Coursera Capstone
IBM Applied Data Science
The Battle of the Neighborhoods – Week 5

Exploring Specialty Hibachi Japanese Restaurant Location In downtown Chicago

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BACKGROUND :

Hibachi is the cooking of meat, vegetable and seafood dishes on a high-heat, metal cooking plate. Under the cooking plate is a wooden or or ceramic container filled with burning charcoal or wood. Hibachi grills can be portable or built into furniture. One of my friend has a great idea of opening a Hibachi restaurant in downtown Chicago area. He asked me to do a market analysis on this project .

INTEREST:

As this is a specialty type of restaurant there is a lot of interest about this food. Chicago downtown is a hub for tourist and locals filled with park, entertainment places, restaurants, hotels , museum and many more sight seeing. All year long this area is full of visitors from all over the world and locals. Having a specialty store makes perfect sense to explore.

BUSINESS PROBLEM:

The objective of this capstone project is to find the most suitable location for the entrepreneur to open a new Hibachi & Grill Restaurant in Downtown Chicago Area. We will be using data science methods and tools along with clustering.

This project aims to provide best solution to provide this entrepreneur, in Metro Chicago area where he can open a Hibachi style Restaurant . The best location in this case is related to other venues in the vincinity that attract visitors and tourists like restaurants, parks & museum near downtown Chicago. There are no Hibachi style restaurant near City hall in Chicago. This project will provide a best possible location to open a Hibachi restaurant in downtown Chicago near. City hall.

DATA :

Data will be collected using Foursquare API. I will be getting the coordinates for the City hall, city of Chicago using Foursquare . Thru that I will be also doing a search for all the Japanese restaurants along with parks and museums .

```
# Find the coordinates for the city hall, City of Chicago
address = '121 North LaSalle St, chicago, Illinois'

geolocator = Nominatim(user_agent="foursquare_agent")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print(latitude, longitude)
```

```
41.88341706625744 -87.632303164487
```

- Getting the data of current Japanese non-hibachi restaurant

	id	name	categories	referralId	hasPerk	location.address	lo
0	4c3e115bdb3b1b8d09e66495	Gyu-Kaku Japanese BBQ	[{'id': '4bf58dd8d48988d111941735', 'name': 'J...	v-1586886821	False	210 E Ohio St	
1	4b4cb5b8f964a52042bb26e3	Cocoro Japanese Restaurant	[{'id': '4bf58dd8d48988d111941735', 'name': 'J...	v-1586886821	False	668 N Wells St	
2	4b36df78f964a520aa3d25e3	Niu Japanese Fusion Lounge	[{'id': '4bf58dd8d48988d1d2941735', 'name': 'S...	v-1586886821	False	332 E Illinois St	
3	4e4043ef81dc6ce0fac9d80b	Japanese Steak House & Sushi	[{'id': '4bf58dd8d48988d111941735', 'name': 'J...	v-1586886821	False	120 Jackson Blvd.	

- Getting the data for for parks and museum near downtown Chicago

	id	name	categories	referralId	hasPerk	location.address
	4a622a61f964a5203dc31fe3	Chicago Cultural Center	[{'id': '4bf58dd8d48988d181941735', 'name': 'M...	v-1586976982	False	78 E Washington St
	4bc23b61b492d13a1539a760	Museum Campus	[{'id': '4bf58dd8d48988d162941735', 'name': 'O...	v-1586976982	False	Burnham Park
	42b75880f964a52090251fe3	Millennium Park	[{'id': '4bf58dd8d48988d163941735',	v-1586976982	False	201 E Randolph St

- Using some data-wrangling and cleansing the data we get cleaner data for each venue

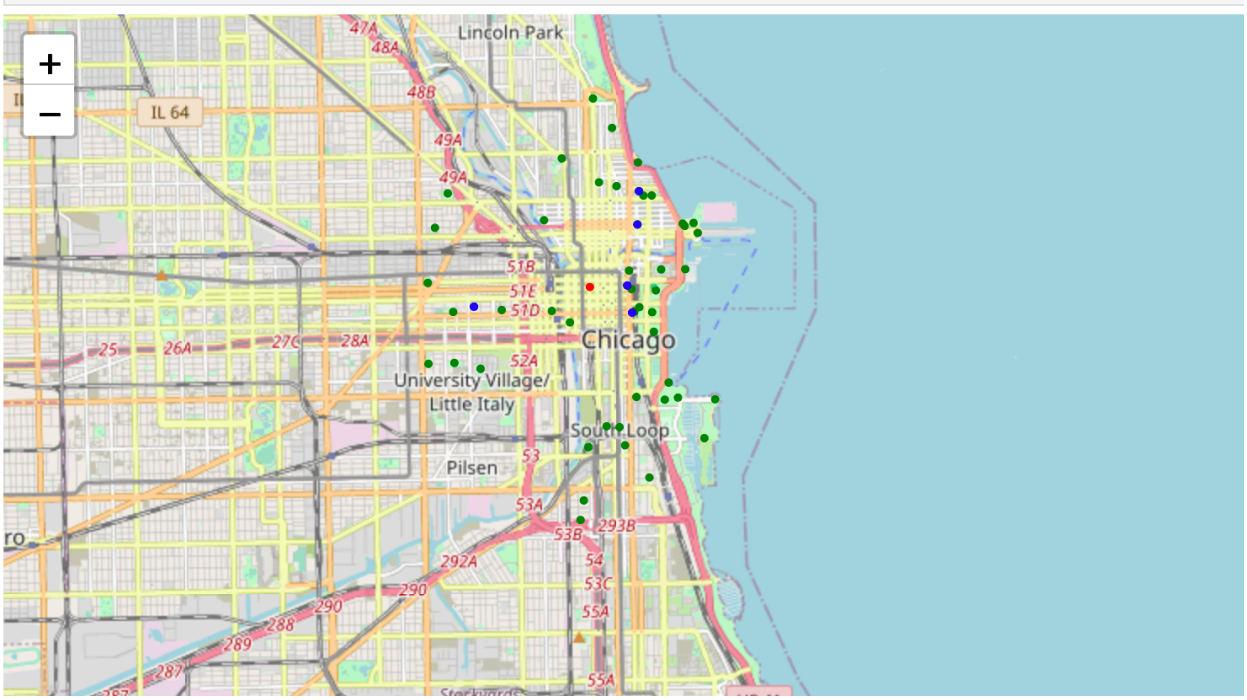
	name	categories	lat	lng	distance	postalCode
0	Gyu-Kaku Japanese BBQ	Japanese Restaurant	41.892594	-87.622262	1317	60611
1	Cocoro Japanese Restaurant	Japanese Restaurant	41.894401	-87.634191	1232	60654
2	Niu Japanese Fusion Lounge	Sushi Restaurant	41.891016	-87.618674	1411	60611
3	Japanese Steak House & Sushi	Japanese Restaurant	41.878691	-87.626053	738	NaN
4	Kohan Japanese Restaurantâ	Sushi Restaurant	41.864803	-87.646404	2378	60607
5	The Mitsubishi Bank Galleries Of Chinese, Japa...	Art Museum	41.879469	-87.623617	843	60603

METHODOLOGY

- Getting latitude and longitude using Geocoder
- Use Foursquare API to get venue data
- Group data by venue and taking mean of the frequency of occurrence for each category
- Filter venue category by restaurant
- Perform Clustering on the data by using K-means clustering
- Visualize the data using Folium
- Graphical representation

EXPLORATION:

We explore the data and plot in map to visualize .



Red Dot = City Hall
Green Dot = Park
Blank = Japanese non-hibachi restaurant

CLUSTERING:

We create a dataframe to find cluster and means for better analysis.

```
# create a new dataframe that includes the cluster as well as the top 10 venues for each neighborhood.
chicago_merged =  drv_final.copy()

# add clustering labels
#chicago_merged["Cluster Labels"] = kmeans.labels_

# merge chicago_grouped with chicago_data to add latitude/longitude for each neighborhood
chicago_merged = chicago_merged.join(chicago_venues_sorted.drop(["categories"], 1).set_index("postalCode"), on="p

print(chicago_merged.shape)
chicago_merged.head() # check the last columns!
```

```
(43, 16)
```

	name	categories	lat	lng	distance	postalCode	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue
0	Gyu-Kaku Japanese BBQ	Japanese Restaurant	41.892594	-87.622262	1317	60611	Art Museum	Trail	Playground	Planetarium	Park	Other Great Outdoors
0	Gyu-Kaku Japanese BBQ	Japanese Restaurant	41.892594	-87.622262	1317	60611	Beach	Trail	Playground	Planetarium	Park	Other Great Outdoors

RESULTS:

- Categorized the results by observing the number of restaurants , parks and museum . Museum and parks always bring more people local or tourist, along with that we look at the type of Japanese restaurants it has in the vicinity

	name	categories	lat	lng	distance	postalCode	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue
0	Gyu-Kaku Japanese BBQ	Japanese Restaurant	41.892594	-87.622262	1317	60611	Art Museum	Trail	Playground	Planetarium	Park	Other Great Outdoors
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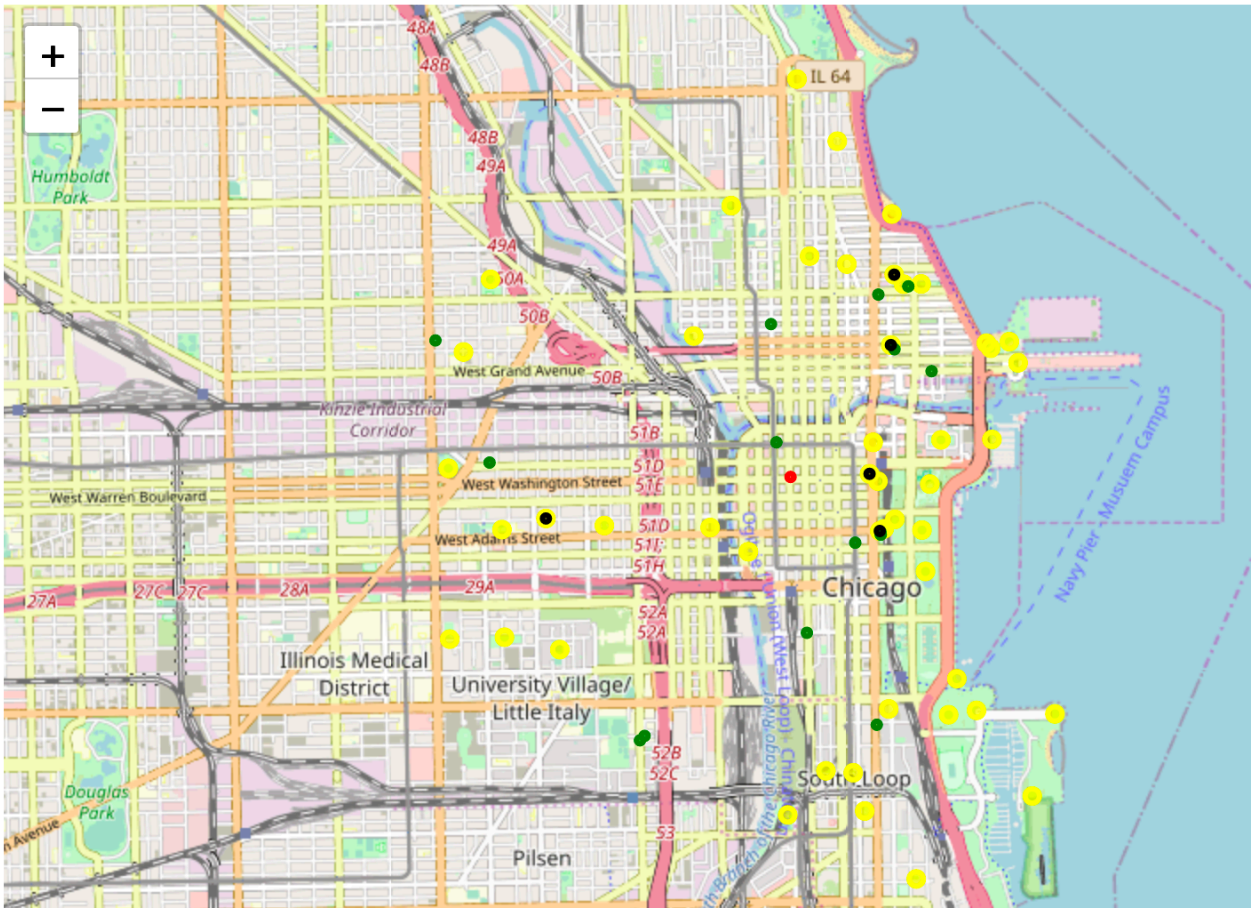
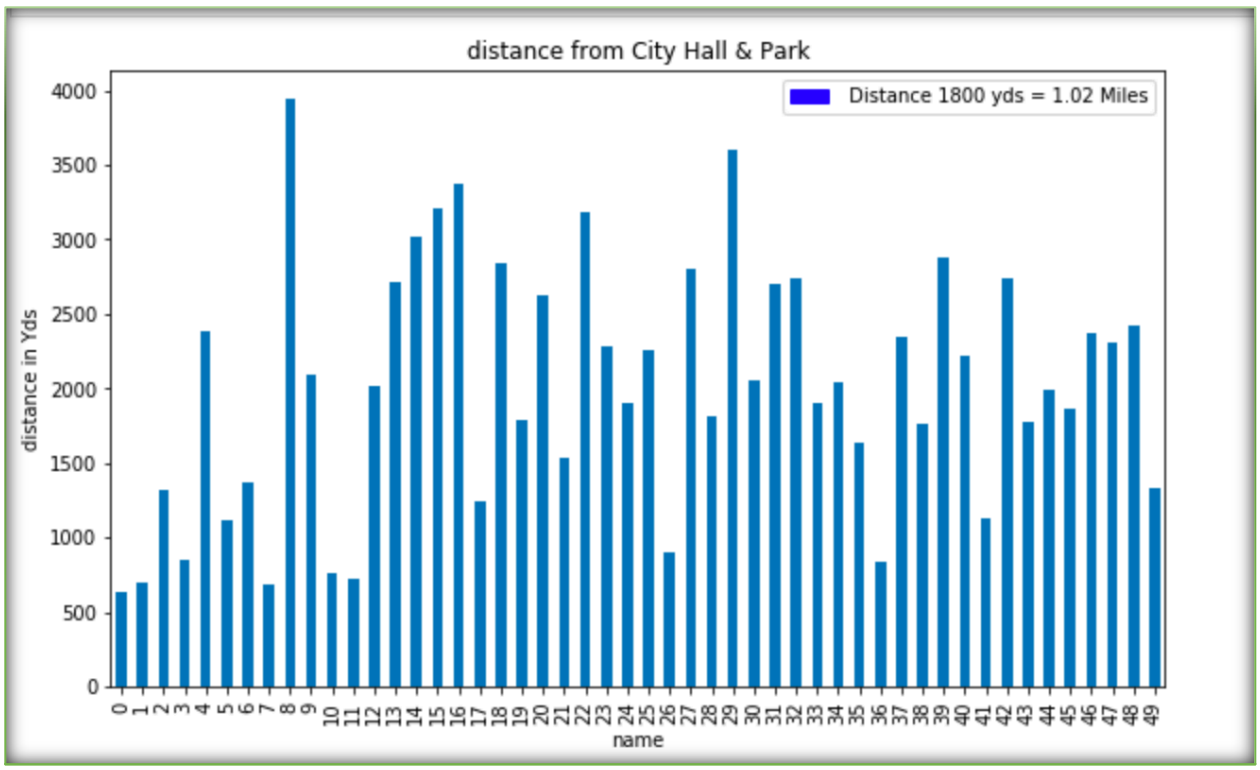
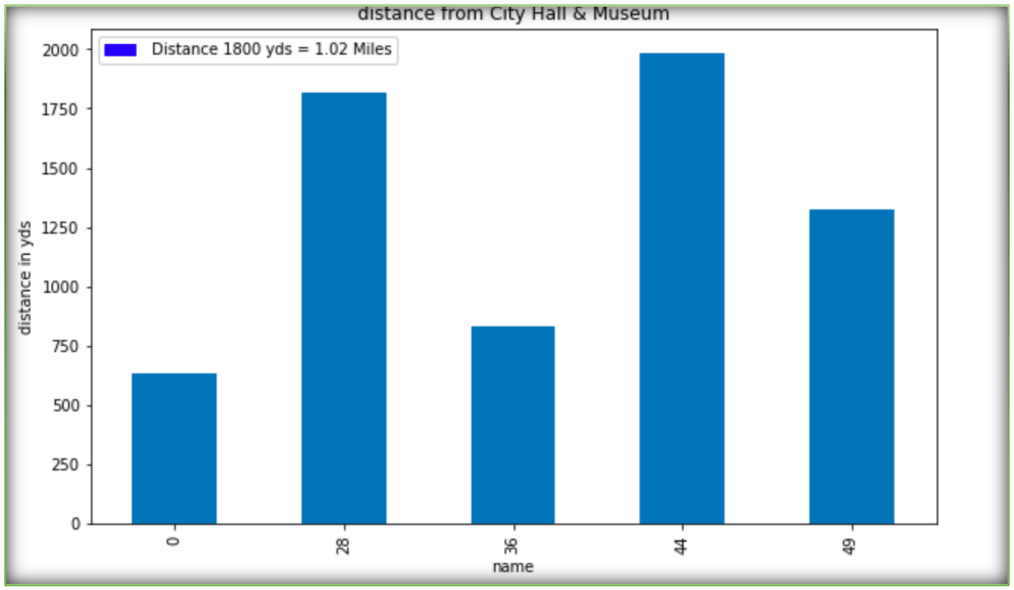


Graphical representation:


distance from City Hall & Park
Distance 1800 yds = 1.02 Miles
distance in Yds
name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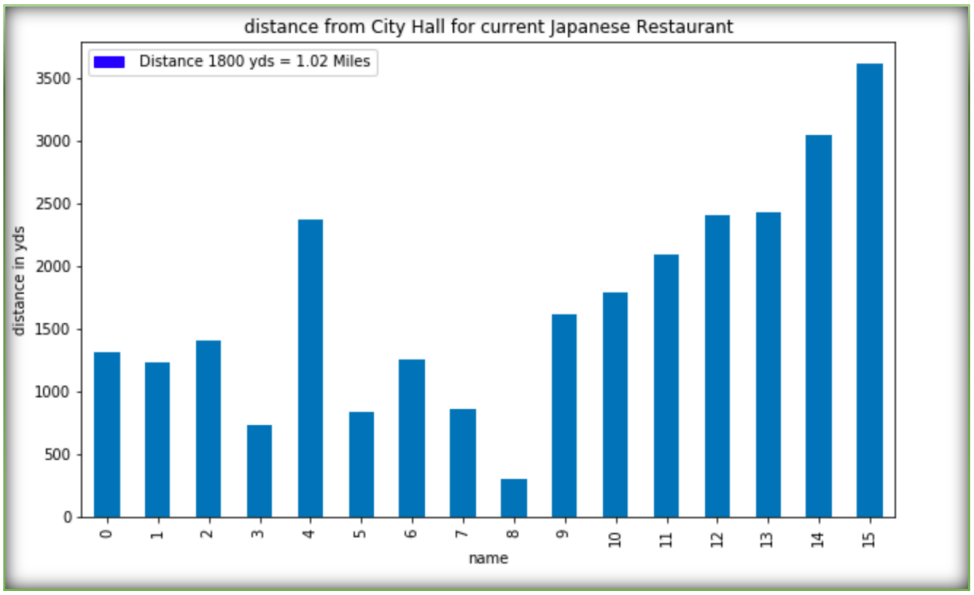

OBSERVATION:

Looking at the Graphical overview of the combined locations of existing Japanese non-hibachi restaurants, and the location of nearby parks and also museums. We see that surrounding the City Hall Chicago, based on visual analysis , that there are plenty of opportunities of Hibachi restaurants circled by a park or Museum. These venues combinations produces tourists,visitors locals as well as visitors all year around. More visitors means better chance for a restaurant specially specialty restaurants.

CONCLUSION:

As a proposal for the project :

- >> Best place to open up a Hibachi style restaurant is within 1 miles from the city hall, Chicago , moreover currently no Hibachi style restaurant are in downtown , that is very favorable for opening one.

- >> The number of locals and tourist in downtown chicago very high due to tourist places and parks which makes the location favorable and business will be good.