



Capstone Project - The Battle of Neighborhoods

1 - PROBLEM STATEMENT

A well-known European restaurant chain wants to develop its franchise growth project in the USA.

The research aims to identify 1 location beyond New York City in which to open a second analog restaurant.

The company aims at a target aged between 18 and 25 and provides customers with a smart and fashionable service.

In the restaurants, in addition to having access to a modern menu, the company provides wi-fi service and youth entertainment, as well as contemporary exhibitions.

The quality of the food is average, with innovative cuisine therefore the price is in proportion to the service.

Therefore one needs to select a city based on:

- a quality of life suitable for what are called millennials
- that the chosen city has characteristics that are among the most evolving cities from a demographic point of view.
- that per capita income is high.

These are the parameters on which the research will focus; however, they could have further search criteria, such as the delinquency rate, the trend in the recruitment of new graduates, the number of people who work with an age group between 18 and 25 years.

These possible researches do not invalidate the initial work could be ideas for a subsequent analysis

The Company that entrusts this presentation wants a technical analysis, which allows to identify a position that has all the required characteristics; later it will also be necessary to identify the neighborhood in which it is advantageous to open the business.

To do this, the indicators chosen were the greater presence of Art Gallery, Art Museum, Arts & Crafts Store, Baseball Field, Bike Rental / Bike Share, Bookstore, College Arts Building, Dance Studio, Gym, Gym / Fitness Center, Museum, Theater, Video Game Store, Yoga Studio.



2 - DATA ACQUISITION

2.1.- smartcitygovt

The first search is to obtain a list of cities in the USA that have been rated among the best as Smart cities.

Smart City innovations offer mayors around the world a promising new way to involve citizens and increase the quality of life, the main users of these services are all young people.

For this reason we have chosen to underestimate the work of Eden Strategy Institute in order to immediately filter the possible destinations of our research.

For them to city leaders a guide on the willingness of their governments to evaluate, facilitate or monitor smart city initiatives, the Eden Strategy Institute has developed an independent classification of the Top 50 Smart City Governments.

Scraping will be performed on the site in order to obtain the dataframe of the cities from the ranking list:" <https://www.smartcitygovt.com/>"

2.2.- best-cities-for-millennials

In order to identify the city which in addition to being Smart is very attractive for the 18/25 age group and their income, I decided to use the data provided by <https://worldpopulationreview.com/us-city-rankings/best-cities-for-millennials>.

This analysis to determine the best cities for millennials was obtained by evaluating several factors, including the cost of living, economic statistics, access to public transport and employment.

This dataframe corresponds to the analysis requests that the franchising restaurant company had requested.

We will perform a scraping on the site in order to obtain a second dataframe.

Interpolating the data frames will provide the US cities selected for the company's investment.

2.3 – Comparison data frame

From the comparison of the 2 data frames it appears that the City of **Columbus** is the most suitable for the opening of the new restaurant.

The selection was made by merging the data of the smartest cities in the world with the cities most suitable for millennials in the USA.

Rank	City	Avg. Rent	Density	Population
2	Columbus	\$1,080	1,609/mi ²	913921

2.4 – Columbus' Neighborhoods

To search for the neighborhoods where to carry out subsequent searches, I will use the site: <https://www.columbusunderground.com/the-top-10-columbus-neysidehoods-of-2020/>, in which the 10 best neighborhoods have been selected.

Once the final city has been obtained, I will analyze the different neighborhoods of the city by tracing the list with the coordinates of the neighborhoods on API GEOCODE GOOGLE

Borough	Latitude	Longitude
German Village	39.947705	-82.991817
Clintonville	40.049611	-83.020201
Grandview Heights	39.979786	-83.040740
Worthington	40.093119	-83.017962
Downtown	39.966788	-82.990474
Dublin	40.099229	-83.114077
Olde Towne East	39.957994	-82.976125
Italian Village	39.982518	-83.001217
Bexley	39.968953	-82.937680
Franklinton	39.953727	-83.028082

3 – Foursquare Dataset

Let's analyze data from 10 Columbus neighborhoods. Foursquare provides 100 venues with each API call.

In the end, we have a dataset of 1000 pieces of data.

I created a sub-group of the data frame with only the categories of venues that were indicated as functions for the selection of the district

I grouped by district by entering the average of the venues for each category found.

	Borough	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center	Museum	Theater	Video Game Store	Yoga Studio
0	Bexley	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1	Clintonville	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	Downtown	0.000000	0.052632	0.000000	0.000000	0.000000	0.000000	0.052632	0.052632	0.052632	0.052632	0.052632	0.052632	0.000000	0.000000
3	Dublin	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.037037
4	Franklinton	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5	German Village	0.000000	0.000000	0.060606	0.000000	0.030303	0.030303	0.000000	0.000000	0.030303	0.000000	0.000000	0.000000	0.000000	0.000000
6	Grandview Heights	0.000000	0.000000	0.000000	0.166667	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
7	Italian Village	0.015625	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.046875	0.015625	0.000000	0.000000	0.000000	0.000000
8	Old Towne East	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
9	Worthington	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Now let's create the new dataframe and display the top 10 venues for each Borough.

	Borough	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	Bexley	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
1	Clintonville	Video Game Store	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym
2	Downtown	Art Museum	College Arts Building	Dance Studio	Gym	Gym / Fitness Center	Museum	Theater	Art Gallery	Arts & Crafts Store	Baseball Field
3	Dublin	Yoga Studio	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym
4	Franklinton	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
5	German Village	Arts & Crafts Store	Bike Rental / Bike Share	Bookstore	Gym	Art Gallery	Art Museum	Baseball Field	College Arts Building	Dance Studio	Gym / Fitness Center
6	Grandview Heights	Baseball Field	Art Gallery	Art Museum	Arts & Crafts Store	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
7	Italian Village	Gym	Art Gallery	Gym / Fitness Center	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio
8	Old Towne East	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
9	Worthington	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center

4 – Clustering

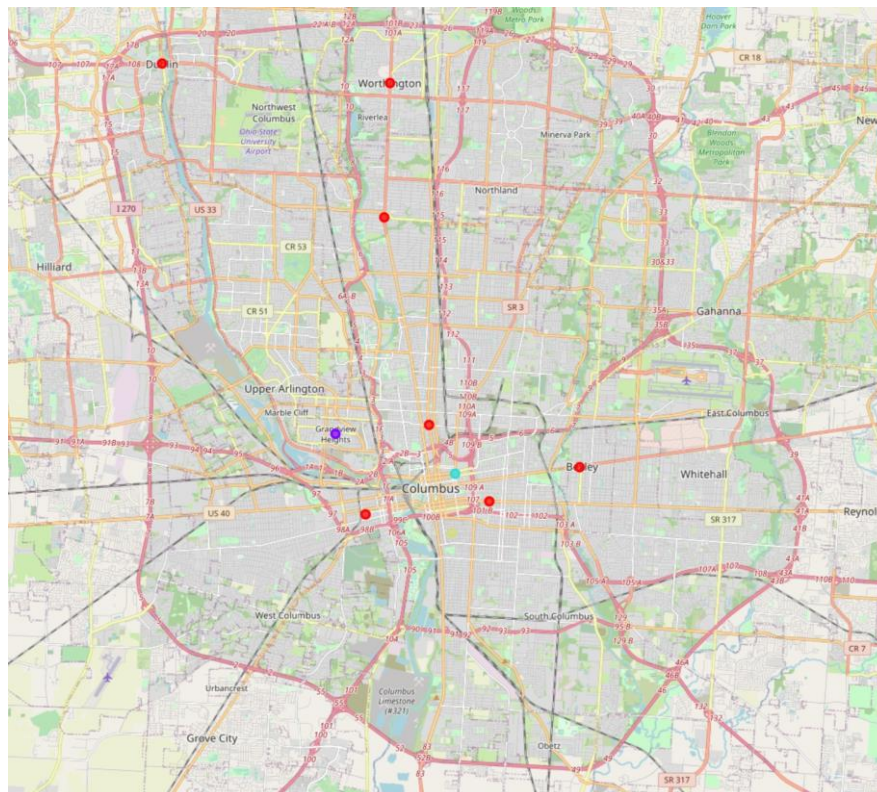
Run k -means to cluster the Boroughs into 4 clusters.


```
kmeans = KMeans(n_clusters=4, random_state=0).fit(Columbus_grouped_clustering)
```

5 – Result data frame

Let's create a new data frame that includes the cluster as well as the top 10 venues for each Borough.

	Borough	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	German Village	39.947705	-82.991817	3	Arts & Crafts Store	Bike Rental / Bike Share	Bookstore	Gym	Art Gallery	Art Museum	Baseball Field	College Arts Building	Dance Studio	Gym / Fitness Center
1	Clintonville	40.049611	-83.020201	0	Video Game Store	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym
2	Grandview Heights	39.979786	-83.040740	1	Baseball Field	Art Gallery	Art Museum	Arts & Crafts Store	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
3	Worthington	40.093119	-83.017962	0	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
4	Downtown	39.966788	-82.990474	2	Art Museum	College Arts Building	Dance Studio	Gym	Gym / Fitness Center	Museum	Theater	Art Gallery	Arts & Crafts Store	Baseball Field
5	Dublin	40.099229	-83.114077	0	Yoga Studio	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym
6	Old Towne East	39.957994	-82.876125	0	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
7	Italian Village	39.982518	-83.001217	0	Gym	Art Gallery	Gym / Fitness Center	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio
8	Bexley	39.968953	-82.937680	0	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center
9	Franklin	39.953727	-83.028082	0	Art Gallery	Art Museum	Arts & Crafts Store	Baseball Field	Bike Rental / Bike Share	Bookstore	College Arts Building	Dance Studio	Gym	Gym / Fitness Center





The best location for Columbus to open a new restaurant is Downtown

From the analysis conducted, starting from global data and then perimeter and conformed with the data of the United States of America, we have identified an optimal location where to open a restaurant with the required characteristics and targets.

The city of Columbus and in particular the Downtown district, appears to be the most favorable for investment.

This result requires a subsequent identification of the building most suited to the needs of the restaurant, but this analysis is left to an accurate site visit.

From the analyzes carried out, the investment is supported by a tendency in this city and this district to promote smart development suitable for a youthful environment.

The Downtown neighborhood is also in the ranking of the 10 neighborhoods that have most evolved in terms of public services and facilities in 2020 and this trend suggests that the level of quality of life may remain so for a few years, if not even grow, encouraging the development of this area.