IBM CAPSTONE PROJECT

Battle of the Neighbourhoods

BACKGROUND

Options for investing into a restaurant business in 3 of the key metros within South Africa being Cape Town, Johannesburg or Durban. These cities where chosen due to them biggest in South Africa for locals as well has being seen from overseas as top travel Destinations.

City	Average disposable salary	Monthly transport costs	Rent for a 1-bedroom apartment in the city centre	Basic utilities	Meal for two people at a restaurant
Johannesburg	R17 360	R1 330	R6 720	R800	R500
Cape Town	R18 300	R425	R11 170	R550	R600
Durban	R15 000	R375	R9 940	R1 230	R410

DATA SOURCES & TOOLS

1. Web Articles

Title	Comment	
Source	Internet	
Extract method	Web scrape	
Use	Review previous analysis to understand key business and tourism cities, disposable income etc.	

2. Geolocator

Title	Comment	
Source	github	
Extract method	Create Function	
Use	geocode the Suburbs	

3. Foursquare

Title	Comment	
Source	www.foursquare.com	
Extract method	Web scrape. Extract venue info for suburbs in city	
Use	this data will be used to understand the different restaurants available in a specific area	

4. Census data

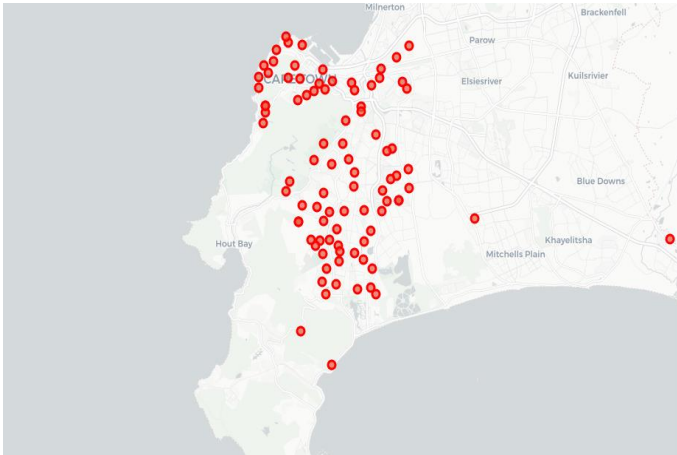| Title	Comment	
Source	https://census2011.adrianfrith.com/place/798013	
Extract method	Web scrape. Extract suburbs within city	
Use	Extract the suburbs for under the main place	

5. Tools and Modules

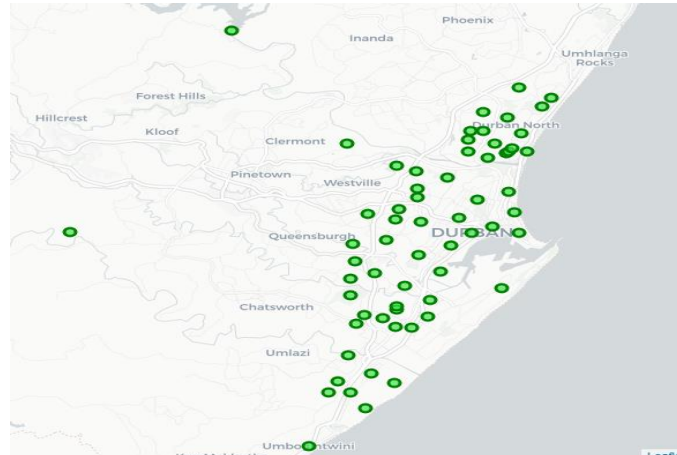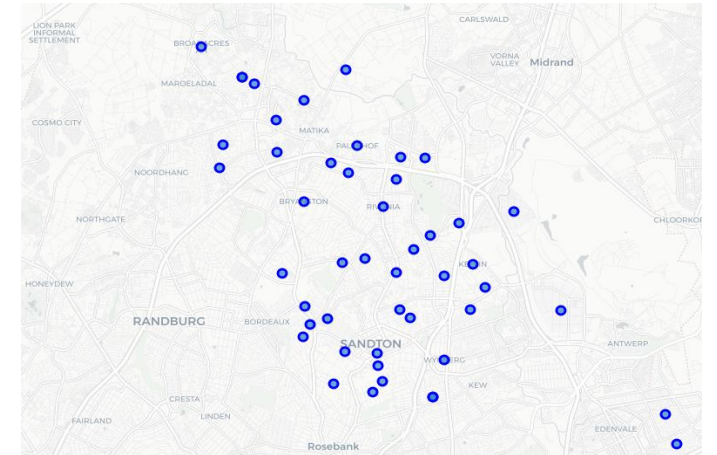| Title	Comment	
Juypter notebook	https://jupyter.org/	
Pandas	https://pandas.pydata.org/	
Numpy	https://numpy.org/	
IBM cloud services	https://cloud.ibm.com/login	
Geo	https://pypi.org/project/geopy/	
BeautifulSoup	https://pypi.org/project/beautifulsoup4/	
Folium	https://github.com/python-visualization/folium	

METHODOLOGY

Extract the location suburb data per main place and city

GEO Code the Subplaces

Explore the data, Visualize graphically and maps

Use FourSquare API to extract the Restaurant Types

Prep the data for Clustering Model

Use Elbow Method to determine Optimum k

Cluster the Subplaces based on Restaurants
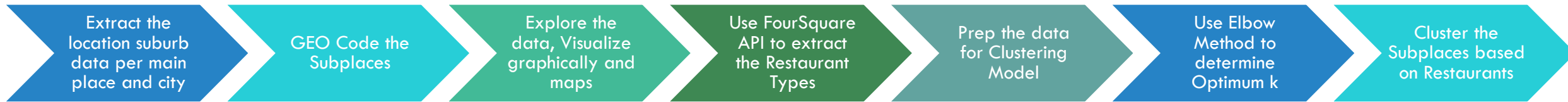
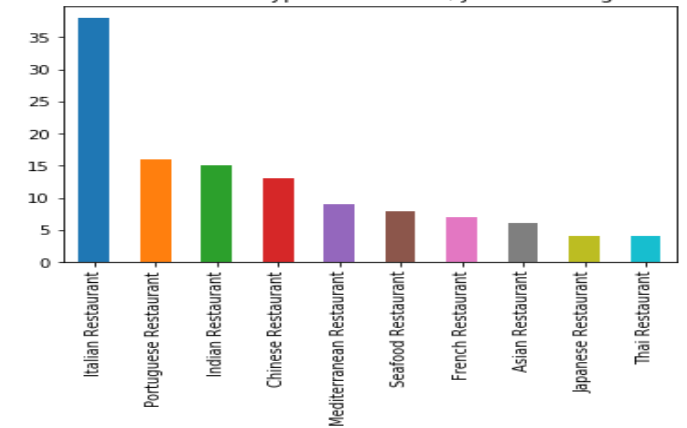# RESULTS FROM EXPLORATION

Cape Town

Durban

Sandton
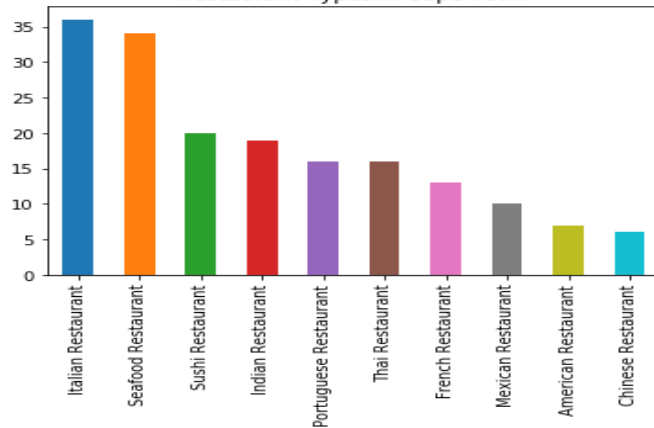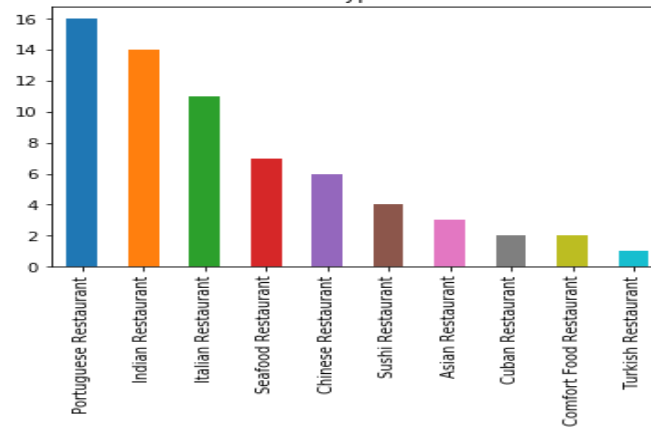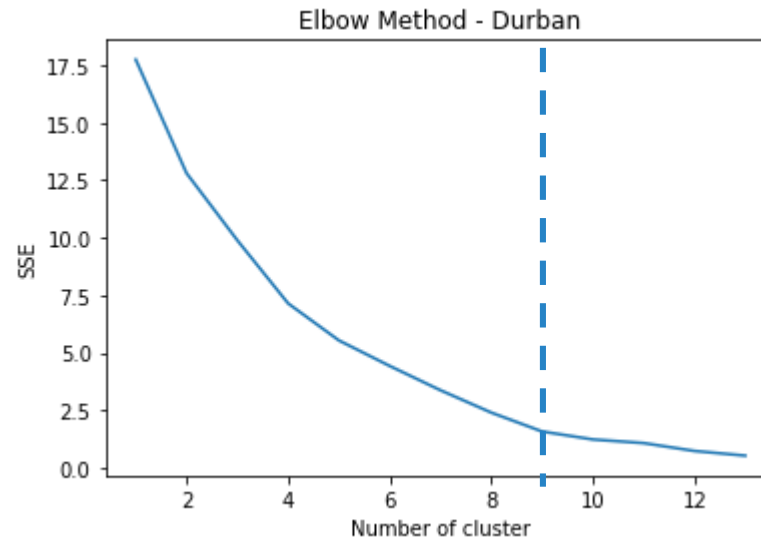
ELBOW JOINT RESULTS

Cape Town

Durban

Sandton

K=9

K=9
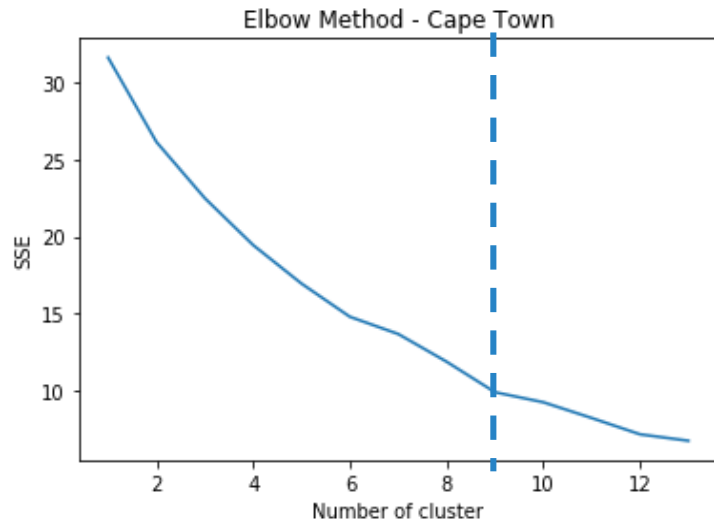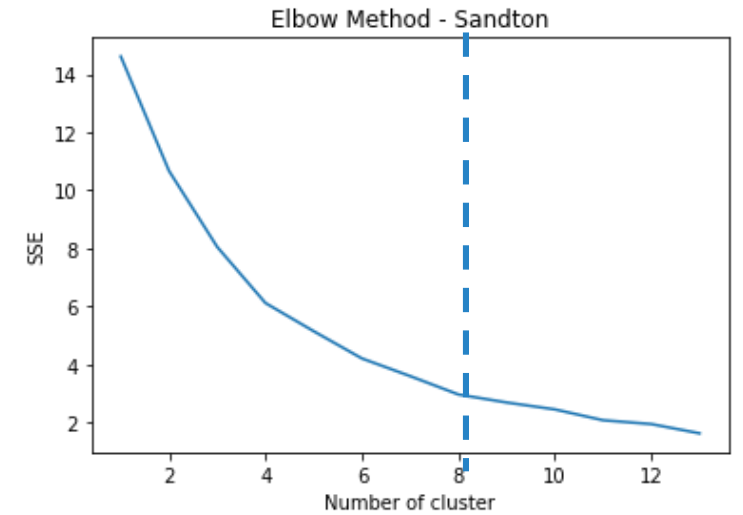
K=8

CLUSTERING RESULTS

Cape Town
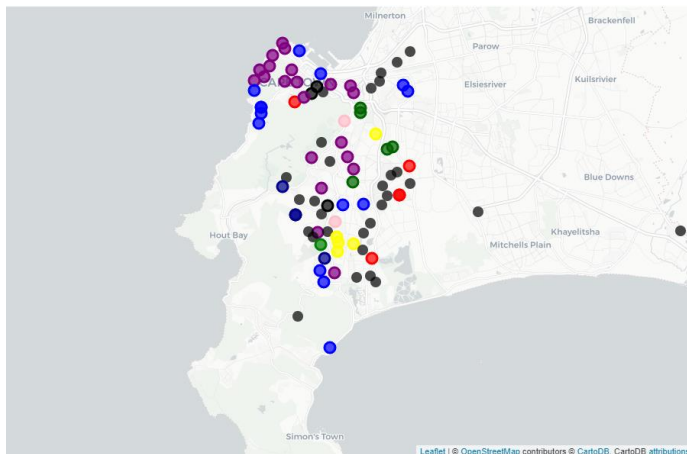
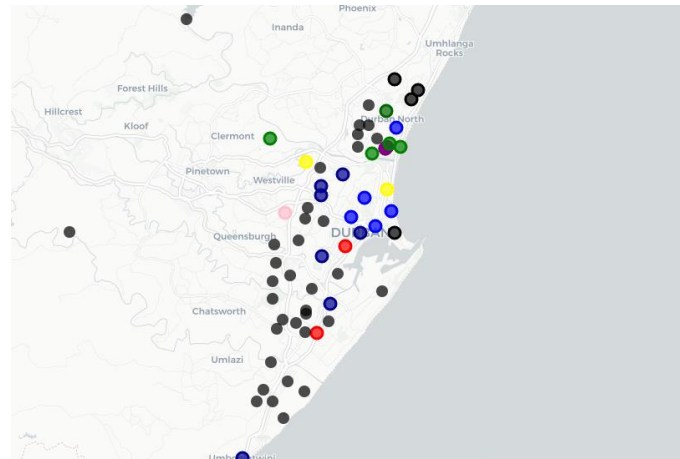|	
Italian Restaurant	36
Seafood Restaurant	34
Sushi Restaurant	20
Indian Restaurant	19
Portuguese Restaurant	16
Thai Restaurant	16
French Restaurant	13
Mexican Restaurant	10
American Restaurant	7
Chinese Restaurant	6

Name: Venue Category, dtype: int64

Durban

Italian Restaurant	38
Portuguese Restaurant	16
Indian Restaurant	15
Chinese Restaurant	13
Mediterranean Restaurant	9
Seafood Restaurant	8
French Restaurant	7
Asian Restaurant	6
Japanese Restaurant	4
Thai Restaurant	4

Name: Venue Category, dtype: int64

Sandton
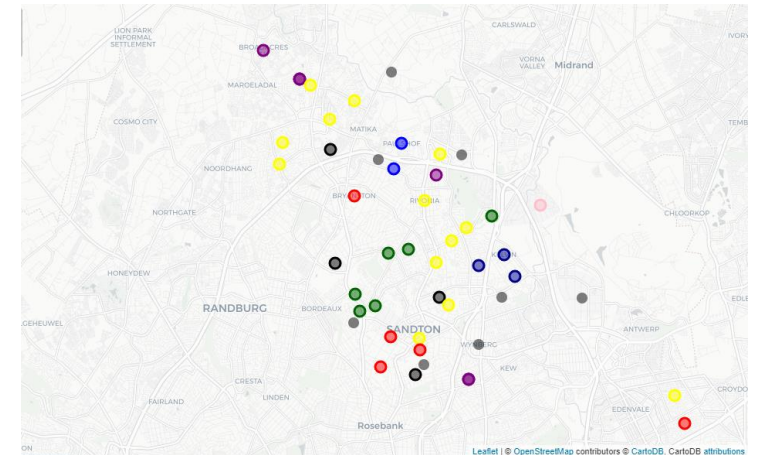
Portuguese Restaurant	16
Indian Restaurant	14
Italian Restaurant	11
Seafood Restaurant	7
Chinese Restaurant	6
Sushi Restaurant	4
Asian Restaurant	3
Cuban Restaurant	2
Comfort Food Restaurant	2
Turkish Restaurant	1

Name: Venue Category, dtype: int64

RECOMMENDATION

The 3 key cities being Durban, Cape Town and Johannesburg are a good investment opportunity.

The market considers both tourist and business hubs, which will maximise both day time and night time occupancy rates.

The recommended choice of restaurant in Sandton and Durban would be of a Thai Theme. This is do to the high preference of food of Asian preference, observed by high demand of Indian, Asain themed restaurants. However Cape Town deviates slightly hence due to current presence Thai and limited Chinese offering.

The minimum occurrence of Thai restaurants in these towns and Chinese specifically in Cape Town presents ideal investment opportunities.