Finding suitable restaurants for tourists for their tastes,

which neighborhoods of İzmir have vegetarian friendly restaurants

The beautiful İzmir

Introduction/Business Problem

- İzmir is a city on Turkey's Aegean coast.

- It is the third most populous city in Turkey, a tourist attraction place of interest

- For tourists, who prefer vegetarian food, finding a right place to eat can be a daunting challenge, especially in a country like Turkey, where meat heavy dishes like Kebab, Doner are the most popular ones.

- Turkey is famous for its meat culture and is not quite vegetarian friendly.

- Discovery of Izmir by studying districts and neighbors applying machine learning tools and try to find best fits for their needs.

Description of the problem

The aim of this project is to explore, cluster, and segment the neighborhoods in the city of İzmir and give recommendations to tourists, immigrants, friends , who are vegetarian and coming from the world to visit İzmir, based on the common restaurant categories in different neighborhoods.

- Where to open restaurants depending on their types in İzmir?'

- What are the most frequently occurring venues in İzmir

- Which neighborhood has the higher number of of restaurants depending on its type?

- Where to find vegetarian-friendly restaurant, sea foods restaurants?

Data

- İzmir data, which contains the list of districts, neighborhoods and their latitudes and longitudes.

- Captured from 'https://www.atlasbig.com/tr/izmirin-mahalleleri'

- There are 29 districts and 178 neighborhoods in İzmir.

- The Foursquare location data is used to fetch all the venues in each neighborhood by their coordinates

Methodology

Collecting data

- By using beautiful soup, I found the data from data source from https://www.atlasbig.com/tr/izmirin-mahalleleri

Data Preparation and Cleansing

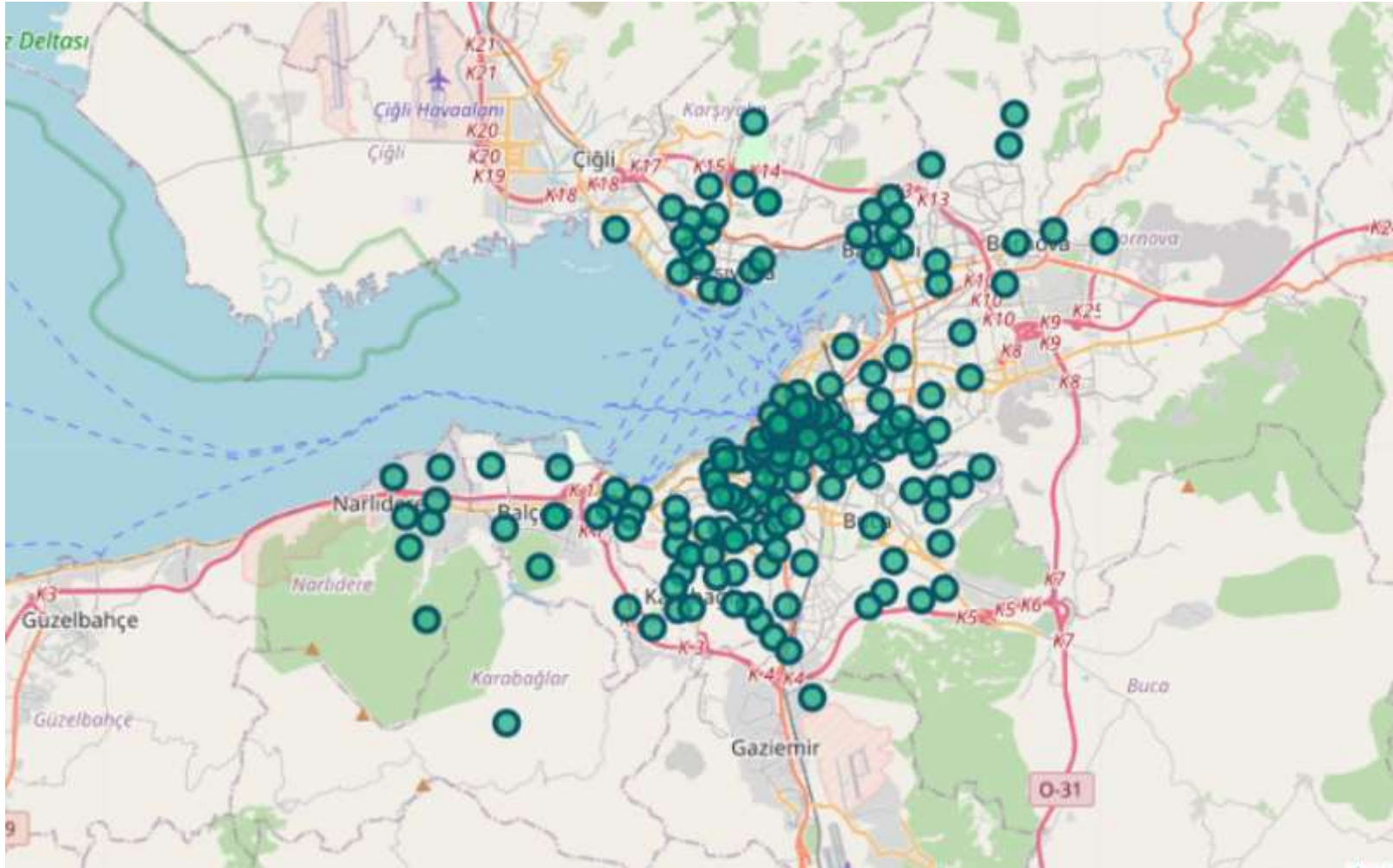- Cleaning and merging your data and put it into dataframes

Getting Coordinates of neigbourhoods from Geopy Client

- Using geopy library to get The latitude and longitude values of Izmir

- Folium library to visualize geographic details of Izmir and its boroughs

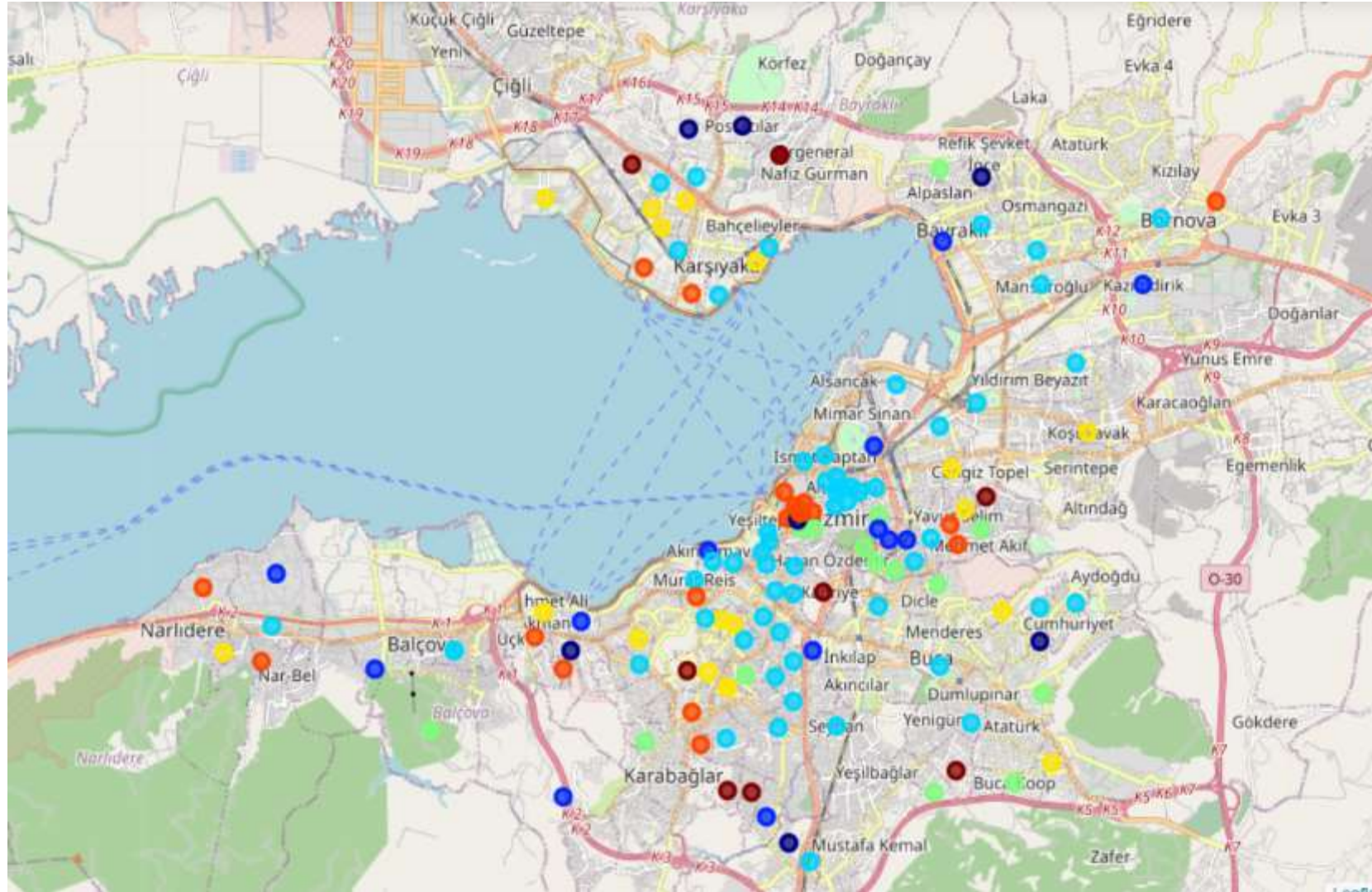- FourSquare to find venues and all restaurants.

Applying Machine Learning Algorithms

- One hot encoding to transform data from categorical data into numerical data

- K-Means clustering algorithm To cluster the neighbourhoods of Izmir based on the venue categories
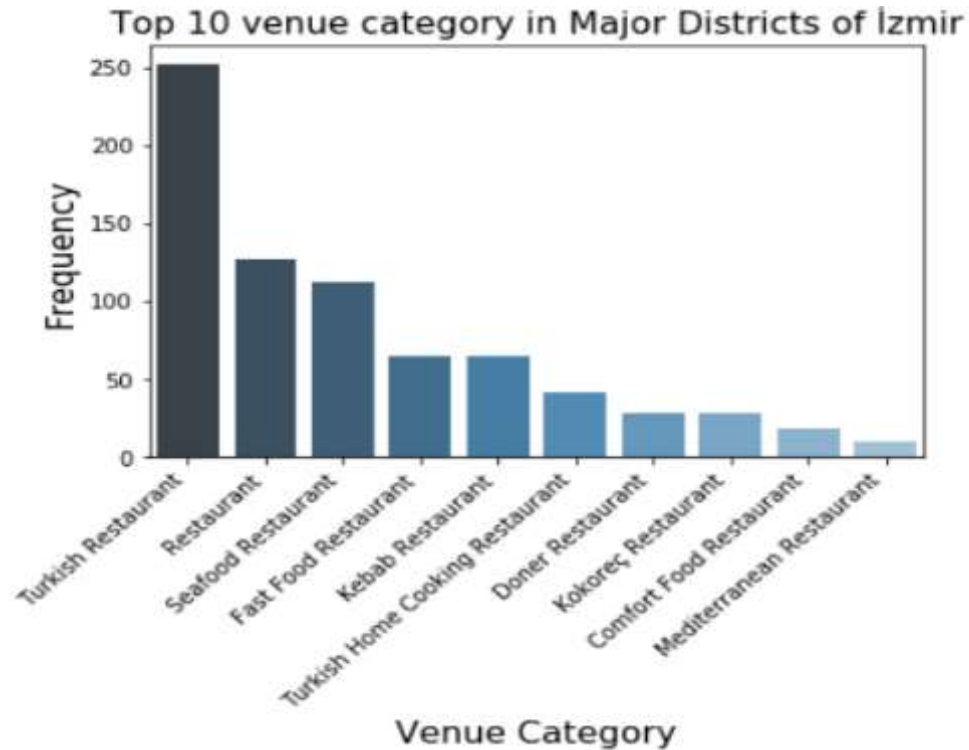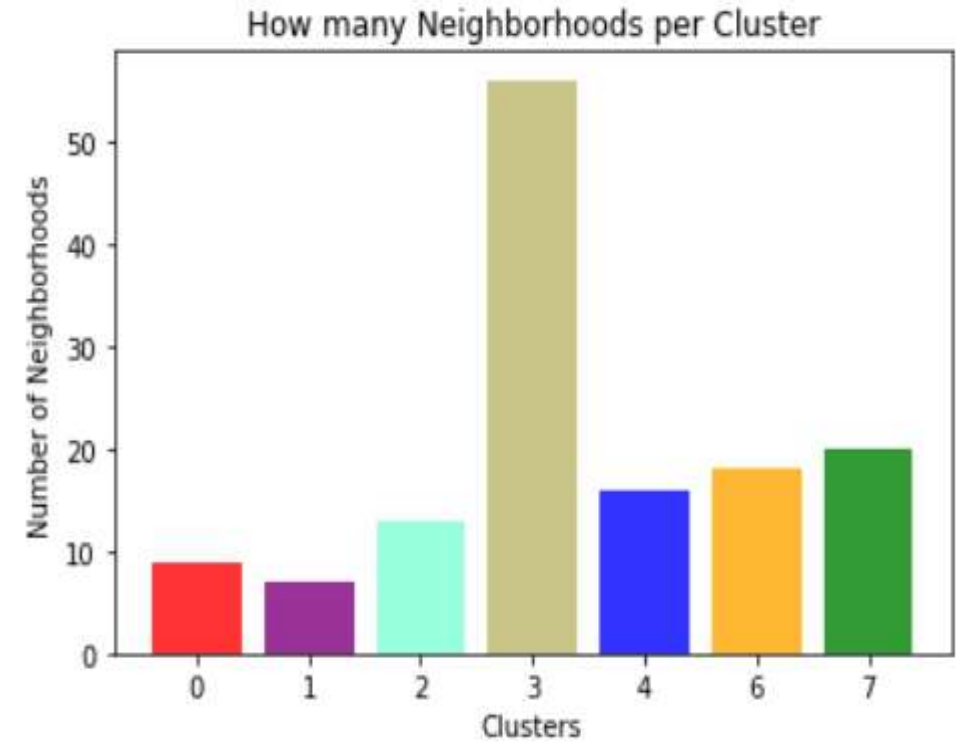
Results and Discussion

Now we can see all the neighbourhoods of Izmir visualized on the map.

Visulaization of Izmir's restaurants after applying clustering algorithm

Top 10 venue category in Major Districts of İzmir

How many Neighborhoods per Cluster

Obiviously, Turkish restaurants are the most popular one alongside with Kebab, Doner, Kokorec. Since Izmir is a coastal Aegean city, Seafood restaurants are popular too. Some of the seafood restaurants might be vegetarian or vegan restaurants.

cluster 3 which is the light blue circle on the map has the most neighborhoods. This is due to fact that this particular area is the most popular place to visit for locals in Izmir

	Neigbourhood	District	Latitude	Longitude	Cluster Labels	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
0	Erzene Mahallesi	Bornova	38.469727	27.229410	6.0	Seafood Restaurant	Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Halal Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant
3	Bostanlı Mahallesi	Karşıyaka	38.458185	27.097839	6.0	Seafood Restaurant	Restaurant	Vegetarian / Vegan Restaurant	Turkish Restaurant	Kumru Restaurant	Kebab Restaurant	Turkish Home Cooking Restaurant	New American Restaurant
26	Aksoy Mahallesi	Karşıyaka	38.453675	27.108870	6.0	Turkish Restaurant	Turkish Home Cooking Restaurant	Seafood Restaurant	Vegetarian / Vegan Restaurant	Halal Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant
32	Ali Fuat Cebesoy Mahallesi	Karabağlar	38.380457	27.108602	6.0	Seafood Restaurant	Kebab Restaurant	Doner Restaurant	Italian Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant	Chinese Restaurant
44	Arap Hasan Mahallesi	Karabağlar	38.400710	27.109956	6.0	Seafood Restaurant	Restaurant	Turkish Restaurant	Turkish Home Cooking Restaurant	Middle Eastern Restaurant	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Greek Restaurant
46	Üçkuyular Mahallesi	Karabağlar	38.393574	27.072844	6.0	Seafood Restaurant	Turkish Restaurant	Restaurant	Vegetarian / Vegan Restaurant	Halal Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant
50	Ulubatlı Mahallesi	Konak	38.409803	27.169766	6.0	Turkish Home Cooking Restaurant	Seafood Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Halal Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant
71	Çamtepe Mahallesi	Narlıdere	38.389342	27.009759	6.0	Seafood Restaurant	Turkish Restaurant	Vegetarian / Vegan Restaurant	Italian Restaurant	American Restaurant	Asian Restaurant	Bosnian Restaurant	Chinese Restaurant

Cluster6 is dominated by Seafood restaurants and Vegetarian / Vegan Restaurants. So if you are a Vegetarian, these are the neighbourhood you want to visit.

Insights

- Turkish restaurants top the charts of most common venues all districts following by Seafood restaurants

- Konak , Karşıyaka, and Karabağlar have the maximum number of restaurants.

- Cluster6 is dominated by Seafood restaurants and Vegetarian / Vegan Restaurants. So if you are a Vegetarian, these are the neighbourhoods that you want to visit. I recommend going somewhere close to the sea side like Bostanlı Karşıyaka ☺

Conclusion

- Built a model to explore Izmir's neighborhoods and its restaurants

- Used FourSquare, Folium library, geopy client

- Segmented the neighborhoods in the city based on the common restaurant categories in different neighborhoods.

- Created 7 clusters by applying ML techniques

- Shortlisted the neighborhoods based on the common venues and decided a neighborhood which best suits to our problem.