The best trip to visit museums

Introduction

For visitors, in their trip, they would like to learn more about the history, art and culture of unfamiliar cities or countries. First come to mind is to visit their museums. Imagine a person didn't have experience in the US, and didn't have enough money to visit all of the big cities here, he would like to visit a city with more museums and less distance to his hotel. The problem is to find a suitable city for his requirement by data analysis. Our customers are people with limited time and budget but would like to learn more knowledge in the short trip.

Data

I choose 5 big famous cities in the US from west area to east area also included Hawaii. They are Seattle, San Francisco, Chicago, New York, Oahu. All of these cities have different kind of professional museums. I use FourSquare to collect data of museum locations in these cites.

Methodology

The first goal is to find the city with the most museums. Foursquare provide venues for me, I use explore query to get venues.
the request is url =
https://api.foursquare.com/v2/venues/explore?&client_id={} &client_secret={}&v={}&near={}&limit={}&categoryId={}
My limit is 100 and category ID for museum is 4bf58dd8d48988d181941735

the second goal is to check if the museums are accumulated in an area or separated with the others. In my opinion, if museums stay far away from each other, it will take long time for visitors to find them one by one, and may take more money on traffic.

the method is I get a center of the venues with the mean longitude and latitude values. And I use python to get the mean of the Euclidean distance from each museum to the center. Compare of the five results to get the lowest level of mean distance is the best choice.

Result

From maps generated by folium, we could see

Total number of Museum
 in Seattle, WA = 27
 in Chicago, IL = 63
 in San Francisco, CA = 49
 in New York, NY = 119
 in Oahu, HI = 58

Seattle, WA
MDMC
0.0354866867517917
Chicago, IL
MDMC
0.05911550326905858
San Francisco, CA
MDMC
0.03680348173197213135
New York, NY
MDMC
0.02866588539627982
Oahu, HI
MDMC
0.05654271267288334

Above all, New York is the best choice with more museums and more concentrated near center.
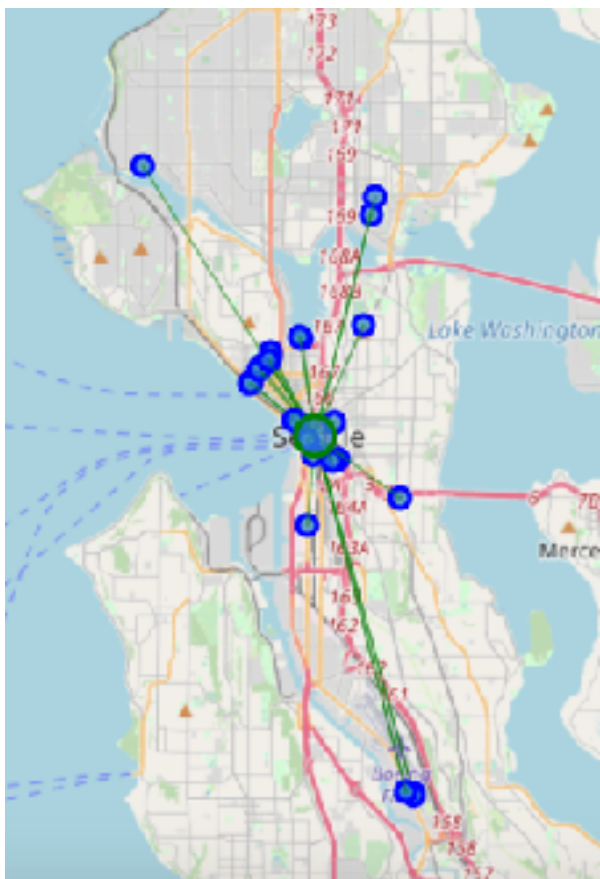
Discussion

By using our method, we get the Maps of the museums scattered in the five big cities as below. According to the numbers and MDMC results, New York is the best choice, since the visitors could visit more and don't have to worry about distances between the museums if they live near the coordinate center of the groups of museums.

If we know the visitors' tastes, we could get more detailed results. For example, they like Art museum instead of history museum, we could choose different category ID, and fit the requirement.
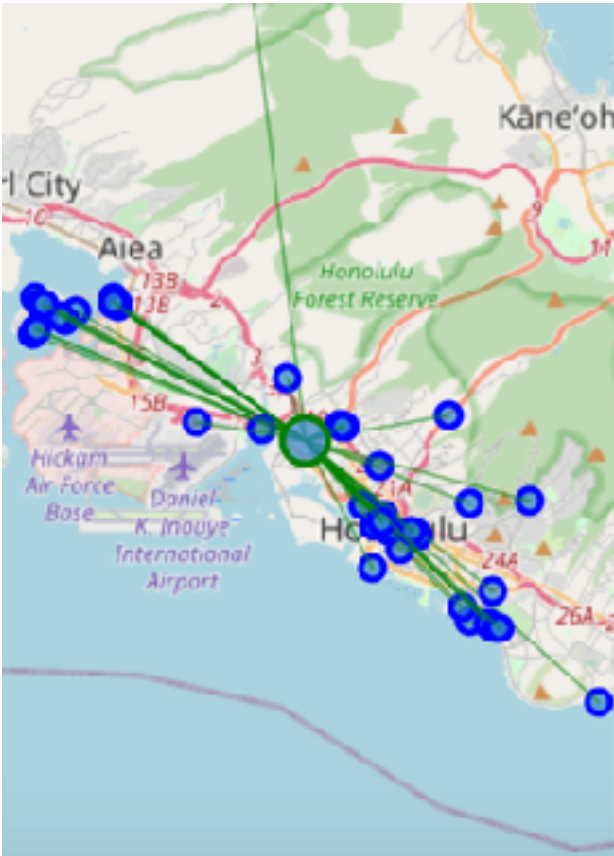
Chicago

Seattle

San Fransisco

New York

Oahu

Conclusion

To sum up, New York is the best place for our customers. It is much more convenient compared with the other four cities Both the numbers of museums and MDMC are suitable for visitors to save time and money.

We also suggest our customers to find hotel near mean coordinate.