DATA PREPARATION

Process 1: MELT OR PIVOT DATA

Connect to the first dataset.

1. Under "Connect: To a File," select Text file.
2. In the File Explorer window, select `RDS-DAVis-TableauDataPrep_20200227-data-bmi.csv`.
3. Tableau will provide the dataset in a card on the left. (Feel free to right-click and rename it as "`BMI data`")
4. You may have to drag it to the middle where it says, "`Drag tables here`" to see the data at the bottom half of the screen.

Melting/pivoting the dataset to make it tidy.

5. Select columns from `2016 Both sexes` to `1975 Female` by clicking the `2016 Both Sexes` column header, then, while holding down the "shift" key, click the `1975 Female` header.

Abc RDS-DAVis-TableauDataPrep_... 2016 Both sexes	Abc RDS-DAVis-TableauDat... 2016 Male	Abc RDS-DAVis-TableauDataPr... 2016 Female	Abc RDS-DAVis-TableauDataPrep_...	Abc RDS-DAVis-TableauDat...	Abc RDS-DAVis-TableauDataPr...	Abc RDS-DAVis-TableauDataPrep_... 2014 Both sexes
			RDS-DAVis-TableauDataPrep_20200227-data-bmi.csv.2016 Female			
23.4 [22.0-24.8]	22.6 [20.1-25.1]	24.1 [23.0-25.3]	23.3 [21.9-24.6]	22.5 [20.1-25.0]	24.0 [22.9-25.1]	23.2 [21.8-24.5]
26.7 [25.8-27.5]	27.0 [25.8-28.2]	26.3 [25.0-27.6]	26.6 [25.8-27.4]	26.9 [25.8-28.0]	26.2 [25.0-27.4]	26.5 [25.8-27.2]
25.5 [24.5-26.5]	24.7 [23.4-26.1]	26.4 [24.9-27.8]	25.5 [24.5-26.4]	24.6 [23.4-25.8]	26.3 [25.0-27.7]	25.4 [24.5-26.2]
26.7 [24.6-28.7]	27.3 [24.8-29.8]	26.1 [22.8-29.5]	26.7 [24.7-28.7]	27.3 [24.9-29.7]	26.1 [22.9-29.4]	26.7 [24.7-28.7]
23.3 [21.2-25.6]	22.3 [19.7-25.0]	24.3 [20.9-27.7]	23.2 [21.1-25.4]	22.3 [19.7-24.9]	24.1 [20.9-27.5]	23.2 [21.1-25.3]
26.7 [24.6-28.8]	25.7 [23.2-28.2]	27.7 [24.4-31.0]	26.6 [24.6-28.7]	25.6 [23.2-28.1]	27.6 [24.3-30.8]	26.5 [24.5-28.5]
27.7 [26.8-28.6]	27.8 [26.6-29.0]	27.6 [26.3-28.8]	27.6 [26.8-28.4]	27.7 [26.6-28.8]	27.5 [26.3-28.6]	27.5 [26.7-28.2]
26.3 [25.8-26.9]	25.6 [24.8-26.3]	27.0 [26.1-27.8]	26.3 [25.7-26.8]	25.5 [24.8-26.2]	26.9 [26.2-27.7]	26.2 [25.7-26.7]
27.1 [26.6-27.6]	27.6 [26.9-28.2]	26.7 [26.0-27.4]	27.1 [26.7-27.5]	27.5 [26.9-28.1]	26.7 [26.0-27.3]	27.1 [26.7-27.5]

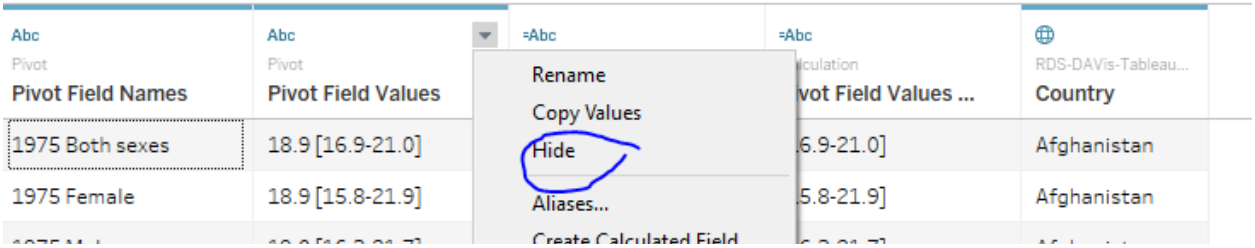
6. Right-click a header within your selection and choose Pivot.
7. Now you will have a *tidy* dataset.

Process 2: SPLIT COLUMNS

Split the BMIs from their SD range.

1. To split the second column **Pivot Field Values**, right-click the header and select **Custom Split.**
2. Where it says, "Use the separator," enter a space. Where it says, "Split off First 1 columns", change it to 2 columns. Press **OK.**

Click the downward arrow on your **Pivot Field Values** column and choose **Hide.**



1. In the next column, rename it from **Pivot Field Values - Split 1** to **BMI.** (Right-click the header and select **Rename.**)
2. In the next column after that, rename it from rename it from **Pivot Field Values - Split 2** to **SD.** (Right-click the header and select **Rename.**) *optional: trim the brackets to use this variable.*

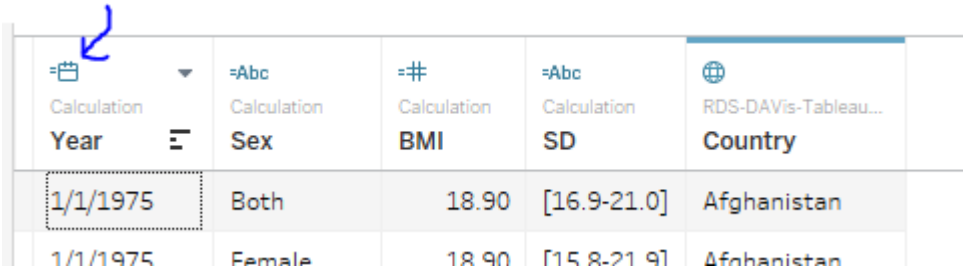
Split the variables of year and sex.

1. In the first column (**Pivot Field Names**), right-click the header and select **Custom Split**.
2. Where it says, "Use the separator," enter a space. Where it says, "Split off First 1 columns", change it to 2 columns. Press **OK.**

Hide the Pivot Field Names column

Process 3: CHANGE VARIABLE TYPE

1. Click the `=Abc` icon above Year and select `Date`. This will now recognize it as a Year.



2. Click the `=Abc` icon above BMI and select `Number(decimal)`. This will recognize it as a number. *NOTE: If you don't do this step now, it becomes more complicated later!*

Make sure that the icon above the Country column is the Geographic Role icon which looks like a sphere.

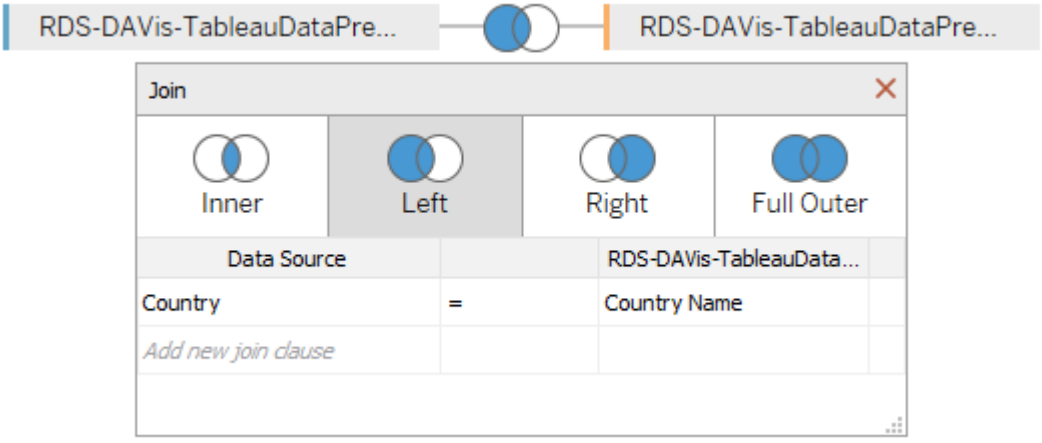
Process 4: JOIN WITH OTHER DATASETS

Join the BMI dataset with the Continents dataset.

1. On the left menu near the top, select **Add** to the right of **Connections**. Then choose "Text file."
2. In the File Explorer window, select `RDS-DAVis-TableauDataPrep_20200227-data-continent.csv`
3. In the middle, you'll need to select a join type. You will select "Left." Meanings:
    a. Inner join – where both datasets match, include that row.
    b. Left join – include all of the rows of the first (left) dataset and append matching data from the second dataset to those rows.

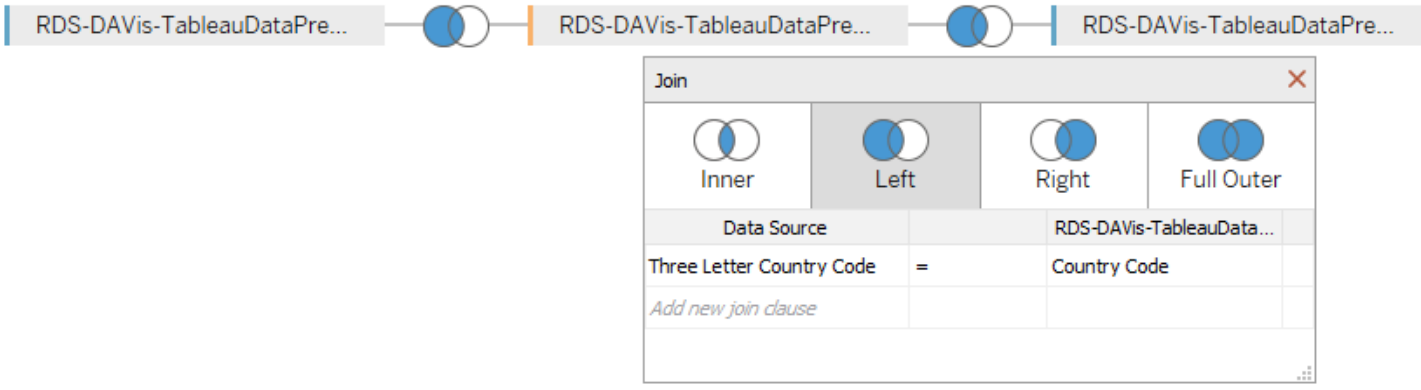
c. Right join - include all of the rows of the second (right) dataset and append matching data from the first dataset to those rows.
d. Full Outer join – include all rows from both datasets. If rows don't match, you will have nulls for the columns that come from the other dataset.

4. Under "Data Source" choose **Country**. Under `RDS-DAVis-TableauDataPrep_20200227-data-continent.csv` choose **Country Name.**



Join the GDP dataset, `RDS-DAVis-TableauDataPrep_20200227-data-gdp.csv`

5. Repeat steps 1-4 to grow your created dataset. Join using the following attributes:
   a. On the left, choose **Three Letter Country Code**.
   b. On the right, choose **Country Code**.



DATA VISUALIZATIONS

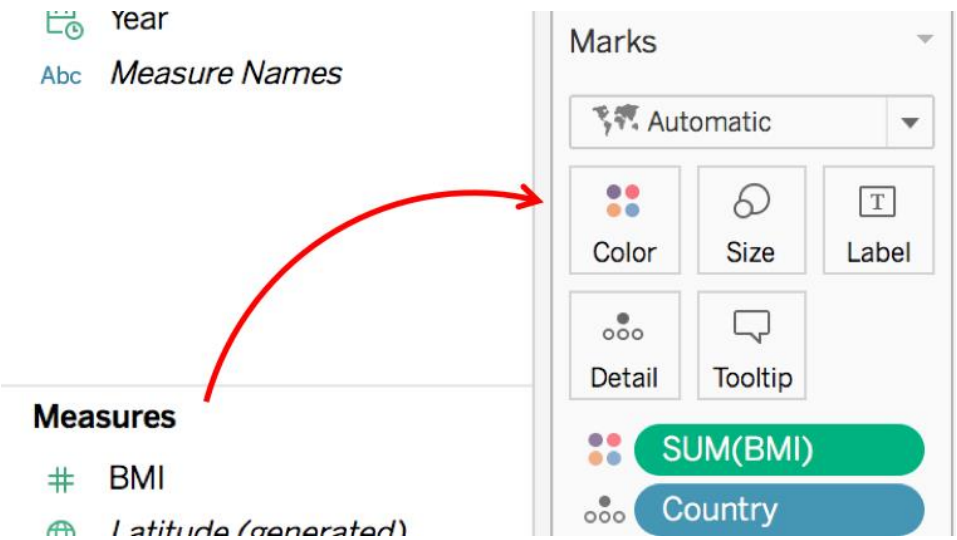
You can create calculated columns in your current location (the Data Source tab), or, you can switch to **Sheet 1** at the bottom. Many visualizations will do the calculation for you (e.g., average BMI or GDP across a continent or sex). *Note: Tableau does not visualize at the Continent Level.*

Chart 1: BMI by country

Let's make a map showing how high or low each country's BMIs are.

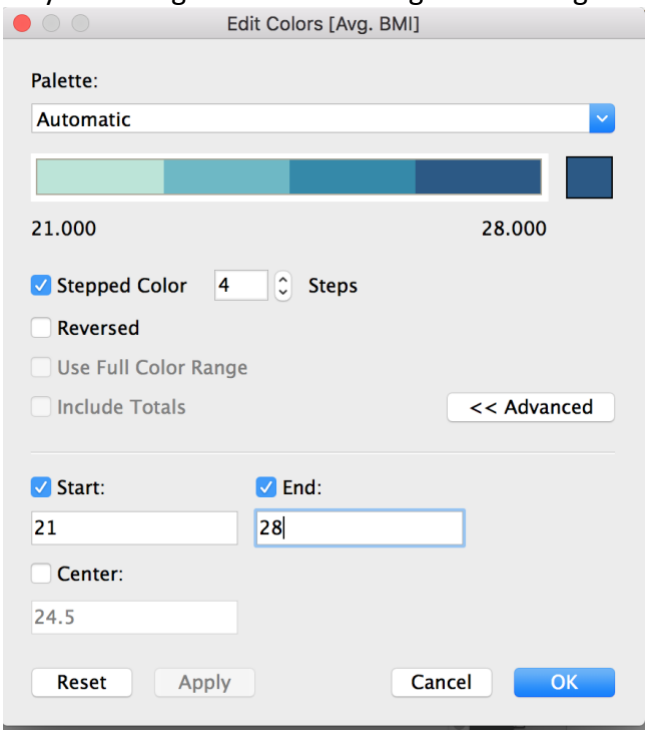
1. If you haven't yet, click the **Sheet 1** tab at the bottom.

2. Drag the **Country** pill onto the open area **in the middle**, and a map should appear with a dot on each country with data. Next, right-click **BMI** and choose **Convert to** Measure. (Repeat this for Country Number and Year1.)
3. Next, drag the **BMI** pill to **Color** in the Marks area. Change the Measure for BMI from Sum to Average.



This will color the map according to BMI.

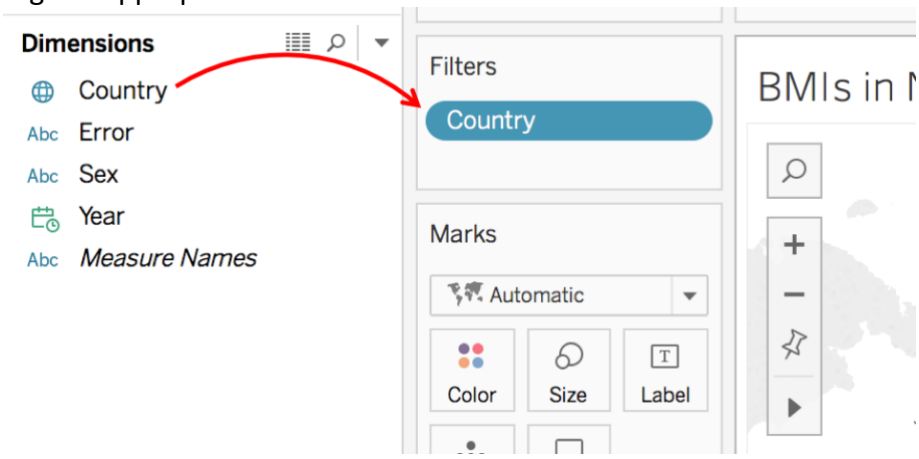
4. You can edit the colors by clicking the arrow pointing down next to the **AVG(BMI)** color scale on the right. Adjust the settings to be Stepped Color with 4 steps. Then press the **<< Advanced** button to then change the Start and End to 21 and 28. Then press **Apply** to see your changes. See the settings in the image below:



5. Next, add a filter by dragging the **Sex** pill onto the **Filters** area, selecting All, and pressing okay. Then click the arrow pointing down on that pill and choose "Show Filter." The filter will then be shown on the left.
6. Click the arrow pointing down next to Sex on that filter and change it from a **Multiple Values (list)** to a **Single Value (list)**.
7. Give the chart a title by double-clicking on the text "Sheet 2" in the tab at the bottom and typing in the following: *Average BMI by Country*.

Chart 2: BMIs in North America

1. Duplicate that first sheet by right-clicking the sheet's tab and pressing **Duplicate**. Re-title the new sheet *Average BMIs of North America*.
2. Limit to North American countries by dragging the **Country** pill to the Filters area and select Canada, Mexico, and the United States of America by pressing **None** and then checking the appropriate boxes.



Create a Calculated Field:

Click on the BMI pill, and select Create → Calculated Field
Name it BMI Range

Include this in your calculated field:

```
IF AVG([BMI]) < 19 THEN "Low"
ELSEIF AVG([BMI]) > 25 THEN "High"
ELSE "Normal"
END
```

There is no missing data in this exercise, but you could also use the `IFNULL()` function for your calculated fields.

Drag BMI Range onto “Tooltip”

You can click on “Tooltip” and edit the message that is displayed. For instance

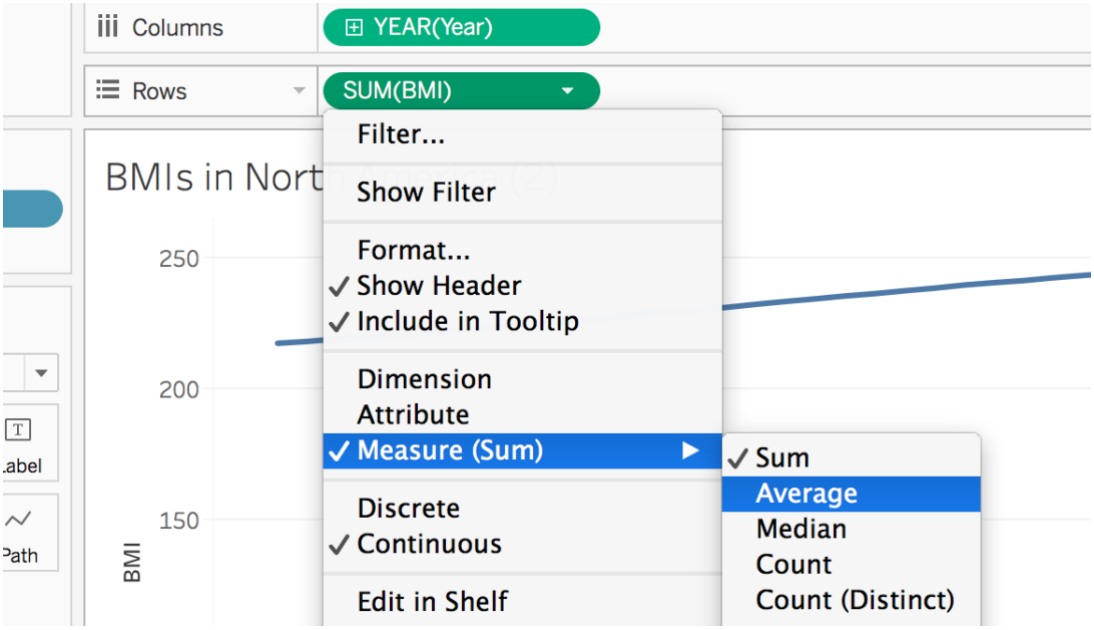
```
The average BMI (<AVG(BMI)>) for <Country> is <AGG(BMI Range)>
```

Create a second sheet to explore change in BMI per year

Chart 3: BMI trends by region

Next, we are going to create a line chart for North America.

1. Start a new sheet. Click the icon of a bar chart with a plus sign in front of it at the bottom of the application. That will create a new sheet.
2. Filter by country, selecting Canada, Mexico, and the United States of America.
3. Next, drag the **Year** pill up to the **Columns** area. Drag the **BMI** pill up to the **Rows** area. Change BMI measure from Sum to Average.



4. Lastly, you will drag the **Country** pill onto the line chart, and that will create a line for each country.

Editing the Tooltip

Let's add info to the tooltip (information that is revealed when you hover over the chart.)
To do this click on the **Tooltip** button in the **Marks** area. Change wording and add new data by dragging them onto the Tooltip button.

Edit the axis by right clicking the Avg. BMI vertical axis. Start at 20

To label the lines: Drag the Country pill onto the Label item. Click on label to adjust labels as desired. To hide the previous labels, right click on the label, select “Mark Label…” and click “Never Show”

Click on “Label” , then “Font” and then “Match Mark Color” to match the color of the label with the color of the line.

Finally create a *dashboard:*

Click on the Dashboard Symbol.
Your sheets should show on the left pane and you can drag them onto the dashboard to customize your dashboard. You can right click on the filters and legend, and select “Floating” to move them inside the visualization.

Right click the filter box and select the “Apply to worksheets” → “All using related data sources” so that both the line chart and the map react to the selection on the filter.