

# The battle of Neighborhood – invest a property in New York

## Introduction

New York City is among the most expensive and competitive housing markets in the nation. It has also been among the most hard-hit by the COVID-19 pandemic with the worst job losses among the major metro areas in the nation. However, since the reopening of the economy last summer, New York has been recovering from the economic impacts of the pandemic.

According to NYSAR's annual report, in 2020, New York was a seller's market for most housing segments as inventories remained at record lows. A high list-to-sell ratio indicates a seller's real estate market where sellers have more negotiating power over buyers. People are leaving big, densely populated areas like New York City and spreading out to suburbs or smaller communities with lower infection rates and/or to save money. Manhattan home prices have dipped, while Brooklyn is defying gloomy economic conditions with a competitive scene that continues to push real estate prices higher.

Many industry experts have been predicting a strong property appreciation in New York in 2021. 2021 is going to be a great one for property owners as the city faces a long recovery ahead. The NYC real estate market is currently a buyer's market which means there are roughly more active homes for sale than there are buyers. The supply for housing is outpacing the demand favoring home buyers who are managing to hold good leverage in price negotiations.

## Business Problem

Since it's a buyer's market now and the mortgage rates are at their lowest, it will be a great time to invest a property in New York. The economic impact of pandemics makes everything more uncertain. The market outlook appears fairly bright for Brooklyn, uncertain for Queens, and likely weak for Manhattan, which has record levels of inventory and many potential buyers looking elsewhere. People are moving out and buyer interest in suburban neighborhoods and areas with low population density has spiked. The question is: **Where will be the best neighborhood to invest a property in New York?** The stakeholders would be the buyers in real estate investment.

## Data

The data required for answering the business problem is as shown below.

1. List of the neighborhoods in New York City

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2. Average housing price of each neighborhoods in New York City
3. Location data of the neighborhoods in New York City

First, the data of neighborhoods, locations and average housing prices will be combined and transformed into a pandas dataframe. Then, applying FourSquare API interface to obtain data on amenities and essential facilities (venues) in each neighborhoods, and we will be able to recommend profitable real estate investments in New York City.

### **Methodology**

#### Data processing

1. Download the neighborhood data of New York city, and check the size of New York neighborhoods data.
2. Import housing price data of New York City.
3. Merge the neighborhood data and the housing price data into a dataframe, and remove data without housing price.
4. Use geopy library to get the latitude and longitude values of New York City.
5. Explore Neighborhoods in New York City and merge the top 10 most common venue data within 2000m of each neighborhood from Foursquare to the dataframe.

#### Data analysis

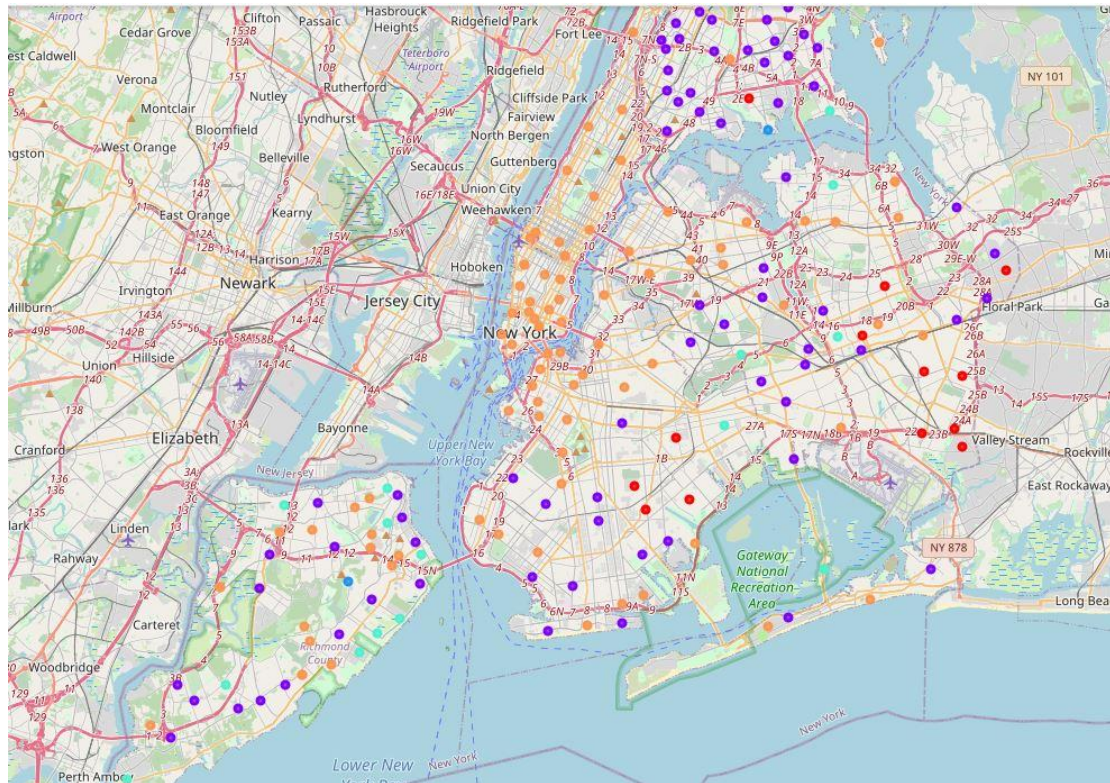
There are several factors that influence a house's value. The house price can also depends on what willing buyers in the market will pay for it, but every buyer is different. Some of the most important factors that influence the value of the property are listed as below.

1. Location – three primary indicators are the quality of local schools, employment opportunities and proximity to shopping, entertainment, and recreational centers.
2. Home size and usable space– Livable space is what is most important to buyers and appraisers, and the size of the house is positively related to its valuation.
3. Age and condition–typically, homes that are newer appraise at a higher value. The fact that critical parts of the house, like plumbing, electrical, the roof, and appliances are newer and therefore less likely to break down, can generate savings for a buyer.
4. The local market–the number of other properties for sale in your area and the number of buyers in the market can impact your house value. Additionally, market conditions can affect how long it takes your house to sell. In a seller's market, homes tend to sell quickly, whereas in a buyer's market it's typical for homes to see longer days on market (DOM).

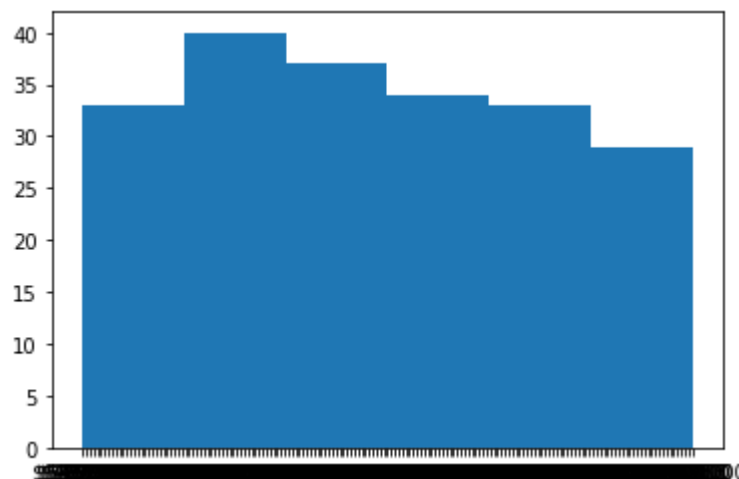
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In this capstone project, the available information is about the location, and the venues within the neighborhood. Thus, we will focus on the influence of location on housing price.

First, K-means algorithm, which is one of the most common cluster method of unsupervised learning, is applied in this project. The Elbow Method is used to fine the optimal  $k=6$ . Neighborhoods are divided into 6 clusters as shown below.

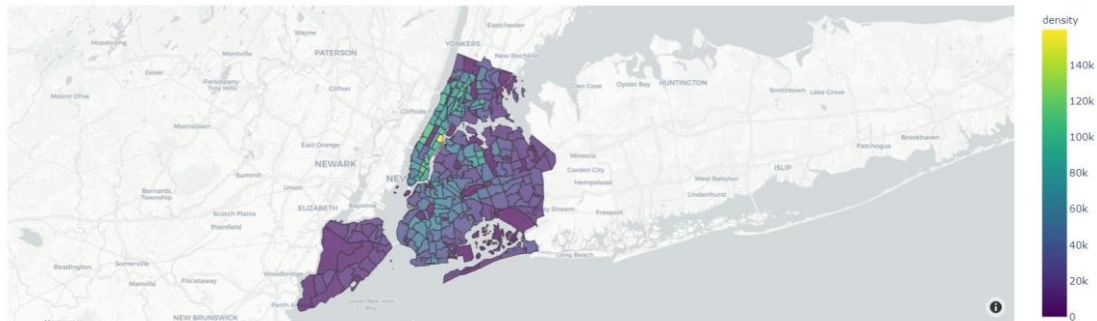


In addition, as for 6 clusters of neighborhoods in New York City, we also bin the prices into 6 distinct values, namely 'Low', 'Low-Medium', 'Medium', 'Medium-High', 'High', 'Extreme High'. The number of neighborhood distributed in different price levels is shown in the histogram below.

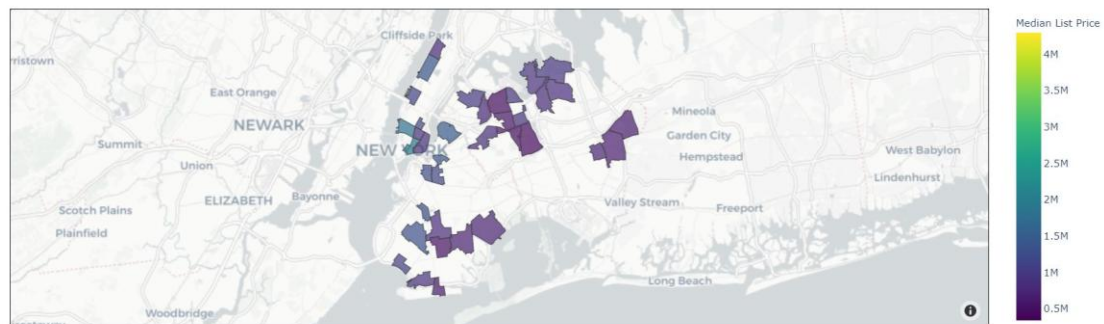


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In addition, the population within a neighborhood may affects the housing price in terms of local market. Therefore, the choropleth map is utilized to visualize the population density of each neighborhood in New York City.



Finally, the choropleth map of housing price by neighborhood in New York City is shown as below.



Due to lack of complete housing price data, the comparison between the population density and the housing price is ineffective.

## Results

In light of most common venues within the neighborhood, restaurants, train stations are most common in cluster 6 with the highest price level. It is comprehensive that the convenience of the neighborhood has a positive relationship with the housing price.

## Discussion

Is NYC a Good Place For Real Estate Investment? Many real estate investors have asked themselves if buying a property in NYC is a good investment? The fact is that New York house prices are not only among the most expensive in New York, but New York real estate also is some of the most expensive in all of the U.S. . It's a relatively

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good time to buy a property in New York as housing inventory is on the rise and competition is less. Currently, the NYC housing market is relatively more friendly to buyers than sellers. With the phased opening of the economy, buyers have been quicker to return to the housing market.

### **Conclusion**

There are many factors that impact the housing price. Besides the analysis of venues within the neighborhood, other factor like comparable house price nearby, new infrastructure development plan shall be taken into account. The more data we got, the more reliable analysis we could made.

### **Reference**

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