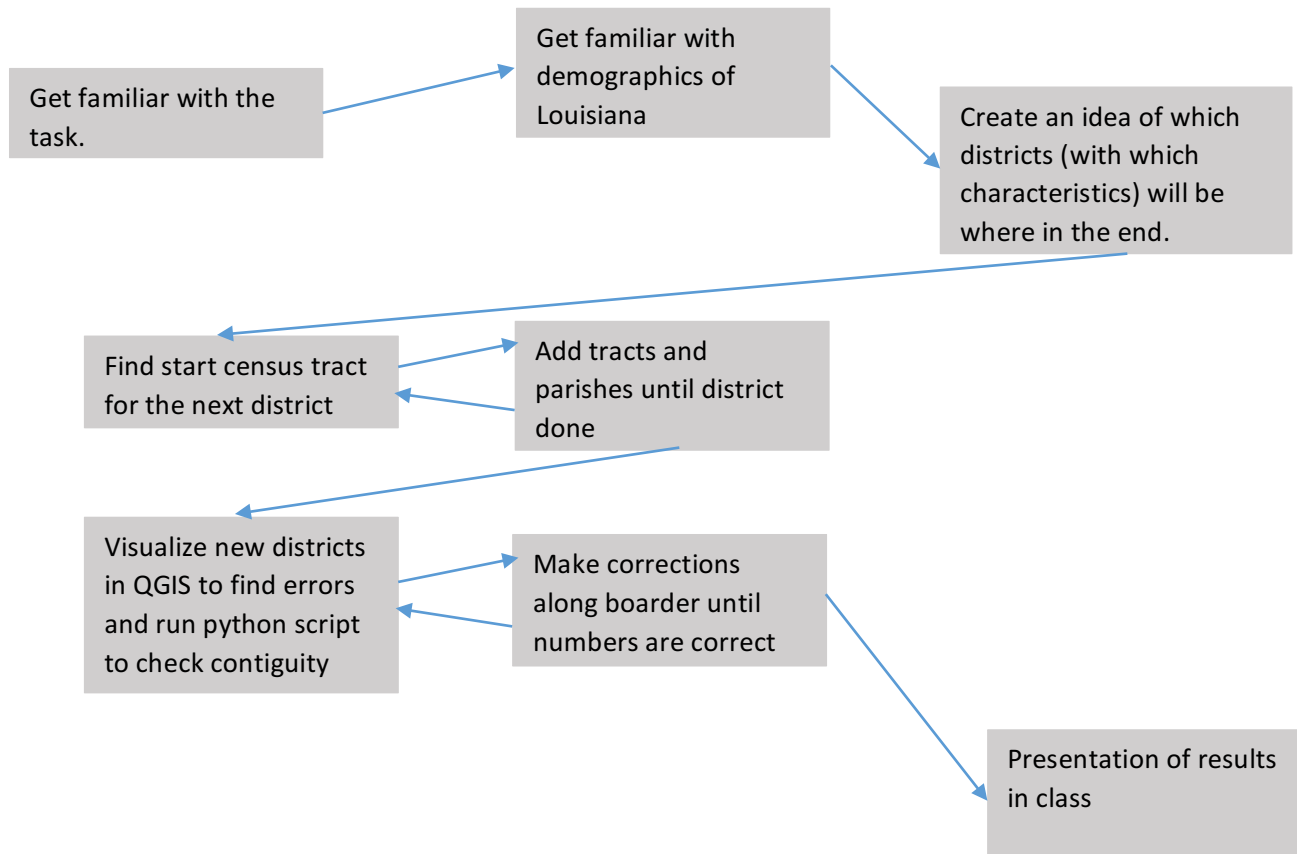# Workflow Suggestion

In this document you can find a suggestion for a possible workflow while you are doing this task. In the beginning of the document you can find a number of steps and further down we give you some details about each step we suggest.

Get familiar with the task.

Get familiar with demographics of Louisiana

Create an idea of which districts (with which characteristics) will be where in the end.

Find start census tract for the next district

Add tracts and parishes until district done

Visualize new districts in QGIS to find errors and run python script to check contiguity

Make corrections along boarder until numbers are correct

Presentation of results in class

Before you start: Download the information given for this task and find a location on your computer or some removable media for all your data. QGIS will save the local path to the data. If you change the data location after you start working with QGIS you will receive an error when opening QGIS the next time.

Get familiar with the task: In this step we advise you to read all the material we have you and get familiar with the task in general. This means understanding of goal, conditions and expectations. It might be helpful, if you do part 1 and 2 of the tutorial now.

Get familiar with demographics of Louisiana: In this part of the workflow please get yourself familiar with the demographic distribution of Louisiana. Please see the *visual aid* folder for help. Remember this paragraph from the overall project description.

> *Visual Aid: in the folder Visual Aid you can find a number of files that will provide the same information as the Excel files, but in a graphical format. The file "Population Louisiana.pdf" shows how many people live in each census tract, the file "Louisiana Parishes.pdf" identifies each parish in the state by its FIPS code. Importantly, however, these codes only identify tracts within each parish. The file "Demographic Maps.pdf" contains a number of different maps including, for example, the census tracts in which there are more Democrats than Republicans (dark always indicates more). The file "Congressional Districts.pdf" shows a map of the Louisiana congressional districts as they exist. The file "Clipped Census Tracts.pdf" is a large document containing the census tracts--with their identifying FIPS code--and the surrounding parish borders. Printing this file allows you to build a large map of Louisiana that will make finding census tracts easier. Cut out all pieces along the border and glue them together from left to right (start from the north west portion of the state) and start a new line when the next portion of the map does not fit.*

It will also be helpful to see section 3 of the tutorial now.

Create and idea of which districts (with which characteristics) will be where in the end: Before you start assigning Census Tracts to districts, we suggest, you create an idea of which district should be where. The information from the *visual aid* folder might be helpful for that.

Find start census tract for the next district: For each district you create first, pic a Census Tract you want to start with. In general, it might be helpful, to start with the most complicated district? Most complicated: the districts with a minority where every Census Tract added will decide if the minority will be a majority in this district.

Add tracts and parishes until district done: Please do this task in the Excel sheet we provided for you. It might be helpful to create 7 extra worksheets. One is only a copy of the worksheet "Tractlevel" the other ones are for district 1 to 6. We suggest copying Census Tracts from the new "Tractlevel" worksheet to the selected district worksheet, to keep track which Census Tracts have been assigned and which have not. Please also fill the column called "District" in the Excel sheet, so that the worksheet "District Overview" can show you your current stats. Do this, until all districts are created.

Visualize new districts in QGIS to find errors: Now it would be helpful to do part 4 (paragraph 1 and 2) of the tutorial. Then open the "Louisiana Districts.qgs" file. If you do these steps with your assigned districts you can find errors, that occurred and you can go back to your Excel document and reassign Census Tracts. Further you want to check if your maps are contiguous. You want to execute the python script provided for that. To execute the file, you should do the following.

Checking for Contiguity

The Data and Python folder contains, besides the three .xlsx files previously discussed, a Pyton file called checkForContiguity.py. If you wish to check your district plan to see whether the districts you created are all contiguous (connected internally), you should put your Data for redistricting edited.xlsx file in this directory. Once that is done you can run (execute the Python file on it. After you have executed the Python file, a new file appears in the Data and Python folder called contiguityInformation.txt. The file contains, for each district, lists holding contiguous GEOIDs hubs of that district. Each list is written to a new line in the file. If only one list is returned for each districts, the map is contiguous. If a district has more than one list returned the district is not contiguous. Before executing the script again delete the old contiguityInformation.txt file.

You have several options for executing the Python file (it is written in Python 3000). We recommend downloading and installing the Anaconda distribution of Python (it's free). Launch the Anaconda Navigator and from that launch Spyder. In Spyder and Open File, navigate to the Data and Python folder and open the Python file there. Clink on the console window (this is only needed once), then click the green arrow button at the top of the Spyder window to run the program. Execution will take 2-3 minutes depending on your computer. When it is done, inspect the contiguityInformation.txt file with a text editor, or even Microsoft Word.

Make corrections along boarder until numbers: If necessary and your stats are not perfect yet, you need to reassign Census Tracts. Therefore, you can use the "Information Icon" (introduced in part 3 of

the tutorial) to find Census Tracts that are helpful to reassign. If you leave you're newly created district map open you can check Census Tracts that are on the border. Do this step and the step before, until all districts stats are to your wishes.

Presentation of results in class: Congratulations, you have created you districts. For a nice presentation of the districts in class you can create a new "shapefile" that looks like the layer called "congressional districts" that you can find in QGIS when you open "Louisiana Districts.qgs".