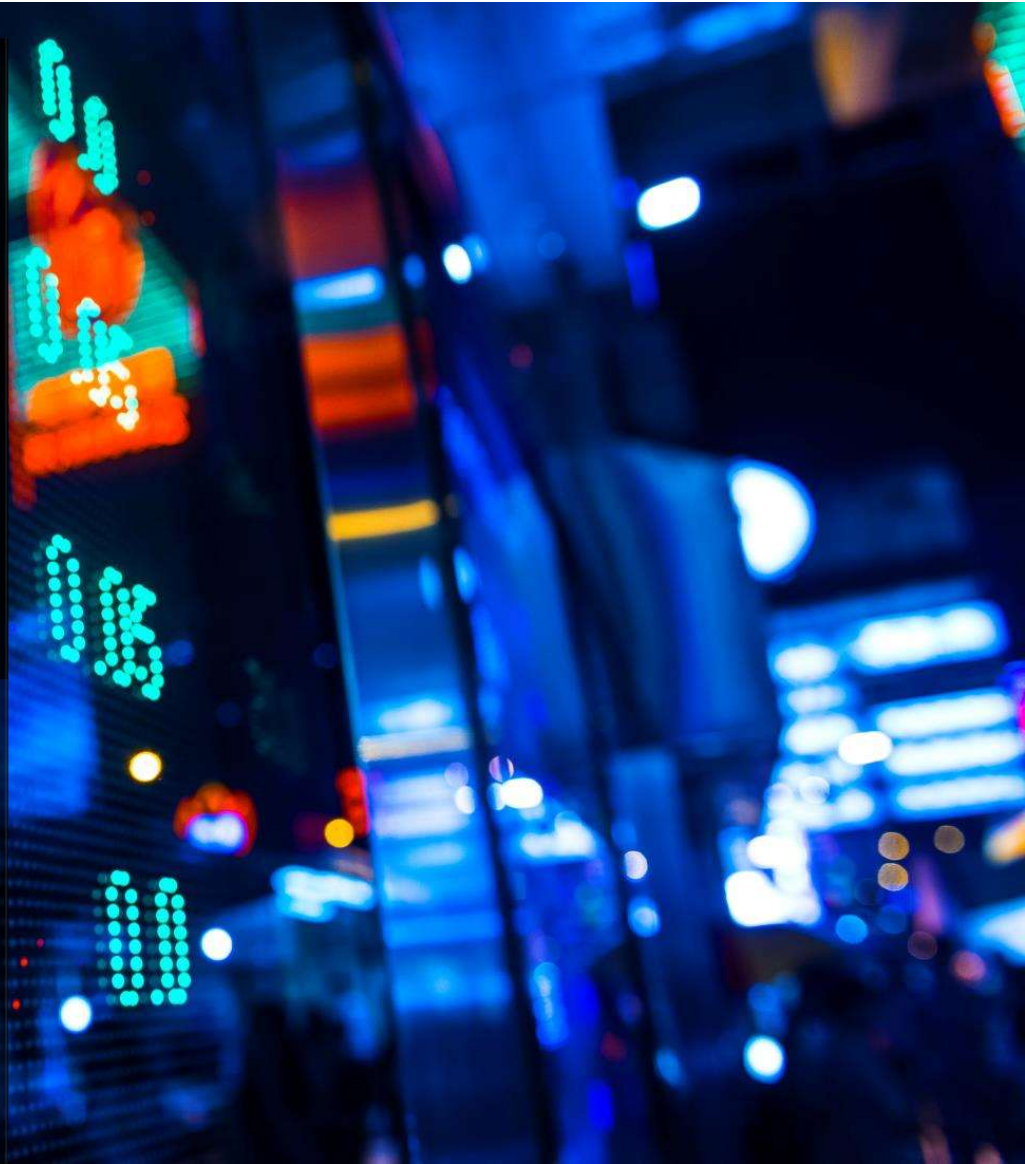




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NEW BRANCH LOCATION

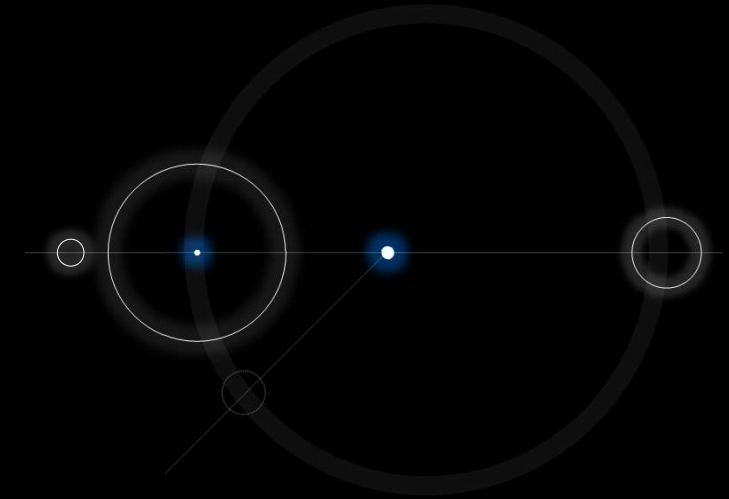
WHERE TO OPEN NEW STORE AND
OFFICE IN MIAMI, FL.



GymNextGen



- Societies evolves to be more fitness and health conscious.
- Major cities require larger number of gyms and sport stores in the heart of their more populous places.
- More people is avid for lifestyle change and ways to be more active.



FUTURE LOOKING

Committed to help people and service providers in their search for better life.

Our next step, Miami, FI

The Problem



Market Share

Market Share will decline if Company Expansion is not carefully planned.



Financial

Optimum decisions will avoid financial unbalance.



Proximity

Company motto is to grow and work closely with all our customers.



Cost

Careful selection of new branch location will avoid requiring more than one branch in the city.



Location

But how to find Optimum Location?

DATA HUNTING

FOURSQUARE SERVICE

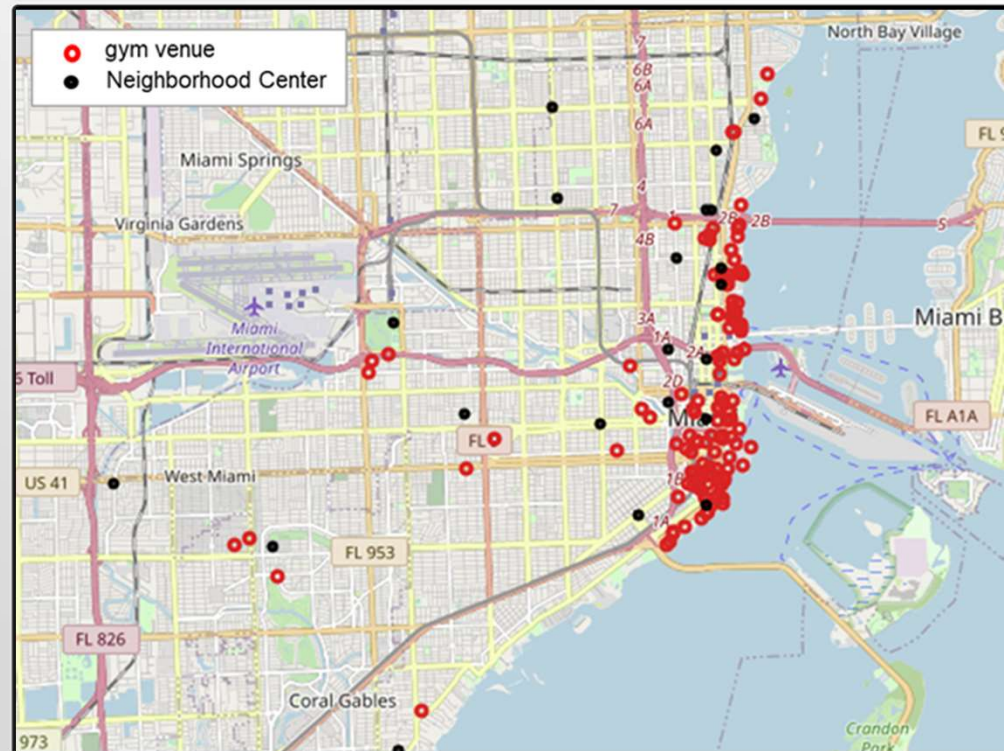
- FourSquare is a service company specialized in providing many sorts of geospatial data oriented to business and customers.
- Tables containing information of businesses name, type, geographical coordinates and addresses which are located within a certain radius from a given location.
- Result: Table of Gym locations in Miami, Fl.



DATA EXPLORATION

CLEANING AND VISUALIZATION

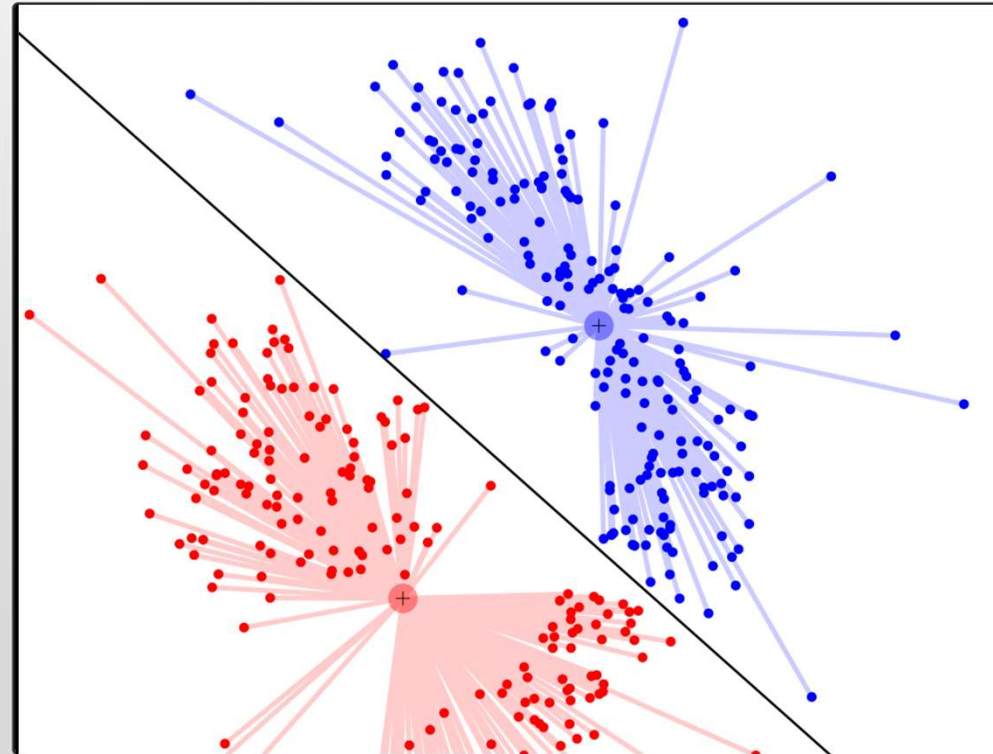
- All Data Obtained was quality controlled and cleaned and stored in a pandas DataFrame for manipulation.
- The resulting dataset consisted of 129 gym locations.
- Most of the venues were more densely located along the beach.



OPTIMUM LOCATIONS

USE OF K-MEANS ALGORITHM

- K-means algorithm splits a given population based on its distance to a cluster center.
- Cluster Centers are iteratively selected such that minimum distance to all samples are achieved.
- By input the gym locations data, algorithm is expected to output locations which minimize the geographical distance to all the gyms in their area.
- Require pre-define number of clusters.

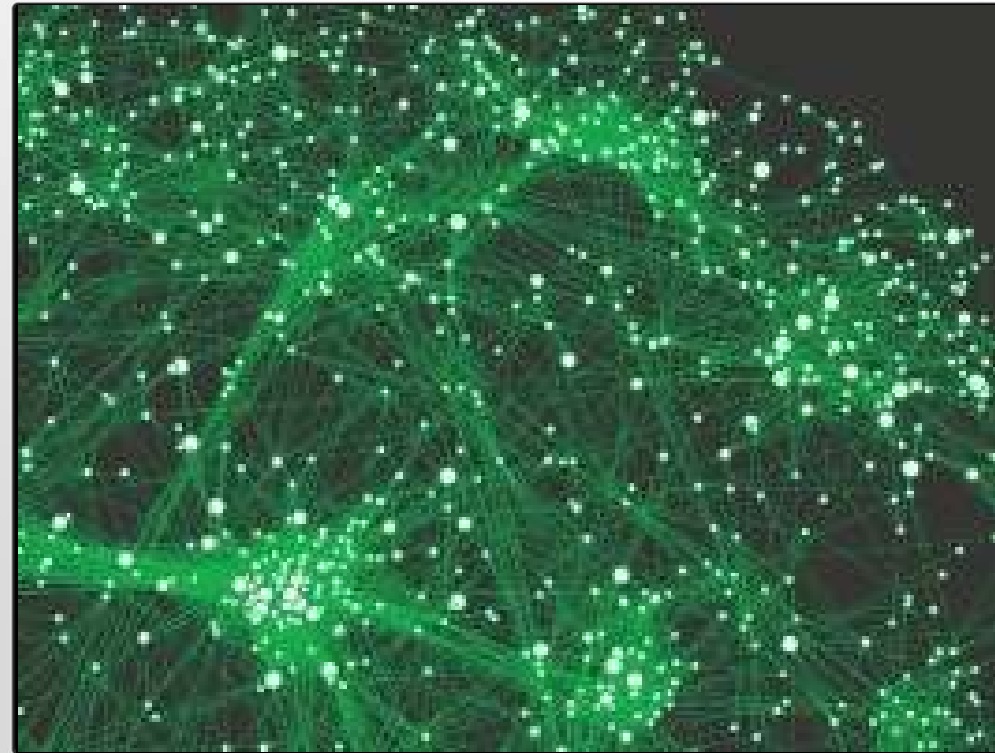


OPTIMUM LOCATIONS

WHAT METRIC

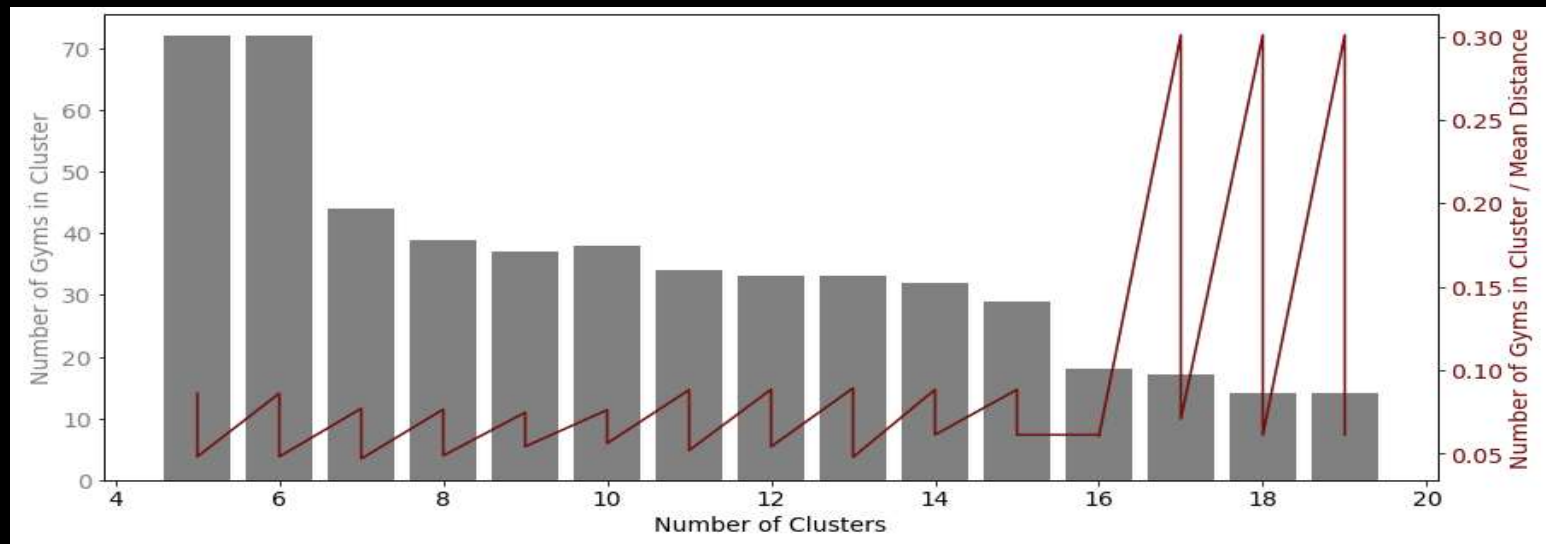
- How to select the best cluster center as optimum location of new branch location?
- Metrics considered:
 - Max Number of Gyms in the cluster.
 - Minimum mean distance between the gym locations and cluster center.
 - Maximize a pseudo density metric: Number of Gyms divided by mean distance.

The pseudo density metric was selected as includes the first two in a single number.



K-MEANS RUN FOR MULTIPLE NUMBER OF CLUSTERS

To understand the impact of the number of cluster that the city is divided into the result of optimum location



Higher than nineteen (19) clusters, empty clusters start appearing so the realizations were bounded to nineteen clusters maximum.

Higher than sixteen (16 clusters) algorithm runs into problems as starts finding clusters with too small frequency cluster together in a small region of the city.

More stable results were found when selected to divide the city between seven (7) and fifteen (15) clusters.

K-MEANS RUN FOR MULTIPLE NUMBER OF CLUSTERS

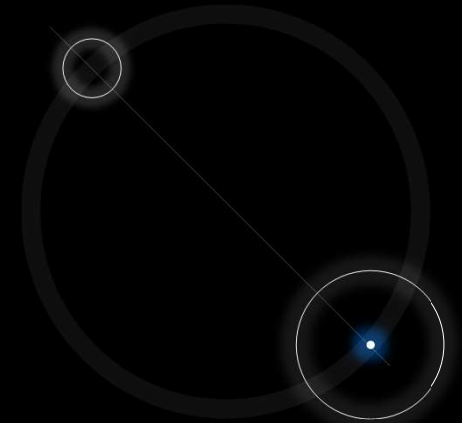
To understand the impact of the number of cluster that the city is divided into the result of optimum location

Clusters Number	Cluster Centroid		Number of Gyms	Mean Distance	Gyms/MeanDist	ranking
	Latitude	Longitude				
11	25.76278	-80.1923	34	385	0.088	best place
11	25.77301	-80.1906	24	462	0.052	second best
12	25.76193	-80.1921	33	373	0.089	best place
12	25.77255	-80.1916	29	535	0.054	second best
13	25.76141	-80.1927	33	370	0.089	best place
13	25.77217	-80.1887	20	418	0.048	second best
14	25.76245	-80.1921	32	362	0.088	best place
14	25.7928	-80.1873	14	228	0.061	second best
15	25.76175	-80.1926	29	328	0.088	best place
15	25.7928	-80.1873	14	228	0.061	second best

Splitting the city between eleven (11) and fifteen (15) clusters result in locations with more than thirty nearby locations within a mean distance between 330 and 385 m.

Therefore the best area for a new branch is bounded by the Southeast 1st Avenue, the Brickell Avenue, the Southwest 14th Street and Southeast 10th Street.

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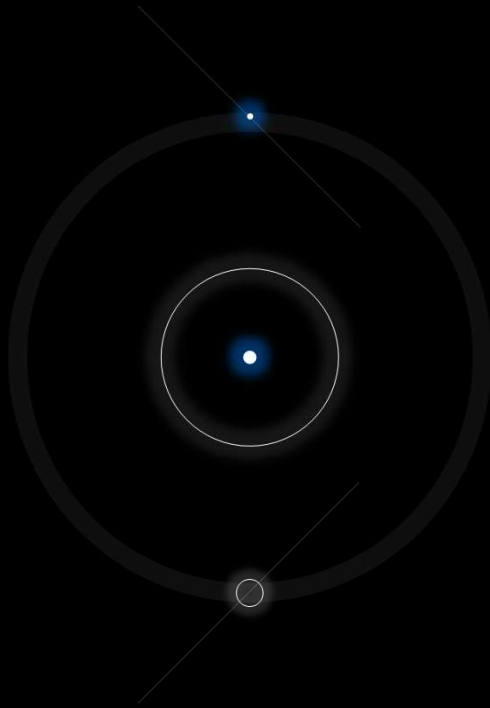


SUMMARY CONCLUSIONS

The analysis presented recommends to explore options to open a branch in Miami, Fl in the mentioned area.

- Our company specialized in gym services and products is looking to expand by opening a branch in Miami, Fl.
- Available census of gym locations in the city was used to select best location for new branch.
- K-means algorithm splitted the city in a number of areas and result in best locations.
- Most suitable locations were found to be in area bounded by the Southeast 1st Avenue, the Brickell Avenue, the Southwest 14th Street and Southeast 10th Street.

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**THANK
YOU**