RIYADH CITY GYM & FITNESS CENTER ANALYSIS
THE BEST DISTRICTS TO OPEN A GYM?

Done by: Abdelrahman Elsayed
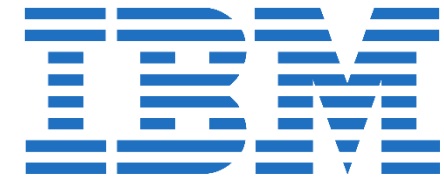
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INTRODUCTION

Riyadh has accounted for the maximum number of organized fitness centers in KSA, primarily for being the commercial capital of the country.

Here, we present some insights to help business owners who are interested in this industry and are looking to build a gym inside Riyadh to know which districts should they target.

Riyadh Gym & Fitness centers analysis

DATA

Data related to Riyadh districts was tricky to find, however after going through several github links I found some large datasets in the formats of JSON and SQL.

The JSON link includes all boundaries of all the districts in Saudi Arabia, however we are only interested in the coordinates of Riyadh (Latitudes, Longitudes)

The links:

https://github.com/FaisalOsaI/Saudi-Arabia-Regions-Cities-and-Districts

https://github.com/aalmangour/Saudi_GIS_Data/blob/master/sa_neighborhoods.sql

Data processing

```python
import pandas as pd
import numpy as np

#the data were obtained online through an SQL file found on GitHub that was scrabed an
#All the preprocessing was done in Power Query to turn the SQL file to a suitable data
Dist=pd.read_excel('https://srv-file10.gofile.io/download/Y9FcIf/RiyadhDistrictsData2.
Dist
```

	ID	DistrictAR	DistrictEN	City	Latitude	Longitude
0	763	حطين	Hitien	Riyadh	26.331606	44.883862
1	764	قرطبة	Qurtubah	Riyadh	26.327879	44.848296
2	765	الفيصلية	Al Faysaliyyah	Riyadh	26.293811	44.802280
3	766	العزيزية	Al Aziziyyah	Riyadh	26.307914	44.815816
4	767	القدس	Al Quds	Riyadh	26.302859	44.804438
5	768	الخالدية	Al Khalidiyyah	Riyadh	26.299103	44.825027
6	769	الروضة	Ar Rawdah	Riyadh	26.293558	44.825436
7	770	الربوة	Al Rabwah	Riyadh	26.321627	44.887540

METHODOLOGY

The methodology and approach are comprised into 4 steps:

I. *Data preparation including sourcing and cleansing.*
II. *Visualization of Gyms in Riyadh to get an initial idea.*
III. *Obtaining the most common venue categories in Riyadh neighborhoods.*
IV. *Clustering the neighborhoods.*

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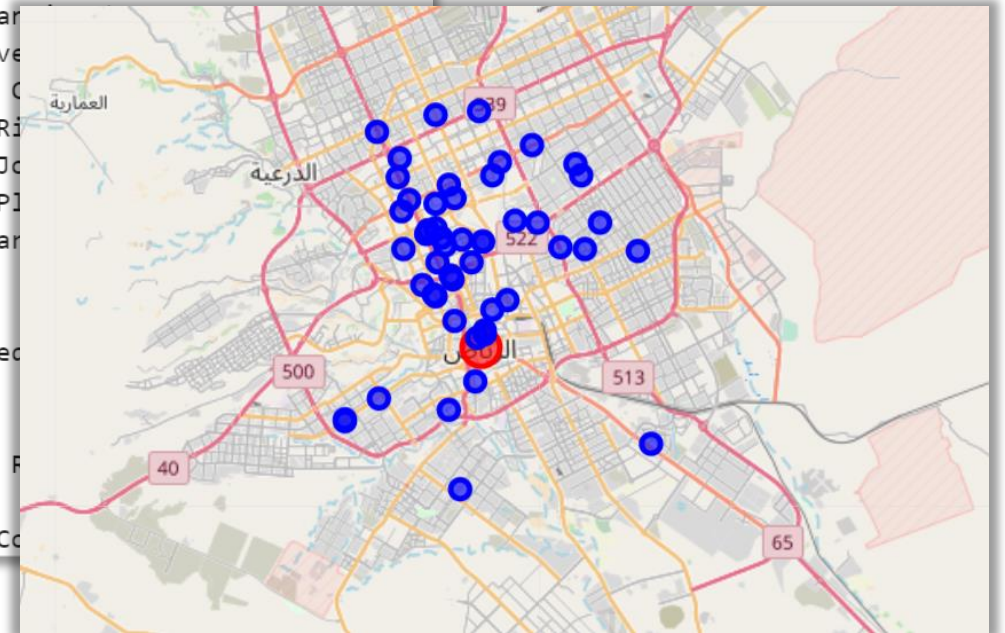
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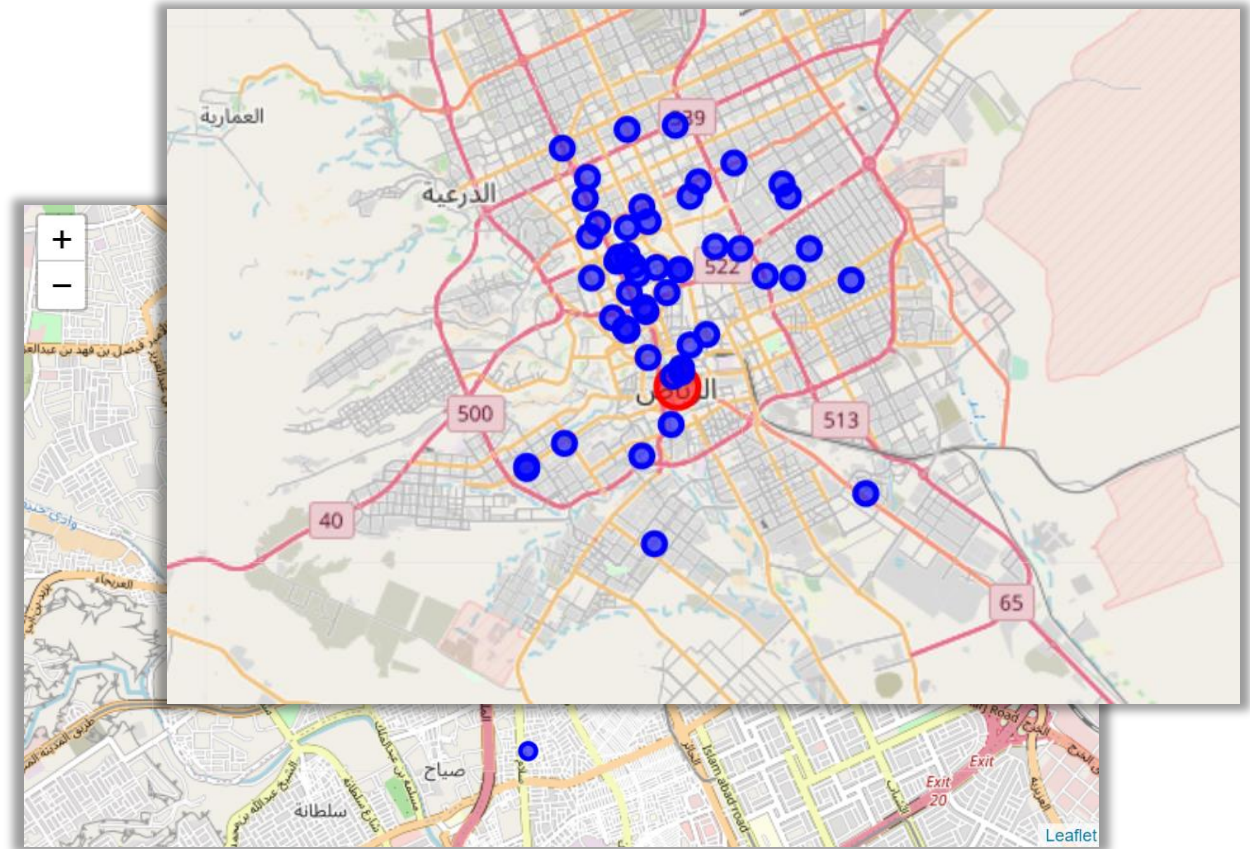# *METHODOLOGY*

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	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Al Faysaliyyah	26.293811	44.802280	توب تشكن/top Chicken	26.293546	44.805734	Fast Food Restaurant
1	Al Faysaliyyah	26.293811	44.802280	twin coffee (توأم	26.294876	44.806953	Coffee Shop
2	Al Faysaliyyah						
3	Al Faysaliyyah						
4	Al Faysaliyyah						
5	Al Faysaliyyah						
6	Al Faysaliyyah						

	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
0	Al Aziziyyah	Candy Store	Flower Shop	Windmill	Gym	Bakery	Burger Joint	Café
1	Al Farouq	BBQ Joint	Shawarma Place	Fast Food Restaurant	Falafel Restaurant	Coffee Shop	Flower Shop	Flea Market
2	Al Faysaliyyah	Coffee Shop	Gym / Fitness Center	Clothing Store	Flea Market	Fast Food Restaurant	Mobile Phone Shop	Grocery Store
3	Al Khalidiyyah	Fast Food Restaurant	Market	Middle Eastern Restaurant	Windmill	Exhibit	Flea Market	Farm
4	Al Muntazah	Park	Windmill	Flower Shop	Flea Market	Fast Food Restaurant	Farm	Falafel Restaurant
5	Al Quds	Coffee Shop	Falafel Restaurant	Turkish Restaurant	Bakery	Burger Joint	Café	Candy Store
6	Al Yamamah	Fast Food Restaurant	Windmill	Gym	Bakery	Burger Joint	Café	Candy Store
7	Al Yarmok	Farm	Ice Cream Shop	Optical Shop	Windmill	Exhibit	Flea Market	Fast Food Restaurant

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Clustering

```python
# import k-means from clustering stage
from sklearn.cluster import KMeans

# set number of clusters
kclusters = 10

Riyadh_grouped_clustering = Riyadh_grouped.drop('Neighborhood', 1)

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(Riyadh_grouped_clustering)

# check cluster labels generated for each row in the dataframe
kmeans.labels_[:]
```

```
array([5, 0, 2, 9, 1, 2, 3, 8, 6, 2, 7, 2, 4])
```

RESULTS

The results are as shown below, illustrating the most common venue categories in Riyadh neighborhoods. Conclusions and insights are discussed in the following section.

	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	Al Aziziyyah	Candy Store	Flower Shop	Windmill	Gym	Bakery	Burger Joint	Café	Castle	Clothing Store	Coffee Shop
1	Al Farouq	BBQ Joint	Shawarma Place	Fast Food Restaurant	Falafel Restaurant	Coffee Shop	Flower Shop	Flea Market	Farm	Exhibit	Clothing Store
2	Al Faysaliyyah	Coffee Shop	Gym / Fitness Center	Clothing Store	Flea Market	Fast Food Restaurant	Mobile Phone Shop	Grocery Store	Pizza Place	Café	Burger Joint
3	Al Khalidiyyah	Fast Food Restaurant	Market	Middle Eastern Restaurant	Windmill	Exhibit	Flea Market	Farm	Falafel Restaurant	Coffee Shop	Grocery Store
4	Al Muntazah	Park	Windmill	Flower Shop	Flea Market	Fast Food Restaurant	Farm	Falafel Restaurant	Exhibit	Coffee Shop	Gym
5	Al Quds	Coffee Shop	Falafel Restaurant	Turkish Restaurant	Bakery	Burger Joint	Café	Candy Store	Castle	Clothing Store	Gym
6	Al Yamamah	Fast Food Restaurant	Windmill	Gym	Bakery	Burger Joint	Café	Candy Store	Castle	Clothing Store	Coffee Shop
7	Al Yarmok	Farm	Ice Cream Shop	Optical Shop	Windmill	Exhibit	Flea Market	Fast Food Restaurant	Falafel Restaurant	Coffee Shop	Grocery Store
8	Alkah	Resort	Exhibit	Windmill	Coffee Shop	Flower Shop	Flea Market	Fast Food Restaurant	Farm	Falafel Restaurant	Clothing Store
9	Ar Rawdah	Supermarket	Café	Fast Food Restaurant	Castle	Farm	Windmill	Exhibit	Flower Shop	Flea Market	Falafel Restaurant
10	As Sanaiyyah	River	Café	Windmill	Exhibit	Flower Shop	Flea Market	Fast Food Restaurant	Farm	Falafel Restaurant	Clothing Store
11	As Sediq	Gym	Coffee Shop	Health Food Store	Restaurant	Plaza	Flea Market	Fast Food Restaurant	Farm	Falafel Restaurant	Exhibit
12	Badr	Windmill	Gym	Bakery	Burger Joint	Café	Candy Store	Castle	Clothing Store	Coffee Shop	Exhibit

Neighborhood
Al Aziziyyah
Al Farouq
Al Faysaliyyah
Al Khalidiyyah
Al Muntazah
Al Quds
Al Yamamah
Al Yarmok
Alkah
Ar Rawdah
As Sanaiyyah
As Sediq
Badr

CONCLUSION

Based on the results shown and illustrated in the notebook as well as the previous section, we developed a criterion to categorize each of the venues into three categories;

Safe Zone

(the recommended neighborhoods to open a new Gym) since currently it doesn't include any Gyms in the top 10 venues.

Moderate-risk Zone

To open a Gym here, a decision maker must take further steps in analyzing the neighborhoods, and the needs and Characteristics of people living in it. (This neighborhood includes Gyms in the top Venues in the rankings from 6th till 10th)

Red Zone

(the recommended neighborhoods to open a new Gym) since currently it doesn't include any Gyms in the top 10 venues.

Neighborhood
Al Aziziyyah
Al Farouq
Al Faysaliyyah
Al Khalidiyyah
Al Muntazah
Al Quds
Al Yamamah
Al Yarmok
Alkah
Ar Rawdah
As Sanaiyyah
As Sediq
Badr

DISCUSSION

The results show a great potential for opening Gyms, giving that there are currently 7 districts which doesn't have Gyms or fitness centers in their top 10 venues. There are also 2 locations which could be considered after further analysis. However, we recommend staying away from the 3 locations depicted in the previous section in the "Red Zone" category.

Finally, this work is just an example of how wonderful this field could be, and how it is integrated in our daily lives and in business.

THANK YOU