

Finding the right spot for a burger bar in Budapest

Introduction

Lets assume that I work as a data scientist in a business consulting firm in Budapest, Hungary. In recent years more and more tourists choose Budapest as a destination for a weekend trip or for a longer stay. Among the visitors significant parts are young backpackers and party tourists because nowadays Budapest is a party capital of Europe.

On the other hand there is a high degree of internal migration toward Budapest from the whole country because young workers can find quality jobs more easily and can earn relatively more money in the capital.

Due to these changes the demand for quality street and fast food has skyrocketed. One of our customers wants to open a fast food bar and asks our team to help him in this new venture. A very important requirement for such business to be successful is to found it on the right location. My task as a data expert is finding the perfect spot using geolocation and other information.

Business Problem

In this case the aim is to find locations in Budapest that has good amount of possible future customers and low competitive presence.

We must be sure that the place where the burger bar will be opened will have enough customers and there aren't a large amount of burger joints in the neighborhood.

Who likes and wants to buy burgers? Burgers are more popular among young people; tourists, office workers, students.

We identified three types of venues where young people can find more likely. These venues are tourist hot spots, offices and universities.

My task is finding locations in the 23 districts of Budapest where demand is high and competition is low.

Data

To help our customer to find the perfect place I will use the following data:

- Neighborhoods of Budapest, Hungary from Wikipedia:
https://hu.wikipedia.org/wiki/Budapest_v%C3%A1rosr%C3%A9szek_list%C3%A1ja
- Latitude and longitude coordinates of the neighborhoods (geocoding API)
- Venues data from Foresquare API
 - Fast food restaurants
 - Tourist attractions
 - Offices
 - Universities
- We will then leverage the data in order to determine which neighborhood is the most appropriate for a new burger bar

Methodology

During the analysis we have to go through the following tasks:

- First we have to load the neighborhoods from Wikipedia site - we exclude neighborhoods with less than 1000 inhabitants
- For each neighborhood we have to collect all fast food restaurants, tourist attractions, offices and universities&colleges data from Foresquare. We have to use the search method to get information for fast food restaurants, offices and universities with the help of the category filter. However we have to use the explore method to query tourist attractions because they can belong to a lot of categories.
- After that we have to count all venues for all neighborhoods
- Finally we have to compute the fitness for each neighborhood. Fitness have been defined according the customers preferences so it is a population equivalent per fast food restaurant
 - Each neighborhood have its own population
 - Tourist spots have been weighted with 5000, so a tourist attraction is equal with 5K population
 - Universities have been weighted with 2500, so a university is equal with 2.5K population
 - Offices have been weighted with 500, so an office is equal with 500 population
 - We have to summarize the population equivalents of the venue types for the neighborhood and divide it with the number of fast food restaurants in the neighborhood (have to count with the new venture)
- With the biggest fitness score we can easily decide the most appropriate neighborhood to open a new burger bar

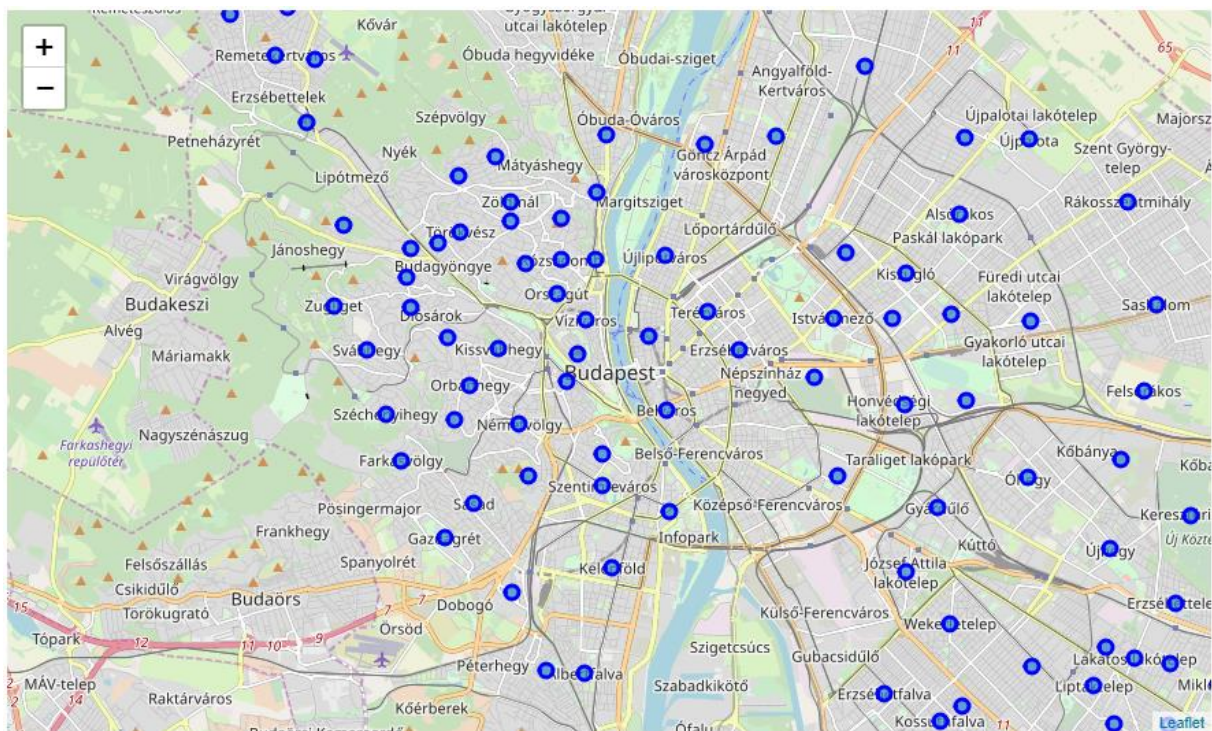
Results

Neighborhoods of Budapest (sample)

	Neighborhood	District	Population	Latitude	Longitude
0	Akadémiaújtelep	XVII. kerület	2895	47.481613	19.219526
1	Albertfalva	XI. kerület	11845	47.447294	19.034295
2	Alsórákos	XIV. kerület	29023	47.525178	19.128280
3	Angyalföld	XIII. kerület	62006	47.538369	19.082082
4	Árpádföld	XVI. kerület	6186	47.533133	19.198560

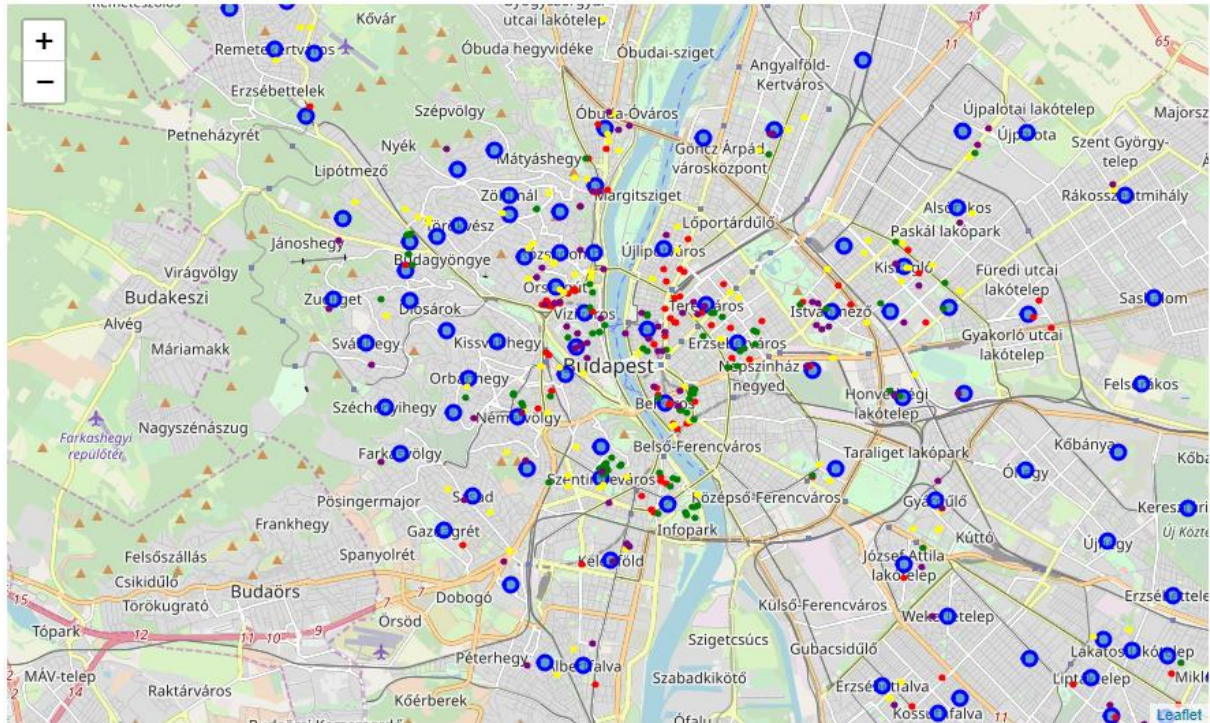
Map made with folium

Blue circles represent the 142 neighborhoods of Budapest with a population over 1000 inhabitants.



Neighborhoods with sample venues from all types

Big blue circles represent the neighborhoods, reds are fast food restaurants, yellows are offices, greens are universities and the purples are tourist attractions. The map contains sample sets of 100 items from each venue types.



Neighborhoods with highest fitness values

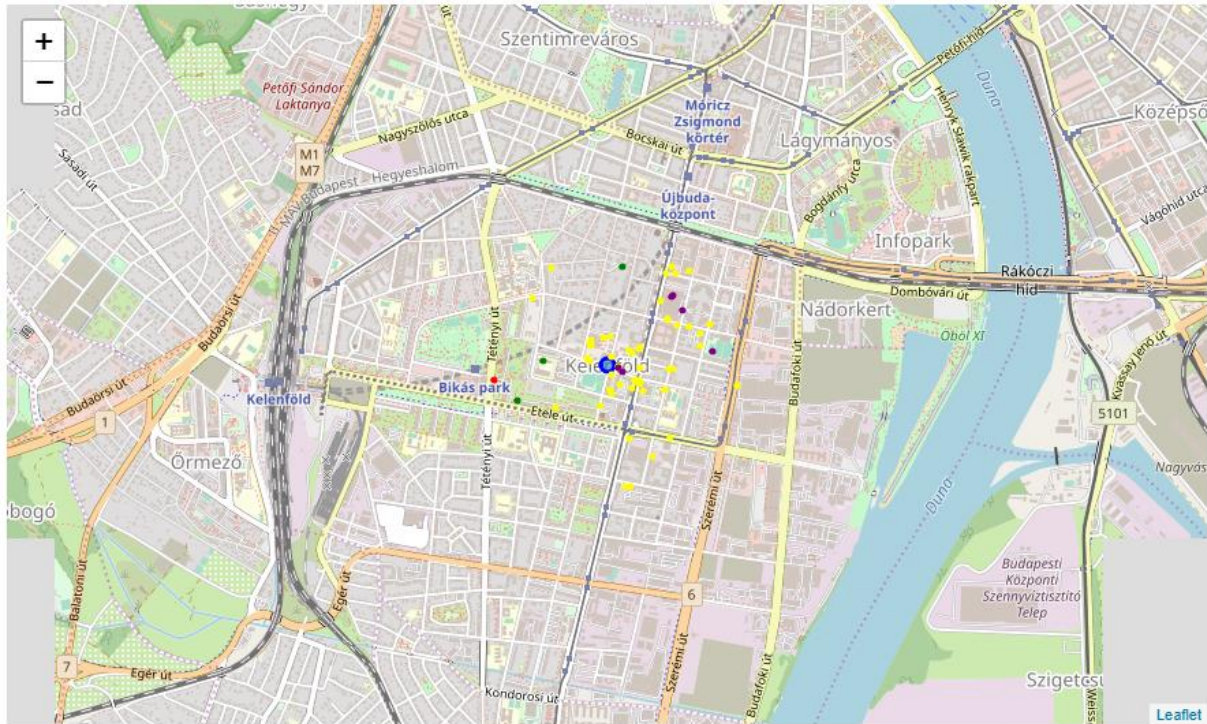
The following table contains the top 5 neighborhoods ordered by fitness level or population equivalent. It also contains the count of each venue type, fast food restaurants, offices, universities and tourist attractions in the neighborhood.

	Neighborhood	District	Population	Latitude	Longitude	FFR counts	Office counts	Uni counts	Tourist spot counts	Fitness
52	Kelenföld	XI. kerület	53332	47.465171	19.041108	1.0	50.0	3.0	6.0	57916.0
117	Szemlőhegy	II. kerület	2753	47.524329	19.028179	0.0	45.0	1.0	6.0	57753.0
126	Törökőr	XIV. kerület	15170	47.507438	19.111503	0.0	43.0	2.0	3.0	56670.0
56	Kispest	XIX. kerület	52349	47.448441	19.146518	0.0	7.0	0.0	0.0	55849.0
44	Herminamező	XIV. kerület	12264	47.518684	19.099723	0.0	44.0	2.0	3.0	54264.0

Map of Kelenföld

The winning neighborhood is Kelenföld as it has a fitness value of 57916. There is only one fast food restaurant in Kelenföld right now so with the new one each restaurant would have half of the population equivalent of the neighborhood which is about 58K people. This 58K is the biggest potential customer base in Budapest.

The following map contains all ventures of the neighborhood. Big blue circle represents the neighborhood, reds are fast food restaurants, yellows are offices, greens are universities and the purples are tourist attractions.



Discussion

The actual approach can be improved with the following extensions:

- With the help of the Foresquare API we can query the number of tips for all venues and exclude the least popular venues
- Tourist attraction exploration can be improved as well
- We can consider also other type of restaurants and food stores which can be also some concurrence
- We can consider other source of geolocation information to get a more complete set of venues

Conclusion

With the help of the geolocation information from Foresquare we could choose the proper neighborhood to open a new burger bar, however to locate the exact location within the neighborhood is another task and it needs a more detailed analysis which is not the purpose of the actual analysis.