Capstone Project - The Battle of Melbourne Neighbourhoods

1. Problem Background

As a business starting off, finding the perfect location is very important. Whether yours is a restaurant or a manufacturing company, where you locate your business plays a pivotal role in the chances of it succeeding. Location may not feature in the top five to-do list items of a new business, because seemingly more important things may be on the forefront. But being in a bad location can be disastrous for many enterprises; it can cause an otherwise great business and management to be suffocated and fail from the start.

Before you start looking for a business location, you should have a clear picture of what you have and what you want to have in future. Coming up with that picture is a time-consuming process, which is both tedious and exciting – but you need to give it the attention that it deserves. Although many business mistakes can be corrected later, a bad location is sometimes impossible to repair.

This is why businesses must conduct a **business location analysis**. To help businesses, we have carefully selected the **most crucial factors** to consider, when choosing a business location for your business.Here are some other factors that you should consider when choosing the best business location:



1.1 Demographics

When considering demographics, you should think about two important angles. First, you should think about who your customers are and how close they are to your location. This is critical for some service providers and retailers but not so for other businesses. The demographic profile that you have for your target audience will allow you to make this decision.

Secondly, you should consider your community. Is your customer base local, and does a percentage of it support your business or match your customer profile? When choosing

communities that are largely dependent on a specific industry, you need to be careful because a slump can be bad for business.

1.2 Parking and Accessibility

Consider the accessibility of the location for every person who will be coming there. If you are on a busy street, is it easy for cars to get in and out of your parking lot? Your facility also needs to be accessible to people with disabilities. Which sort of deliveries are you likely to receive, and will your suppliers be able to access the facility easily?

If you are considering an office building, ask yourself whether you need the keys for periods when the main doors are locked. If the building closes on weekends and you would like to work then, you should look elsewhere. Make sure that there is sufficient parking for employees and customers.

Just as with foot traffic, you should monitor the facility and see how the parking demand fluctuates. Moreover, you should make sure that the parking lot is adequately lit and well maintained.

1.3 Competition

Are competing companies close by? In some instances, this can be advantageous if comparison shopping is popular. You might end up catching the excess from nearby businesses if you are situated near an entertainment area or restaurant. However, if you are selling CJ aviation fuel pumps and there is a competitor nearby that sells the same thing, start looking elsewhere. When consumers are looking for very specific products, they understand that their choices may be limited, so they will probably only visit one location.

1.4 Summary

The closer the products are to your customers, the higher your market value. From planning future expansions, relocating to newer offices, or opening new shops in the right location can mean many things for your business.

2. Problem Description

Melbourne is the coastal capital of the southeastern Australian state of Victoria. At the city's centre is the modern Federation Square development, with plazas, bars, and restaurants by the Yarra River. In the Southbank area, the Melbourne Arts Precinct is the site of Arts Centre Melbourne – a performing arts complex – and the National Gallery of Victoria, with Australian and indigenous art.

Given the this background, A businessman from Italy is thinking of open a new restaurant in Melbourne city in Australia and has approached a data scientist to help determine the best location for his restaurant to kick start his chain of restaurants in the country

2.1 Interest

Almost everything about business exists at a particular time and location. It could be objects like raw materials, products, facilities, people like employees, agents, customers or events like deliveries, purchases, production runs. By understanding how these elements relate to one another through locational analytics, businesses can make more informed decisions that can improve both efficiency and effectiveness. Location analytics helps in understanding and targeting customers and understanding and optimising business processes.

3. Data sources

3.1 Australian Postcodes

The project requires a dataset that has suburb or postal codes with latitude and longitude and the dataset should include all the major suburbs in Melbourne. We are going to use data on https://www.matthewproctor.com/australian_postcodes which has Australian Post Codes + Latitude/Longitude with more than 16K entries. The data files have eight fields as show below:

Data Fields

The files have eight fields in each:

Field	Description	Example	Updated
id	Primary Key from source database	1	Regularly
postcode	The postcode in numerical format - 0000 to 9999	3000	Regularly
locality	The locality of the postcode - typically the city/suburb or postal distribution centre	Melbourne	Regularly
state	The Australian state in which the locality is situated	VIC	Regularly
long	The longitude of the locality - defaults to 0 when not available	144.956776	Regularly
lat	The latitude of the locality - defaults to 0 when not available	-37.817403	Regularly
dc1	The Australia Post distribution Centre servicing this postcode - defaults to blank when not available	MELBOURNE	Infrequently
type1	The type of locality, such as a delivery area, post office or a "Large Volume Recipient" such as a GPO, defaults to blank when not available	LVR	Regularly

3.2 Four Square

Foursquare is a places API that offers real-time access to Foursquare's global database of rich venue data and user content to power your location-based experiences in applications

or websites. We are going to use regular endpoints for this project that include basic venue firmographic data, category, and ID.

The dataset obtained for Melbourne will provide the project with the different latitude and longitude of neighbourhoods and will be used to make calls to the Foursquare API for different purposes. We will construct a URL to send a request to the API to search for a specific type of venues, to explore a particular venue, to explore a Foursquare user, to explore a geographical location, and to get trending venues around a location.

3.3 K Square Clustering

You will use the explore function from Foursquare to get the most common venue categories in each neighbourhood , and then use this feature to group the neighbourhood into clusters. You will use the k-means clustering algorithm to complete this task

K Means Clustering Algorithm

- Specify number of clusters K.
- Initialise centroids by first shuffling the dataset and then randomly selecting K data points for the centroids without replacement.
- Keep iterating until there is no change to the centroids. i.e assignment of data points to clusters isn't changing.

4. Conclusion

Now, each cluster can be examined and determine the discriminating neighbourhood or business location categories that distinguish each cluster. Based on the defining categories, you can then assign a name to each cluster according to suitability for a new business Finally, you will use the Folium library to visualize the neighborhoods in Melbourne and their emerging business zones (Color coded).