Gentrification in New York City

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Overview
Gentrification is a process present in many large cities around the world, and especially rampant in New York City. Appealing to some, and unpleasant to many others, gentrification suffers from loose definitions and diverse characterizations in studies around the world. Critical factors for the study of gentrification include property values, types of local businesses, crime rates, demographics, and job openings.

Our team was tasked with defining gentrification trends through publically available datasets that uncover insights on the spread of gentrification across 55 PUMA districts in NYC.

Data and Feature Selection
- Census: Demographics, income, health insurance coverage, education, migration
- Crime: Valid crimes reported to the New York City Police Department (NYPD)
- New Businesses: Legal businesses in NYC opening each year
- Real Estate: Square footage, sale price, and tax class for each house sold

Number of New Businesses (top row) and Real Estate Prices (bottom row) in 2008, 2012, and 2016 (left to right) in Upper East Side, Williamsburg and Sunny Side & Woodside.

Results
To have a better understanding of our data we ran an agglomerative clustering model with 3 clusters across 55 PUMA districts. We took the percentage change of all variables from 2010 to 2015 and then normalized the data. According to our findings, different neighborhoods across NYC experienced varying degree of gentrification (marked blue, green yellow in figure below). To determine what factors carry the most weight in defining the level of gentrifications in a given area, we fit a Random Forest Classifier to our clustering labels. The four most important factors were: real estate price, race of inhabitants, employment and education -- in the order of importance.

Conclusions and Recommendations
Although gentrification is a complex and poorly defined process, we have identified features that can allow cities to detect it at an early stage and take necessary measures. This can be further improved by adding more data from different cities.

References
NYU Furman Center. Focus on Gentrification. FurmanCenterNYU, 9 June 2016.