



Vegatarian Restaurant Choice

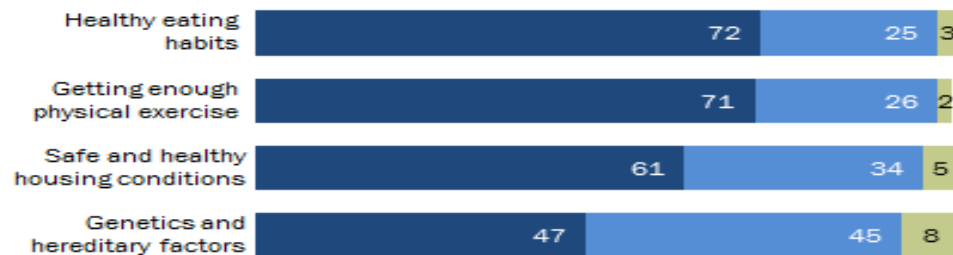
Vegatarian Restaurant and its trend

- ▶ People from US are becoming more and more health concious today
 - ▶ 54% of the US people pay more attention to healthy eating
 - ▶ 97% of US people believe that healthy eating habits and getting enough exercises are key to a long and healthy life
 - ▶ Within millenial group (age <30), around 12% of them are strictly or mostly or simply vegan.
- ▶ Opportunities arises for health-related business

Majority of Americans say healthy eating, physical exercise are key to a long and healthy life

% of U.S. adults who say each of the following is _____ when it comes to improving a person's chances of a long and healthy life

■ Very important ■ Somewhat important ■ Not too important/Not at all important



Note: Respondents who did not give an answer are not shown.

Source: Survey conducted May 10-June 6, 2016.

"The New Food Fights: U.S. Public Divides Over Food Science"

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More vegans and vegetarians in younger generations

% who say they are strictly or mostly vegan or vegetarian

U.S. adults	9%
18-29	12
30-49	12
50-64	5
65+	5

Have food allergies	21
Have food intolerances, but no allergies	8
Have neither	6

Republican	6
Democrat	12

Conservative Rep	4
Mod/lib Republican	8
Mod/cons Democrat	9
Liberal Democrat	15

Note: Republicans and Democrats include independents and other non-partisans who "lean" toward the parties. Respondents who do not lean to a political party not shown.

Source: Survey conducted May 10-June 6, 2016.

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Our Business problem

- A friend would like to open a vegetarian restaurant in New York city – Manhattan
- Which location can he choose?

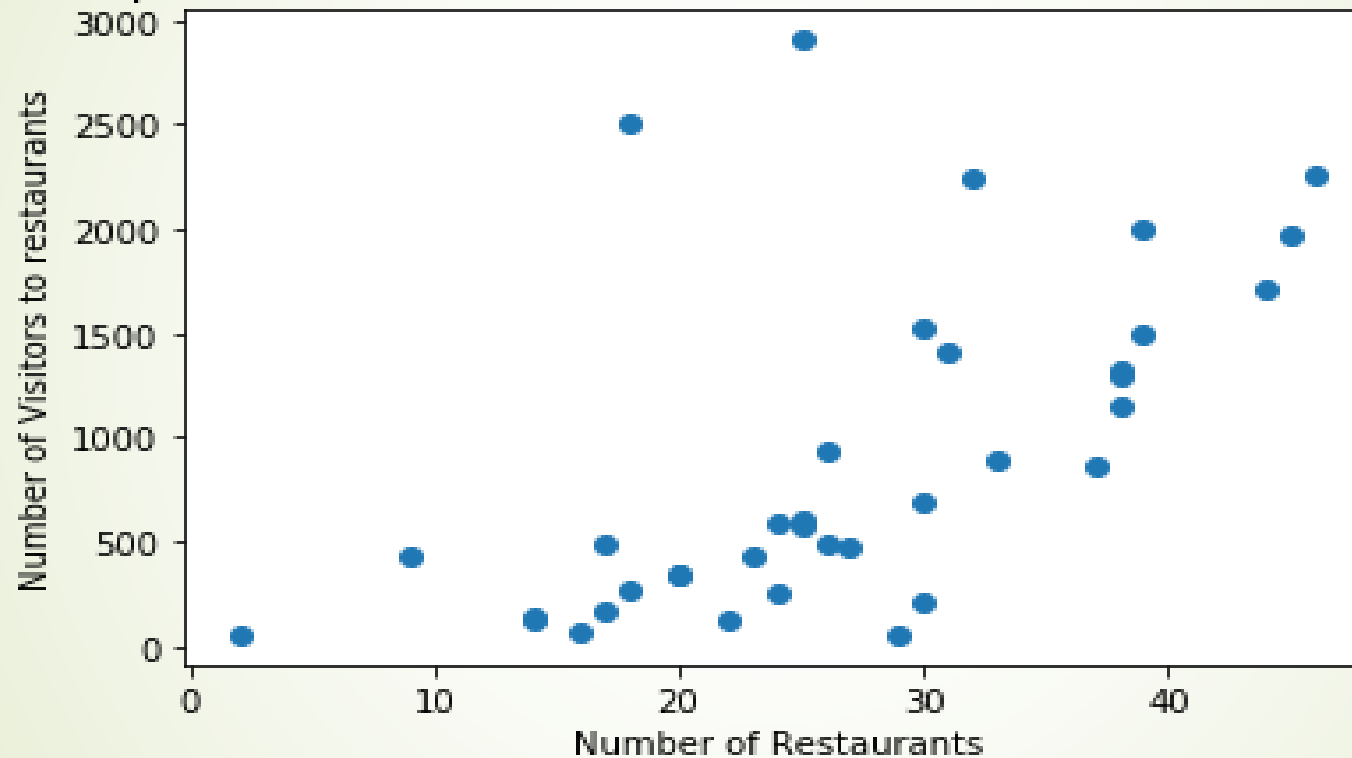


Data Acquisition and Data Cleansing

- Collect health-related business around the neighbourhood
- Where can we obtain such data?
 - Neighbourhood Data in Manhattan City
 - Foursquare API
 - Google API Data
- Data Cleansing
 - Missing Value are replaced by 0
 - Categories are regrouped
 - In the end, 185 gyms and 940 restaurants in Manhattan are included in our study

Relationship between number of restaurants and number of visitors to restaurants

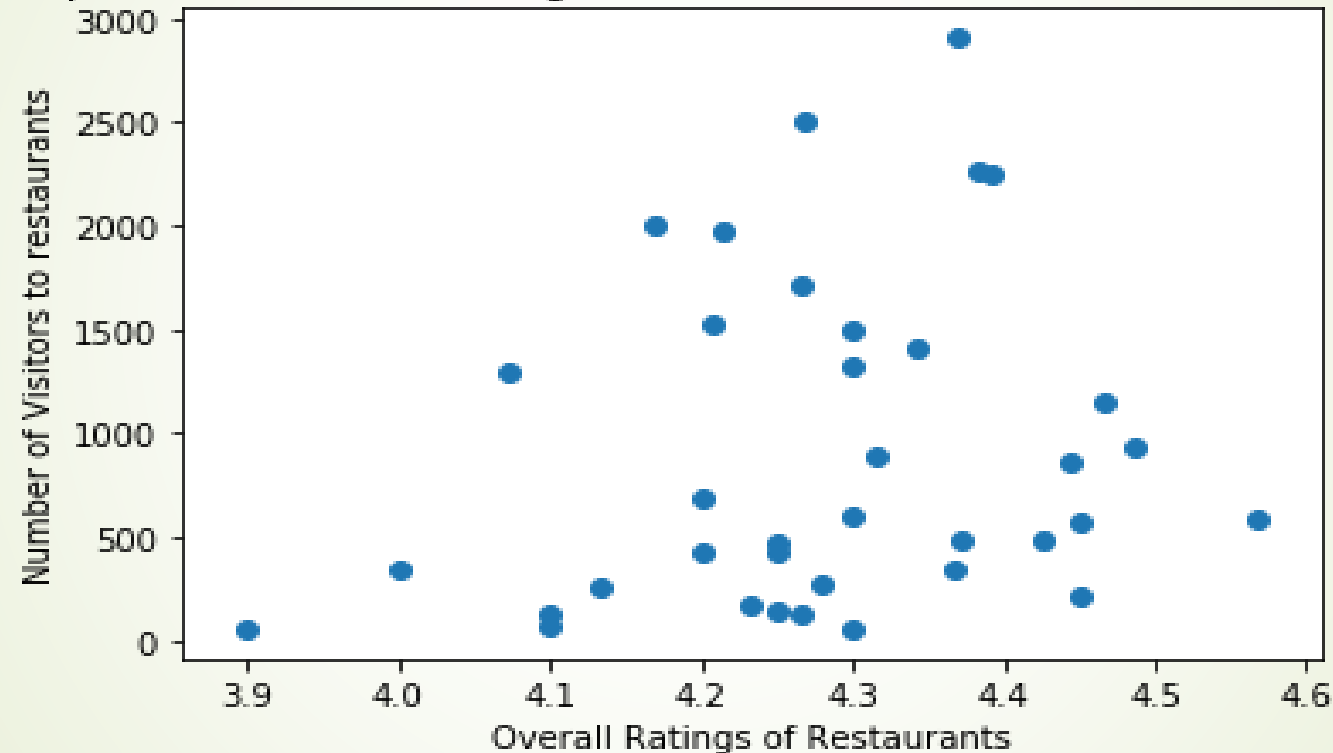
Relationship between Number of restaurants and Number of Visitors to restaurants



Average number of customers to a restaurant increases when the number of restaurants in the neighbourhood increases

Relationship between overall rating of restaurants and number of visitors to restaurants

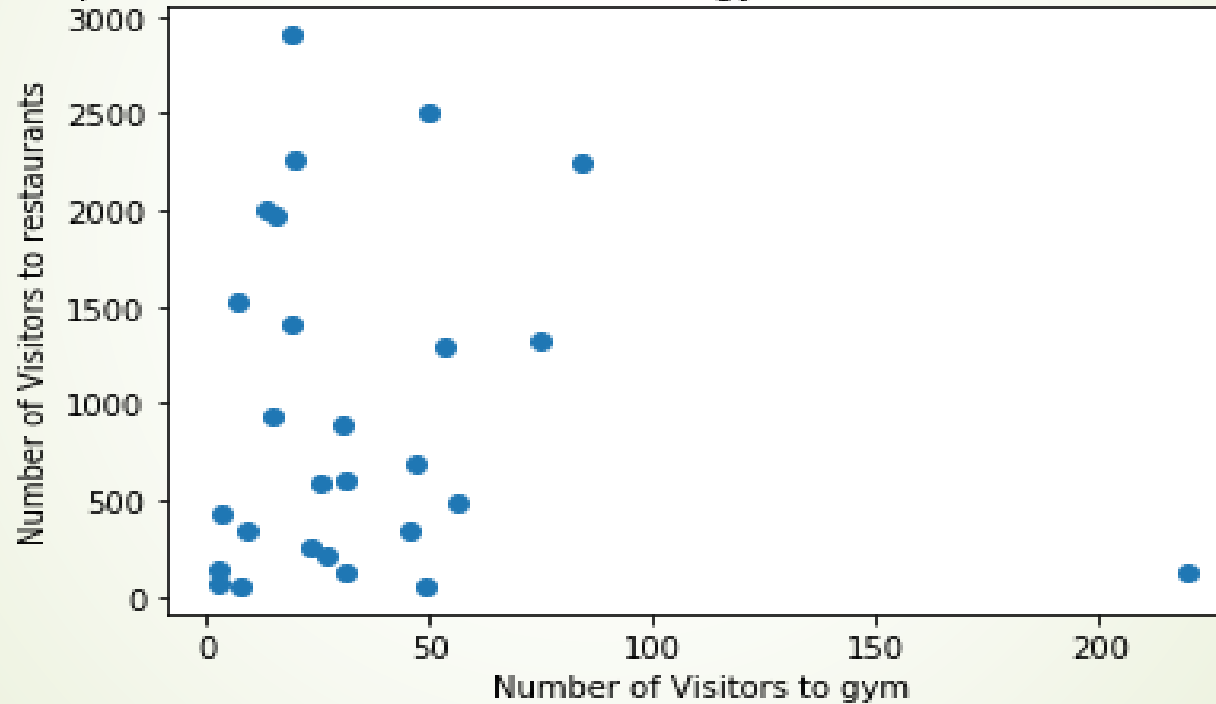
Relationship between overall rating of restaurants and Number of Visitors to restaurants



Average number of customers to a restaurant increases until overall rating of restaurants in the neighbourhood is 4.4

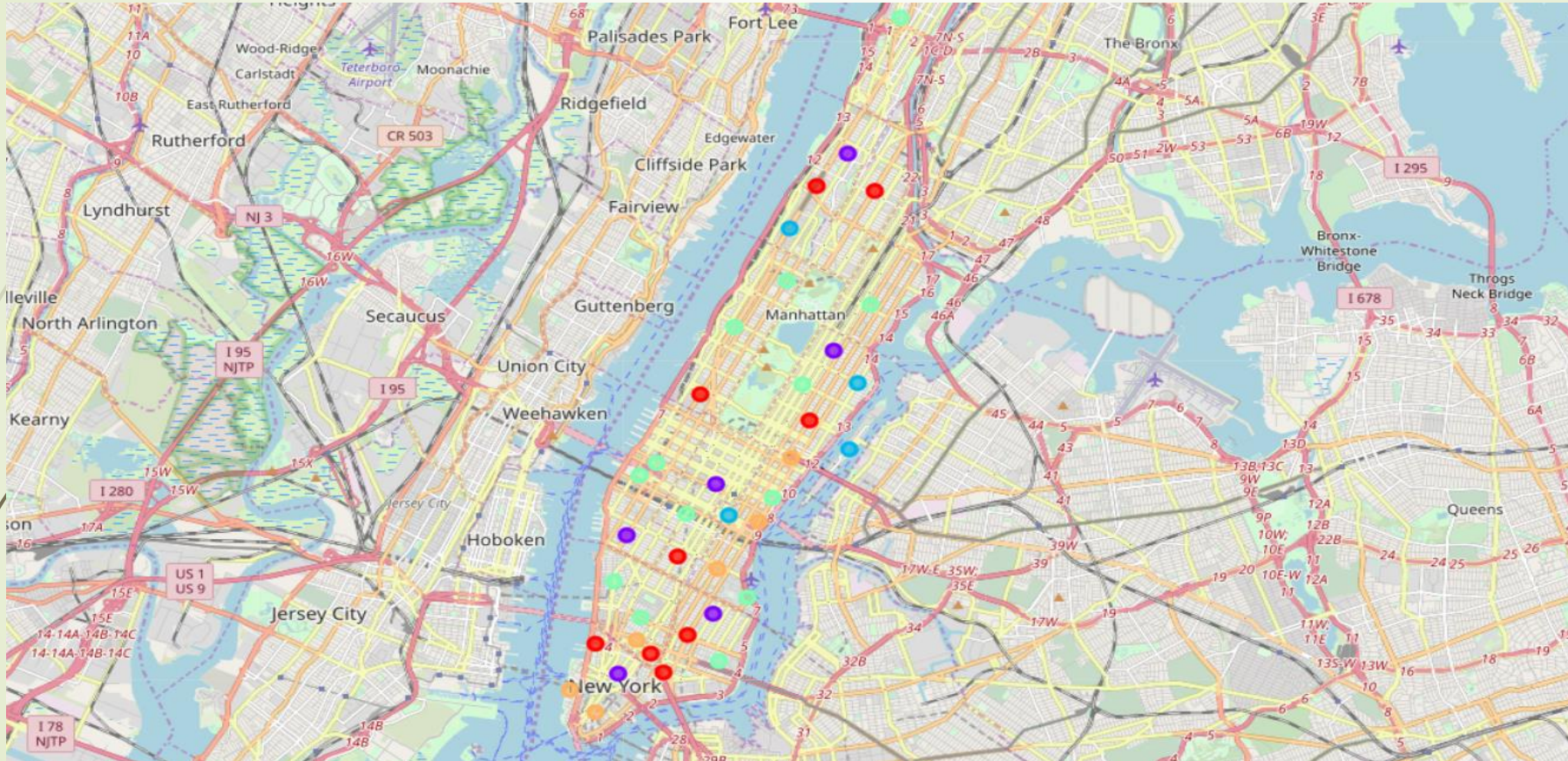
Relationship between number of visitors to gym and number of visitors to restaurants

Relationship between Number of Visitors to gym and Number of Visitors to restaurants



Average number of customers to a restaurant increases until Average number of customers to a gym in the neighbourhood is 30

Clustering Model

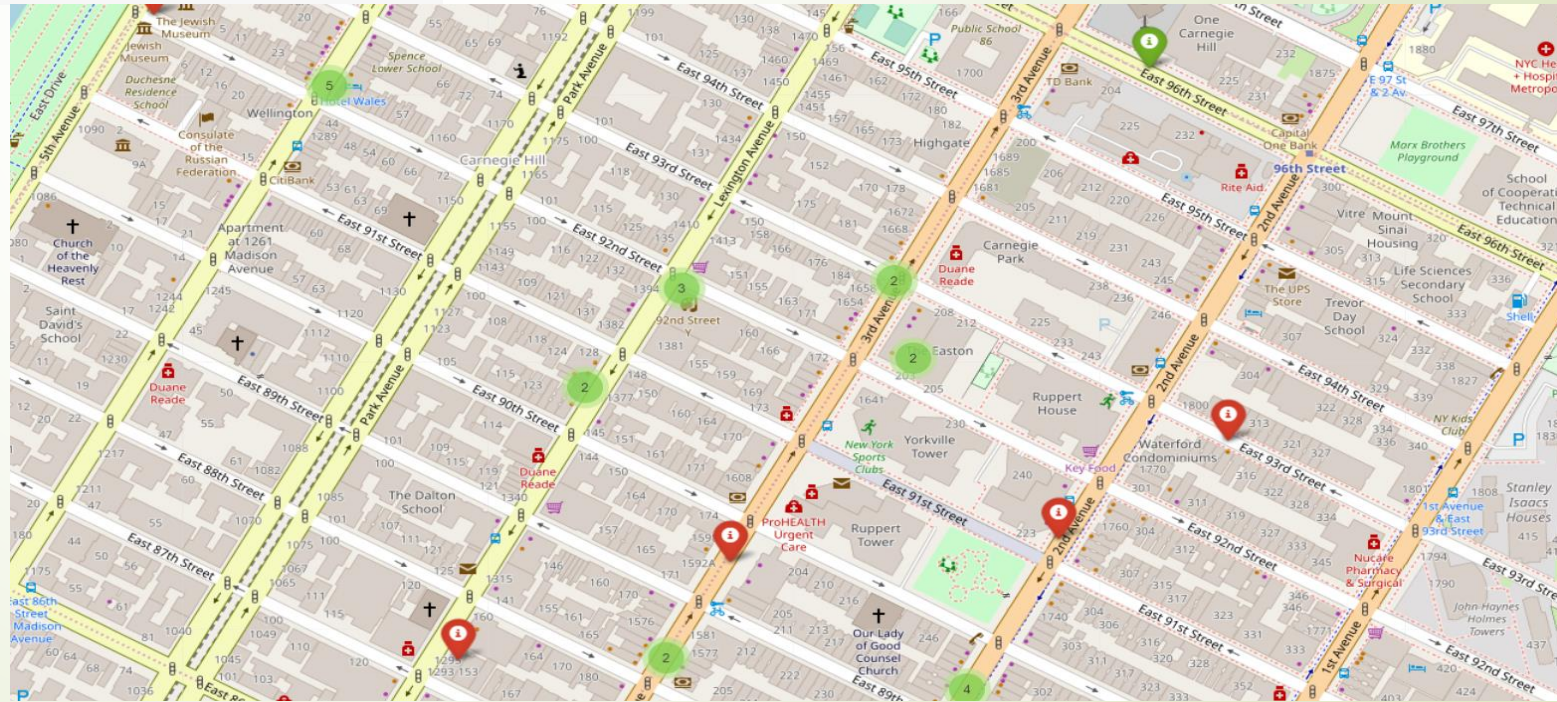


By applying k-means clustering model on the attributes mentioned, we are able to cluster neighbourhoods in 5 groups.

Conclusion

	Cluster Labels	rest_Overall rating	rest count	gym User total Rating	gym_Overall rating	gym count	Rest User total Rating
0	0	4.297591	26.700000	1068.0	3.487833	5.700000	48942.0
1	1	4.350794	26.000000	415.0	2.941667	5.666667	15646.0
2	2	3.200000	19.500000	298.0	1.812500	3.750000	7710.0
3	3	3.954847	24.714286	1750.0	2.682143	3.642857	46503.0
4	4	3.523788	26.000000	617.0	3.541667	6.166667	24876.0

Cluster 1 converges to our equilibrium so we pick one of the neighbourhood to take a closer look





Conclusion and Future Directions

- In future, after restaurants are set up
 - regression model on the visitors flow to the new restaurants basing on the clustering model
 - measure the accuracy for the forecast
- Pricing strategy
- With traffic flow data:
 - how to allocate the best manpower during different time of the day to serve the customer
 - study how often they would visit a vegatarian restaurant after visiting gym