APPLIED DATA SCIENCE CAPSTONE

CAPSTONE PROJECT

THE BATTLE OF NEIGHBORHOODS

ISTANBUL

ABSTRACT

- To determine a neighborhood to open a restaurant:

  ✓ neighborhoods of Istanbul will be divided into groups considering which venues are in those neighborhoods using machine learning algorithms.

  ✓ From these groups, the most eligible one will be selected and features of this group will be displayed using the venue information of this group.

INTRODUCTION

- If one thinks about openning a restaurant in Istanbul, how does s/he decide where to open this restaurant? In this project, the main goal is to answer this question.

- To achieve this, the neighborhoods of Istanbul will be under examination.

- The most eligible neighborhoods will be presented as a group with their common features.
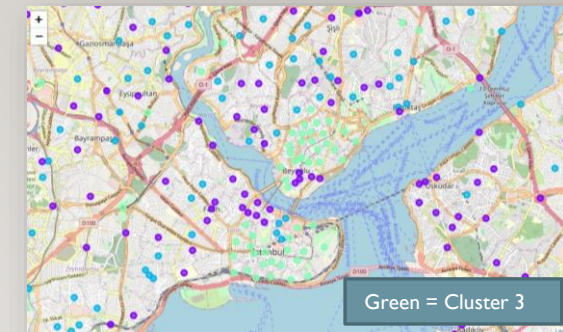
DATA

- Neighborhood List

  from https://en.wikipedia.org/wiki/List_of_neighbourhoods_of_Istanbul

- Coordinates of neighborhoods

  using OpenStreetMap Nominatim via Python Geopy library

- Venue information

  using FourSquare Places API

  https://developer.foursquare.com/docs/places-api/

METHODOLOGY

- Using **Beautiful Soup** library, wikipedia page is scraped

- Using **GeoPy** library, latitudes and longitudes of the neighborhoods are gathered

- Using **Foursquare Places API**, information of venues in neighborhoods are obtained

- Based on most frequently seen 10 venue categories in neighborhoods, 5 clusters are created via **K-Means** algorithm

- Using 10 most frequent venues information and considering position of neighborhoods in the map (via **Folium** library) most suitable cluster of neighborhood is chosen

RESULTS

Green = Cluster 3

- Cluster 3 is chosen because neighborhoods in Cluster 3:
  - ✓ have venue categories labeled as "Hotel", "Café", "Breakfast Spot", "Restaurant" and tourist attraction places like "Art Gallery", some historical "Mosque"s, "History Museum" etc.
  - ✓ are highly touristic neighborhoods. To be clear, neighborhoods mainly focus on:
    - The Historic Peninsula (palaces, big mosques, museums, tourist attractions)
    - Istiklal Square (souvenir shops, cafés and restaurants)

Neighborhood	Borough	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
Kamerhatun	Beyoğlu	Hotel	Café	Restaurant	Turkish Restaurant	Art Gallery	Bar	Coffee Shop	Gastropub	Theater	Meyhane
Kalyoncukulluğu	Beyoğlu	Bar	Hotel	Café	Turkish Restaurant	Coffee Shop	Meyhane	Art Gallery	Seafood Restaurant	Kebab Restaurant	Restaurant
Katip Mustafa Çelebi	Beyoğlu	Hotel	Café	Coffee Shop	Pizza Place	Dessert Shop	Seafood Restaurant	Restaurant	Bar	Dance Studio	Theater
Kuloğlu	Beyoğlu	Hotel	Coffee Shop	Café	Restaurant	Dessert Shop	Pizza Place	Art Gallery	Theater	Dance Studio	Nightclub
Ömeravni	Beyoğlu	Hotel	Café	Coffee Shop	Tea Room	Restaurant	Pizza Place	Park	Waterfront	Mosque	Bar
Örnektepe	Beyoğlu	Turkish Restaurant	Café	Hotel	Steakhouse	Soccer Field	Fast Food Restaurant	History Museum	Coffee Shop	Dessert Shop	Restaurant
Pürtelaş	Beyoğlu	Café	Hotel	Coffee Shop	Art Gallery	Seafood Restaurant	Restaurant	Bakery	Tea Room	Park	Hookah Bar
Sururi	Beyoğlu	Turkish Restaurant	Hotel	Café	Kebab Restaurant	Jewelry Store	Coffee Shop	Restaurant	Dessert Shop	Mosque	Health Food Store

DISCUSSION

- The venues in neighborhoods will constitute the determined criterion in this endeavour because venues display the socio-cultural structure of their environment.

- In conclusion, cluster 3 is perfect for openning a restaurant because neighborhoods labeled as cluster 3 have - in addition to at least 5 different types of restaurants/take-out places - hotels and tourist attractions.

- Because cluster 3 neighborhoods are highly touristic neighborhoods, there is more people traffic than any other place in Istanbul.

- Thus, cluster 3 is suggested for openning a restaurant

FOR FUTURE

- To make a deeper examination onto neighborhoods:
  - ✓ Actual people traffic and population of tourists in different neighborhoods can be comapred
  - ✓ For openning a restaurant types of restaurants in neighborhoods can be compared and the neighborhood that does not have the type of our restaurant should be preferred
  - ✓ Using Premium requests on Foursquare Places API, most liked type of restaurant should be suggested