

Peer-graded Assignment: Capstone Project - The Battle of Neighborhoods (Week 2)

The Best Big Texas City Having Many German Restaurants as a Holiday Destination for Senior German Tourist Group

(Report)

1. Introduction/Business Problem

1.1 Problem Background

Holiday is an indispensable part of every German adult. Almost all of them have a holiday at least once a year. Most of the German citizens prefer European Countries like Greece, Spain, Italy, or Turkey. As a tourism company located in Frankfurt am Main, Germany, we have many connections in these countries for our customers. We know the preferences of our customers in those countries and we have enough information about these countries.

We would like to reach more people to sell them holiday packages. However, some of our new costumers would like to travel to the different countries and they have different preferences. Since we do not have old connections in probable new countries, sometimes it may be difficult to response to the specific preferences of our new customers.

1.2 Problem

We have a new customer group including 50 German seniors from Frankfurt am Main, Germany. All of them are over 65 years old. They want to purchase a holiday package from our Tourism Company. They would like to travel to a big city in Texas where a new destination is for our Germany based company. They want to travel to a big city in Texas but they insist on a city having many German restaurants. This is an indispensable prerequisite for this tourist group.

Texas will be a new destination for our company. Thus, we do not have connections in Texas. Besides, we do not have information about the German restaurants in Texas. Thereby, as a tourism company wanting more and new customers, we have to solve this problem and we have to find the best destination (location) for our new customers.

1.3 Target Audience

In order to find the best big Texas city having many German restaurants, my company has appointed me to lead the Data Science Team. The goal of the project is to determine the best location for our new customers and recommend it to our management.

This will interest any tourism company having customers who want to go to Texas for holiday and those who prefer many German restaurants in their destination.

1.4 Success Criteria

The success criteria of this project will be the finding of the best big Texas city having many German restaurants.

2. Data

For our project named “The Best Big Texas City Having Many German Restaurants as a Holiday Destination for Senior German Tourist Group”, the most populated five Texas cities will be used. According to information in the below Wikipedia website Houston, San Antonio, Dallas, Austin, and Fort Worth are the most populated cities in Texas.

https://en.wikipedia.org/wiki/List_of_cities_in_Texas_by_population

Moreover, these 5 cities are among the most populated 13 United States Cities and Houston is the 4th most populated city of the USA.

https://en.wikipedia.org/wiki/List_of_United_States_cities_by_population

The geographical coordinates data of Houston, San Antonio, Dallas, Austin, and Fort Worth cities will be used as input for the Foursquare API. Foursquare API will also be used to find and explore the German Restaurants. The venue category ID for German Restaurant (4bf58dd8d48988d10d941735) is also derived from the following Foursquare developer website:

<https://developer.foursquare.com/docs/build-with-foursquare/categories/>

Briefly, both the geographical coordinates and the German restaurants as the venues extracted from the Foursquare dataset.

3. Methodology

In this project, our goal is to find the best big Texas city having many German restaurants for our senior German customers. In order to achieve this aim, Foursquare API will be used. We will use Foursquare API to search and find for our specific venues (German restaurants). The near query will be used to get these venues in the five most populated Texas cities (Houston, San Antonio, Dallas, Austin, and Fort Worth). The venue category ID for German Restaurant (4bf58dd8d48988d10d941735) will be also derived from the Foursquare developer website. This is the unique ID for German restaurants. Even though Foursquare limits us to a maximum of one hundred venues per query, indeed, for Texas cities we do not expect German restaurants more than one hundred. However, we will see it after we make the analyses.

Furthermore, Folium visualization library will be used to visualize the results of our project. With these analyses we will get maps showing our results.

Additionally, center coordinates of the venues (German restaurants) will be calculated and displayed as an indicator of the venues in our target five cities.

Lastly, the mean of the Euclidean distance from each venue to the mean coordinates will be calculated. The same analysis will be repeated for all of the five cities in order to find the best option.

4. Results

After giving total numbers of German restaurants in all of the selected five cities, this section will start by showing the maps derived from the analyses. We will start from the most populated Texas city. The sorting and displaying of the results will continue according to the population size of the cities.

Total numbers of German restaurants in all of the selected five cities:

Total number of German restaurants in Houston, TX = 36
Showing Top 100

Total number of German restaurants in San Antonio, TX = 25
Showing Top 100

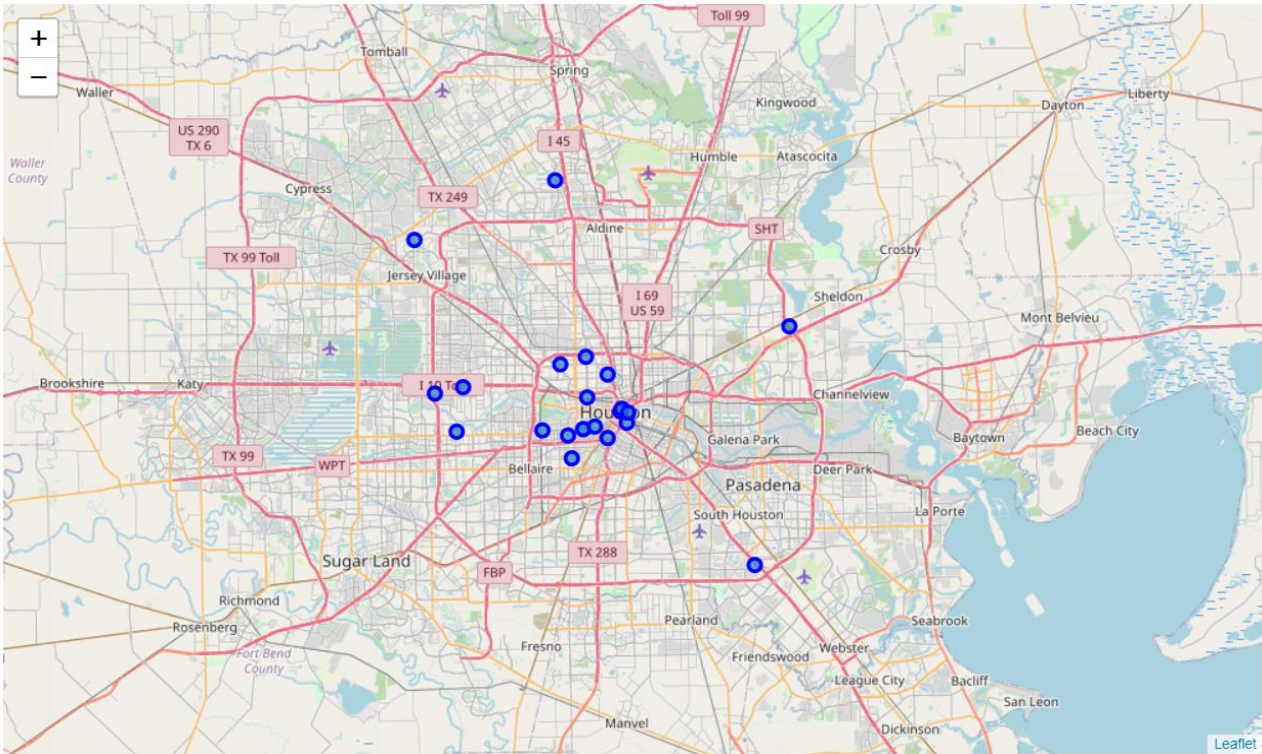
Total number of German restaurants in Dallas, TX = 20
Showing Top 100

Total number of German restaurants in Austin, TX = 11
Showing Top 100

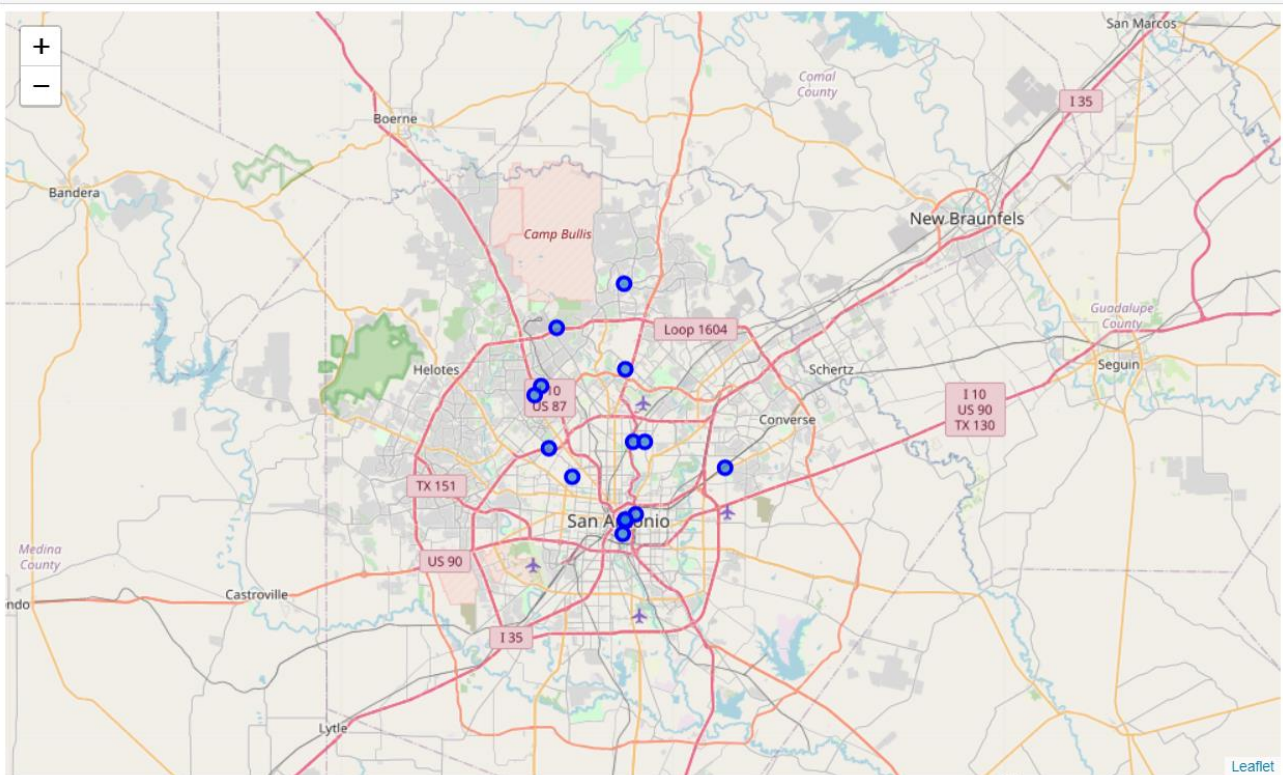
Total number of German restaurants in Fort Worth, TX = 8
Showing Top 100

Each of the most populated 5 Texas cities has fewer than 100 German restaurants. Houston has the most number of German restaurants among them.

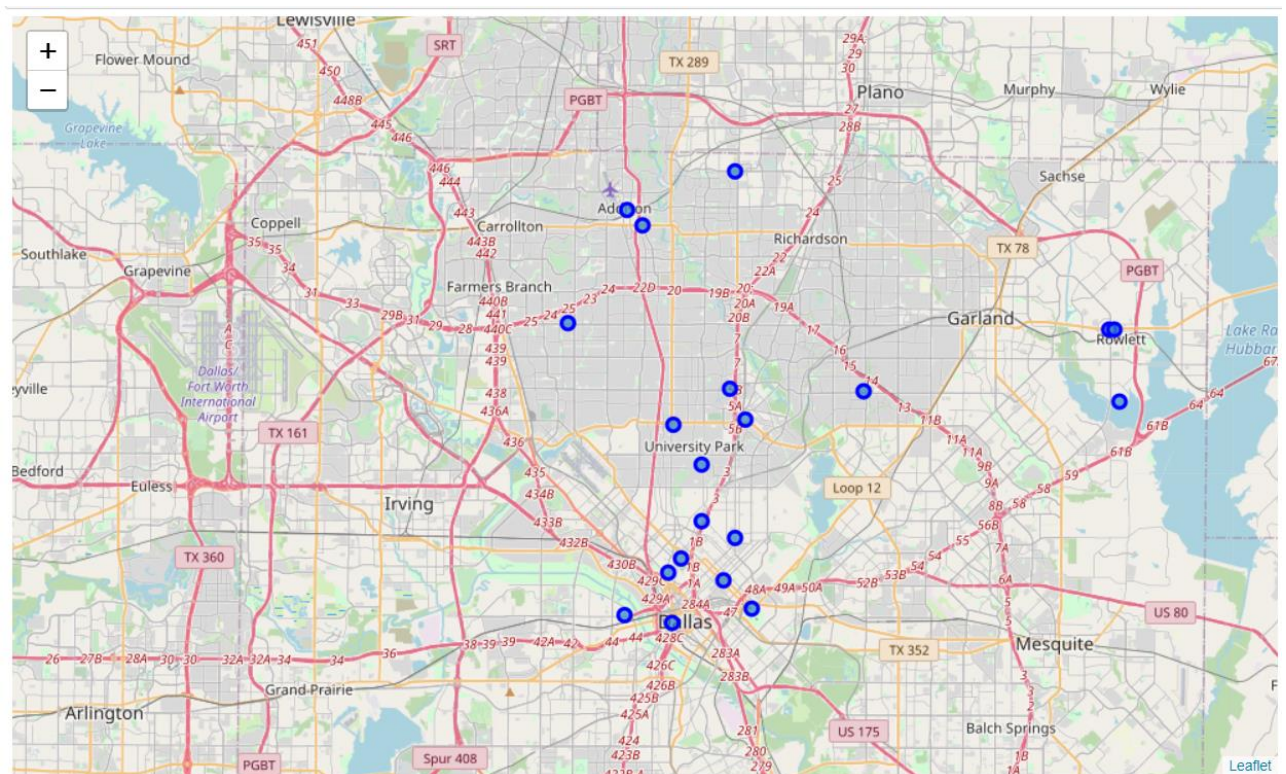
Houston:



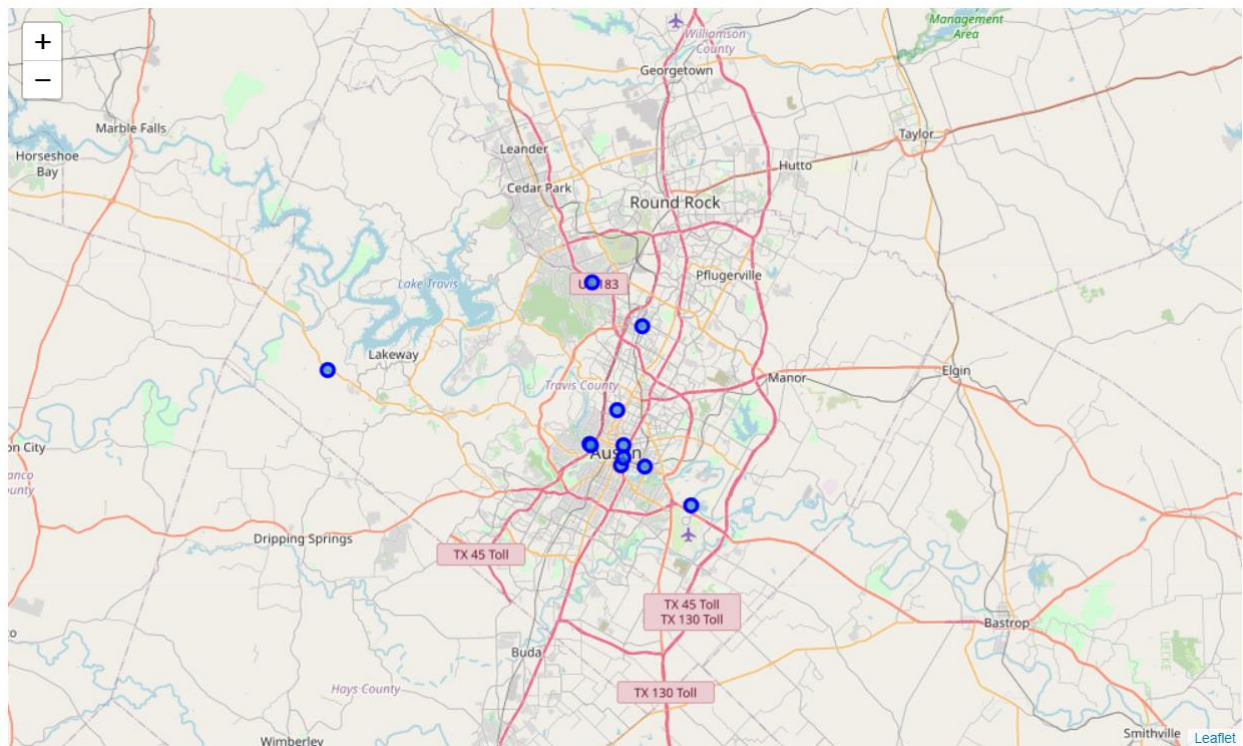
San Antonio:



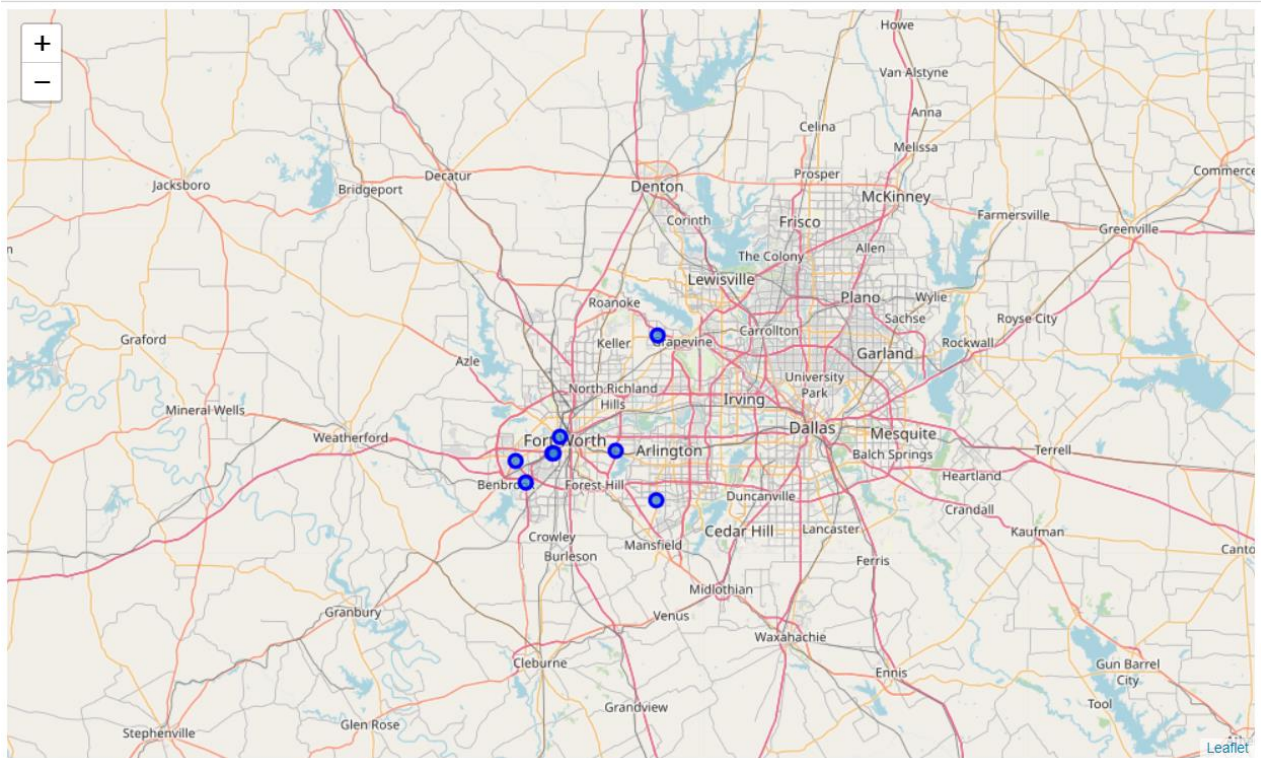
Dallas:



Austin:



Fort Worth:



Houston and San Antonio are the most densely German restaurant cities in Texas. However Houston has some more advantages with its population and nearness to Gulf of Mexico. Now, we can focus on the measure of this density in order to get better and more scientific result. For this, the mean location of the German restaurants and then the mean distance (green lines on the maps) of the venues (blue circles on the maps) to the mean coordinates (green circles on the maps) will be calculated.

Mean Distances from Mean coordinates

Houston, TX

Mean Distance from Mean coordinates

0.08846559317499479

San Antonio, TX

Mean Distance from Mean coordinates

0.07862877888903066

Dallas, TX

Mean Distance from Mean coordinates

0.09101133334455755

Austin, TX

Mean Distance from Mean coordinates

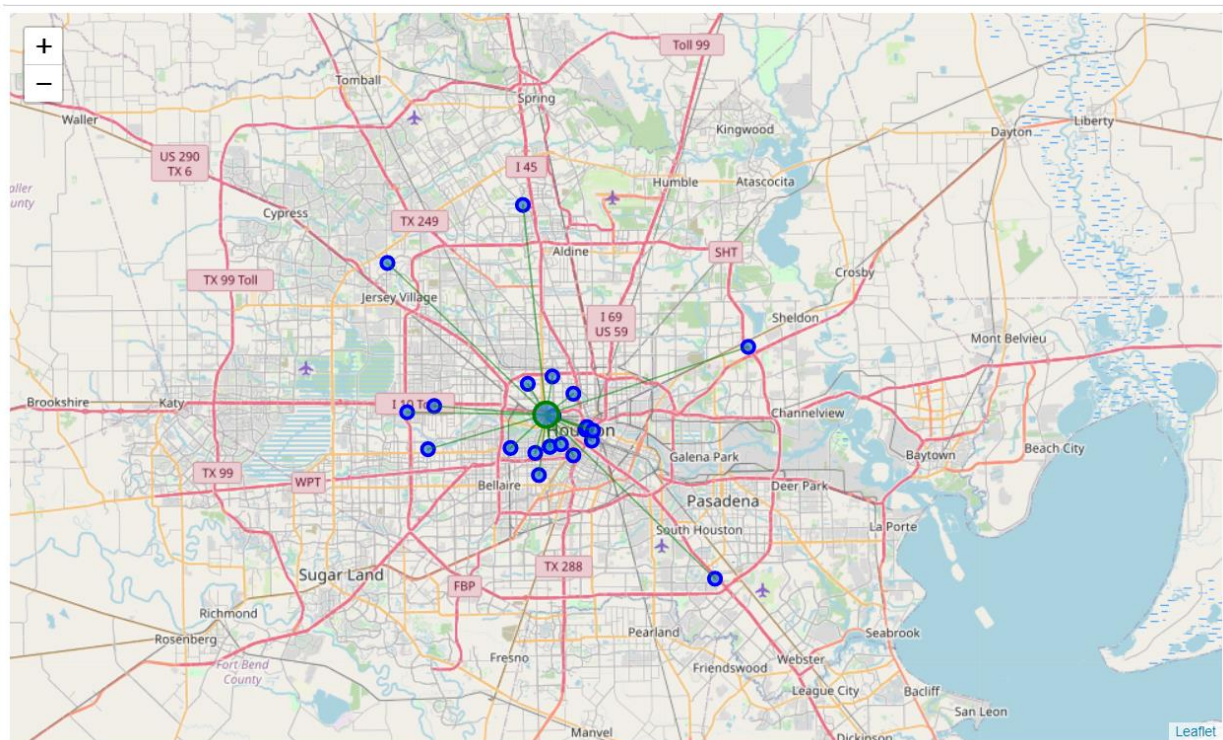
0.08539539724233915

Fort Worth, TX

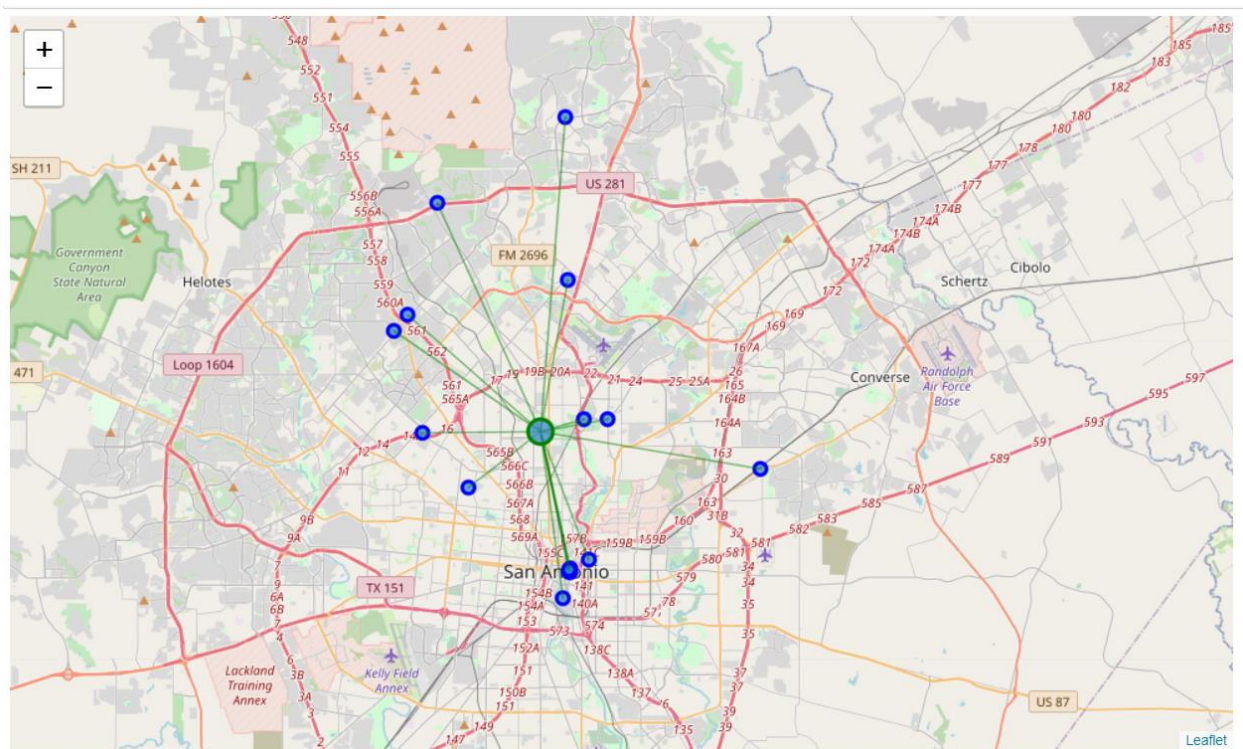
Mean Distance from Mean coordinates

0.12214078337882303

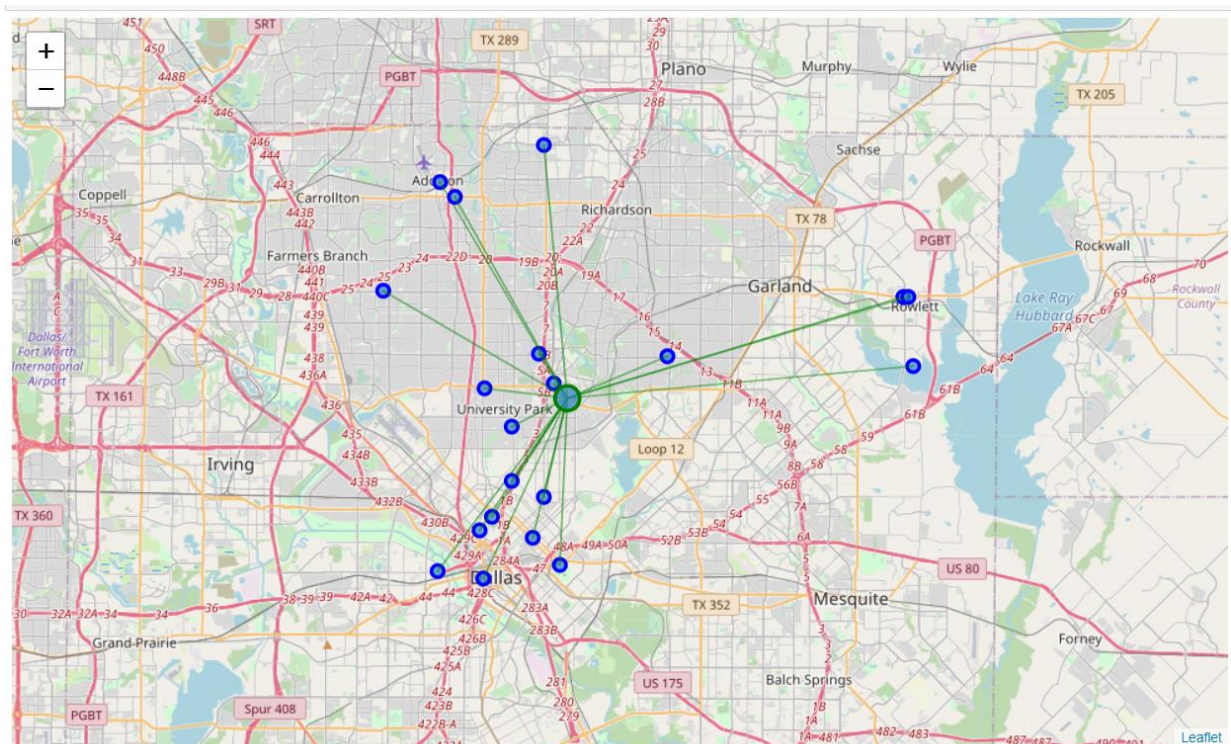
Houston :



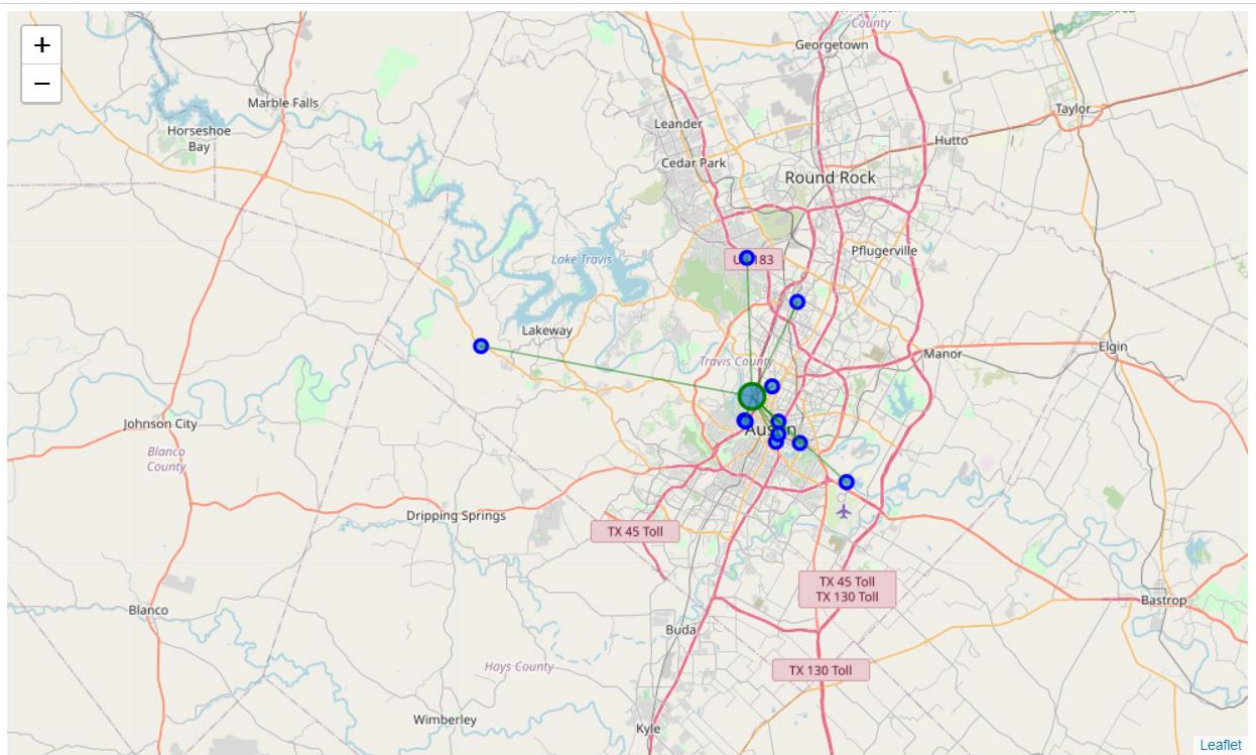
San Antonio:



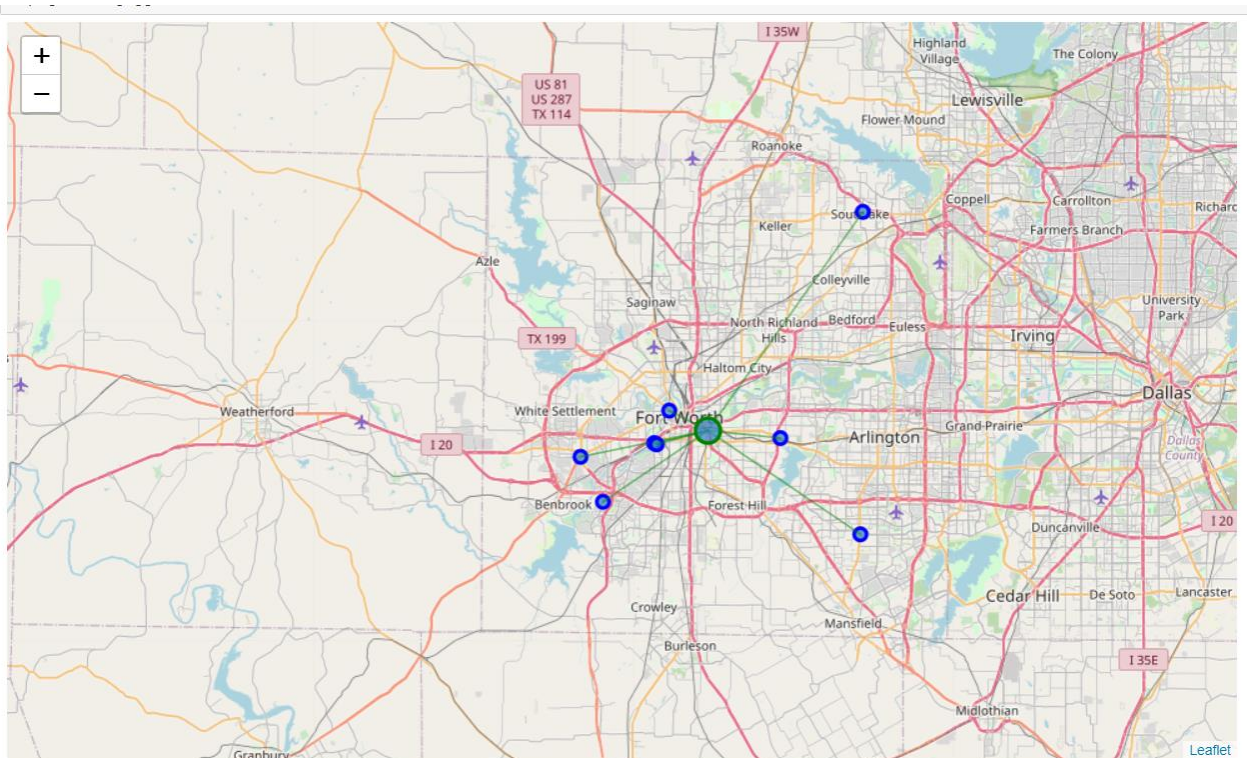
Dallas :



Austin:



Fort Worth :



According to results, San Antonio seems the best option. However, according to Foursquare API information, Houston is the most densely German restaurant city in Texas. When we check the results and observe the Houston map, we can easily see that four German restaurants are far far away from our center point. These may have caused problem and change or manipulated the results. Therefore, these four restaurants will be removed from the analysis to get a more accurate result. After we remove these four restaurants, Houston will be still the most densely German restaurant city in Texas.

After new calculation we have gotten the following result:

New Mean Distance from Mean coordinates

Houston, TX
Mean Distance from Mean Coordinates
0.05726521085264694

According to new result, Houston became the best option. These four restaurants have significantly changed the result of our analysis. Houston is the best destination for our senior German tourist group insisting on a destination having many German restaurants.

5. Discussion

Even though initial results showed that San Antonio is the best option, according to Foursquare API information, Houston is the most densely German restaurant city in Texas. When we checked the results and observed the Houston map, we could easily see that four venues (German restaurants) are far far away

from our center point. Thus, we thought that these might have caused problem and changed or manipulated the results. Then, these four restaurants were removed from the analysis to get a more accurate result. After we removed these four restaurants, Houston would be still the most densely German restaurant city in Texas.

Re-analysis showed that these four venues significantly changed the result of our initial analyses. According to new result, Houston became the best option with new mean distance from mean coordinates value of 0.05726521085264694.

For further studies or projects, the other cities of Texas or the big cities in the other states of United States can be evaluated.

6. Conclusion

The result of the analyses explicitly indicated that Houston is the best destination for our senior German tourist group insisting on a destination having many German restaurants. Houston is both most densely German restaurant city and distances of them are closer when we compare the situations in the other selected cities. Thereby, we are ready to inform our customers and make preparations and reservations for the holiday in Houston. Of course, a hotel for our group should be selected at a point as close as possible to mean coordinate in Houston by our tourism company.