Applied Data Science

Capstone Project

Finding an Optimal Place for a Café Shop in Athina City, Greece

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1.   Introduction: Business Problem

1.1 Background

Athina is the capital of Greece, the urban complex of Athina has a population of almost 4 million, it includes many boroughs and the largest of which is Athina with a population of about 650,000 inhabitants. Each borough is a separate entity with its own special environment, its center, its stores, etc.

1.2 Problem

A good friend of mine decided to open a store, specifically a cafeteria, and asked for my advice on which area of urban complex of Athina is the best for the store to be profitable. My friend set some prerequisites for choosing the area for the cafeteria: to be in the center of a borough, to have other cafes in the area (so that it is considered a "hangout") and generally to be in the center of the urban complex of Athens.

1.3 Interest

The results of the analysis will be of particular interest to my friend, as he asked me for my help.

2. Data

2.1 Data sources

Two sources were used to gather the information. The first source concerns the geographical coordinates of the borough centers in the urban complex of Athina from the website http://geodata.gov.gr/ , while the second source is the foursquare program which was used to gather the necessary information for the shops located in the centers of the boroughs.

2.2 Data cleaning

There was no need to clean the data as the excel file used for the geographical coordinates of the borough centers contained all the required information in csv format.

3. Methodology

The methodology has as follow:

Identification of borough centers for evaluation.

Search for information about the shops around the centers within a radius of 500 meters.

Then group the centers of the boroughs into 5 clusters, based on the categories of stores they include.

Choose this cluster that has the cafeteria as its first or second most common venue. Then, within the group, select the most suitable borough centers. Finally, propose one of these borough centers as an optimal place to open a cafe.
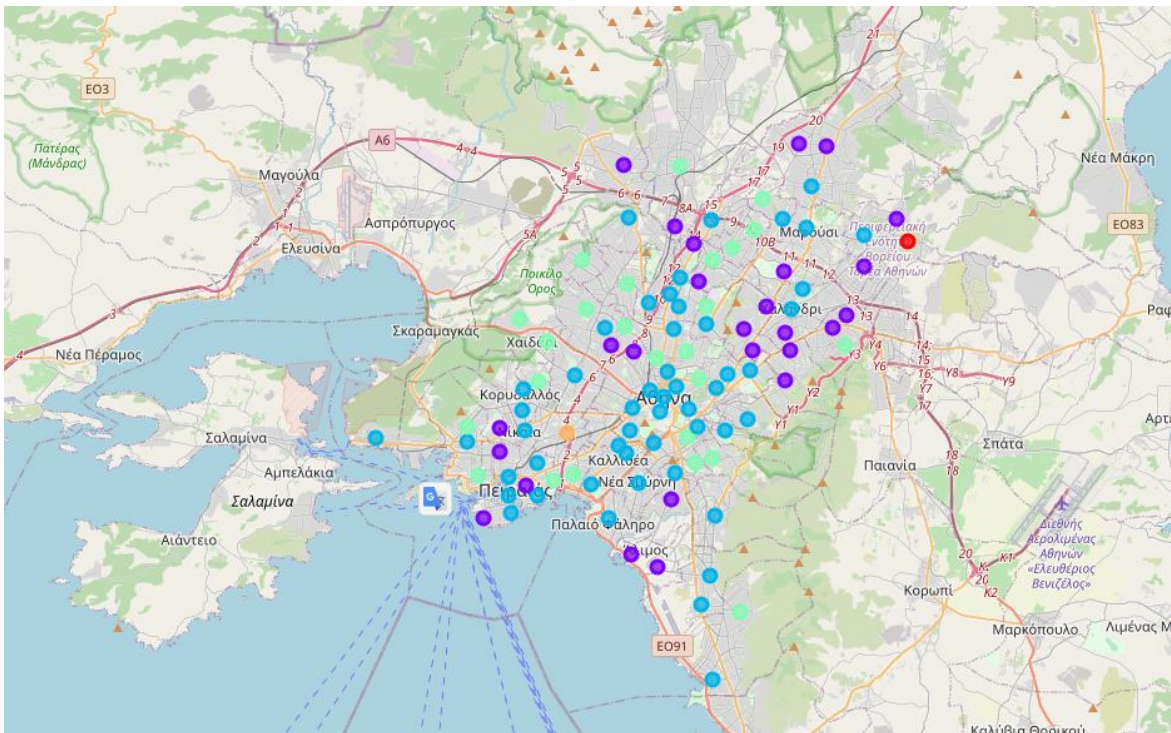
4. Analysis

4.1 Boroughs

The centers of the boroughs for evaluation were identified and found to be a total of 104, as in the picture below:
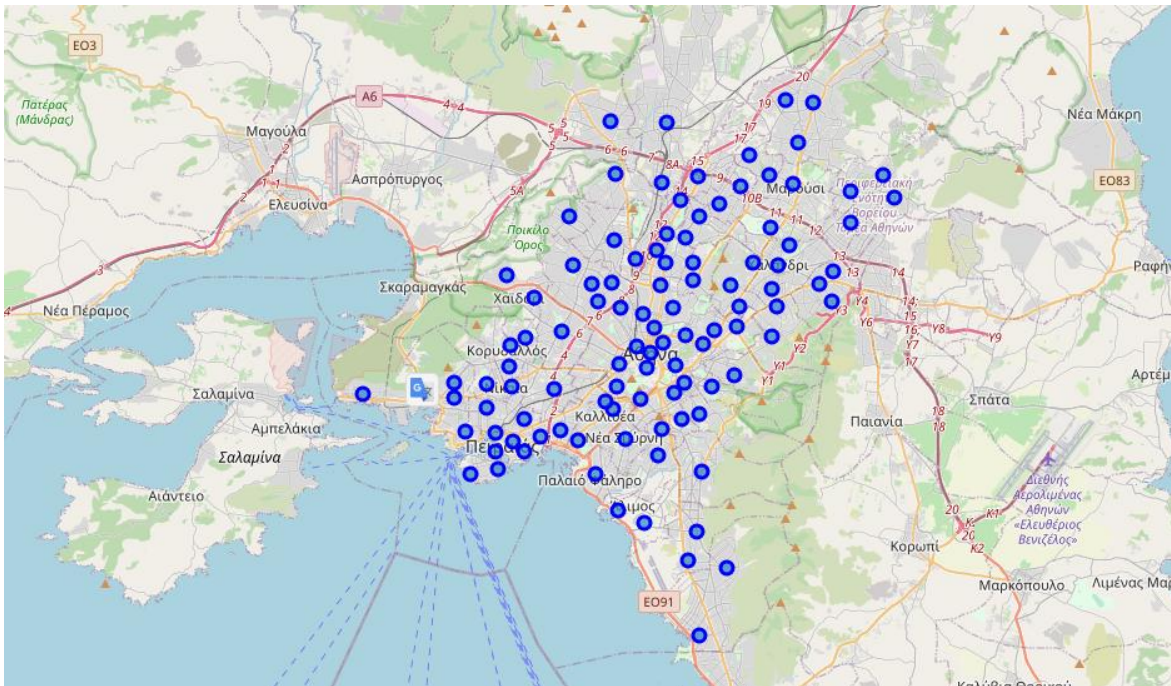
4.2   Clustering

The centers of the boroughs were grouped into 5 clusters, based on the type of stores they include, within a radius of 500 meters, with data obtained from the foursquare program. The result as in the picture below:

5.   Results and Discussion

Our analysis shows that cluster number 4 is the one with a high density of cafe shops, so these borough centers are candidates' places for our proposal. We will take only those centers that have a cafe shop as the first common venue. That choice narrows our results furthermore from 25 to 19 centers. Lastly, if we want something closer to Athina center, we have only 6 centers.

We can propose any one of those 6 for opening a cafe shop, as the picture below:
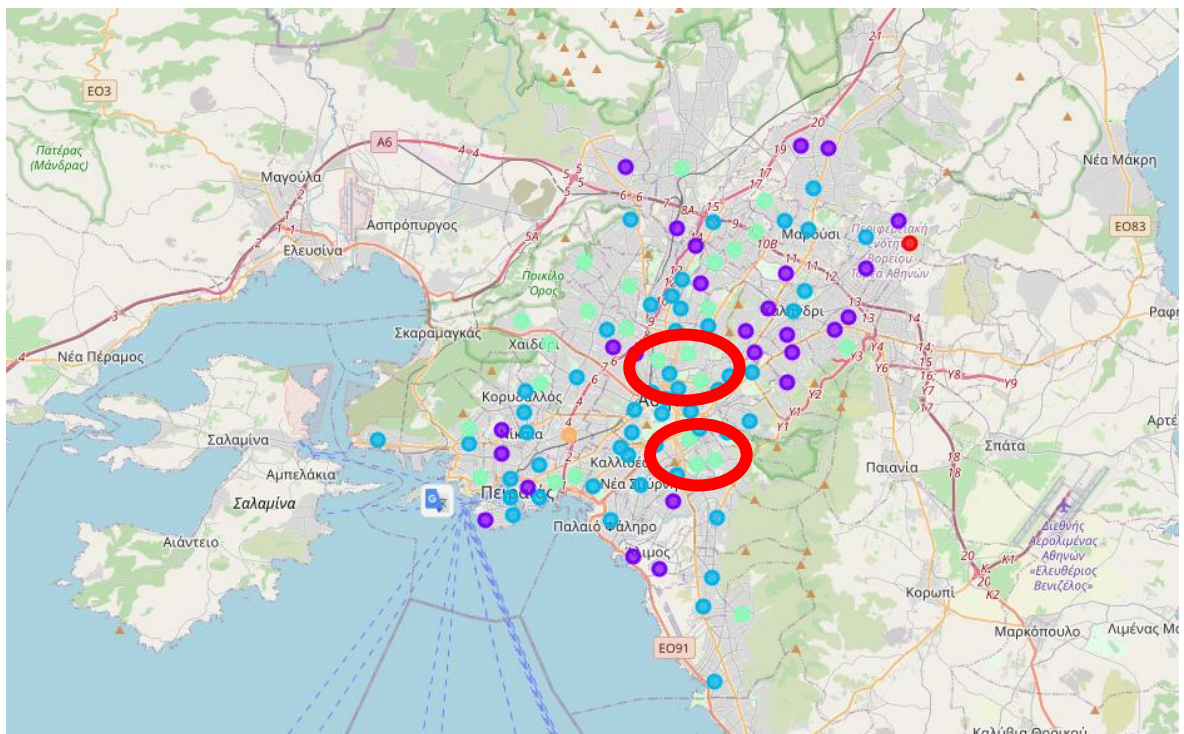
6.   Conclusion

The purpose of this project was to find for a friend of mine an optimal location for a business operation in Athina Greece, specifically a cafe shop. As my friend request, it doesn't matter in which borough in Athina his cafe is going to open as soon as it is in the center of a borough with a lot of similar shops. Our initial data includes 104 borough centers and after analysis, we cluster the centers into 5 clusters, we choose cluster number 4 as the most suitable and finally, we narrow down into 6 centers as optimal locations. Of course, can be done more work and search these areas with more details.