Melbourne East vs Melbourne West

By Derrick Lim 13/11/2020

Introduction

Melbourne, Australia enjoys its super rich diversity both culturally and socially. It attracts tourists from all around the world to experience its unique character and food culture. Due to the fact that Melbourne is identified as the most diverse city across Australia, it welcomes various kinds of food and beverages (F&B) services from various countries for its residents.

The effect of historic events and the direction of urban development/growth has favoured more towards the eastern areas from the Central Business District (CBD) whilst the western and northern areas are less prioritised. This has caused a clear segregated demographic profile of communities. The map below highlights areas based on an Index of Relative Socio-economic Disadvantage (IRSD) SEIFA scores such that higher intensity of red are areas that are disadvantaged in terms of income, occupation and education. It is evident that higher socio-economic communities are located at the east whilst more disadvantaged communities are located at the west and north.

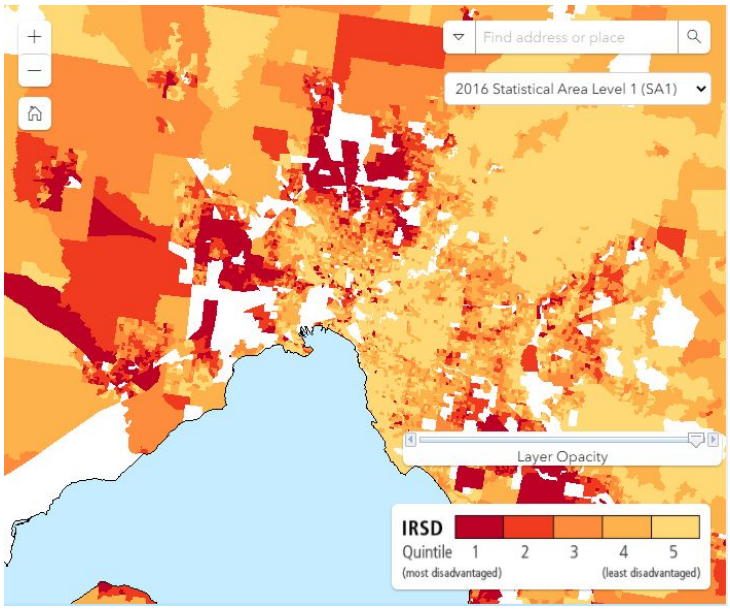


Image sourced from
https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001~2016~Main%20Features~IRSD%20Interactive%20Map~15

The goal of this study is to understand what are the top food and drink premises found in Melbourne inner east suburbs and Melbourne's West. This is so that informed decisions can be made on what sort of F&B services should be pursued that the community likes.

Research questions:

1. Do Melbourne's east and west have similar clusters of F&B services?
2. Is there a frequent occurrence of the same type of businesses in both areas?

3. What would be the best F&B services to be pursued in both west and east of Melbourne?

Data

Data of suburbs boundaries will be acquired from the Australian Bureau of Statistics (ABS). Moreover, metadata such as suburbs within melbourne western and eastern boundaries will be taken from the ABS Statistical Area Level 2 (SA2) areas. SA2 areas are used for the dissemination of population estimates and to provide a human perspective by using a scale that can be readily understood as a locality.

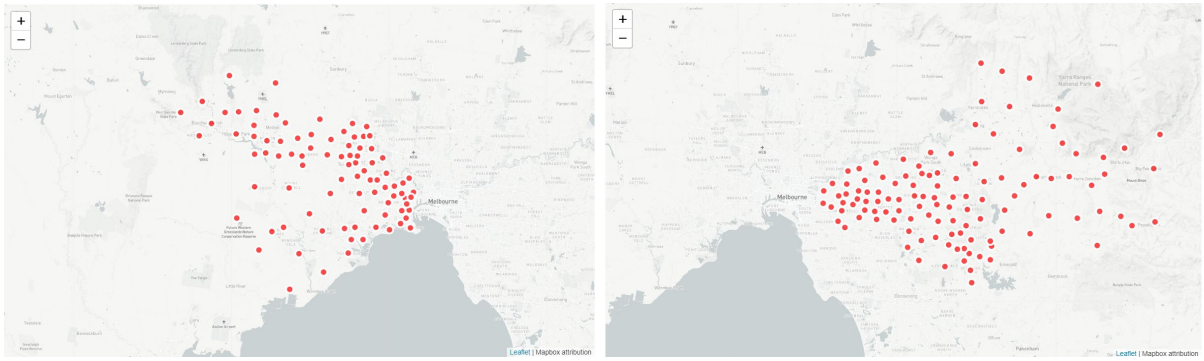
A geographic information software known as QGIS will be used to visualise these spatial data and undertake a geoprocessing process to acquire the centroids (points) of each suburb as well as its latitude and longitude.

After that is done, the data will be exported to a CSV file for it to be read and further analyse it with python coding and jupyter notebook.

The table and images below shows the dataframe created and points visualised on the map using folium library.

	LOCALITY	POSTCODE	LGA_NAME	Longitude	Latitude	SA2_NAME16	SA3_NAME16	SA4_NAME16	GCC_NAME16
0	CARDIGAN VILLAGE	3352	BALLARAT	143.709721	-37.517478	Alfredton	Ballarat	Ballarat	Rest of Vic.
1	ALFREDTON	3350	BALLARAT	143.800631	-37.555913	Alfredton	Ballarat	Ballarat	Rest of Vic.
2	CARDIGAN	3352	BALLARAT	143.734845	-37.536613	Alfredton	Ballarat	Ballarat	Rest of Vic.
3	LUCAS	3350	BALLARAT	143.769085	-37.554111	Alfredton	Ballarat	Ballarat	Rest of Vic.
4	LAKE WENDOUREE	3350	BALLARAT	143.834014	-37.550156	Ballarat	Ballarat	Ballarat	Rest of Vic.

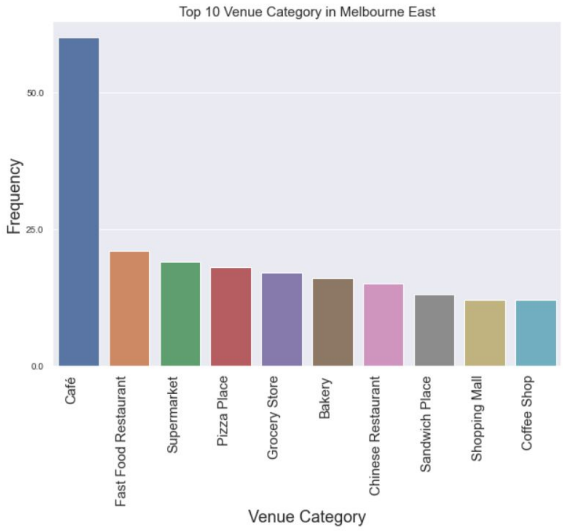
List of suburbs with coordinates



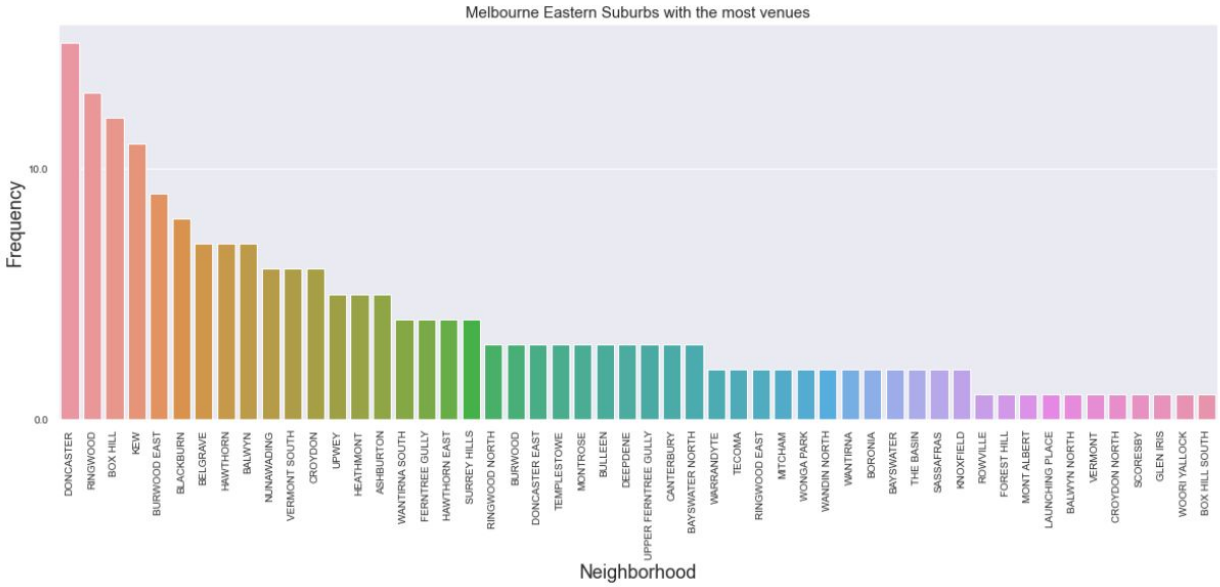
List of suburb centroids. Western suburbs (left) and Eastern suburbs (right)

Foursquare data and leveraging its location data is utilized to capture venues around these suburb centroids. The table and graphs below shows the top 10 venue categories as well as suburbs with the highest venues indicating the intensity of businesses or urban activity

	Venue Category	Frequency
0	Café	60
1	Fast Food Restaurant	21
2	Supermarket	19
3	Pizza Place	18
4	Grocery Store	17
5	Bakery	16
6	Chinese Restaurant	15
7	Sandwich Place	13
8	Shopping Mall	12
9	Coffee Shop	12

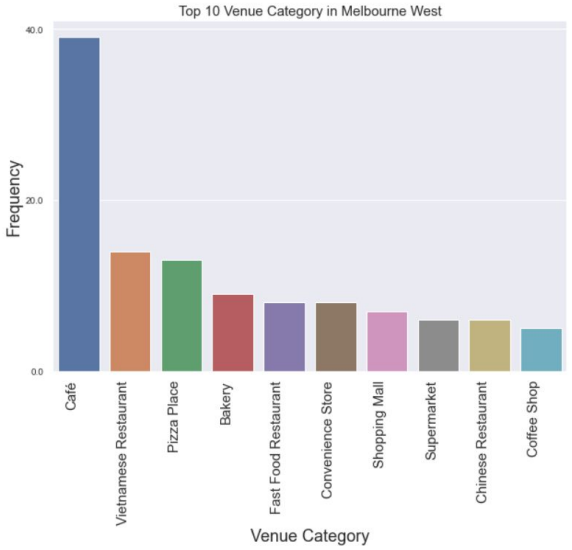


List of top 10 venue category in Melbourne Eastern suburbs

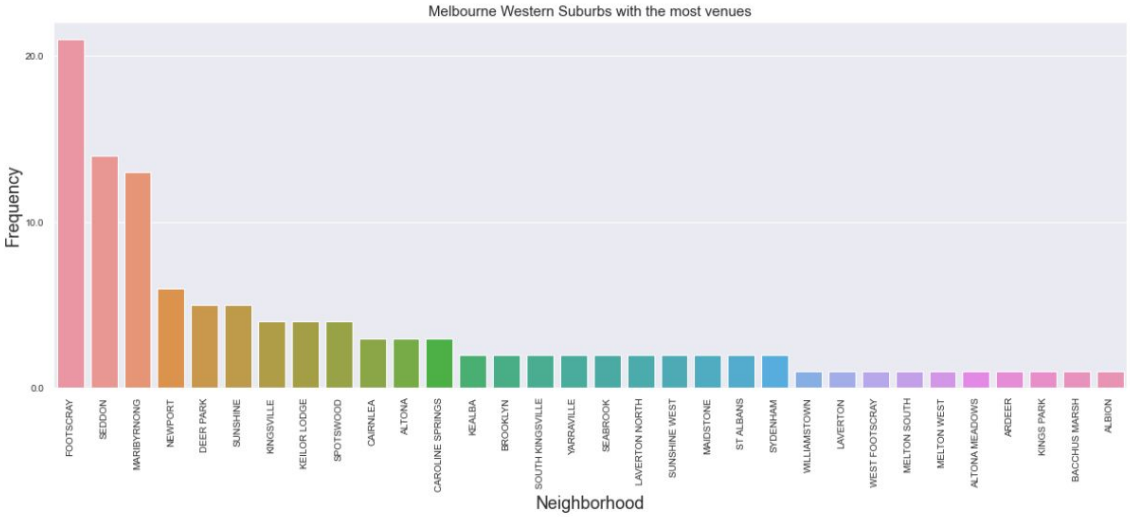


Number of venues found in Melbourne Eastern suburbs within a 500m walkable catchment

	Venue Category	Frequency
0	Café	39
1	Vietnamese Restaurant	14
2	Pizza Place	13
3	Bakery	9
4	Fast Food Restaurant	8
5	Convenience Store	8
6	Shopping Mall	7
7	Supermarket	6
8	Chinese Restaurant	6
9	Coffee Shop	5



List of top 10 venue category in Melbourne Western suburbs



Number of venues found in Melbourne Western suburbs within a 500m walkable catchment

The top 5 suburbs with the highest frequency of venues is noted to highlight suburbs with the most activity and chances of attracting businesses and commerce activities, viable for opening a business and contribution to the agglomeration of economic activities in these areas.

Methodology

Foursquare location data will be used here to disseminate the top 10 most frequent or occurrence of venue categories that are located within Melbourne east and west. Scikit python library will be used to undertake a K means clustering to carry out the clustering of similar venue categories within the neighbourhood. Venue categories other than food and drinks will be excluded from the study if it is identified within the top 10 and will be replaced with the next one below the line.

Venue are being filter by applying a 500m walkable catchment on each centroids of the suburbs. Moreover, 100 venues are set as a limit when search for nearby venues.

The number of K clusters that is assigned to each K clustering processes is seven. This is result of the reiterative process to find the optimum value that best classify these clusters.

	Neighborhood	Bakery	Café	Chinese Restaurant	Coffee Shop	Fast Food Restaurant	Grocery Store	Pizza Place	Sandwich Place	Shopping Mall	Supermarket
0	ASHBURTON	0.200000	0.600000	0.0	0.0	0.200000	0.000000	0.0	0.000000	0.0	0.000000
1	BALWYN	0.142857	0.428571	0.0	0.0	0.000000	0.142857	0.0	0.142857	0.0	0.142857
2	BALWYN NORTH	0.000000	0.000000	0.0	0.0	0.000000	0.000000	0.0	0.000000	1.0	0.000000
3	BAYSWATER	0.000000	0.000000	0.0	0.0	0.000000	0.000000	0.0	0.000000	0.0	1.000000
4	BAYSWATER NORTH	0.000000	0.000000	0.0	0.0	0.666667	0.000000	0.0	0.333333	0.0	0.000000

Transforming dataframes into float type

	Neighborhood	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	ASHBURTON	Café	Fast Food Restaurant	Bakery	Supermarket	Shopping Mall	Sandwich Place	Pizza Place	Grocery Store	Coffee Shop	Chinese Restaurant
1	BALWYN	Café	Supermarket	Sandwich Place	Grocery Store	Bakery	Shopping Mall	Pizza Place	Fast Food Restaurant	Coffee Shop	Chinese Restaurant
2	BALWYN NORTH	Shopping Mall	Supermarket	Sandwich Place	Pizza Place	Grocery Store	Fast Food Restaurant	Coffee Shop	Chinese Restaurant	Café	Bakery
3	BAYSWATER	Supermarket	Shopping Mall	Sandwich Place	Pizza Place	Grocery Store	Fast Food Restaurant	Coffee Shop	Chinese Restaurant	Café	Bakery
4	BAYSWATER NORTH	Fast Food Restaurant	Sandwich Place	Supermarket	Shopping Mall	Pizza Place	Grocery Store	Coffee Shop	Chinese Restaurant	Café	Bakery

Prepare dataframe according from the most to the least common venue

	index	LOCALITY	POSTCODE	LGA_NAME	Longitude	Latitude	SA2_NAME16	SA3_NAME16	SA4_NAME16	GCC_NAME16	Cluster Labels	1st Most Common Venue
0	1511	ASHBURTON	3147	BOROONDARA	145.080182	-37.867299	Ashburton (Vic.)	Boroondara	Melbourne - Inner East	Greater Melbourne	3.0	Café
1	1512	DEEPDENE	3103	BOROONDARA	145.065860	-37.811414	Balwyn	Boroondara	Melbourne - Inner East	Greater Melbourne	3.0	Café
2	1513	BALWYN	3103	BOROONDARA	145.083326	-37.809004	Balwyn	Boroondara	Melbourne - Inner East	Greater Melbourne	3.0	Café
3	1514	BALWYN NORTH	3104	BOROONDARA	145.084342	-37.791759	Balwyn North	Boroondara	Melbourne - Inner East	Greater Melbourne	0.0	Shopping Mal
4	1515	CAMBERWELL	3124	BOROONDARA	145.073613	-37.838461	Camberwell	Boroondara	Melbourne - Inner East	Greater Melbourne	NaN	NaN

The output of the dataframe with the identified clusters

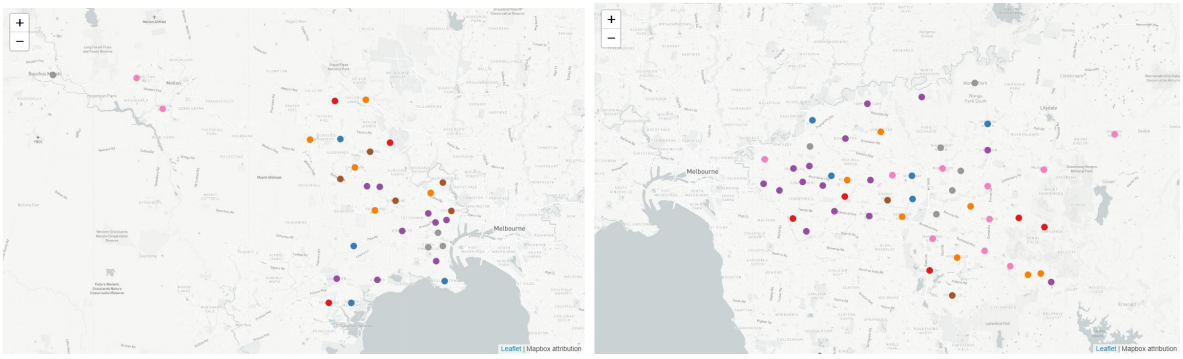
Analysis

The table below shows the summary and validation of the k means clustering and they are clusters fairly accurately.

circle color	cluster no.	melbourne east	melbourne west
grey	0	supermarket & grocery store	mixture
red	1	cafe	pizza place
blue	2	pizza place	convenience store
purple	3	cafe	cafe
orange	4	mixture	supermarket & shopping mall
brown	5	sandwich	vietnamese
pink	6	fast food	fast food

Table of melbourne east vs west cluster comparison

Results and Discussion



Melbourne west (left) and east (right) suburb centroids with clusters color coded.

Cafe (purple & red dot) along with **Vietnamese Cuisine** (brown dot) are common in Melbourne Western Suburbs. Business owners should be encouraged to open businesses similar to these F&B categories to best match the demand of the community. There is a strong cluster of cafe at the inner western suburbs whilst Vietnamese cuisine in inner and further north west from the CBD.

Cafe (purple & red dot) along with **Fast Food Restaurants** (pink dot) are common in Melbourne Eastern Suburbs. Business owners should be encouraged to open businesses similar to these F&B categories to best match the demand of the community. There is a strong cluster of cafe at the inner eastern suburbs whilst fast food restaurant are futher out east.

Conclusion

This project has helped in identifying similar F&B categories in both Melbourne's eastern and western suburbs. Cafes has deemed to have a very strong presence in both inner east and west of Melbourne. This can be strongly justified that residents in Melbourne admired the culture and lifestlye of drinking coffee and cafe ambience.

However, there are two distinct types of cuisine that occurs in both east and western suburbs. The eastern suburbs comprises of more fast food restaurant whilst western suburbs with more vietnamese or asian restuarants. This is significant as it may also reflects the taste and likes of the surrounding community of the preferred type of food. It it possible that ethnicity, cultural and identity could play a factor in this.

It is important to note that however a walkable catchment of 500m is applied to all suburbs, the generalisation may not be accurate to be located at the central/heart of the community that best reflect the high concentration of human activity. It will be better and more accurate when this analysis is carry out again, the adjustment of these suburb centroids should be adjusted too.