MIS 0855 – Data Science (Section 005) – Fall 2016
In-Class Exercise (Week 4) – Visualizing with Maps

Objective: Learn how to use Tableau's powerful mapping tools

Learning Outcomes:

- Learn at what levels (e.g. city, zipcode, congressional districts) Tableau can create maps

- Understand how to format fields for geographic information so that Tableau can identify as such

- Create maps with multiple visualization components.

Tableau has very powerful mapping functions which help you come up with cool visualization at various levels including very granular ones such as cities, zipcodes, and congressional districts.

In this exercise, we will use the data on population race make-ups from the American Community Survey in 2010-2014 published by the U.S. Census Bureau (https://www.census.gov/programs-surveys/acs/.) In particular, we will use the percentage of population in each race (White, African American, Hispanic, and others) for analyses.

Part 1. Metropolitan Areas

1) Download "ACS Race 2010-2014.xlsx" and save it to your computer. Remember where you saved it!

2) Start Tableau.

3) Click on "Microsoft Excel" under "In a file."

4) Navigate to the location where your data file ("ACS Race 2010-2014.xlsx") is stored and select it.

5) Drag the "Metro" sheet to the workspace.

6) Select New Worksheet icon at the bottom-left.

7) On Dimensions, we do not see a globe icon next to Metro, which means that Tableau does not identify it as a geographic indicator. We can force it to do so.

Right-click Metro and select "Geographic Role" -> "CBSA/MSA." (MSA stands for Metropolitan Statistical Areas, where at least 50,000 people live.)
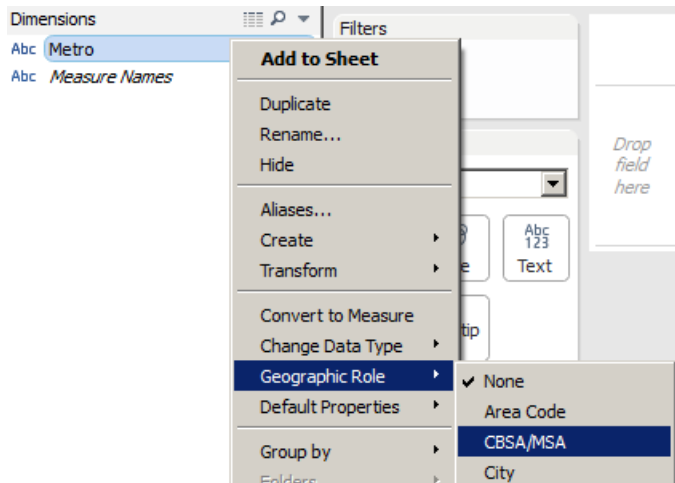
8) Now you will see a globe icon with Metro and "Latitude" and "Longitude" measures on the bottom-left, which are automatically generated by Tableau.

9) Drag Metro from Dimensions to Rows, and drag Asian from Measures to Columns.

10) Select Filled Maps from Show Me tab. Now you'll see a map of US large metropolitan areas.
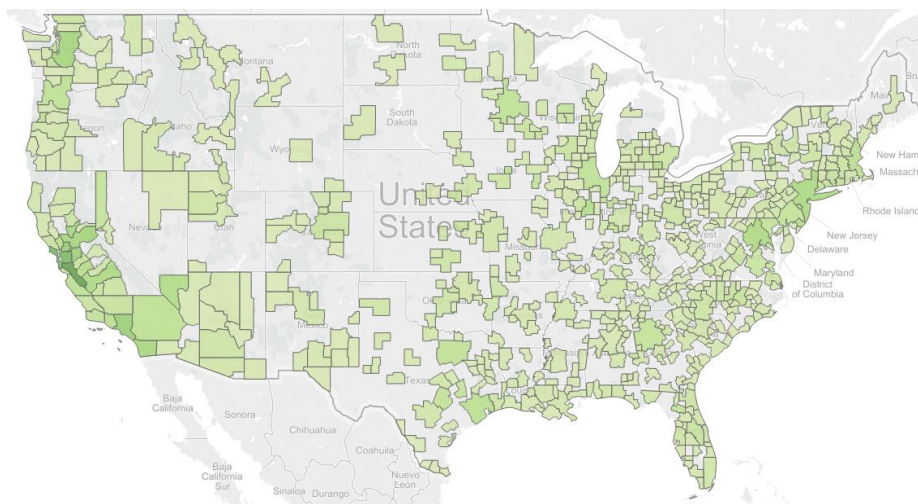
11) Rename Sheet 1 to "Metro" and save.

Part 2. Congressional District

1) Select Data > New Data Source from the menu.

2) Click on "Microsoft Excel" under "In a file" and select "ACS Race 2010-2014.xlsx" again.
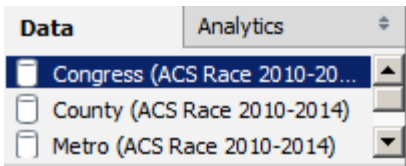
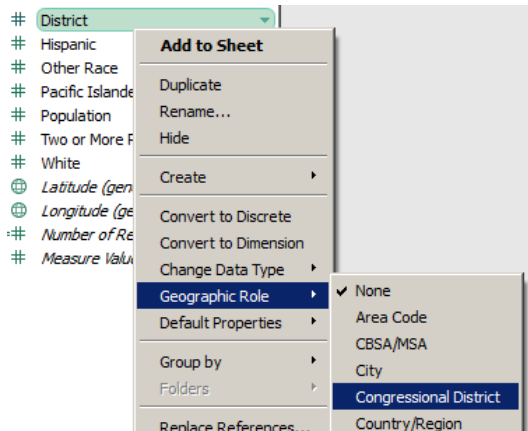3) This time, drag the "Congress" sheet to the workspace.

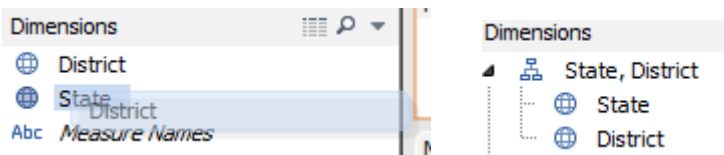4) Select New Worksheet icon at the bottom-left.

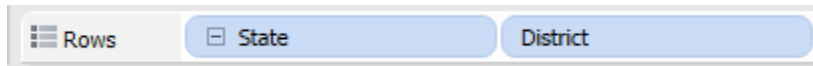5) Make sure "Congress" was selected as a data source.

6) On Measures, right-click District and select Geographic Role > Congressional District.

7) On Dimensions, drag District over State to create a hierarchy. Click Ok next.
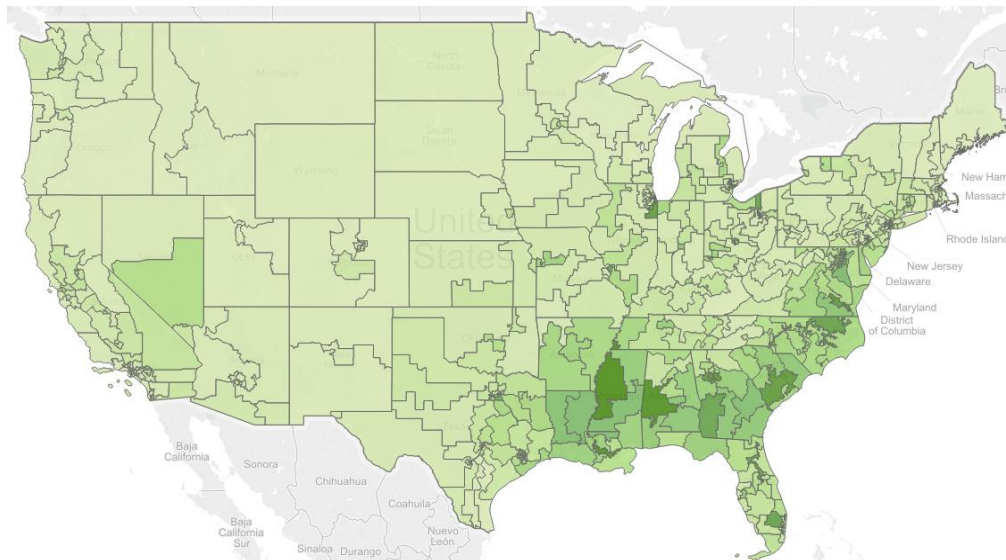

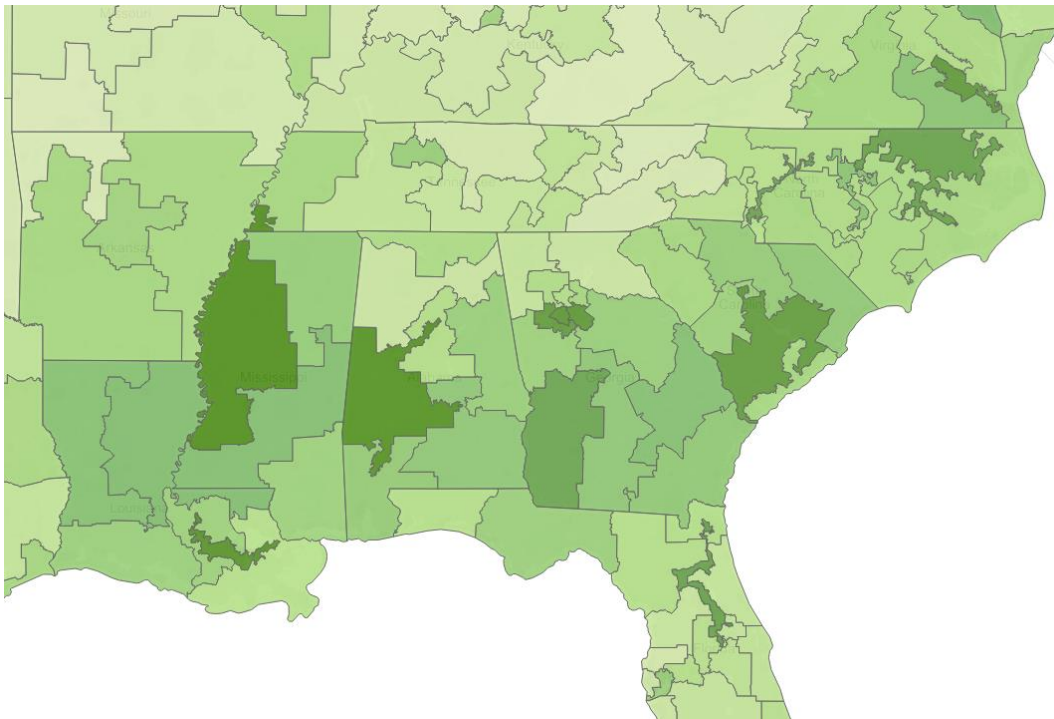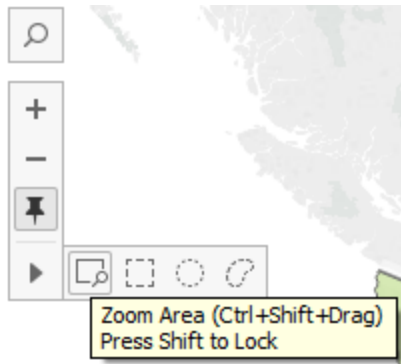8) Drag "State, District" to Rows and click "+" next to State.

9) Drag African American from Measure to Columns and change SUM to AVG.

10) Click "Filled Maps" on Show Me and you'll see the U.S. map with congressional districts, with dark green indicating large African American population.

11) Use Zoom Area to take a close look at southern states.

Q: This map describes what?

12) Rename Sheet 2 to "Congress" and save.

Part 3. U.S. Cities

1) Select Data > New Data Source from the menu.

2) Click on "Microsoft Excel" under "In a file" and select "ACS Race 2010-2014.xlsx" again.

3) This time, drag the "City" sheet to the workspace.

4) Select New Worksheet icon at the bottom-left.
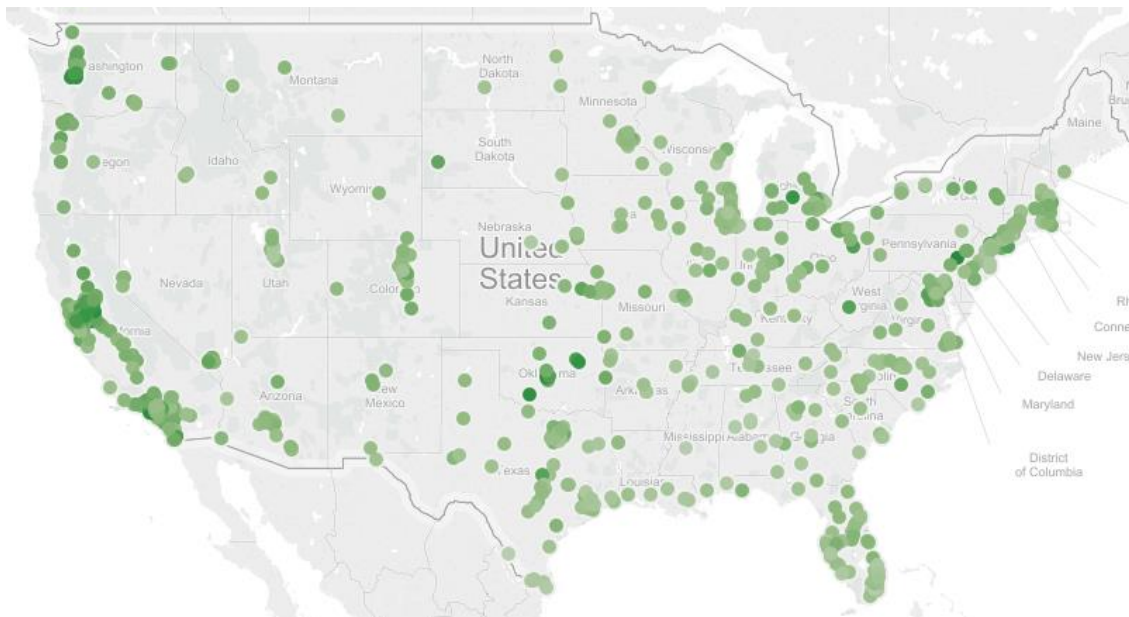
5) Make sure "City" was selected as a data source.
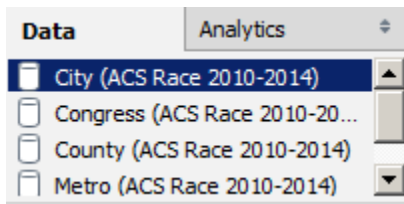
6) Drag "State, City" from Dimensions to Rows and "Two or More Race" to Columns. Change SUM to AVG.
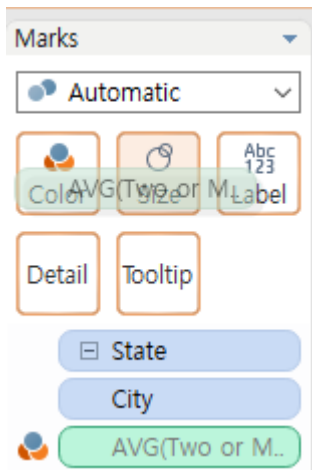
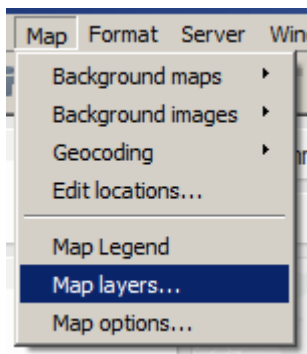7) Click "+" next to State.
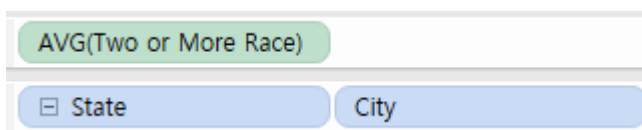
8) Click "Filled Maps" on Show Me.

You'll see that Tableau came up with a Symbol Map, not with a Filled Map. Tableau does not support a Filled Map with City, because there are too many of them.
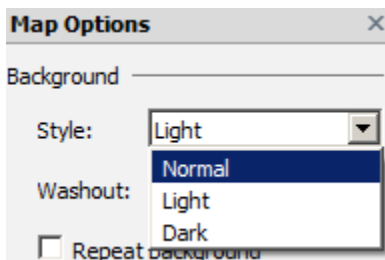
8) On Marks panel, drag "AVG(Two or More Race)" over Size.

9) Let's make the map cooler. Select Map > Map Layers on the top menu.

10) On Map Options panel, change the map style to Normal.

11) On the right-bottom of Map Options, you'll see Data Layer. Select "Per Capita Income" on Layer and Zip Code for By.

12) You can also notice "3 unknown" on the bottom-right." Click it, and select Edit Locations...

13) We are seeing this because Tableau cannot identify these three cities.

⚠ City	State/Province	
Your Data		Matching Location
Boise City		Unrecognized
Menifee		Unrecognized
Weymouth Town		Unrecognized

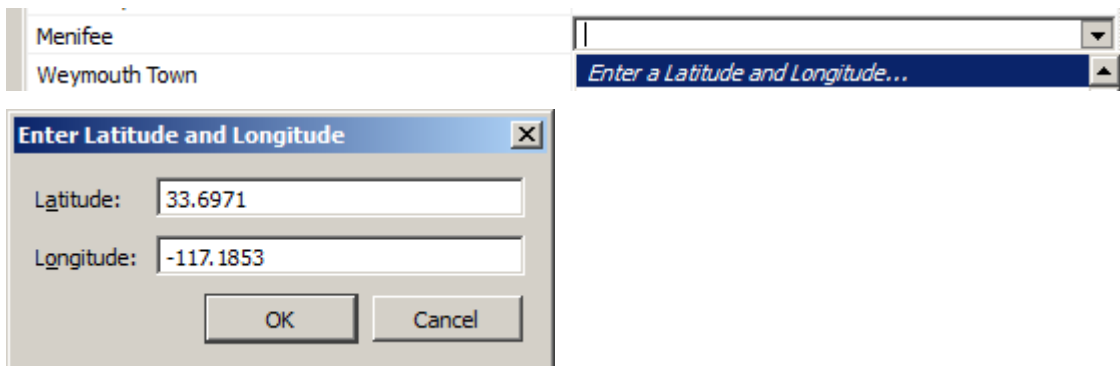14) Let's change Boise City to Boise and Weymouth Town to Weymouth.

⚠ City	State/Province	
Your Data		Matching Location
Boise City		Boise
Menifee		Unrecognized
Weymouth Town		Weymouth

15) We can't find Menifee on the list of cities Tableau provides. Don't worry.

Google — menifee longitude latitude

All   Maps   News   Images   Shopping   More ▾   S

About 28,100 results (0.92 seconds)

Menifee / Coordinates

33.6971° N, 117.1853° W

Google says that Menifee, CA, locates at 33.6971 N and 117.18 W. We can put this information into Tableau.

Make sure to put "-117.1853" to Longitude. (Minus means West.)


| Menifee | | |
| Weymouth Town | *Enter a Latitude and Longitude…* | ▲ |

Enter Latitude and Longitude   ☒

Latitude: 33.6971

Longitude: -117.1853

OK   Cancel

Now you can see that all cities are identified.

16) Rename Sheet 3 to "City" and save.


Part 4. U.S. States Map with Pie Charts

1) Select Data > New Data Source from the menu.

2) Click on "Microsoft Excel" under "In a file" and select "ACS Race 2010-2014.xlsx" again.

3) This time, drag the "State" sheet to the workspace.

4) Select New Worksheet icon at the bottom-left.

5) Make sure "State" was selected as a data source.

6) Drag State from Dimension to Rows.
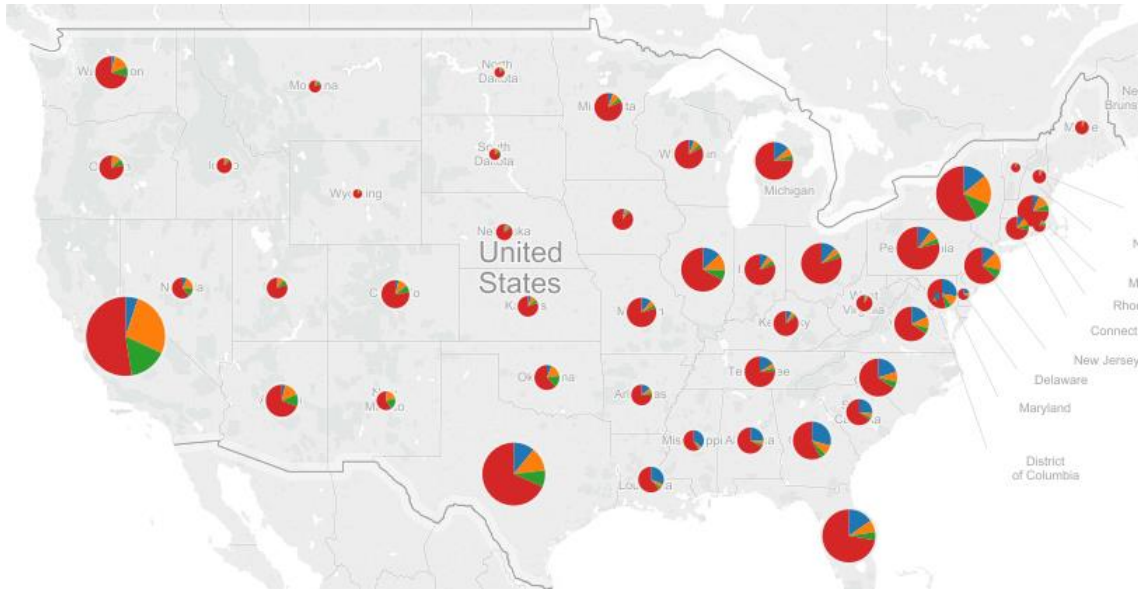
7) Click "Symbol Maps" on Show Me.
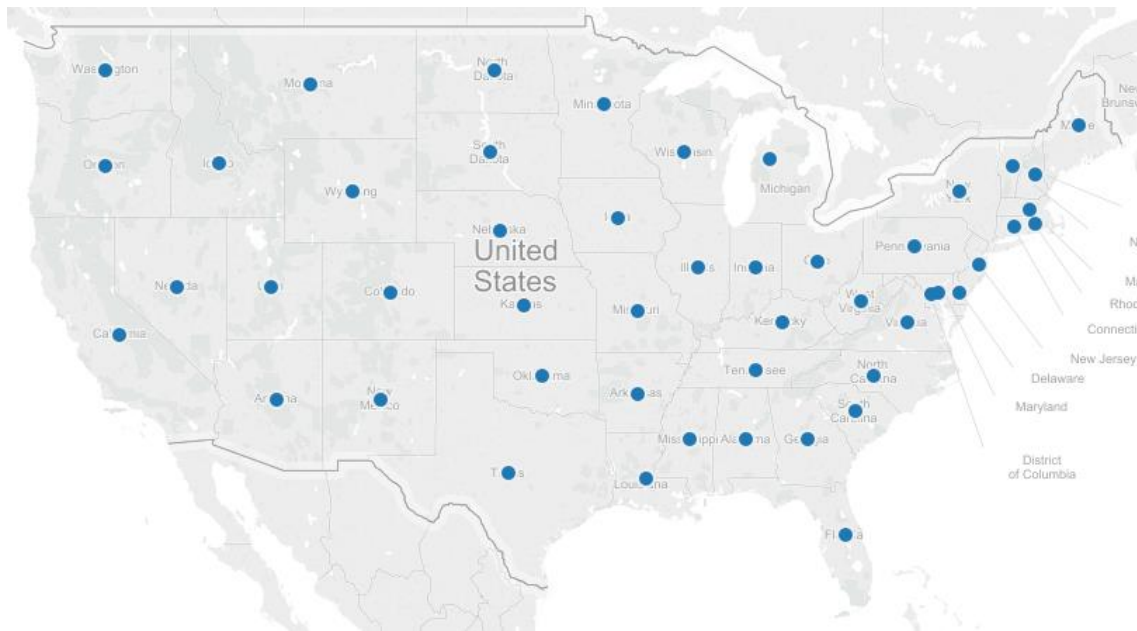
8) Drag Population from Measures to Size on Marks panel, and click Size to make the circles a little bigger.
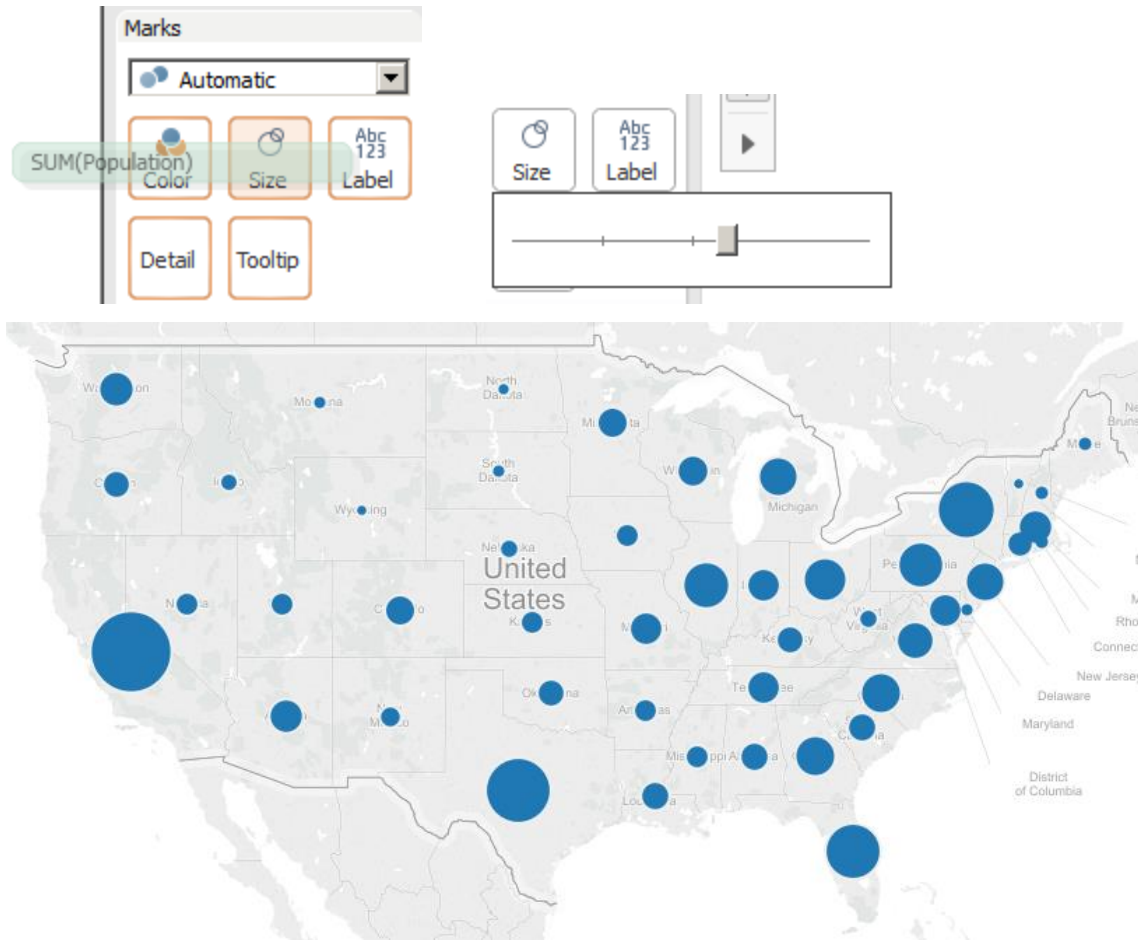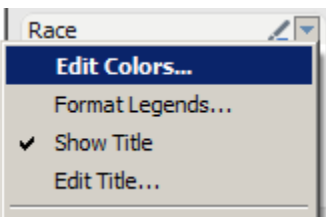

9) Drag Race from Dimension to Color on Marks. Then change Automatic to Pie.
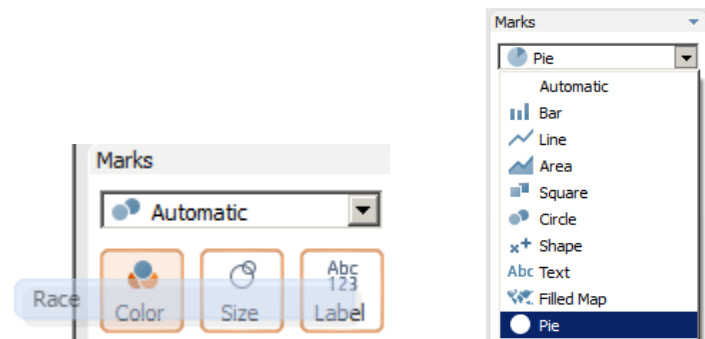
This map uses two components to deliver different information. The size of circle represents the size of population, and the pie charts show the racial make-up of each state.
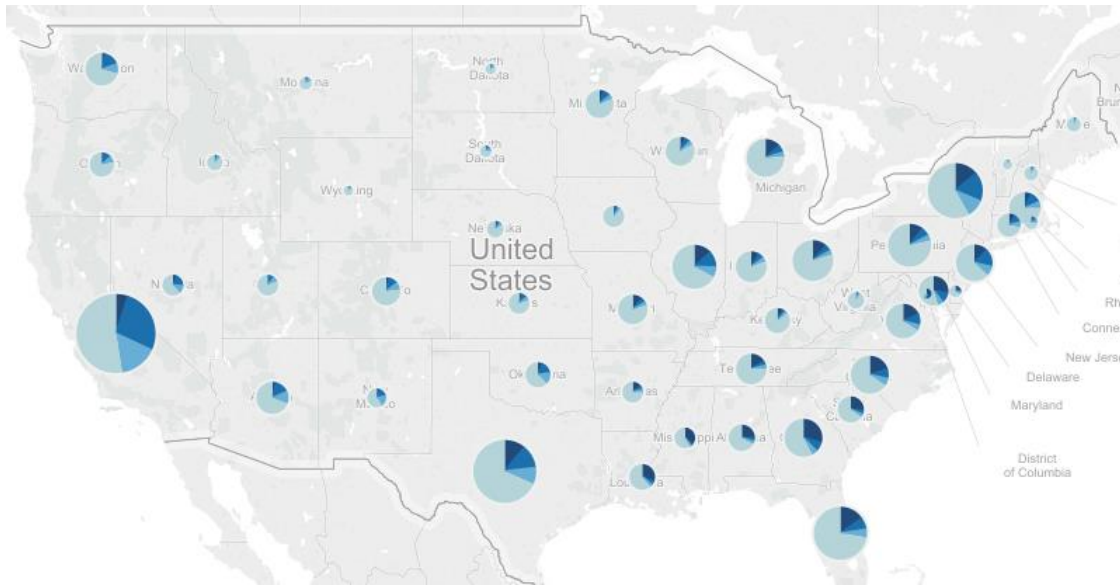
10) This is not a good visualization, however. It is better to use one color gradually. On Race panel, select Edit Colors.

11) On Color Palettee, select Blue.
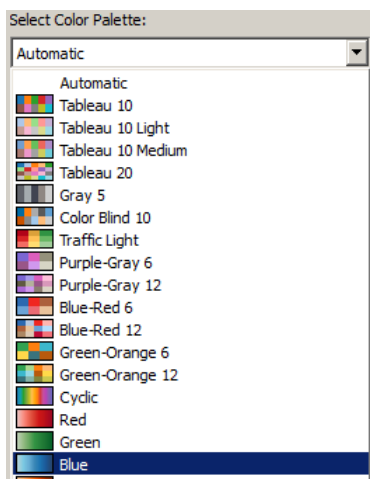
12) Click each race, and select one color for each race.

This is a much better, more visually-appealing map.

13) Rename Sheet 4 to State and save.

Part 5. Do It Yourself!

Create a Pennsylvania map to display the percentage of Hispanic population in each zipcode of Pennsylvania.

Hint: Use State as a filter.