

# Capstone Project - The Battle of the Neighborhoods (Week 2)

Applied Data Science Capstone by IBM/Coursera

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## Introduction: Business Problem

In this project we will try to find an optimal location for a restaurant. Specifically, this report will be targeting what are arguably the two hottest areas for real estate at the moment in NYC: **Hudson Yards** Neighborhood and '**Billionaires Row**.'

Since there are lots of restaurants in those areas we will try to detect **under represented cuisines**. We are also interested in **restaurants with a low rating by customers**. If we can combine those two to find an area of opportunity, we'll have a better chance of success with our own restaurant versus starting a restaurant with a cuisine that is over-represented and/or those that enjoy high customer satisfaction.

## Data

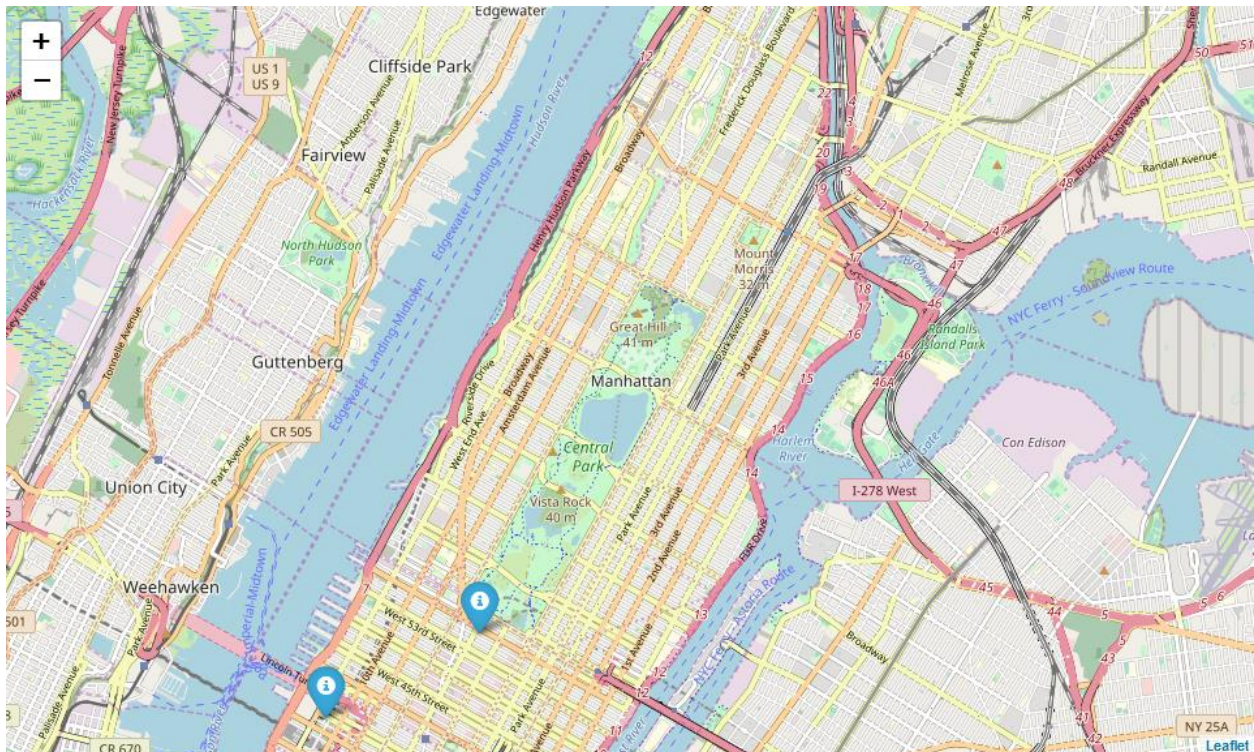
Following data sources will be needed to extract/generate the required information:

- One is a free data source from **NYU Spatial Data Repository** - [https://geo.nyu.edu/catalog/nyu\\_2451\\_34572](https://geo.nyu.edu/catalog/nyu_2451_34572). The neighborhood locations will be obtained from here.
- Number of restaurants, their type, location and rating will be obtained using **Foursquare API** and **Zomato**.

## Methodology

- The NYU data source contains location information for all 5 NYC boroughs and 306 neighborhoods. Since we already know which neighborhoods we want to focus on we can simplify our data source from here.
- The area known as 'Billionaires Row' isn't a neighborhood per se but an area mainly concentrated along 57th St. between 8th Ave. and Park Ave. Carnegie Hall sits conveniently along 57th st, so we'll use its location to derive restaurants in that area.

	Borough	Neighborhood	Latitude	Longitude
0	Manhattan	Hudson Yards	40.756658	-74.000111
1	Manhattan	Billionaires Row	40.76503	-73.979886



## Hudson Yards

Hudson Yards is New York's newest neighborhood and home to more than 100 diverse shops and culinary experiences, offices for leaders in industry, significant public art and dynamic cultural institutions including The Shed, modern residences, 14 acres of public plazas, gardens and groves and the world's first Equinox Hotel®. <https://www.hudsonyardsnewyork.com/about>

## Billionaires Row

Billionaires' Row is the name given to a set of ultra-luxury residential skyscrapers, constructed or in development, that are arrayed roughly along the southern end of Central Park in

Manhattan, New York City. Several of these buildings are in the supertall category (taller than 1,000 feet (300 m)), and are among the tallest buildings in the world. Since most of these buildings are built or proposed on 57th Street, the term has been used to refer to the street itself as well. The area is notable for containing some of the most expensive residences in the world. [https://en.wikipedia.org/wiki/Billionaires%27\\_Row\\_\(Manhattan\)](https://en.wikipedia.org/wiki/Billionaires%27_Row_(Manhattan))

## Analysis

The top 100 restaurant venues that are within a radius of 500 meters of Carnegie Hall. (Sample)

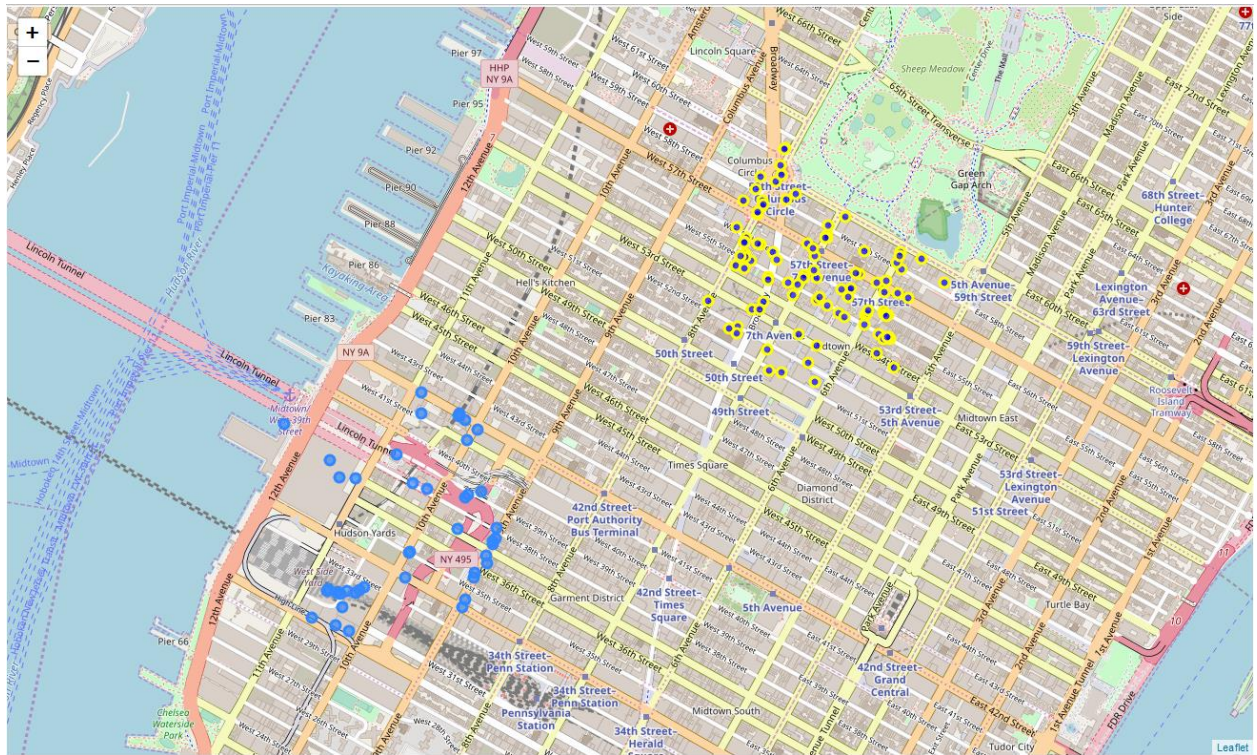
	Name	Category	Lat	Long
0	Estiatorio Milos	Greek Restaurant	40.763386	-73.979204
1	Indian Accent	North Indian Restaurant	40.764127	-73.978787
2	Souvlaki GR	Souvlaki Shop	40.764600	-73.980194
3	La Esquina	Taco Place	40.764417	-73.981440
4	The Halal Guys	Halal Restaurant	40.763826	-73.980182

The top 100 restaurant venues that are within a radius of 500 meters of Hudson Yards. (Sample)

	Name	Category	Lat	Long
0	Friedman's	American Restaurant	40.755271	-73.998509
1	Kawi	Asian Restaurant	40.753913	-74.001322
2	Hudson Yards Grill	American Restaurant	40.754068	-74.000544
3	Legacy Records	American Restaurant	40.757592	-73.998352
4	Chef's Table at Brooklyn Fare	American Restaurant	40.756024	-73.996366

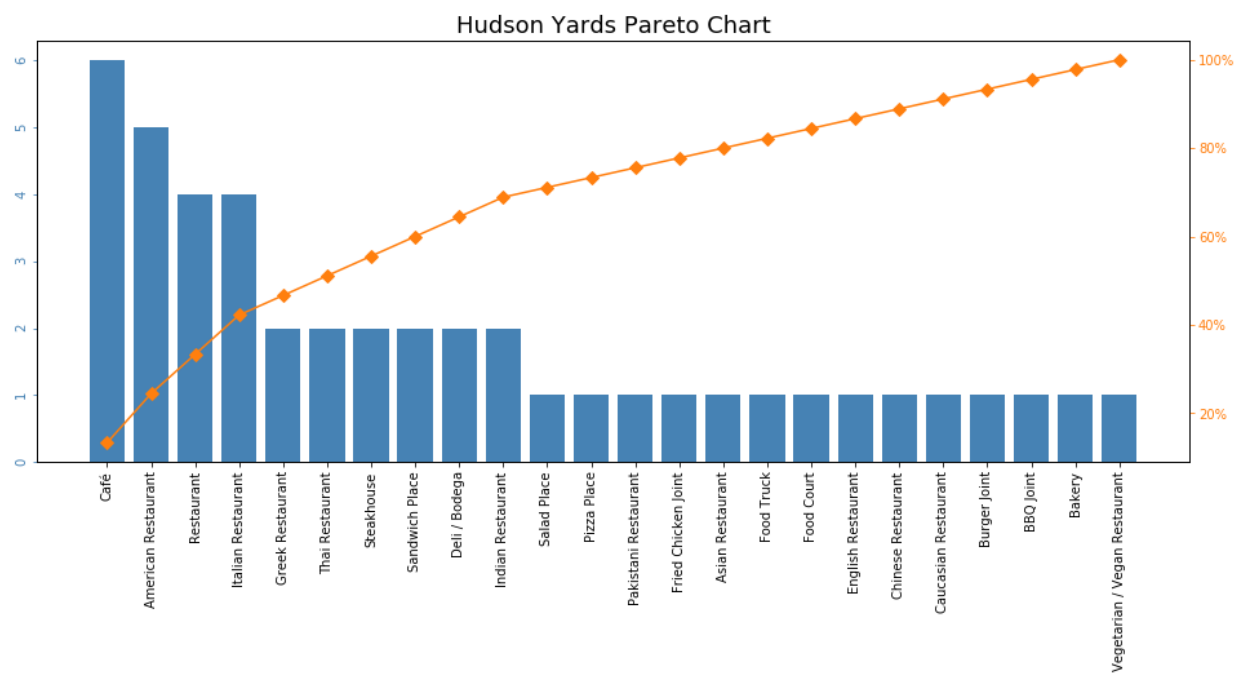
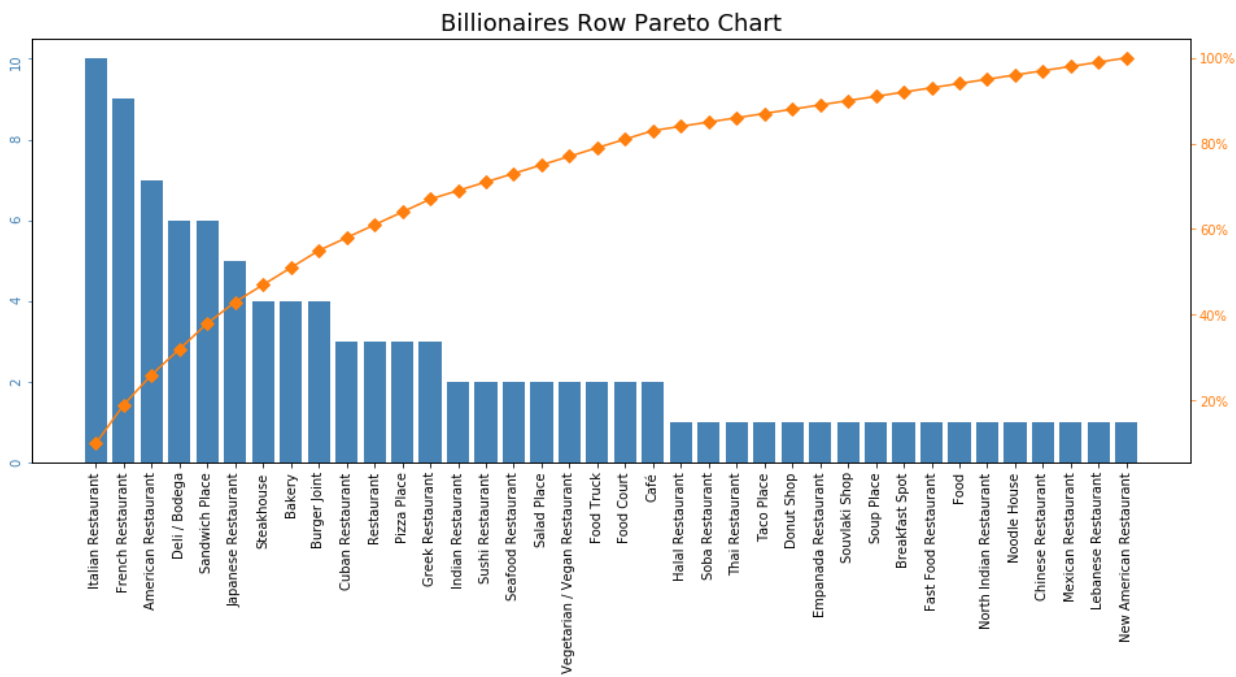
Map of restaurant location in respective neighborhoods.





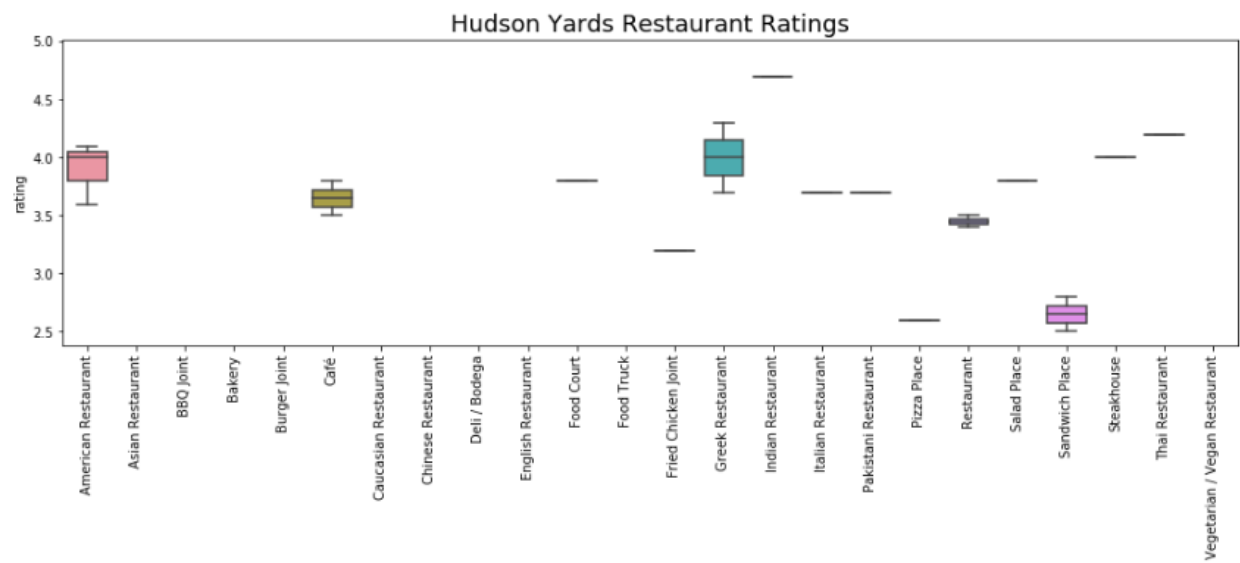
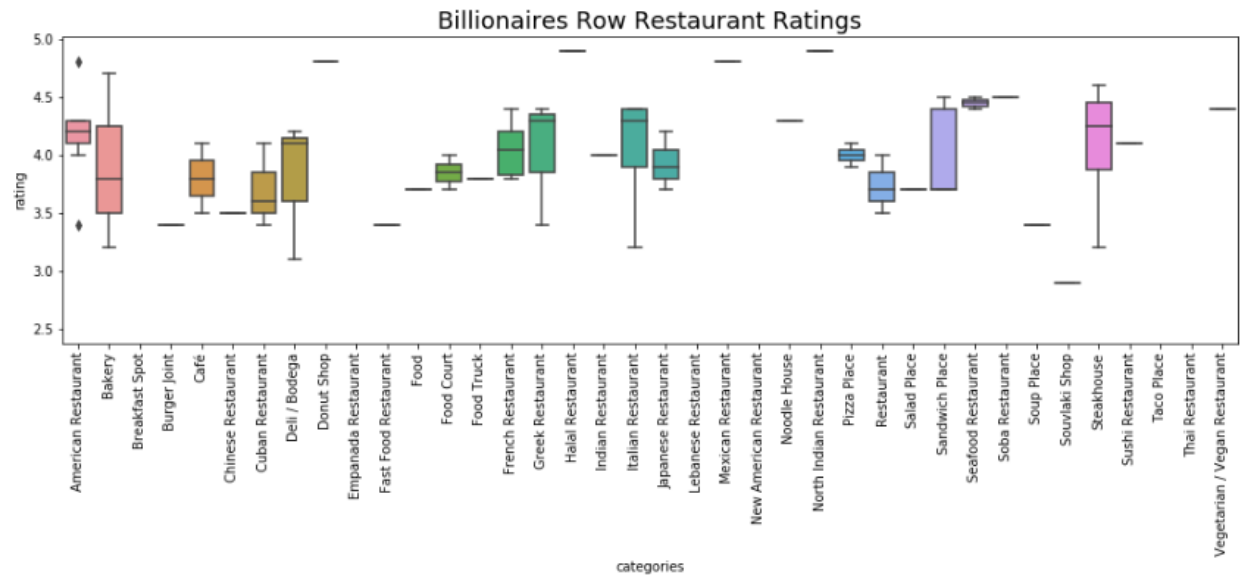
Both neighborhood restaurant category charts.

With these two charts we see that we can focus on only those restaurants with less competition, namely those with only one restaurant in their respective category.



Category Ratings Boxplot

With this information we can find out what the ratings are for those categories we took from the previous charts.



Here the results in tabular form.

### Billionaires Row

Category	Rating
Souvlaki Shop	2.9
Donut Shop	3.4
Fast Food Restaurant	3.7
Chinese Restaurant	4.1
Mexican Restaurant	4.1
Soba Restaurant	4.3
Breakfast Spot	4.3
New American Restaurant	4.7
Hala Restaurant	4.9
North Indian Restaurant	4.9
Thai Restaurant	NaN
Taco Place	NaN
Empanada Restaurant	NaN
Soup Place	NaN
Noodle House	NaN
Lebanese Restaurant	NaN

### Hudson Yards

Category	Rating
Pizza Place	2.6
Salad Place	3.6
Pakistani Restaurant	3.7
Fried Chicken Joint	4.7
Asian Restaurant	NaN
English Restaurant	NaN
Chinese Restaurant	NaN
Caucasian Restaurant	NaN
Burger Joint	NaN
BBQ Joint	NaN
Bakery	NaN
Vegetarian/Vegan Restaurant	NaN

## Results and Discussion

Our analysis shows a large number of restaurant categories in both locations with ratings that span the gamut. the Hudson Yards project is brand new so the lack of ratings for some places can be justified by that fact. Our main focus was to narrow our search to those categories that are under-represented.

After directing our attention to this narrower area of interest we then took a look at the categorical ratings and filtered those categories so those with only a single restaurant representing that category were included in our results.

Result of all this for both neighborhood locations would be to focus on those categories receiving ratings under 4.0. As this would be prime to provide a quality restaurant in a category that has little competition and what competition there is has received low ratings from their patrons.

Those with no rating we would ignore as the number of reasons could be varied and outside the scope of this project.

## **Conclusion**

Purpose of this project was to identify under represented cuisine in two neighborhoods in NYC. Secondary was to identify which of those have low ratings. By using Foursquare data we identified restaurant categories, and used Zomato ratings to further analysis.

Final decision on restaurant location and cuisine type will require further research. As of now those cuisines with only one restaurant in their respective area are worthy of consideration. And those with two or more, and have high ratings, regardless of being under-represented we should not consider.