Immigrants in Istanbul

Capstone Project - The Battle of Neighborhoods (Week 1-2)

Introduction

Background

Ever since 2011, one of the biggest humanitarian crises in history has begun to be experienced in Syria. More than 5.5 million Syrians were forced to leave their country.More than 5.5 million forced to flee from Syria's 3.2 million refugees are living in Turkey, ie more than half. The main source of urban population growth in Istanbul in the last seventy years is the migration.The Syrian refugees under temporary protection in Istanbul live in all 39 districts of Istanbul, even if they are of different density and numbers. The distribution of the Syrian refugees is very clearly concentrated on the European side. According to November 2016, 86% (411,318) of the Syrians covered by 478,850 temporary protection in Istanbul is located on the European side and 14% (67,532) on the Asian side.

Despite the exceptions, it is seen that the places where refugees are most preferred / sheltered, poverty is common, conservatism-religiosity is evident, the social environment is resistant and relatively life is cheaper.

Business Problem

Local governments wants to know population of immigrants in Istanbul. They know the amount of population; but what are the reasons on choosing borough? When the population increasing growth day by day and local governments have to know more details. It will be very useful for placing new immigrants incoming. Getting more information from boroughs where the immigrants live will be expands the visions and policies on them. We will obtain more data from researches and clustering by borough with additional data, will be using ML techniques with Foursquare.

Data Section

We will use updated statistical data including population of immigrants in Istanbul. Data from local governments will support us for the amount of living immigrants. We have a report from Immigration Administration of Istanbul. Imported as 'multeci.xlsx'. We have 3 columns as [Boroughs], [Syrian(population)], [Ratio(to population)]. To explore and target recommended locations across different venues according to the presence of amenities and essential facilities, we will access data through FourSquare API interface and arrange them as a dataframe for visualization.

We will use the presentation data from
http://marmara.gov.tr/UserFiles/Attachments/2018/09/14/52dd9554-8e48-4982-8051-a148b65cbdb3.pdf
Raw data hasn't been found but the tables in the pdf file we able to use it.

Methodology Section

The Methodology section will describe the main components of our analysis and predication system. The Methodology section comprises four stages:

1. Collect Inspection Data
2. Explore and Understand Data
3. Data preparation and preprocessing
4. Modeling

```
# Define a function to return the most common venues#

def return_most_common_venues(row, num_top_venues):
    row_categories = row.iloc[1:]
    row_categories_sorted = row_categories.sort_values(ascending=False)

    return row_categories_sorted.index.values[0:num_top_venues]
```

```
num_top_venues = 10

indicators = ['br', 'nd', 'rd']

# create columns according to number of top venues
columns = ['Borough']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))
```

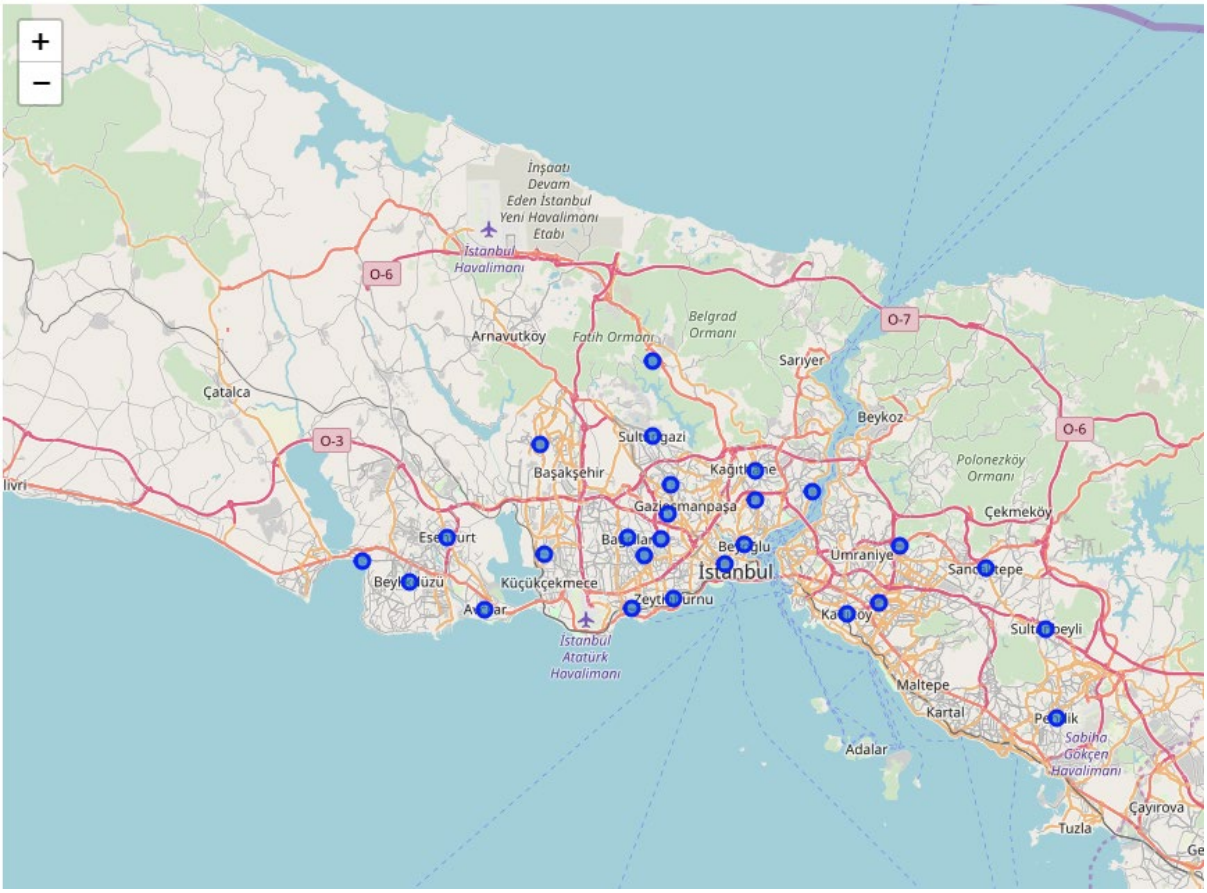
```
# create a new dataframe
venues_sorted = pd.DataFrame(columns=columns)
venues_sorted['Borough'] = istanbul_grouped['Borough']

for ind in np.arange(istanbul_grouped.shape[0]):
    venues_sorted.iloc[ind, 1:] = return_most_common_venues(istanbul_grouped.iloc[ind, :], num_top_venues)
```

```
venues_sorted.head(10)
```

	Borough	1br 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
0	Arnavutköy	Seafood Restaurant	Café	Restaurant	Lounge	Art Gallery	Pastry Shop	Arts & Entertainment	Lighthouse	Boat or Ferry	Cocktail Bar
1	Ataşehir	Café	Restaurant	Doner Restaurant	Bakery	Coffee Shop	Bistro	Kebab Restaurant	Gym / Fitness Center	Meyhane	Residential Building (Apartment / Condo)
2	Avcılar	Café	Gym / Fitness Center	Dessert Shop	Bar	Breakfast Spot	Restaurant	Turkish Restaurant	Art Gallery	Jewelry Store	Boutique
3	Bahçelievler	Farm	Deli / Bodega	Electronics Store	Eastern European Restaurant	Dumpling Restaurant	Dry Cleaner	Donut Shop	Doner Restaurant	Dog Run	Dive Bar

```
map_istanbul
```




```
# add clustering labels
istanbul_grouped_clustering['Cluster Labels'] = kmeans.labels_

# merge istanbul_grouped with istanbul_data to add latitude/longitude for each neighborhood
istanbul_grouped_clustering = istanbul_grouped_clustering.join(venues_sorted.set_index('Borough'), on='Borough')

istanbul_grouped_clustering.head(30) # check the last columns!
```

	Borough	Syrian	%	Latitude	Longitude	Cluster Labels	1br 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
0	Küçükçekmece	38278.000	5.02	41.021033	28.776432	3	Park	Soccer Stadium	Amphitheater	Performing Arts Venue	Garden Center	BBQ Joint	Dry Cleaner	Rental Car Location	Café	Stationery Store
1	Bağcılar	37643.000	4.97	41.033899	28.857898	3	Café	Gym	Coffee Shop	Turkish Restaurant	Steakhouse	Hookah Bar	Dessert Shop	Gym / Fitness Center	Arcade	Soup Place
2	Sultangazi	31426.000	6.02	41.109240	28.882614	2	Music Venue	Factory	Farm	Tunnel	Soccer Stadium	Deli / Bodega	Dumpling Restaurant	Dry Cleaner	Donut Shop	Doner Restaurant
3	Fatih	30747.000	7.33	41.014462	28.954551	2	Café	Hotel	Turkish Restaurant	Kebab Restaurant	Steakhouse	Dessert Shop	Restaurant	Middle Eastern Restaurant	Tea Room	Historic Site
4	Esenyurt	29177.000	3.92	41.034240	28.680018	2	Café	Mobile Phone Shop	Restaurant	Electronics Store	Farm	Burger Joint	Fast Food Restaurant	Pool Hall	Bookstore	Hotel
5	Başakşehir	26424.000	7.48	41.102728	28.772460	2	Pizza Place	Butcher	Soccer Stadium	Department Store	Kebab Restaurant	Turkish Restaurant	Garden	Steakhouse	Playground	Café
6	Zeytinburnu	25000.000	8.63	40.988118	28.903635	2	Café	Turkish Restaurant	Clothing Store	Restaurant	Steakhouse	Hookah Bar	Tea Room	Dessert Shop	Ice Cream Shop	Coffee Shop

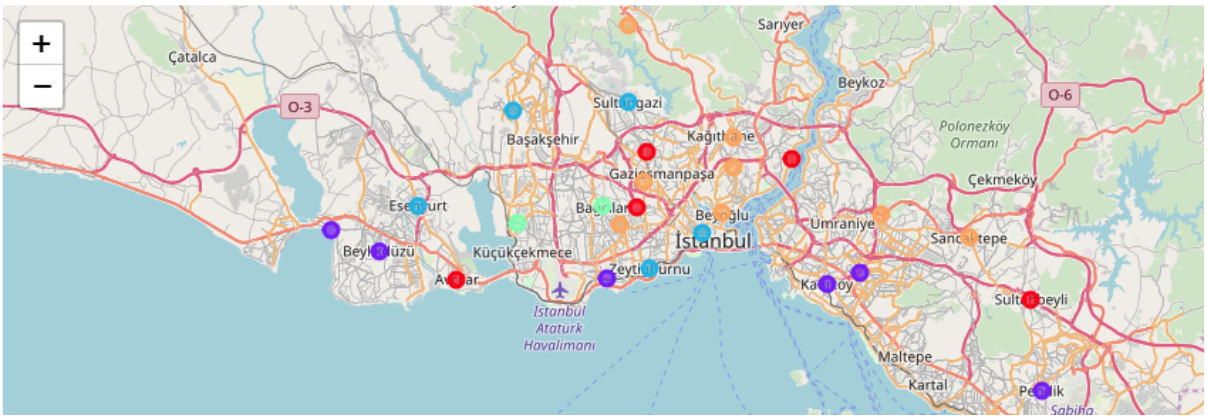
```
# Create Map

map_clusters = folium.Map(location=[latitude, longitude], zoom_start=11)

# set color scheme for the clusters
x = np.arange(kclusters)
ys = [i+x+(i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# add markers to the map
markers_colors = []
for lat, br, poi, cluster in zip(istanbul_grouped_clustering['Latitude'], istanbul_grouped_clustering['Longitude'], is
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, br],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```




```
istanbul_grouped_clustering.loc[istanbul_grouped_clustering['Cluster Labels'] == 0, istanbul_grouped_clustering.columns[[1] + list(range(5, istanbul_grouped_clustering.shape[1]))]].head()
```

	Syrian	Cluster Labels	1br 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
7	22678.0	0	Café	Gym / Fitness Center	Gym	Soccer Stadium	Pizza Place	Pharmacy	Fried Chicken Joint	Restaurant	Fast Food Restaurant	Pub
8	20192.0	0	Café	Steakhouse	Kebab Restaurant	Turkish Restaurant	Gym	Electronics Store	Mobile Phone Shop	Tea Room	Doner Restaurant	Boutique
9	19554.0	0	Café	Gym / Fitness Center	Dessert Shop	Bar	Breakfast Spot	Restaurant	Turkish Restaurant	Art Gallery	Jewelry Store	Boutique
10	17838.0	0	Seafood Restaurant	Café	Restaurant	Lounge	Art Gallery	Pastry Shop	Arts & Entertainment	Lighthouse	Boat or Ferry	Cocktail Bar
11	17710.0	0	Farm	Deli / Bodega	Electronics Store	Eastern European Restaurant	Dumpling Restaurant	Dry Cleaner	Donut Shop	Doner Restaurant	Dog Run	Dive Bar

```
istanbul_grouped_clustering.loc[istanbul_grouped_clustering['Cluster Labels'] == 1, istanbul_grouped_clustering.columns[[1] + list(range(5, istanbul_grouped_clustering.shape[1]))]].head()
```

	Syrian	Cluster Labels	1br 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
21	6.728	1	Café	Turkish Restaurant	Restaurant	Nightclub	Pizza Place	Gym	Dessert Shop	Bar	Supermarket	Kebab Restaurant
22	5555.000	1	Café	Beach	Seafood Restaurant	Bar	Turkish Restaurant	Art Gallery	Italian Restaurant	Salon / Barbershop	Restaurant	Ice Cream Shop
23	4951.000	1	Borek Place	Dessert Shop	Department Store	Snack Place	Bakery	Arts & Crafts Store	Furniture / Home Store	Rental Car Location	Fast Food Restaurant	Soccer Stadium
24	2191.000	1	Café	Park	Athletics & Sports	Restaurant	Playground	Pizza Place	Shopping Mall	Dessert Shop	Kebab Restaurant	Spa
25	1436.000	1	Café	Restaurant	Doner Restaurant	Bakery	Coffee Shop	Bistro	Kebab Restaurant	Gym / Fitness Center	Meyhane	Residential Building (Apartment / Condo)

```
istanbul_grouped_clustering.loc[istanbul_grouped_clustering['Cluster Labels'] == 2, istanbul_grouped_clustering.columns[[1] + list(range(5, istanbul_grouped_clustering.shape[1]))]].head()
```

	Syrian	Cluster Labels	1br 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
2	31426.0	2	Music Venue	Factory	Farm	Tunnel	Soccer Stadium	Deli / Bodega	Dumpling Restaurant	Dry Cleaner	Donut Shop	Doner Restaurant
3	30747.0	2	Café	Hotel	Turkish Restaurant	Kebab Restaurant	Steakhouse	Dessert Shop	Restaurant	Middle Eastern Restaurant	Tea Room	Historic Site
4	29177.0	2	Café	Mobile Phone Shop	Restaurant	Electronics Store	Farm	Burger Joint	Fast Food Restaurant	Pool Hall	Bookstore	Hotel
5	26424.0	2	Pizza Place	Butcher	Soccer Stadium	Department Store	Kebab Restaurant	Turkish Restaurant	Garden	Steakhouse	Playground	Café
6	25000.0	2	Café	Turkish Restaurant	Clothing Store	Restaurant	Steakhouse	Hookah Bar	Tea Room	Dessert Shop	Ice Cream Shop	Coffee Shop

```
istanbul_grouped_clustering.loc[istanbul_grouped_clustering['Cluster Labels'] == 3, istanbul_grouped_clustering.columns[[1] + list(range(5, istanbul_grouped_clustering.shape[1]))]].head()
```

	Syrian	Cluster Labels	1br 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
0	38278.0	3	Park	Soccer Stadium	Amphitheater	Performing Arts Venue	Garden Center	BBQ Joint	Dry Cleaner	Rental Car Location	Café	Stationery Store
1	37643.0	3	Café	Gym	Coffee Shop	Turkish Restaurant	Steakhouse	Hookah Bar	Dessert Shop	Gym / Fitness Center	Arcade	Soup Place

```
istanbul_grouped_clustering.loc[istanbul_grouped_clustering['Cluster Labels'] == 4, istanbul_grouped_clustering.columns[[1] + list(range(5, istanbul_grouped_clustering.shape[1]))]].head()
```

	Syrian	Cluster Labels	1br 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
13	15269.0	4	Hotel	Café	Restaurant	Turkish Restaurant	Gym / Fitness Center	Clothing Store	Bakery	Gym	Health & Beauty Service	Coffee Shop
14	14858.0	4	Clothing Store	Café	Furniture / Home Store	Coffee Shop	Bookstore	Restaurant	Cosmetics Shop	Gym / Fitness Center	Shopping Mall	Boutique
15	14216.0	4	Clothing Store	Café	Shoe Store	Turkish Restaurant	Italian Restaurant	Fast Food Restaurant	Coffee Shop	Cosmetics Shop	Electronics Store	Fried Chicken Joint
16	12727.0	4	Turkish Restaurant	Department Store	Café	Restaurant	Bakery	Music Store	Bar	Donut Shop	Dessert Shop	Pide Place
17	12072.0	4	Café	Turkish Restaurant	Cosmetics Shop	Convenience Store	Ice Cream Shop	Arcade	Snack Place	Dessert Shop	Gym	Turkish Coffeehouse

Results and Discussion Section

The main issue that determines the process management of refugees in the 39 district municipalities in Istanbul, which host between 166 and 38,278 refugees within their borders, is naturally the numerical magnitude. The number of Syrian refugees in each of the Küçükçekmece, Bağcılar, Sultangazi, Fatih and Esenyurt districts of Istanbul is over 30 thousand. In Başakşehir, Zeytinburnu, Esenler, Sultanbeyli and Avcılar, the number of refugees is between 20 and 30 thousand; The number of refugees in Arnavutköy, Bahçelievler, Gaziosmanpaşa, Şişli, Ümraniye, Kağıthane, Güngören, Sancaktepe, Beyoğlu, Bayrampaşa and Eyüp is between 10 thousand and 20 thousand; The number of refugees in Beylikdüzü, Büyükçekmece and Pendik is between 5 thousand and 10 thousand. The number of refugees in the 10 district municipalities in Istanbul is between 1000 and 3 thousand and in the 5 district municipalities is below 1000 people.

We have a big picture where the immigrants lives. Istanbul has many culture and also very appealing city for domestic migration. We can see the differences among boroughs. Foursquare show us the decisions of immigrants where they want to live and where they want to do as a job.

We may analyze our results according to the five clusters we have produced.

- High inhabited immigrants boroughs (cluster 2-3) shows us the immigrants choose the developing boroughs and these boroughs is the lowest population in Istanbul in reality. Government policies also guiding the placement.

- For the most common venues (cluster 0-4), we can see the most job opportunities for immigrants. Local governments has many expanding on immigration policies; for example privileges on tax for opening new workplace.

- Adaptation is the first problem; religious is the same with immigrants but life styles are different. There are a lot of unemployed immigrants, but they can easily find a job at restaurants (especially Kebab and Turkish) and Coffee Houses.

- This clusters may benefits the local governments and also real estate brokers. Immigrants populations affecting house and rental prices. The Turkish citizens generally deciding the place where least population of immigrants.

Conclusion

To sum up, migrations depends on many reasons. Because of war, economical crisis, for a good future etc. Immigration policies have to be different other policies. In this report we able to see how important more data about immigrants and researching. Living places changing with people. It affects life style, education policies, health policies, house prices, retail and insurance.

For local citizens:

- They can use these potential for new work places.
- They may look at these map and easily find new employees from immigrants.
- Homeowners and real estate brokers can determine their prices and investment.
- Local governments can set up their crisis management and plans the project about immigrants.

For Immigrants:

- They can see the where high taking migrations boroughs and benefits them for choosing easy adaptation places.
- If a immigrants want to be a investor or want to make money itself, these report can help the where or what can be do.
- Borough's life standard making the life easier or hard; because of this for a logical choices pre-researching about cities is the best way before migration.

"Peace at home, peace in the world!" M.Kemal Ataturk

Many thanks for reading my report! And especially thanks to Coursera!

AYDIN KEMENT