



# 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 were chosen due to them being the biggest in South Africa for locals as well as 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.

## 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

## 2. Geolocator

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

## 4. Census data

Title	Comment
Source	<a href="https://census2011.adrianfrith.com/place/798013">https://census2011.adrianfrith.com/place/798013</a>
Extract method	Web scrape. Extract suburbs within city
Use	Extract the suburbs for under the main place

## 5. Tools and Modules

Title	Comment
Jupyter notebook	<a href="https://jupyter.org/">https://jupyter.org/</a>
Pandas	<a href="https://pandas.pydata.org/">https://pandas.pydata.org/</a>
Numpy	<a href="https://numpy.org/">https://numpy.org/</a>
IBM cloud services	<a href="https://cloud.ibm.com/login">https://cloud.ibm.com/login</a>
Geo	<a href="https://pypi.org/project/geopy/">https://pypi.org/project/geopy/</a>
BeautifulSoup	<a href="https://pypi.org/project/beautifulsoup4/">https://pypi.org/project/beautifulsoup4/</a>
Folium	<a href="https://github.com/python-visualization/folium">https://github.com/python-visualization/folium</a>

# 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

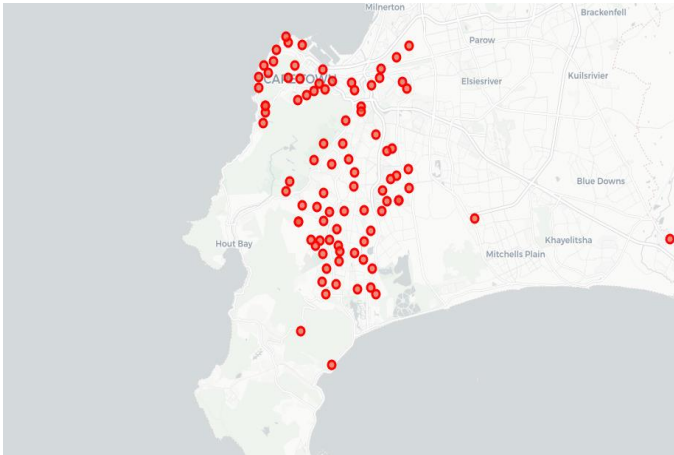
Prep the data  
for Clustering  
Model

Use Elbow  
Method to  
determine  
Optimum k

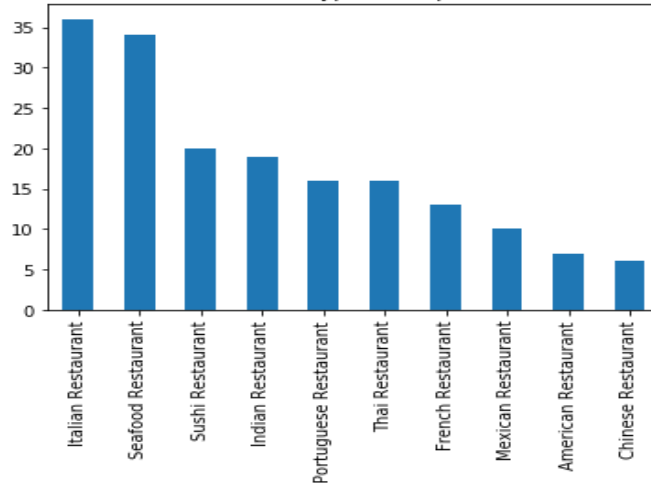
Cluster the  
Subplaces based  
on Restaurants

# RESULTS FROM EXPLORATION

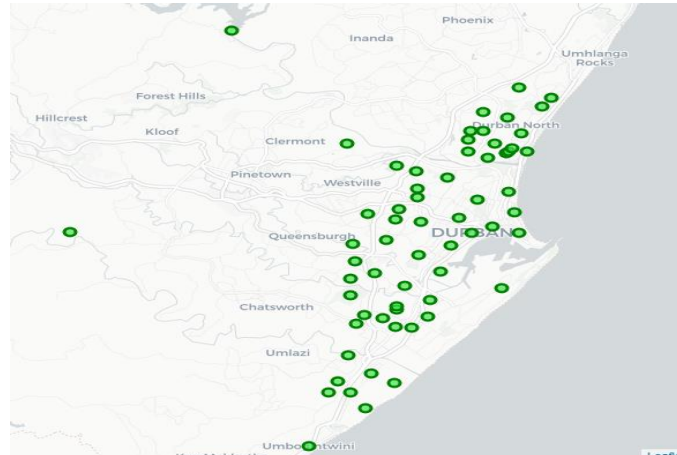
Cape Town



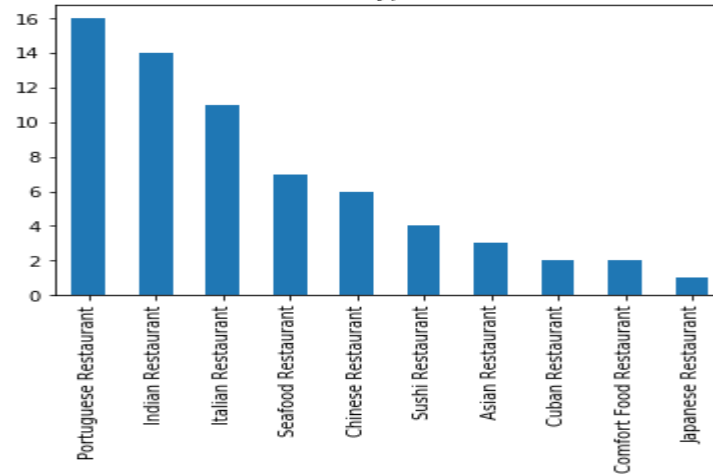
Restaurant Types in Cape Town



Durban



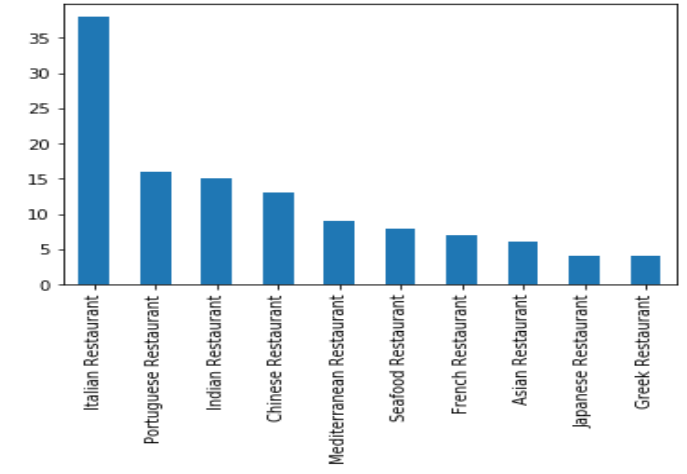
Restaurant Types in Durban



Sandton

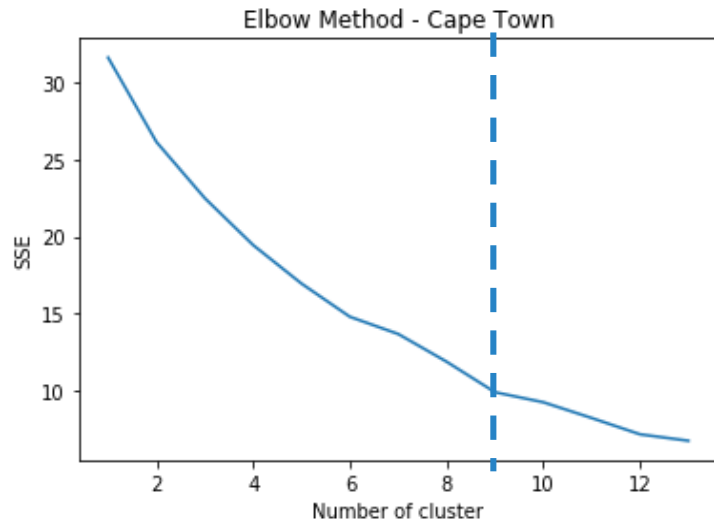


Restaurant Types in Sandton, Johannesburg



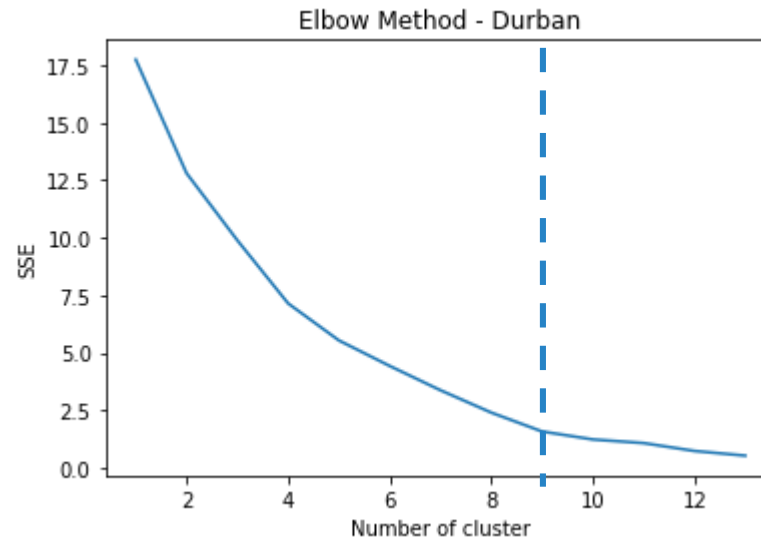
# ELBOW JOINT RESULTS

Cape Town



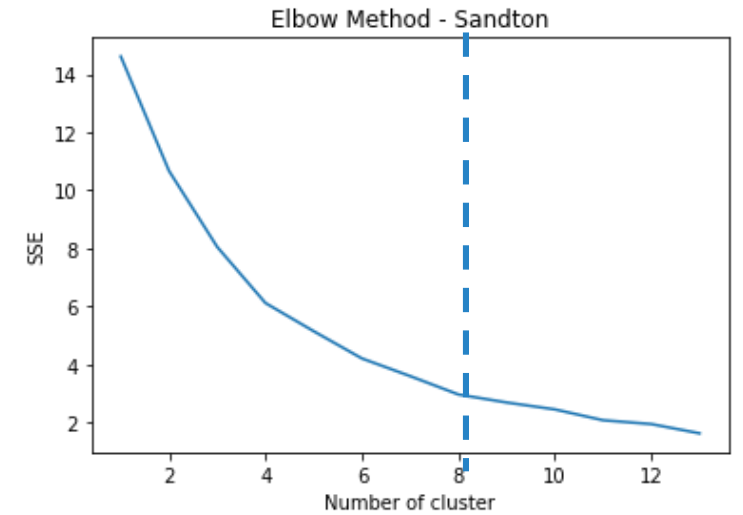
K=9

Durban



K=9

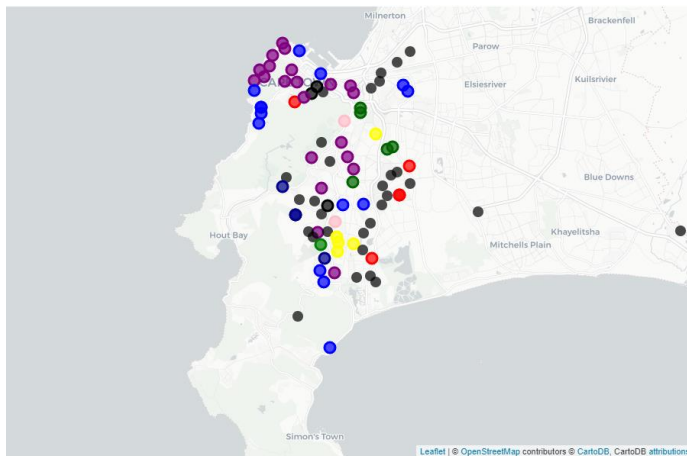
Sandton



K=8

# CLUSTERING RESULTS

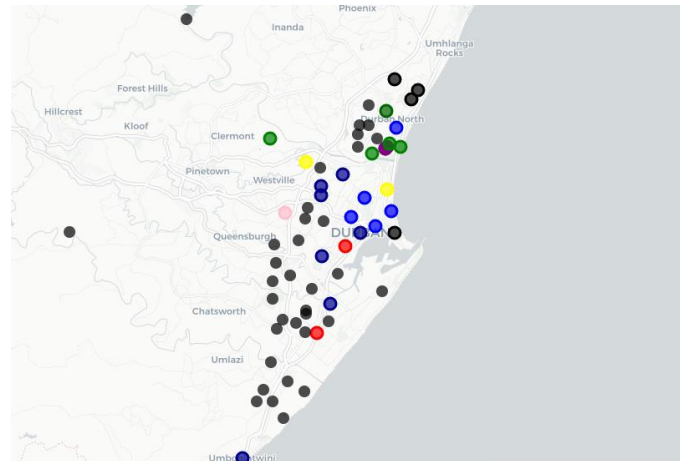
Cape Town



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

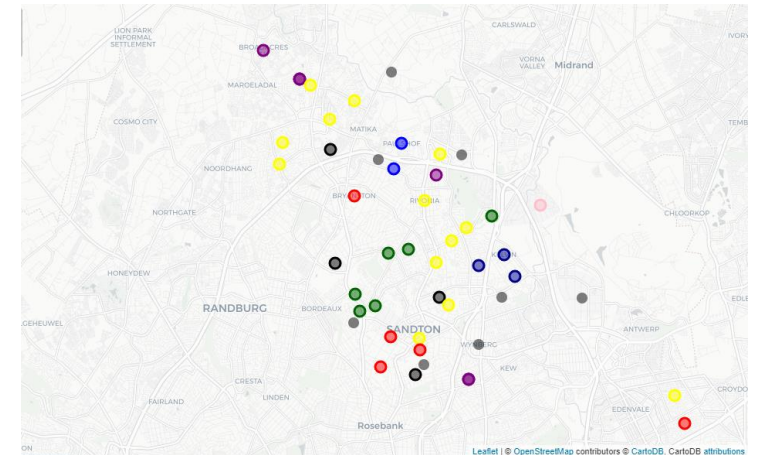
Durban



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.