BEST CITY TO VISIT FOR SEEING MUSEUMS

Introduction

- Background
  - Travelers want to reduce cost by spending less on transportation.
    - The way to accomplish this is to avoid car rental and taxis.
  - Museums is a big market for tourists.
- Problem
  - Determine which city has the highest density of museums which would require the least amount of traveling within the city.
- Audience
  - Anyone looking for an educational vacation with multiple museums in a close area.

Data

- FourSquare API
  - Will capture all museums with category code of ‘4bf58dd8d48988d181941735’.
  - Only review the most popular cities for museums.
    - San Francisco, CA
    - Baltimore, MD
    - Boston, MA
    - Philadelphia, PA
    - New Orleans, LA
    - Seattle, WA
    - Los Angeles, CA
    - Chicago, IL
    - Washington DC
    - New York, NY

```
#add cities to lookup
cities = ['New York, NY','San Francisco, CA', 'Baltimore, MD', 'Boston, MA', 'Philadelphia, PA', 'New Orleans, LA', 'Seattle, WA', '
results = {}
for city in cities:
    url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&near={}&limit={}&categoryId={}'.format(
        client_id,
        client_secret,
        version,
        city,
        limit,
        "4bf58dd8d48988d181941735") # Museum category
    results[city] = requests.get(url).json()
```

Methodology

- Ingested data from FourSquare
  - Submitted all 10 cities and received all information for top 100 museums within the city.
    - Note: FourSquare maxed at 100 records for each city.
- Created a DataFrame from the retrieved data.

```
In [135]: #create dataframe for Museums
          df_venues={}
          for city in cities:
              venues = json_normalize(results[city]['response']['groups'][0]['items'])
              df_venues[city] = venues[['venue.name', 'venue.location.address', 'venue.location.lat', 'venue.location.lng']]
              df_venues[city].columns = ['Name', 'Address', 'Lat', 'Lng']
```

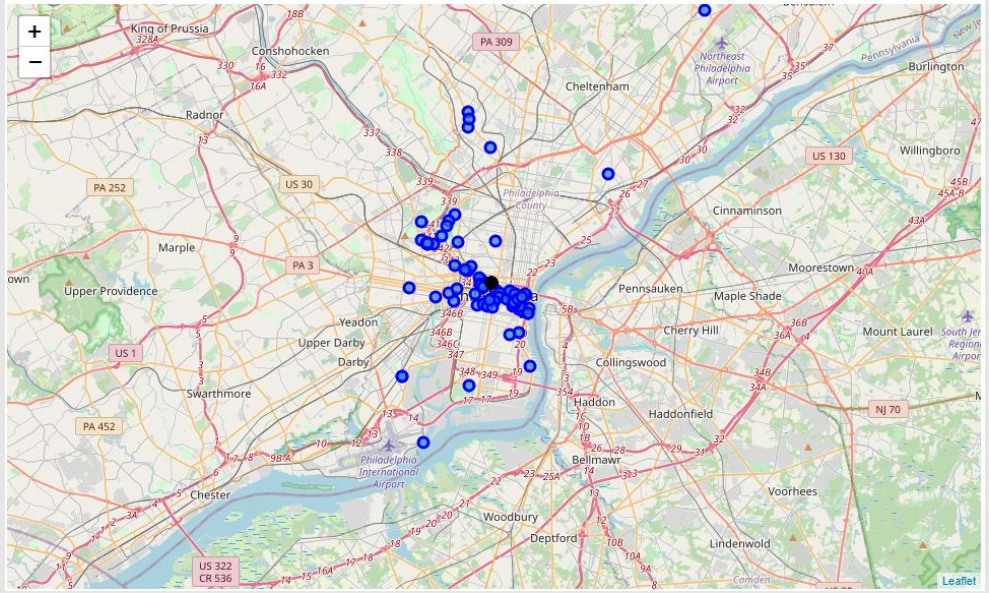
```
In [136]: df_venues
```

Out[136]: {'New York, NY':

	Name
0	The Metropolitan Museum of Art (Metropolitan M...
1	The Jewish Museum
2	MoMA: Architecture and Design
3	Japan Society
4	Whitney Museum of American Art
5	Museum of Modern Art (MoMA)
6	American Museum of Natural History
7	The Morgan Library & Museum
8	The Frick Collection
9	Sotheby's
10	Rubin Museum of Art

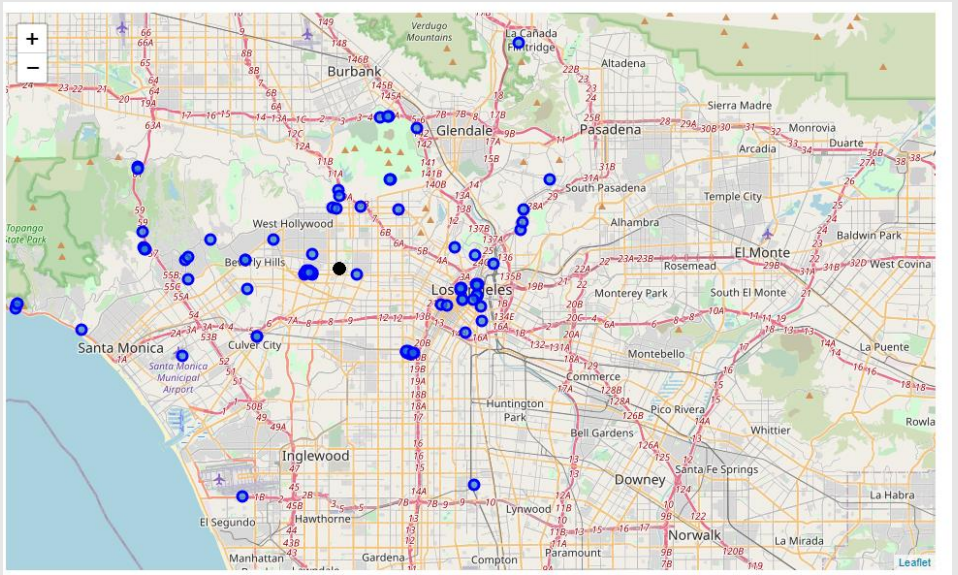
Map Creation

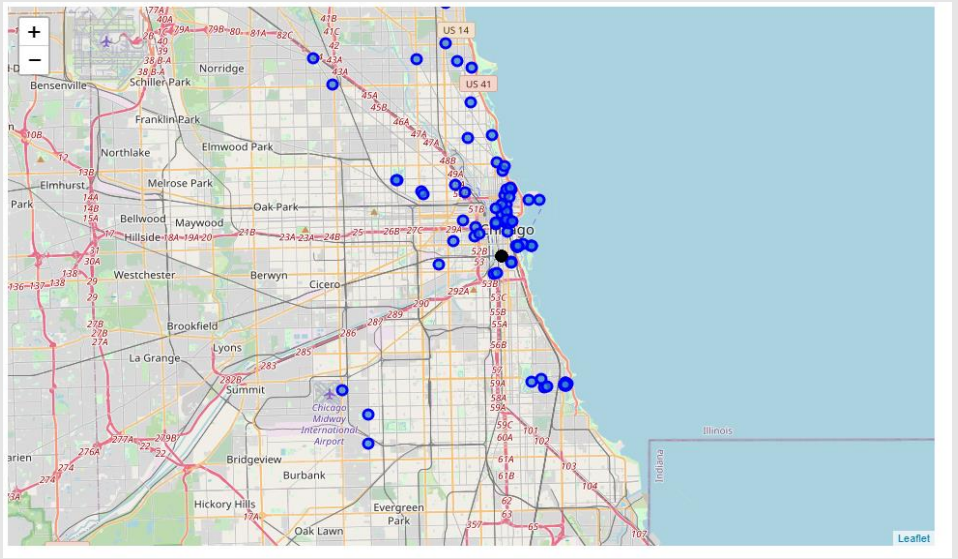
- Took the data collected from FourSquare and created a map for each city.
  - Each map has a blue dot for the museum and a black dot for the central location.
  - This helped with creating a visual for each location to see how close vs spread out the city was.



Most Spread Out

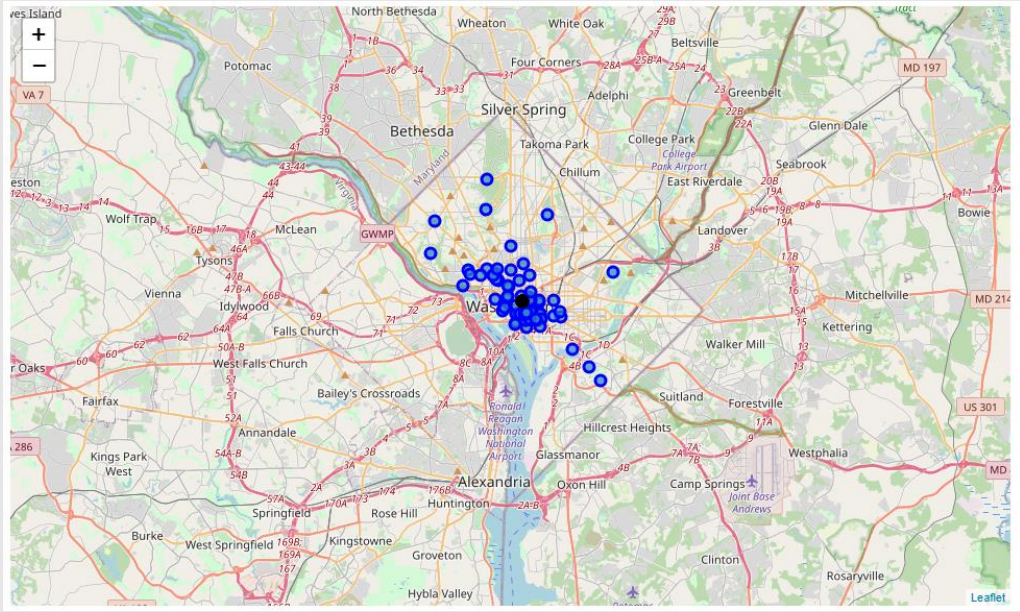
- Los Angeles, CA & Chicago, IL
  - Visually these were the most spread out cities.

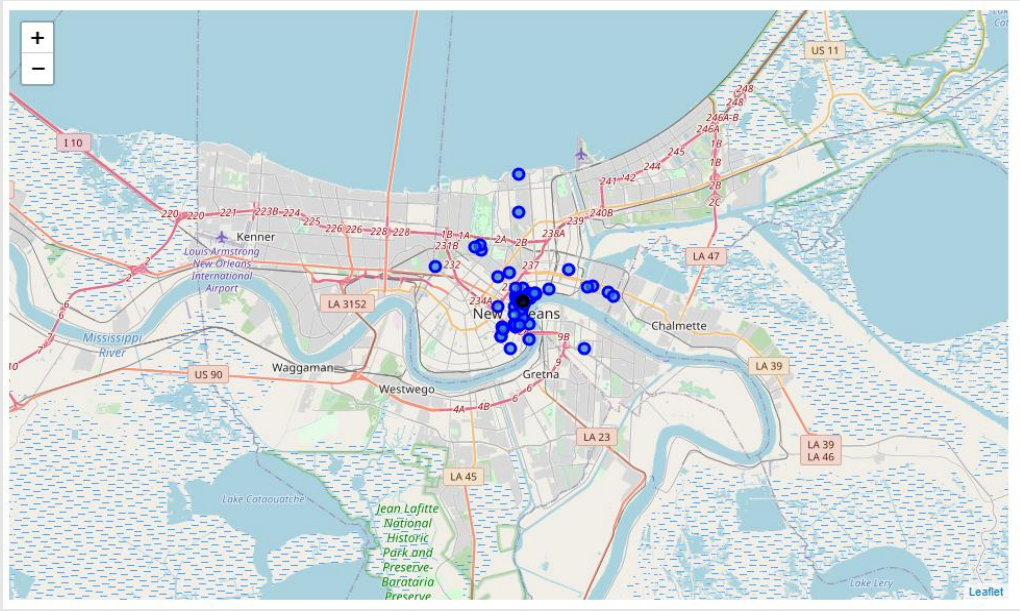




Most Clustered

- Washington, DC & New Orleans, LA
  - Visually these were the most clustered cities.





Results

- Created a central point for each city based on the mean latitude and mean longitude for that location.
- Calculated the mean distance between the museums and the central point.
  - Washington DC is the lowest mean distance from the central location.

```
In [153]: #Show dataframe
          cities_df
```

Out[153]:

City	Mean Distance	Total Museums	Max Museums Reviewed	Latitude, Longitude
New York, NY	0.028179	189	100	[40.75424234522059, -73.98281677705133]
San Francisco, CA	0.036904	119	100	[37.78010728075259, -122.42588125502732]
Baltimore, MD	0.020074	52	52	[39.29291402871929, -76.6160116179364]
Boston, MA	0.025194	76	76	[42.35136614115616, -71.07083477066293]
Philadelphia, PA	0.030391	101	100	[39.9593977887982, -75.16565891996316]
New Orleans, LA	0.017323	68	68	[29.956932692429223, -90.06575947440294]
Seattle, WA	0.042603	84	84	[47.60090287961491, -122.33114639130766]
Los Angeles, CA	0.095729	174	100	[34.06576958566551, -118.3367902099242]
Chicago, IL	0.055767	146	100	[41.86092322200809, -87.62846317781916]
Washington DC	0.016346	183	100	[38.89751372885385, -77.02835154630353]

Discussion/Observations

- Washington DC, New Orleans, LA, and Baltimore, MD were all very close for mean distance.
  - Washington DC was the lowest mean distance at .016346 and they have 183 total museums.
    - More than New Orleans and Baltimore combined (68 + 52 = 120)
  - The best hotel to stay at in Washington DC based on the central latitude and longitude is Hotel Harrington.
    - This hotel was the closest to the mean Latitude and Longitude in Washington DC.

	name	categories	address	cc	city	country	distance	formattedAddress	labeledLatLngs	lat	lng	postalCode	state	
0	Hotel Harrington	Hotel	436 11th St NW	US	Washington	United States	153	[436 11th St NW, Washington, D.C. 20004, Unite...	[{'label': 'display', 'lat': 38.89617549241759...	38.896175	-77.027921	20004	D.C.	4

Conclusion

- Washington DC has the highest density of museums with a mean distance at .016346.
  - The best central hotel in Washington DC is Hotel Harrington located at 436 11th St NW, Washington, D.C. 20004

- West Coast winner was San Francisco, CA
  - San Francisco, CA was the lowest mean distance at .036904 and they have 119 total museums.