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I spent a lot of time on parts that were not used as part of the final work. The investigation of Zillow cost a few hours of work, but my research into trying to determine if we could use the google API took a large bulk of my independent work (at least 5 hours outside of class). I learned a great deal in the effort, but ultimately had to abandon it because too many calls would be required. I would like to explain my effort since I did learn some interesting things, and I am proud of it in some ways. My goal was to determine how we could call the google API with a small enough radius to pull the bank search we were looking for. I was able to get a geographic polygon representation of Charlotte using the Shapely module and generate a box to surround it. I found a method that could take 2 different longitude and latitude points and provide back the distance in meters. I created a function that would take a box, and split it into 4 quadrants (top left, top right, bottom left, and bottom right). I used a stack to hold the boxes that needed to be split into quadrants, and a list to hold boxes that were smaller than 500 meters….probably TMI…but its under Bank\_API in LatLngBounding\_lib.py.

I also worked on pulling the census data by zip code (based on work that Karine did, so my effort was jumping off her work). It is not in our final work as we needed to pull the data by county to match what we were getting for corvid 19 data. I probably spent between 2-3 hours on this outside of class….**unc\_census\_lib.py**

One of my contributions that did make it into the project was some work on merging of the data frames. I believe that Karine had it mostly working, but the issue I found in the end was that the *County* from census data (which we had difficulty getting) had a blank space at the end which prevented matches on the merge. After its removal, the merge worked fine (Karine did work on that as well). There were a few hours playing with the merge in different ways before finding the real problem, so probably 2-3 hours here.

I tried to be the focal point for Git, and I pull everything into our repository in the end. In a lot of cases I took information that was posted in the slack and added it to the repository. I would guess 1-2 hours total for that role.

Work that I can claim as mostly my own was work on the plots. I provided all the plots except those dealing with google map. I would guess a total of three hours with those as I initially had trouble getting the rotated numeric values to fit within the grid.

I think overall I was a valuable member of the team, and participated in our join discussions and work on the power point presentation.