there are multiple matches on the join condition.

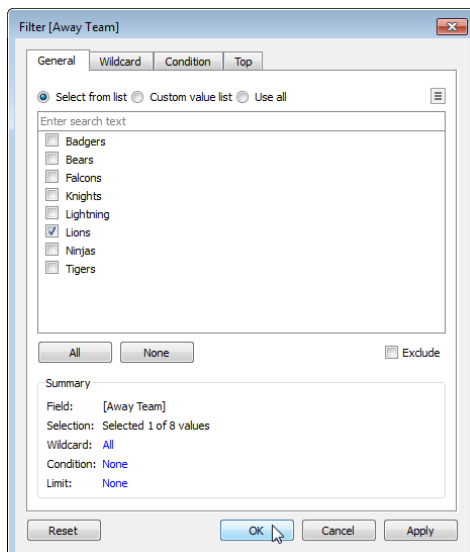
In some situation blending data can avoid duplication you would get with a join, but this wasn't one of the answers. Changing the join condition can remove duplicates if the original condition was giving more matches than the modified join condition.

Analytics, Questions 15 - 19

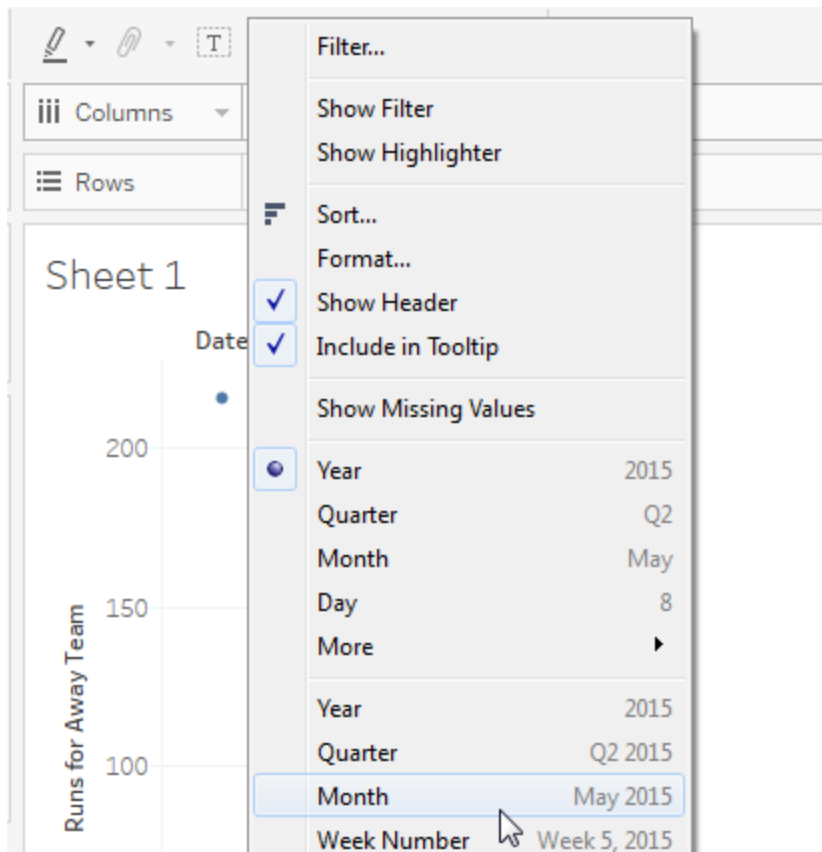
15. Answer this question with the Games worksheet from the [Little League](#) data. Create a line graph showing total away team runs for the Lions by month. Add a linear trendline. What is the R-squared value?

- A. -0.1346
- B. **.6846**
- C. .7503
- D. .0573

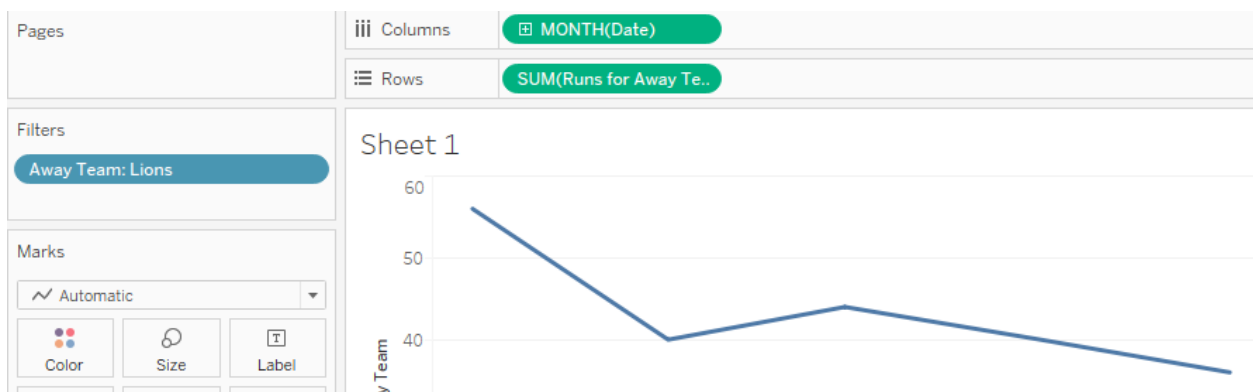
Filter on Away Team = Lions



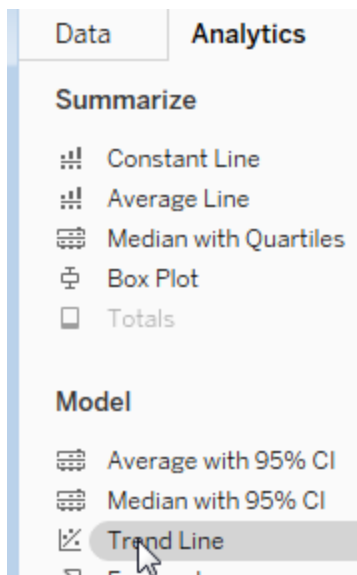
Add Date, and change it to Month:



Add to worksheet, and add Runs for Away Team

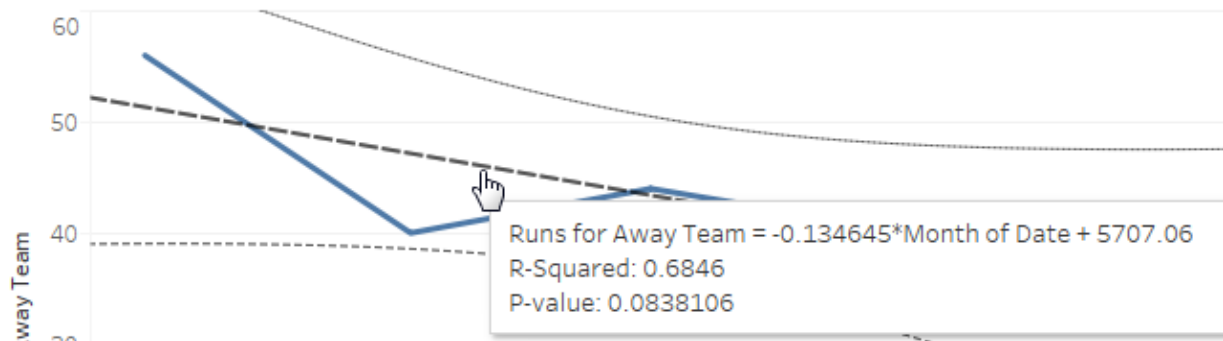


Add trendline:



See R-Squared on hover:

Sheet 1



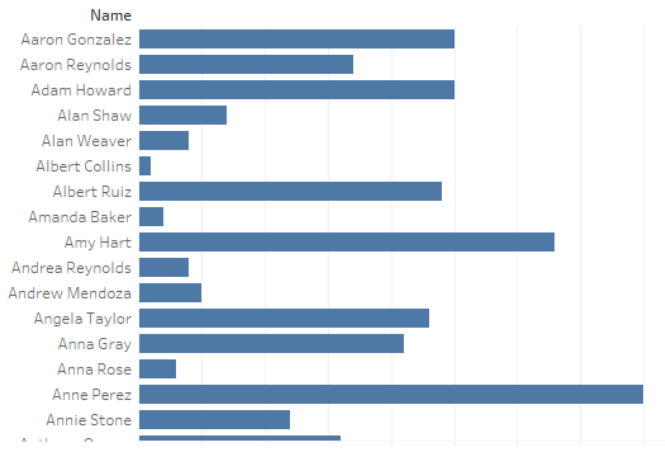
16. Answer this question with the Players worksheet from the [Little League](#) data. Create a bar chart showing runs by player. Add a reference distribution showing sample standard deviations. What is one standard deviation below the mean?

- A. 1.94
- B. 27.07
- C. 172.58
- D. 8.70

Bar chart showing runs by player:

Columns	SUM(Runs)
Rows	Name

Sheet 1



Add distribution band:

Edit Reference Line, Band, or Box

Line

Band

Distribution

Box Plot

Scope

Entire Table
Per Pane
Per Cell

Computation

Value: -1, 1 Standard Deviation

Label: Percentages

Formatting: Percentiles

Line: N

Fill: Standard Deviation

Factors:

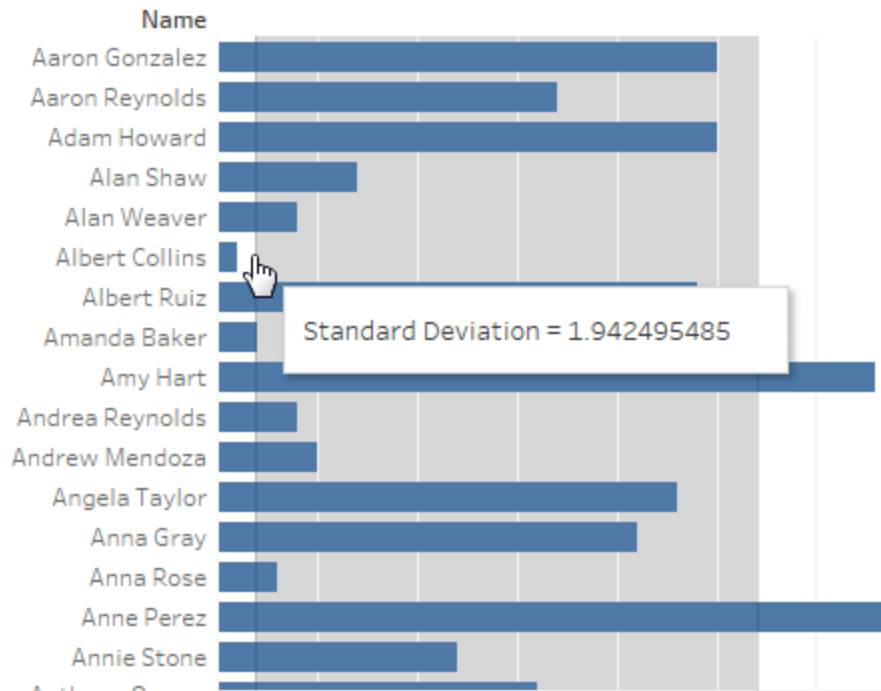
-1, 1

Sample
Population

☒ Show recalculated band for highlighted or selected data points

OK

Mouse over to see 1 standard deviation below the mean:



17. (NEW) Knowledge: _____ is a tendency to increase or decrease over time
- A. Seasonality
 - B. Slope
 - C. Trend**
 - D. Gradient
18. (NEW) Knowledge: Which of the following graph types provide information on the distribution of a continuous measure?
- A. Pie Chart
 - B. Heat Map
 - C. Box Plot**
 - D. Packed Bubbles

[https://onlinehelp.tableau.com/current/pro/desktop/en-us/help.html#qs_boxplots.html?Highlight=box plot](https://onlinehelp.tableau.com/current/pro/desktop/en-us/help.html#qs_boxplots.html?Highlight=box%20plot)

19. (NEW) Knowledge:
- (True or False) Positive skewness means the extreme values are to the right, while negative skewness means the extreme values are to the left.

TRUE

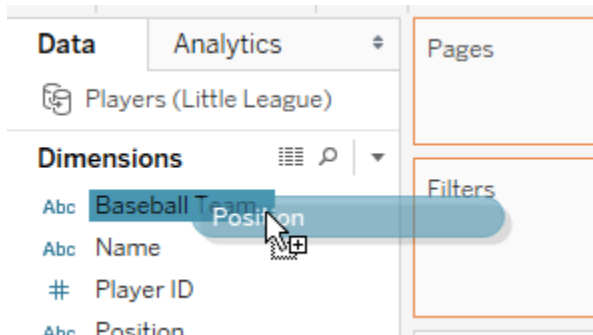
https://onlinehelp.tableau.com/current/pro/desktop/en-us/inspectdata_summary.html

Organizing and Simplifying Data, Questions 20 - 23

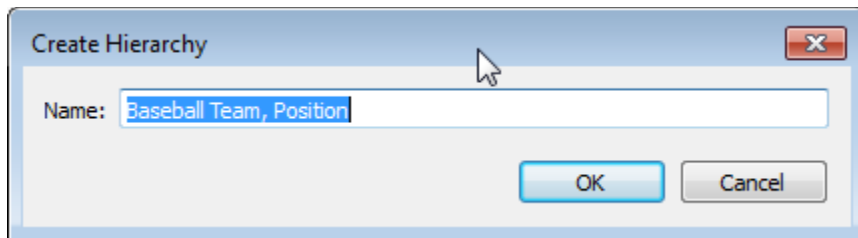
20. Hands-on: Answer this question with the Players worksheet on the [Little League](#) data. Create a hierarchy Baseball Team – Position. For the Ninjas, how many runs were scored by the position with the lowest average batting average?
- A. 150

- B. 70
- C. 54
- D. 24

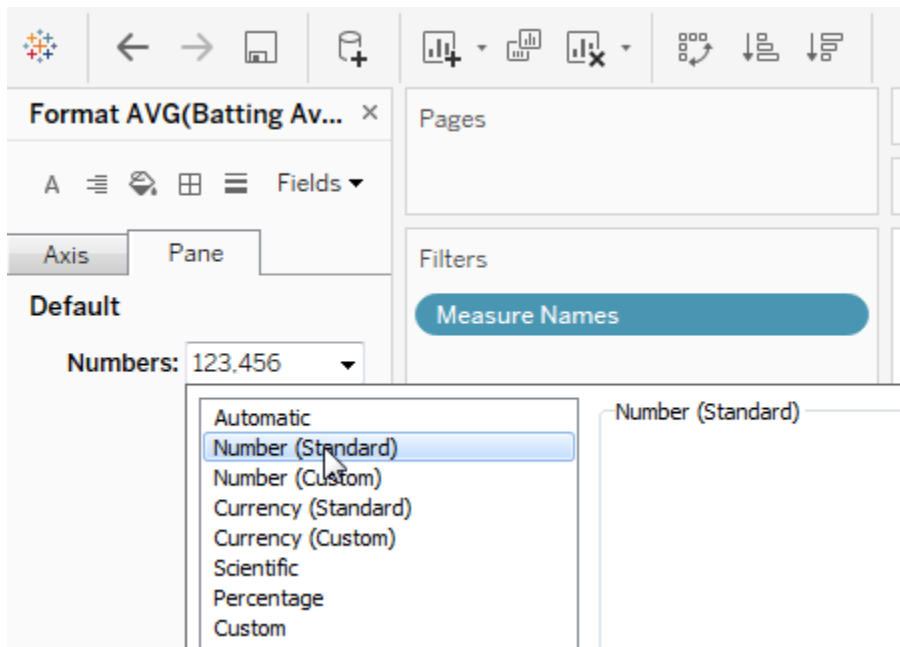
You can create a hierarchy by dragging Position to Baseball team:



Click OK



Add the hierarchy to the view. Add batting average, changing the calculation to Average. Add Runs. Change the format so you can see the full decimals for average batting average:



It looks like catcher has the lowest batting average, and 54 runs:

Pages

Columns: Measure Names

Rows: Baseball Team, Position

Filters: Measure Names

Marks: Automatic

Color, Size, Text

Detail, Tooltip

Measure Values: AVG(Batting Average), SUM(Runs)

Sheet 3

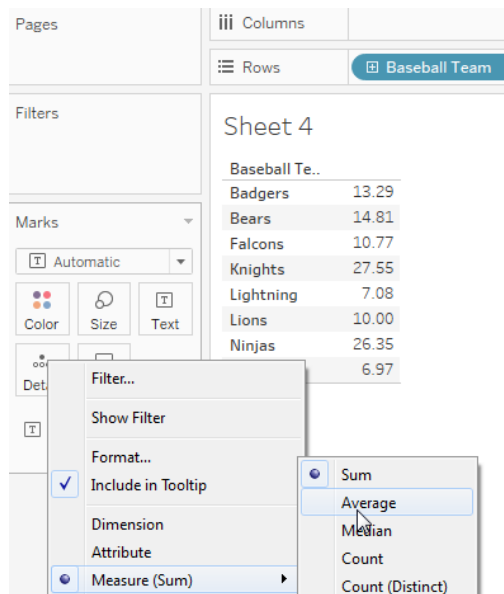
Baseball Te..	Position	Avg. Batting A..	Runs
Lions	right fielder	0.6675	15.0
	second baseman	0.7385	45.0
	shortstop	0.190666667	13.0
	third baseman	0.465333333	36.0
Ninjas	catcher	0.378333333	54.0
	center fielder	0.498833333	63.0
	first baseman	0.482666667	70.0
	left fielder	0.6138	81.0
	pitcher	0.4405	66.0
	right fielder	0.413666667	58.0
	second baseman	0.6485	150.0
	shortstop	0.5788	64.0
	third baseman	0.534833333	74.0
Tigers	catcher	0.3515	27.0
	center fielder	0.5455	2.0
	first baseman	0.5855	29.0

Baseball Team: Ninjas
Position: catcher
Runs: 54.0

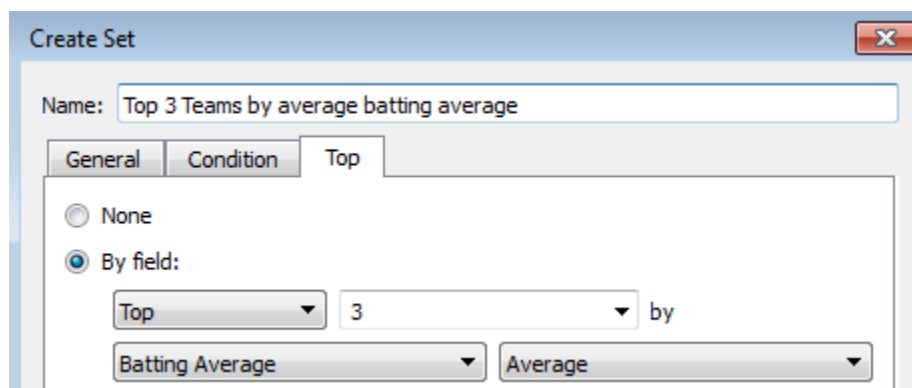
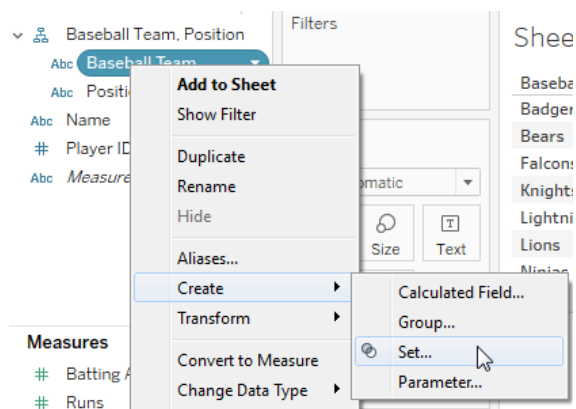
21. Hands-on: Answer this question with the Players worksheet on the [Little League](#) data. What percent of runs were scored by the top three teams with the highest average batting average?

- A. 7.73%
- B. 8.97%
- C. 34.55%
- D. 92.27%

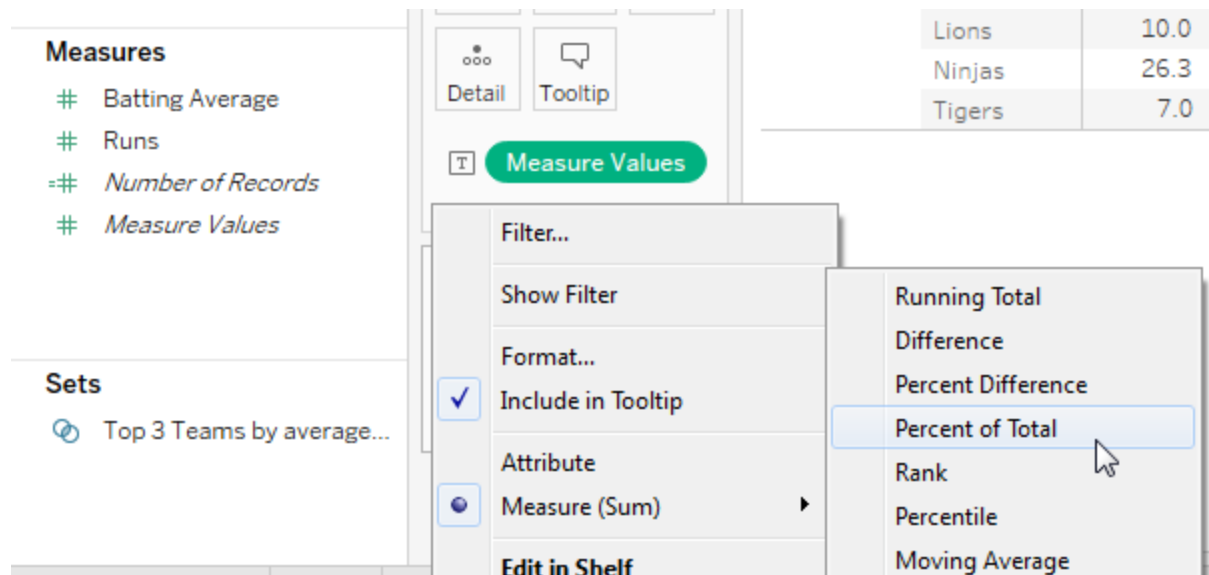
Add baseball team and runs, and change the calculation to Average to show average batting average:



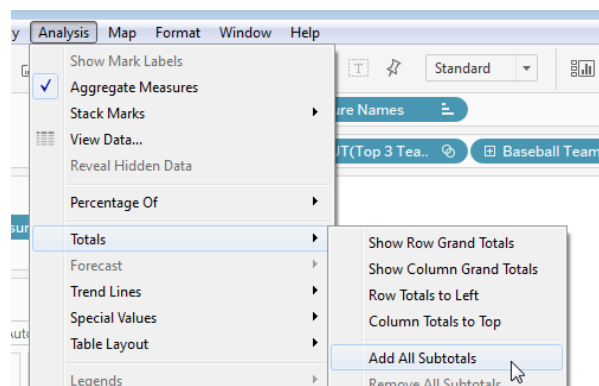
Create a set for top three average batting average:



Add runs and change to "Percent of Total"



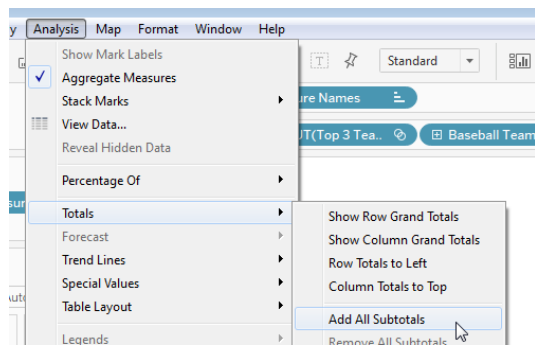
Add subtotals:



Final view:

In / Out of Top 3 Team..	Baseball Team	Batting Average	% of Total R..
In	Badgers	13.29	13.60%
	Bears	14.81	12.17%
	Falcons	10.77	8.78%
	Total	38.86	34.55%
Out	Knights	27.55	25.34%
	Lightning	7.08	5.15%
	Lions	10.00	8.91%
	Ninjas	26.35	20.74%
	Tigers	6.97	5.31%
	Total	77.95	65.45%

Add subtotals:



Final view, showing 34.55% of total runs from the top three teams by batting average:

In / Out of Top 3 Team..	Baseball Team	Batting Average	% of Total R..
In	Badgers	13.29	13.60%
	Bears	14.81	12.17%
	Falcons	10.77	8.78%
	Total	38.86	34.55%
Out	Knights	27.55	25.34%
	Lightning	7.08	5.15%
	Lions	10.00	8.91%
	Ninjas	26.35	20.74%
	Tigers	6.97	5.31%
	Total	77.95	65.45%

22. When you sort data in a hierarchy, Tableau rearranges headers that appear before the sorted field.

(FALSE)

“Tableau does not rearrange [hierarchy] headers that appear before the sorted field.”

https://onlinehelp.tableau.com/current/pro/desktop/en-us/sortgroup_sorting_computed_ex2hierarchy.html

23. Context Filters are executed after data source filters. **(True)**

Context filters are executed after data source filters but before dimension source filters.

https://onlinehelp.tableau.com/current/pro/desktop/en-us/order_of_operations.html

Field & Chart Types, Questions 24 - 29

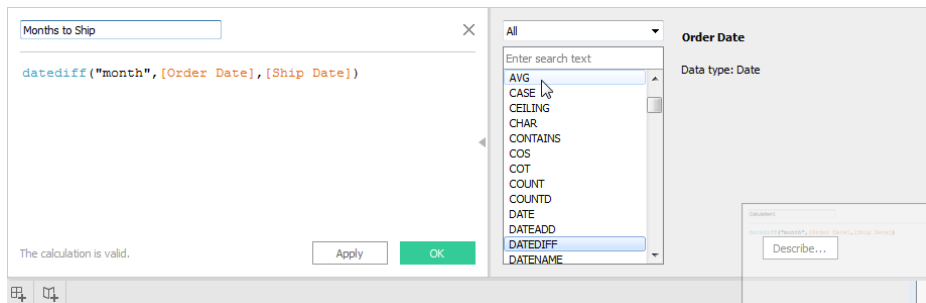
24. Answer this using the SuperStore data.

What is the maximum number of months between the ship date and the order date? How many orders took this many months to ship?

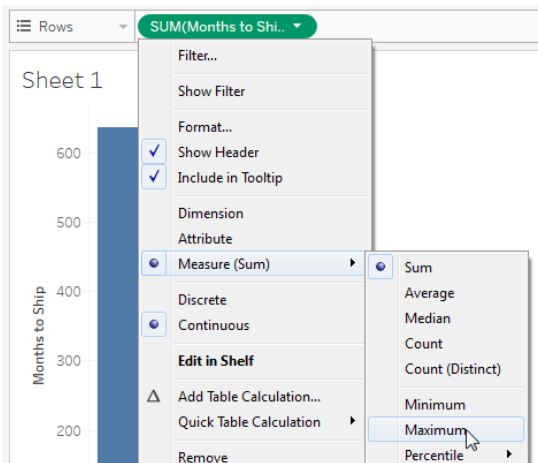
- a. 5 months, 1 order
- b. 5 months, 2 order
- c. 3 months, 2 order**
- d. 3 months, 1 order

e. None of the above

Create a calculation “Months to ship”

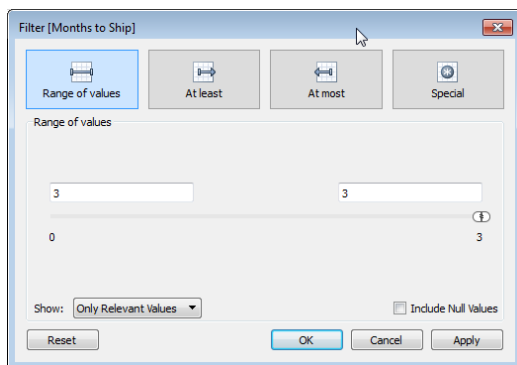


Add calculation and change to max:

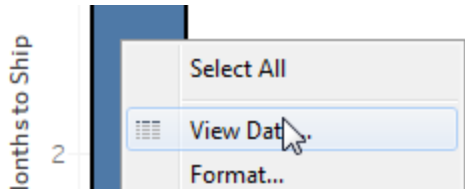


You will see that the maximum months to ship = 3.

Add a filter where months to ship = 3



Right-click and view data:



Select full data to see that two orders took three months to ship:

View Data: Sheet 1

☒ Show aliases ☒ Show all fields

City	Customer ID	Customer Name	Customer Segment	Order Date	Order ID	Order Priority	Postal Code	Product
Richfield	250	Brenda Nelson Blanchard	Corporate	12/29/2011	87215	Critical	55423	Office St
Redwood City	964	Virginia Rivera	Home Office	12/30/2011	86177	Low	94061	Office St

Summary Full Data 2 rows

25. Hands-on: Answer this question with the Games worksheet on the [Little League](#) data. Find the moving average for the total number of runs in three months prior to May 2015.

- A. 749.3
- B. 753.8
- C. 796.0
- D. 753.8

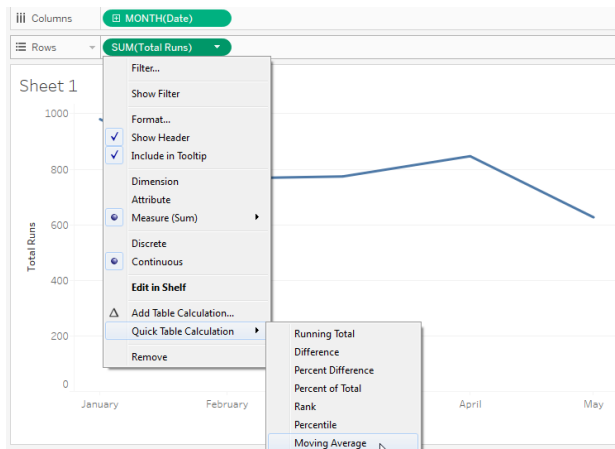
Calculate Home + Away runs:

Total Runs

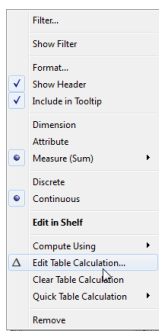
$[\text{Runs for Away Team}] + [\text{Runs for Home Team}]$

Create a line graph showing runs by month.

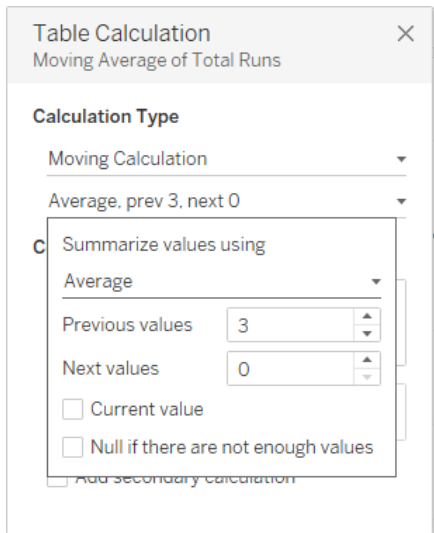
Add a moving average:



Edit table calculation:



Use the three prior values, and uncheck “Current value” to avoid including the current value. This way the May 2015 value will show the average of the three prior months (February, March, April)



Mouse-over on May to see the average.

Month of Date:

May 2015

Moving Average of Total Runs from the previous 3 to the next 0 along Table (Across): 796.0

26. Knowledge (TWO POINTS): Tableau displays an axis when you drop this onto the Rows or Column shelf.

Continuous field

Discrete field

Measure names

Measure values

Tableau displays an axis when you drop a continuous field onto the row or columns shelf. The automatically generated *Measures Values* field is always a continuous field.

Continuous and Discrete: http://onlinehelp.tableau.com/current/pro/desktop/en-us/datafields_typesandroles_dataroles_continuousdiscrete.html

Measure Names and Measure Values: https://onlinehelp.tableau.com/current/pro/desktop/en-us/datafields_understanddatawindow_meavalues.html

27. Answer this question with the Players worksheet on the [Little League](#) data. Create a histogram showing batting averages using a bin size of .05. Find the average number of runs scored for players with a batting average between .55 and .6.

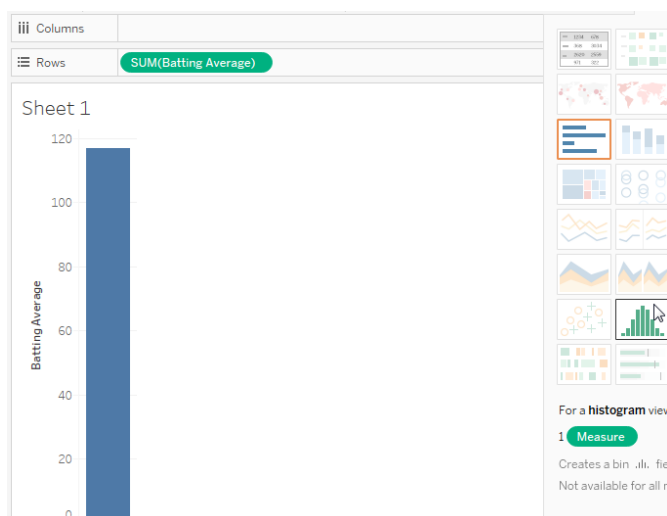
A. 13.53

B. 15.64

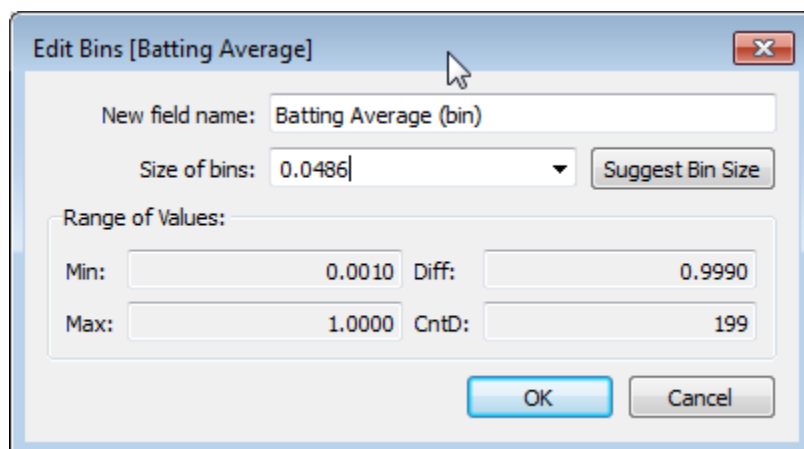
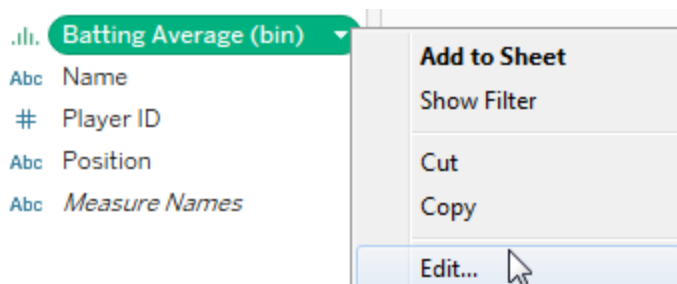
C. 18.92

D. 13.38

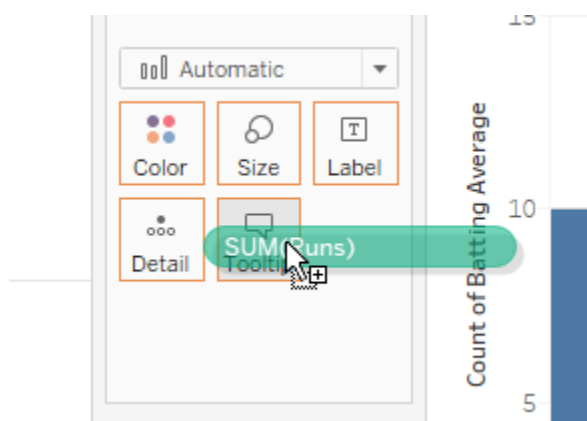
Add batting average to the view, then open the “Show Me” menu and select the Histogram icon.



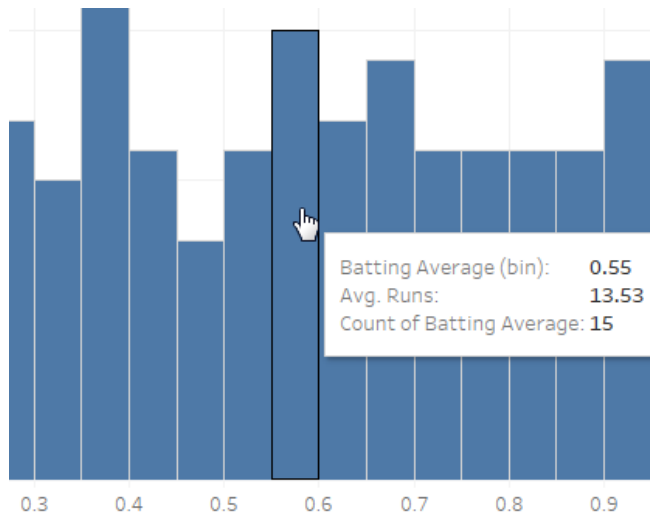
Change the bin size from .0486 to .05:



Drag Runs to tooltip:



Switch from SUM(Runs) to AVG(Runs) and mouse over the .55 to .6 bin to see the average runs:



28. Knowledge: Gantt charts are useful for:

- a. Showing changes to a continue variable over time
- b. **Displaying duration of events or activities over time**
- c. Showing how a measure varies with respect to one or more dimensions
- d. Display the distribution of a continuous variable

“Use Gantt charts to show the duration of events or activities.”

https://onlinehelp.tableau.com/current/pro/desktop/en-us/buildexamples_gantt.html

29. Knowledge: Bins acts as containers that summarize data for a specific range of values. Without using a calculated field, Tableau's bin feature allows you to create variable sized bins. **(FALSE)**

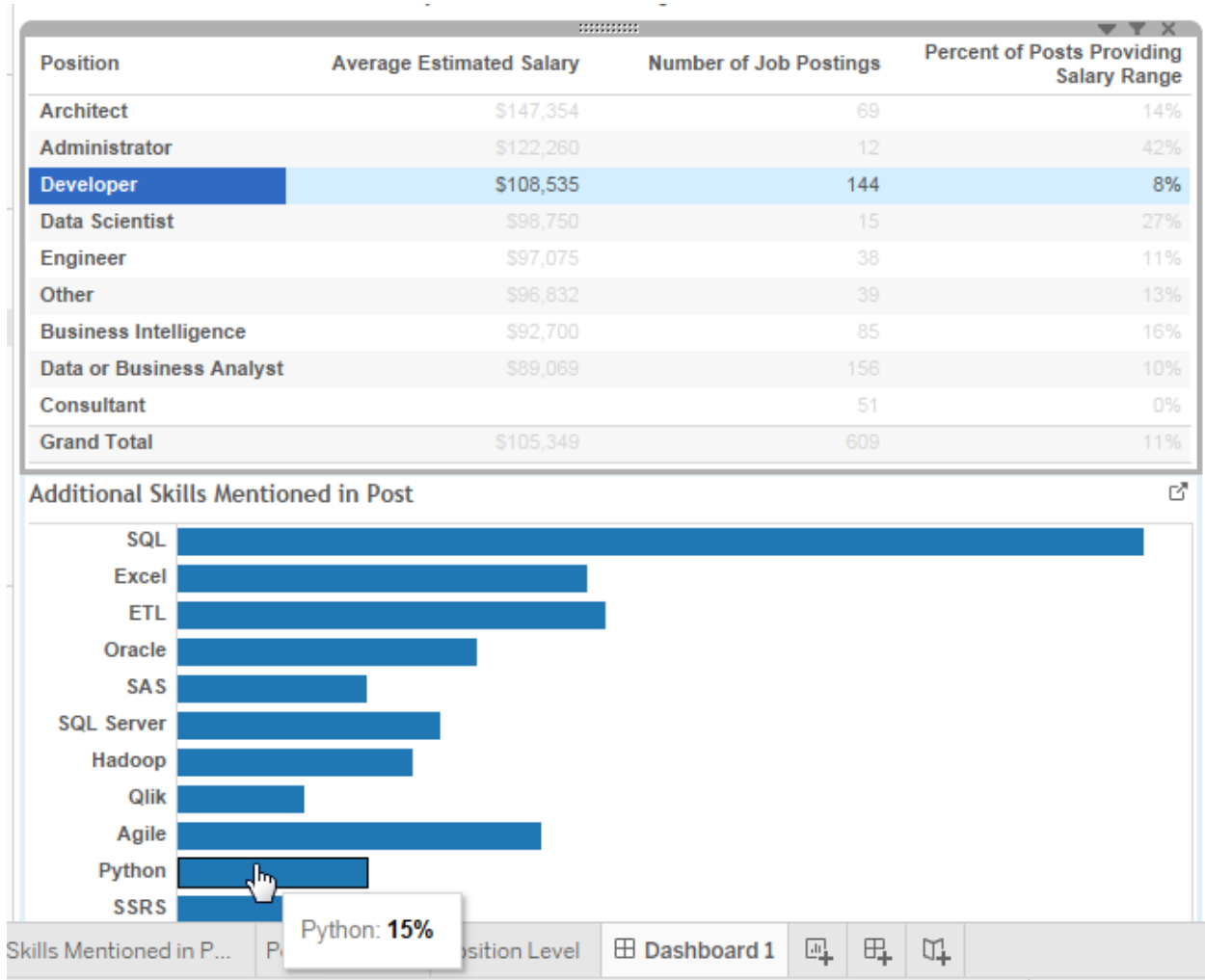
If you want to create variable sized bins, you'll need to create a calculated field with IF THEN ELSE statements. An example is shown here: <http://kb.tableau.com/articles/knowledgebase/creating-variable-sized-bins>

Dashboards, Questions 30 - 34

30. Answer this question using the [Tableau Jobs](#) dashboard. What percent of job postings for Developers mention Python skills?

- A. 13%
- B. 15%**
- C. 17%
- D. 19%

Select “Developer” on the top part of the dashboard. You should see the bar chart below change – you are now filtering to show only job postings for developers. Mouse over Python:



31. Hands-On: Answer this question using the [Tableau Jobs](#) dashboard. For the Business Intelligence position, what is the Title with the most job postings?

BI Developer

Business Intelligence Analyst

Data Analyst

Business Analyst

You can see this by expanding the hierarchy:

The US Market for Tableau Skills

Analysis of 882 Job Postings from Dice.com

Position	Average Estimated Salary	Number of Job Postings	Percent of Posts Providing Salary Range
Data or Business Analyst	\$89,069	156	10%
Developer	\$108,535	144	8%
Business Intelligence	\$92,700	85	16%
Architect	\$147,354	69	14%
Consultant		51	0%
Other	\$96,832	39	13%
Engineer	\$97,075	38	11%
Data Scientist	\$98,750	15	27%
Administrator	\$122,260	12	42%
Grand Total	\$105,349	609	11%

BI Developer has 13 associated postings, more than any other for the business intelligence position.

The US Market for Tableau Skills

Analysis of 882 Job Postings from Dice.com

Position	Title	Average Estimated Salary	Number of Job Postings	Percent
Developer	Big Data Hadoop Developer		1	
	BI/SAP BW Developer		1	
	Application Developer		1	
	*MIS Software Application De..		1	
	.Net Developer		1	
Business Intelligence	BI Developer	\$67,500	13	
	Business Intelligence Analyst	\$80,000		
	Business Intelligence Develop..	\$91,667		
	Business Intelligence Technic..			
	Business Intelligence Report ..			
	BI Engineer		2	
	SQL/BI Developer	\$120,000	1	
	SQL Server Business Intellige..		1	

Position: **Business Intelligence**
 Title: **BI Developer**
 Number of Job Postings: **13**

32. If a dashboard is difficult to view on a smartphone, you can use the _____ designer to create a phone-specific view of your dashboard:

Custom layout

Device Designer

Floating layout

Narrower width

<http://www.tableau.com/about/blog/2016/8/tips-designing-device-specific-dashboards-make-everyone-happy-57548>

33. Knowledge: A ____ action allows Tableau to open a page on an external website. **URL**, Filter, Highlight, Web

“A URL action is a hyperlink that points to a Web page, file, or other web-based resource outside of Tableau.”

https://onlinehelp.tableau.com/current/pro/desktop/en-us/actions_url.html

34. Knowledge: You can combine multiple worksheets in a single dashboard. **(TRUE)**

“A dashboard is a collection of several worksheets and supporting information shown in a single place so you can compare and monitor a variety of data simultaneously.”

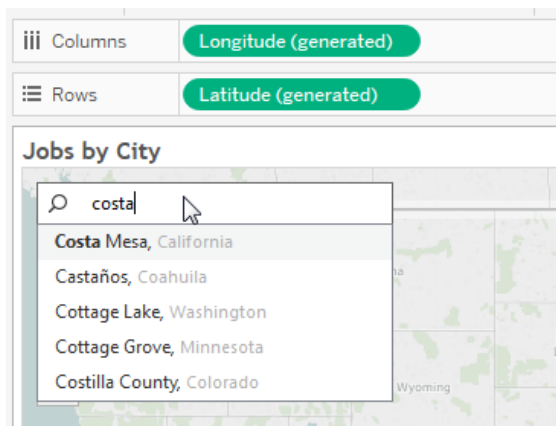
<http://onlinehelp.tableau.com/current/pro/desktop/en-us/help.htm#dashboards.html>

Mapping, 35 - 36

35. Answer this question using the [Tableau Jobs](#) dashboard. Create a map view and zoom in to southern California. How many jobs are either in Costa Mesa or within 4 miles of Costa Mesa?

- A. 2
- B. 5
- C. 8**
- D. 10
- E. None of the above

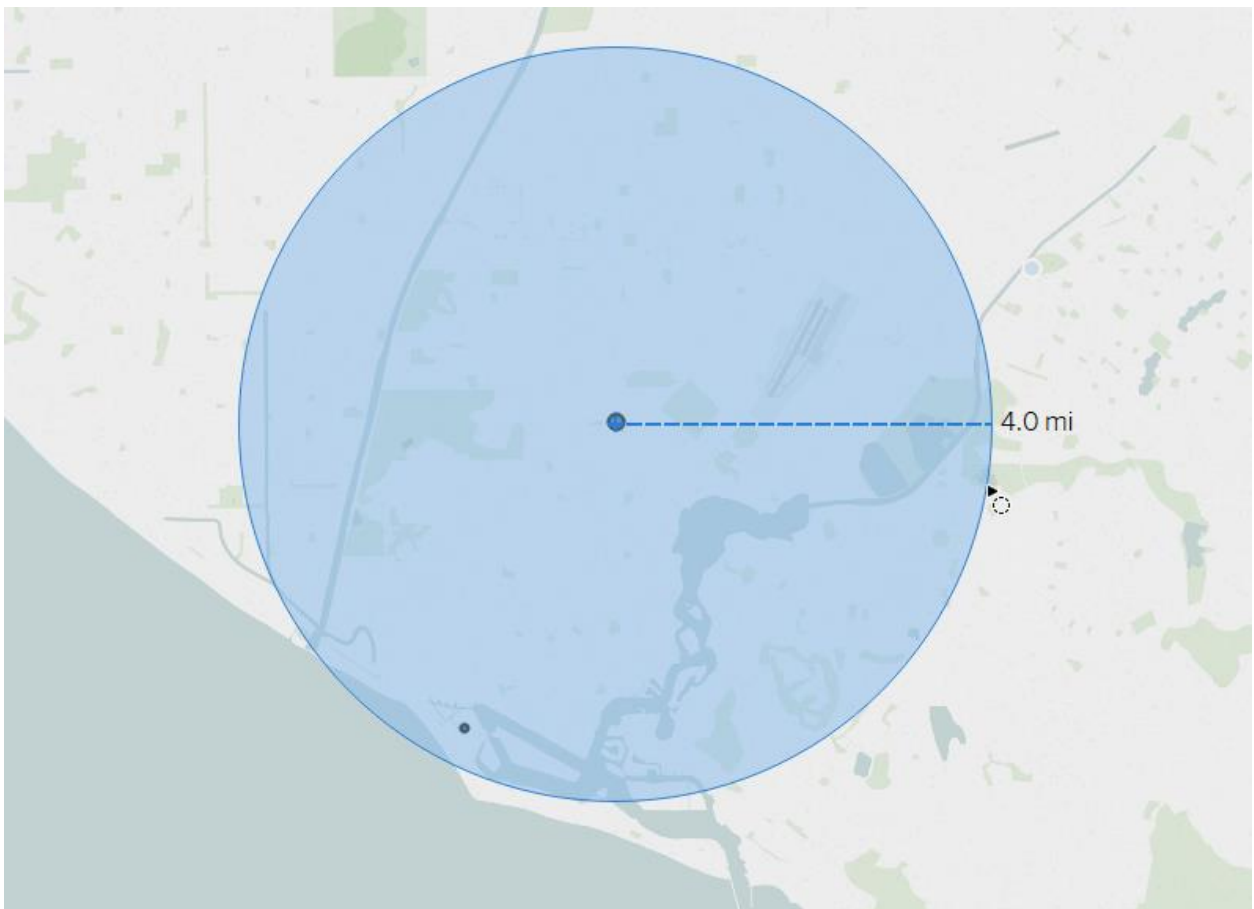
On the Jobs By City worksheet, do a search for Costa Mesa, California:



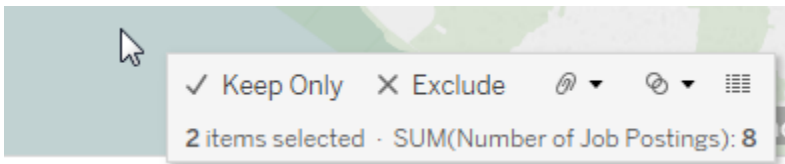
Use the radial selection tool:



Click on Costa Mesa and drag a 4 mile radius:



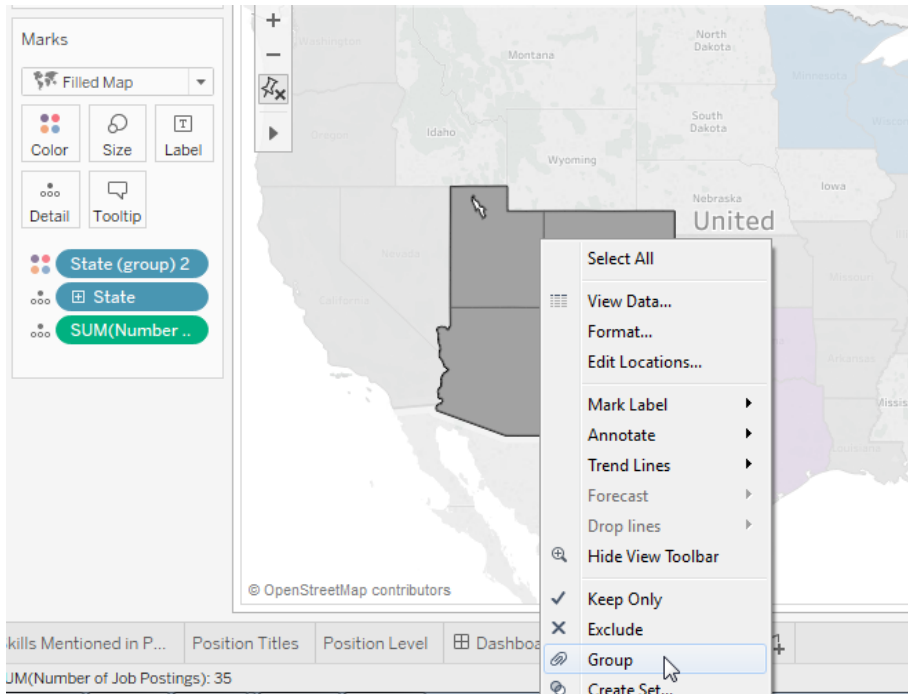
When you release you will see the number of posts within the 4.0 radius:



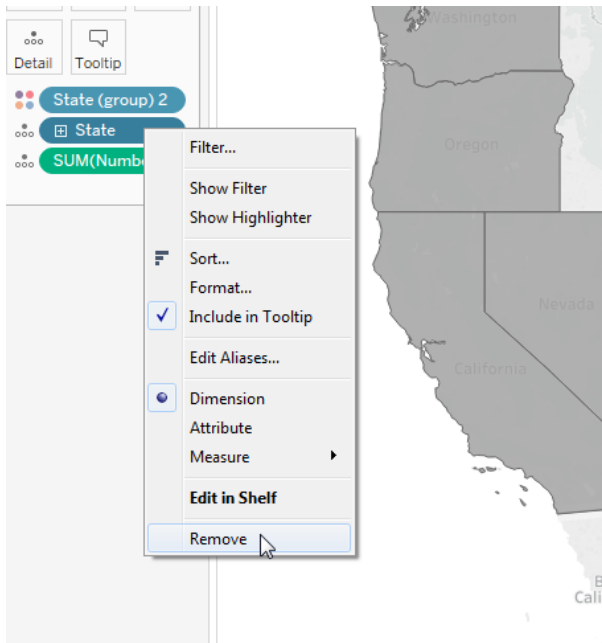
36. Using the Tableau Job Market dashboard, determine which group of three states have the most job posts:

Minnesota, Wisconsin, and Michigan
Texas, New Mexico, Oklahoma
Florida, Georgia, Alabama
Arizona, Utah, Colorado

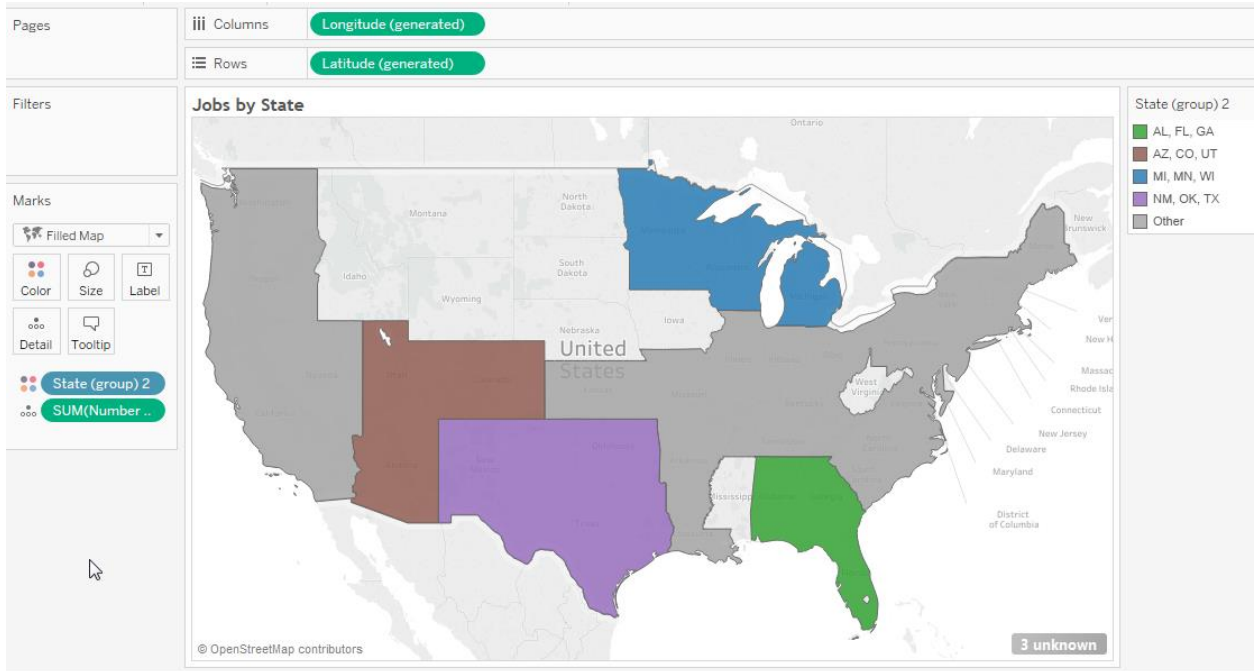
You can group the states like this:



Remove State from the view



Then you should see the the new Custom Territories:



Alabama, Florida, and Georgia have 68 postings, more than any of the other three state groups:

