The-Battle-of-Neighborhoods

What’s the best place when You Want to Eat Pizza?

Introduction

Let's say you have never been to the US and you want to have the best pizza while you are there. So you want to go to a place with a high density of Pizza places around you so you can try a variety number of pizzas. The main problem we aim to solve is to analyze the Pizza stores' locations in the major US cities and find the best place for our guests so that he can have a good pizza and pizza store/restaurant must be easily accessible and there should be a huge no. of pizza restaurants nearby to make it easy. So here for this problem, we will find pizza store density and the distance there are located from the city and consider the top 5 major cities in the U.S.

Data section

I will use the FourSquare API to collect data about locations of Pizza stores in 5 major US cities which are: New York, NY, San Francisco, CA, Jersey City, NJ, Boston, MA and Chicago, IL. These are one of the most populated US cities and there are the most tourist visited places in the U.S.I am hopeful that they will contain the best Pizza places which contain a variety of pizza stores and are easily accessible in the US.

Target audience:

All the people and tourists who are visiting the U.S for the first time and want to have a nice lunch at a Pizza store which has a nice variety and which are easily accessible to them.

Methodology:

My main target here is to asses which city would have the highest Pizza store density. I used the Four Square API through the venue's channel. I used the near query to get venues in the cities. Also, I use the CategoryID to set it to show only Pizza Places. An Example of a request:

```
https://api.foursquare.com/v2/venues/explore?&client_id=&client_secret=&v=20180605&New York, NY&limit=100&categoryId=4bf58dd8d48988d1ca941735
```

Where "4bf58dd8d48988d1ca941735" is the Id of the Pizza Place Category. Also, Foursquare limits us to a maximum of 100 venues per query.

Moreover, I repeated this request for the 5 top tourists visited cities and got their top 100 venues. I saved the name and coordinate data only from the result and plotted them on the map for visual inspection.

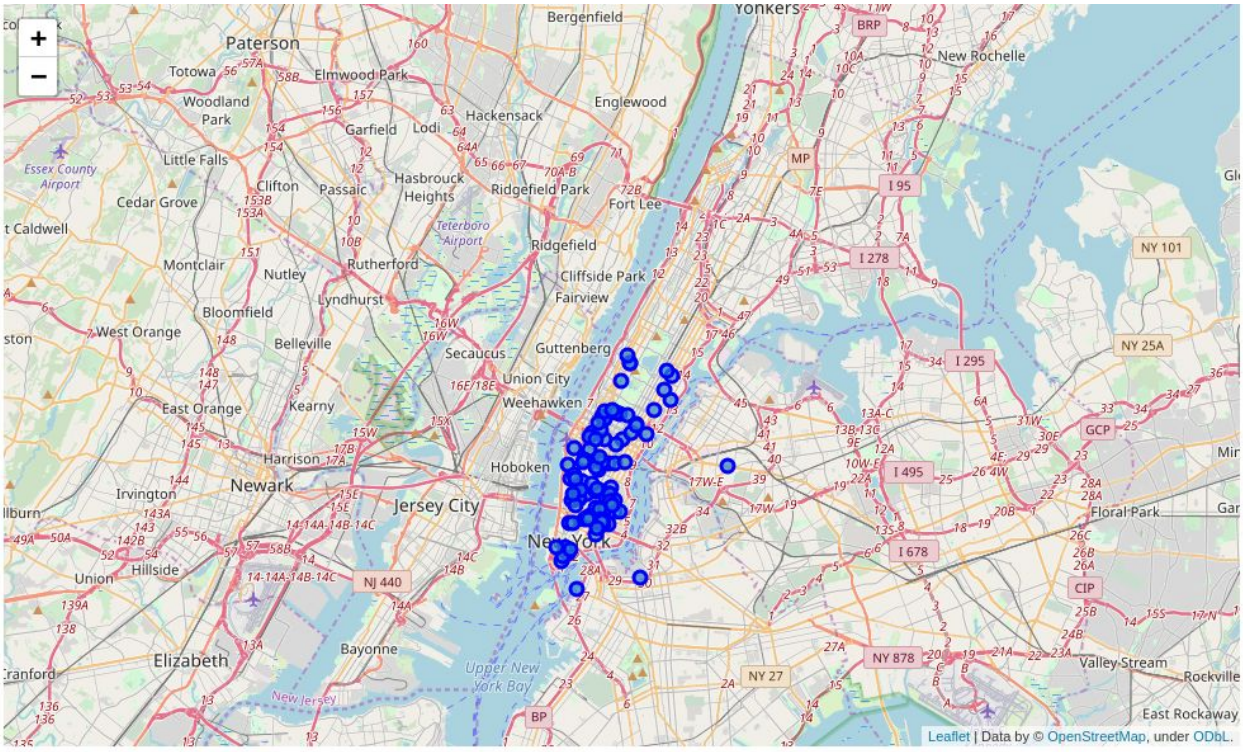
Next, to get an indicator of the density of Pizza Places, I calculated a center coordinate of the venues to get the mean longitude and latitude values. Then I calculated the mean of the Euclidean distance from each venue to the mean coordinates. That was my indicator; mean distance to the mean coordinate. The lesser the MDMC the denser the city is with the pizza shops.

Results

For our initial visual inspection, we see that they all have multiple pizza places and often more than Foursquare would like to supply us. The following here are the pictures of the geoplot generated with folium:

New York

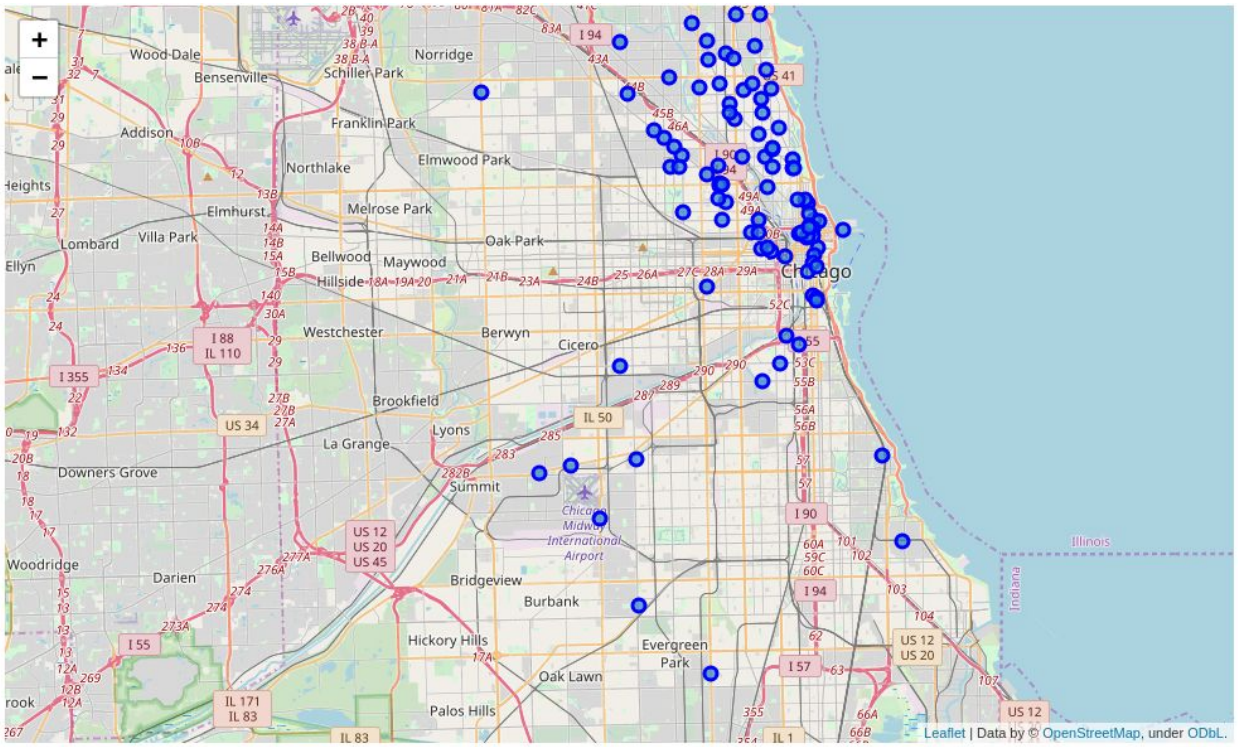
Total number of pizza places in New York, NY = 317
Showing Top 100



Chicago

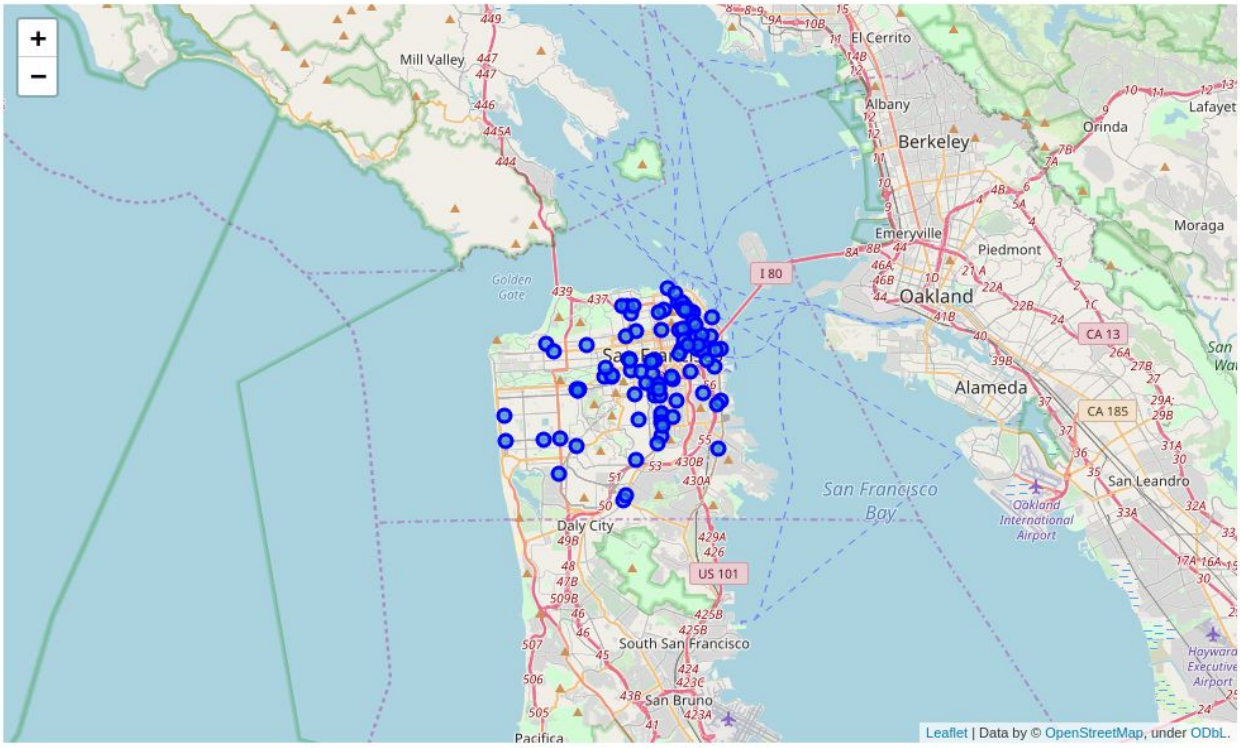
Total number of pizza places in Chicago, IL = 225

Showing Top 100



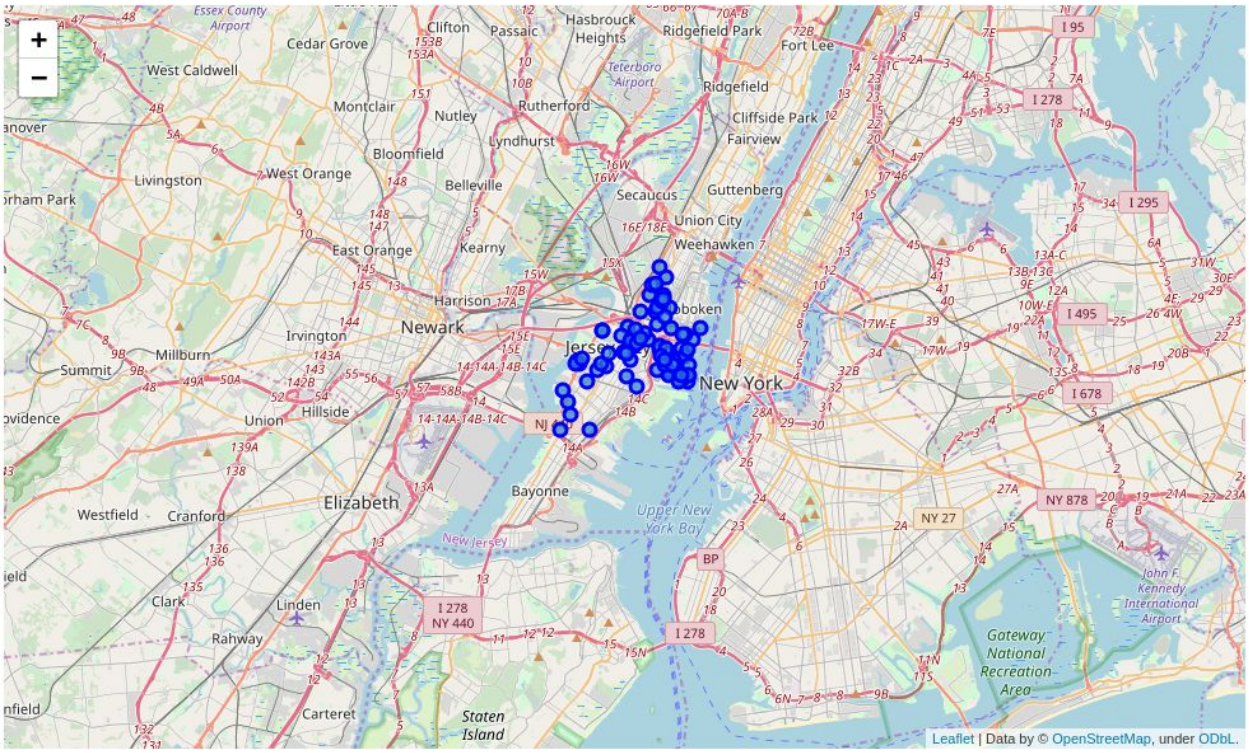
San Francisco

Total number of pizza places in San Francisco, CA = 169
Showing Top 100



Jersey City

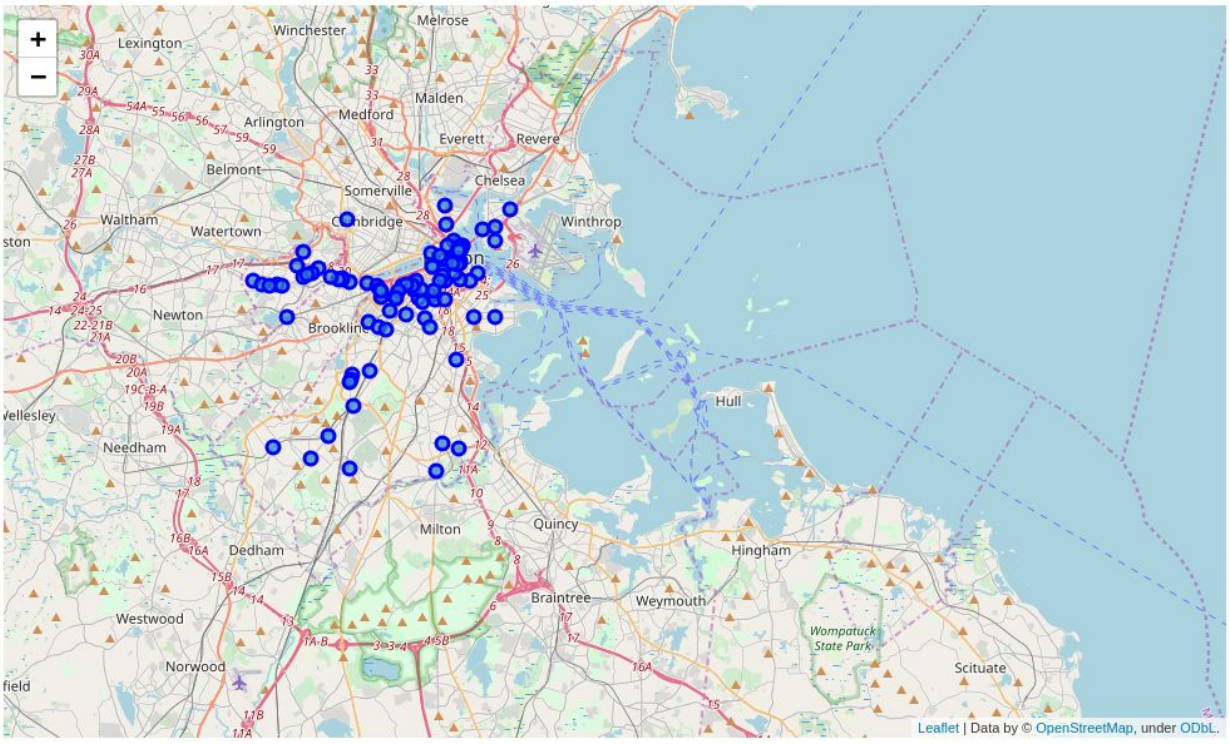
Total number of pizza places in Jersey City, NJ = 125
Showing Top 100



Boston

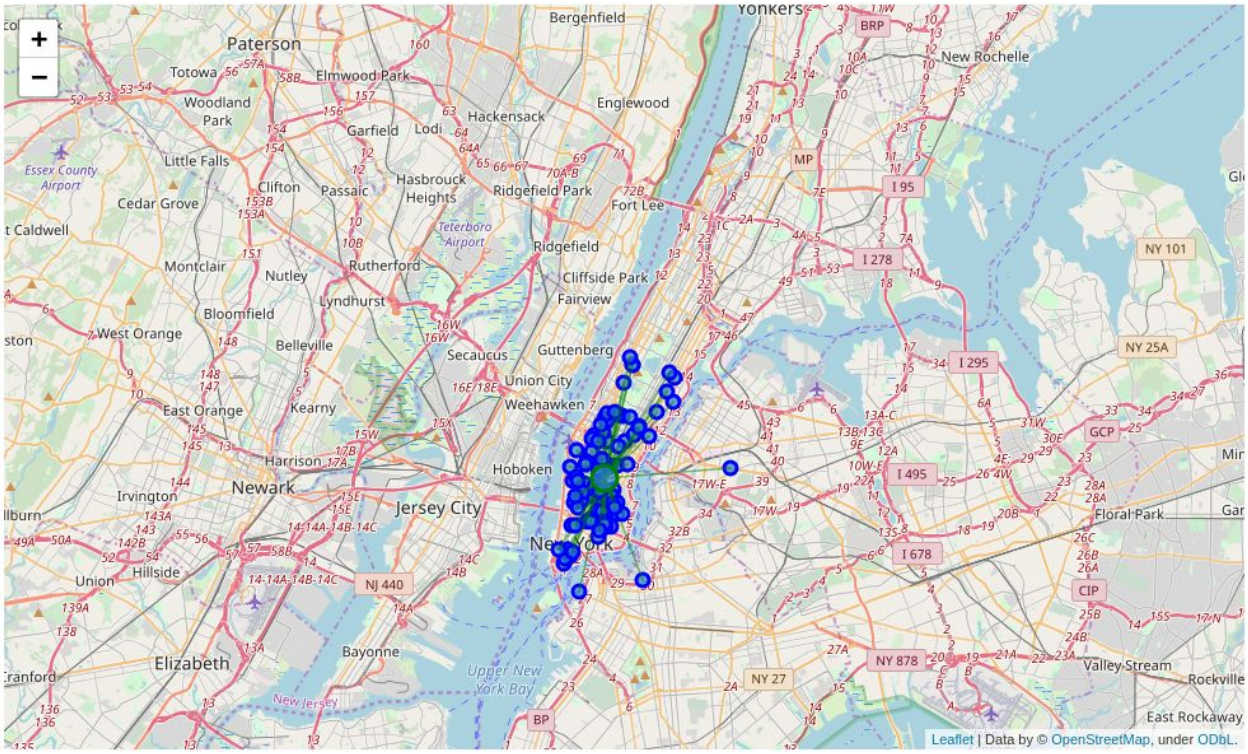
Total number of pizza places in Boston, MA = 190

Showing Top 100

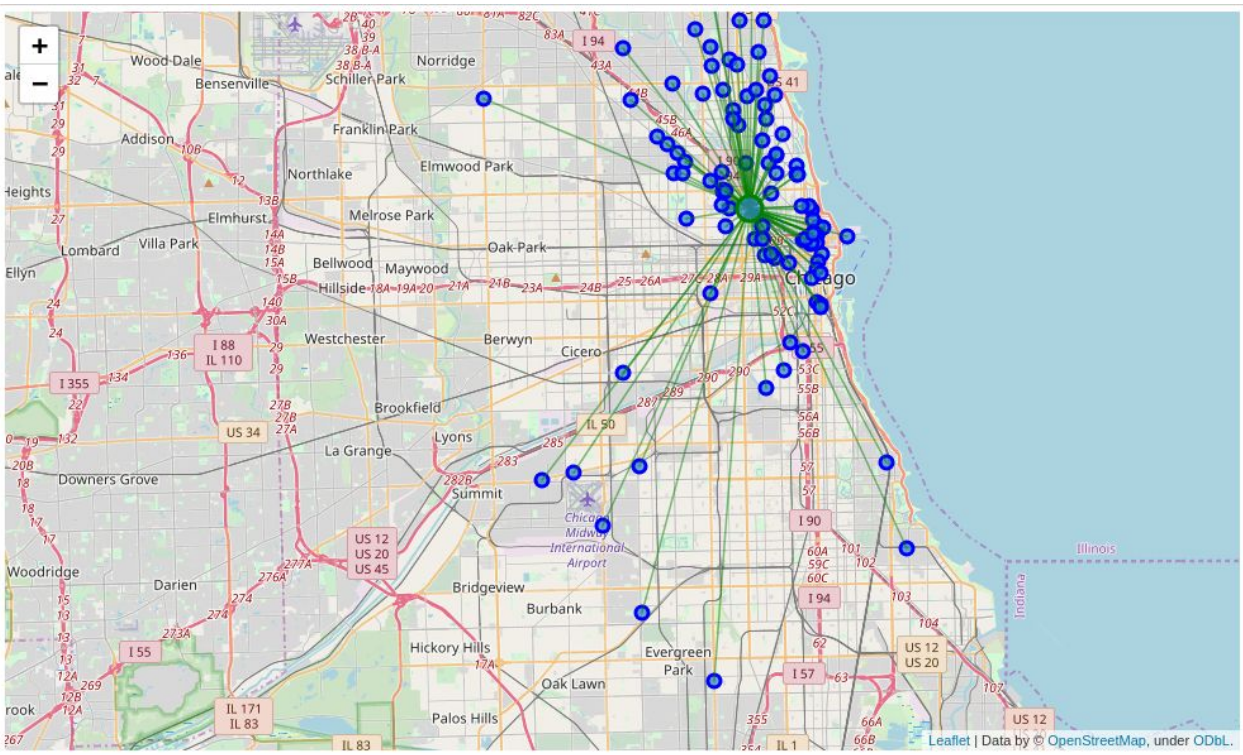


After Calculating Mean Distance from Mean coordinates

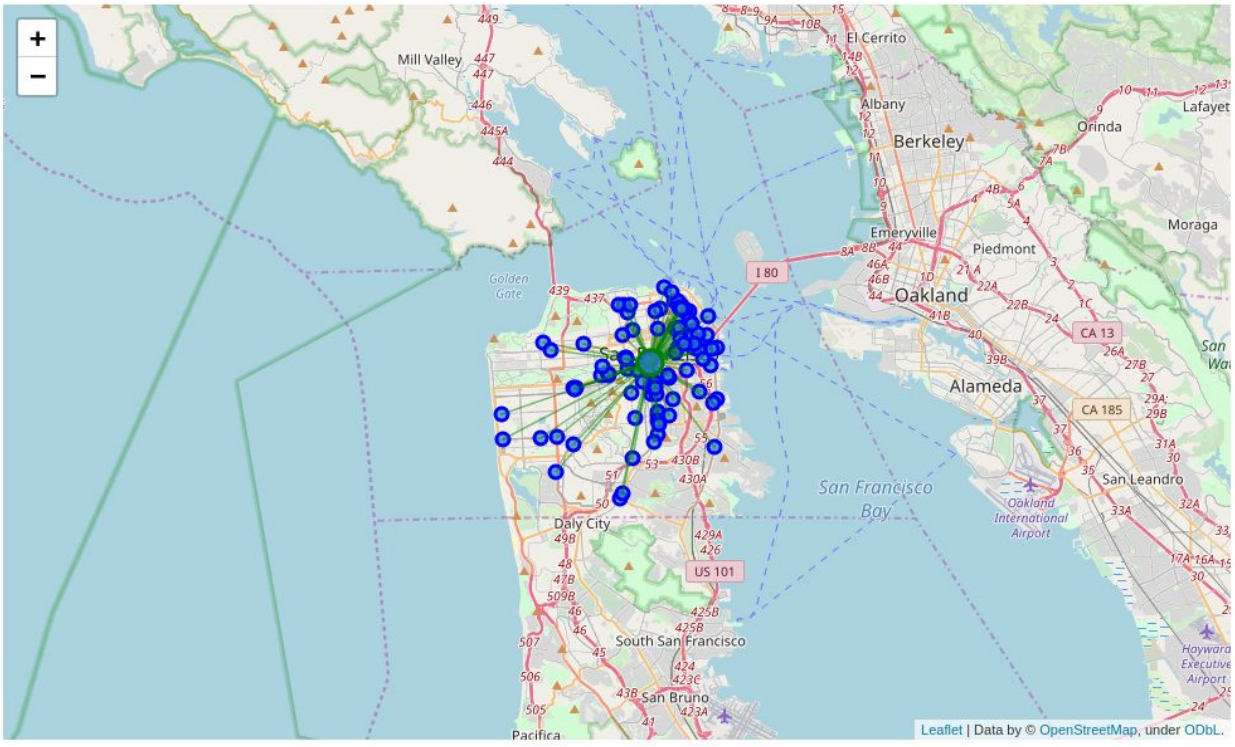
New York, NY
Mean Distance from Mean coordinates
0.022656966339103884



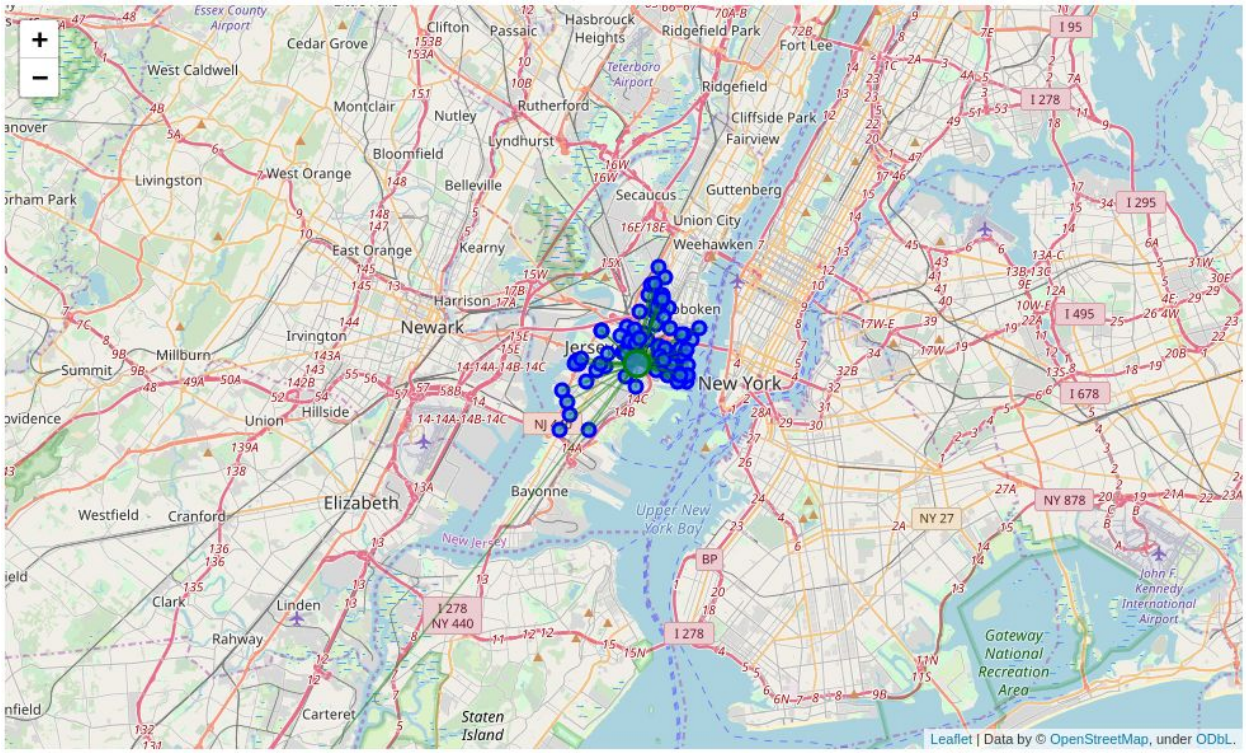
Chicago, IL
Mean Distance from Mean coordinates
0.05723120018998896



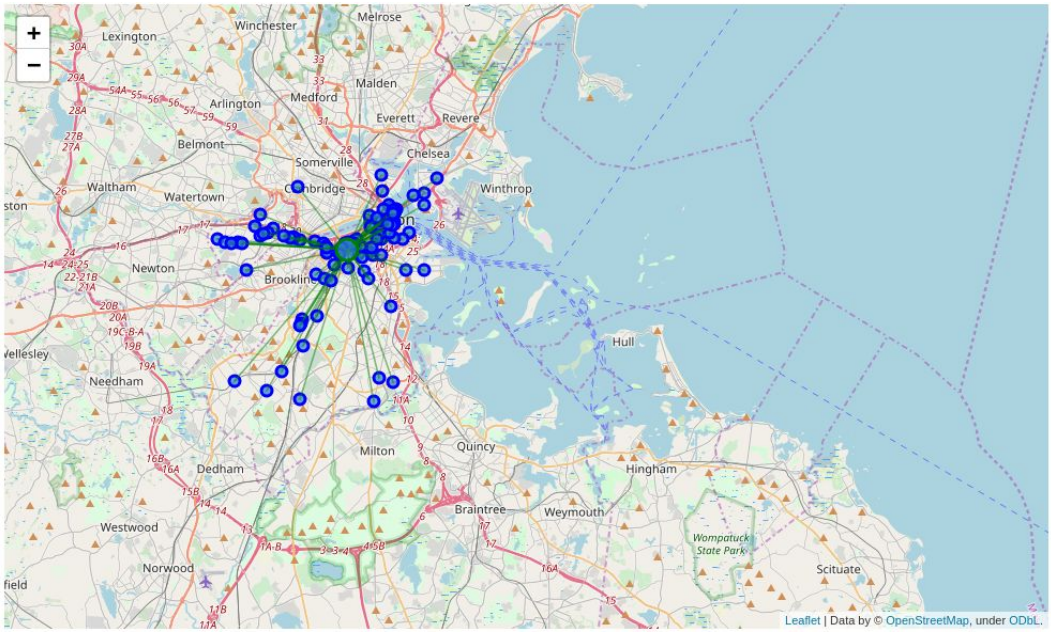
San Francisco, CA
Mean Distance from Mean coordinates
0.028113426734888782



Jersey City, NJ
Mean Distance from Mean coordinates
0.02926443118932975



Boston, MA
Mean Distance from Mean coordinates
0.034801157434600334



Our First Preference: New York City

Now Just by removing 1 shop which is farthest from Jersey city we are able to achieve the lowest MDMC.

Jersey City, NJ
Mean Distance from Mean coordinates
0.02137780278460641

Therefore Our Result is:

1. **Jersey City**
2. **New York**
3. **San Francisco**
4. **Boston**
5. **Chicago**

Discussion:

One thing I noticed in the figure is that there is a really far away Pizza Store in Jersey City that is probably giving it a higher MDMC. So I checked what if I removed it, it would not harm anyone to try 99 pizza places than 100 and New York is just at the other shore.

The new MDMC was: 0.0219953, putting it one place up on the list replacing San Francisco.

One consideration to do further work on is to move the location of the Foursquare API query until we get all the pizza places in each city and do the calculations again.

Conclusion:

Now there is no doubt that New York is the best place to try many Pizza Places in the US. Also, if our tourist is done with all the New York pizza places he can go to Jersey City and enjoy 99 more. Since it is the next city with the least MDMC value after New York, after that he can go to San Fransico City, then Boston and our final choice is Chicago. Also, we would recommend that our tourist book a hotel close to the mean coordinate (i.e) at the closest possible hotel to New York City since it is our first recommendation for trying out pizzas so it is also feasible to the customer to try pizza without wasting huge amount of money in transport.