Which is the best Neighborhood to open a Mexican Restaurant

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1. Introduction

1.1 The best part of living in a big city is the abundance of fast food restaurants you have to choose from! Cultures in different neighborhoods allow for a diverse food experience. It has been my experience to see several Mexican restaurants located in the same neighborhoods and sometimes on the same street depending on the racial makeup of the neighborhoods, while in some areas there are a few to none. According to https://www.franchisehelp.com/industry-reports/fast-food-industry-analysis-2018-cost-trends/, "In the United States revenue was a whopping $200 billion in 2015 - quite a lot of growth since the 1970 revenue of $6 billion. The industry is expected to have an annual growth of 2.5% for the next several years." Although the Fast Food market in the United States is dominated by Hamburgers, Mexican food is rising in industry sales. With this in mind, I would like to find the best location to open a new Mexican fast food restaurant in Manhattan, New York.

1.2 Problem

Although there may be an abundance of restaurants or fast chains available, There is always room for one more! What information to we look at when deciding where to open a food joint. How do we choose what neighborhood is best for business.

1.3 Interest

Everyone wants to enjoy an authentic Mexican meal! Some people may be interested in opening up their own Mexican restaurant and want to know which neighborhood would be best for business.

2. Data acquisition and cleaning

2.1 Data sources

Data has been pulled to capture the following most important questions to consider when deciding on which is the best neighborhood for business

- Which are the most popular venue categories
- What is the population base of this area?
- What is the income in this area?
- What is the average age of the people who live in this area?
- What is the average household income of the people who live in this area?
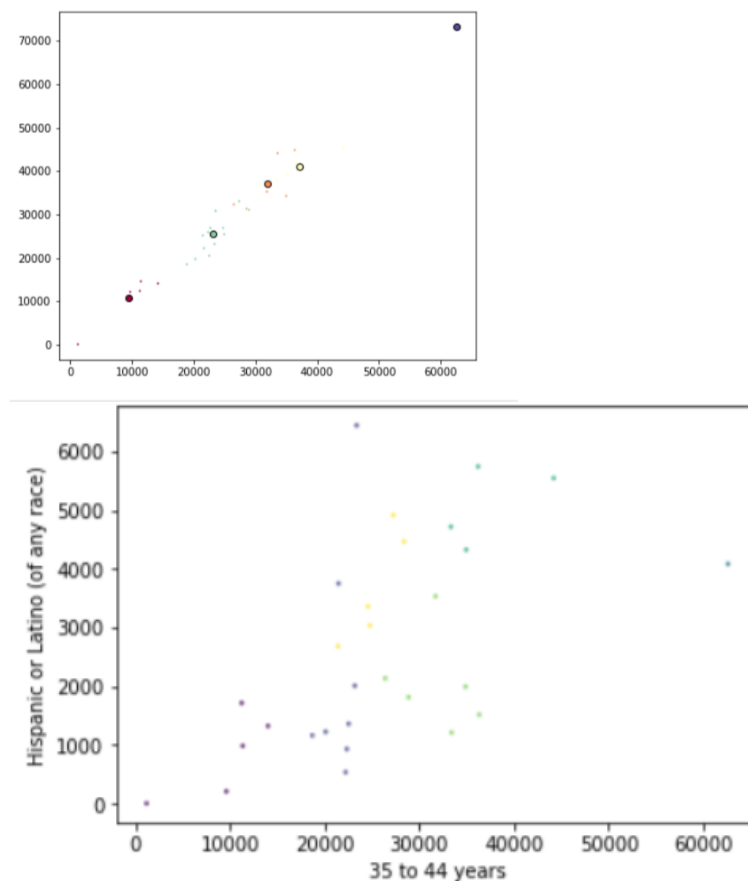- What is the ethnic breakdown of this neighborhood?

2.2 Data Gathering & Cleansing

Wikipedia table of the population by neighborhood was scraped and cleaned. We can see that the neighborhoods are ranked by population from 1 to 36. I merged new_york json file of latitudes and longitudes with the population data file so we can see exactly where the highest populated neighborhoods are located in Manhattan.

When the files were merged, we notice that there are some neighborhoods that display "Nan". For the purposes of this project. I removed all Nan from the dataset.

We use KMeans for neighborhood segmentation clusters of all data extracted. We use different data points like Race and Age Group, Employed vs Unemployed within the neighborhoods.

Figure 1. Clusters

Figure 2: Top 5 neighborhoods by Population. See table below:

Rating	Borough	Neighborhood	Population	Latitude	Longitude
1	Manhattan	Midtown	391,371	40.754691	-73.981669
4	Manhattan	Upper East Side	229,688	40.775639	-73.960508
5	Manhattan	Upper West Side	209,084	40.787658	-73.977059
6	Manhattan	Washington Heights	158,318	40.851903	-73.936900
7	Manhattan	East Harlem	115,921	40.792249	-73.944182

Then we used the geocoordinates to plot the location of each neighborhood into the map.
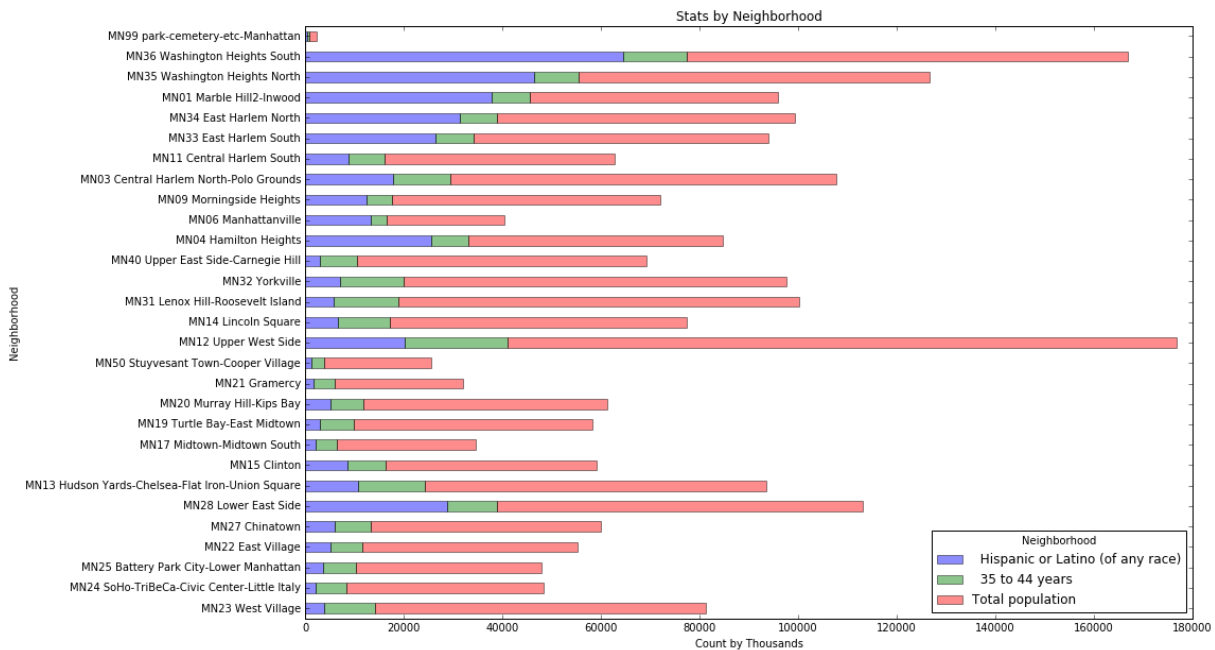
We import demographic data from New York open source. There were fields with "Nan" and duplicated columns, these were removed from the dataset. We convert the data from a string into integer and focus on the following columns below:

Figure 3: Dataframe of Top 5 Populated neighborhoods by Hispanic or Latino race within 35 to 44 years of age.

Neighborhood	Hispanic or Latino (of any race)	35 to 44 years	Total population
MN23 West Village	3908	10167	67185
MN24 SoHo-TriBeCa-Civic Center-Little Italy	2188	6104	40059
MN25 Battery Park City-Lower Manhattan	3623	6710	37506
MN22 East Village	5195	6280	43755
MN27 Chinatown	5918	7403	46550

We will import Matplotlib ply.plot to visualize the target age group, populaton and Hispanic population in each neighborhood:

Figure 4: Stats by Neighborhood

We can see Upper West Side and Washington Heights are the largest populated neighborhoods in Manhattan. Our concentration is on Hispanic neighborhoods with the age group of 35 to 44. We can see that most of the Hispanic population resides in Washington Heights (North, South) with a comparable size of people within our target age group.

We want to see the % of Hispanic Population and % of Age group within 35 to 44 years of total population.

Figure 5: Top 5 by % of Hispanic Population:

Neighborhood	Hispanic or Latino (of any race)	35 to 44 years	Total population	Hispanic % of Population	Age group % of Population
MN01 Marble Hill2-Inwood	37889	7647	50358	0.752393	0.151853
MN36 Washington Heights South	64553	12827	89551	0.720852	0.143237
MN35 Washington Heights North	46510	9041	71085	0.654287	0.127186
MN06 Manhattanville	13312	3275	23845	0.558272	0.137345
MN34 East Harlem North	31253	7582	60465	0.516878	0.125395

We also want to take into account the household income within these neighborhoods, so we will also pull in additional data. The Data was cleaned and formatted for our intended purpose. Below pic displays the household income by population count compared to total household of each neighborhood.

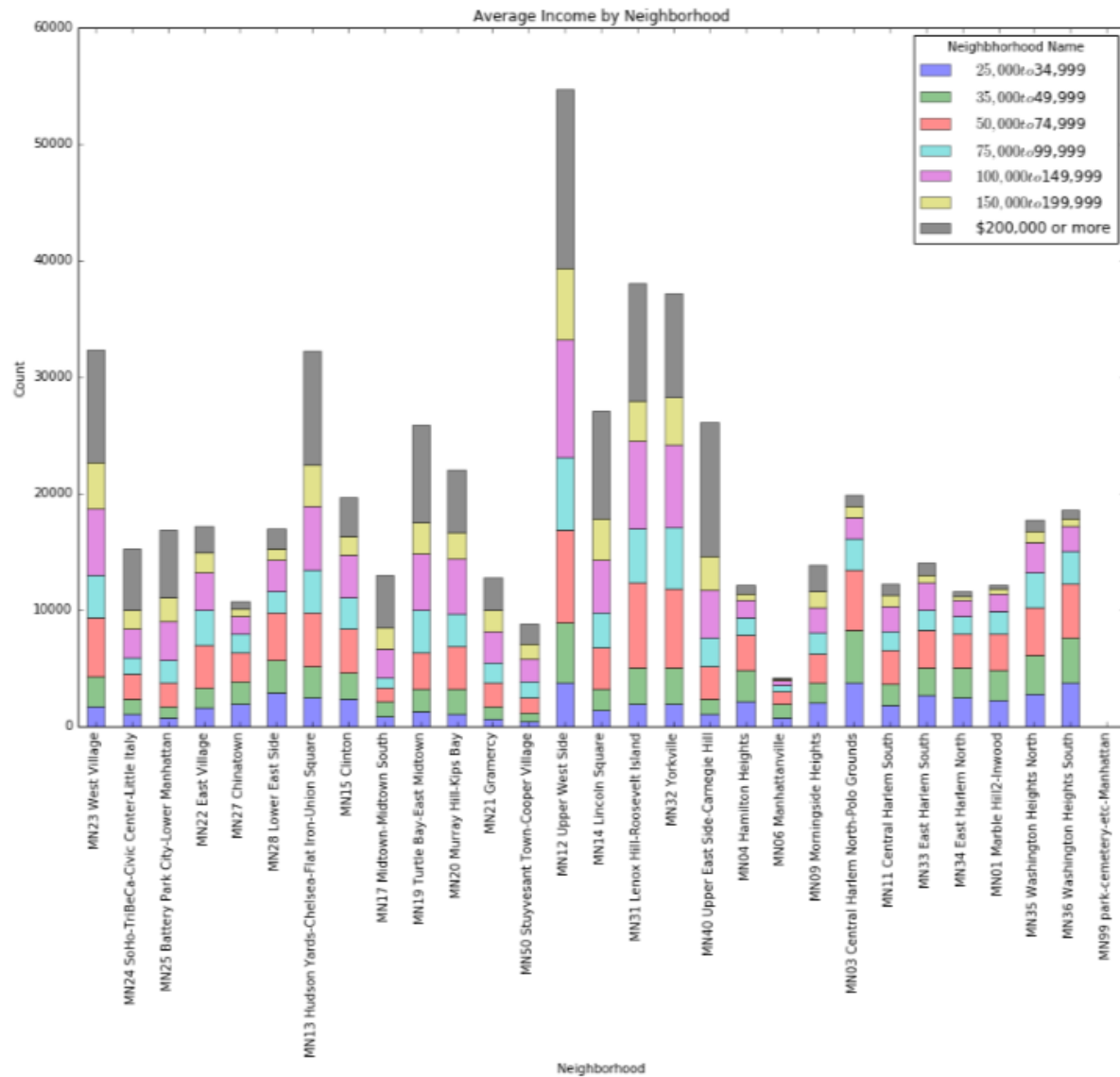For example: In West Village, the majority of household income is within $100,000 to $149,999

Figure 6: Dataframe Count of Population within each Average Household income bucket:

Neighborhood Name	Total households	25,000 to 34,999	35,000 to 49,999	50,000 to 74,999	75,000 to 99,999	100,000 to 149,999	150,000 to 199,999	$200,000 or more
MN23 West Village	37218	1728	2565	4998	3712	5715	3932	9655
MN24 SoHo-TriBeCa-Civic Center-Little Italy	18761	1052	1321	2098	1394	2506	1568	5336
MN25 Battery Park City-Lower Manhattan	18931	725	935	2125	1881	3340	2067	5814
MN22 East Village	22306	1583	1756	3608	2993	3260	1706	2229
MN27 Chinatown	18107	1911	1898	2530	1646	1467	632	661
MN28 Lower East Side	30216	2924	2803	4035	1847	2676	958	1706
MN13 Hudson Yards-Chelsea-Flat Iron-Union Square	39072	2448	2743	4573	3613	5495	3533	9786
MN15 Clinton	25261	2321	2246	3759	2696	3659	1649	3302
MN17 Midtown-Midtown South	15964	834	1345	1082	859	2546	1773	4500

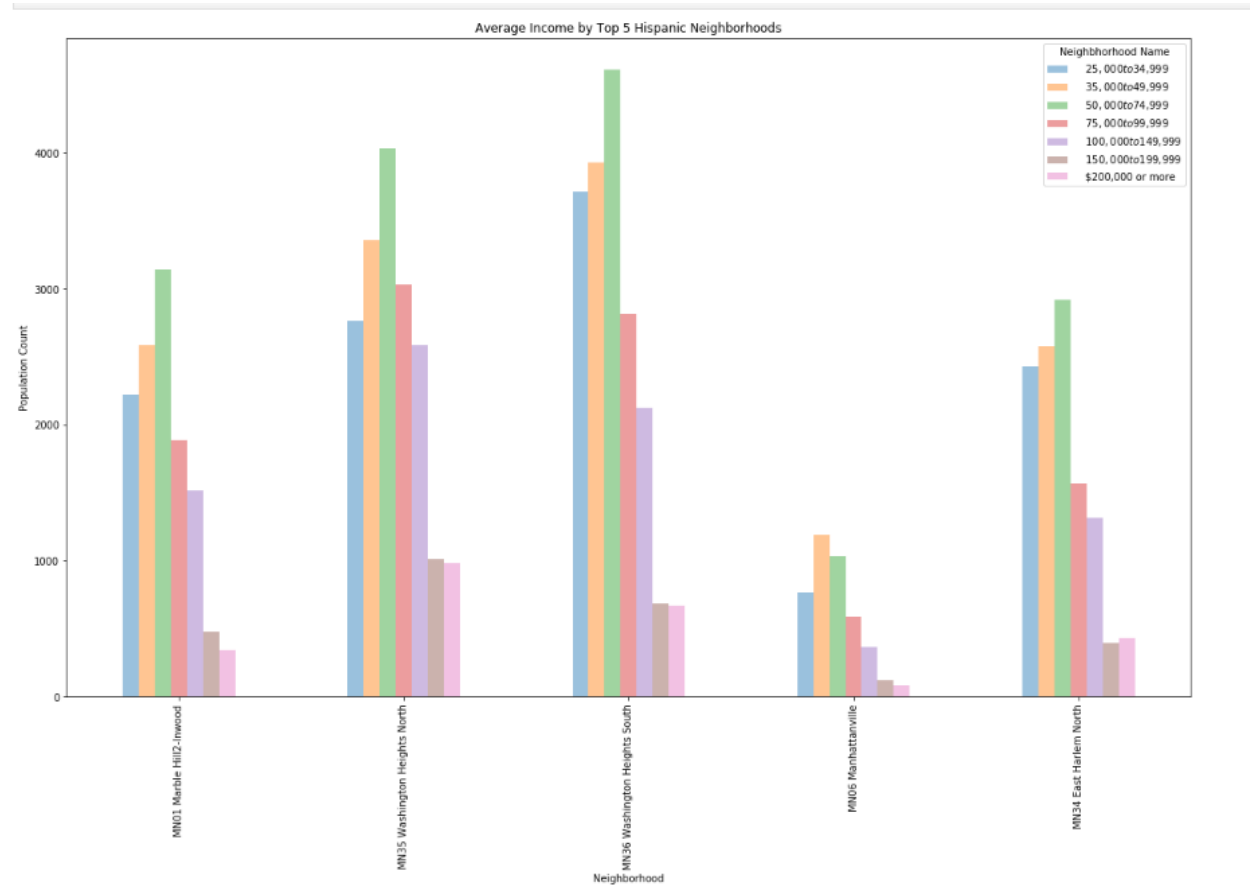We want to see which neighborhoods have an Average Income of at least $25,000 to > $200,000.

- Upper West Side neighborhood has the highest average income > $ 50,000
- Manhatanville is the lowest populated neighborhood with lowest combined average income compared to all Manhattan neighborhoods

Figure 7: Average Income by Neighborhood from $25,000 to > $200,000

Average Income by Neighborhood

Our focus will remain on the income of the Top 5 Hispanic neighbhoorhoods by % of the population.   We will look at the average household income within these neighborhoods

Figure 8. Top 5 Average Household income by Neighborhood:

With our current data, we will now use FourSquare API to look at the most popular type of venues in these neighbhoorhoods. Narrow our choice of neighborhood based on Food Industry venue and ratings if there is a current Mexican restaurant in the neighborhood.

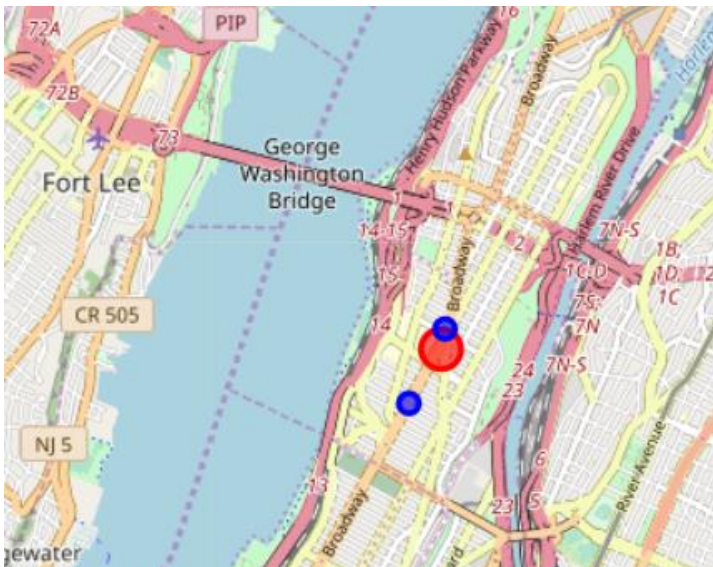We pull the venue categories by location in each neighborhood.

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng	postalCode	state	id
0	Columbia Wine Company	Wine Shop	4038 Broadway	US	New York	United States	at W 170th St	240	[4038 Broadway (at W 170th St), New York, NY 1...	[{'label': 'display', 'lat': 40.8420756, 'lng'...	40.842076	-73.938801	10032	NY	506cc066e4b019e8dad3a401
1	Highbridge Park	Park	173rd St & Amsterdam Ave	US	New York	United States	at Amsterdam Ave	236	[173rd St & Amsterdam Ave (at Amsterdam Ave). ...	[{'label': 'display', 'lat': 40.84076848482368...	40.840768	-73.942927	10032	NY	4ac93103f964a52013bf20e3
2	Carrot Top Pastries	Bakery	3931 Broadway	US	New York	United States	btwn 165th & 166th St.	170	[3931 Broadway (btwn 165th & 166th St.), New Y...	[{'label': 'display', 'lat': 40.83893274991639...	40.838933	-73.941359	10032	NY	4b2ce776f964a5208fca24e3
3	Tasty Deli	Sandwich Place	4020 Broadway	US	New York	United States	W 169th St	196	[4020 Broadway (W 169th St), New York, NY 1003...	[{'label': 'display', 'lat': 40.84181825314834...	40.841818	-73.939296	10032	NY	4af0c188f964a520e2de21e3

We map those venues to see where they are located

Figure 9. Map display of venues in neighborhood

We look for venues specific to "Mexican" food. Two restaurants were location within 500 miles of the neighborhood coordinates.

We use code to see if there are currently any trending venues in the area.

The dataset populated no trending values.

```
'No trending venues are available at the moment!'
```

Conclusion:

Based on Manhattan neighborhoods, the following were considered choosing the best neighborhood to open a Mexican Food chain

- Population of each neighborhood
- Hispanic population of each neighborhood
- Research stated the age group of 35 to 44 years old spend the most % of their income on eating out
    - neighborhood with highest population within this target area
- Household income of neighborhoods
- Venue catergory type of each neighborhood
- # of Mexican restaurants in the area

Best location is Washington Heights!

Sites used for reference:

https://data.cityofnewyork.us/browse?category=City+Government&limitTo=datasets

https://www.franchisehelp.com/industry-reports/fast-food-industry-analysis-2018-cost-trends/

https://www.restohub.org/operations/planning/new-york-restaurant/

http://worldpopulationreview.com/boroughs/manhattan-population/

https://statisticalatlas.com/county-subdivision/New-York/New-York-County/Manhattan/Race-and-Ethnicity

https://www.worldatlas.com/articles/manhattan-neighborhoods-by-population.html

Research your local market

This as important as studying overall industry trends - probably more. Make sure you understand the local economic situation and cultural context. Here are some examples of the types of questions you should be asking:

- Is fast food a fit for the people of my community?

- Are they likely to explore new types of food? Or will they eat burgers 7 days a week and twice on Sunday?

- Is this a particularly health conscious community?

- Are there specific regional flavors that resonate with the locals?

- What does the area "need"? What other types of restaurant options are nearby?

- What is the local labor force like?