Capstone Project -The Battle of Neighborhoods

CHOOSING THE BEST PLACE TO OPEN A FITNESS CENTER IN THE CENTRAL ADMINISTRATIVE BOROUGH OF MOSCOW

INTRODUCTION & BUSINESS PROBLEM

- ❏ Moscow is the capital of the Russian Federation, the most populous city in Russia. In a given variety of business opportunities with a favorable business environment. Data attracts many investors to the financial market. In fact, the city of Moscow is a global center of business and trade. He is also major in banking and finance, retail, world trade, transport, tourism, sports, media, advertising, legal services, accounting, insurance, culture, fashion and art in the Russian Federation. This also means that the market is highly competitive. Thus, any new business venture or expansion needs to be analyzed. The conclusions drawn from the analysis will provide a good understanding of the business environment, which will help in strategic market orientation. This will help reduce risk and the return on investment will be successful.

- ❏ Many people live and work in the city of Moscow. Most people work in an office environment (financial institutions, government agencies, educational institutions, and so on). It is this part of the people that the project is aimed at. People who work in offices simply need to maintain their health with physical education. Office work is associated with a sedentary way of working. And such people need to visit fitness centers for sports. Fitness centers have become popular in the cities of Russia, which seems to be on every corner, not only in large, but also in small cities. Opening a fitness center can be a great business opportunity, but we need to understand how our fitness center should be different from others in order to enjoy long-term success.

BUSINESS PROBLEM

❑ My client wants to open his business in the Central administrative boroughs of Moscow, so I focus my attention during my analysis only on this area. The Central administrative boroughs of the city of Moscow is one of the twelve districts of the capital. It was formed in 1991 to administer the territory. The Central administrative boroughs includes 10 neighborhoods: Arbat, Basmanny, Zamoskvorechye, Krasnoselsky, Meshchansky, Presnensky, Tagansky, Tverskoy, Khamovniki and Yakimanka.

❑ The goal is to find and recommend to management which area of Moscow would be the best choice for opening a fitness center. The client's management also expects to understand the rationale behind the recommendation to open a new fitness center in the downtown area. Therefore, this analysis necessary to ensure that we have enough customers and that we are not so close to other fitness center places.

DATA

❏ To determine the characteristics of our competitors' sites in the Central administrative borough, we need to find out the number of fitness centers in the Central Administrative District and their location.

❏ We will use information from the open data portal of the Moscow Government (https://data.mos.ru). According to the portal, more than 1000 thematic datasets and reference books have been published on it, disclosing information on more than 1,900,000 urban infrastructure facilities, including those with reference to geographic coordinates. The portal contains the most extensive data on education, sports, health care, key cultural and entertainment facilities.

❏ There are 269 fitness centers in the Central administrative borough.

DATA SELECTION

The geographic coordinates of the city of Moscow will be used as input for the Foursquare API, as a result, we have received a dataset. Here is an example of the first 5 rows of a dataset:

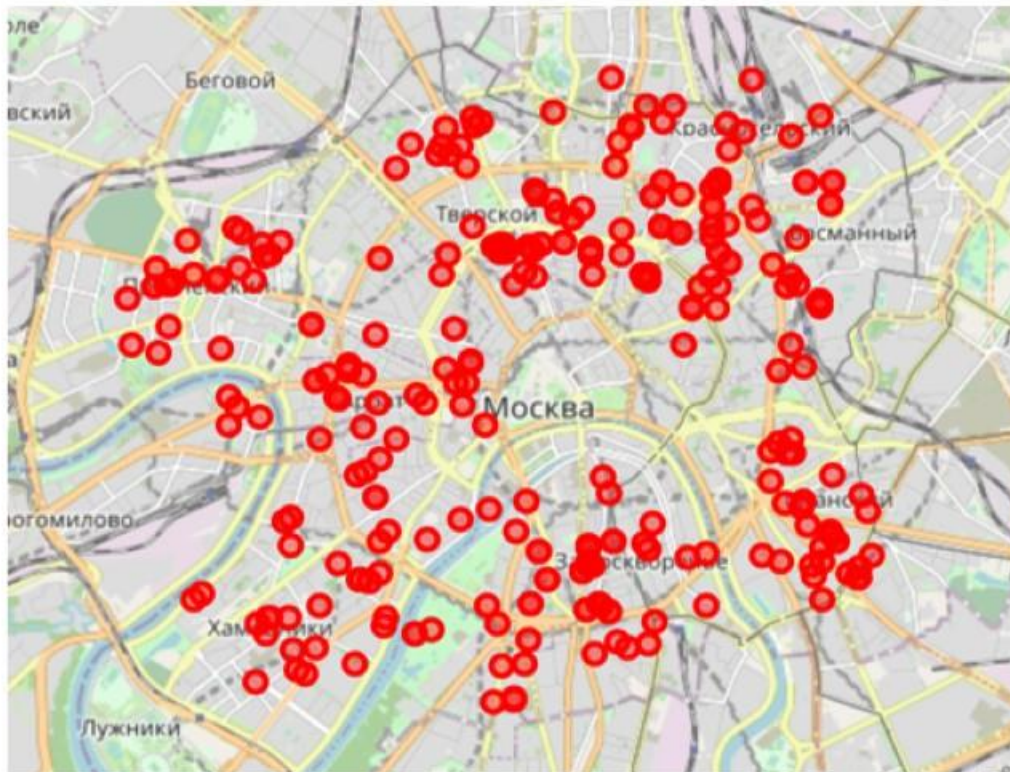|	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Taganskij	55.741998	37.662322	La Salute	55.743409	37.656018	Gym / Fitness Center
1	Taganskij	55.741998	37.662322	FOK v Parke «Taganskij»	55.738409	37.666063	Gym / Fitness Center
2	Taganskij	55.741998	37.662322	World Class	55.747110	37.657317	Gym / Fitness Center
3	Taganskij	55.741998	37.662322	Trenazhernyj Zal MTT	55.738093	37.660673	Gym / Fitness Center
4	Taganskij	55.741998	37.662322	sportzal Srednerusskogo banka	55.744838	37.669034	Gym / Fitness Center

```
msk_venues.shape
```

```
(269, 7)
```

METHODOLOGY

✓ Addresses are converted into their equivalent latitude and longitude values.

✓ Foursquare API is used to explore neighborhoods in Central administrative borough, Moscow.

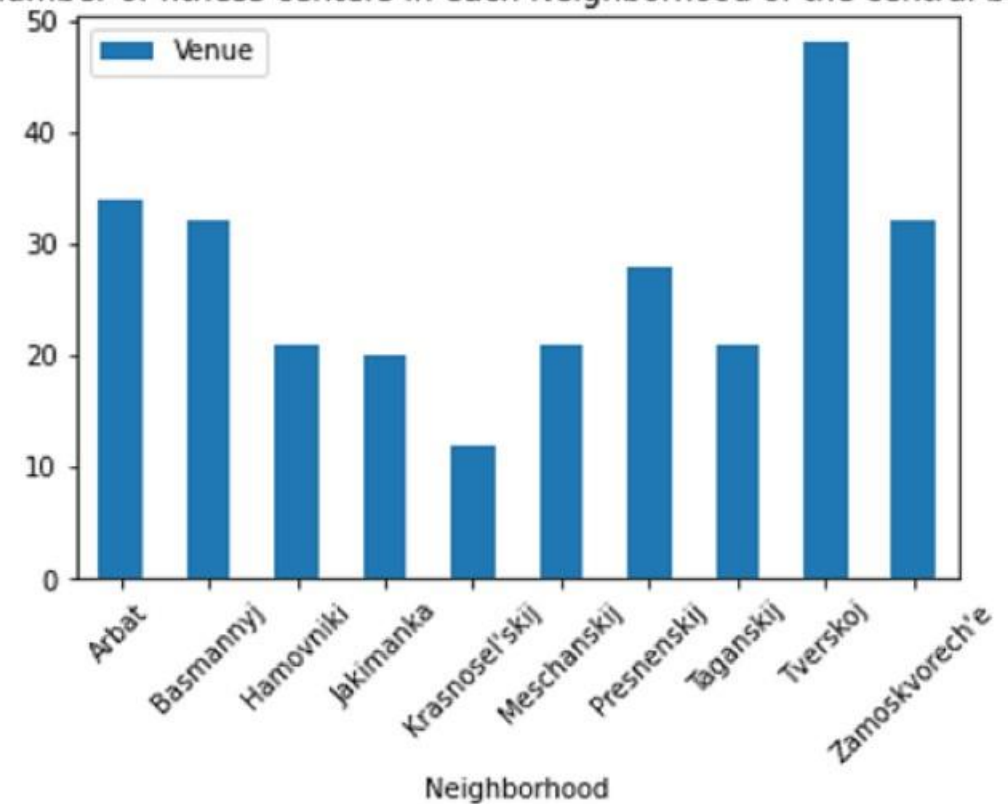✓ After that, explore function to get fitness centers/gym in each neighborhood.

	Neighborhood	Arts & Entertainment	Boxing Gym	Cycle Studio	Dance Studio	Gym	Gym / Fitness Center	Gym Pool	Gymnastics Gym	Health & Beauty Service	Martial Arts School	Massage Studio	Pilates Studio	Pool	Salon / Barbershop	Soccer Field	Tennis Court	Track	Yoga Studio
0	Taganskij	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1	Taganskij	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
2	Taganskij	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
3	Taganskij	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Taganskij	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0

METHODOLOGY

Visualization with magnification, on the OpenStreetMap tile of Folium library, all fitness centers of Central administrative borough:

The number of fitness centers in each Neighborhood of the central borough

RESULTS

❑ Using K-mean to clustering data area with less number of fitness centers.

❑ Then using this feature to group the neighborhoods into clusters K-means clustering algorithm will be use to complete this task. And also, the Folium library to visualize the neighborhoods in Central administrative borough and its emerging clusters.

	Borough	Neighborhood	Latitude	Longitude	Cluster Labels	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
0	Central	Taganskij	55.741998	37.662322	4	Gym / Fitness Center	Yoga Studio	Gymnastics Gym	Track	Soccer Field	Salon / Barbershop	Boxing Gym	Martial Arts School	Gym	Health & Beauty Service
1	Central	Arbat	55.750998	37.592153	2	Gym / Fitness Center	Yoga Studio	Martial Arts School	Gymnastics Gym	Dance Studio	Gym	Cycle Studio	Boxing Gym	Gym Pool	Health & Beauty Service
2	Central	Meschanskij	55.771993	37.627735	1	Yoga Studio	Gym / Fitness Center	Martial Arts School	Gym	Gymnastics Gym	Health & Beauty Service	Massage Studio	Tennis Court	Dance Studio	Cycle Studio
3	Central	Basmannyj	55.763280	37.656543	0	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Dance Studio	Cycle Studio	Gym Pool	Gymnastics Gym	Health & Beauty Service	Boxing Gym
4	Central	Zamoskvorech'e	55.735110	37.632451	1	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Gymnastics Gym	Track	Gym Pool	Dance Studio	Cycle Studio	Health & Beauty Service

RESULTS

Cluster 0

	Neighborhood	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
4	Zamoskvorech'e	Gym / Fitness Center	Yoga Studio	Gym	Track	Dance Studio	Sports Club	Gymnastics Gym	Soccer Field	Tennis Court	Spiritual Center
8	Krasnosel'skij	Gym / Fitness Center	Yoga Studio	Gym	Track	Spiritual Center	Boxing Gym	Pool	Tennis Court	Sports Club	Spa
9	Jakimanka	Gym / Fitness Center	Yoga Studio	Gym	Track	Dance Studio	Sports Club	Outdoor Gym	Soccer Field	Tennis Court	Spiritual Center

Cluster 1

	Neighborhood	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
1	Arbat	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Track	Gymnastics Gym	Boxing Gym	Spa	Soccer Field	Tennis Court
2	Meschanskij	Gym / Fitness Center	Gym	Yoga Studio	Gymnastics Gym	Tennis Court	Outdoor Gym	Boxing Gym	Martial Arts School	Massage Studio	Gym Pool
3	Basmannyj	Gym / Fitness Center	Yoga Studio	Gym	Martial Arts School	Spiritual Center	Boxing Gym	Soccer Field	Track	Tennis Court	Sports Club

RESULTS

Cluster 2

	Neighborhood	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
5	Presnenskij	Gym / Fitness Center	Yoga Studio	Gym	Track	Sports Club	Spa	Martial Arts School	Outdoor Gym	Soccer Field	Tennis Court
6	Tverskoj	Gym / Fitness Center	Yoga Studio	Gymnastics Gym	Cycle Studio	Tennis Court	Gym	Martial Arts School	Boxing Gym	Spa	Social Club

Cluster 3

	Neighborhood	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
0	Taganskij	Gym / Fitness Center	Yoga Studio	Martial Arts School	College Gym	Cycle Studio	Track	Gym	Gym Pool	Gymnastics Gym	Boxing Gym

Cluster 4

	Neighborhood	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
7	Hamovniki	Gym / Fitness Center	Yoga Studio	Gym	Outdoor Gym	Gymnastics Gym	Boxing Gym	Track	Social Club	Pool	Arts & Entertainment

RESULTS

Based on dataframe the best option is to consider the Hamovniki and Taganskij neighborhoods. They have almost the same potential for starting a business.

Visualization, on the OpenStreetMap tile of Folium library, of the Central borough and its new five clusters.

DISCUSSION

This analysis was performed on limited data. This may or may not be correct. But if you have enough data, you can get better results.

- ✓ The best option is to consider the Hamovniki and Taganskij neighborhoods. They have almost the same potential for starting a business.

- ✓ There is a lot of competition the Zamoskvorech'e, Krasnosel'skij, Jakimanka, Arbat, Meschanskij, Basmannyj, Presnenskij and Tverskoj neighborhoods, so it is very risky to start a business in these areas.

- ✓ For a more detailed analysis, it is necessary to add other factors such as demographics, the proximity of office buildings, etc.

CONCLUSION

The goal of the project was achieved and, with some work, could support the discovery of a business idea in an unknown location. Of course, there is room for further improvement and development, because we used a limited set of data. According to the type of area and type of business - gym / fitness center, the analysis can be checked.

The analysis allows you to determine the place with the least risk and competition.