For my project, I set out to investigate whether single family zoning laws caused community segregation. I'm interested in the effects legislation can have on the housing market and community dynamics, especially as zoning has come under increasing political pressure in the United States. Many people point to zoning as a potential source of segregation, both racially and economically, and I wanted to see if changes in this legislation could help move these trends in the right direction. I looked at ACS data from 2010 to 2019 for all census tracts in Suffolk County, MA in order to measure these things. I will first describe what I did for this project, followed by my results. I will then discuss what I cut and what I learned from this whole process.

The first thing I had to do was define segregation. As discussed in earlier presentations, this is a pretty tricky subject. While it can be difficult to make a perfect metric for something like segregation, what often matters the most is simply making an ok metric and using it for comparison. I used an entropy index in order to calculate levels of segregation within tracts. There are some serious drawbacks to this method, mainly that it does not take city-wide population counts into account, only tract-wide ones. With this in mind, I summed different racial categories for each tract for every year that I was looking at.

Since going through the zoning codes is difficult and time consuming, I had to simplify the metric by which I measured changes in zoning codes. The main divide that activists talk about when discussing zoning is the split between zones for single family homes and zones for multifamily homes and other units. This can be boiled down to units owned by the occupants and units rented by occupants. It was also important to note that changes in zoning laws in the city of Boston only affected new construction, as a change in zoning would not result in the entire neighborhood being demolished, only

that new units being constructed would have to abide by the new zoning rules. This is not true of all cities, but this assumption generally holds true for Boston during the years I examined.

Because of this interaction between zoning and new construction, I narrowed my focus to examine changes from the previous year in the percentage of units occupied by renters in each tract and the changes from the previous year in entropy indices. I calculated entropy for both racial groups and income groups as I was interested to see if zoning changes would affect these forms of segregation differently.

My results showed a strong zero correlation in both race and income segregation. This was interesting to me because I expected there to be some sort of trend, even if it was small. Regardless, the plots included in my repository make the effects quite clear.

I cut a lot over the course of this project. While I was really interested in Andrew's suggestions to look at Boston property assessments and their street address database, I didn't have enough time to clean things up and work with that data as it required some pretty extensive geographic data wrangling. Because of this, rather than looking at actual zoning designations and accurate tallies of new construction, I had to rely on ACS estimates and a proxy for zoning designations which was not ideal.

This semester was a challenge for me personally, and I think that reflected in my final submission. That said, I think I learned a lot. Despite not being able to adequately use the pretty much ideal dataset I had access to through the city of Boston, I learned a lot about how to think about creating proxies for data in order to fill gaps. I also learned a lot about evaluating the quality of a model, which I had to think a lot about when it came to quantifying segregation. While I could have spent the whole semester figuring out a way to properly weight different minority groups based on their proportion in the

overall population, I had other things to focus on and settled on a passable entropy index that didn't take that into account. When it came to the things I cut and the concessions I had to make due to external circumstances, I think I learned a lot about what it would be like to work as a data scientist. Making a project while only having limited resources is something I hadn't thought about until this course and I think it was an extremely valuable lesson.