

Tapas in Vancouver

Introduction

The goal of this exercise is to find the best location in Vancouver for a new "tapas" restaurant (<https://en.wikipedia.org/wiki/Tapas>).

A company wants to open a new restaurant in Vancouver. This restaurant will serve only tapas in a "Spanish Bar" way. As is not your usual restaurant, it becomes fundamental to choose carefully the neighborhood.

Using the information about restaurants in Vancouver from Foursquares and analyzing this data, we decide the best location for a successfully restaurant.

Data Sources.

We use data from wikipedia to define Vancouver neighborhoods and data from Foursquares to gather information about venues already established; postal codes from Vancouver to delimit the neighborhoods and Foursquare data to locate restaurants in those neighborhoods, and the restaurants main cuisine.

We need to find a neighborhood with a lot of different restaurants and/or a neighborhood with an important spanish community.

Wikipedia url with Vancouver postal codes:

["https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_V"](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_V).

Methodology.

First, I need to clean the data from wikipedia. Get only the postal codes from Vancouver neighborhoods from ["https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_V"](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_V).

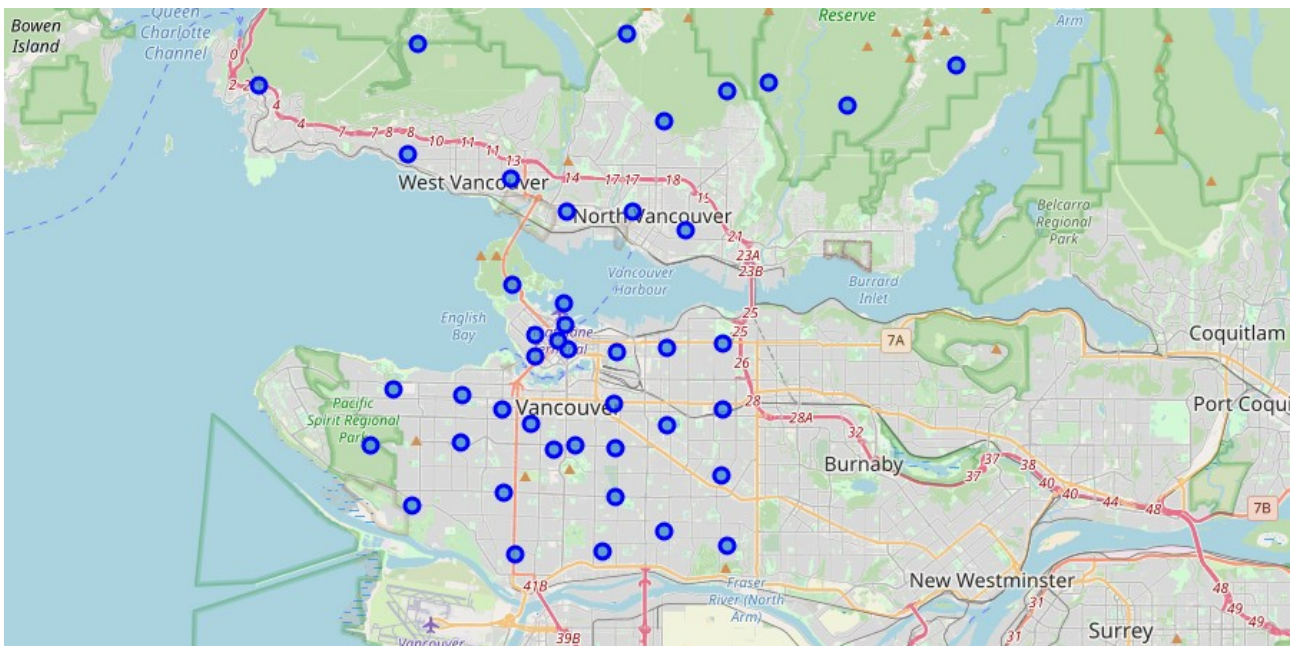
With BeautifulSoup, I get the table with the postal codes. Then, select only the postal codes with Borough "Vancouver". The result is a panda dataframe with this structure:

	Postal Code	Borough	Neighborhood
0	V6A	Vancouver	Strathcona / Chinatown / Downtown Eastside
1	V6B	Vancouver	NE Downtown / Gastown / Harbour Centre / Inter...
2	V6C	Vancouver	Waterfront / Coal Harbour / Canada Place
3	V6E	Vancouver	SE West End / Davie Village
4	V6G	Vancouver	NW West End / Stanley Park
5	V7G	Vancouver	NW West End / Stanley Park

I am using Nominatim from geolocator to add latitude and longitude for each Neighborhood:

	Postal Code	Borough	Neighborhood	Latitude	Longitude
0	V6A	Vancouver	Strathcona / Chinatown / Downtown Eastside	49.2779	-123.091
1	V6B	Vancouver	NE Downtown / Gastown / Harbour Centre / Inter...	49.2788	-123.114
2	V6C	Vancouver	Waterfront / Coal Harbour / Canada Place	49.2866	-123.116
3	V6E	Vancouver	SE West End / Davie Village	49.2833	-123.13
4	V6G	Vancouver	NW West End / Stanley Park	49.299	-123.141

With the folium package, I draw the map with the neighborhoods on it:



Then, using this coordinates, reach to foursquare API to get the venues. I'd like to limit the venues to restaurants, delis, ...

Also, I limited the radio to 500 meters.

To find clusters of restaurant types in the different city districts, I first transformed the dataframe with the venues, associated to city districts, by one-hot encoding (0/1), then I select the categories with restaurant, deli or bodega in the category name.

Next, I used grouping to show the frequency of each category of restaurants in each city district.

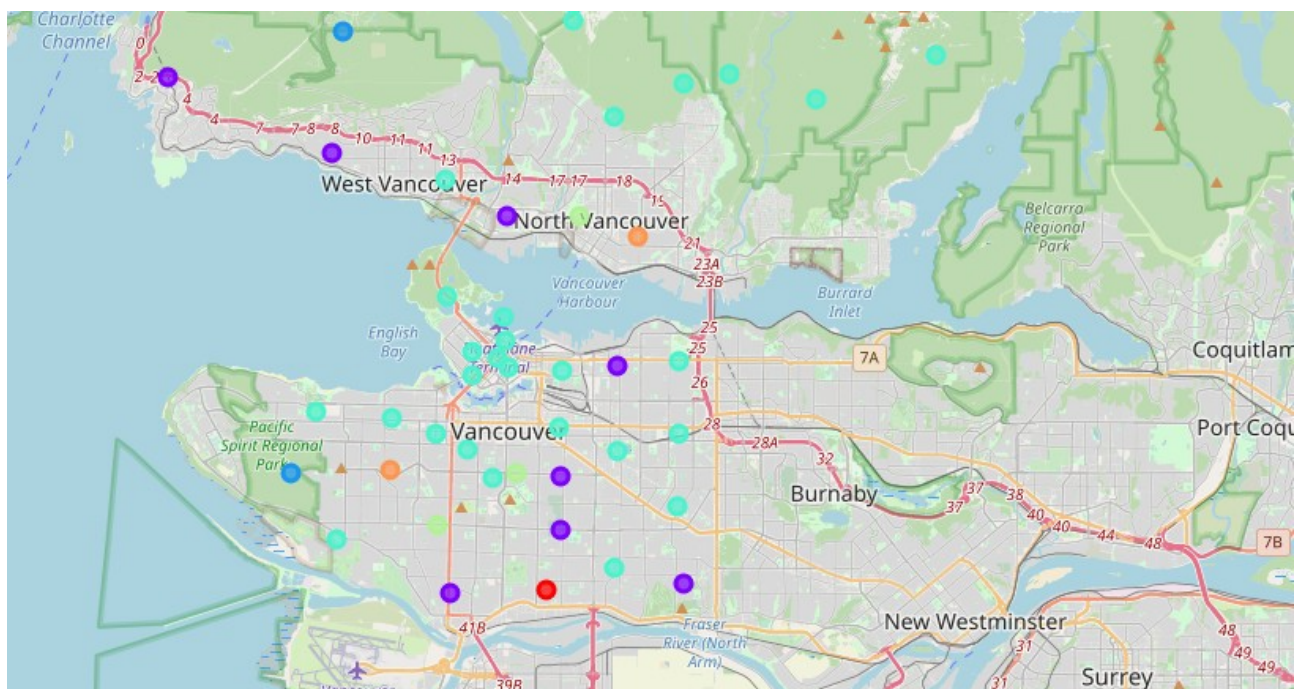
Using this data I generated a dataframe with the top 10 most common restaurants in each neighborhood:

	Postal Code	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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	V6A	Vancouver	Strathcona / Chinatown / Downtown Eastside	49.2779	-123.091	3	Vietnamese Restaurant	Seafood Restaurant	Restaurant	Deli / Bodega	Asian Restaurant	Belgian Restaurant	Falafel Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
1	V6B	Vancouver	NE Downtown / Gastown / Harbour Centre / Inter...	49.2788	-123.114	3	Restaurant	Vietnamese Restaurant	Sushi Restaurant	Fast Food Restaurant	Ramen Restaurant	Italian Restaurant	American Restaurant	Lebanese Restaurant	Seafood Restaurant	Asian Restaurant
2	V6C	Vancouver	Waterfront / Coal Harbour / Canada Place	49.2866	-123.116	3	Restaurant	Vietnamese Restaurant	Seafood Restaurant	Vegetarian / Vegan Restaurant	New American Restaurant	American Restaurant	Italian Restaurant	Middle Eastern Restaurant	Fast Food Restaurant	Falafel Restaurant
3	V6E	Vancouver	SE West End / Davie Village	49.2833	-123.13	3	Japanese Restaurant	Italian Restaurant	Thai Restaurant	Sushi Restaurant	Restaurant	Mexican Restaurant	Falafel Restaurant	Greek Restaurant	Indian Restaurant	Malay Restaurant
4	V6G	Vancouver	NW West End / Stanley Park	49.299	-123.141	3	Vietnamese Restaurant	Ethiopian Restaurant	Hotpot Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant

Finally I could run a k-means clustering algorithm from the scikit-learn package. I chose k= 6 to achive a good representation.

Results.

This is the map with clusters in six different colors:



Now, we have the different clusters with the most common restaurants:

Cluster 1 – no specific restaurant type.

Neighborhood	Cluster Labels	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
38 SE Oakridge / East Marpole / South Sunset	0	Restaurant	Indian Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

Cluster 2- Chinese as the most common restaurant:

	Neighborhood	Cluster Labels	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
13	North Grandview-Woodland	1	Italian Restaurant	Chinese Restaurant	Deli / Bodega	Indian Restaurant	Japanese Restaurant	Asian Restaurant	Vietnamese Restaurant	Sushi Restaurant	Thai Restaurant	South Indian Restaurant
23	SE Kerrisdale / SW Oakridge / West Marpole	1	Chinese Restaurant	Japanese Restaurant	Vietnamese Restaurant	Sushi Restaurant	Restaurant	Dim Sum Restaurant	Greek Restaurant	Indian Restaurant	Italian Restaurant	Thai Restaurant
24	SE Kerrisdale / SW Oakridge / West Marpole	1	Chinese Restaurant	Japanese Restaurant	Vietnamese Restaurant	Sushi Restaurant	Restaurant	Dim Sum Restaurant	Greek Restaurant	Indian Restaurant	Italian Restaurant	Thai Restaurant
28	Killarney	1	Chinese Restaurant	Deli / Bodega	Sushi Restaurant	Fast Food Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant
34	West Kensington-Cedar Cottage / NE Riley Park...	1	Chinese Restaurant	Vietnamese Restaurant	Filipino Restaurant	Restaurant	Greek Restaurant	Indian Restaurant	Japanese Restaurant	Malay Restaurant	American Restaurant	Seafood Restaurant
35	West Kensington-Cedar Cottage / NE Riley Park...	1	Chinese Restaurant	Vietnamese Restaurant	Filipino Restaurant	Restaurant	Greek Restaurant	Indian Restaurant	Japanese Restaurant	Malay Restaurant	American Restaurant	Seafood Restaurant
36	SE Riley Park-Little Mountain / SW Kensington...	1	Chinese Restaurant	Indian Restaurant	Vietnamese Restaurant	Fast Food Restaurant	Asian Restaurant	Tapas Restaurant	Japanese Restaurant	Cantonese Restaurant	Himalayan Restaurant	Hawaiian Restaurant
37	SE Riley Park-Little Mountain / SW Kensington...	1	Chinese Restaurant	Indian Restaurant	Vietnamese Restaurant	Fast Food Restaurant	Asian Restaurant	Tapas Restaurant	Japanese Restaurant	Cantonese Restaurant	Himalayan Restaurant	Hawaiian Restaurant

Cluster 3- not specific but with dim sum flavor.

	Neighborhood	Cluster Labels	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
29	NW Dunbar-Southlands / Chaldecutt / South Univ...	2	Restaurant	Vietnamese Restaurant	Dim Sum Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
30	NW Dunbar-Southlands / Chaldecutt / South Univ...	2	Restaurant	Vietnamese Restaurant	Dim Sum Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant

This is an important distinction because dim sum are “small” plates, similar to tapas.

Cluster 4 – asian food:

	Neighborhood	Cluster Labels	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	Strathcona / Chinatown / Downtown Eastside	3	Vietnamese Restaurant	Seafood Restaurant	Restaurant	Deli / Bodega	Asian Restaurant	Belgian Restaurant	Falafel Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
1	NE Downtown / Gastown / Harbour Centre / Inter...	3	Restaurant	Vietnamese Restaurant	Sushi Restaurant	Fast Food Restaurant	Ramen Restaurant	Italian Restaurant	American Restaurant	Lebanese Restaurant	Seafood Restaurant	Asian Restaurant
2	Waterfront / Coal Harbour / Canada Place	3	Restaurant	Vietnamese Restaurant	Seafood Restaurant	Vegetarian / Vegan Restaurant	New American Restaurant	American Restaurant	Italian Restaurant	Middle Eastern Restaurant	Fast Food Restaurant	Falafel Restaurant
3	SE West End / Davie Village	3	Japanese Restaurant	Italian Restaurant	Thai Restaurant	Sushi Restaurant	Restaurant	Mexican Restaurant	Falafel Restaurant	Greek Restaurant	Indian Restaurant	Malay Restaurant
4	NW West End / Stanley Park	3	Vietnamese Restaurant	Ethiopian Restaurant	Hotpot Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
5	NW West End / Stanley Park	3	Vietnamese Restaurant	Ethiopian Restaurant	Hotpot Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant	Falafel Restaurant
6	West Fairview / Granville Island / NE Shaughnessy	3	Japanese Restaurant	Sushi Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
7	West Fairview / Granville Island / NE Shaughnessy	3	Japanese Restaurant	Sushi Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

Cluster 5 – Chinese and sushi restaurants:

	Neighborhood	Cluster Labels	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
17	South Shaughnessy / NW Oakridge / NE Kerrisdal...	4	Chinese Restaurant	Asian Restaurant	Sushi Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant
18	South Shaughnessy / NW Oakridge / NE Kerrisdal...	4	Chinese Restaurant	Asian Restaurant	Sushi Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant
40	West Mount Pleasant / West Riley Park-Little M...	4	Chinese Restaurant	Sushi Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

Cluster 6 – Italian restaurants:

	Neighborhood	Cluster Labels	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
14	NW Arbutus Ridge / NE Dunbar-Southlands	5	Italian Restaurant	Japanese Restaurant	Caribbean Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant
15	NW Arbutus Ridge / NE Dunbar-Southlands	5	Italian Restaurant	Japanese Restaurant	Caribbean Restaurant	Ethiopian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	French Restaurant	Filipino Restaurant	Fast Food Restaurant

Discussion

Using the information shows on the maps, and the different clusters, we can see that Est Fairview, West Mount Pleasant and West Kensington, are neighborhoods close to each other and with a wide range of cuisines represented in their restaurants.

To open a new successful restaurant you need more than just a good location, but this information will help reach your goal.

Acknowledgements

The data available on the internet, wikipedia as the most representative, made possible to learn from and work with data.

The examples of how to present this capstone project published in different webs, were invaluable to write this document.