

You can choose to do either Assignment 10A or Assignment 10B.

We expect that you will choose D3 V5 version. However, if you experience difficulty in creating a D3 V5 version, we will accept an earlier version so long as you insert comments in your code explaining the challenges you encountered in creating a D3 V5 version.

Reminder: It is critical that you cite all the sources used for creating your solution as a comment inserted in your file (otherwise it is plagiarism).

Assignment 10A
GeoMapping a Country
with Population Density or Other Data Variables
(8 points)
Due Date: May 27, Wednesday, 11:59pm

1. Acquiring Topojson files (2 points)

Your first task is to extract a GeoJson/Topojson file of a country as follows:

1. *Download the ESRI Shapefile from the following website:*

https://gadm.org/download_country_v3.html

You should have a zip file, such as gadm36_USA_shp.zip

If you unzip, you will see several files inside including .shp, .shx, .dbf, .prj, and .cpg files.

2. Use the following website to convert shp files to Topojson files

<https://mapshaper.org/>

A tutorial to convert to Topojson files has been provided.

2. Acquiring Data associated with Subregions of the Country (1 point)

Your second task is to search the internet to find some data related to subregions of Level 1 (or Level 2) of the country. Typically, population is the simplest data to find. In addition, if you can find the data for the area of the region, then you can compute the population density as follows: divide population by the area. My first preference is to attempt to find population density data for latest years (something around 2015 or later would be ideal, but 2010 or later would also be acceptable). My second preference is to use population data (only if you cannot find the area of the subregions). My third preference is to find any data for the subregions (make sure you understand the units of the data and the year for which the data is available).

Note: We have not attempted to find this data for all the countries. Efforts to find this data may vary from country to country.

3. Visualize Population Density Data for the Country (5 points)

Your third task is to visualize the country data (and host it on github) with subregions mapped to different colors based on population density data or population data or the data that you have found. Be sure to provide a legend and a color scheme that depicts the variations well. If you are using population density data, then your visualization will be similar to the CA population density visualization created by Mike Bostock.

Proposing a Country

Every student must choose a different country¹. Propose the name of the country by filling out a Google form:

<https://docs.google.com/forms/d/e/1FAIpQLSdwt1hU61GfK9ZmiTHhvH7VcYBYHClbxspJqb7OJdQF6W8fw/viewform>

The google form is set to **accept submissions using your ucsc email**. You can submit once, and make modifications to your submissions afterwards.

Before submitting the form, make sure that no one else has already chosen that country by viewing (but not editing) the submissions by all students at the following Google spreadsheet:

<https://docs.google.com/spreadsheets/d/14GgEh77NjWS43My0CIWFiD4OuKk9hs3A7P1imxoLszU/edit#gid=1501757394>

Your proposal is automatically approved so long as you are the first person to propose the name of that country.

Since you may not know whether you can or cannot find appropriate data for the country you have chosen, I recommend that you follow a two-step process: In the first step, you fill out the Google form by proposing a country name. This way, you will stake a claim to that country. Once you have identified the variable name, you are all set, but if you are unable to find data for subregions, then revisit the Google form and resubmit name of a different country.

In addition, please follow the following steps

1. Host visualization on github.
2. Add a Bold Title at the top something like, "Brazil Population Density, 2017".
3. Add your name and affiliation with the class at the bottom as follows:

Github Link (clickable)

Weblink(s) for data source(s) with appropriate titles for the weblinks

Your Name

Instructor: Suresh Lodha

CSE 163: Data programming for Visualization

Spring 2020

¹ Except USA or China (because these have already been done by previous students and readily available)

Submission Requirements

Submit the following on canvas:

1. countryname.json (for example, Brazil.json)
2. datafile.csv (for example PopulationDensity.csv)
3. Code (html, css, and/or javascript file; for example, BrazilPopDensity.html)
3. Any intermediate data files generated
4. A clickable weblink for visualization

Assignment B: You may choose to do additional work associated with this assignment to earn Assignment B points². Number of points assigned will vary depending upon the tasks performed. Some possible tasks are:

1. Create **level 2** GeoJson/Topojson files, find associated data sets, and visualize this data.
2. Create level 1 GeoJson files, and find at least **two different types of data sets** (such as population, literacy rate) and visualize them where the user can toggle between the two variables. Be sure to provide appropriate legends, units, and the year.

Assignment 10B
**GeoMapping a US State with Counties
With Population Density**
(8 points)
Due Date: March 27, Wednesday, 11:59pm

Your task is to create a population density map of one of the 49 states of the United States (other than California) for the latest year the data is available.

Visualization will be similar to the CA Population Density example created by Mike Bostock.

1. Acquiring Topojson/GeoJson Files for the state (1 point)

You will need to find Geojson/Topojson file for the state you choose. We have provided us-10m.json file which has the json files for various states embedded inside. You can also find json files for various states with county borders at other sites such as <https://github.com/topojson/us-atlas>

You can also use the instructions on [Command-Line Cartography Four Part Tutorial](#) by Mike Bostock to (i) extract the census files for your state. You will need to know the [FIPS Code](#) for your state, (ii) to project the census tract file using a projection system that is appropriate for your state and using the parameters that are applicable for your state. Mike Bostock offers the following advice: “If you’re not sure [what projection](#) to use,

² Assignment B points can get you to B+/A- but not beyond. For A/A+, you must attempt class enhancement project.

try <https://github.com/veltman/d3-stateplane> or search <http://spatialreference.org/>

2. Acquiring Population Density data for the Counties within the State (1 point)

You should be able to find county population data easily. In addition find the data for the area of the region, then you can compute the population density as follows: divide population by the area. It is possible that you may be able to find the population density data for counties directly.

3. Visualize Population Density Data for the State (6 points)

1. You will use exactly the *same normalization for population density* as used in California Population Density, and *same color binding/legend and same data quantization*, so that the visualization of the population density of your state could mesh seamlessly with California Population Density map. (2 points)

2. You will create a variation where a different color binding and color legend is chosen (different shades of one color where deeper shade is more dense) so that it brings out the variations of population density within your state better. You will provide a clickable button (unobtrusive button under the legend with something like “Change Legend Color” on the visualization) that will flip between the two visualizations. (2 points)

3. You will create a variation where the visualization will toggle (display or not display) state-boundary and census tract boundaries using the following button names “Toggle State Boundary”, “Toggle Census Tract Boundary”. County boundaries will always be shown. (2 points)

In order to toggle between census tracts boundaries and state boundaries, look for `statename.objects.tracts` and `statename.objects.counties` inside your `statname.json` files. Please note that in CA population density by Mike Bostock, only inner county boundaries are shown. To display state boundary, you will have to display the state-border, which is the outer boundary of counties.

Proposing a State

Every student must choose a different state³. Propose the name of the country by filling out a Google form:

<https://docs.google.com/forms/d/e/1FAIpQLSdwt1hU61GfK9ZmiTHhvH7VcYBYHClbxspJqb7OJdQF6W8fw/viewform>

The google form is set to **accept submissions using your ucsc email**. You can submit once, and make modifications to your submissions afterwards.

Before submitting the form, make sure that no one else has already chosen that country by viewing (but not editing) the submissions by all students at the following Google spreadsheet:

³ Except California (because this has already been done by Mike Bostock)

<https://docs.google.com/spreadsheets/d/14GgEh77NjWS43My0CIWFiD4OuKk9hs3A7P1imxoLszU/edit#gid=1501757394>

Your proposal is automatically approved so long as you are the first person to propose the name of that country.

In addition,

1. Host above visualization on github.
2. Add a Bold Title at the top something like, "New York Population Density, 2018".
3. Add your name and affiliation with the class at the bottom as follows:

Github Link (clickable)

Your Name

Instructor: Suresh Lodha

CSE 163: Data programming for Visualization

Spring 2020

Submission Requirements

Submit the following on canvas:

1. stateabbreviation.json (for example, NY.json)
2. StatePopDensity.html (for example NYPopDensity.html)
3. Any intermediate data files generated
4. A clickable weblink for visualization

Assignment B: You may choose to do additional work associated with this assignment to earn Assignment B points⁴. Number of points assigned will vary depending upon the tasks performed. Some possible tasks are:

1. Create a tooltip to display information associated with a county.
2. Find additional **data sets** associated with counties (such as covid data and visualize them where the user can toggle between the two variables. Be sure to provide appropriate legends, units, and the year.

⁴ Assignment B points can get you to B+/A- but not beyond. For A/A+, you must attempt class enhancement project.