

DATA SOCIETY:

Introduction to Tableau

Part 11



Recap: functions in Tableau

- Number Functions
- String Functions
- Date Functions
- Type Conversion
- Logical Functions
- Aggregate Functions
- Table Calculation Functions
- User Functions
- Spatial Functions
- Additional Functions

The screenshot displays three separate instances of Tableau's Table Calculation dialog box, each showing a different function or calculation.

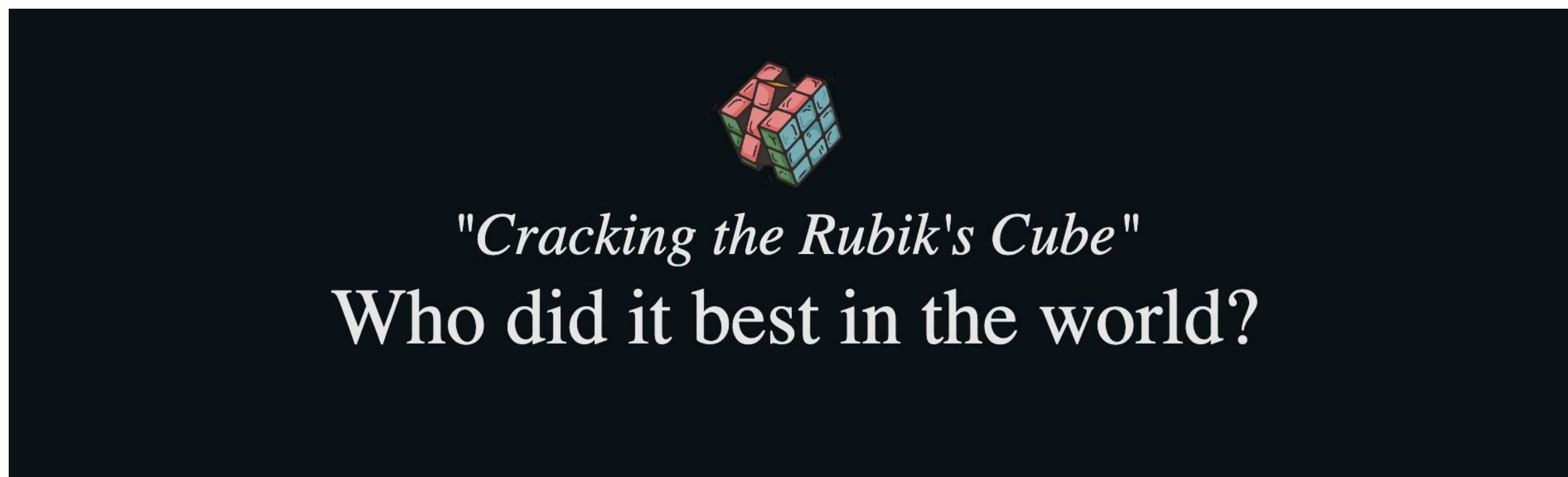
- Top Dialog:** Shows a calculation named "years since independence". The formula is `ZN(DATEDIFF("year", [Indep Year], TODAY(), "sunday"))`. The preview shows the result as a single value.
- Middle Dialog:** Shows a calculation named "population rank". The formula is `RANK(avg([Population (country.csv)]))`. A note says "Results are computed along Table (across)". The preview shows the rank for each row.
- Right Sidebar:** A list of available Table Calculation functions, including FIRST, INDEX, LAST, LOOKUP, PREVIOUS_VALUE, RANK, RANK_DENSE, RANK_MODIFIED, RANK_PERCENTILE, RANK_UNIQUE, RUNNING_AVG, RUNNING_COUNT, and RUNNING_MAX.
- Bottom Dialog:** Shows a calculation named "Pop Level". The formula is a conditional IF statement:

```
IF [Population (country.csv)] > 100000000
THEN "high"
ELSEIF [Population (country.csv)] > 50000000
THEN "medium"
ELSE "low"
END
```

The preview shows the resulting categories for each row.

Warm-up: Tableau Public

- Spend a few minutes exploring the Cracking the Rubik's Cube dashboard from the Tableau Public Viz of the Day collection.
- How many different ways do you see the dashboard leverage **geospatial data?**



[Cracking the Rubik's Cube](#)
[dashboard \(link\)](#)

Module completion checklist

Objective	Complete
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Why is mapping useful?

- Spatial data is a prevalent data type, and can be especially useful with financial and economic data.
- Visualizing spatial data can uncover interaction between economic variables and geographic locations.
- Can you think of any such interactions with data you work with?

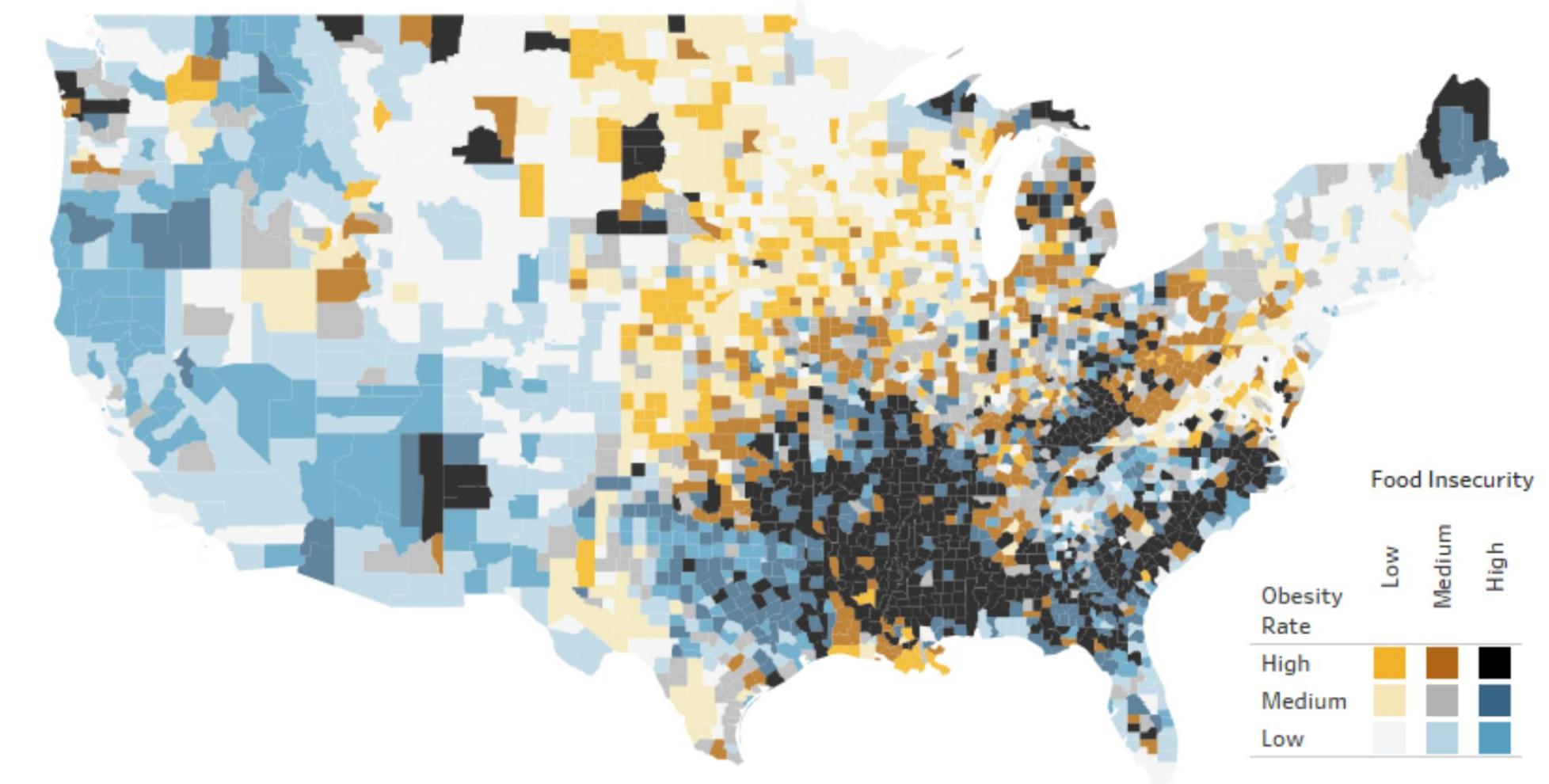


Mapping in Tableau

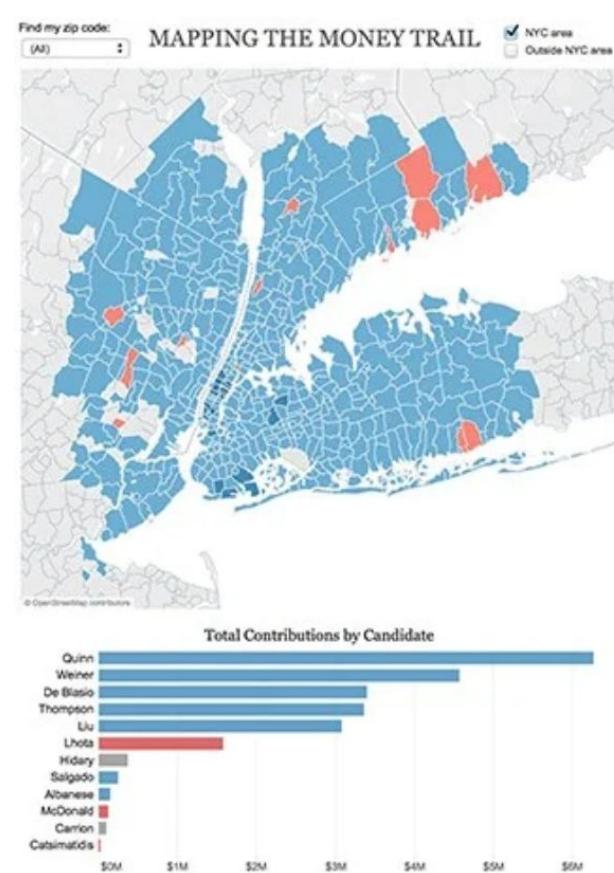
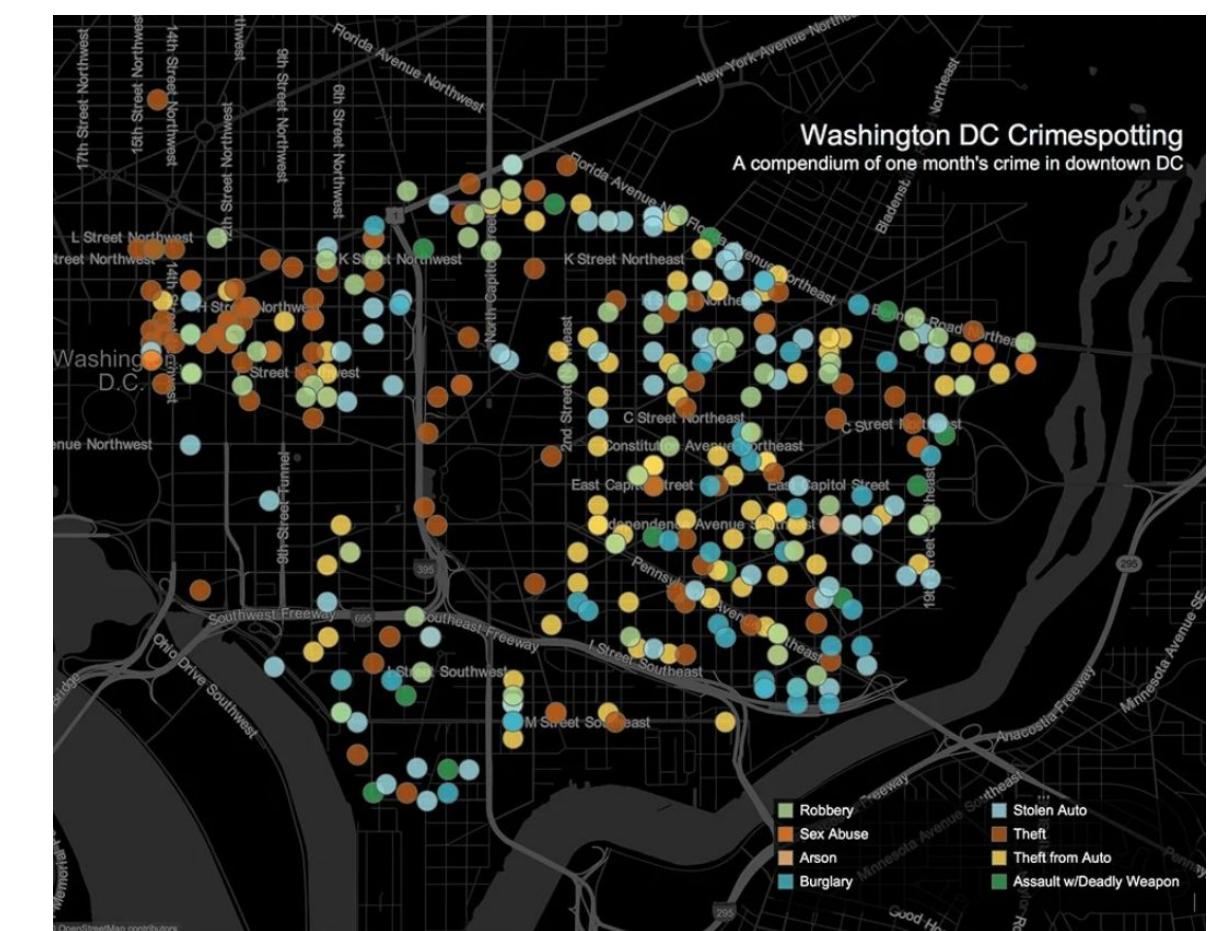
- **Geospatial visualization** is one of the most compelling uses for Tableau.
- Tableau makes mapping convenient by offering ready-made map types and plugins.
- Custom mapping capacity
 - Makes mapping custom regions possible.
 - Allows custom backgrounds and coordinates.
 - You could map spots on the sun or annotate regions of the brain.
- Tableau mapping can be extended through connections to more advanced tools, like Mapbox.

Geospatial visualization

- Some examples of where one would use maps include:
 - Obesity rates plotted across the US.
 - Crime events in Washington DC.
 - Campaign contributions by district in NYC.

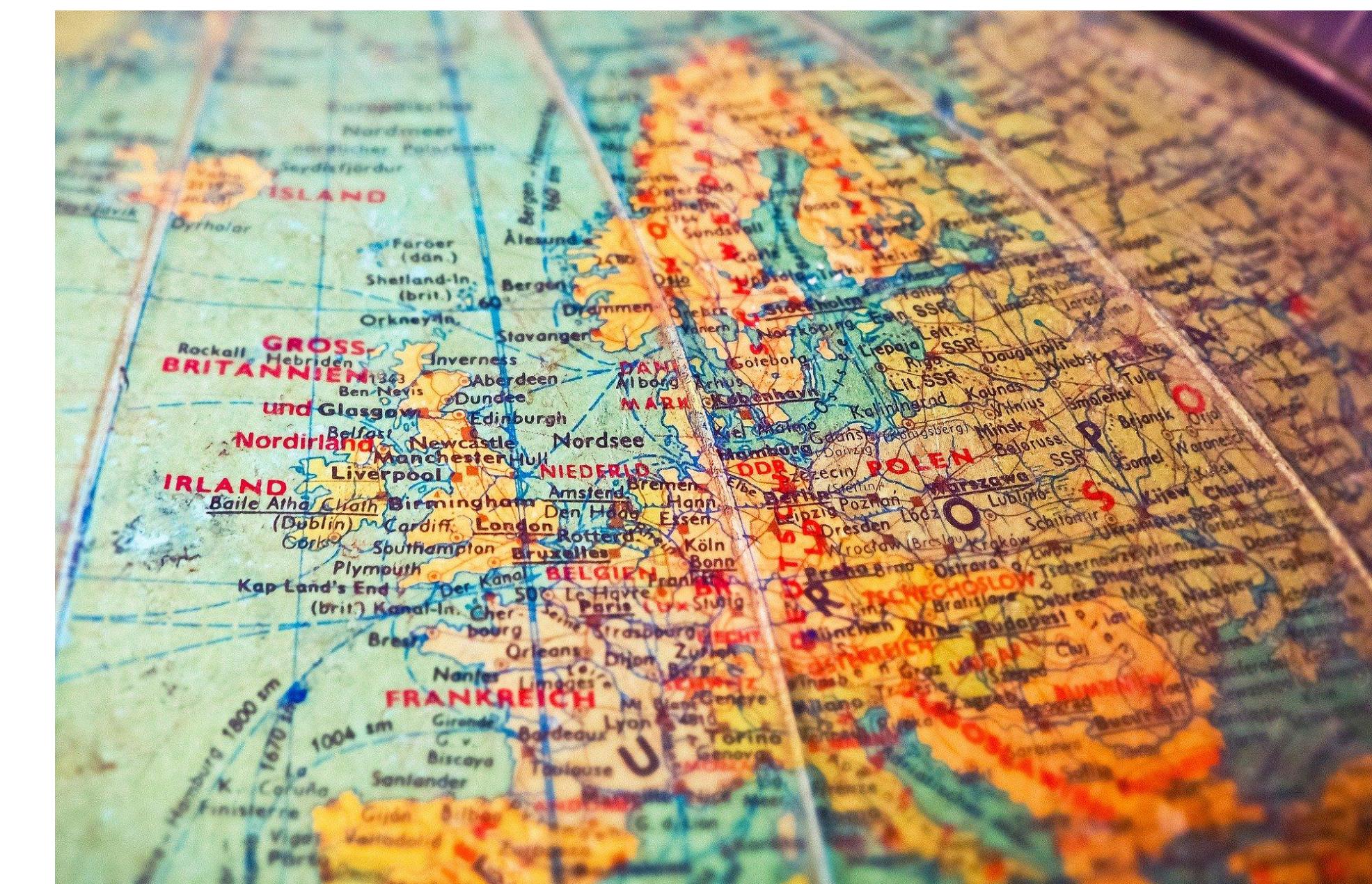


- You can see more examples of Tableau maps ([link](#)).



Automatic coordinate generation

- Tableau automatically recognizes data that naturally has coordinates, like countries, cities, counties, etc.
- For these data it **automatically generates longitude and latitude coordinates** as measures.



Reminder: save your work!

- In the next few modules, we will be creating more elaborate visualizations.
- We will see a lot of different insights from the data as we learn more in Tableau.
- **Make sure to save all your classwork** (including Exercises), because we will be putting it all together at the end of the unit to create a story.

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Generating automatic coordinates

- Let's implement Tableau's mapping function using our world dataset.
- Notice that “**Name(country.csv)1**” in the country table has been assigned coordinates.
 - The globe indicates geospatial data.
- Note that other geospatial dimensions such as “**City**” were not recognized.
 - We will fix this later in the class.

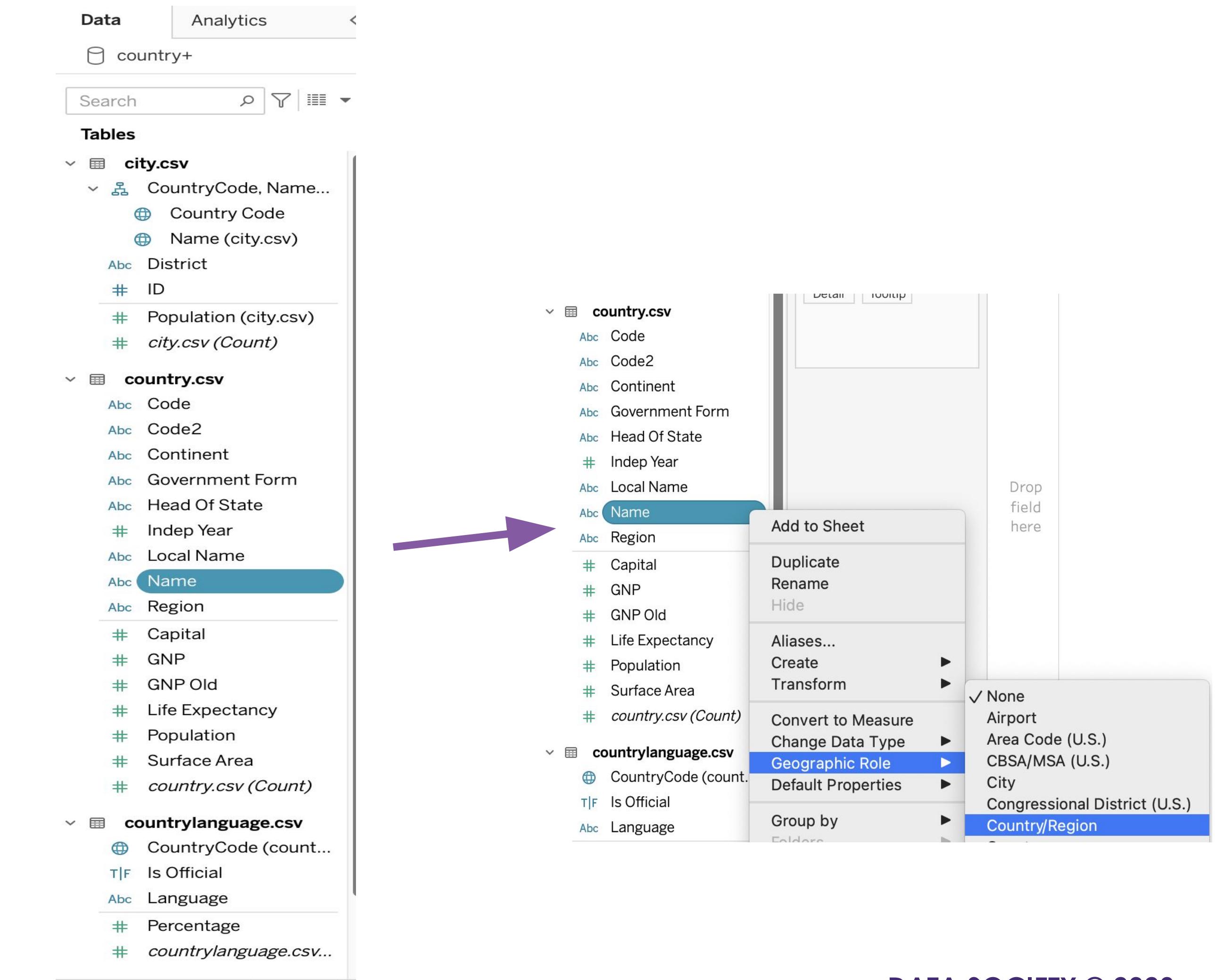
The screenshot shows the Tableau Data pane with the following structure:

- Data** tab selected.
- Dimensions** section:
 - city.csv**: District, ID, Name (highlighted with a blue bar).
 - country.csv**: Code, Code2, Continent, Government Form, Head Of State, Indep Year, Local Name, Name (highlighted with a blue bar), Region1.
 - country.csv1**: add5 indep year, Calculation1 + 5.
- Measures** section:
 - # regional population, -# years since independence.
 - # Number of Records.
 - Latitude (generated), Longitude (generated) (highlighted with a blue bar).

A purple arrow points from the "Name (country.csv)1" dimension in the Dimensions section to a callout bubble labeled "Name (country.csv)1". Another purple arrow points from the "Latitude (generated)" and "Longitude (generated)" measures in the Measures section to a callout bubble labeled "Latitude (generated)" and "Longitude (generated)".

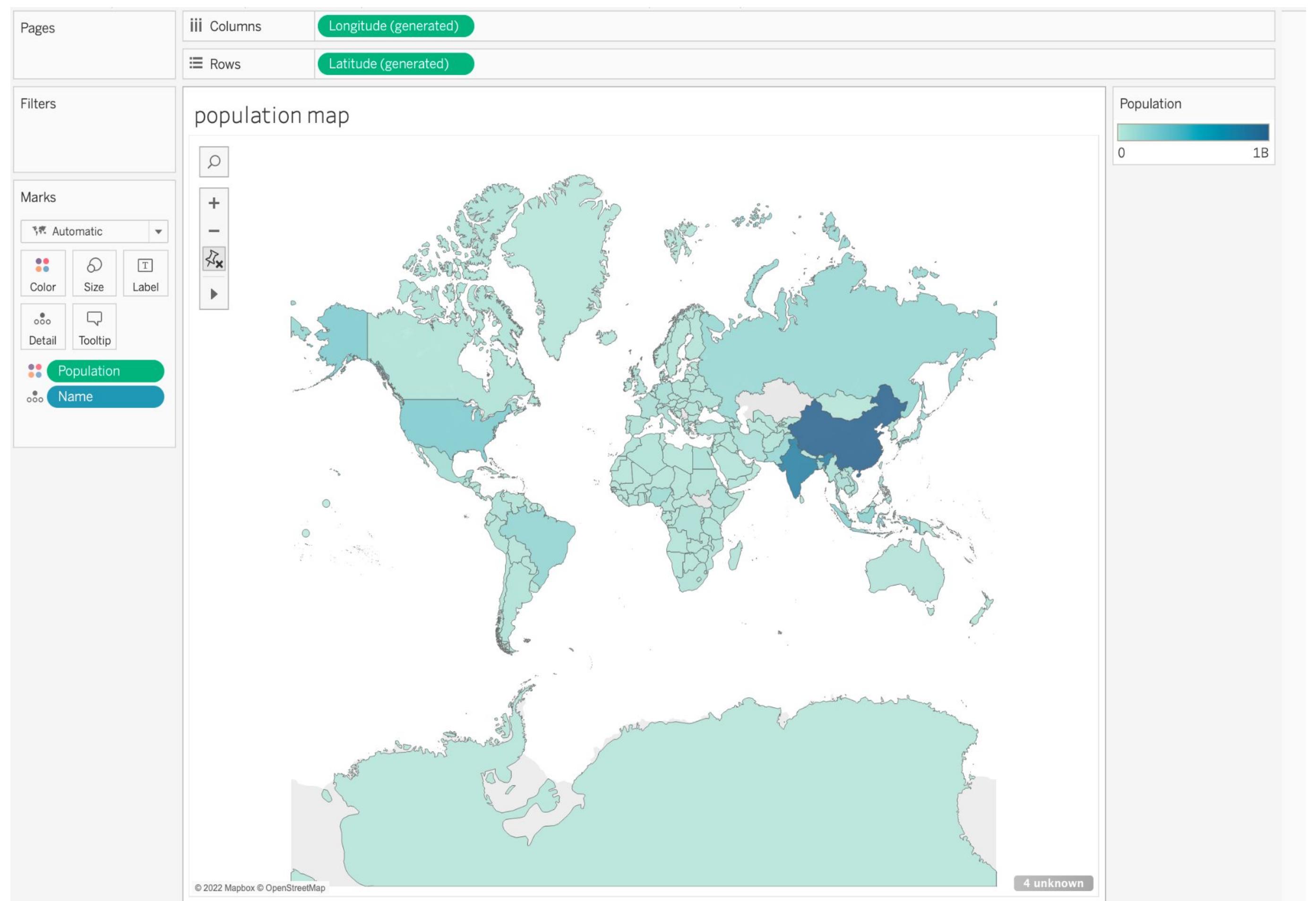
Manually converting to geospatial data

- Note that Tableau didn't recognize some of our geospatial data, like for “**Name(country.csv)**”
- To fix this, use the dropdown from the pill and tell Tableau which type of geospatial coordinates we have.
- In this case we have to tell Tableau that this is “**Name**” is country data.



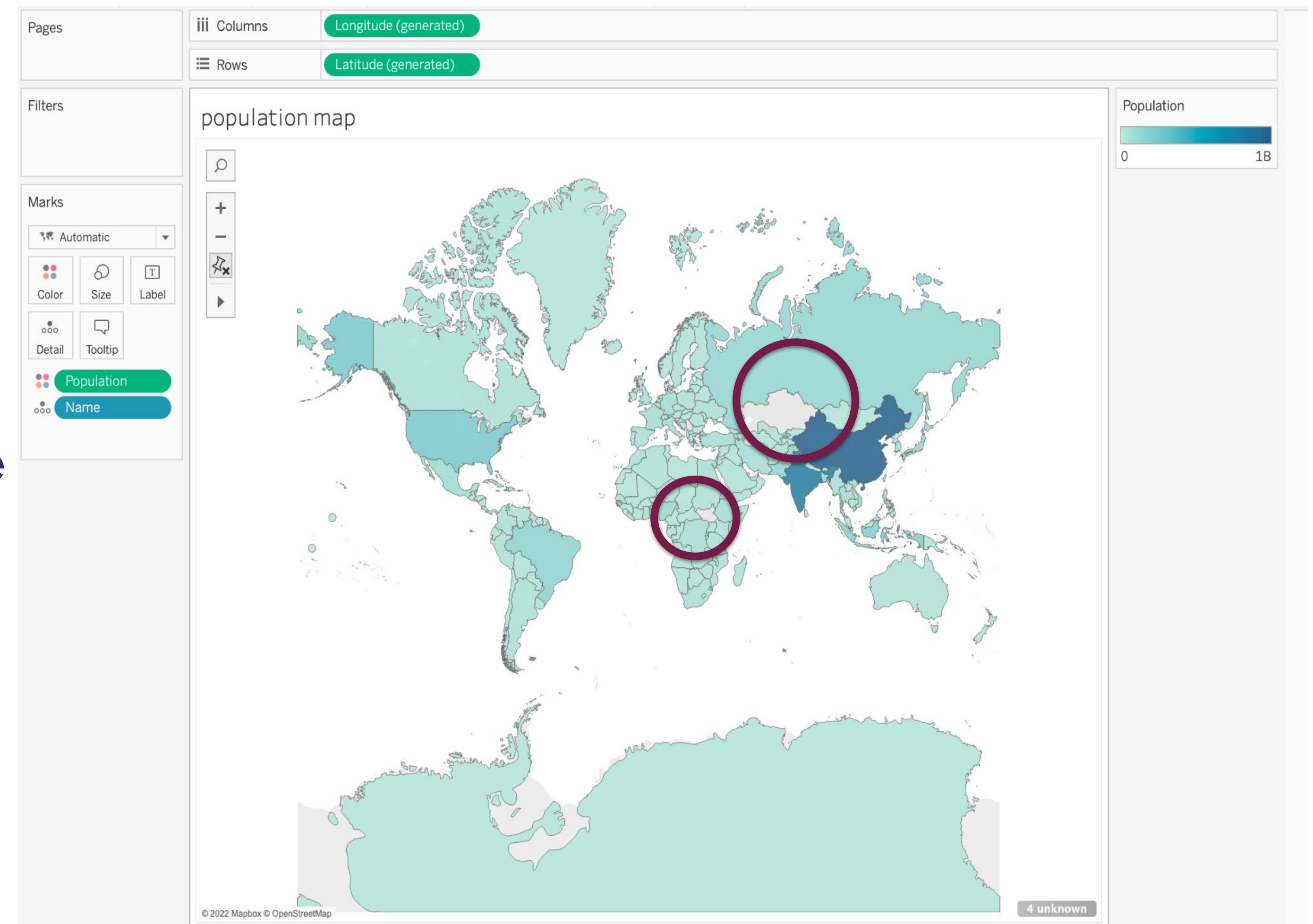
World map of population

- Together, we will walk through the process of generating a population map.
- Drag:
 - **Longitude** to **columns**.
 - **Latitude** to **rows**.
 - **Population** to the **marks color** panel.
 - **Country name** to the **detail** panel.
- Tableau automatically generates a filled map where we have data.



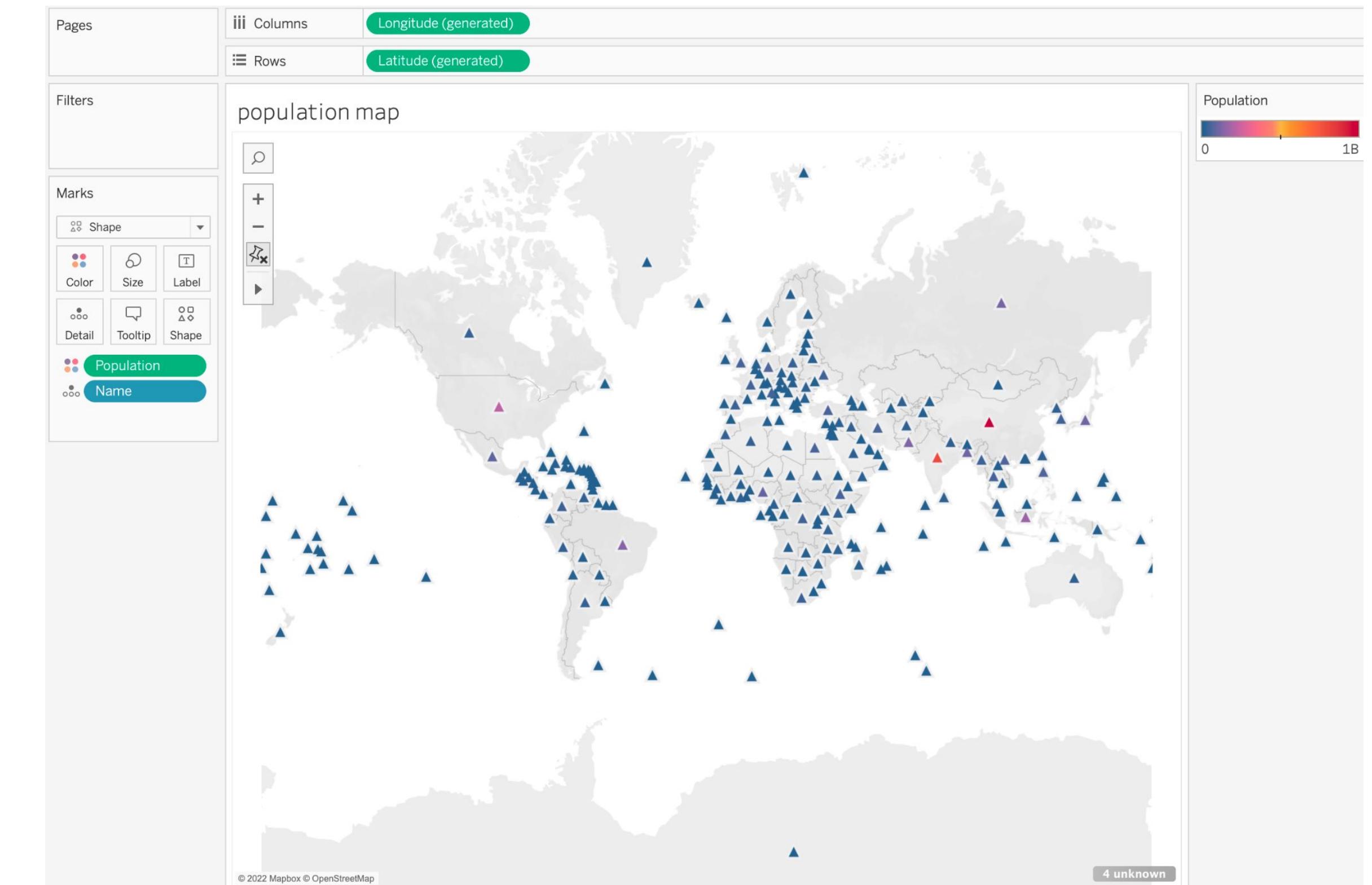
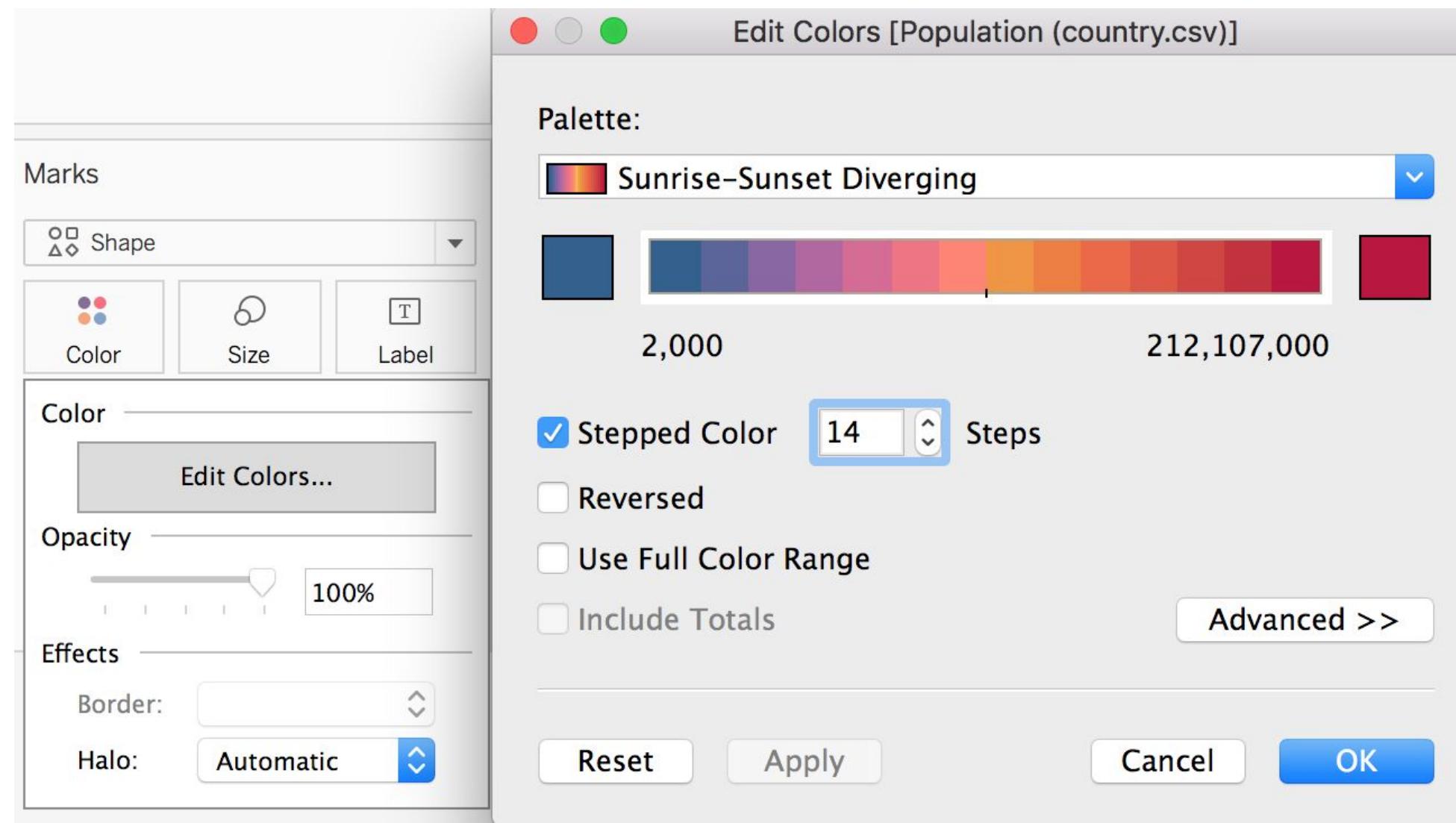
A few gray on that map...

- Remember how we found that there was missing population data way back in our first Tableau session?
- From this view, we can also see the missing data.



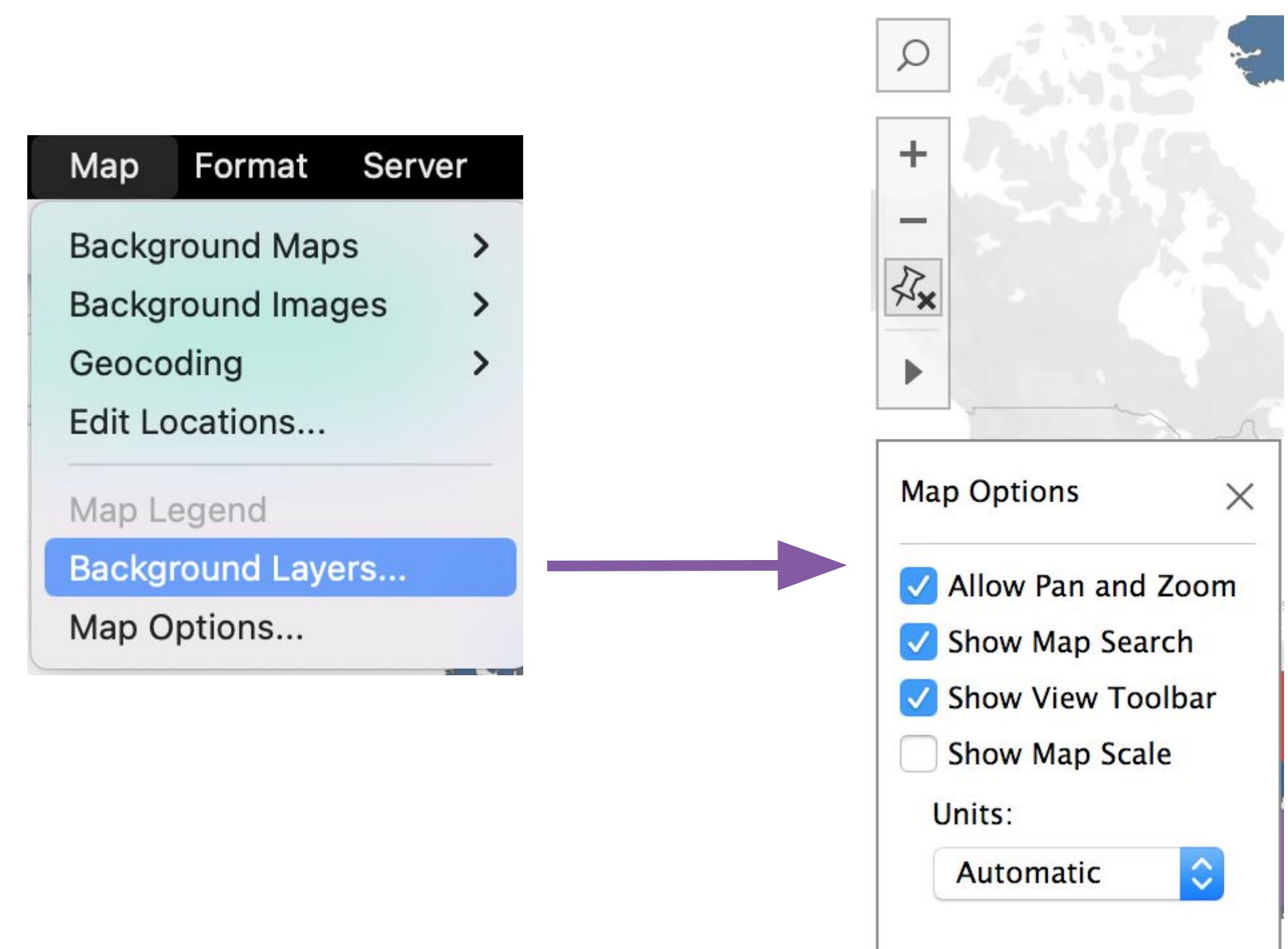
Symbols and filled maps

- It is easy to change the look of the map view with the marks dropdowns.
- Edit colors on the marks tab to give a more divergent range of colors so that we can distinguish less populous countries.



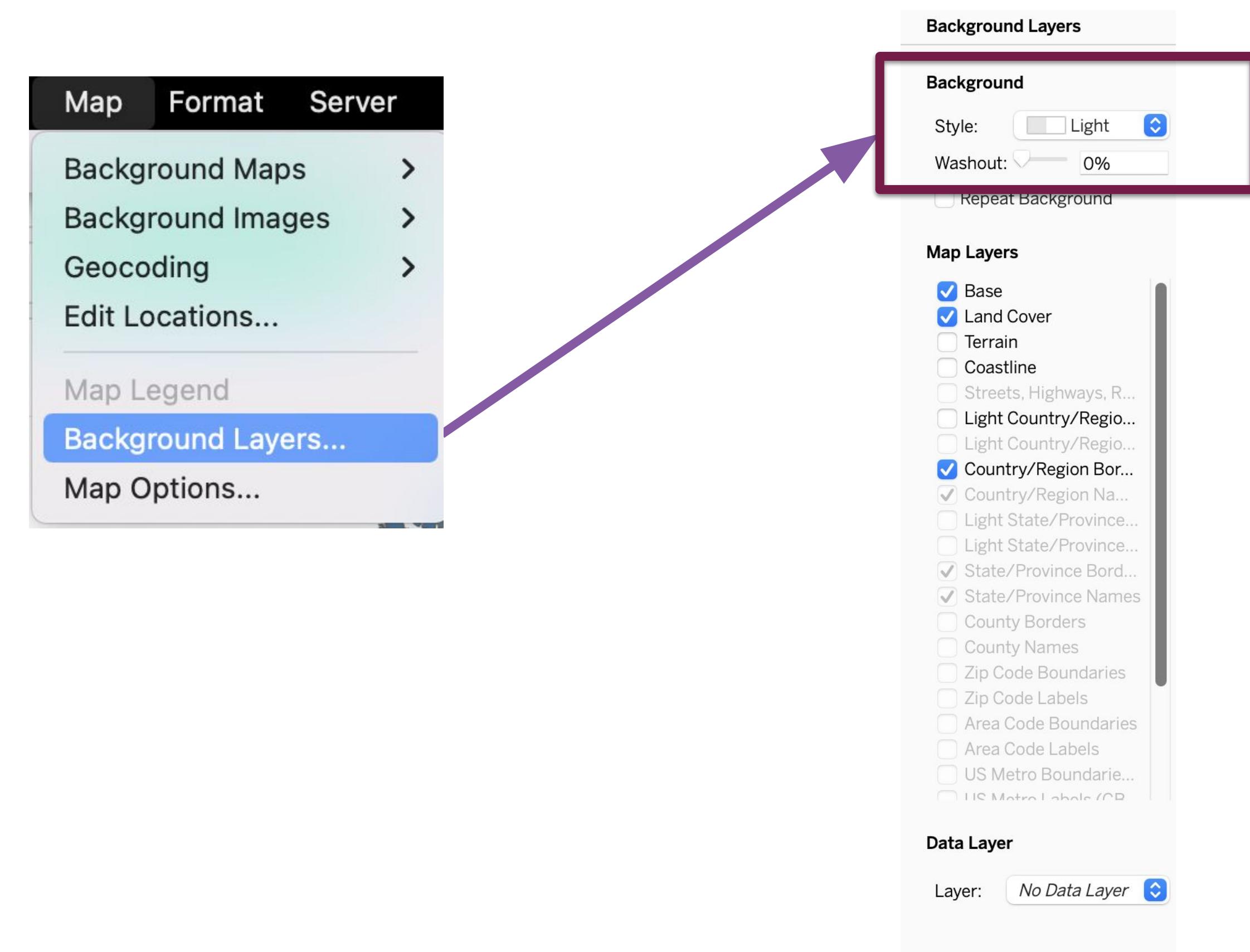
Map control options

- Tableau offers map control options like pan, zoom, search, etc.
- You have control of these options in the map menu in the top bar.
- Notice that pan and zoom are automatically given to you in the view.



Background layers options: background

- The options in the **Background Layers** submenu let you change the way the map looks.
- It can also be used to overlay different maps over each other.
 - For example, one could look at rainfall map layer over a crop yield map.
- For now, try toggling the **Background** style from the dropdown menu.

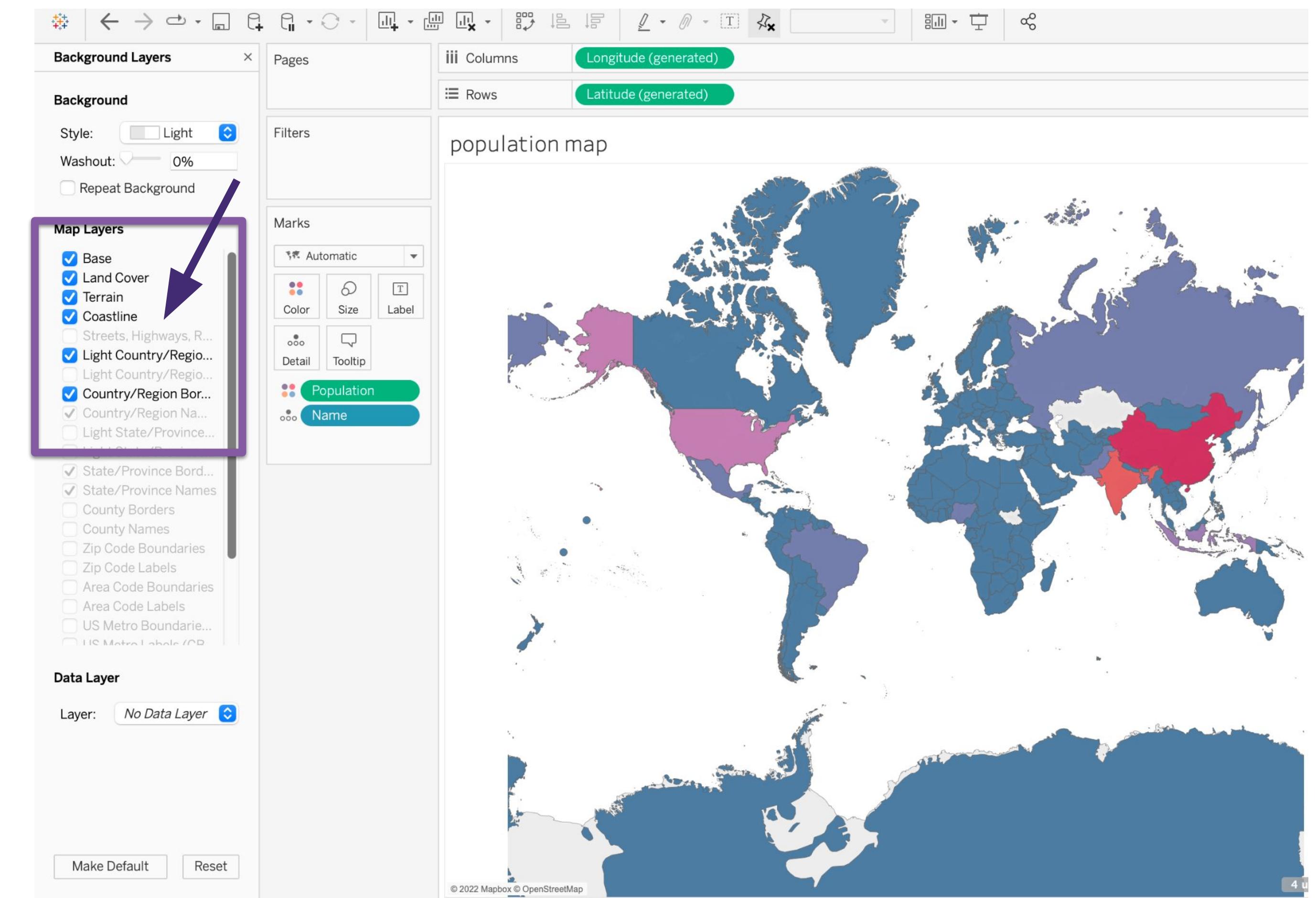


A few possible backgrounds



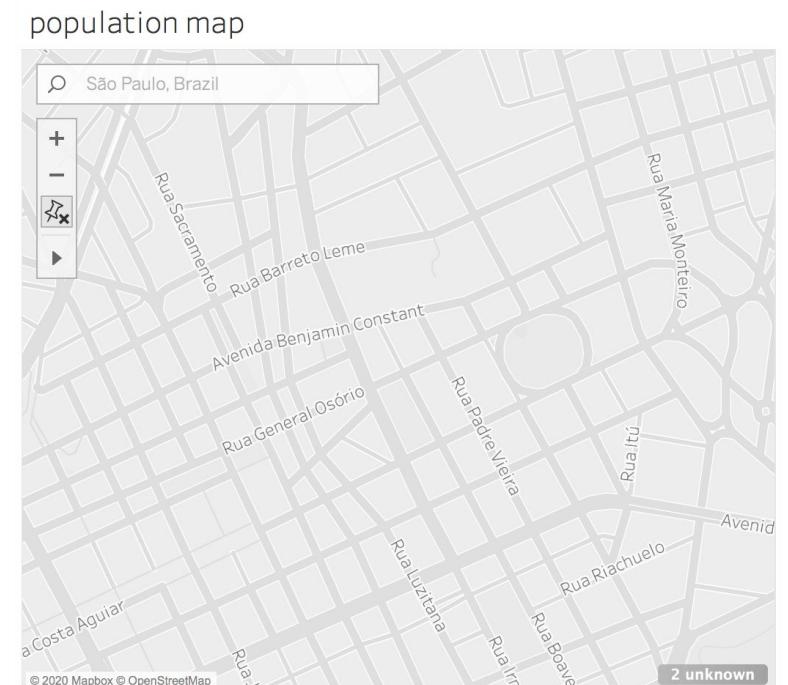
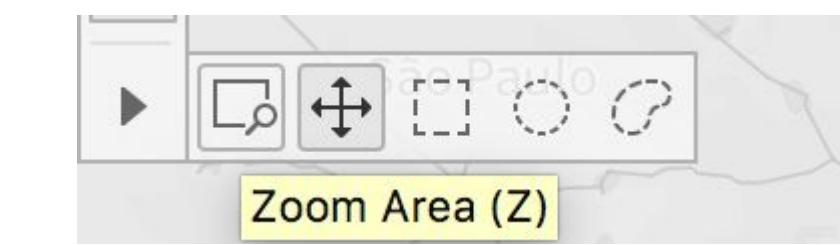
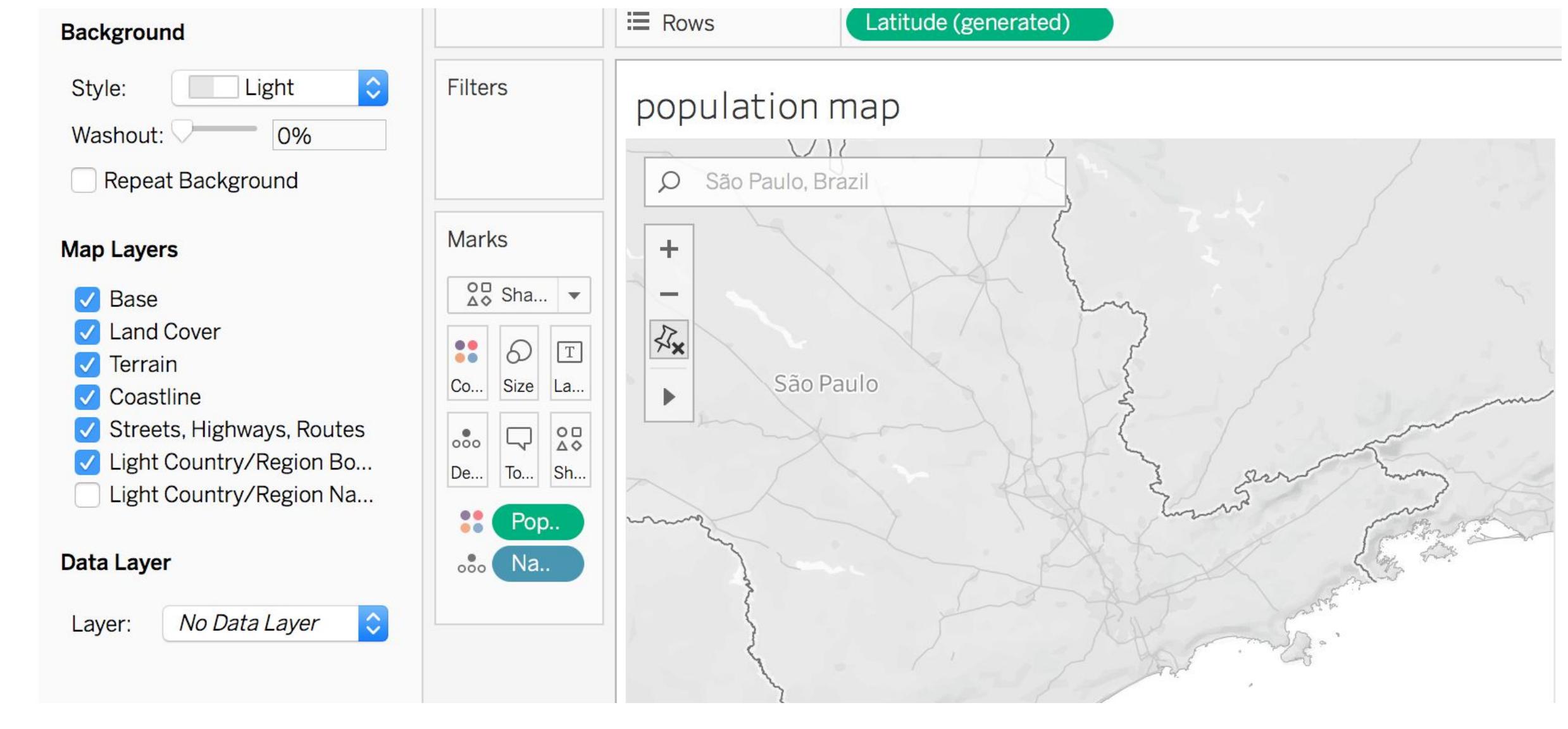
Map layer options: layer checkboxes

- The map layers checkboxes allow finer control.
- Note: some options are not allowed at this resolution.
 - Streets and Highways need to be at a higher resolution.



Map layer options: local features

- Zoom in to enable local features.
- Since Brazil has a high population on this map let's go to the city level for São Paulo, Brazil.
 - Note : It is easier to see street details **without** the population color fill.
- Zoom in further to an area that looks interesting, and we can get street level information.

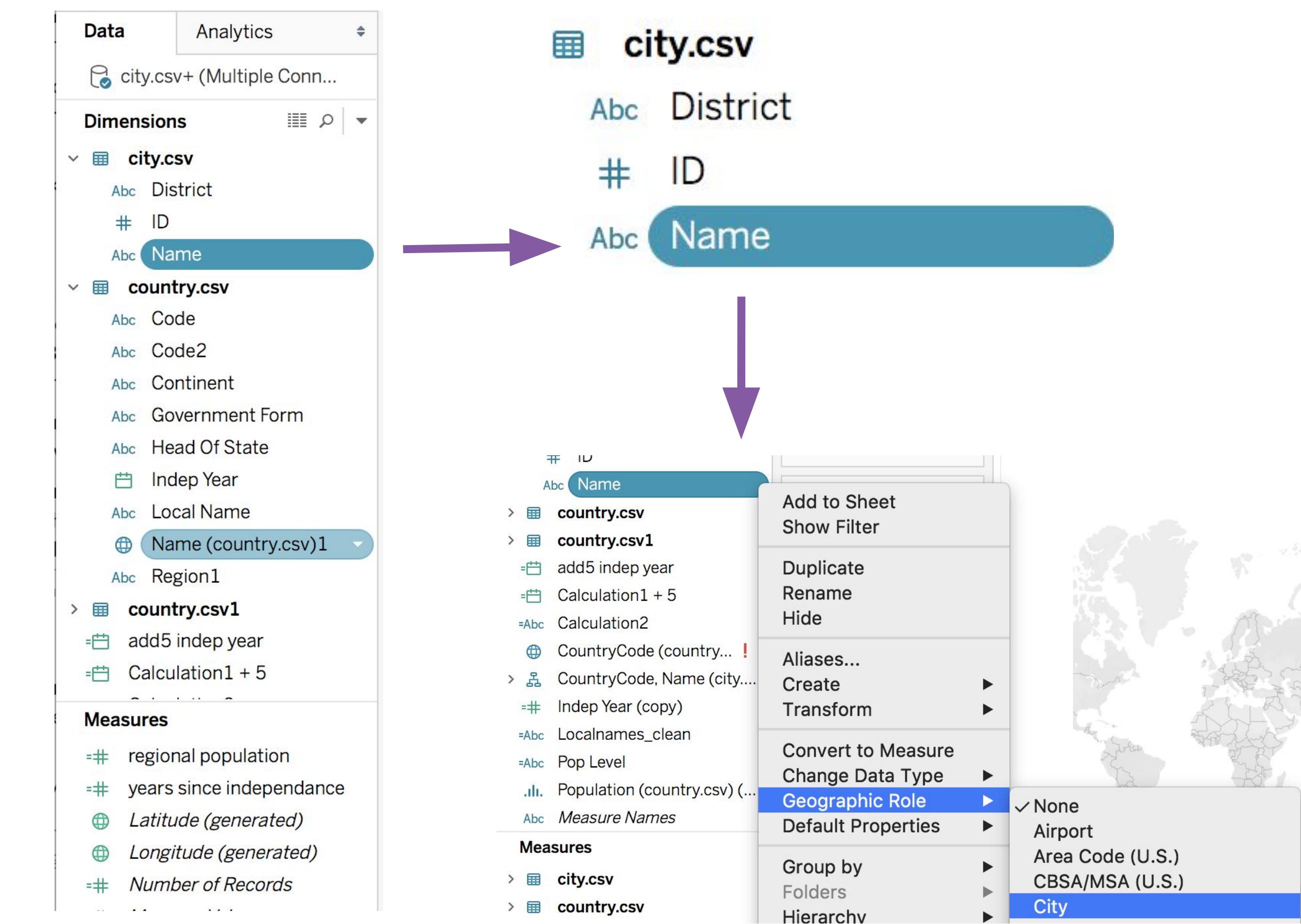


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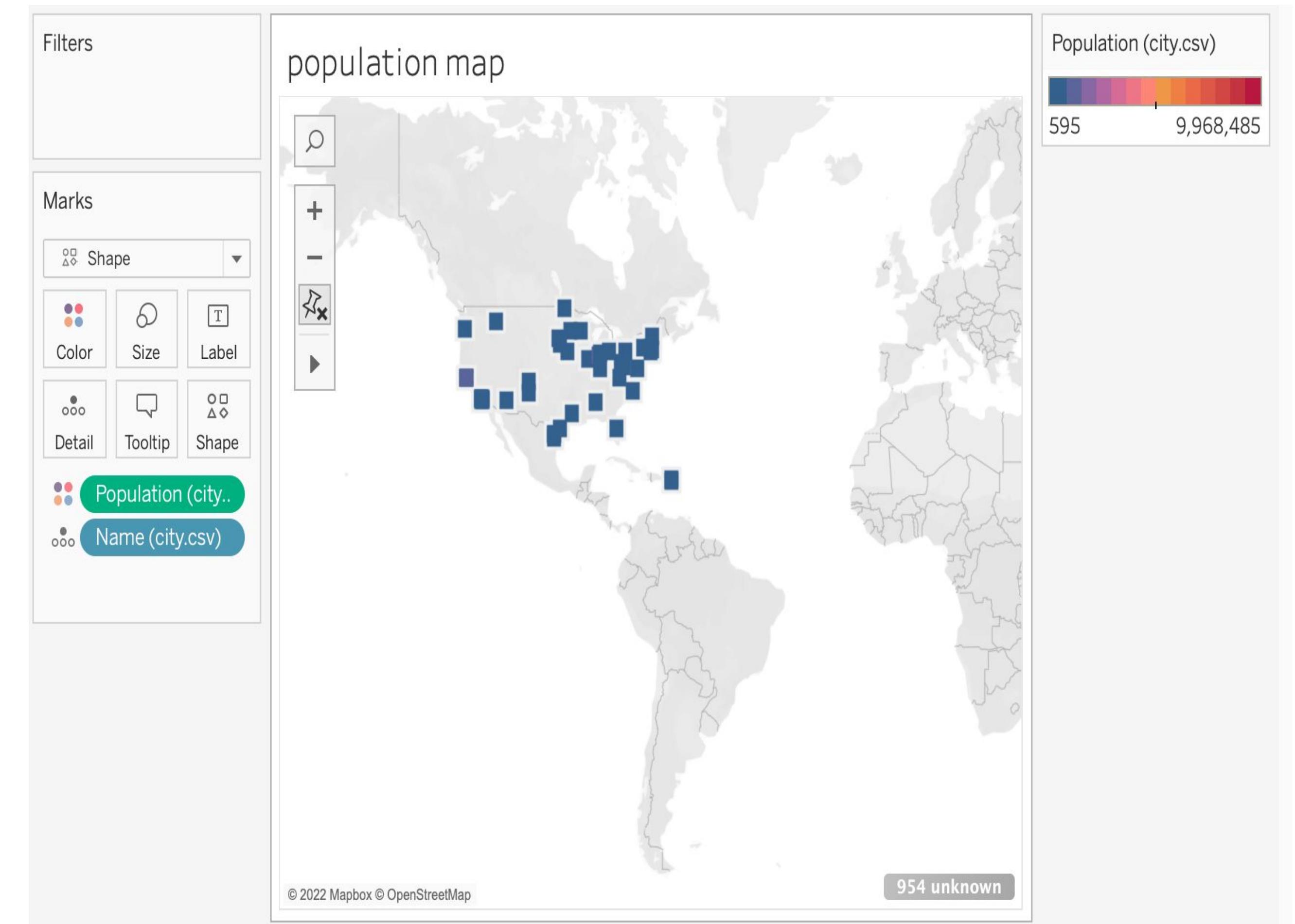
Manually converting to geospatial data

- Remember: Tableau didn't recognize some of our geospatial data, like for “**City**.”
 - We can tell because “**City**” doesn’t have any globe icons.
- To fix this, use the dropdown from the pill and tell Tableau which type of geospatial coordinates we have.
- In this case we have to tell Tableau that this is “**City**” data.



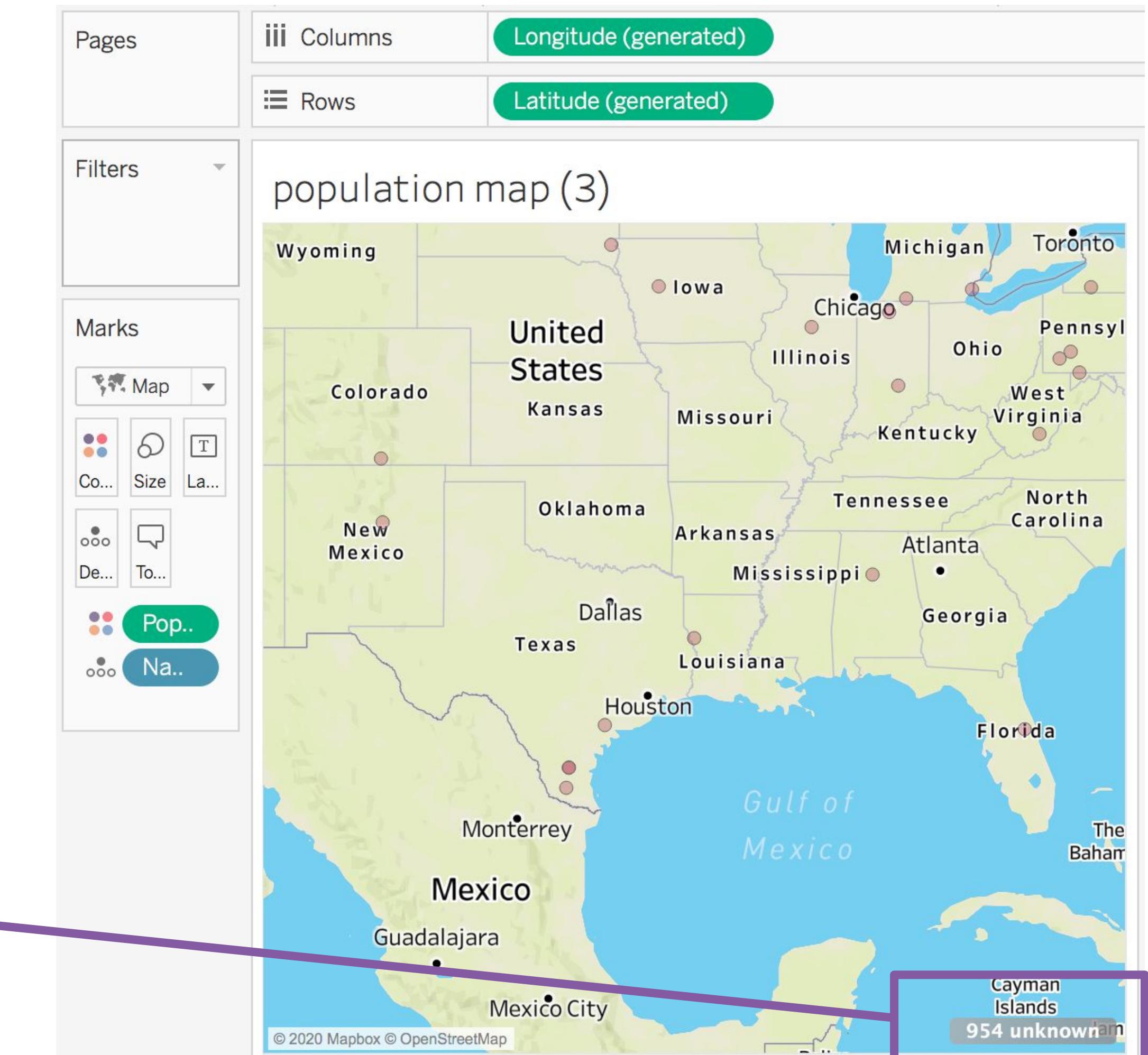
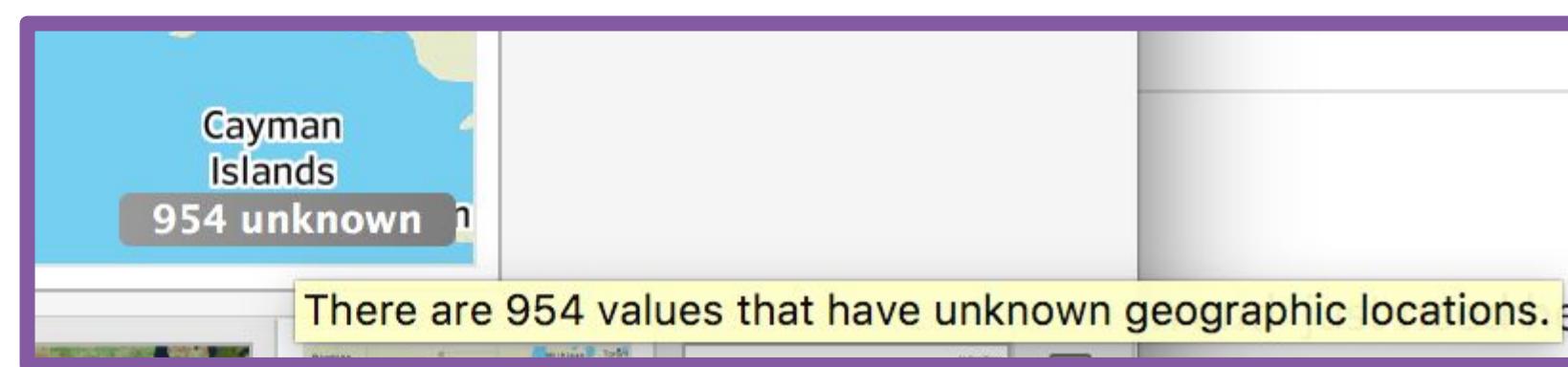
Plot city populations

- Now that we have city level coordinates, replace country data with city data in the Marks palette.
- What happened when we made that change?
- How would you troubleshoot this issue?



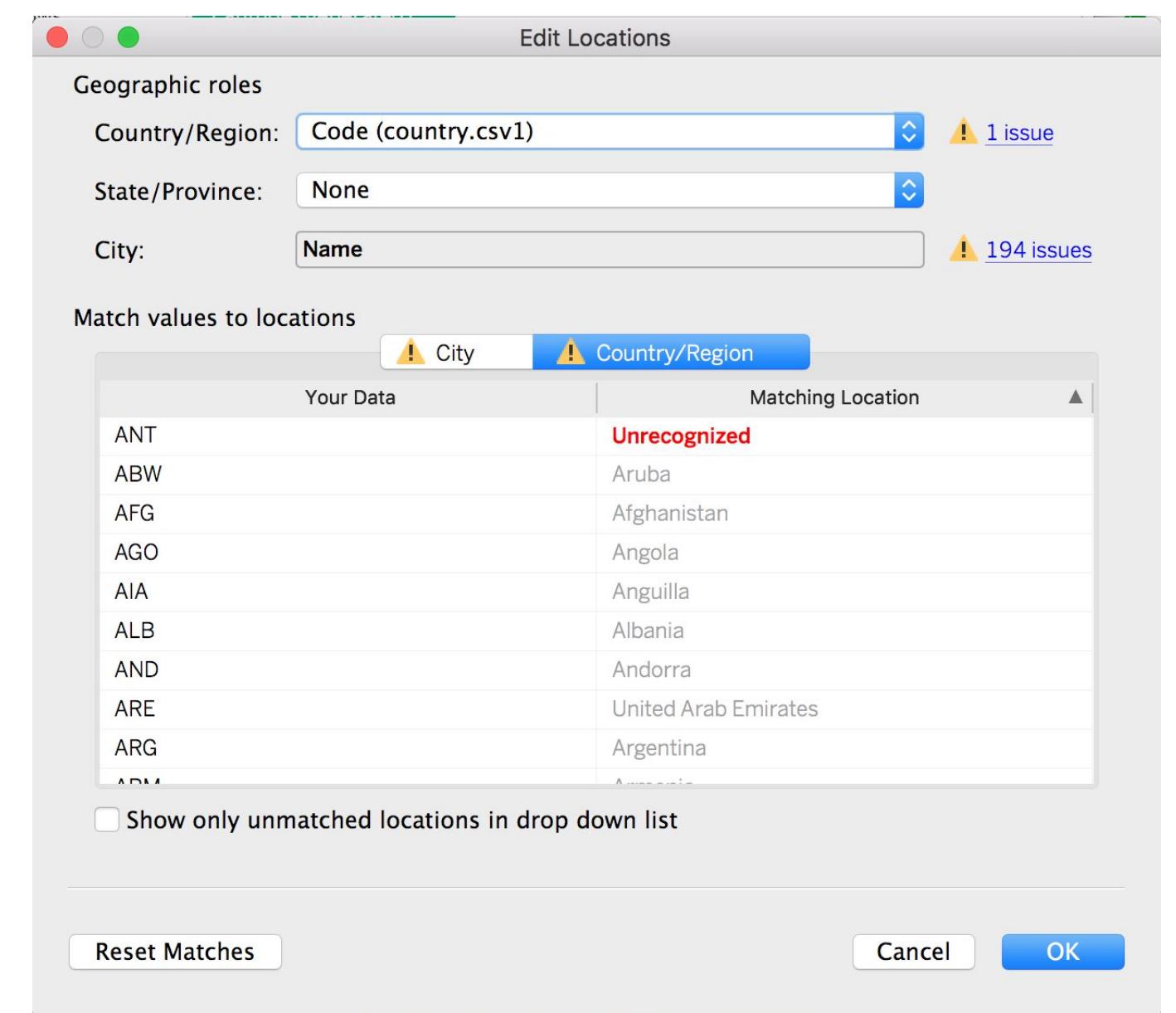
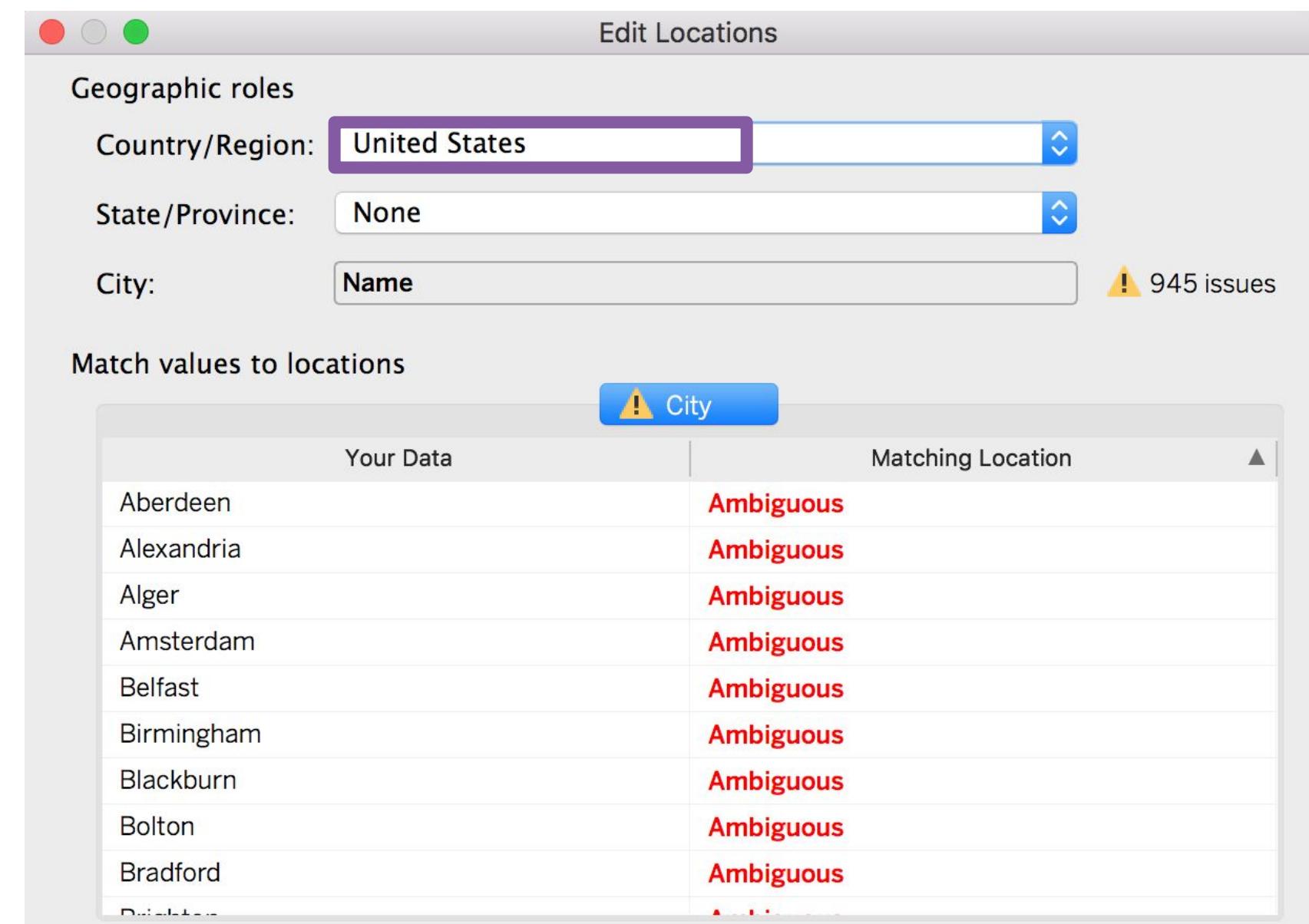
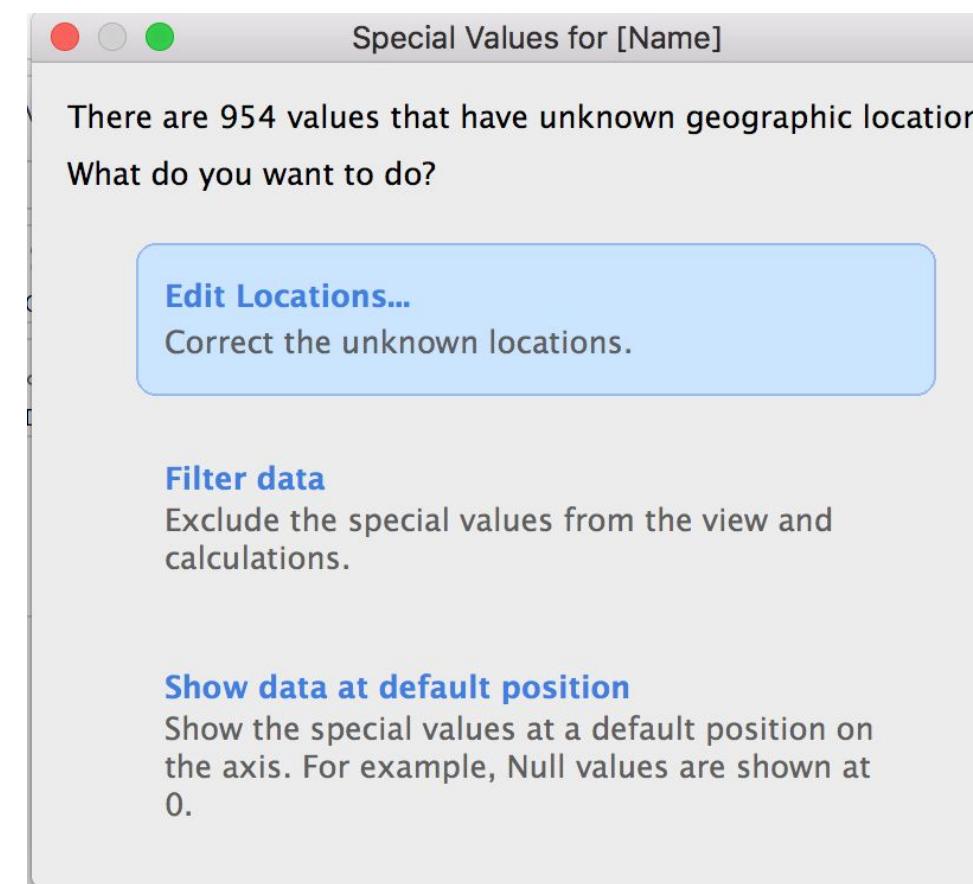
Missing cities

- We can see that Tableau has caught **954 cities** that it cannot assign a location to.
 - Click on the “**unknown**” button on the lower right to troubleshoot and edit the locations.
 - We could suppress the error message by right clicking it, but in this case that is a bad idea.



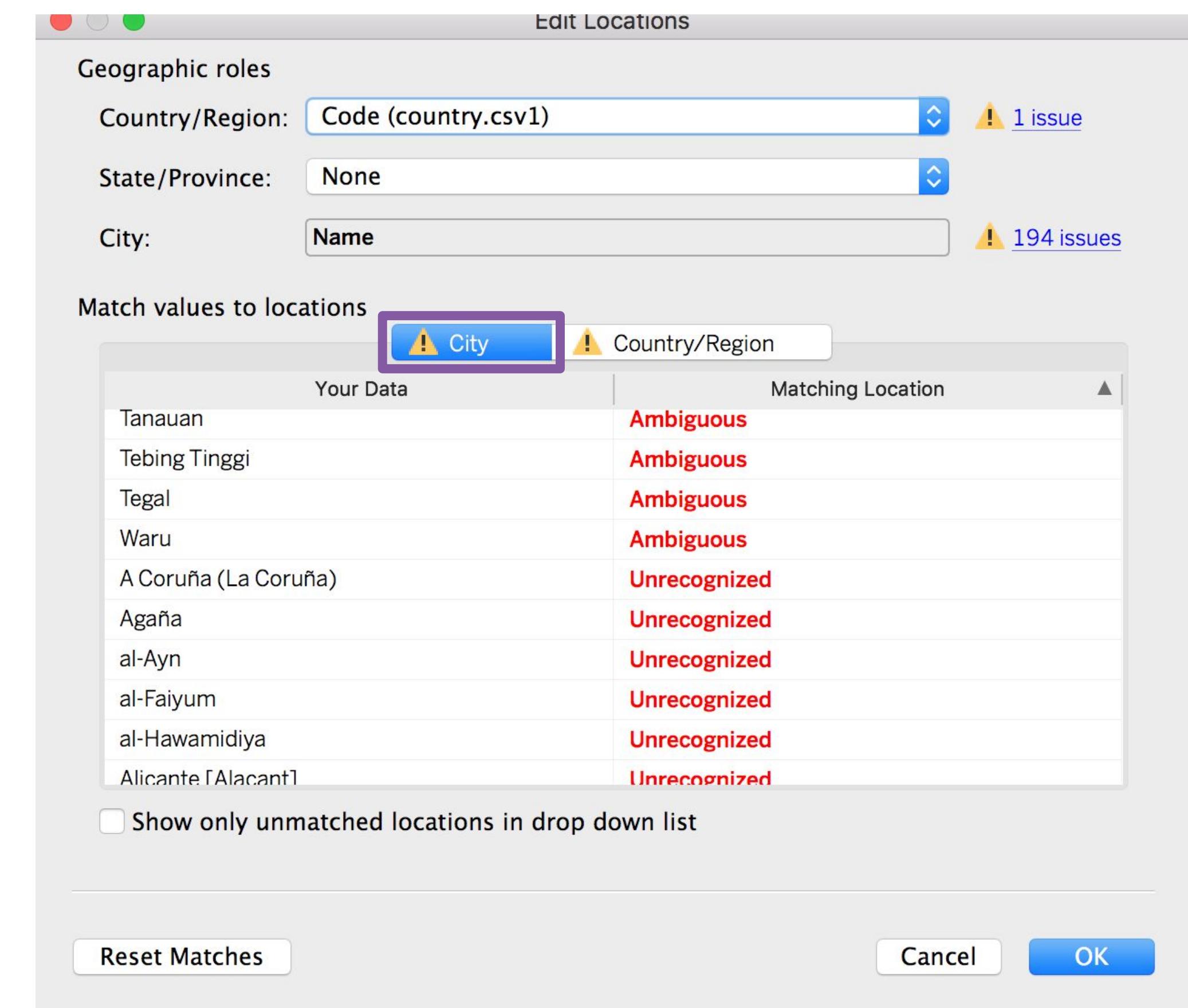
Country assignment issue

- When we click on “**Edit Locations...**,” we can see that the country was limited to the United States.
- We want to associate all of these cities with their **Country Code**, which fixes **757** issues.



Explore the remaining issues

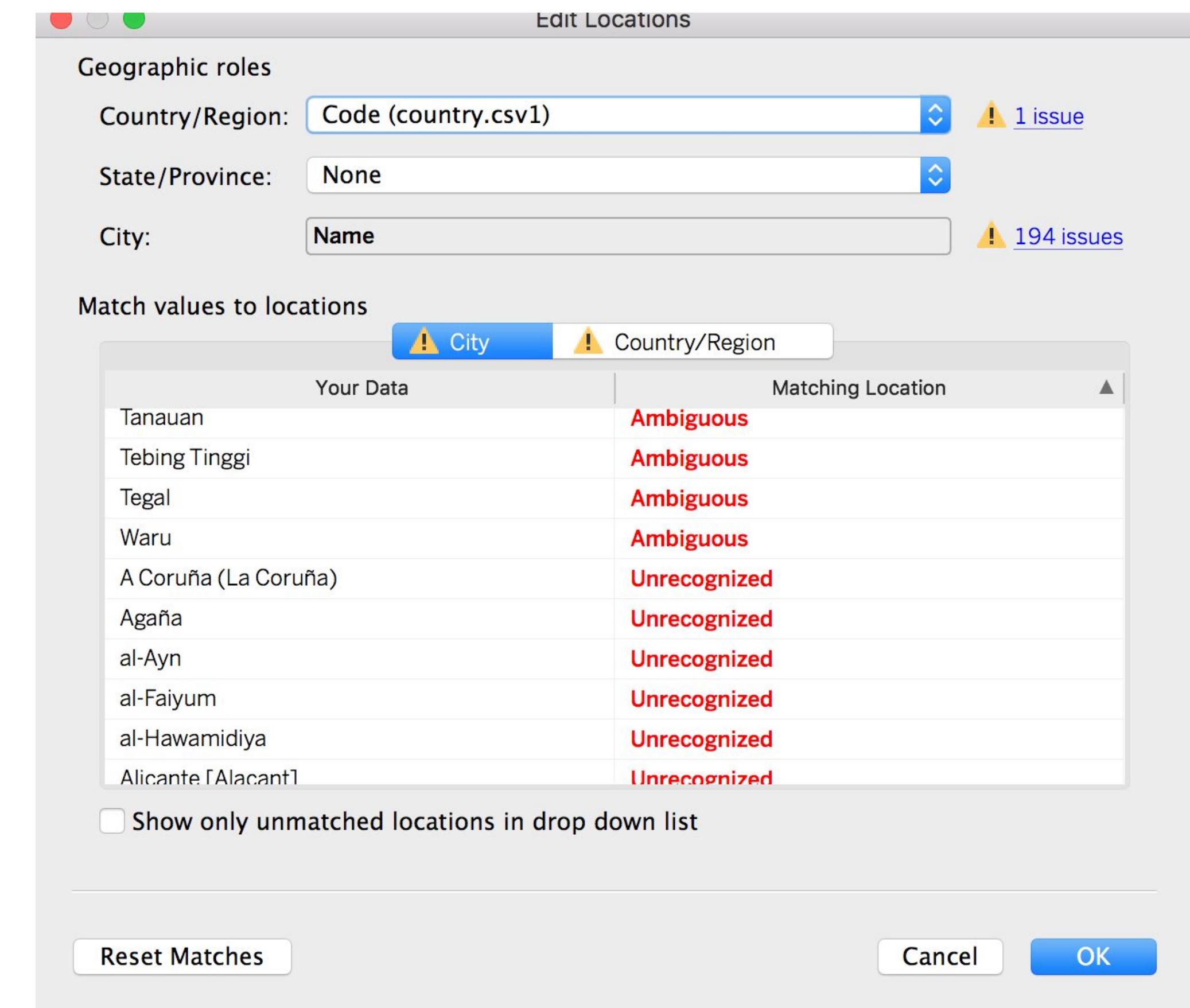
- Look at the cities that are missing.
- We see two types of issues:
 - “**Ambiguous**”: some cities or counties have the same name but could exist in multiple places.
 - “**Unrecognized**”: if there is a location or abbreviation that Tableau does not recognize.



Fix ambiguous issues, if possible

- Adding another geographic field, like **State/Province**, defines the correct location for that data.
- If there is a hierarchy in the data pane, Tableau will automatically use the appropriate levels of the hierarchy to solve location ambiguities.

Note: We do not have state/province data, so we will have to leave this out.



Fix unrecognized issues, if possible

- This will take some research.
- Many cities may include special characters, or may be entered as an alternate / local spelling.
 - **Go back to the dataframe** and find out if there is any other information.
 - **Search Tableau's database** for alternative spellings.
 - Verify your hypothesis by **cross-checking with Google**.
 - Alternatively, **enter longitude and latitude coordinates manually** if you have them.

View Data: city.csv+ (Multiple Connections)

Localnames_clean	Name	Name (country.csv)1
Al-Imarat_al-'Arabiya_al-Muttaahida	al-Ayn al-Faiyum	United Arab Emirates Egypt

El Ain (disambiguation)

From Wikipedia, the free encyclopedia

El Ain, or a variant thereof, may refer to:

- Al Ain, a city in Abu Dhabi, United Arab Emirates
- Al-Ayn, Oman, an archaeological site in Oman
- El Ain, Tunisia, a town in Sfax Governorate, Tunisia
- El Ain, Ash Shamal, Lebanon, a town in Batroun District, North Governorate, Lebanon
- El Ain, Beqaa, Lebanon, a town in Baalbek District, Beqaa Governorate, Lebanon
- El Ain, Jabal Lubnan, Lebanon (North), a town in Keserwan District, Mount Lebanon Governorate, Lebanon
- El Ain, Jabal Lubnan, Lebanon (South), a town in Baabda District, Mount Lebanon Governorate, Lebanon

A view over Green Mubazzarah in Al-Ain, at the base of Jebel Hafeet (Mount Hafeet)

Nickname(s): مَدِينَةُ الْحَرِيقَةِ^[1]
The Garden City^[2] (of Abu Dhabi,^[3] the UAE^[4] or the Gulf)^{[5][6]}

Tebing Tinggi
Tegal
Waru
A Coruña (La Coruña)
Agaña
al-Ayn
al-Faiyum
al-Hawamidiva

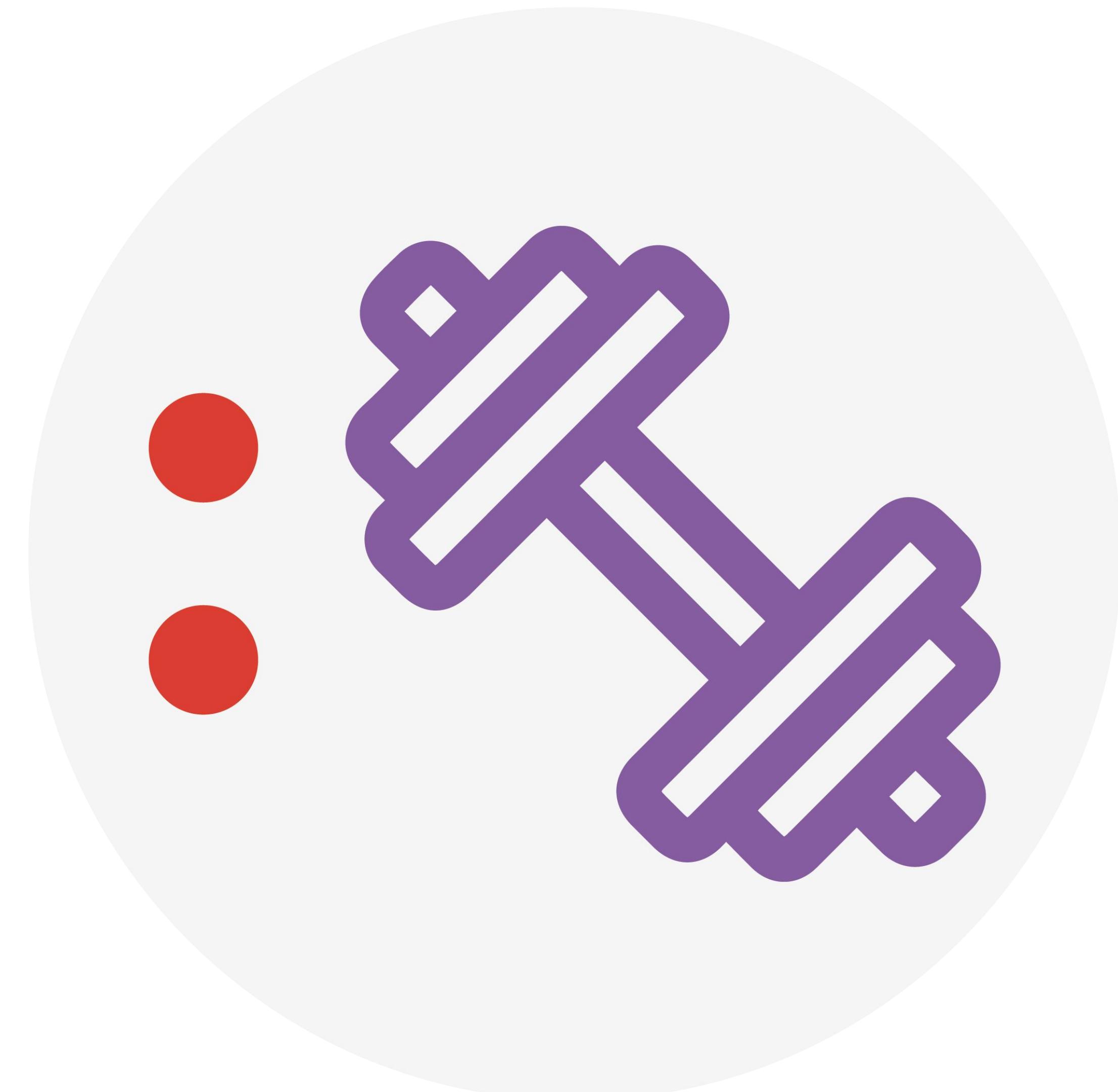
Alagon del Río
Alahanpanjang
Alabsa
Al Ain
Alaincourt
Alaior
Alairac

Unrecognized
Unrecognized

Knowledge check 11



Exercise 11



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: End of Part 11

