



# **Best neighbourhood for an Indian Restaurant**

**Capstone Project**

## Points to consider

- Neighbourhood's that reflect a dining preference for Indian cuisine
- Identifying all the “Food” categories for Indian eateries
- Household Incomes
- Centrally located neighbourhood

# Data

- Postcodes, latitude and longitude data scrapped from <https://www.geonames.org/postalcode-search.html?q=auckland&country=NZ>
- Household income data was taken from New Zealand's most recent Census (2018). These were downloaded as a.csv file from <https://www.stats.govt.nz/>
- Household income data required additional information, namely latitude and longitude data from <https://geocoder.readthedocs.io/index.html>

# Data Cleaning

- From <https://www.geonames.org/> 202 neighbourhood's were found for Auckland City and 199 postcodes identified. The data was cleaned and presented in a data frame with 4 features: neighbourhood, postcode, latitude, longitude.
- The median household incomes for the greater Auckland region along with associated latitudes and longitudes were provided by <https://www.stats.govt.nz/> . Postcodes associated with geolocations were acquired by using the centroid for each postcode's location and reverse geocoding with <https://nominatim.org/> . This data was presented in a data frame with 4 features: Income, postcode, latitude, longitude.
- The data frame prepared for household incomes was amended to included distances from the city central business district (CBD) to each neighbourhood of interest. This was presented as 2 features. The first as distance as a direct line between 2 points (latitude and longitude), and secondly as the most direct driving route (Google maps).

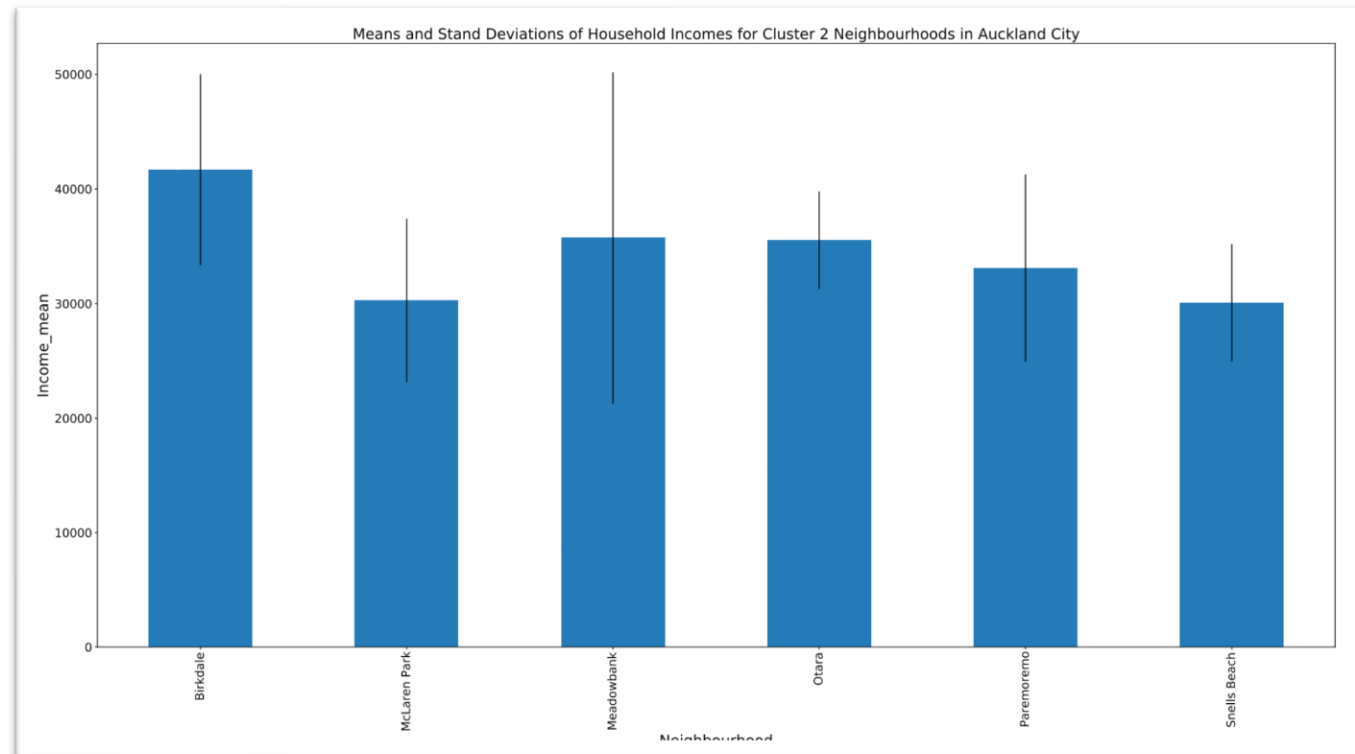
## K-means clustering - Cluster 2

Neighbourhoods	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
McLaren Park	Indian Restaurant	Malay Restaurant	Dim Sum Restaurant	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court	Fish & Chips Shop	Filipino Restaurant
Birkdale	Indian Restaurant	Bakery	Fast Food Restaurant	Yakitori Restaurant	Dim Sum Restaurant	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court
Paremoremo	Indian Restaurant	Yakitori Restaurant	Dim Sum Restaurant	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court	Fish & Chips Shop	Filipino Restaurant
Snells Beach	Indian Restaurant	Restaurant	Deli / Bodega	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court	Fish & Chips Shop	Filipino Restaurant
Meadowbank	Indian Restaurant	Café	Yakitori Restaurant	Dim Sum Restaurant	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court	Fish & Chips Shop
Otara	Indian Restaurant	Yakitori Restaurant	Dim Sum Restaurant	German Restaurant	Gastropub	Fried Chicken Joint	French Restaurant	Food Court	Fish & Chips Shop	Filipino Restaurant

# Household Income of Cluster2 Neighbourhood's

	Neighbourhood	count	mean	std	min	25%	50%	75%	max
0	Birkdale	5124.0	41683.606557	8318.946846	19800.0	36400.0	41800.0	47800.0	61200.0
1	McLaren Park	30178.0	30289.240506	7132.470791	10300.0	24400.0	29900.0	36000.0	50500.0
2	Meadowbank	5796.0	35715.527950	14451.863287	13500.0	22400.0	35200.0	45500.0	72200.0
3	Otara	60.0	35530.000000	4252.229724	29400.0	31775.0	34650.0	38150.0	43600.0
4	Paremoremo	2142.0	33105.555556	8162.100243	11700.0	26900.0	32700.0	39300.0	57700.0
5	Snells Beach	1984.0	30071.875000	5111.953432	21300.0	26800.0	29650.0	33275.0	45600.0

# Household Income of Cluster2 Neighbourhood's



## Neighbourhood Sprawl of Cluster 2

Neighbourhood	Direct Distance (Km's) <sup>1</sup>	Distance via road (Km's) <sup>2</sup>
McLaren Park	11.7	18.9
Birkdale	8.9	12.6
Paremoremo	14.1	25.3
Meadowbank	9.2	10.1
Otara	15.2	18
Snells Beach	46.6	66.6

1 Distance calculated as a direct line between latitude and longitude points.

2 Distance calculated by most direct driving route, as determined by Googlemaps.com



# Conclusions

- A cluster of six neighbourhood's that might potentially meet the needs of the client were found using a K-means algorithm.
- An examination of median household incomes showed that Birkdale, Meadowbank and Otara had a higher incomes and Snells Beach at the lower end.
- Using the Auckland CBD as a centroid, Birkdale and Meadowbank were the most central neighbourhood's with Snells beach representing the most isolated location.
- Further information beyond the scope of this report would assist the client decide on the best location to open her first restaurant. Such as commercial property availability and location, cost of property purchase or lease, purchase or rent of personal living arrangements (house).