Restaurant in Tel Aviv – Predicting Best Location

Background

- As for the end of 2020, there are more than 12,000 restaurants in Israel but without a doubt, the best place in Israel to open a restaurant is Tel Aviv, since it's a small city the competition can be very high; more than 33% of the restaurants in Israel will close after 1 year and 50% after 2 years, with such a terrifying statistics the location of the restaurant become a top priority issue for the entrepreneur.

Goals

- This project has 2 goals:
- 1. Create a model which will allows a visualization of different types of restaurants locations, this will help entrepreneurs find the best location for their new restaurant.
- 2. Create a model which allows clustering of different locations and Tel Aviv, this will help entrepreneurs to decide what the best location to open a similar restaurant is.

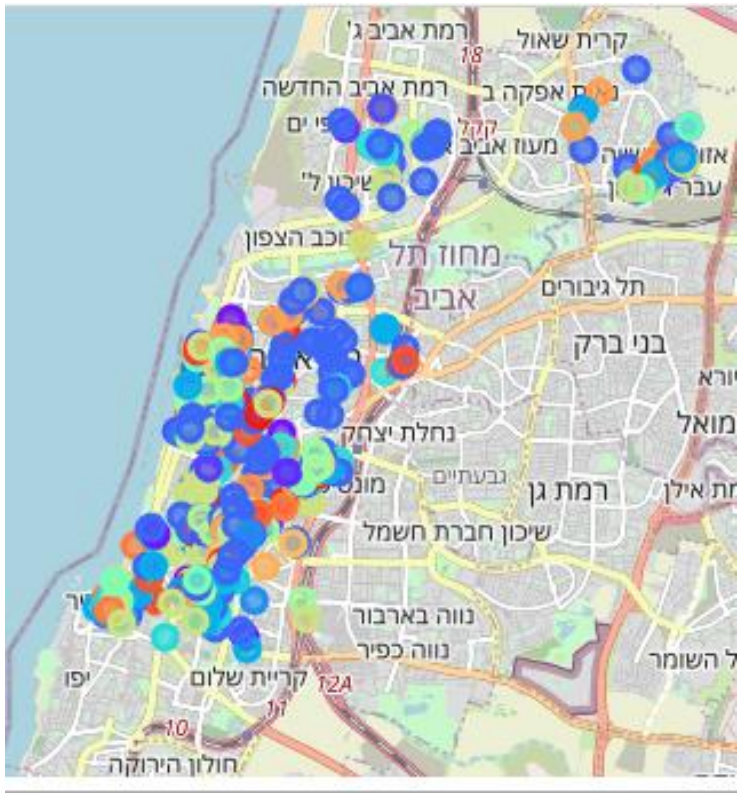
Data

- Tel Aviv divided to 8 different areas which cover most of Tel Aviv:
- 'Rothschild', 'Kikar Hamdina', 'Hatahana', 'TLV Lev', 'Beach', 'Ramat Hahayal', 'Ramat Aviv', 'Drom TA'

- I used the geo location (https://www.latlong.net/) website in order to find the locations of these areas:
- 'Latitude': [32.06730651855469, 32.0868522, 32.05824516363195, 32.0661324, 32.083150, 32.112790, 32.108110, 32.052250],
-
- 'Longitude': [34.778079986572266, 34.7898459, 34.76291204921263, 34.7831839, 34.770640, 34.835230, 34.796760, 34.777730]}

- Foursquare API has been used to get the common venues of a given location.
- The data will be cleaned and aggregated to restaurants categories

Data Visualization



Data Interpretation

- Almost 1/3 of the restaurants in Tel-Aviv are Café, it means that there is a large competition in this type, the 2nd common type is 'Mediterranean Restaurants', the 3rd is 'Diner' and the 4th is 'Italian Restaurants'.
- Other restaurants types have a market share of less than 3.5% for each category, in order to avoid competition those types of restaurants will be preferable.

Data Summary

- A quick look on the data shows that there is large similarity among the locations in respect for the 1st and 2nd restaurants types.
- We will use clustering algorithm in order to find out which location has similar characteristics.

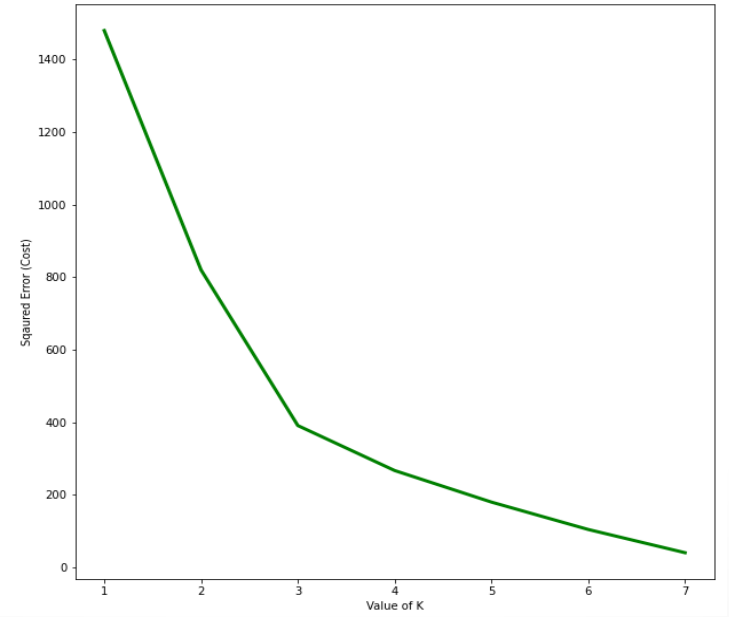
Location	Location Latitude	Location Longitude	N1 Venue Type	N2 Venue Type	N3 Venue Type	N4 Venue Type	N5 Venue Type
Beach	32.083150	34.770640	Cafe	Mediterranean Restaurant	Sandwich Place	Italian Restaurant	Falafel Restaurant
Drom TA	32.052250	34.777730	Cafe	Mediterranean Restaurant	Diner	Italian Restaurant	Eastern European Restaurant
Hatahana	32.058245	34.762912	Mediterranean Restaurant	Cafe	Diner	Italian Restaurant	Seafood Restaurant
Kikar Hamdina	32.086852	34.789846	Cafe	Mediterranean Restaurant	Pizza Place	Italian Restaurant	Fast Food Restaurant
Ramat Aviv	32.108110	34.796760	Cafe	Mediterranean Restaurant	Pizza Place	Fast Food Restaurant	Bistro
Ramat Hahayal	32.112790	34.835230	Cafe	Mediterranean Restaurant	Fast Food Restaurant	Sandwich Place	Italian Restaurant
Rothschild	32.067307	34.778080	Cafe	Mediterranean Restaurant	Diner	Italian Restaurant	Vegetarian / Vegan Restaurant
TLV Lev	32.066132	34.783184	Cafe	Italian Restaurant	Mediterranean Restaurant	Seafood Restaurant	Japanese Restaurant

Classification Model

- A clustering model (K-Means) will be used in order to find similarity between locations and to group Tel Aviv locations
- The optimal K will be determined by using the elbow method, the point where this distortion declines the most is the elbow point

Classification Model

- Based on the plot we select number of clusters as 3. Hence, we segment the selected Locations into three different clusters



Classification Results

Location	Location Latitude	Location Longitude	N1 Venue Type	N2 Venue Type	N3 Venue Type	N4 Venue Type	N5 Venue Type	Cluster
Beach	32.083150	34.770640	Cafe	Mediterranean Restaurant	Sandwich Place	Italian Restaurant	Seafood Restaurant	2
Drom TA	32.052250	34.777730	Cafe	Mediterranean Restaurant	Diner	Italian Restaurant	Eastern European Restaurant	0
Hatahana	32.058245	34.762912	Mediterranean Restaurant	Cafe	Diner	Italian Restaurant	Seafood Restaurant	1
Kikar Hamdina	32.086852	34.789846	Cafe	Mediterranean Restaurant	Pizza Place	Italian Restaurant	Fast Food Restaurant	2
Ramat Aviv	32.108110	34.796760	Cafe	Mediterranean Restaurant	Pizza Place	Fast Food Restaurant	Bistro	0
Ramat Hahayal	32.112790	34.835230	Cafe	Mediterranean Restaurant	Fast Food Restaurant	Sandwich Place	Italian Restaurant	0
Rothschild	32.067307	34.778080	Cafe	Mediterranean Restaurant	Vegetarian / Vegan Restaurant	Diner	Italian Restaurant	1
TLV Lev	32.066132	34.783184	Cafe	Italian Restaurant	Mediterranean Restaurant	Japanese Restaurant	Seafood Restaurant	2

Conclusion

- The purpose of this model was to allow entrepreneurs to receive information regarding different restaurants in Tel Aviv and to help find the best location for a new one. Based on the analysis conveyed, it can be concluded that there are still opportunities in Tel Aviv for open a new restaurant with low competition. Future exploration of competitors' reviews and customers' satisfaction need to be made in order to make this model more precise.