Clustering Suburbs in Melbourne, VIC, Australia

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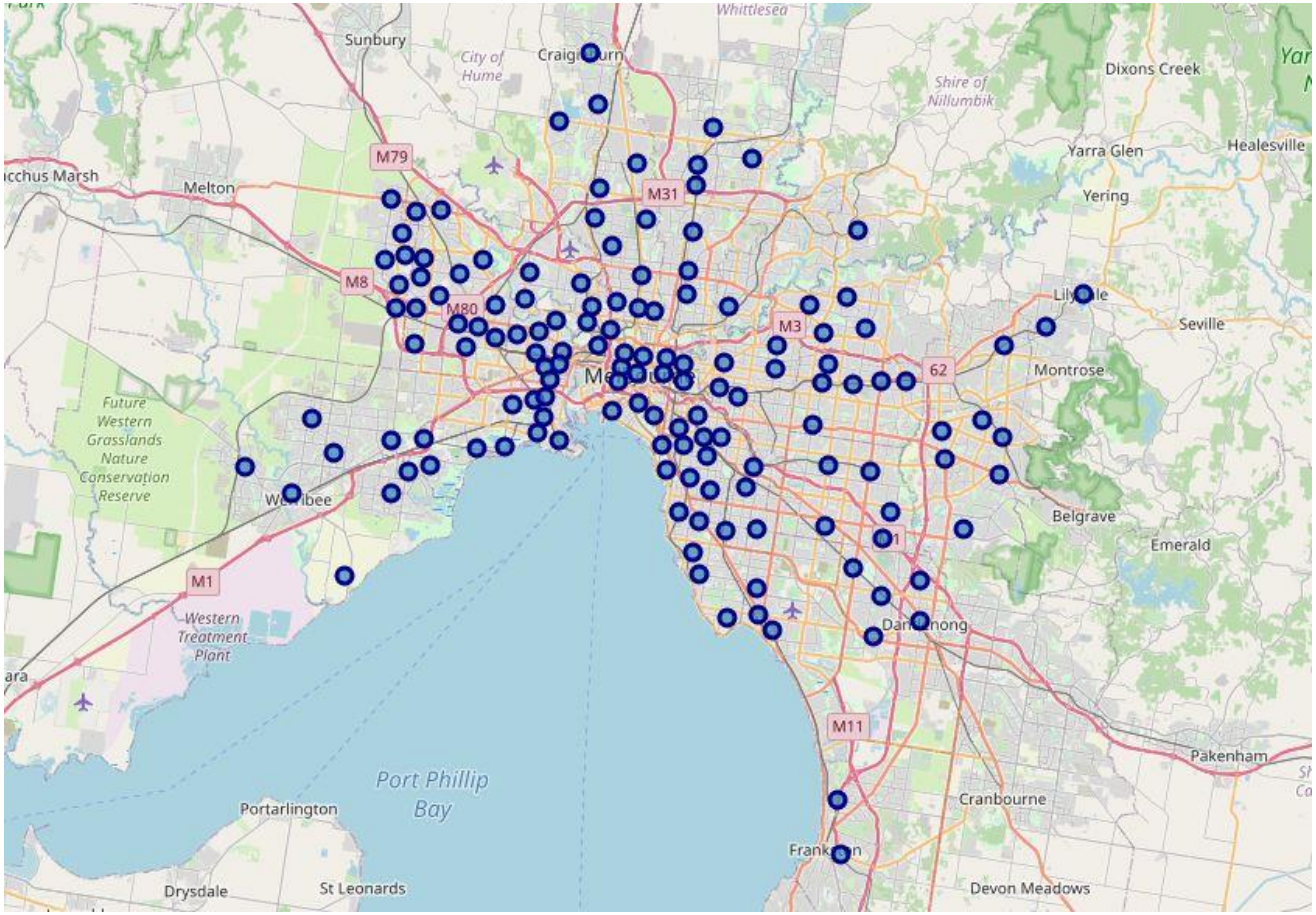
Introduction

- Melbourne is one among the world's most liveable cities which has been attracting many international students from different countries around the globe.
- When moving into a new city, one must be wondering about where to live.
- Our data-driven analysis project is meant to explore the suburbs in Melbourne, targeting at international students who are about to come to the city, helping to have a better idea about suburbs across the city of Melbourne in order to make a decision on where they want to reside in.

Data

- Names and coordinates of suburbs in Melbourne scraped from this web page. The coordinates will be used to visualize the suburbs on an interactive map and to explore nearby areas.
- Foursquare API location data to retrieve nearby venues around each suburb based on its coordinates. The suburbs will then be explored and grouped together based on their similarity in terms of what venue category and how many of them can be found in the area.

Map of suburbs in Melbourne



Nearby venues

Venues within 1km around each suburb were retrieved using Foursquare API and grouped into 8 groups:

1. Market/Grocery
2. Food court/Restaurant
3. Dessert shop
4. Coffee shop
5. Shopping
6. Entertainment (e.g., movies, museum, gallery, bar, pub)
7. Fitness/Sports (e.g., gym, pool, basketball court)
8. Recreational area (e.g., park, garden, beach)

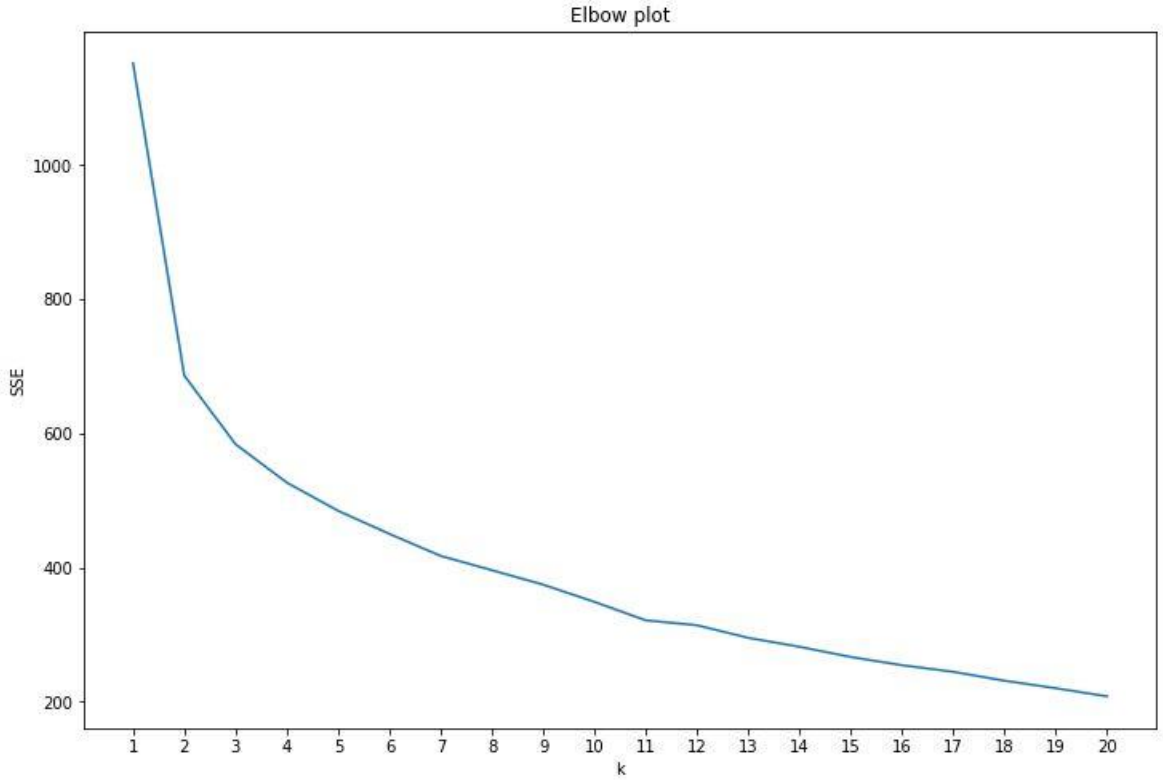
Nearby venues

Frequencies of nearby venues will be used to cluster suburbs.

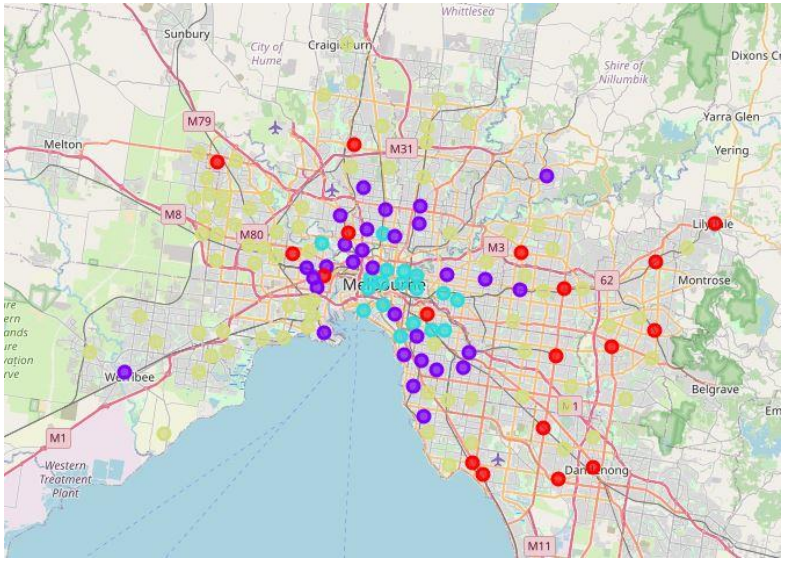
	Suburb	Coffee shop	Dessert shop	Entertainment	Fitness/Sports	Food court/Restaurant	Market/Grocery	Recreational area	Shopping
0	3000, Melbourne	15	10	23	3	29	2	1	8
1	3002, East Melbourne	24	2	20	6	32	0	4	2
2	3003, West Melbourne	20	6	12	2	44	5	5	1
3	3004, Melbourne	16	0	3	2	13	2	2	1
4	3008, Docklands	20	5	9	3	39	4	6	4

K-means clustering

We clustered the suburbs into 4 groups as suggested by the Elbow plot.



Results



Color codes:

- Cluster 0: Red
- Cluster 1: Purple
- Cluster 2: Blue
- Cluster 3: Yellow

Cluster	Coffee shop	Dessert shop	Entertainment	Fitness/Sports	Food court/Restaurant	Market/Grocery	Recreational area	Shopping
0	4.333333	1.500000	2.055556	1.888889	10.944444	4.166667	0.388889	3.333333
1	8.066667	2.133333	3.066667	1.766667	14.566667	4.000000	2.166667	0.533333
2	18.611111	5.277778	12.666667	3.277778	34.944444	5.388889	2.722222	1.888889
3	1.358974	0.525641	0.487179	0.833333	4.038462	1.717949	0.435897	0.474359

Results

- Cluster 2 (Blue): Very close to the city center, with more venues of most categories than any other cluster. Especially there are many coffee shops and food courts/restaurants.
- Cluster 1 (Purple): Close to the city center, with decent quantities of coffee shops, food courts/restaurants, market/grocery and recreational areas.
- Cluster 0 (Red): Far away from the city center, with decent quantities of coffee shops, food courts/restaurants, market/grocery and shopping centers.
- Cluster 3 (Yellow): Far away from the city center, very few venues of each category.

Conclusion

- We would recommend international students to match their preferences with the features of suburb clusters in order to pick the most suitable suburb to reside in.
- Future improvements:
  - Add missing suburbs
  - Add more latitudes and longitudes to locate suburbs
  - Add more features, e.g., rental price, population or crime rate