Capstone Project – Battle of the Neighborhoods

➢ Introduction

This project is for those who are planning to create a new restaurant in Budapest. I will make a suggestion on what would be the best place to start a new restaurant in a big city that already has many restaurants. Budapest is the capital of Hungary, also the largest and most populous city, cultural and commercial center.

More than a thousand restaurants, cafés and entertainment venues await guests, where Hungarian and international gastronomic dishes are served on the table. The gastronomic value of the city is shown by the fact that recently Michelin has been constantly watching Budapest with half an eye, in a few years six restaurants have received Michelin stars.

Since the early 2000s, so-called ruin pubs have played a key role in the life of the city, becoming the most visited places with their alternative way of operating, their unique style, and their attractive atmosphere - with a variety of entertainment and cultural opportunities.

Budapest is a popular tourist destination, in 2011 it was the 25th most visited city in the world with more than 4 million, in European terms, after London, Istanbul, Paris, Rome and Barcelona, it ranks sixth on this list, considering its advantages and pitfalls in a big city where many restaurants already offer its services.

Budapest consists of 23 districts, and I focus on the districts, where the busiest places in the city are located. With that in mind, I can find areas where it’s worth opening a brand new restaurant.

Business problem

In my report, I focus on the question of where to open a new restaurant in Budapest .

What facts should we consider when determining the location of a restaurant? When choosing a place, is it worth considering, for example, the most visited places in the city? If there are already restaurants that have good ratings, will it be risky to open a new one near them?

➢ Data acquisition and cleaning

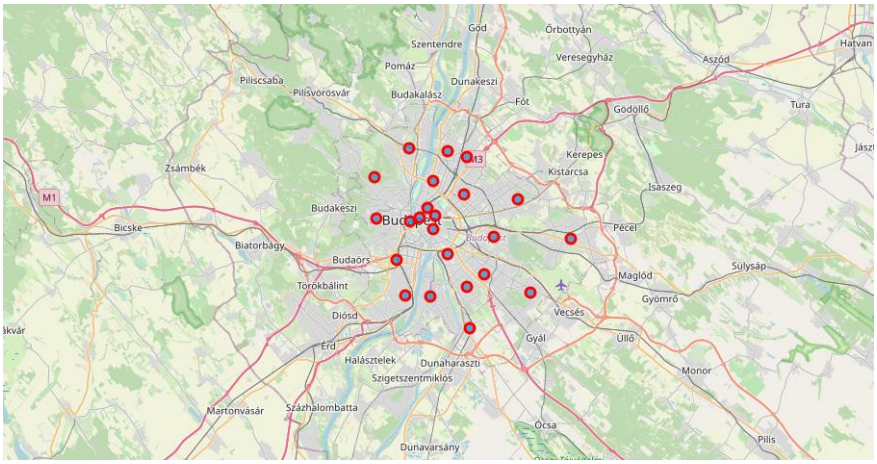
City analysed in this project : Budapest

Data sources:

I use datasets which exists for free on the web. Link to the dataset is :

https://en.wikipedia.org/wiki/Districts_of_Budapest
https://developer.foursquare.com/docs/data

Once we have the latitude and longitude of the districts, we use the Foursquare Location app to get the number of restaurant locations per district, which gives us an idea of what places people visit if they want to eat. This already shows us the best districts to open a restaurant. Accommodation details can be downloaded using the search endpoint.



I used the following python libraries

Pandas – for Data Analysis
Nympy – to handle data in a vectorized manner
JSON – to handle JSON files
Geopy – to retrive Location Data
Requests to handle http requests
Matplotlib -Pythin Plotting Module
Sklearn – Python machine learning Library
Folium – Map rendering Library

Data cleaning:

Once the dataset of Budapest has been downloaded, we must edit the dataset provided to have the necessary information. Wikipedia provided information but we have been left with only the name, area, population for each districts.

Foursquare provides a dataset of venues around the specific coordinates of venues, if we use explore function. Once requied, we get a full breakdown of all record venues around the districts of interest.

For convenience, we transform the dataset to show 20 venues to work with. After that, we merge the dataframes together for a comprehensive set of values, worth analysing.

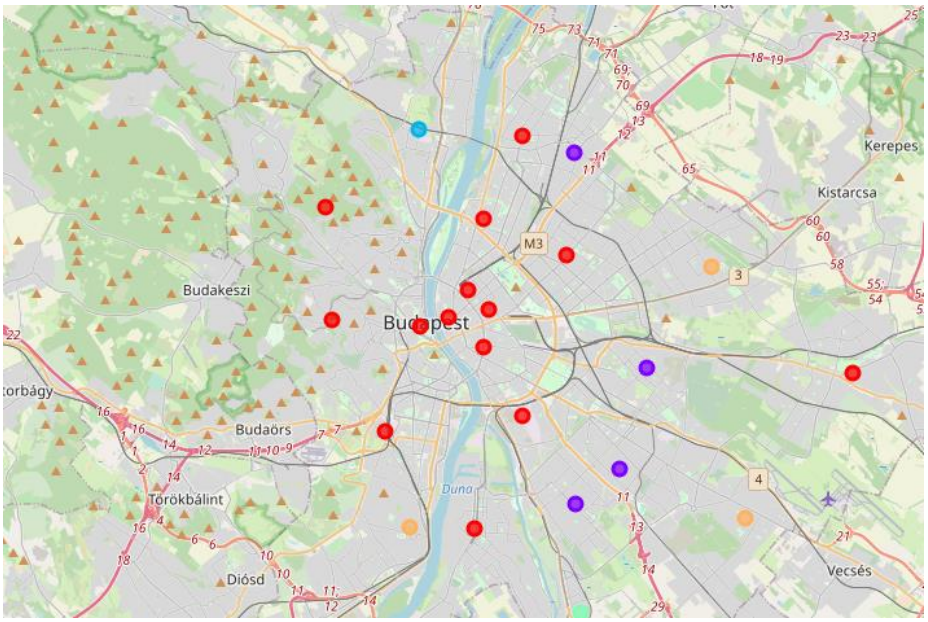
	District	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	11th Most Common Venue
0	I. kerület	Café	Hotel	Hungarian Restaurant	Plaza	Coffee Shop	Pub	Scenic Lookout	Bistro	Bar	Dessert Shop	Park
1	II. kerület	Athletics & Sports	Tennis Court	Park	Bus Stop	Playground	Campground	Forest	Scenic Lookout	Soccer Field	Track	Fast Food Restaurant
2	III. kerület	Train Station	Bus Station	Bus Stop	Heliport	Fast Food Restaurant	Furniture / Home Store	Fruit & Vegetable Store	Fried Chicken Joint	French Restaurant	Forest	Food Court
3	IV. kerület	Fast Food Restaurant	Dessert Shop	Burger Joint	Bar	Gastropub	Park	Grocery Store	Supermarket	Café	Furniture / Home Store	Sporting Goods Shop
4	IX. kerület	Tram Station	Train Station	Soccer Field	Arcade	Café	Dance Studio	Brewery	Electronics Store	Bus Station	Office	Forest
5	V. kerület	Hotel	Hungarian Restaurant	Italian Restaurant	Coffee Shop	Dessert Shop	Restaurant	Cocktail Bar	Pizza Place	Wine Bar	Ice Cream Shop	Modern European Restaurant
6	VI. kerület	Coffee Shop	Bar	Hostel	Italian Restaurant	Ice Cream Shop	Thai Restaurant	Theater	Bakery	Indian Restaurant	Escape Room	Pub

- Data Analysis

Clustering

I placed the districts onto the map and analised the similar ones against other and within clusters themselves. Each of the clusters compared against the popularity of the venues, worth considering for a new restaurant venture, as well as the hospitality of the venues climate. Depending on the area and population, each clusters offer different advantages and disadvantages in term of our choices.

	Formal_name	District	Size km²	Population	latitude	longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	I. kerület	Várkerület ("Castle District")	3.41	25,196	47.496822	19.037458	0	Café	Hotel	Hungarian Restaurant	Plaza	Coffee Shop
1	II. kerület	-	36.34	89,903	47.539333	18.986934	0	Athletics & Sports	Tennis Court	Park	Bus Stop	Playground
2	III. kerület	Óbuda-Békásmegyer ("Old Buda-Békásmegyer")	39.70	130,415	47.567177	19.036852	2	Train Station	Bus Station	Bus Stop	Heliport	Fast Food Restaurant
3	IV. kerület	Újpest ("New Pest")	18.82	101,558	47.564891	19.091315	0	Fast Food Restaurant	Dessert Shop	Burger Joint	Bar	Gastropub
4	V. kerület	Belváros-Lipótváros ("Inner City - Leopold Town")	2.59	26,284	47.500232	19.052018	0	Hotel	Hungarian Restaurant	Italian Restaurant	Coffee Shop	Dessert Shop



- **Results**

I use k-mens to group the districts to 5 clusters. Cluster 0 includes districts where cafes, bars, and restaurants are typically the most common locations. These are the central and middle districts of Budapest.

In the districts classified in cluster 1, bus stops, pharmacies and supermarkets are most often present. These are the eastern districts of Budapest.

One district was included in cluster 2, this is the III. district, where public transport stations and restaurants can be found.

Cluster 3 contains the XXIII. district, mainly shops and stores are here.

Cluster 4 includes 3 outer districts with stations, sports fields, playgrounds and shops.

- **Discussion**

The question of which part of Budapest is most worth opening a restaurant can be answered depending on the nature of our restaurant and how prepared we are for the presence of competitors. There are already many excellent restaurants, bars and cafes in the central districts of Budapest (cluster 0), it is worth doing business here only if we are strong enough, we can compete, we have enough capital, as there will be the highest rents here. Here we should only think about opening a restaurant if we can serve high quality food and we are financially strong.

The parts of the eastern districts (cluster 1) bordering the central districts may be suitable for opening restaurants, as the rents are lower here, furthermore guests and tourists can come here from the more visited central districts. As there are many transport hubs and supermarkets, these districts can also be considered busy locations. They may be suitable for starting a new restaurant and developing smaller restaurants. In district XXIII (cluster 3) there are mainly shops and department stores, so it is worth thinking about opening fast food restaurants here.

In the outer districts of the 4th cluster, we should consider opening buffets and cafes, because there are mainly stations, sports fields, playgrounds and shops.

One district was included in cluster 2. district III. There are public transport stations and restaurants, but it is far from the central busy districts. There are no sights here, so tourists do not visit this district, therefore we can only count on people living or working here as restaurant guests. However, as the population here is larger (130,000) it can also be a good place to open smaller restaurants.

- **Conclusion**

Finally to conclude this project, I had a good trial run at solving a real problem, using available data to find a business solution – choosing to open a restaurant in Budapest. I worked with some frequently used python libraries to manipulate data, use Foursquare API to explore the information ont he Districts I looked into and managed to make a map of results, that allowed me to illustrate mypoint clearly to someone, not familiar with data manipulation and who only wants to know one thing – where will my restaurant be succesful?