Finding the ideal neighborhood for a new restaurant in Miami

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Coursera Capstone Project
Panagiotis T.

Contents

1.Introduction

1.1 Background

- Miami is a major center and leader in finance, commerce, culture, media, entertainment, the arts, and international trade. The metro area is by far the largest urban economy in Florida and the 12th largest in the United States.
- Miami is the sixth most densely populated major city in the United States.
- The cuisine of Miami reflects its diverse population, with a heavy influence from Caribbean and Latin American cuisine. By combining the two with American cuisine, it has spawned a unique South Florida style of cooking known as Floribbean cuisine.

1.2 Problem

A group of investors wants to open a fine dining restaurant in the Miami, Florida. By using available data and taking into consideration multiple parameters for every neighborhood in Miami, we will make recommendations to the investors about the possible ideal neighborhoods for their restaurant and its suggested cuisine.

1.3 Interest

In general, anyone interested in opening a new restaurant in Miami should be interested, because he could get very useful information about Miami's current situation (restaurant's cuisine and location, population demographics).

2.Data acquisition

2.1 Data Sources

Miami neighborhood information and population demographics were scraped from Wikipedia. However, Miami's demographics available on Wikipedia were constricted to race, while we were interested about nationalities. Data were only available for Florida as a whole. I downloaded they dataset and uploaded on Github in csv format. Furthermore information for venues in Miami were obtained using the foursquare API. Finally data regarding average earnings in Miami, were found online and stored in a csv file that was uploaded on Github.

Data	Source
Miami neighborhood information	https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Miami
Venues	Foursquare
Florida demographic information	https://datausa.io/profile/geo/miami-fl/
Miami demographics	https://en.wikipedia.org/wiki/Miami
Miami average earnings by Neighborhood	Google

2.2 Sample Data

Table 1.Neighborhood data from Wiki.

	Neighborhood	Denonym	Population	Population/sqkm	Sub	Coordinates
0	None	None	None	None	None	None
1	Allapattah		54,289	4,401		25.815,-80.224
2	Arts & Entertainment District		11,033	7,948		25.799,-80.190
3	Brickell	Brickellite	31,759	14,541	West Brickell	25.758,-80.193
4	Buena Vista		9,058	3,540	Buena Vista East Historic District and Design ...	25.813,-80.192
5	Coconut Grove	Grovite	20,076	3,091	Center Grove, Northeast Coconut Grove, Southwe...	25.712,-80.257

Table 2.Foursquare Venue data

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Allapattah	25.815	-80.224	Three Fingers Liquor & Lounge	25.815408	-80.224361	Lounge
1	Allapattah	25.815	-80.224	Ross	25.815820	-80.221753	Department Store
2	Allapattah	25.815	-80.224	Showtime Boxing Gym	25.812364	-80.224504	Boxing Gym
3	Allapattah	25.815	-80.224	Damage Ink Screen Printing	25.811107	-80.223729	Print Shop
4	Arts & Entertainment District	25.799	-80.190	Bunnie Cakes	25.799544	-80.190953	Cupcake Shop

Table 3.Miami's demographic profile

Profile	2010
White (Includes White Hispanics)	72.6%
Hispanics	70.0%
Black or African American	19.2%
Non-Hispanic White	11.9%
Other	4.2%
Asian	1.0%

Table 4. Florida demographic data

Birthplace	Year	Total Population
Cuba	2018	1028508
Haiti	2018	339246
Colombia	2018	285400
Mexico	2018	254426
Jamaica	2018	213763

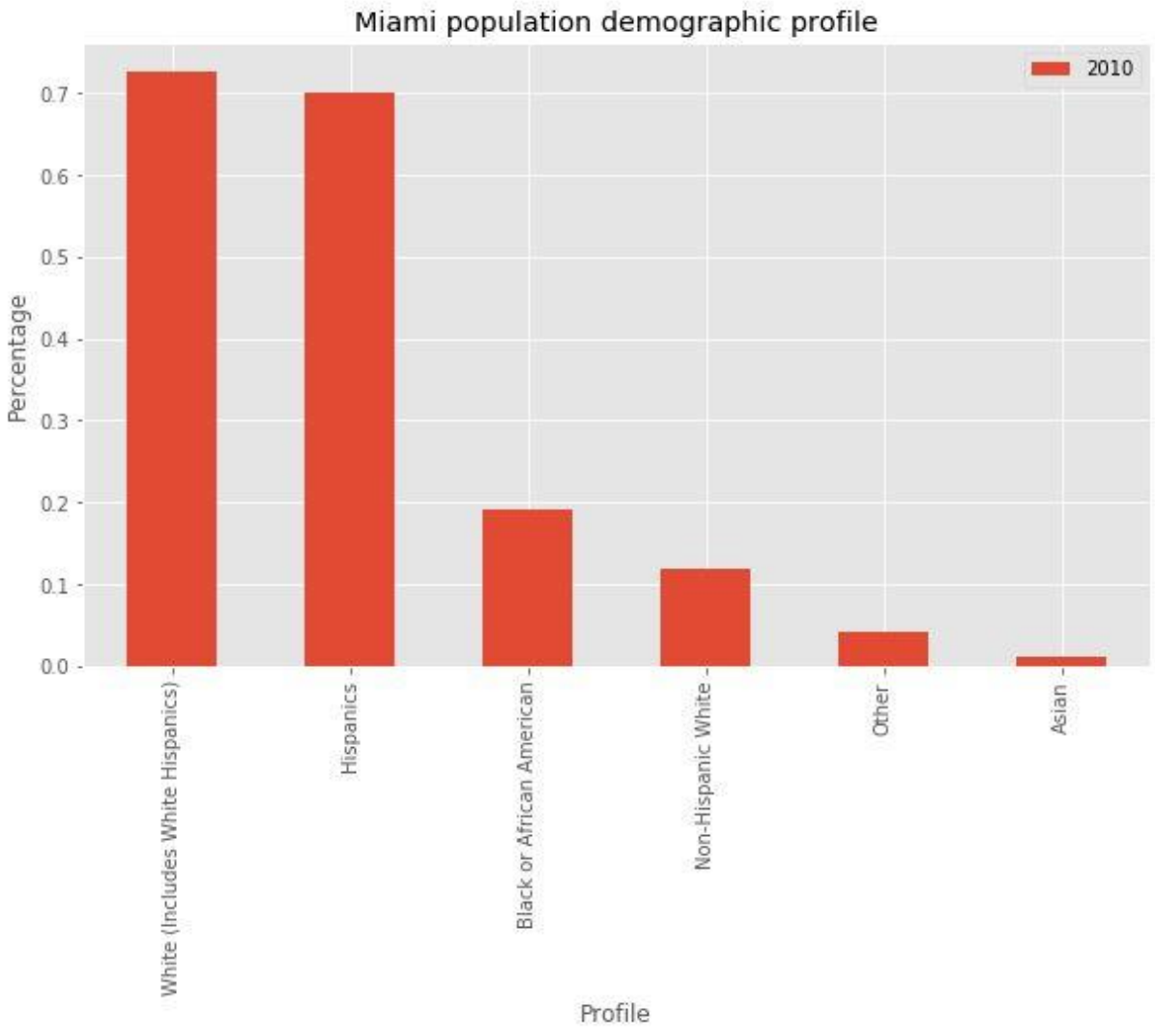
Table 5. Average net earnings in Miami, by neighborhood.

Neighborhood	Earnings
Allapattah	25.700
Arts & Entertainment District	70.597
Brickell	44.154
Buena Vista	33.666
Coconut Grove	77.685
Coral Way	41.603
Design District	53.203
Downtown	38.001
Edgewater	37.205
Flagami	37.708
Grapeland Heights	24.332
Liberty City	24.596
Little Haiti	32.470
Little Havana	26.881
Lumnus Park	23.681
Midtown	33.833
Overtown	24.779
Park West	22.292
The Roads	39.173
Upper Eastside	44.964
Venetian Islands	107.222
Virginia Key	35.231
West Flagler	37.020
Wynwood	36.159

3.Data Analysis

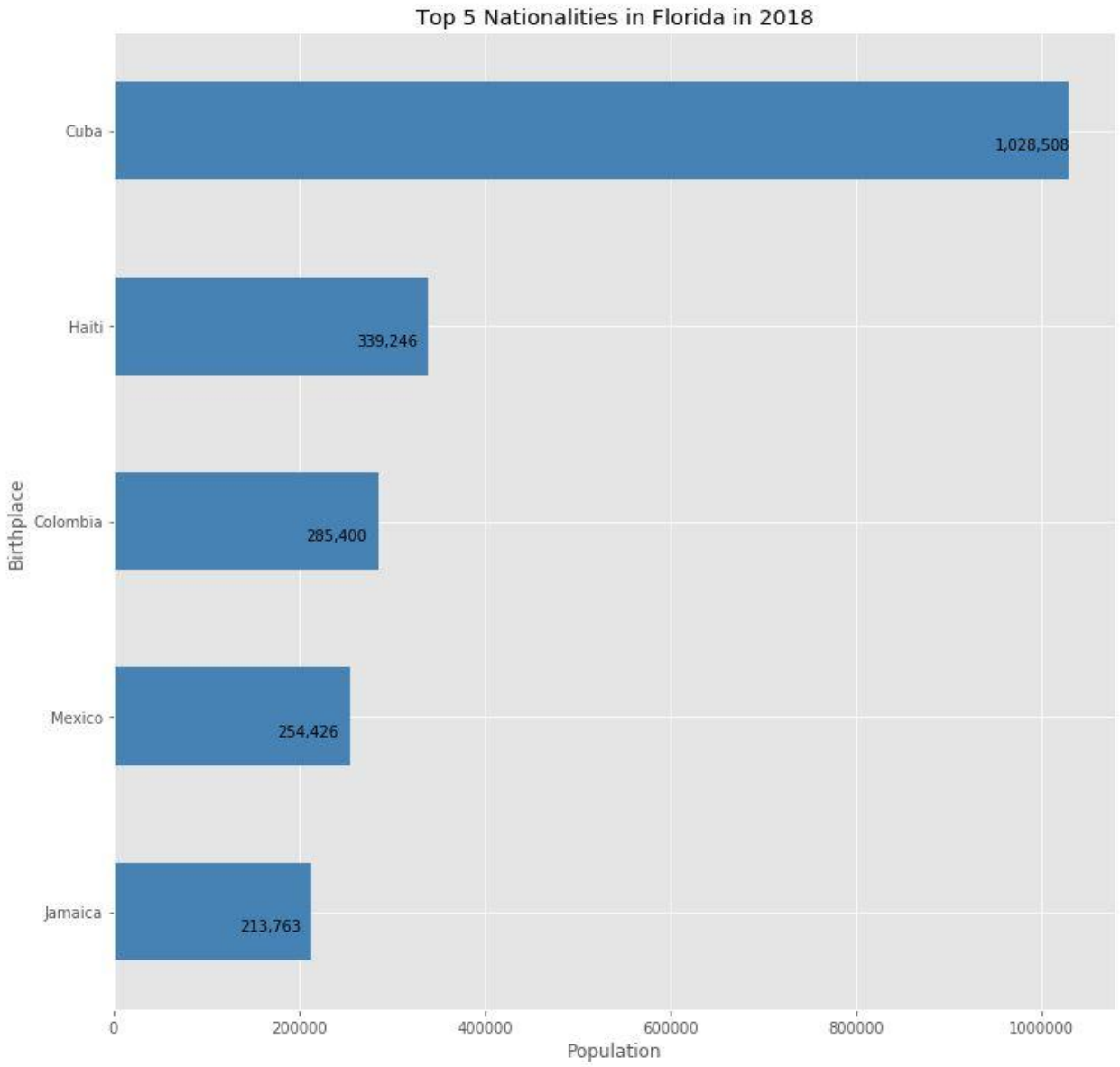
3.1 Relationship between demographics and cuisine

One of the main purposes of this project was to suggest to the investors an appropriate cuisine for their restaurant. As mentioned in the introduction Miami's cuisine is heavily influenced by its diverse population. Thus, we make our suggestion based on the demographic data we mentioned on the previous chapter.



As its obvious from the figure above, Miami's population is on its majority Hispanic. However, that's not enough for us in order to make a proper suggestion to the investors. The U.S. government Office of Management and Budget has defined Hispanic or Latino people as "a person of Cuban, Mexican, Puerto Rican, South or Central American, or other

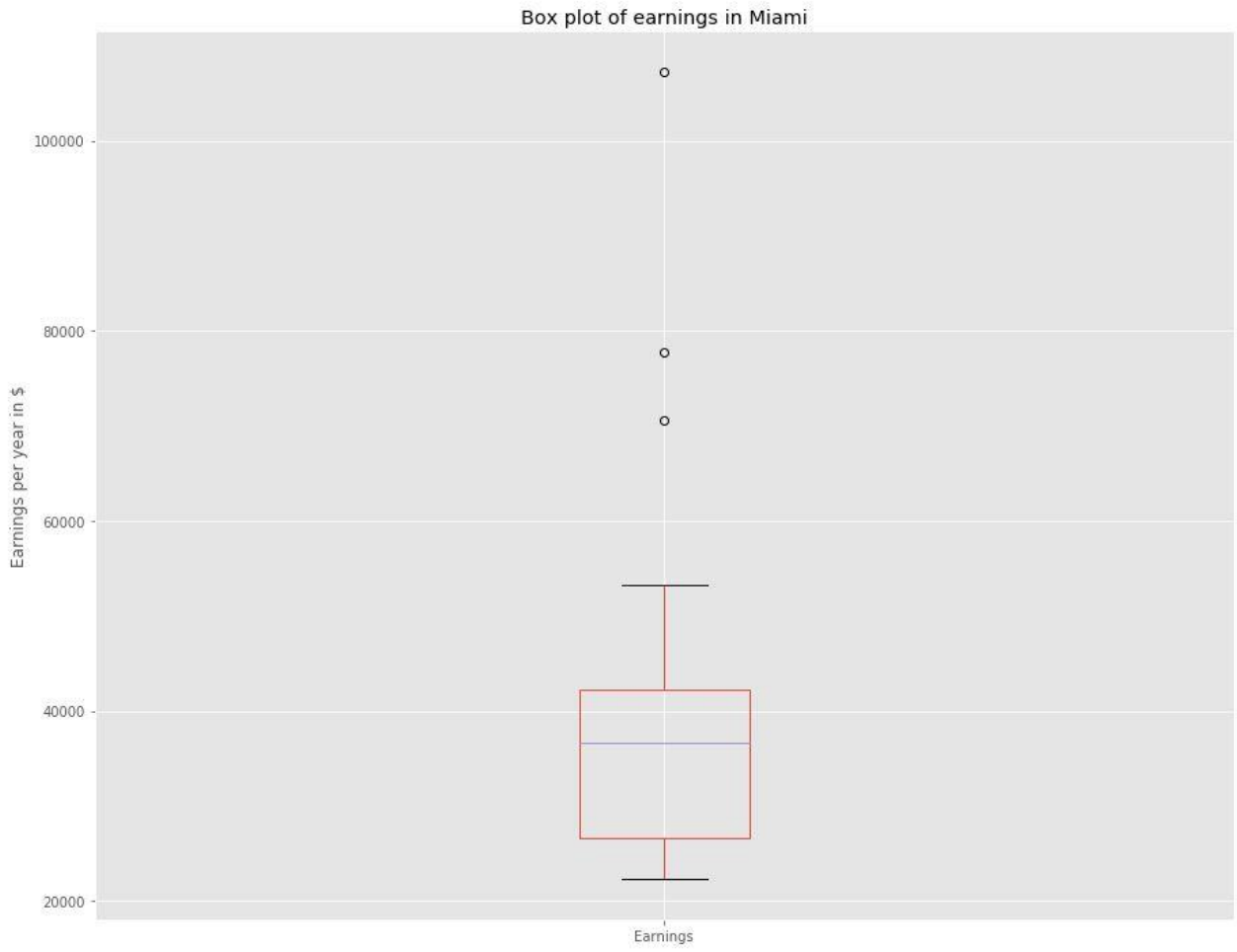
Spanish culture or origin, regardless of race". In order to make our suggestion we use more detailed demographic about Florida, due to data limitations about Miami.



Over 1 million people living in Florida have Cuban origins, almost 3 times more than people born in Haiti which is the second most common birthplace. As a result, Cuban cuisine is our choice for further investigation using Foursquare API. Another parameter we must take into consideration is the economic situation in different neighborhoods.

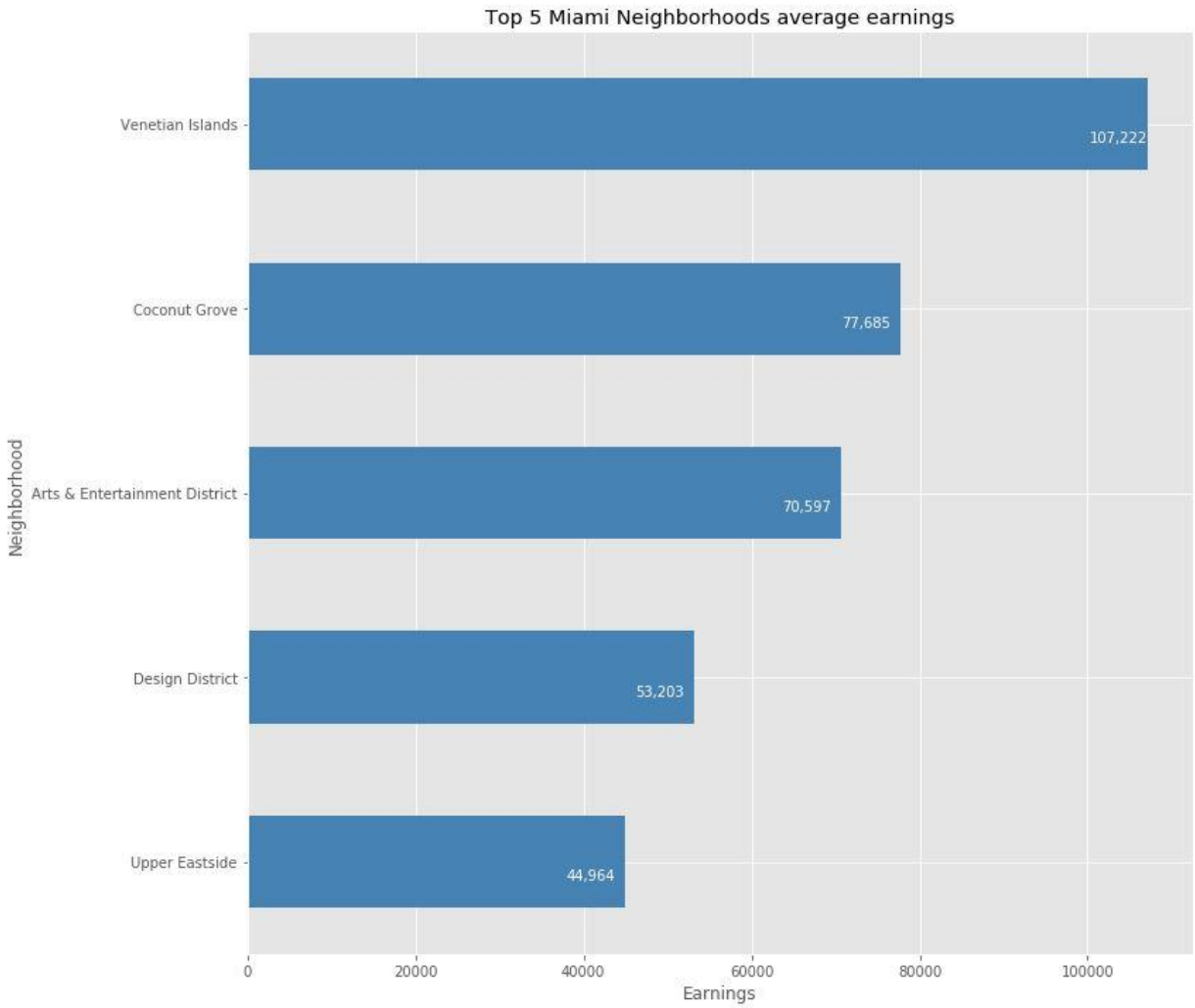
3.2 Relationship between type and earnings

Our stakeholders want to invest in a fine dining restaurant in Miami. As opposed to casual eateries, cafes or family-style restaurants, fine dining caters to an upscale clientele and provides the highest quality of food. A fine dining restaurant has a formal atmosphere, is almost always a sit down restaurant, and has a fancier menu than most restaurants. So, it's necessary to consider financial data such as Miami's citizens' average net earnings by neighborhood in order to locate the wealthiest.



Boxplot data	Earnings
Mean	40.506,45$
Std	19.734,83$
Min	22.292$
25%	26.585,75$
50%	36.589,5$
75%	42.240,75$
Max	107.222,0$

The insight provided from this dataset will help us choose the ideal neighborhood after k-means clustering. Our suggested neighborhood should be above 75% in net earnings, so let's visualize the figure displaying the top five neighborhoods in average net earnings.



3.3 Foursquare venues and clustering

After acquiring data about nearby venues in the neighborhoods of Miami using Foursquare API, we will focus our analysis on Cuban restaurants. Following we will use k-means clustering, to partition our data in 3 clusters, using the frequency of existing Cuban restaurants among the venues in each neighborhood as the main parameter. The final number of clusters was determined after multiple tries and iterations. Our aim is to find neighborhoods with high or medium frequency for our project. Despite the possible competition with existing restaurants, our stakeholders believe that higher frequencies of existing restaurants reflect people's preference for a specific cuisine, in our case Cuban.

4.Results

We ran the notebook and got the following results. Visualized results on figure 1, after discussion.

Label	Value	Number of neighborhoods	Map label color
Cluster 1	Low frequency	21	Red
Cluster 2	High frequency	2	Purple
Cluster 3	Medium frequency	2	Green

- Cluster 2: Arts & Entertainment District and Edgewater.
- Cluster 3: Wynwood and Midtown.
- Cluster 1: The rest of the neighborhoods.

5.Discussion

Despite Edgewater being the neighborhood with the highest frequency, its' residents average net earnings are close to average and thus Edgewater is not the ideal neighborhood for a fine dining Restaurant. The other neighborhood on high frequency is Arts and Entertainment district. Arts and Entertainment district is third on top5 list with 70.597 dollars and above the target of 75 percentile which in Miami is 42.240 dollars. As a result, Arts and Entertainment district is our suggestion for being the ideal neighborhood for a new fine dining Cuban restaurant.

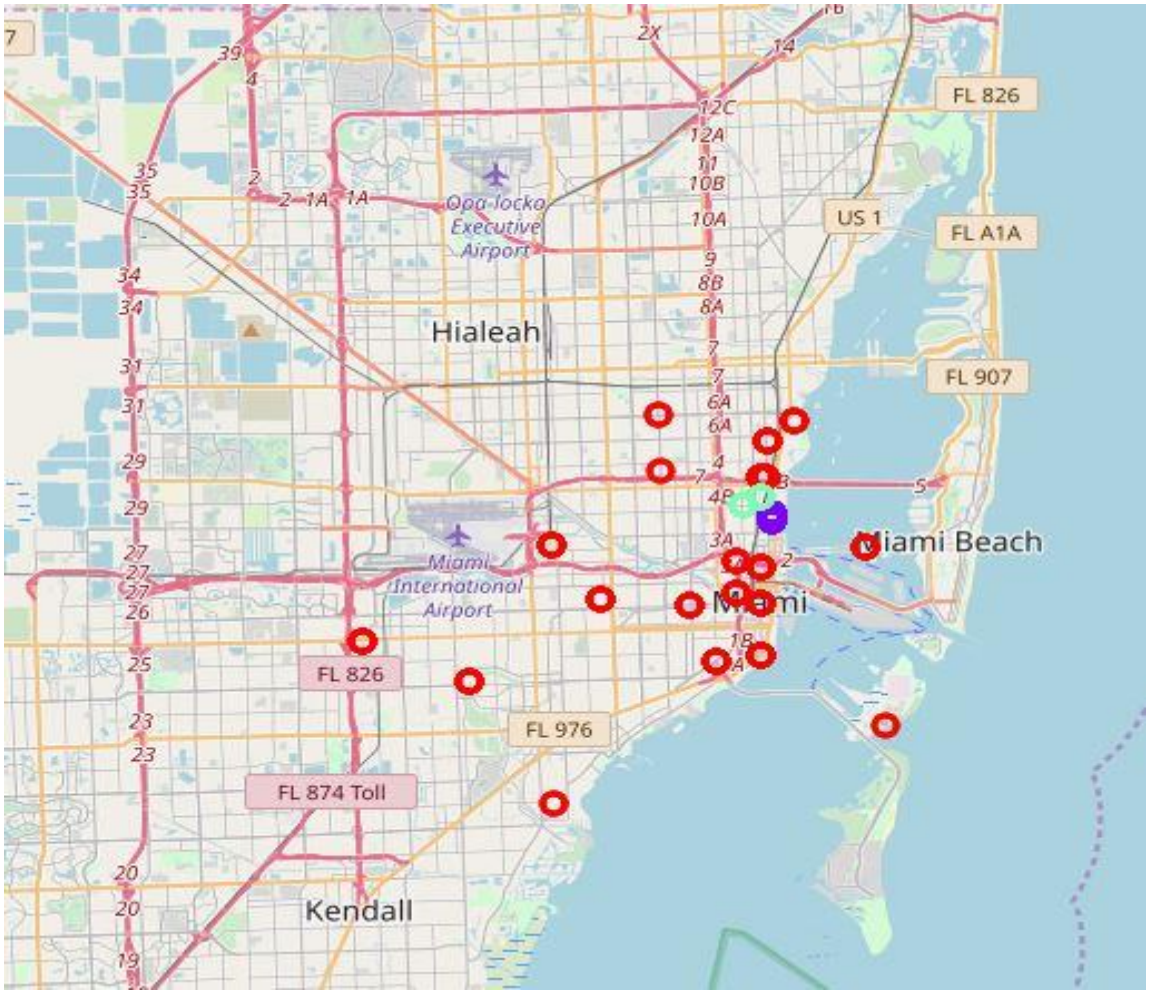


Figure 1.k-means clustering visualization

6.Conclusion

This project's purpose was to find the ideal neighborhood for a new fine dining restaurant in Miami by using demographic, economical and existing restaurants' data. By using open available online data, we suggested Arts &Entertainment district (also known as Omni) as the ideal neighborhood for the investment. However, the final decision will be taken by the stakeholders after examining more data like real estate prices, wages, public transport, parking etc.