

The Battle of Neighborhoods

WEEK 1

Initial Questions

Initial Prologue

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Week 1

Who is carrying out this study?

A friend of us who wants to start a new and successful business in the area of food and restaurants. He needs to choose a location in order to maximize the incomes of this business.

Where is he thinking about starting his project?

He considers that a good location could be a place surrounded by offices and business people. He should consider also to build the business in a country or city where the life cost and salaries are high in comparison to the average.

Our friend lives in the USA and according to this conditions, New York could be a right city due to all its economic activity.

Taking this considerations, Manhattan is famous all over the world for having a big density of offices, business men and expensive companies.

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Who are the stakeholders?

The main customers would be the businessmen of Manhattan. This people is characterized for having a lot of money, not a lot of free time and to have to look usually for a place where they could continue their meetings while eating with the customers.

Which kind of restaurant?

We need to find something that matches the next prerequisites:

- It has to be a fast food
- But must be elegant and appropriate for a business meal
- It must be a light food, where the people could eat and speak comfortably at the same time
- There's no problem in being expensive, the company will pay normally the bill
- Another point would be to let the customers to take away the food to the office so they don't have to stop their work

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Who's the winner?

We consider that a Sushi restaurant could be a good opportunity to math those requirements.

They can eat it during a meeting, take away to the offices and is a food that does not carry a high risk of making the suit dirty.



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Advantages

- It can be made quickly and it can be stored for some time before being sold
- It's a light food which contains vegetables, fish and rice. The perfect match to meet your feeding requirements in the meal and the dinner
- It doesn't need to be heated in the microwave and can be eaten while working with almost no risk of having an accident with your papers
- It's easy to package and transport
- It's a fashion food and it's not cheap, so there's a considerable margin of benefits

To sum up the Problem

We can suppose that we are thinking about opening a exotic restaurant in Manhattan, more specifically a Japanese or Asiatic one. This could be a good business opportunity but we need to carry out a market research in order to establish a long-term success.

To start with, we will analyse the existing restaurants of this category in Manhattan. And we will sort them by neighborhood, in order to identify the best possible location.

At the end, we will identify, based on a clustering, the best possible location in Manhattan.

Presentation of the Problem

Initial Presentation

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We take data from all Boroughs

We create a Dataframe with the downloaded data

```
[44] > MI
neighborhoods_data = newyork_data['features']
# We define the columns of the dataframe
column_names = ['Borough', 'Neighborhood', 'Latitude', 'Longitude']

# We start and initialize the dataframe
neighborhoods = pd.DataFrame(columns=column_names)

for data in neighborhoods_data:
    borough = neighborhood_name = data['properties']['borough']
    neighborhood_name = data['properties']['name']

    neighborhood_latlon = data['geometry']['coordinates']
    neighborhood_lat = neighborhood_latlon[1]
    neighborhood_lon = neighborhood_latlon[0]

    neighborhoods = neighborhoods.append({'Borough': borough, 'Neighborhood': neighborhood_name,
                                          'Latitude': neighborhood_lat, 'Longitude': neighborhood_lon}, ignore_index=True)

# We show the Dataframe
neighborhoods.head()
```

| | 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 |

And then concentrate on Manhattan

We analyze of the neighborhoods in Manhattan

```
[46] > MI
manhattan_data = neighborhoods[neighborhoods['Borough'] == 'Manhattan'].reset_index(drop=True)
manhattan_data.head()
```

| | Borough | Neighborhood | Latitude | Longitude |
|---|-----------|--------------------|-----------|------------|
| 0 | Manhattan | Marble Hill | 40.876551 | -73.910660 |
| 1 | Manhattan | Chinatown | 40.715618 | -73.994279 |
| 2 | Manhattan | Washington Heights | 40.851903 | -73.936900 |
| 3 | Manhattan | Inwood | 40.867684 | -73.921210 |
| 4 | Manhattan | Hamilton Heights | 40.823604 | -73.949688 |

Presentation of the Problem

Analysis of the New York Perspective and concentrate the focus on Manhattan

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We take data from Foursquare about all the Venues in Manhattan, filtering by Category

```
We take the venues in Manhattan of Japanese and Sushi Restaurants

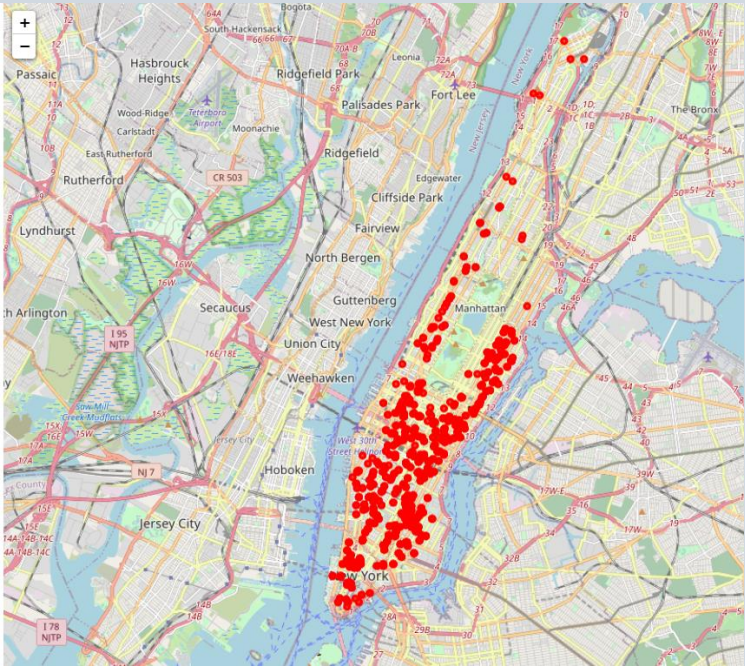
[50] > MI
neighborhoods = neighborhoods[neighborhoods['Borough'] == 'Manhattan'].reset_index(drop=True)
newyork_venues_sushi = getNearbyVenues(names=neighborhoods['Neighborhood'], latitudes=neighborhoods['Latitude'], longitudes=neighborhoods['Longitude'], radius=1000, categoryIds='4bf58dd8d48988d1d2941735')
newyork_venues_sushi.head()

Neighborhood Neighborhood Latitude Neighborhood Longitude Venue Venue Latitude Venue Longitude Venue Category
0 Harlem Hill 40.876551 -73.910660 Planet Tokyo 40.886233 -73.909479 Sushi Restaurant
1 Chinatown 40.715618 -73.994279 Nakeji 40.715912 -73.996597 Sushi Restaurant
2 Chinatown 40.715618 -73.994279 Shinsen 40.715608 -73.996611 Japanese Restaurant
3 Chinatown 40.715618 -73.994279 Sushumi Asian Fusion 40.721155 -73.987337 Sushi Restaurant
4 Chinatown 40.715618 -73.994279 Bondi Bar 40.721247 -73.996264 Sushi Restaurant

[51] > MI
print("To answer the question How many Sushi Restaurants are there in Manhattan?")
newyork_venues_sushi.shape

To answer the question How many Sushi Restaurants are there in Manhattan?
(1100, 7)
```

And show them in a map



Presentation of the Problem

Analysis of the Venues in Manhattan

We analyze the different neighborhoods in Manhattan by frequencies, according to the venues

Presentation of the Problem

Analysis of the Venues in Manhattan

| | Neighborhood | Asian Restaurant | Bakery | Chinese Restaurant | Cocktail Bar | Deli / Bodega | Fish Market | Grocery Store | Hawaiian Restaurant | Indian Chinese Restaurant | Japanese Restaurant | Noodle House | R |
|---|-------------------|------------------|----------|--------------------|--------------|---------------|-------------|---------------|---------------------|---------------------------|---------------------|--------------|------|
| 0 | Battery Park City | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.090909 | 0.045455 | 0.00 |
| 1 | Carnegie Hill | 0.041667 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.000000 | 0.000000 | 0.000000 | 0.041667 | 0.125000 | 0.000000 | 0.00 |
| 2 | Central Harlem | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.00 |
| 3 | Chelsea | 0.045455 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.022727 | 0.000000 | 0.000000 | 0.000000 | 0.113636 | 0.000000 | 0.00 |
| 4 | Chinatown | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.125000 | 0.000000 | 0.00 |
| 5 | Civic Center | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.062500 | 0.031250 | 0.00 |

And the most common venues

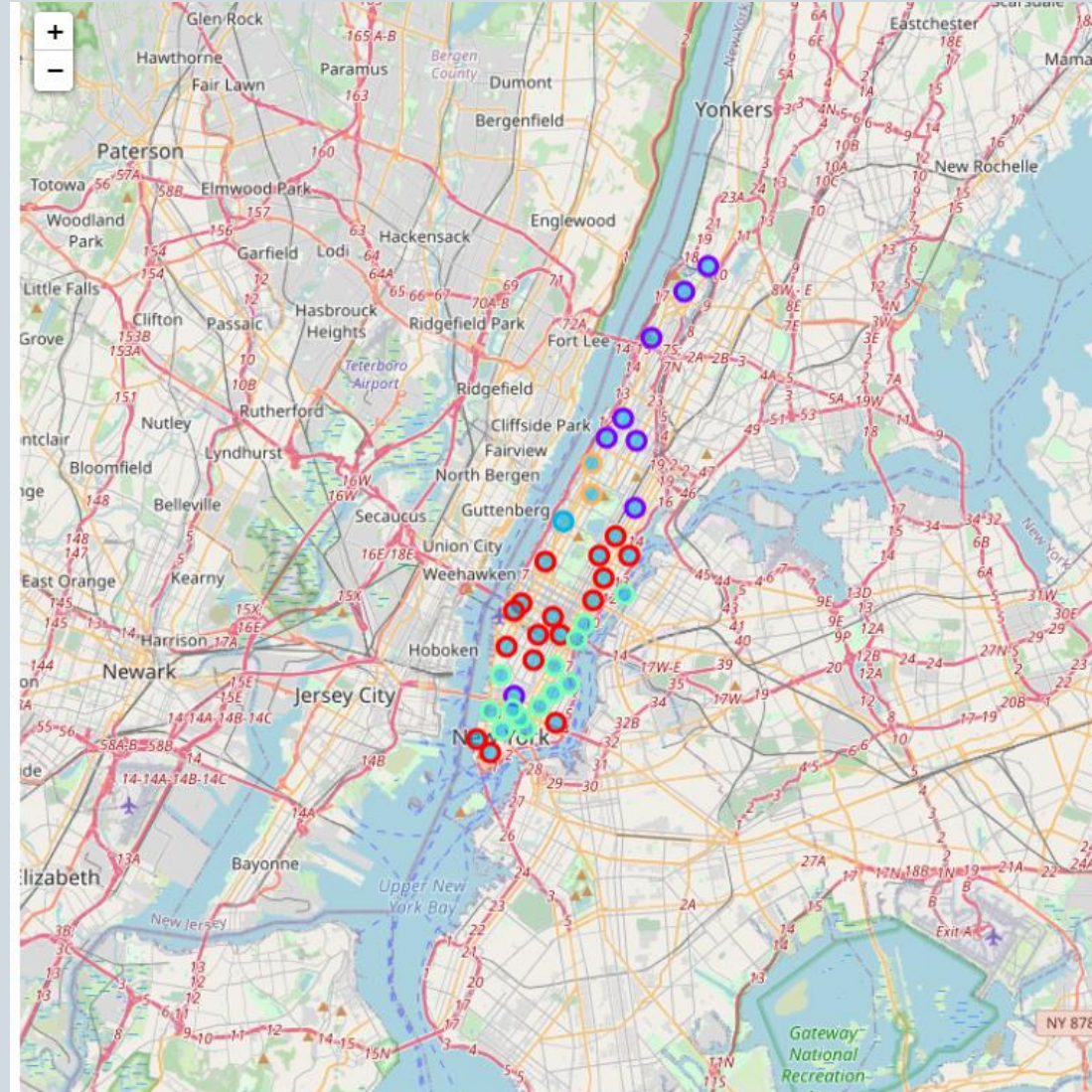
| | Neighborhood | 1st Most Common Venue | 2nd Most Common Venue | 3rd Most Common Venue | 4th Most Common Venue | 5th Most Common Venue | 6th Most Common Venue | 7th Most Common Venue |
|---|-------------------|-----------------------|-------------------------------|-------------------------------|---------------------------|-------------------------------|-----------------------|-----------------------|
| 0 | Battery Park City | Sushi Restaurant | Japanese Restaurant | Noodle House | Theme Restaurant | Indian Chinese Restaurant | Bakery | Chinese Restaurant |
| 1 | Carnegie Hill | Sushi Restaurant | Japanese Restaurant | Vegetarian / Vegan Restaurant | Indian Chinese Restaurant | Asian Restaurant | Seafood Restaurant | Sandwich Place |
| 2 | Central Harlem | Sushi Restaurant | Vegetarian / Vegan Restaurant | Japanese Restaurant | Bakery | Chinese Restaurant | Cocktail Bar | Deli / Bodega |
| 3 | Chelsea | Sushi Restaurant | Japanese Restaurant | Asian Restaurant | Fish Market | Vegetarian / Vegan Restaurant | Seafood Restaurant | Sandwich Place |
| 4 | Chinatown | Sushi Restaurant | Japanese Restaurant | Vegetarian / Vegan Restaurant | Bakery | Chinese Restaurant | Cocktail Bar | Deli / Bodega |

We cluster them into 5 groups and present it in a map with different colours

Presentation of the Problem

Clustering the Venues

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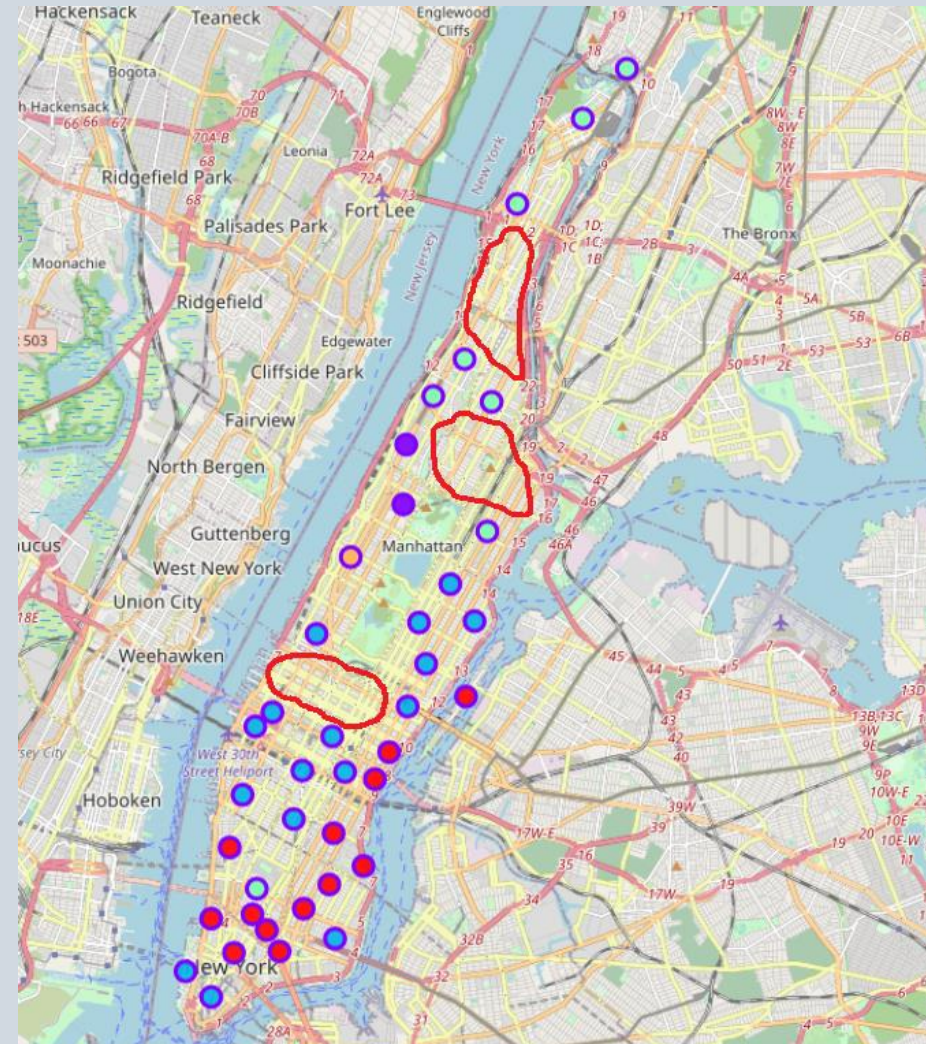


We find the best zones to open our restaurant and highlight them in red

Presentation of the Problem

Finding the best location

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Presentation of the Problem

Extra

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Possible future lines:

- To include an analysis of all the companies in the city and their average salary to determine the locations with the highest acquisition level
- To include information related to bus stops, underground stations and the traffic in the avenues
- Contrast this conclusions with other types of restaurant around the neighborhoods