Exercise 9: Arms Traffic
Table Calculations

Objectives

1. Use Arms Traffic data to practice leveraging quick table calcs to create a moving average, percent of total, and rank
2. Practice partitioning and addressing by leveraging a logical calculation

Applying Quick Table Calculations

Quick table calculations are common table calculations that are applicable to your visualization with the most typical settings for the calc type you choose. These calculations can be customized by changing the calculation type, how values are aggregated, and how to compute the calculation.

Rank

1. Open the Tableau starter workbook called **Exercise 9 Arms Traffic Starter** in the Exercise Starter Workbooks folder. In the Data Source tab notice that each row in the dataset represents a monetary arm trafficking value. These values will be aggregated by the yearly level for imports or exports at given countries/regions. Let's start by creating a rank to compare European countries arms trafficking activity for each decade.
2. First, create a new **group** and label the field name **'decades'**. Group together each year and name them respectively **1950's, 1960's, 1970's, etc**.
3. Compute ranks in a table by dragging the **discrete group year** to columns and **Country/Region** to rows. Display **Value** as text and filter the **region** to Europe.

Notice that we have a table of all imports and exports by decade for each country in Europe. Before creating a rank recall Tableau's default ranking order. How do we want to address this rank? Should we add color to draw out the countries with high monetary trafficking values? How should we order the color palette?

4. Right click Value from the marks card and apply the **rank** quick table calc. Tableau's default partition is to rank monetary value descending by decade. Let's change the table scope and rank monetary value descending by country. To complete this, compute the rank using **Table (down).**

Country/Region	1950's	1960's	1970's	1980's	1990's	2000's	2010's
Albania	22	22	21		38	35	32
Austria	23	24	24	21	27	18	21
Belarus					23	21	16
Belgium	9	17	15	17	22	15	17
Bosnia-Herzegovina					30	37	36
Bulgaria	14	13	14	12	16	23	26
Croatia					31	26	24
Czech Republic					26	17	20
Czechoslovakia	4	6	5	5	19		
Denmark	18	19	19	19	17	16	19
East Germany (GDR)	11	7	8	10	28		
Estonia					35	31	30
Finland	24	23	22	22	11	14	13
France	3	4	3	2	4	3	4
Germany (FRG)	6	2	2	4	2	2	2
Greece	15	16	9	14	6	5	11
Hungary	16	12	16	20	21	22	27
Iceland		25	26	27	40		31
Ireland	25	26	25	24	34	24	22
Italy	8	8	6	7	9	6	6

5. Now ctrl click and drag value from text on the mark car to color. Notice how the table calculation is still applied to the field on the colors card. Edit the color card to have the top ranked Countries appear darker than the lower ranked ones.

Notice how the table calculation is being handled by Tableau when applied to color on the marks card. Now drag Value from the measures pane onto color. Notice the difference?

0	157,622

1	43

Question 1: What is the default name for the colors card after applying Value form the measures pane? _____

Question 2: What is the default name for the colors card when you switch back to applying the table down rank of value to the colors card? _____

6. After switching back to the color palette setting addressed in step 5, show row of grand totals by navigating to the Analysis tab.
7. Apply the color scheme used for the table in the grand Total column by editing colors on the marks card and selecting Include Totals.

Country/Region	1950's	1960's	1970's	1980's	1990's	2000's	2010's	Grand T..
Albania	22	22	21		38	35	32	27
Austria	23	24	24	21	27	18	21	25
Belarus					23	21	16	26
Belgium	9	17	15	17	22	15	17	16
Bosnia-Herzegovina					30	37	36	39
Bulgaria	14	13	14	12	16	23	26	15
Croatia					31	26	24	32
Czech Republic					26	17	20	28
Czechoslovakia	4	6	5	5	19			7
Denmark	18	19	19	19	17	16	19	21
East Germany (GDR)	11	7	8	10	28			12
Estonia					35	31	30	34
Finland	24	23	22	22	11	14	13	23
France	3	4	3	2	4	3	4	4
Germany (FRG)	6	2	2	4	2	2	2	3
Greece	15	16	9	14	6	5	11	10
Hungary	16	12	16	20	21	22	27	20
Iceland		25	26	27	40		31	40
Ireland	25	26	25	24	34	24	22	30
Italy	8	8	6	7	9	6	6	6
Kosovo							39	43
Latvia					37	30	29	36
Lithuania					33	28	25	33
Luxembourg	26		28	25	41	36	38	42
Malta			27	25	39	34	33	41
Moldova					29	27	37	31
Montenegro						29	35	38
Netherlands	7	9	11	6	7	7	7	8
Northern Cyprus					42			43
Norway	19	14	23	16	14	12	10	19
Poland	5	5	7	8	18	10	14	9
Portugal	21	21	20	23	15	19	15	24
Romania	12	15	12	18	20	20	18	17
Russia					1	1	1	5
Serbia					36	32	23	37
Slovakia					25	25	34	29
Slovenia					32	33	28	35
Soviet Union	1	1	1	1	5			1
Spain	20	20	10	9	10	8	5	11
Sweden	10	18	17	15	12	9	9	14
Switzerland	17	10	18	11	8	13	12	13
Ukraine					13	11	8	22
United Kingdom	2	3	4	3	3	4	3	2
Yugoslavia	13	11	13	13	24			18

Question 3: How does Tableau Calculate the Grand Total Ranks? _____

Question 4: What are the top six ranked countries based on the Grand Total Column? _____

_____

Percent of Total

1. To create a percent of total table, start by dragging the **discrete group year** to columns and **Country/Region** to rows. This time, Display **Value** as color and filter the **region** to Europe. Display the value's text by clicking the "show mark labels" shortcut button. 🅣
2. Right click value from the colors card and apply a table down percent of total calculation to it.

|				Year (group)				
Country/Region	1950's	1960's	1970's	1980's	1990's	2000's	2010's	Grand To..
Albania	0.26%	0.48%	0.31%		0.02%	0.01%	0.03%	0.18%
Austria	0.13%	0.14%	0.26%	0.42%	0.43%	0.78%	0.18%	0.33%
Belarus					0.64%	0.57%	0.96%	0.20%
Belgium	2.56%	1.11%	1.20%	1.15%	0.74%	0.86%	0.44%	1.22%
Bosnia-Herzegovina					0.10%	0.00%	0.02%	0.01%
Bulgaria	1.41%	1.64%	1.43%	1.77%	0.98%	0.38%	0.08%	1.28%
Croatia					0.09%	0.12%	0.11%	0.03%
Czech Republic					0.55%	0.80%	0.30%	0.17%
Czechoslovakia	6.21%	4.25%	4.40%	5.30%	0.85%			3.67%
Denmark	1.00%	0.83%	0.66%	0.80%	0.95%	0.81%	0.41%	0.79%
East Germany (GDR)	1.68%	3.78%	2.80%	2.48%	0.28%			1.97%
Estonia					0.04%	0.10%	0.05%	0.02%
Finland	0.05%	0.39%	0.29%	0.40%	2.27%	1.06%	1.12%	0.65%
France	6.93%	6.23%	7.93%	8.78%	11.28%	10.36%	8.45%	8.38%
Germany (FRG)	3.77%	11.17%	8.23%	5.83%	13.19%	11.96%	9.36%	8.55%
Greece	1.24%	1.17%	2.28%	1.37%	6.14%	5.79%	1.62%	2.51%
Hungary	1.15%	1.83%	1.15%	0.43%	0.82%	0.40%	0.07%	0.90%
Iceland		0.02%	0.01%	0.00%	0.00%		0.05%	0.01%
Ireland	0.01%	0.00%	0.04%	0.04%	0.05%	0.15%	0.16%	0.05%
Italy	3.07%	3.16%	4.35%	3.29%	3.26%	4.31%	5.28%	3.70%
Kosovo							0.00%	0.00%
Latvia					0.03%	0.10%	0.06%	0.02%
Lithuania					0.07%	0.12%	0.10%	0.03%
Luxembourg	0.00%		0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
Malta			0.00%	0.00%	0.01%	0.02%	0.03%	0.01%
Moldova					0.17%	0.12%	0.01%	0.03%
Montenegro						0.10%	0.02%	0.01%
Netherlands	3.10%	2.52%	2.01%	3.84%	4.14%	3.98%	3.93%	3.22%
Northern Cyprus					0.00%			0.00%
Norway	0.92%	1.60%	0.28%	1.16%	1.45%	1.94%	1.83%	1.18%
Poland	4.28%	4.66%	3.86%	2.81%	0.90%	2.42%	1.12%	3.15%
Portugal	0.58%	0.65%	0.45%	0.24%	1.16%	0.69%	1.05%	0.59%
Romania	1.51%	1.40%	1.57%	1.14%	0.84%	0.66%	0.42%	1.18%
Russia					14.56%	30.93%	39.00%	7.59%
Serbia					0.04%	0.05%	0.11%	0.02%
Slovakia					0.57%	0.14%	0.02%	0.08%
Slovenia					0.07%	0.05%	0.06%	0.02%
Soviet Union	33.69%	37.96%	43.64%	43.54%	9.59%			30.06%
Spain	0.63%	0.76%	2.19%	2.66%	3.14%	3.56%	5.88%	2.37%
Sweden	2.04%	1.09%	1.07%	1.16%	2.11%	2.99%	3.03%	1.68%
Switzerland	1.02%	2.08%	1.02%	1.82%	3.32%	1.93%	1.61%	1.74%
Ukraine					1.72%	2.15%	3.78%	0.68%
United Kingdom	21.32%	9.03%	7.10%	8.20%	12.81%	9.60%	9.24%	10.58%
Yugoslavia	1.44%	2.05%	1.46%	1.38%	0.61%			1.18%

Question 5: What country had the highest percent of total value for imports/exports? What decade did this take place? _____

Notice how Soviet Union has data collected till the nineties, when Russia became an independent state. Let's analyze their arms trafficking a little closer.

Moving Average

1. First, drag **Year** to the columns shelf and **Value** to the rows shelf.
2. Filter out all **countries/regions** except for Soviet Union and Russia then drag **Import/Export** to color.
3. Now add **Country/Region** to label to see trafficking for these two countries.
4. Right click **Value** on the rows shelf and create a **moving calculation**. Edit this to summarize using **Average** and **previous 2 values.**
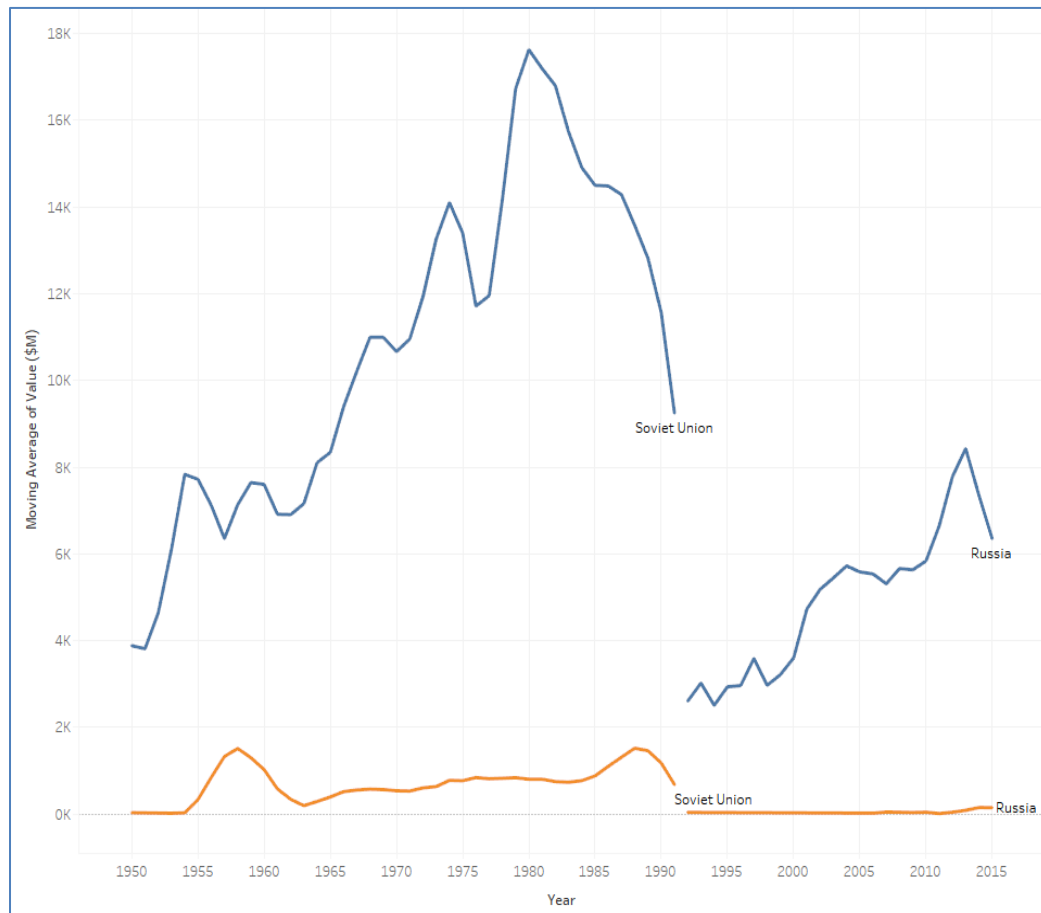
Question 6: What is the formula for this Moving Average table calculation? _____

5. Revise this table calculation to compute the **Difference from** the **First** value in the series, instead of performing a moving calculation.

Question 7: What is the formula for this Difference from table calculation? _____

Applying Logical Calculations

A logical function allows you to determine if a condition is true or false. Tableau by default handles this as False = 0 and True = 1.

Advanced Partitioning and Addressing

1. We would like to see six seperated area graphs for **all regions**. Each graph will be broken out by **imports** and **exports** from **1950** to **2015**. Use a logical calculation to address what region should appear where on our viz. First, drag **Year** to columns, **Value** to rows, and mark type to **Area**.
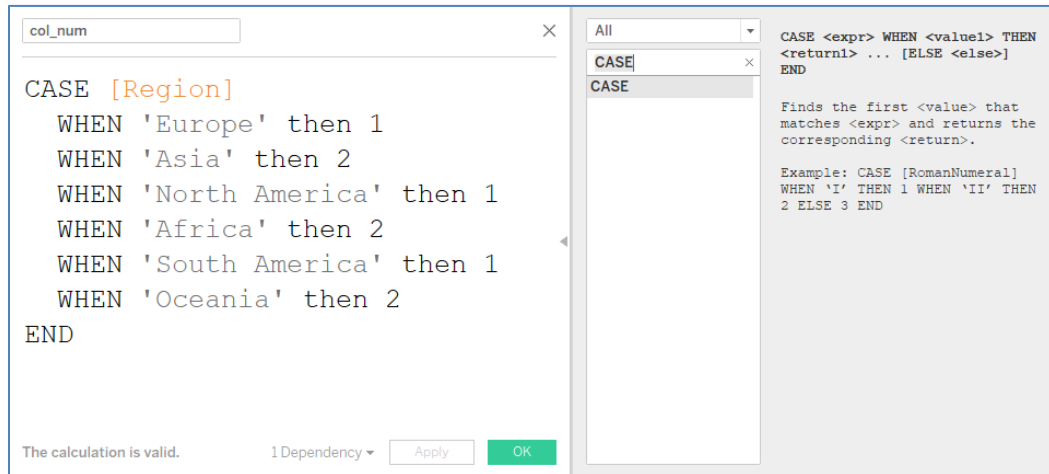
	1	2
1	Europe	Asia
2	North America	Africa
3	South America	Oceania

Think about what logical function is best used for searching and matching to an expression. This task calls for defining columns and rows, so tableau can partition based on what you've addressed in the calculation.

2. Use a **case** function to address the desired row and column for each of our graphs to appear. First start with the **column number** calculation. After creating this calculation, add it to the columns shelf.

```
col_num                                    ×        All           ▼    CASE <expr> WHEN <value1> THEN
                                                                        <return1> ... [ELSE <else>]
                                                    CASE       ×        END
CASE [Region]                                       CASE
   WHEN 'Europe' then 1                                               Finds the first <value> that
   WHEN 'Asia' then 2                                                 matches <expr> and returns the
                                                                      corresponding <return>.
   WHEN 'North America' then 1
   WHEN 'Africa' then 2                                               Example: CASE [RomanNumeral]
   WHEN 'South America' then 1                                        WHEN 'I' THEN 1 WHEN 'II' THEN
                                                                      2 ELSE 3 END
   WHEN 'Oceania' then 2
END


The calculation is valid.      1 Dependency ▾   Apply    OK
```

3. Use a second **case** function like the previous to create a **row number** calculation. Refer to the **sample grid** above to place the countries in the correct order. After creating this calculation, add it to the rows shelf.

Question 8: What region had the greatest amount of exports in 1980?_____