

# Where is Jet's New Restaurant?

By John Leung

## Business Problem

On my recent trip to LA, I met a young American Chinese friend named Jet who is a Chef by training. He moved to LA six months ago hoping to open his own restaurant. But he was disappointed by all the different well established restaurants everywhere in the Chinese neighborhoods. He did not think his restaurant would have a chance in that market condition. He was trained in this country and because of his Chinese heritage, his passion is to create his own fusion Chinese dishes. He needs to rethink his idea of his first restaurant now. Should it be a fusion Chinese cuisine which is his original thought or other non Chinese restaurant? He loves to stay within Chinese neighborhood but it does not seem possible if he is in LA. Since I am from the East Coast, I told him that the City of New York and the City of Toronto would be other cities for him to consider. These cities have big Chinese and Asian populations. He had lots of questions about the two cities. Yelp is a good site for him to do his research. But I offered to use Foursquare to look at the city and restaurant data to quantitatively answer his questions and make recommendations.

## Data

The first and foremost question to answer is location: where should this new restaurant be? After making the wrong move to LA at the first time, he can really benefit from a research on the potential locations before making his move again. Taking my suggestion, the focus is on the City of Toronto and NYC areas.

The City of Toronto is made up of many neighbourhoods. The list of neighbourhoods is downloaded from [https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M).

In order to use the Foursquare API, location addresses are converted into their equivalent latitude and longitude values which is included in constructing url. Geographical coordinates data of these Toronto neighbourhoods is downloaded from [http://cocl.us/Geospatial\\_data](http://cocl.us/Geospatial_data).

Among the neighbourhoods, Scarborough and North York are the two neighbourhoods with higher Chinese population. The neighbourhood list is trimmed to include only these two neighbourhoods.

To obtain dataset of NYC, I turned to the NYU Spatial Data Repository provided by NYU DataServices for data on New York city. I downloaded a dataset which contain data on the boroughs and the neighborhoods in each borough, as well as the latitude and longitude coordinates of each neighborhood.

In New York City, the obvious choice of location with many Chinese is Manhattan Chinatown. The neighbourhood list is trimmed to include only Manhattan Chinatown.

The lists of neighbourhoods in Scarborough, North York, and Manhattan Chinatown are combined to make a single list to perform neighbourhood analysis in Foursquare. The list has 76 neighbourhoods in total.

## Methodology

According to Foursquare website, Foursquare's global venue database provides information for millions of global venues and details such as photos, tips, and reviews. The database was created based on the information generated from more than 12 billion check-ins by Foursquare community members. A list of the top 4 most common venues of each neighbourhood on our neighbourhood list is generated using Foursquare's database.

Out of the 76 neighbourhoods, 6 neighbourhoods with Chinese Restaurant ranked 4th Most Common Venue or higher become the potential future locations of the restaurant.

<i>Neighborhood</i>	<i>1st Most Common Venue</i>	<i>2nd Most Common Venue</i>	<i>3rd Most Common Venue</i>	<i>4th Most Common Venue</i>
Bayview Village	Caf��	Japanese Restaurant	Bank	Chinese Restaurant
Chinatown	Chinese Restaurant	American Restaurant	Cocktail Bar	Hotpot Restaurant
Dorset Park	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant
L'Amoreaux West	Fast Food Restaurant	Chinese Restaurant	Burger Joint	Pharmacy
Scarborough Town Centre	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant
Wexford Heights	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant

Clustering is a Machine Learning technique that involves the grouping of data points to get an intuition about the structure of the data. In theory, data points that are in the same group should have similar properties and/or features. I used K-mean clustering algorithm, a common exploratory data analysis technique, to group the neighbourhoods into clusters. I set the number of clusters to 5.

Neighbourhood	Cluster Labels
Chinatown	0
Bayview Village	1
L'Amoreaux West	1
Dorset Park	3
Scarborough Town Centre	3
Wexford Heights	3

To investigate the neighbourhood data quantitatively, the mean of the frequency of occurrence of the four Most Common Venues in these neighbourhoods are tabulated in tables.

Chinatown	
Venue	Frequency
Chinese Restaurant	0.11
American Restaurant	0.04
Cocktail Bar	0.04
Hotpot Restaurant	0.03
Bakery	0.03

L'Amoreaux West	
Venue	Frequency
Chinese Restaurant	0.14
Grocery Store	0.14
Fast Food Restaurant	0.14
Discount Store	0.07
Thrift / Vintage Store	0.07

Bayview Village	
Venue	Frequency
Japanese Restaurant	0.25
Café	0.25
Bank	0.25
Chinese Restaurant	0.25
Accessories Store	0.00

Scarborough Town Centre	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

Wexford Heights	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

Dorset Park	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

## Results

Jet prefers to locate his restaurant in a Chinese neighbourhood. A screening on the Most Common Venue of the Neighbourhoods return a list with 6 neighbourhoods having Chinese restaurants in the top four Most Common Venue list. They are Manhattan Chinatown in NYC, and Bayview Village, Dorset Park, L'Amoreaux West, Scarborough Town Centre, Wexford Heights in Toronto.

Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
Bayview Village	Café	Japanese Restaurant	Bank	Chinese Restaurant
Chinatown	Chinese Restaurant	American Restaurant	Cocktail Bar	Hotpot Restaurant
Dorset Park	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant
L'Amoreaux West	Fast Food Restaurant	Chinese Restaurant	Burger Joint	Pharmacy
Scarborough Town Centre	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant
Wexford Heights	Indian Restaurant	Vietnamese Restaurant	Pet Store	Chinese Restaurant

The data in this study includes venues in 76 neighbourhoods. 5 clusters are assumed in performing K-mean clustering analysis on the data. The analysis put these 6 neighbourhoods into 3 different clusters. Chinatown by itself is in Cluster 0. Bayview Village and L'Amoreaux West are in Cluster 1. Dorset Park, Scarborough Town Centre and Wexford Heights are in Cluster 3.

Neighbourhood	Cluster Labels
Chinatown	0
Bayview Village	1
L'Amoreaux West	1
Dorset Park	3
Scarborough Town Centre	3
Wexford Heights	3

Because the neighbourhoods in the same cluster should have similar properties and/or features, The choice for Jet is to select which Cluster is a better fit to start his new restaurant.

We can examine the mean of the frequency of occurrence of the top venues in these 3 clusters to see their differences.

In Cluster 0 where Chinatown belongs, there are a wide variety of restaurants in the area not just Chinese restaurants. Customers go there for different tastes the restaurants have to offer. They can have Chinese, American, Hotpot or snacks like bakery food etc. The impression on the area data is that the location is an area where eating is the only thing that matters to the people.

**Cluster 0**

Chinatown	
Venue	Frequency
Chinese Restaurant	0.11
American Restaurant	0.04
Cocktail Bar	0.04
Hotpot Restaurant	0.03
Bakery	0.03

In Cluster 1, there is a high proportion of Chinese restaurants in the area and there are other Asian restaurants as well. The balance of the most common venues are banks and stores. The Cluster represents average neighbourhood with a well balance between residential and commercial venues. Bayview Village and L'Amoreaux West are most likely be the kind of neighbourhood you and I live in now.

**Cluster 1**

L'Amoreaux West	
Venue	Frequency
Chinese Restaurant	0.14
Grocery Store	0.14
Fast Food Restaurant	0.14
Discount Store	0.07
Thrift / Vintage Store	0.07

**Cluster 1**

Bayview Village	
Venue	Frequency
Japanese Restaurant	0.25
Café	0.25
Bank	0.25
Chinese Restaurant	0.25
Accessories Store	0.00

In Cluster 3, the restaurant selection is very Asian oriented: Chinese, Indian, and Vietnamese. There is not much of a variety of restaurants to choose from for food lovers. But this could mean

neighbourhoods in this Cluster are densely populated with Asians. The food being served in these restaurants could be the authentic kind that suit the locals need. It will be interesting to study the demographics of Dorset Park, Scarborough Town Centre and Wexford Heights to see how this analysis on restaurant relates to the neighbours.

**Cluster 3**

Scarborough Town Centre	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

**Cluster 3**

Wexford Heights	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

**Cluster 3**

Dorset Park	
Venue	Frequency
Indian Restaurant	0.4
Chinese Restaurant	0.2
Vietnamese Restaurant	0.2
Pet Store	0.2
Mobile Phone Shop	0.0

## Recommendation

Jet's passion is in creating his own fusion Chinese dishes. A fusion Chinese restaurant in Dorset Park or Scarborough Town Centre or Wexford Heights seems to be out of the question. People love the authenticity of the dishes in these Cluster of neighbourhood. Jet is a young American Chinese. His version of fusion dishes is not the same kind as the fusion Chinese dishes that immigrants love before they moved out of their home countries.

New York City Chinatown is the largest Chinatown in the US. Over 150,000 Chinese-speaking people call this place their home. About 14.6 million tourists had visited lower Manhattan in 2018 where Chinatown is. When people talk about Chinatown, where to eat is always on the top of their lists. The wide variety of restaurants and the big crowd of people with different tastes in the area seems to be an open invitation to any new Chef who wants to open a new restaurant anytime.

Well, look at Cluster 1, the average neighbourhoods: Bayview Village and L'Amoreaux West. There is no excitement from thousands of tourists rushing into a restaurant for quick meals. Many customers actually go to restaurants to enjoy a good meal with friends and families. They don't need the authentic dishes to satisfy their tastes. There are other Asian restaurants if they so choose. A Chef can mingle with their customers to find out if a particular dish needs improvement.

For a new Chef like Jet, either Bayview Village or L'Amoreaux West is the best choice for his new restaurant. These locations are like training ground with more interaction between him and his customers. The business atmosphere is less pressing than the other neighbourhoods. He can focus on improving his menu with less worries about competitions and food critics.

## Conclusion

A typical business startup has a breakeven period of 5 years on average. Knowing the right location for the restaurant to stay in business for the first 5 years is important to Jet. This study honed in on the most common restaurant types in Toronto and New York City neighbourhood. Data was collected from public databases and Foursquare databases. The non data side of factors also taken

into consideration: Jet's passion in creating his own fusion Chinese dishes and his skill level as a new Chef. Exploratory data analysis showed that a new Chinese fusion restaurant can fit in well in Bayview Village or L'Amoreaux West in the City of Toronto.