

Opening a High-end Restaurant in New York City

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Introduction

There are countless options for entrepreneurs, developers and investors as to where they could potentially invest their money, time and resources. One of these possible investment opportunities are businesses such as restaurants, bars, night clubs, etc. The risk of opening such a business can be mitigated by choosing an appropriate location and type. Then as investors look to protect their money from potentially risky enterprises, being able to leverage existing business and population data to determine what kind of venues and in which locations to invest would be of great value.

In this report, we aim to build a model to determine what kind of venue and in which location in New York City would a prospective entrepreneur chose for their new business. We will restrict our report to restaurants, as restaurants and eateries are one of the most common venues and one of the riskiest. Our focus will be on high-end or expensive restaurants in New York City.

When considering opening a new restaurant, it can be tempting to look for a one-size-fits-all model for success. Unfortunately, there is no one approach to determine the most profitable type of restaurant. Finding the right kind of restaurant to open is a mixture of deciding what kind of business you want to run, selecting the right location, knowing your competition, and staying within your budget.

The objective of this project is to inform what kind of restaurant and where should it be located for a person or group looking to open a new high-end restaurant. Using Data Science methodologies and Foursquare location data this project aims to answer the question; what type of eatery should somebody chose for their new high-end restaurant and where in New York City would it be located?

Data

To address this problem, we will make use of the following data:

- List of boroughs in New York City with their respective coordinates. This will define the scope of this project to New York City.
- Coordinates of each of the neighborhoods in each borough of New York City. This will be used to search venues using the Foursquare API and to plot the map. Below is a map of New York City with all the neighborhoods superimposed:

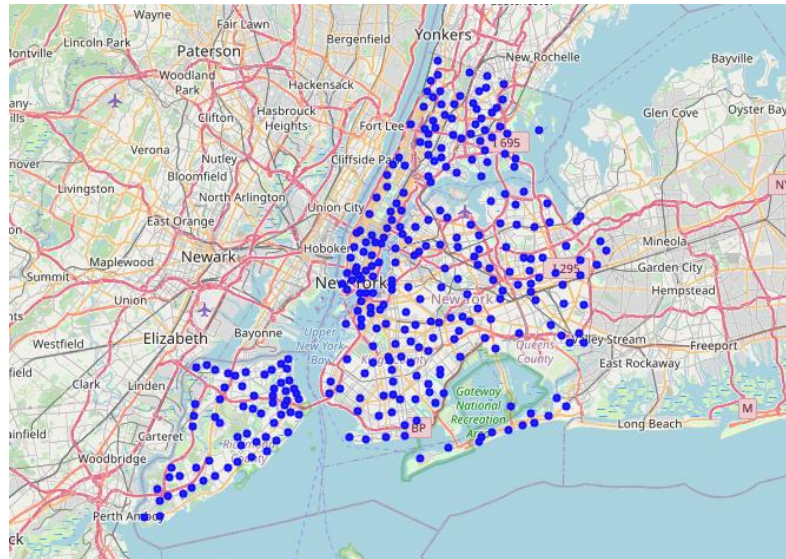


Figure 1: Map of New York City Neighborhoods

- Population and economic data for the New York City Boroughs. This will be used to narrow down the location of our high-end restaurant within New York City

New York City's five boroughs								
Jurisdiction		Population	Gross Domestic Product		Land area		Density	
Borough	County	Estimate (2019) ^[3]	billions (US\$) ^[4]	per capita (US\$)	square miles	square km	persons / sq. mi	persons / km ²
The Bronx	Bronx	1,418,207	42.695	30,100	42.10	109.04	33,867	13,006
Brooklyn	Kings	2,559,903	91.559	35,800	70.82	183.42	36,147	13,957
Manhattan	New York	1,628,706	600.244	368,500	22.83	59.13	71,341	27,544
Queens	Queens	2,253,858	93.310	41,400	108.53	281.09	20,767	8,018
Staten Island	Richmond	476,143	14.514	30,500	58.37	151.18	8,157	3,150
City of New York		8,336,817	842.343	101,000	302.64	783.83	27,547	10,636
State of New York		19,453,561	1,731.910	89,000	47,214	122,284	412	159

Sources:^[5] and see individual borough articles

- Venue data from the Foursquare API for New York City. Foursquare classifies each venue with a price qualifier in the form of a Price Tier from 1 (least pricey) to 4 (most pricey). For food venues, in the United States, the Foursquare Price Tiers are defined as follows:
 - 1 is < \$10 an entree
 - 2 is \$10-\$20 an entree
 - 3 is \$20-\$30 an entree
 - 4 is > \$30 an entree

In particular, we will restrict our search to venues in the priciest tier, as we define these as high-end venues. Additionally, we will use the Venue Category to further filter our data to eateries and restaurants, thus excluding stores, bars, nightclubs and any other

type of venue returned by the API. This is an example of the output from the Foursquare API with venue names, locations and categories.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue ID	Venue Latitude	Venue Longitude	Venue Category
2	Chinatown	40.715618	-73.994279	Contra	50234a5ae4b0e5018836a116	40.719889	-73.989250	New American Restaurant
3	Chinatown	40.715618	-73.994279	Balvanera	53e02d67498e78c091589343	40.720547	-73.985399	Argentinian Restaurant
4	Chinatown	40.715618	-73.994279	Atera	4f627061e4b05c1d57815977	40.716752	-74.005712	Molecular Gastronomy Restaurant
7	Hamilton Heights	40.823604	-73.949688	Ponty Bistro Harlem	53e01975498e78c0915599bf	40.817886	-73.941522	African Restaurant
8	Central Harlem	40.815976	-73.943211	Ponty Bistro Harlem	53e01975498e78c0915599bf	40.817886	-73.941522	African Restaurant

Demographic information for New York City consisting of population and economic data for each of the boroughs is scraped from the following source on Wikipedia: https://en.wikipedia.org/wiki/Demographics_of_New_York_City

Then we will get the geographical coordinates of the New York City neighborhoods from a JSON file obtained using the Python Geocoder package. After that, we will use the Foursquare API to get the venue data for those neighborhoods. Foursquare has one of the largest databases of 105+ million places and is used by over 125,000 developers. The Foursquare API will provide many categories for each of the queried venues. We are particularly interested in the Restaurant Category (e.g. French Restaurant), filtered by the priciest Price Tier in order to help us to solve the business problem at hand.

Methodology

If our investors are looking to open a high-end restaurant, we believe finding the right location is of the utmost importance. To find the proper location, we will examine which of the New York City boroughs is the most appropriate one based on population and economic data. We then begin our exploratory analysis by looking at the population and the GDP of each borough. GDP stands for "Gross Domestic Product" and represents the total monetary value of all final goods and services produced (and sold on the market) within a country during a period (typically 1 year). This last metric is an important measure, as we consider an area with high incomes to be essential to the success of a high-end restaurant.

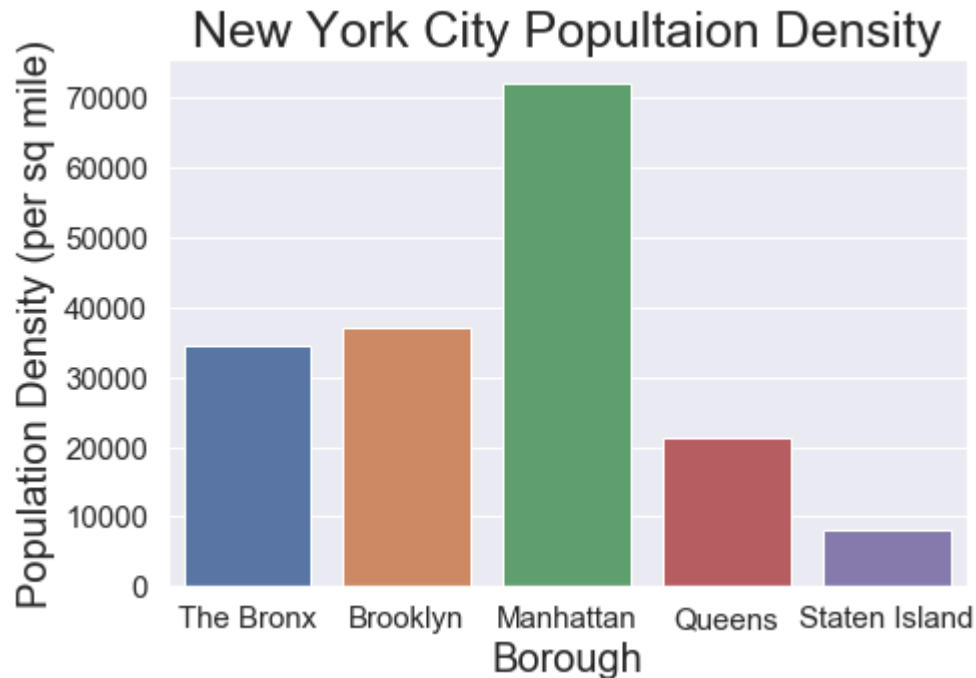


Figure 2. Population distribution for each of the boroughs in New York City. Manhattan has the largest population density.

Based on population density and GDP data, as shown below, it is clear that Manhattan has the greatest potential to open a high-end venue. We will turn our focus on further study of the Manhattan area for our gourmet restaurant.

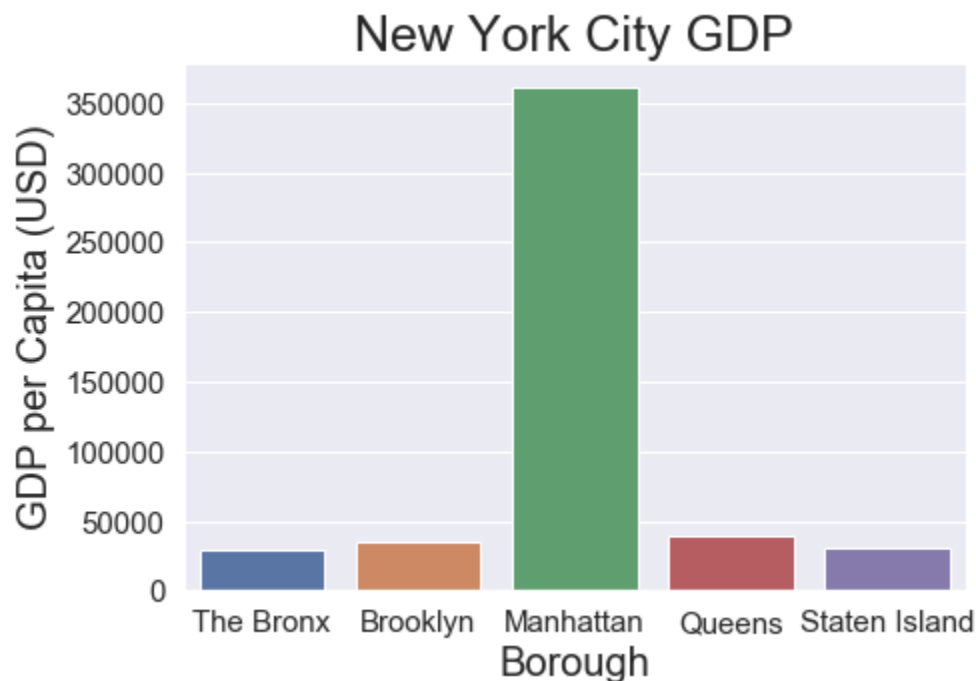


Figure 3. GDP for each of the boroughs in New York City. Manhattan has by far the highest GDP per capita.

There are dozens, if not hundreds, of different types of cuisines that our restaurant could be. Of course, if we want to guarantee success for our venture, in what is an established market, we cannot deviate too far from the established path. To determine what kind of restaurant would be most appropriate for Manhattan, we will use Foursquare location data to explore what kind of high-end venues exist are the highest rated. As explained in the data section, to selectively filter only venues of the highest price tier. Additionally, we further filter our search to only contain eateries and restaurants since the default Foursquare search also returns venues such as gyms and stores that are of no interest to us.

Results and Discussion

The Foursquare search for high-end restaurants in Manhattan returned the Italian, steakhouses and American restaurants are the most common types with twenty, sixteen and ten venues respectively.

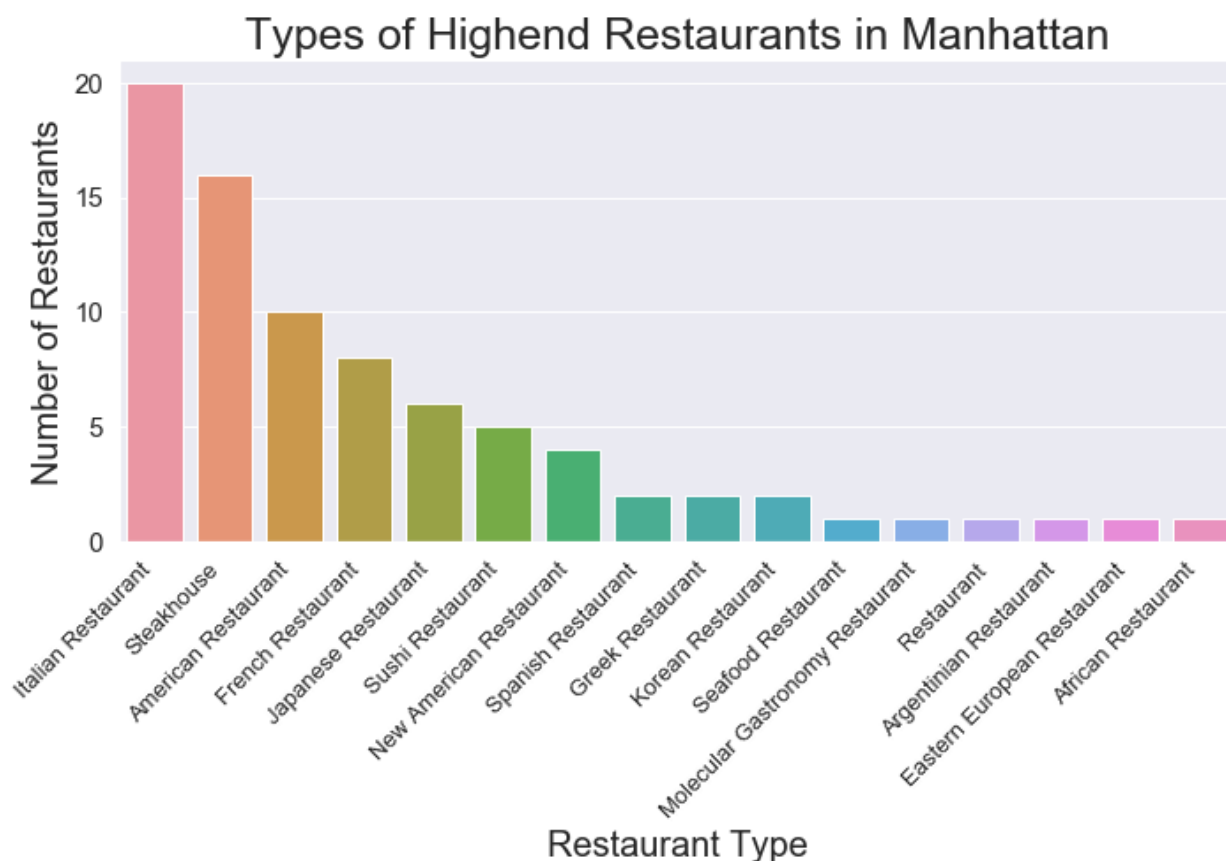


Figure 4. Types of high-end restaurants in the New York borough of Manhattan.

This means that those types of restaurants have proven to have a high chance of success and have a consistent customer base. Choosing one of these types of cuisine

for our high-end restaurant investment might be wise. However, we must be wary of over-saturation for a particular cuisine. Competing for consumers with established fixtures in the market could cause weak traffic to our restaurant and our venture to prove unsuccessful.

On the other hand, on the other extreme of the spectrum are cuisines with very few venues in Manhattan. Our research indicates that African, Eastern European, Argentinian and seafood cuisines only have one venue each in Manhattan. These are likely niche locations catering to a very select customer base. Therefore, we should not be choosing any of these cuisines for our investment. Instead, we will be shifting our focus to restaurants with ten to five total venues in Manhattan. These have an established consumer base that enjoys the cuisine while having less competition and avoiding market saturation. Based on this, our most likely choices of cuisine for our high-end restaurant are French, Japanese, or Sushi.

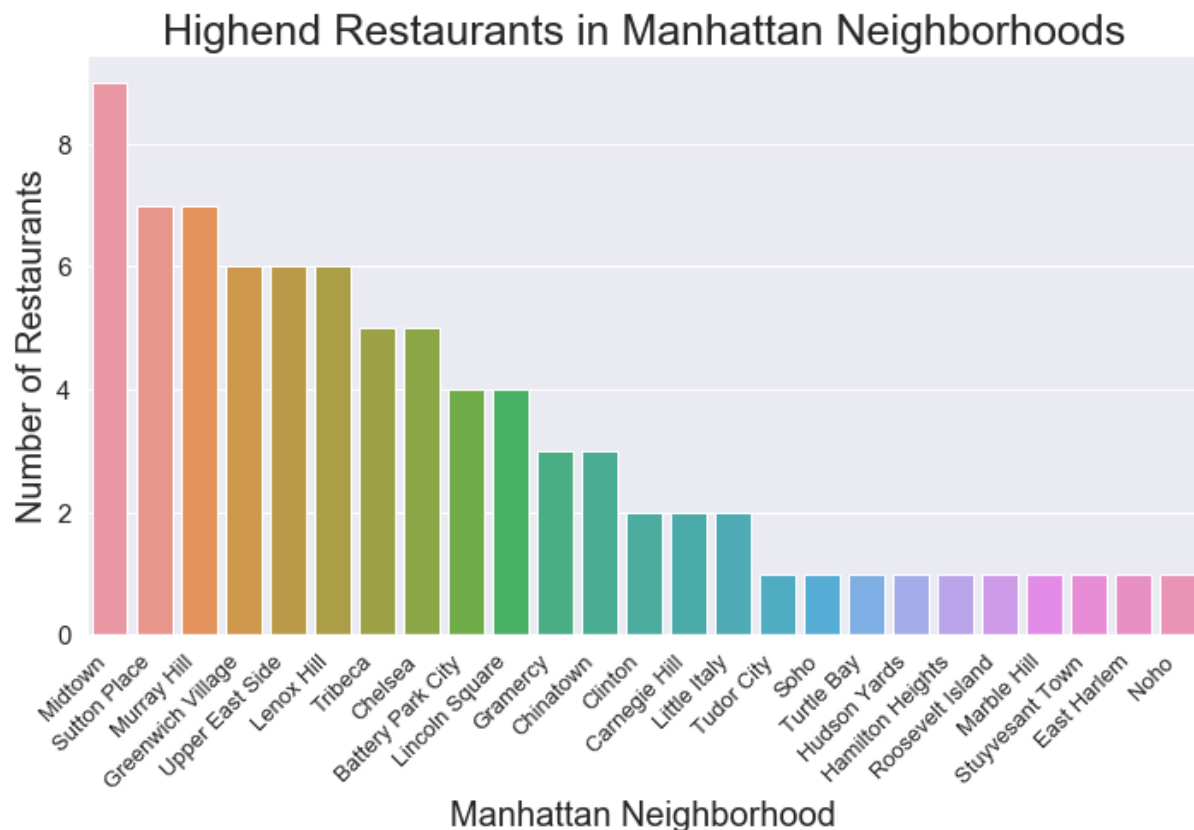


Figure 5. The number of high-end restaurants for each neighborhood in Manhattan.

Next, we shift our focus to where in Manhattan our upscale restaurant should be located. Based on the returns from our Foursquare query, and population data for Manhattan our most likely location for our restaurant is in the Midtown neighborhood. The Midtown neighborhood has the highest concentration of high-end restaurants when compared to other Manhattan neighborhoods. Additionally, Midtown is also the most

populous neighborhood allowing our restaurant to have the highest number of potential customers.

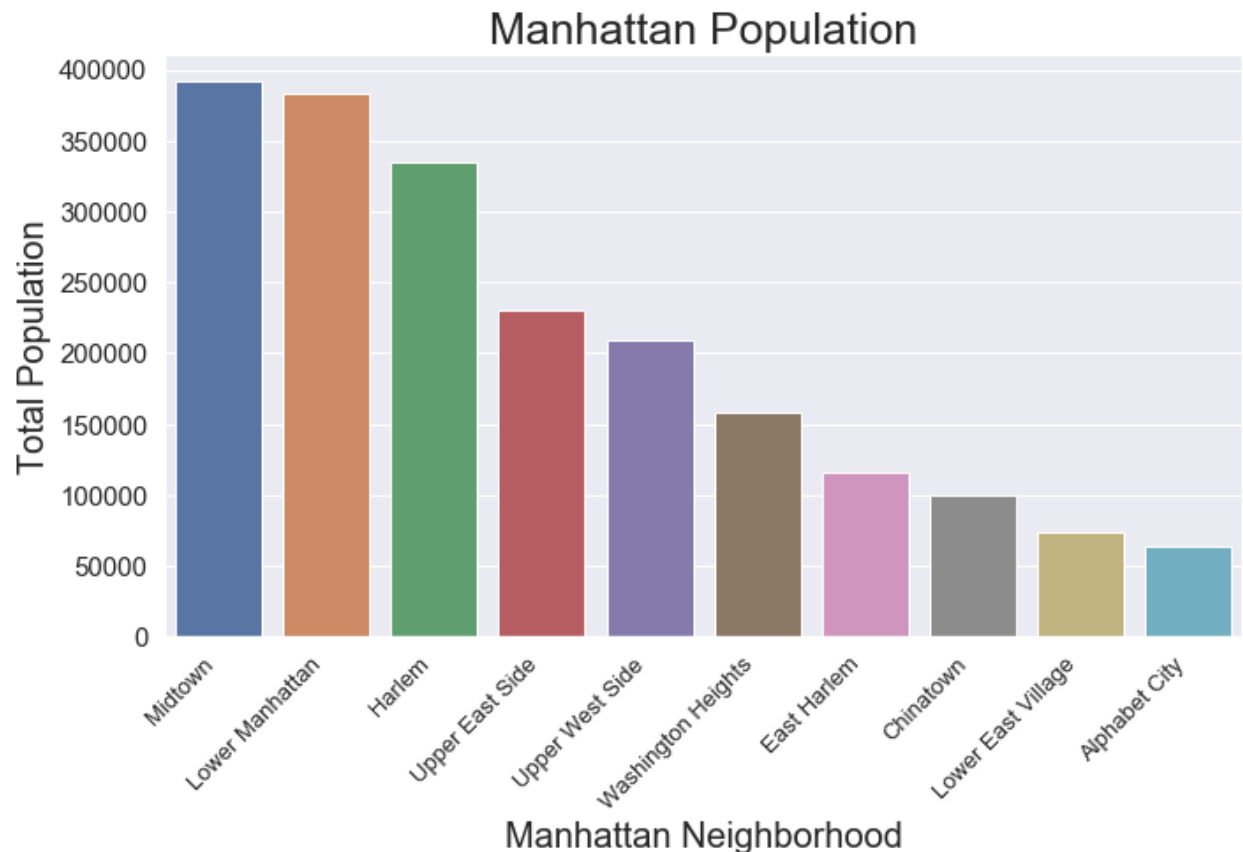


Figure 6. The total population of the top ten most populous Manhattan neighborhood.

Conclusion

The purpose of this report was to set out a roadmap to choose the type of cuisine and location for a high-end restaurant located in New York City. Using population and economic data for New York City, we determined that our ideal location was the borough of Manhattan in New York City. Focusing our search on high-end venues in Manhattan, we determined that there are numerous options of cuisine for consumers. The most common food types being Italian, American and steakhouses. Due to possible competitive pressure and market saturation, the most common cuisines were discarded as options for our venture. We also discarded what we defined as niche restaurant types with one or two venues in total in Manhattan. This left French, Japanese, or Sushi as our most likely candidates for our upscale eatery in Manhattan. Finally, we decided our location would be Midtown as it is the most populous neighborhood in the borough of Manhattan with the largest concentration of high-end restaurants.

As mentioned before, there is no perfect solution to ensure the success of our restaurant investment. Hopefully, the tools deployed here increase our chances of opening a high-end restaurant in Manhattan with lasting power. Ultimately, the experience delivered by our restaurant will be the defining factor. Although beyond the scope of our analysis, regardless of cuisine, with precise attention to detail, perfect execution, and exceptional service, every fine dining restaurant aims for a top-notch experience.