

# MANHATTAN JUICE BAR

IBM DATA SCIENCE CAPSTONE PROJECT

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# Introduction

The Health & Wellness industry is ever expanding, and the global wellness economy is currently value at \$4.5 trillion. A significant part of this market is devoted to the healthy eating and nutrition segment (\$702 billion). (Source: Global Wellness Institute).

This focus on healthy eating is seeing a major shift, with the average consumer more conscious than ever about the food they consume. Trends such as transparency and naturalness dominate our daily decisions starting with breakfast, to mindful eating through the day. Companies flaunt the origin, quality and purity of the ingredients as a measure towards transparency while promising minimally processed food to maximize the nutritional benefits.

A 2019 article published in the International Journal of Obesity shows the correlation between regular exercise and dietary preference. The lead researcher said that compliance with an exercise regimen is strongly co-related with a move towards healthy eating. It was also noted that exercise can change brain function and the rewiring may be behind the urge to eat more healthfully. The ongoing pandemic has also shifted consumer priorities and has the populace looking for health-focused products that can be accessed easily and safely.

The aim of the project is to help players in the health and wellness segment by identifying highly desirable physical locations for their businesses in Manhattan, New York. The project particularly focuses on **fresh juice stands, juice bars, healthy smoothie stations, juice cleanses** or similar businesses. For an independent self-starter hoping to cash in on the recent fitness boom, this project will provide optimal locations to set up a new health-food business that can leverage existing synergistic businesses and startup with very little capital.

The above-mentioned correlation between healthy habits was utilized to analyze existing fitness centers and recommend prime locations to set up juice bars to maximize profitability.

## Data

The following data was analyzed to determine the optimal locations to set up juice bars in the Manhattan borough of New York City.

1. Locations of Fitness Centers
2. Locations of Existing Juice Bars
3. Locations of Existing Health and Wellness Markets

The goal of the project is to analyze the three groups of data in order to be within walking distance of fitness centers while avoiding existing juice bars to maximize revenue potential by avoiding competition. Health and Wellness markets were included to further refine the data to identify locations to develop synergistic relationships by partnering with them and reducing start-up costs of establishing a standalone juice bar.

### Data sources

1. NYU Spatial Data Repository - 2014 New York City data
2. Foursquare API – Business/ Landmark location

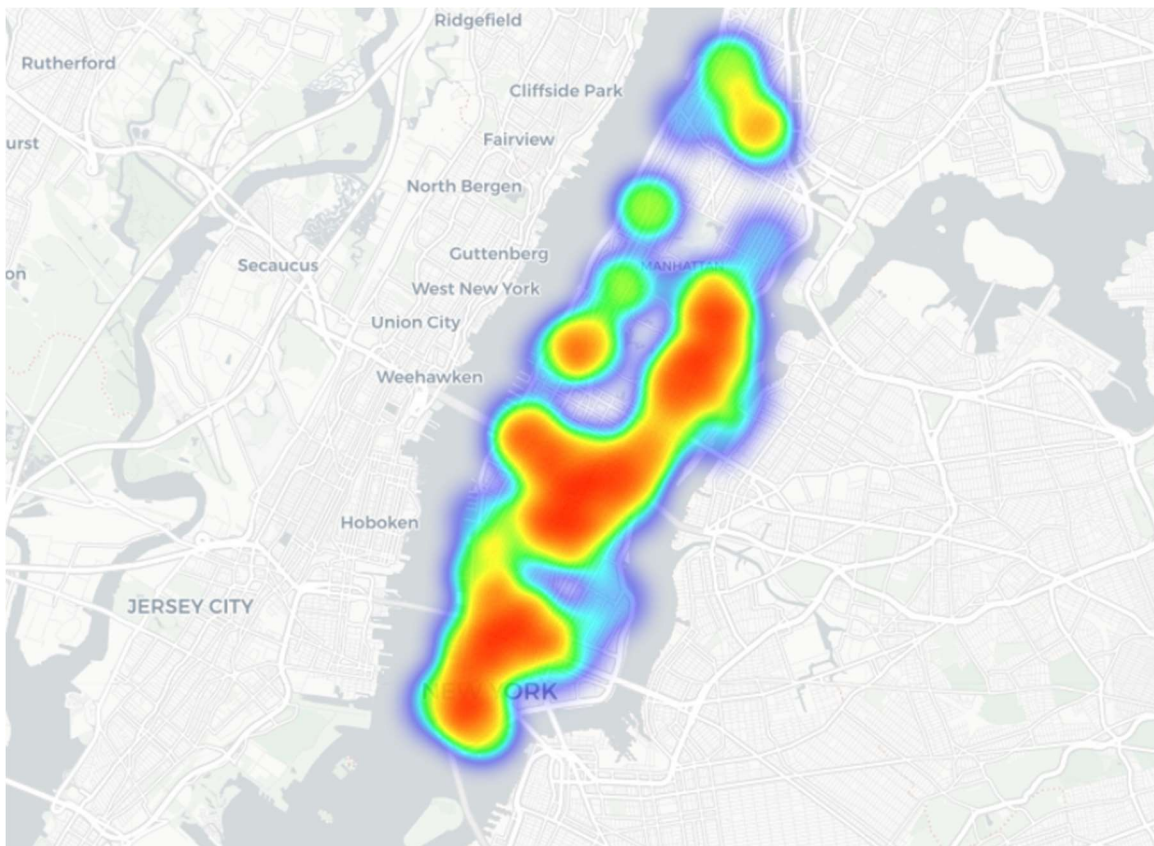
# Methodology

The data was analyzed in 4 steps:

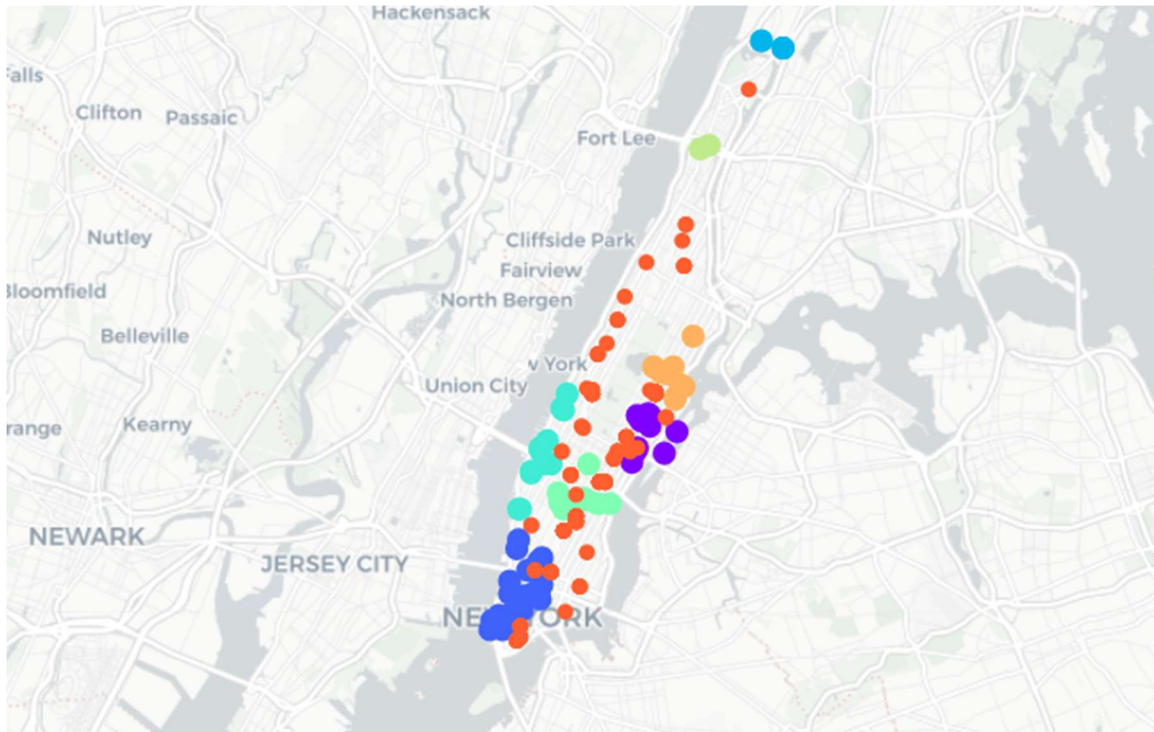
1. The location data of the fitness centers in Manhattan was extracted and visualized using a heat map. The red zones broadly indicate the potential locations of the juice bars.
2. The location data of existing juice bars was extracted. This data was collated against nearby fitness centers to determine which fitness centers should be excluded from the analysis.
3. K-means Clustering algorithm was used to cluster the fitness centers and refine the potential locations.
4. The location data of synergistic businesses was then extracted. This data was then analyzed to see if they are close to the potential locations as determined from the clustering step above.

## Analysis

Heat map showing the concentration of fitness centers in Manhattan



It was determined that 7 clusters are optimal to achieve the project objectives. Map showing 7 clusters with existing juice bars.



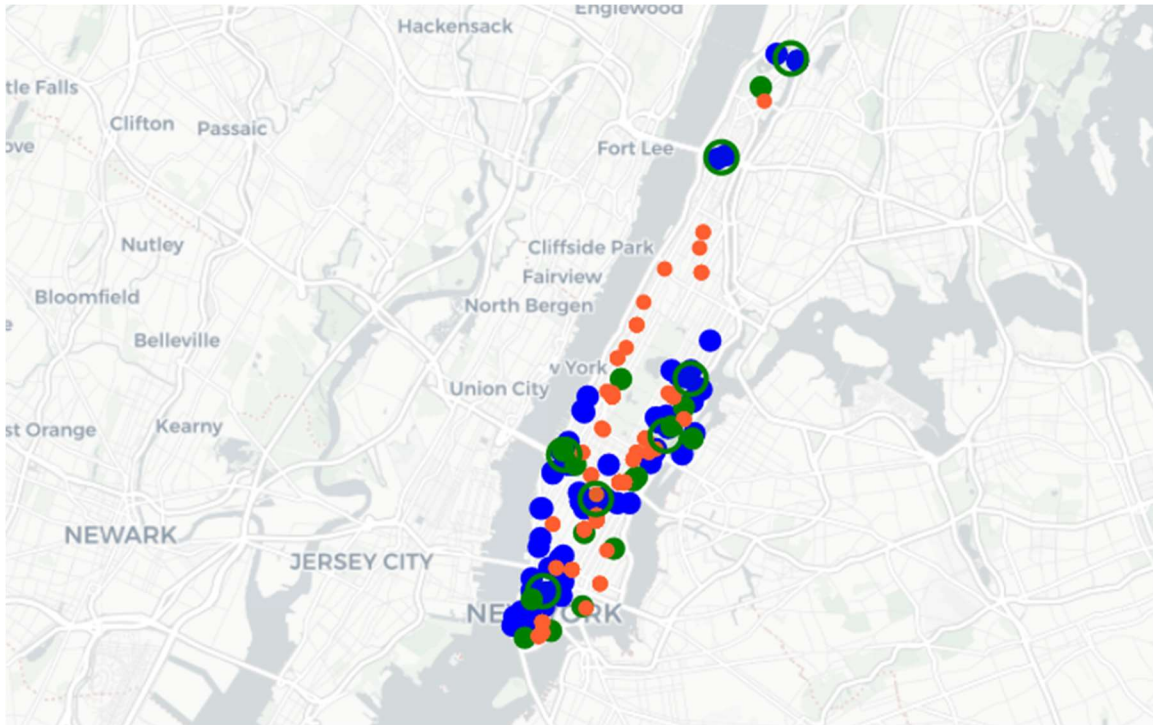
## Synergistic Businesses

The **7 clusters** shown on the map only indicate a general area in which the juice bars can be located. To improve the chances of success and to reduce capital expenditures the data was further explored to see if there are businesses with whom a **synergistic relationship** can be formed. These businesses would have similar clientele as the target customers but are not in direct competition and would be typically labeled as **Organic Groceries, Farmers' Markets or Health Food Stores**.

Synergistic businesses will have these characteristics:

- Located close to the cluster center (within 500m) so capital expenditure can be reduced via co-location.
- Have an established reputation so their customer base and foot traffic can be leveraged.

The data for 15 such businesses was extracted and analyzed to determine if they fit these criteria.



## Results

A review of the results obtained by neighborhood and cluster is presented below.

### 1. Lenox Hill, Clinton, Civic Center - Clusters 0,1,2

These three clusters have clear targets per the criteria. These are prime candidates to set up juice bars with minimal cost and greatest chance of success.

|                      | Neighborhood | Market Name         | Market Latitude | Market Longitude | Distance to Cluster Center |
|----------------------|--------------|---------------------|-----------------|------------------|----------------------------|
| <b>Cluster Label</b> |              |                     |                 |                  |                            |
| 0                    | Lenox Hill   | A Matter of Health  | 40.768028       | -73.955933       | 359.929642                 |
| 1                    | Clinton      | Sunac Natural Food  | 40.760725       | -73.998425       | 130.053516                 |
| 1                    | Clinton      | Terra Market        | 40.756864       | -73.993737       | 472.221335                 |
| 2                    | Civic Center | Tribeca Greenmarket | 40.716802       | -74.010880       | 456.535864                 |

## **2. Carnegie Hill - Cluster 6**

Carnegie Hill has a good concentration of fitness centers and there are no competing juice bars near the cluster center. However, this location may need significant investment to setup a physical location near the cluster center as there are no existing synergistic businesses that can be leveraged. More cost-benefits analysis need to be performed to proceed.

## **3. Marble Hill, Washington Heights - Cluster 3,5**

The concentration of fitness centers is really low in these neighborhoods therefore may not justify the capital required to setup a juice bar. There is a possibility to serve these clusters from a central location with a synergistic business: **Inwood Farmers Market, Inwood, NY**. However, there could be competition from a nearby juice bar in Inwood.

## **4. Midtown South - Cluster 4**

Midtown South has a good number of fitness centers however there is competition and no compatible businesses. This should be the last target.

# **Discussion**

As with any data analysis, the recommendations are only as good as the data used. Stakeholders need to constantly monitor and update this data to ensure that the analysis is providing the right direction.

Also, the assumptions and constraints play a crucial role in analyzing the business case and in providing the resulting recommendations. These need to be monitored regularly and updated when the business environment changes.

# **Conclusion**

Purpose of this project was to analyze the location of fitness centers in Manhattan and suggest optimal locations to setup a fresh juice bar to attract customers from underserved fitness centers. In addition, to leverage the benefits of co-location with a synergistic business. The results for each neighborhood have been clearly discussed above.

Stakeholders can now obtain a lot of valuable information on the distribution of fitness centers in Manhattan and can strategically locate their juice bars depending on their risk appetite and capital availability.

Map showing cluster centers with synergistic businesses.

