Choosing the best location for a new restaurant in Istanbul

Capstone Project

«The Battle of Neighbourhoods»

September 2019

An international restaurant chain plans to open its first venue in Istanbul

- The aim of the project is to propose the best location (borough and neighbourhood) to be chosen by the management
  - The restaurant targets the high-income segment. Its menu will showcase some of the best examples of world's gastronomy.
  - Istanbul is Turkey's largest city with a population of 15 million. It has an active nightlife and historic taverns, a signature characteristic of the city for centuries.
  - Many of the city's most popular and upscale restaurants line the shores of the Bosphorus.
  - With 31% of Turkey's GDP coming from the city Istanbul's per capita income is US$ 18,000 and has a highly skewed distribution.

All data used in the study is acquired from public sources

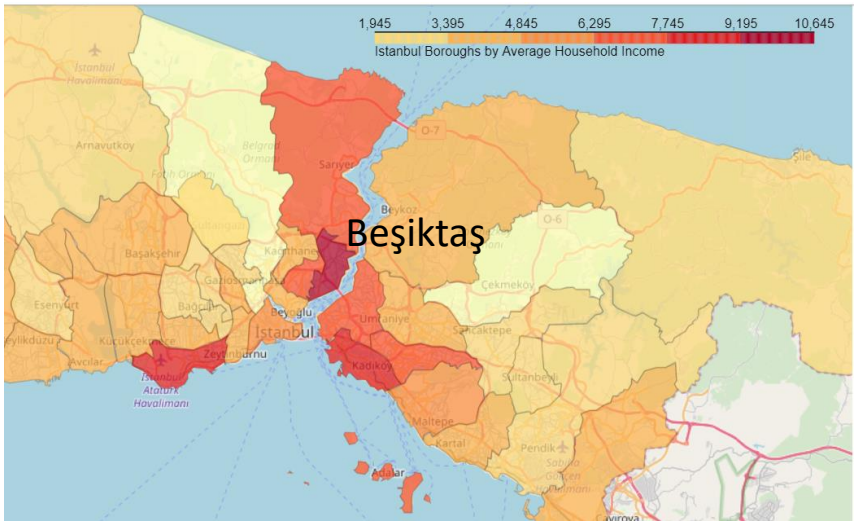
- Istanbul's boroughs geographical coordinates is obtained from Ismail Baskın's Github repository
- The average household income data is acquired by using a daily newspaper website
- The number of restaurants and their type and location is received using Foursquare API
- The population data and average house rent data of the top candidate borough is obtained from public websites.
- Istanbul and its boroughs' GeoJson files were acquired from Yusuf Güven's and Leonardo Iheme's Github repositories.

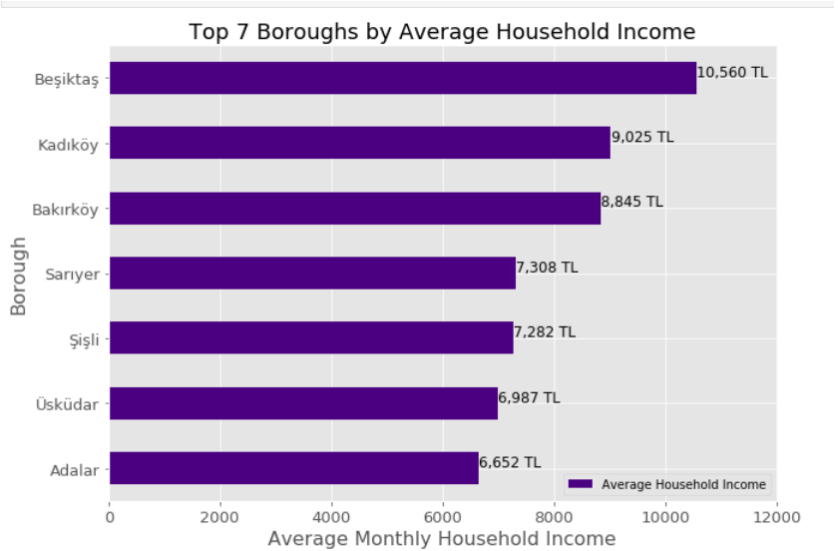
The project methodology consists of two stages

- Stage 1: Choose the best borough
  - Compare Istanbul's boroughs by average household income
- Stage 2: Identify the best neighbourhood within the chosen borough
  - **Criteria 1:** focus on neighbourhoods with a **population more than 10K** to achive critical mass
  - **Criteria 2**: focus on neighbourhoods with **high average house rent** to ensure target segment concentration
  - **Criteria 3**: focus on neighbourhoods with **low restaurant density** to minimise competitive pressures
- To achieve the above objective explanatory data analysis and k-means clustering algorithm were conducted

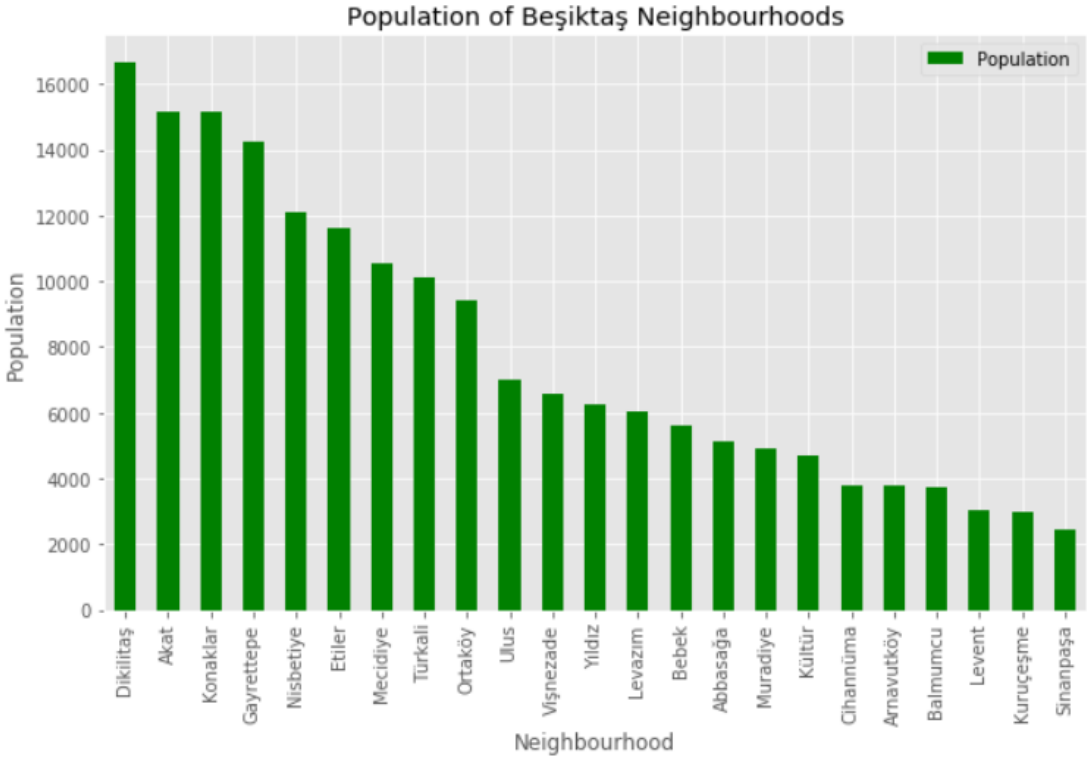
Beşiktaş has the highest average household income amongst Istanbul's 39 boroughs

- **Beşiktaş** is by far the wealthiest borough with an average household income of **10,560 TL**. Its location on the Bosphorus, where many restaurants are found, makes it a perfect choice for our stakeholders.



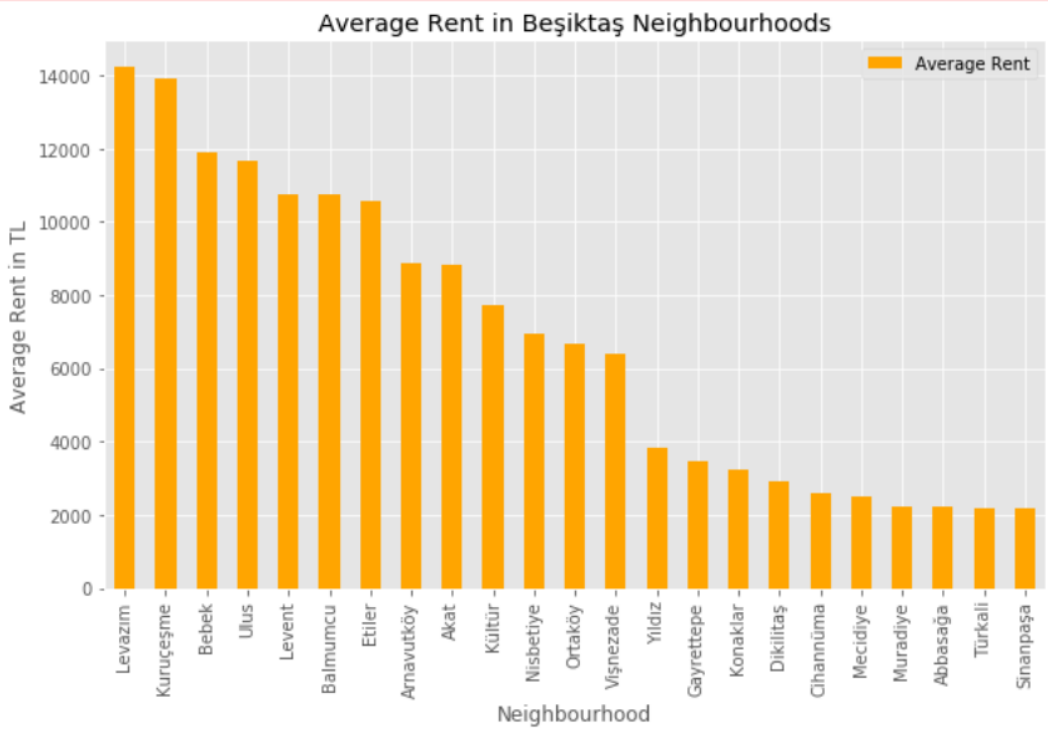


Population of Beşiktaş neighbourhoods



- Dikilitaş is the most populous neighbourhood amongst Beşiktaş' 22 neighbourhoods.
- There are 8 neighbourhoods exceeding the 10000 population threshold

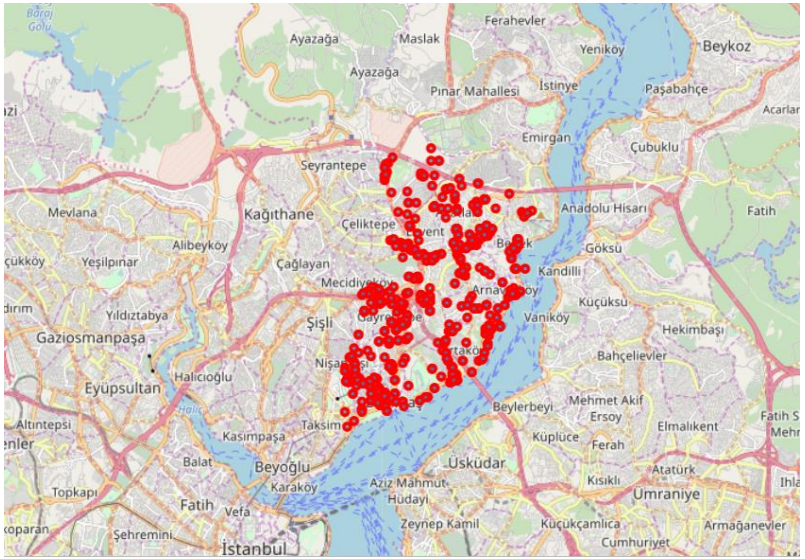
Average house rent of Beşiktaş neighbourhoods



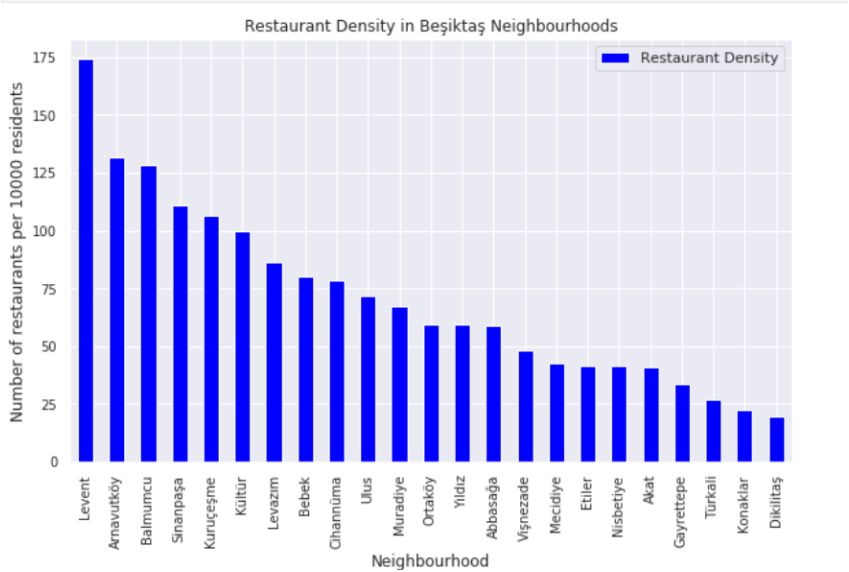
- Average house rent is an indication of household income.
- Levazım, Kuruçeşme and Bebek are the top three neighbourhoods as far average rent is concerned.

Foursquare data analysis yielded 969 restaurants in 40 unique categories

- Restaurants are mostly concentrated along the Bosphorus coast and Beşiktaş' main avenues.

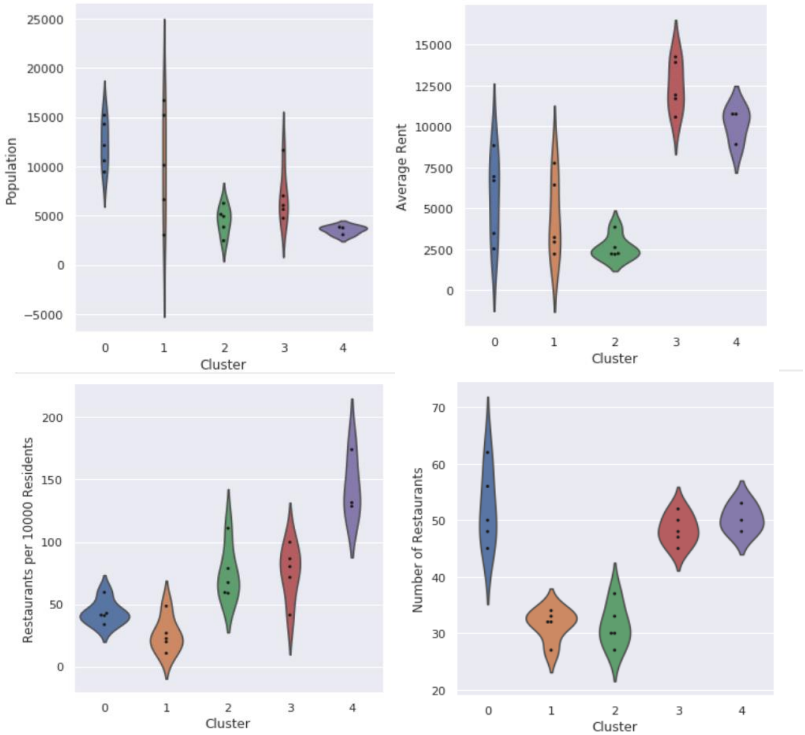


- Levent has the highest restaurant density, as defined by the number of restaurants per 10,000 residents.



K-means algorithm yields 5 clusters of similar neighbourhoods

- Cluster 0 is the **most populous** cluster whilst having a restaurant density (43.6) which is lower than Beşiktaş average (53,1).
- Cluster 3 is the clear leader in Average House Rent. Indeed, this cluster includes the most expensive neighbourhoods **Bebek, Etiler, and Ulus**.
- Looking at **restaurant density**, Cluster 1 is the most advantageous, whilst Cluster 4 is the least. In fact, **Cluster 4** has the highest restaurant density 144.7. **Levent**, a business neighbourhood with many shopping malls is included in this cluster.
- **Cluster 1** has the **lowest restaurant density**, and it is mainly composed of residential neighbourhoods such as **Dikilitaş** and **Türkali.**



We can recommend Etiler, Akat and Nisbetiye as top three spots for launching the new restaurant

- Etiler, Akat and Nisbetiye are in the upper half of the 3D scatterplot meeting the 10k population threshold.
- Having a restaurant density of only 40 per 10k residents, they provide a favourable competitive environment for a new market entrant.
- They have the highest average house rent in the sector – with Etiler having the highest (10565) and followed by Akat (8820) and Nisbetiye (6927).

The restaurant density and population are plotted on x and y axes of the scatterplot, respectively. The size of the bubbles represent the average house rent.

Conclusion and ideas for next steps

- This study deals with the business problem of finding the best location of new restaurant in Istanbul
- In the first step, Istanbul's boroughs were compared in terms of household income, which led to choosing Beşiktaş.
- In the second step, population, restaurant density and average house rent characteristics were analysed to come up with a short list of neighbourhoods.
- Explanatory data analysis and k-means clustering techniques were used.
- The work can further be improved by acquiring additional data such as a consumer surveys, restaurant reviews, and foot traffic data.
- If data can be collected one can attempt to build a model that will predict the foot traffic of a new restaurant at a particular location.