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COURSERA

CAPSTONE

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TITLE:

**STARTING UP
SUCCESSFUL
RESTAURANT
BUSINESS IN
NEW YORK
CITY**

1. Introduction

1.1. Why New York City (NYC) ?

New York City (NYC) is the most populous city in the United States as well as worldwide. We often call United States as the "melting pot". Among big cities in States, especially New York City can be nicely expressed with the nick name above ("melting pot"). With an estimated 2018 population of 8,398,748 distributed over about 302.6 square miles (784 km**2), New York is also the most densely populated major city in the United States[1]. Located at the southern tip of the U.S. state of New York, the city is the center of the New York metropolitan area, the largest metropolitan area in the world by urban landmass.[2] With almost 20 million people in its metropolitan statistical area and approximately 23 million in its combined statistical area, it is one of the world's most populous megacities. New York City has been described as the cultural, financial, and media capital of the world, significantly influencing commerce,[3,4] entertainment,



Figure 1. New York City

research, technology, education, politics, tourism, art, fashion, and sports. Home to the headquarters of the United Nations,[5] In addition, New York is an important center for international diplomacy. Through all of powerful environmental conditions like above, New York City provides various business opportunities and tempts to start up the business.

1.2. How to approach to business item ?

In this chapter, I am going to explain how I've approach to the target business (restaurant business) and supporting sentences for my choice. As you know, there are the necessities of life. They are food, clothing, and shelters. First of all, I made a focus on those essential things for human life. Next, I thought about the way to extremely take benefits of the environmental characteristics of New York City. The main key of my decision is "floating population" of New York City. As I made a comment above, population of New York City is more than 23 million. Then, let us think about floating population. New York shares its borders with five states: Pennsylvania, New Jersey, Vermont, Connecticut, and Massachusetts [6]. Numerous people are commuting to or through New York City from surrounding States/Cities. Moreover, we should remember that various people from other countries visit New York City through airway for traveling or business trip. Finally, I sorted the best item among human necessities to make fit for this floating population. Finally, I choose the food among human essentials and easily approach to business item as a restaurant one.

1-3. Why restaurant business ?

There are some reasons why I choose the restaurant business in New York City as our target business. Details are as below;

- The business is flexible
- The demand is high
- Different products to suite your style
- Different business structure as options
- The business is lucrative

2.Business problem / Approaching methodology

2.1. How to choose a type of restaurant business ?

Somebody says that "New York City is made by immigrants". I understand this sentence as New York City has deep immigrant history and is multi-cultural city. The New York Times describes that how immigrants made the City [7]. The multi-cultural characteristics of New York City provides us to broad range of categories of foods. I carried out researches and summarize the best restaurant of New York City with food categories as below (information from business insider [8])

```
In [3]: import pandas as pd
my_series = pd.Series({"AMERICAN":"Kingsley", "Malaysian":"Asiate", "GERMAN/SWISS":"Wallsé", "CANADIAN":"Hometown Bar-B-Que", "PHILIPPINEAN":"PIO PIO", "DUTCH":"Black Iron Burger", "CHINESE":"Decoy", "AUSTRIAN":"Russ & Belgian","Wallflower", "GREEK":"Milos", "INDIAN": "Indian Accent", "ITALIAN": "Marea", "JAPANESE": "Sushi Yasuda", "KOREAN": "Jungsik", "SPANISH": "PearlOyster Bar", "Portuguese": "Meadowsweet", "MEXICAN": "Los Tacos No.1", "THAI": "SriPraPhai", "TURKISH": "Taci's Beyti", "VIETNAMESE": "Bricolage"})
my_series

Out[3]: AMERICAN          Kingsley
Malaysian          Asiate
GERMAN/SWISS        Wallsé
CANADIAN           Hometown Bar-B-Que
CARIBBEAN          Ali's Roti
PHILIPPINEAN        PIO PIO
DUTCH               Black Iron Burger
CHINESE             Decoy
AUSTRIAN            Russ & Daughters
Indonesian          Pacificana
French              Le Bernardin
Belgian             Wallflower
GREEK                Milos
INDIAN              Indian Accent
ITALIAN              Marea
JAPANESE            Sushi Yasuda
KOREAN               Jungsik
SPANISH              PearlOyster Bar
Portuguese           Meadowsweet
MEXICAN              Los Tacos No.1
IRANIAN              Tanoreen
BRAZILIAN            Llama Inn
THAI                 SriPraPhai
TURKISH              Taci's Beyti
VIETNAMESE           Bricolage
dtype: object
```

Figure 2. Hot restaurant of New York City

As you can see the table above, it is truly important to make solid strategy for choosing food categories. When we start to build a strategy, we should consider at least some points as below ;

- Cost (delivery, rent, parking)
- Availability to get food ingredient

- Population
- Demographics
- Neighbors
- Concept of site
- Menu of the competitors
- etc

2.2 Preparation of data set

As you know we decided to start up the restaurant business in New York City. For successful business, I considered bunches of analytic data set. First of all, we should check out regal things for food business like below;

- To open a restaurant in NYC, you need certain certificates, permits and licenses from various city and state agencies, including the Health Department.
- To see which type of permit and licenses you may need to apply for, visit our food service establishment permits page.
- For help opening your business, we need to visit NYC Small Business Services Start a Business portal.
- To organize and maintain all of your NYC permits in one place, sign up for NYC Business.
- Applying for a Health Department Permit/Designing a Restaurant
- Apply for a New Food Service Establishment Permit
- Suggested Guide to Food Establishment Design

We can get the information through "<https://www1.nyc.gov/site/doh/business/food-operators/opening-a-restaurant.page>". Next, we need to check boroughs and neighborhoods. Neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segment the neighborhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighborhoods that exist in each borough as well as the latitude and longitude coordinates of each neighborhood. I utilized data from "https://geo.nyu.edu/catalog/nyu_2451_34572".

In addition, getting some supporting essential background data is helpful for us. ;

- Population/floating population of New York City

- New York City demographics
- Transition type of people in New York City
- Cuisines of New York city
- Trend of the food business

We should consider some important and vital items like above. We can get the data through wikipedia and some websites as below;

- <https://nypost.com/2019/12/17/the-10-worst-nyc-food-trends-of-2019>
- <https://nypost.com/tag/food-trends>
- https://en.wikipedia.org/wiki/New_York_City
- https://en.wikipedia.org/wiki/Economy_of_New_York_City
- https://en.wikipedia.org/wiki/Portal:New_York_City
- https://en.wikipedia.org/wiki/Cuisine_of_New_York_City

Finally, we need geographical coordinates data set for utilizing Foursquare API. New York city geographical coordinates data will be utilized as input for the Foursquare API, that will be leveraged to provision venues information for each neighborhood. We will use the Foursquare API to explore neighborhoods in New York City.

3. Data Analysis

In this section, we are going to explore New York City firstly with a geometric information. I am going to convert addresses into their equivalent latitude and longitude values.

Next, I have a plan to try the Foursquare API to explore neighborhoods in New York City. I will use the ****explore**** function to get the most common venue categories in each neighborhood, and then use this feature to group the neighborhoods into clusters.

Then, I will show you use of the ***k*-means clustering algorithm** to finish up stages of segmenting and clustering. Finally, I will use the Folium library to visualize the neighborhoods in New York City and their emerging clusters.

```
In [2]: import numpy as np # library to handle data in a vectorized manner
import pandas as pd # library for data analysis
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json # library to handle JSON files
!conda install -c conda-forge geopy --yes # uncomment this line if you haven't completed the Foursquare API lab
from geopy.geocoders import Nominatim # convert an address into latitude and longitude values

import requests # library to handle requests
from pandas.io.json import json_normalize # transform JSON file into a pandas dataframe

# Matplotlib and associated plotting modules
import matplotlib.cm as cm
import matplotlib.colors as colors

# import k-means from clustering stage
from sklearn.cluster import KMeans

!conda install -c conda-forge folium=0.5.0 --yes # uncomment this line if you haven't completed the Foursquare API lab
import folium # map rendering library

print('Libraries imported.')
```

Figure 3. Libraries for this chapter

Neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segment the neighborhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighborhoods that exist in each borough as well as the the latitude and longitude coordinates of each neighborhood. Here is the link to the dataset what I utilized, "https://geo.nyu.edu/catalog/nyu_2451_34572". Then, I transformed the data set through pandas as figure 4.

In [13]:	neighborhoods.head()																														
Out[13]:	<table border="1"> <thead> <tr> <th></th> <th>Borough</th> <th>Neighborhood</th> <th>Latitude</th> <th>Longitude</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>Bronx</td> <td>Wakefield</td> <td>40.894705</td> <td>-73.847201</td> </tr> <tr> <td>1</td> <td>Bronx</td> <td>Co-op City</td> <td>40.874294</td> <td>-73.829939</td> </tr> <tr> <td>2</td> <td>Bronx</td> <td>Eastchester</td> <td>40.887556</td> <td>-73.827806</td> </tr> <tr> <td>3</td> <td>Bronx</td> <td>Fieldston</td> <td>40.895437</td> <td>-73.905643</td> </tr> <tr> <td>4</td> <td>Bronx</td> <td>Riverdale</td> <td>40.890834</td> <td>-73.912585</td> </tr> </tbody> </table>		Borough	Neighborhood	Latitude	Longitude	0	Bronx	Wakefield	40.894705	-73.847201	1	Bronx	Co-op City	40.874294	-73.829939	2	Bronx	Eastchester	40.887556	-73.827806	3	Bronx	Fieldston	40.895437	-73.905643	4	Bronx	Riverdale	40.890834	-73.912585
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Figure 4. Data transform through pandas

With a geocoded, I created map of New York with neighborhoods. It is shown in figure 5.

Out[16]:

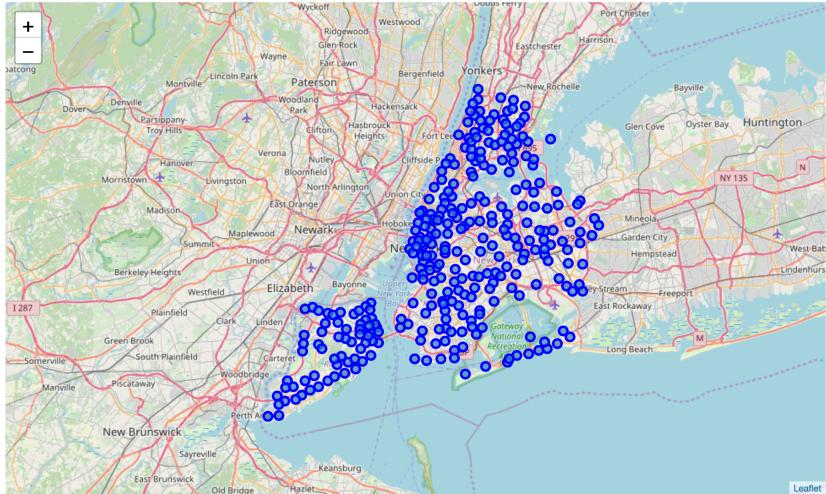


Figure 5. Create a map of New York with neighborhoods superimposed on top and narrow down target area.

However, I referred to the information data for dynamic population of New York City. I decided to narrow down the area to Manhattan for starting up the restaurant business. As following to report[9], Simply put, Manhattan consists of much more than its residential population and daily workforce. This island, measuring just 22.96 square miles, serves approximately 4 million people on a typical weekday, 2.9 million on a weekend day, and a weekday night population of 2.05 million. let's simplify the above map and segment and cluster only the neighborhoods in Manhattan. So let's slice the original data frame and create a new data frame of the Manhattan data.

As following to the GPSMYCITY [10], they choose some 'must see' site seeing spots of Manhattan. The Picked items are Times Square, Museum of Modern Art, St. Patrick's Cathedral, Rockefeller Center, Grand Central Terminal, New York Public Library, Bryant Park, Empire State Building, Macy's in Herald square, Madison Square Garden. All of top ranked sites are situated in midtown. Getting hint with these facts, once more I narrowed down the business site to Midtown of Manhattan. Get the neighborhood's name in the midtown. Figure 6 and 7 show Map creation result and image of midtown of Manhattan, respectively.

Out[19]:

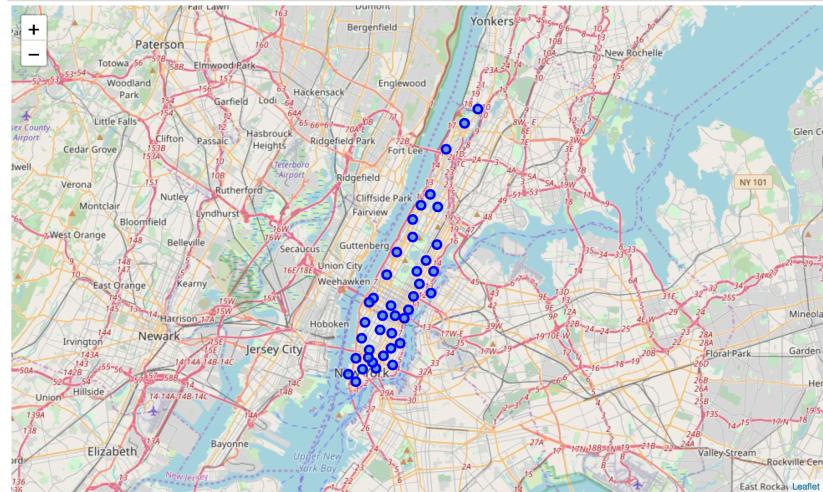


Figure 6. Create a map of New York with neighborhoods superimposed on top and narrow down target area.



Figure 7. Create a map of New York with neighborhoods superimposed on top and narrow down target area.

As following data analysis for sorting num_top_venues, there is no restaurant among ranked places. This is positive result for us to run the restaurant in midtown. The result for midtown is as follows. The series are as venue and frequency. The 1st is Coffee Shop 0.07, 2nd is Hotel 0.06, 3rd is Sandwich Place 0.04, 4th is Theater 0.04, 5th is Sporting Goods Shop 0.04.

Then, I checked the most common venue comparing with neighborhoods. The result is shown in fire 8.

```
# create a new dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['Neighborhood'] = manhattan_grouped['Neighborhood']

for ind in np.arange(manhattan_grouped.shape[0]):
    neighborhoods_venues_sorted.iloc[ind, 1:] = return_most_common_venues(manhattan_grouped.iloc[ind, :], num_top_venues)

neighborhoods_venues_sorted.head()
```

Out[57]:

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Battery Park City	Park	Hotel	Gym	Boat or Ferry	Coffee Shop	Memorial Site	Wine Shop	Gourmet Shop	Mexican Restaurant	Shopping Mall
1	Carnegie Hill	Coffee Shop	Café	Yoga Studio	Gym	Pizza Place	Bookstore	Bakery	Japanese Restaurant	Cosmetics Shop	Italian Restaurant
2	Central Harlem	Seafood Restaurant	Bar	African Restaurant	American Restaurant	Chinese Restaurant	French Restaurant	Dessert Shop	Library	Gym / Fitness Center	Beer Bar
3	Chelsea	Coffee Shop	Art Gallery	American Restaurant	Italian Restaurant	Ice Cream Shop	Bakery	Gym / Fitness Center	Speakeasy	Hotel	Nightclub
4	Chinatown	Chinese Restaurant	Cocktail Bar	Bakery	American Restaurant	Spa	Dessert Shop	Salon / Barbershop	Vietnamese Restaurant	Hotpot Restaurant	Optical Shop

In [58]:

	neighborhoods_venues_sorted.head(100)											
18	Little Italy	Café	Bakery	Hotel	Shop	Place	Cocktail Bar	Restaurant	Restaurant	Restaurant	Shop	
19	Lower East Side	Chinese Restaurant	Café	Bakery	Japanese Restaurant	Coffee Shop	Park	Ramen Restaurant	Art Gallery	Pizza Place	Filipino Restaurant	
20	Manhattan Valley	Coffee Shop	Mexican Restaurant	Indian Restaurant	Bar	Yoga Studio	Pizza Place	Thai Restaurant	Chinese Restaurant	Clothing Store	Ethiopian Restaurant	
21	Manhattanville	Coffee Shop	Seafood Restaurant	Italian Restaurant	Park	Mexican Restaurant	Chinese Restaurant	Spanish Restaurant	Check Cashing Service	Bank	Bar	
22	Marble Hill	Sandwich Place	Gym	Coffee Shop	Yoga Studio	Deli / Bodega	Supplement Shop	Steakhouse	Shopping Mall	Seafood Restaurant	Pizza Place	
23	Midtown	Coffee Shop	Hotel	Theater	Sandwich Place	Sporting Goods Shop	Steakhouse	Gym	Clothing Store	Café	Bakery	
24	Midtown South	Korean Restaurant	Hotel	Japanese Restaurant	Dessert Shop	Burger Joint	Clothing Store	American Restaurant	Gym / Fitness Center	Coffee Shop	Salad Place	
25	Morningside Heights	Park	Bookstore	Coffee Shop	American Restaurant	Deli / Bodega	Burger Joint	New American Restaurant	Outdoor Sculpture	Grocery Store	Greek Restaurant	

Figure 8. Neighborhood analysis

In the midtown, 1st to 10th most common venue is Coffee Shop, Hotel, Theater, Sandwich Place, Sporting Goods Shop, Steakhouse, Gym, Clothing, Store, Café, and Bakery. With this analysis, we can remove the steakhouse on our type of food.

Next, I carried out cluster neighborhoods work for finalizing data analysis processes. For this process I run k-means to cluster the neighborhood into 5 clusters. I created a new data frame that includes the cluster as well as the top 10 venues for each neighborhoods and visualized result is shown in figure 9.

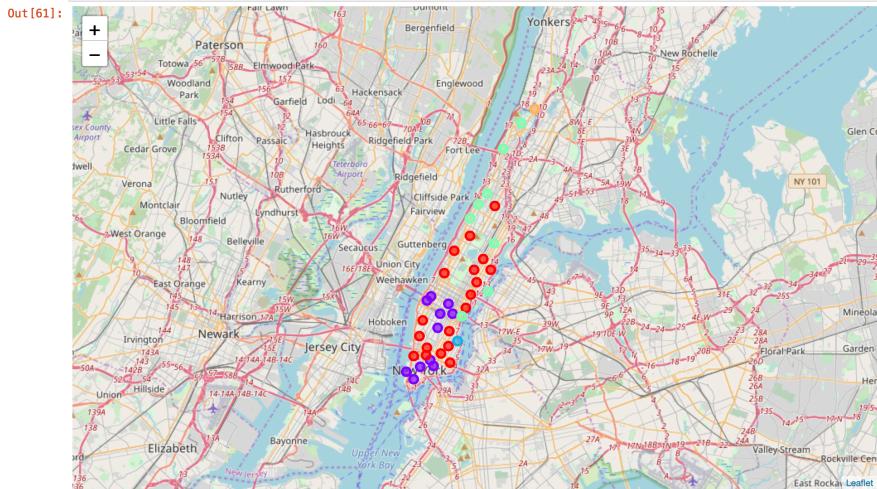


Figure 9. Clustering result for New York City

4. Result and discussion

We need to consider the cluster data. Like seen in above, our business target area is in cluster 2. I just focus on midtown south. In midtown south, common venues are Korean Restaurants, Hotels, Japanese Restaurant, Dessert Shop, Burger Joint, Clothing Store, American Restaurant, Gym / Fitness Center, Coffee Shop, Salad Places. We might delete those kinds of restaurant like Korean, Japanese, American restaurant and burger shop.

We can get one more hint from race population ratio of New York City. According to the research Health of Latinos in New York City by the New York City Department of Health and Mental Hygiene's, NYC residents who identify themselves as Latino or Hispanic account for nearly a third of the city's population. From 2000 to 2015, the Latino population grew by more than

14% to 2,485,125. The largest heritage groups in NYC are Puerto Ricans and Dominicans. More than Half of Latinos are US-born. Of Latinos born outside of the US, nearly three-quarters have lived in the US for 10 years or more [11].

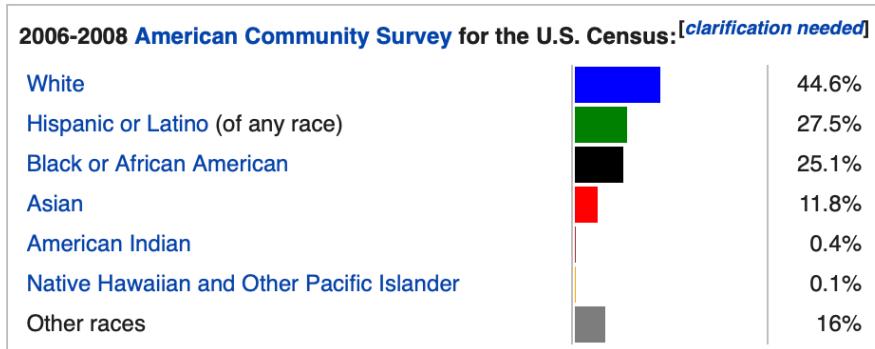


Figure 10. Demographic profiles

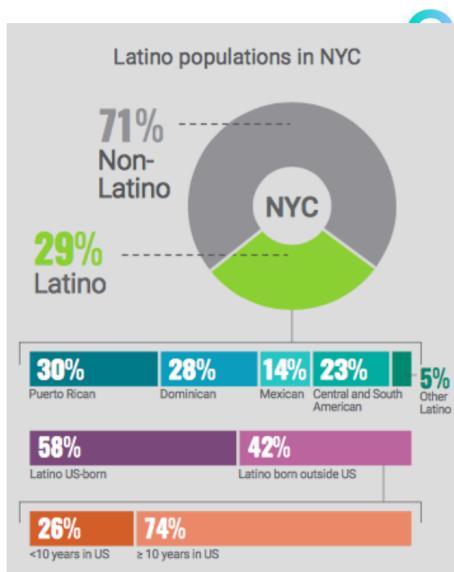


Figure 11. City population

We can also refer the demographic profile of New York City [12]. Spanish and Latino hold 27.7 % of population of New York City right after 40% of whites. If you can remember our approaching process above, you should easily pop up we removed American food, steakhouse, burgers like foods coming from western side. As following all processes aboves, finally, I can make a dicision to start up the Spanish restaurant on midtown of Manhattan.

5. Conclusion

We've analyzed and discussed on the problem that stating up the successful restaurant business in New York City. As following our analysis and approaching methodologies above, the best place is midtown of manhattan. Moreover, I finalized the answer with pick the Spanish restaurant as the most promise kind of food style. I wish that all of above contents will be helpful for somebody wants to open a restaurant in New York City.

References

- [1] Mike Maciag (October 2, 2013). "Mapping the Nation's Most Densely Populated Cities". Governing - The States and Localities. Archived from the original on August 27, 2016. Retrieved August 27, 2016.
- [2] "World Urban Areas" (PDF). Demographia. 2018. Retrieved March 27, 2018..
- [3] "Top 8 Cities by GDP: China vs. The U.S." Business Insider, Inc. July 31, 2011. Retrieved July 1, 2018. For instance, Shanghai, the largest Chinese city with the highest economic production, and a fast-growing global financial hub, is far from matching or surpassing New York, the largest city in the U.S. and the economic and financial super center of the world.
- [4] "New York City: The Financial Capital of the World". Pando Logic. October 8, 2015. Retrieved July 1, 2018.

[5] "Plan your visit". United Nations Visitor Centre. Archived from the original on March 14, 2017. Retrieved February 9, 2017. The Headquarters of the United Nations is located in New York City, along the East River. When you pass through the gates of the United Nations visitors' entrance, you enter an international territory. This 18-acre site does not belong to just one country, but to all countries that have joined the Organization; currently, the United Nations has 193 Member States.

[6] Which States Border New York State? - WorldAtlas.comwww.worldatlas.com › articles › which-states-border-new-york-state

[7] <https://www.nytimes.com/2016/11/06/books/review/city-of-dreams-history-of-immigrant-new-york-tyler-anbinder.html>

[8] <https://www.businessinsider.com/best-nyc-restaurant-for-every-cuisine-2016-12>

[9] The dynamic population of manhattan, Mitchell L. Moss and Carson Qing Rudin Center for Transportation Policy and Management, Wagner School of Public Service, New York University, 2019

[10] <https://www.gpsmycity.com/tours/midtown-manhattan-walking-tour-1623.html>

[11] <https://withcanopy.com/blog/a-snapshot-of-the-latino-population-in-nyc>

[12] https://en.wikipedia.org/wiki/Demographics_of_New_York_City