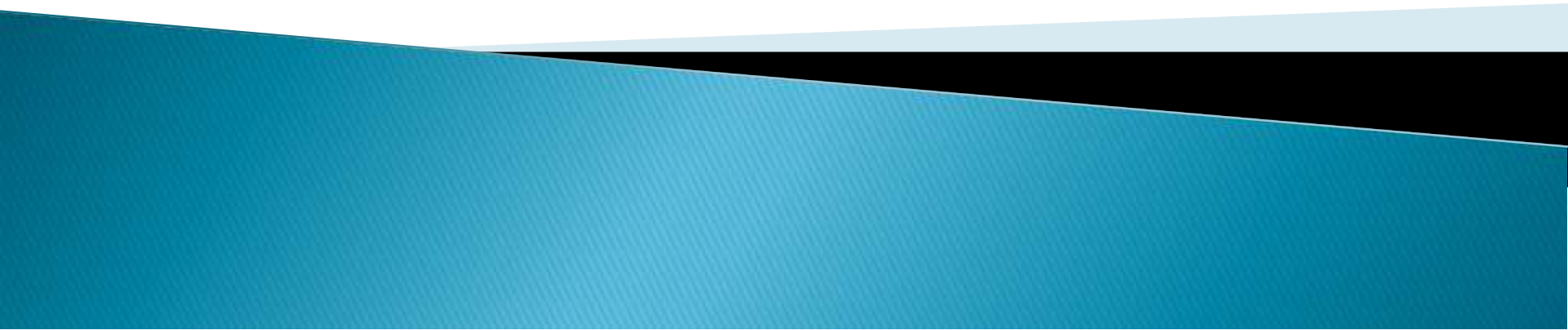



COURSERA CAPSTONE

THE BATTLE OF THE NEIGHBOURHOODS



1. INTRODUCTION

- ▶ Toronto is the capital city of the province of Ontario and the largest city in Canada by population. Many IT companies are based in Toronto.
 - ▶ Melbourne is one of the largest cities in Australia, with an area of 9,992.5 km² covering 31 municipalities and over 345 localities.
 - ▶ A fictional IT company based in Rosedale, Toronto needs to choose locations in Melbourne which are similar to Rosedale and a possible list of hotels at those locations for their employees.
 - ▶ Therefore, the business problem is: “Which areas of Melbourne are similar to Rosedale, Ontario? Can we have the names and locations of hotels in these locations where accommodation can be arranged for their employees?”
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2. DATA

- ▶ Toronto neighbourhood data to obtain list of neighbourhoods in Toronto along with latitude/longitude:

https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M

- ▶ Melbourne neighbourhood data to obtain list of neighbourhoods in Melbourne along with latitude/longitude:

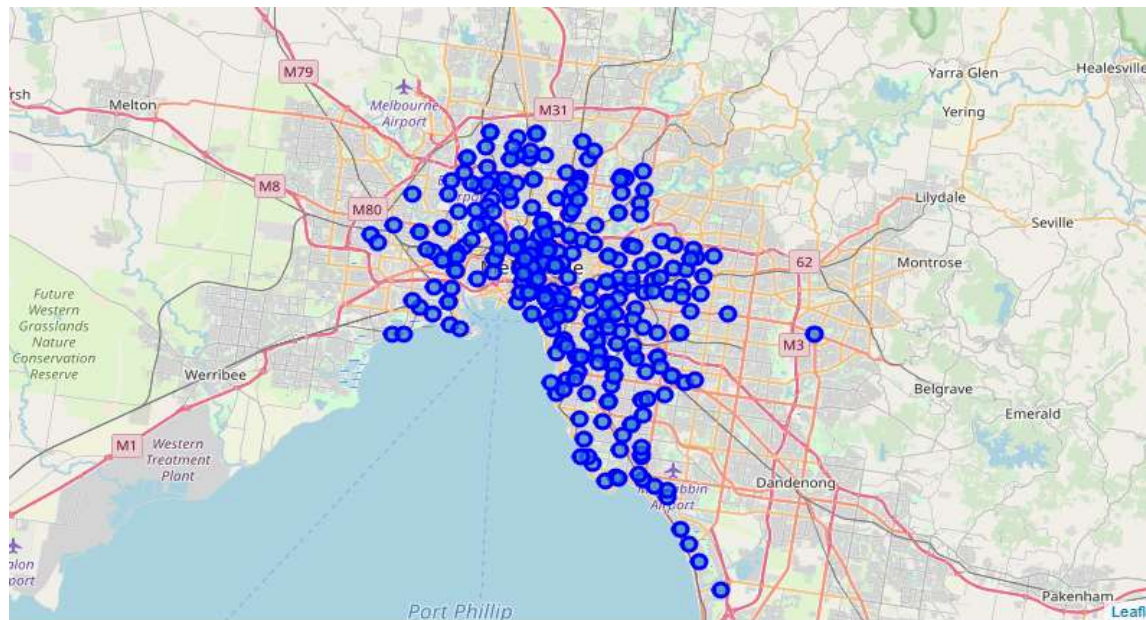
https://en.wikipedia.org/wiki/Postal_district_numbers_of_Melbourne

http://www.mapdevelopers.com/batch_geocode_tool.php

- ▶ Foursquare location data to search and explore the various types of venues and their categories available in each neighbourhood.

3. METHODOLOGY

- ▶ Neighbourhood and geolocation data is merged into required format for processing.
- ▶ The Melbourne dataset is analysed and the 345 neighbourhoods are visualised using the Folium library.

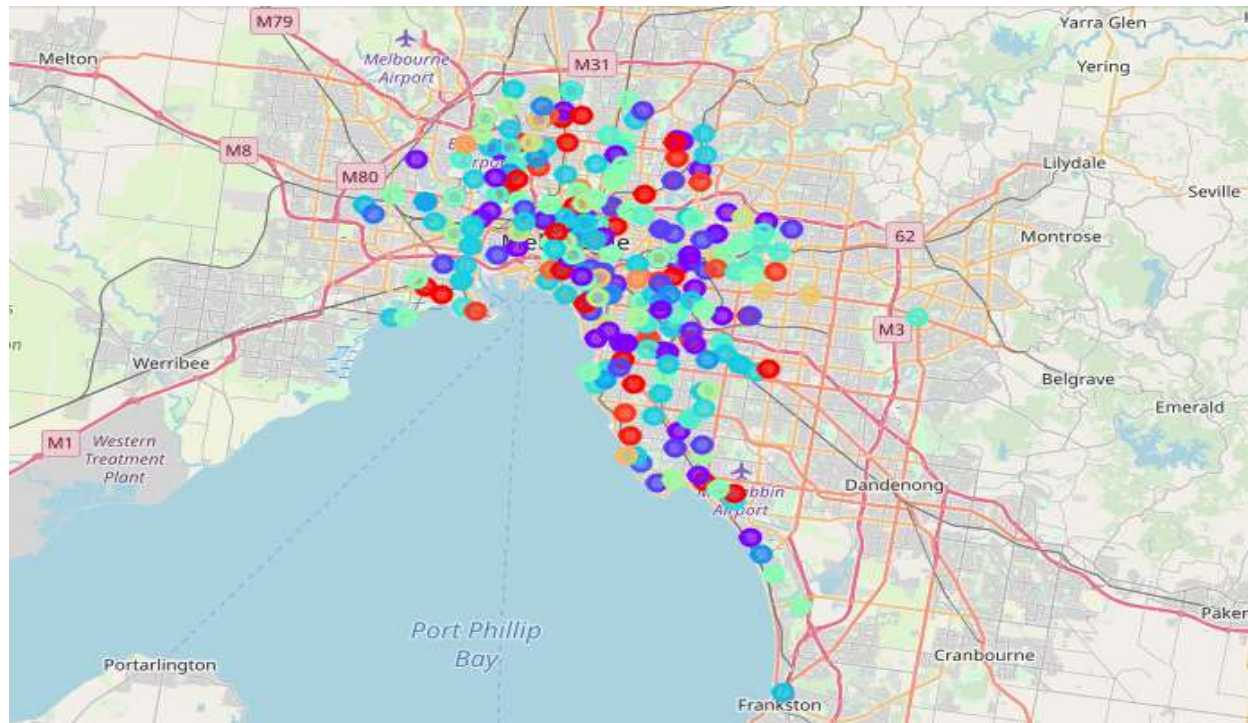


- ▶ Foursquare API is used to search/explore neighbourhoods in Rosedale and Melbourne, and obtain the most common venue categories within a radius of 500 meters for each neighborhood.
- ▶ Melbourne dataset contains 313 unique venue categories. The 10 most common venue categories are found for each of the 345 neighbourhoods in Melbourne.

	Area	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	
0	(Carnegie North)	Malay Restaurant	Thai Restaurant	Dumpling Restaurant	Supermarket	Korean Restaurant	Asian Restaurant	Japanese Restaurant	
1	(Hawthorn East)	Malay Restaurant	Asian Restaurant	Park	Liquor Store	Multiplex	Movie Theater	Café	
2	(St Kilda Road North)	Café	Hotel	Indonesian Restaurant	Australian Restaurant	Sushi Restaurant	Mobile Phone Shop	Park	
3	(St Kilda Road South)	Café	Hotel	Indonesian Restaurant	Australian Restaurant	Sushi Restaurant	Mobile Phone Shop	Park	
4	(Williamstown West)	Pier	Flea Market	Zoo Exhibit	Exhibit	Farm	Farmers Market	Fast Food Restaurant	
5	Abbotsford	Café	Pub	Farmers Market	Japanese Restaurant	Vegetarian / Vegan Restaurant	Convenience Store	Coffee Shop	Farm

K-Means Clustering

- ▶ The original neighbourhood (Rosedale, Toronto) and the 345 Melbourne neighbourhoods are grouped into 70 clusters on the basis of their shared characteristics and features using K-means algorithm.



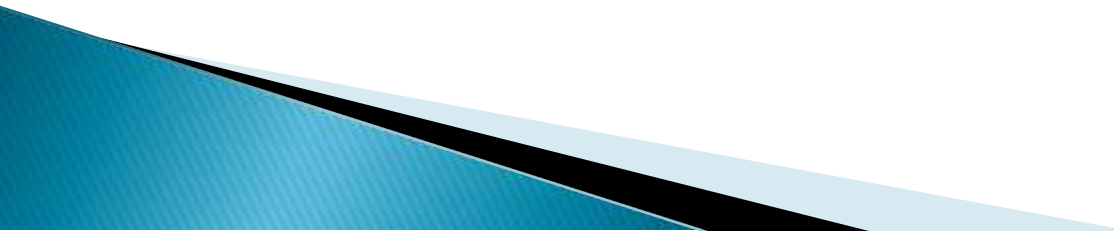
Visualization of the neighborhoods in Melbourne and their clusters using Folium

4. RESULTS

- ▶ The cluster of 29 Melbourne neighbourhoods which have similar features and characteristics as Rosedale, Toronto are obtained.
- ▶ A list of 5 hotels in this cluster is obtained using the Foursquare API.

	name	location
0	Adina Apartment Hotel	{'address': '157 Fitzroy St', 'crossStreet': '...
1	Quest Windsor Hotel	{'address': '111 Punt Rd', 'lat': -37.85107890...
2	Park Regis Hotel	{'address': '604 St. Kilda Rd.', 'lat': -37.85...
3	Windsor Castle Hotel	{'address': '89 Albert St.', 'crossStreet': 'a...
4	The Elephant & Wheelbarrow Hotel	{'address': '169 Fitzroy St', 'crossStreet': '...

5. DISCUSSION

- ▶ The clustering analysis done was useful at classifying the neighborhoods with similar features; however it is not a perfect solution.
 - ▶ Other factors and data sources, demographic and socio-economic features data, detailed information related to the hotels, can be considered for further refinement.
 - ▶ No algorithm can predict an accurate analysis of the neighbourhoods in consideration as an actual visit and stay at the places.
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6. CONCLUSION

- ▶ The neighbourhoods in Melbourne that are similar to Rosedale, Toronto are found, along with a list of 5 hotels in these areas
 - ▶ This info can be used by the IT company to arrange for accommodation for their employees.
 - ▶ This project can be replicated for different neighbourhoods and cities in order to find similar neighbourhoods
 - ▶ Further expansion using different datasets and taking more factors into consideration to provide more accurate analysis.
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