



Capstone Project

The battle of neighborhoods

Gym / Fitness centers location analysis

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Chapter 1

Data description

1.1 Description

Data used will be data obtained through the FOURSQUARE API similar to the format used in the labs.

1.2 Data Source and format

The main data format used will be that of pandas data frames. We will use Foursquare to do the following:

- Search areas and identify the nearby venues in those areas.
- Explore specific venues to get ratings and number of likes to evaluate the success or popularity of venues.

Chapter 2

Methodology

As explained in the introduction the goal of the analysis is to choose a suitable location for a new gym / fitness center in the Montreal area.

The analysis aims at answering the following questions:

- Where are the existing gyms located
- What type of venues surround these gyms
- Can there be a correlation between the presence of a certain type of nearby venues and the success/popularity of the gym
- What type of nearby venues should we seek

2.1 Existing gyms / training centers

The first step of our study is to use the FOURSQUARE API in order to search the Montreal area and find all facilities that fall into the following categories:

- Gym
- Boxing Gym
- Martial Arts School

At the time this report is being written we have found 96 gyms in the area explored. The data is organised in a dataframe as follows:

	name	categories	address	crossStreet	lat	lng	labeledLatLngs	distance	postalCode	cc	city	state	country	formattedAddress	neighborhood	id
0	UnderDog Boxing Gym	Boxing Gym	9 Ste-Catherine East	St-Laurent	45.510055	-73.563710	[{'label': 'display', 'lat': 45.51005460345811...	3910	Ca	CA	Montréal	QC	Canada	[9 Ste-Catherine East (St-Laurent), Montréal Q...	NaN	4b6f9c10f964a520c6f72ce3
1	Guerrero's Gym	Boxing Gym	3250 Boul Crémazie E	NaN	45.562825	-73.604641	[{'label': 'display', 'lat': 45.562825, 'lng':...	7317	H2A 3N9	CA	Montréal	QC	Canada	[3250 Boul Crémazie E, Montréal QC H2A 3N9, Ca...	NaN	5d6f075a49a1f10008ba9fd6
2	Hard Knox Boxing Gym	Boxing Gym	NaN	NaN	45.479412	-73.581359	[{'label': 'display', 'lat': 45.47941243891546...	3008	NaN	CA	Montréal	QC	Canada	[Montréal QC, Canada]	Le Sud-Ouest	51791840e4b0650bb54cbfc1
3	apex	Boxing Gym	1827 St-Catherine W.	St-Marc	45.493524	-73.580149	[{'label': 'display', 'lat': 45.493524, 'lng':...	2393	H3H 1M8	CA	Montréal	QC	Canada	[1827 St-Catherine W. (St-Marc), Montréal QC H...	NaN	54ee76b3498ecc627d1df2a3
4	JKS Martial Arts School	Boxing Gym	295 Labrosse	Boul Saint Jean	45.482627	-73.798840	[{'label': 'display', 'lat': 45.48262718747421...	14797	H9R 1A3	CA	DDO	QC	Canada	[295 Labrosse (Boul Saint Jean), DDO QC H9R 1A...	NaN	4d36e42d4754f04dd62e9e7e

Figure 2.1: DataFrame containing data on existing gyms

The most important features of this dataFrame are:

- Gym Name
- Gym Category (boxing gym, martial arts school, fitness center, etc...)
- Gym id (used by the FOURSQUARE API to uniquely identify each venue)
- Gym latitude
- Gym longitude
- Gym address postal code

We then plot a heat map to better visualize the distribution and density of these centers as shown below:

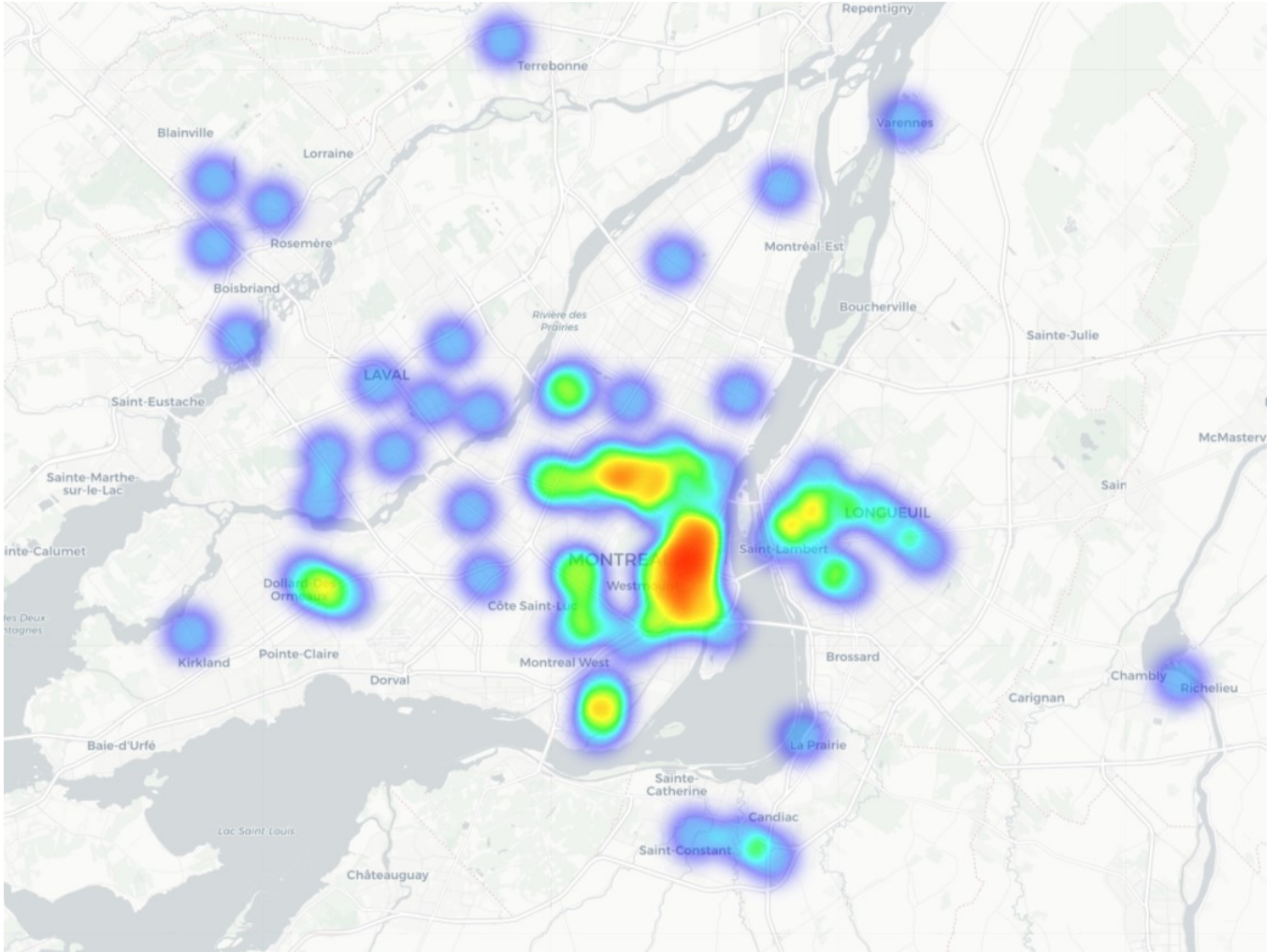


Figure 2.2: Montreal gyms heat map

The highest density is recorded around the downtown area which is not surprising.

2.2 Gym nearby venues:

The next step in our analysis is to explore the surroundings of the gyms and training centers previously found. The aim is to have a better understanding of the type of venues that are in proximity to these gyms. For this purpose we will use the FOURSQUARE API with a search radius of 500m and a limit of 300 venues.

At the same for each gym / training center we will use the FOURSQUARE API to get the rating and number of likes.

This data will be grouped in a data frame containing the following fields:

- Gym Name
- Gym Category (boxing gym, martial arts school, fitness center, etc...)
- Gym id (used by the FOURSQUARE API to uniquely identify each venue)
- Gym latitude
- Gym longitude
- Likes count: number of likes in FOURSQUARE
- Rating
- Venue name: column containing venues associated with the Gym, each gym will as many rows as the number of nearby venues found.
- Venue category: category of each of the venues found
- Latitude and longitude of the nearby venue

	Gym Name	Gym category	Gym id	Gym lat	Gym lng	Likes count	Rating		Venue Name	Categories	Lat	Lng
0	UnderDog	Boxing Gym	Boxing Gym	4b6f9c10f964a520c6f72ce3	45.510055	-73.56371	15	8.3	Cadet	Restaurant	45.510260	-73.564584
1	UnderDog	Boxing Gym	Boxing Gym	4b6f9c10f964a520c6f72ce3	45.510055	-73.56371	15	8.3	Bouillon Bilk	Restaurant	45.510845	-73.566017
2	UnderDog	Boxing Gym	Boxing Gym	4b6f9c10f964a520c6f72ce3	45.510055	-73.56371	15	8.3	Société des arts technologiques [SAT]	Music Venue	45.509369	-73.562654
3	UnderDog	Boxing Gym	Boxing Gym	4b6f9c10f964a520c6f72ce3	45.510055	-73.56371	15	8.3	Cachitos	Bakery	45.509814	-73.564077
4	UnderDog	Boxing Gym	Boxing Gym	4b6f9c10f964a520c6f72ce3	45.510055	-73.56371	15	8.3	La Maison Symphonique de Montréal	Concert Hall	45.509442	-73.566599

Figure 2.3: Gym and nearby venues Data frame

This data will be at the core of our subsequent analysis.

