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# The Battle of Neighbourhoods

— A New Restaurant in Vancouver, —  
BC

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# Business Problem

- There is a businessperson (stakeholder), who is looking forward to opening a french cuisine restaurant in the city of Vancouver, British Columbia, Canada.
- The current project aims to find the most suitable location for a french cuisine restaurant in Vancouver.



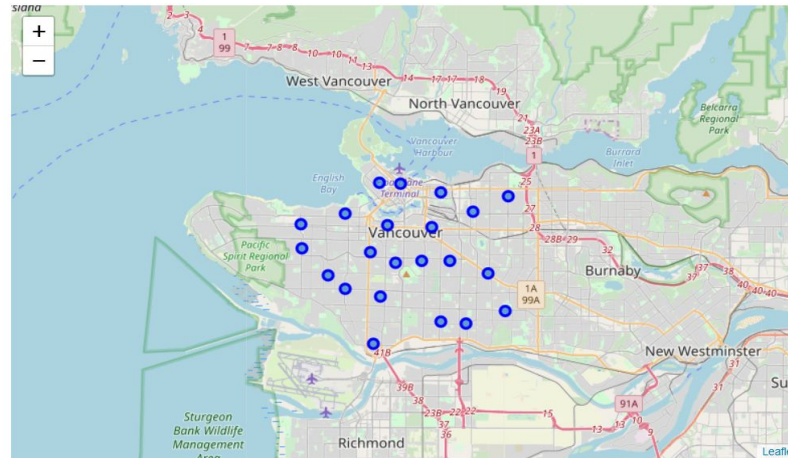
# Data



- Local Areas data from Open Data Catalogue - "Neighbourhoods":  
<https://data.vancouver.ca/datacatalogue/localAreaBoundary.htm>
- Geographic coordinates of each Local Area obtained by using: *geopy.geocoders - Nominatim*.
- Final dataset has: ID, Local Area name, latitude, and longitude.
- Foursquare API used to retrieve venues (Name, Latitude, Longitude, and Category).

# Methodology

k-means algorithm used because the goal is to segment local areas in Vancouver and by which aspects they are similar.



# Methodology - Step 1: Data Cleaning

- Download data in CSV file and convert it to pandas dataframe.
- Complete the name of each local area with the string “ , Vancouver, BC” to get geographic coordinates more precisely.
- Dataframe:

	MAPID	LocalArea
0	SUN	Sunset, Vancouver, BC
1	MP	Mount Pleasant, Vancouver, BC
2	RP	Riley Park, Vancouver, BC
3	CBD	Downtown, Vancouver, BC
4	KITS	Kitsilano, Vancouver, BC

There are 22 local areas  
in Vancouver

22 rows and 2 columns

# Methodology - Step 2: Add coordinates

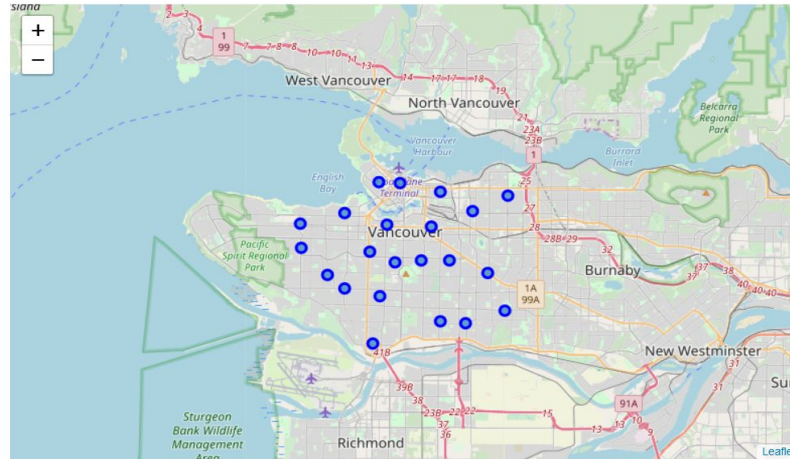
- Obtain latitude and longitude of each Local Area, by using: *from geopy.geocoders import Nominatim*.
- Merge it with the first dataframe
- Dataframe:

	MAPID	LocalArea	Latitude	Longitude
0	SUN	Sunset, Vancouver, BC	49.219593	-123.090239
1	MP	Mount Pleasant, Vancouver, BC	49.263330	-123.096588
2	RP	Riley Park, Vancouver, BC	49.247438	-123.102966
3	CBD	Downtown, Vancouver, BC	49.283393	-123.117456
4	KITS	Kitsilano, Vancouver, BC	49.269410	-123.155267

22 rows and 4 columns

# Methodology - Step 3: Visualise local areas

- A map of Vancouver with its local areas



# Methodology - Step 4: Use Foursquare API

- Foursquare API gets the top 100 venues within 500 metres for each Local Area in Vancouver.
- Venue features: name, latitude, longitude and category.
- Filter dataframe to focus only on *Restaurants*
- Dataframe after filtering:

	LocalArea	LocalArea Latitude	LocalArea Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Sunset, Vancouver, BC	49.219593	-123.090239	Kalai's Dosa Hut	49.218998	-123.091160	South Indian Restaurant
1	Sunset, Vancouver, BC	49.219593	-123.090239	Sartaj Sweets & Restaurant	49.224046	-123.090841	Indian Restaurant
2	Mount Pleasant, Vancouver, BC	49.263330	-123.096588	Sushiyama	49.262897	-123.097169	Sushi Restaurant
3	Mount Pleasant, Vancouver, BC	49.263330	-123.096588	Carp	49.262393	-123.096070	Sushi Restaurant
4	Mount Pleasant, Vancouver, BC	49.263330	-123.096588	Congee Noodle House 粥麵館 (Congee Noodle House)	49.263029	-123.102105	Chinese Restaurant

227 rows and 7 columns



# Methodology - Step 5: Analyse each local area

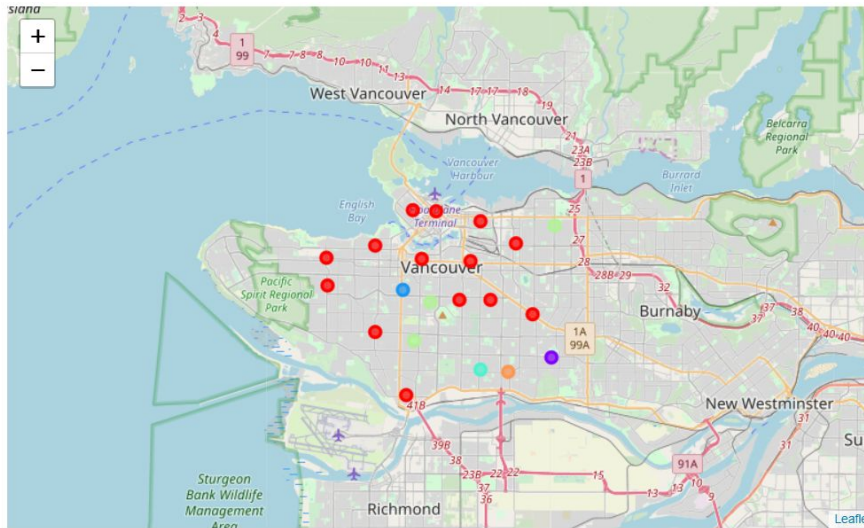
- Applying One Hot Encoding, then grouping by Local Area to calculate the mean of the frequency of occurrence of each category.
- Calculate top 5 common venues in each local area.
- Dataframe:
  - *Note:* Only 21 rows because 'Arbutus-Ridge, Vancouver, BC' has no restaurants, hence no venues were selected.

	LocalArea	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Downtown, Vancouver, BC	Vietnamese Restaurant	Seafood Restaurant	Restaurant	American Restaurant	Hawaiian Restaurant	Mexican Restaurant	Japanese Curry Restaurant	Australian Restaurant	French Restaurant	Chinese Restaurant
1	Dunbar-Southlands, Vancouver, BC	Sushi Restaurant	Italian Restaurant	Indian Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Falafel Restaurant	Japanese Curry Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant
2	Fairview, Vancouver, BC	Asian Restaurant	Vietnamese Restaurant	Chinese Restaurant	Korean Restaurant	Indian Restaurant	Malay Restaurant	Fast Food Restaurant	Falafel Restaurant	Restaurant	Sushi Restaurant
3	Grandview-Woodland, Vancouver, BC	Sushi Restaurant	Italian Restaurant	Indian Restaurant	Japanese Restaurant	French Restaurant	Seafood Restaurant	Greek Restaurant	Vegetarian / Vegan Restaurant	Mexican Restaurant	Middle Eastern Restaurant
4	Hastings-Sunrise, Vancouver, BC	Vietnamese Restaurant	Sushi Restaurant	Falafel Restaurant	Japanese Curry Restaurant	Italian Restaurant	Indian Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant

21 rows and 11 columns

# Methodology - Step 6: Cluster local areas

- By running k-means, the local areas grouped into 6 clusters.
- Result saved in dataframe, also include top 10 venues for each local area.



- : Cluster 1
- : Cluster 2
- : Cluster 3
- : Cluster 4
- : Cluster 5
- : Cluster 6

Map showing clusters

# Methodology - Step 7: Examine Clusters

- **Cluster 1**

- Consists of 14 local areas.
- The most popular restaurant venues are: Sushi Restaurant and Vietnamese Restaurant



- **Cluster 2**

- The most common restaurant venue is Italian Restaurant in Killarney.



# Methodology - Step 7: Examine Clusters

- **Cluster 3**

- French Restaurant is the most common venue in Shaughnessy.



- **Cluster 4**

- Indian Restaurant is the most common venue in Sunset.



# Methodology - Step 7: Examine Clusters

- **Cluster 5**

- Consists of 3 local areas: Oakridge, South Cambie, and Hastings-Sunrise
- The most common venue is Vietnamese Restaurant.



- **Cluster 6**

- Fast Food Restaurant is the most common venue in Victoria-Fraserview.



# Methodology - Step 8: Find French Restaurants

- Explore French Restaurants in Vancouver using Foursquare API.

Group, count, and sort  
values

LocalArea	Venue
Downtown, Vancouver, BC	4
Grandview-Woodland, Vancouver, BC	4
Kitsilano, Vancouver, BC	4
Riley Park, Vancouver, BC	3
Kerrisdale, Vancouver, BC	1
Shaughnessy, Vancouver, BC	1
West End, Vancouver, BC	1

18 French Restaurants  
in Vancouver

Largest Number



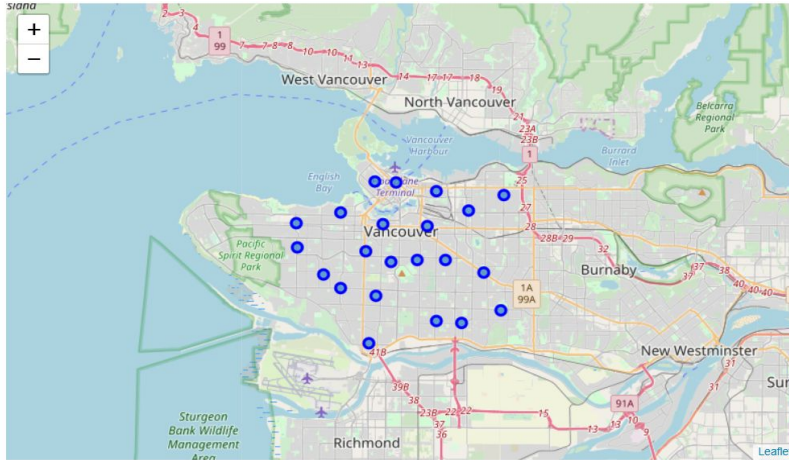
Downtown  
Grandview-Woodland



Kerrisdale  
Shaughnessy  
West End

Smallest Number

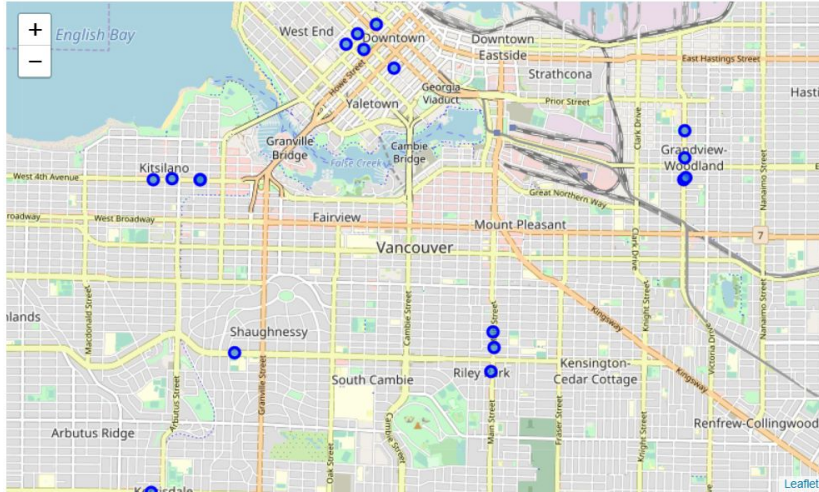
# Results



- West End, and Grandview-Woodland have the largest number of total restaurants, with a total of 28 each. Whereas, Killarney, Shaughnessy, and Victoria-Fraserview have the smallest number of restaurants, with 1 each.



# Results



- Throughout Vancouver, there are 18 French Restaurants, distributed across 7 local areas: Downtown, Grandview-Woodland, Kitsilano, Riley Park, Kerrisdale, Shaughnessy, and West End.
- Downtown, Grandview-Woodland, and Kitsilano have 4 French Restaurants each, whereas Riley Park has 3, and Kerrisdale, Shaughnessy, and West End have 1 each.



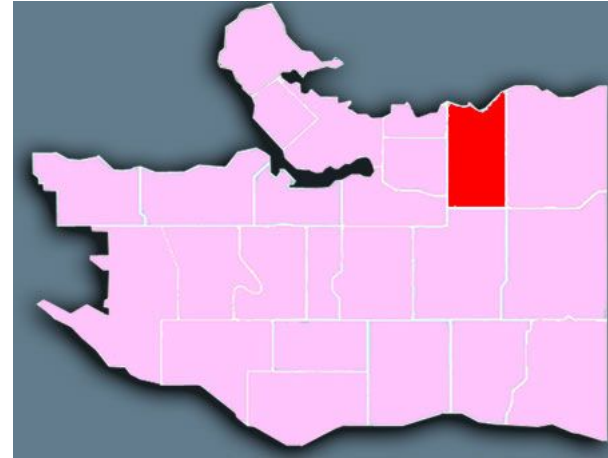
# Conclusion

- The local areas to be considered to open a French Restaurant are: Shaughnessy, Downtown, and Grandview-Woodland
- Shaughnessy only has one restaurant, so the number of competitors is small.



# Conclusion

- Grandview-Woodland is more optimal to open a French Restaurant due to French Restaurants are in the top 5 most common venue. Additionally, this local area is recognised for its multiculturalism.



**Thank you!**