

# Capstone Project - The Battle of Neighborhoods (Abuja and Lagos)

## A GLIMPSE INTO THE CITIES OF LAGOS AND ABUJA

### INTRODUCTION

Nigeria is full of wonderful places for both business adventure and vacation trips. Many people dedicate themselves to explore Nigeria to know where is more suitable for business or for Vacation trips. This project seeks to explore venues in the cities of Abuja and Lagos, cluster them and reveal the different cities in terms of different venues categories. By the nature of this project, travel companies and their customers might be interested in this project to find similar and different places in Nigeria. Our case study will be Abuja and Lagos.

### DATA

In order to accomplish this goal, the cities of each state with their latitudes and longitudes are required. The longitude and latitude of each locations in the state were computed manually as well as the cities of each state. From this data, I need to explore the venue category around these cities of Lagos and Abuja by utilizing Foursquare API.

Then I used the acquired location data to explore the venues from the Foursquare API. Using the "explore" option, I look for top 10 venue categories in 10 km radius for each city center and I get "Venue", "Venue Latitude", "Venue Longitude" and "Venue Category" columns.

### METHODOLOGY

In this project we will direct our efforts on detecting the various kind of venue category in both states using the **Foursquare API** to get such information

The **Foursquare API** is used to retrieve all venues of each neighborhoods, then group by each neighborhoods and to count how many venues before filter top 10 most common venue types of each neighborhoods and then using the K Means clustering to cluster each venue Category

### RESULT AND DISCUSSION

- Lagos has more venues than Abuja (114 vs 45)

## Analysis

Let's perform some basic explanatory data analysis and derive some additional info from our raw data:

```
In [23]: Abuja_venues=getNearbyVenues(Abuja_df['District / Area'], Abuja_df['Latitude'], Abuja_df['Longitude'])
Lagos_venues=getNearbyVenues(Lagos_df['District / Area'], Lagos_df['Latitude'], Lagos_df['Longitude'])
```

```
In [24]: Abuja_venues.head()
```

```
Out[24]:
```

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Abaji	9.03438	7.47372	Area 1 Shopping Complex	9.035810	7.470744	Bookstore
1	Abaji	9.03438	7.47372	Bolton White Hotel	9.034883	7.475637	Hotel Pool
2	Yaba	9.03810	7.48889	Old parade ground	9.042023	7.488829	Soccer Field
3	Yaba	9.03810	7.48889	Agura Hotel	9.039289	7.487925	Resort
4	Yaba	9.03810	7.48889	Blue Light Restaurant and Bar	9.038502	7.491794	Food & Drink Shop

```
In [25]: Lagos_venues.head()
```

```
Out[25]:
```

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Orile Agege	6.63098	3.31609	Agege Market	6.628480	3.319192	Market
1	Alimosho	6.54599	3.26598	Ikotun market	6.548099	3.266322	Market
2	Alimosho	6.54599	3.26598	Hotel Soluos	6.547196	3.268031	Hotel Pool
3	Alimosho	6.54599	3.26598	Suya spot	6.547192	3.263758	BBQ Joint
4	Alimosho	6.54599	3.26598	Alagomeji	6.543687	3.264760	Bus Station

```
In [26]: Abuja_venues.shape
```

```
Out[26]: (45, 7)
```

```
In [27]: Lagos_venues.shape
```

```
Out[27]: (114, 7)
```

- Victoria Island has the most venues in Lagos (24)

In [29]: # Number of venues of each Neighborhood in Lagos  
Lagos\_venues.groupby('Neighborhood').count()

Out[29]:

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Agboyi-Ketu	1	1	1	1	1	1
Alimosho	4	4	4	4	4	4
Amuwo Odofin	4	4	4	4	4	4
Apapa	5	5	5	5	5	5
Badagry	2	2	2	2	2	2
Badagry West	2	2	2	2	2	2
Bariga	2	2	2	2	2	2
Coker Aguda	1	1	1	1	1	1
Egbe-Idimu	4	4	4	4	4	4
Eredo	5	5	5	5	5	5
Eti-Osa East	4	4	4	4	4	4
Iba	1	1	1	1	1	1
Ifako-Ijaiye	1	1	1	1	1	1
Ikeja	7	7	7	7	7	7
Ikorodu	3	3	3	3	3	3
Ikosi Ejinrin	2	2	2	2	2	2
Ikoyi-Obalende	4	4	4	4	4	4
Iru Victoria Island	24	24	24	24	24	24
Isolo	1	1	1	1	1	1
Itire-Ikate	1	1	1	1	1	1
Lagos Island East	1	1	1	1	1	1
Lagos Island West	4	4	4	4	4	4
Lagos Mainland	4	4	4	4	4	4
Mosan Okunola	3	3	3	3	3	3
Mushin	2	2	2	2	2	2
Odi-Ofowo	1	1	1	1	1	1
Ojodu	5	5	5	5	5	5
Onigbongbo	7	7	7	7	7	7
Orile Agege	1	1	1	1	1	1
Oshodi	1	1	1	1	1	1
Oto Awori	1	1	1	1	1	1
Surulere	3	3	3	3	3	3
Yaba	3	3	3	3	3	3

- Bwari and Nyanya has the most venues in Abuja

In [28]: # Number of venues of each Neighborhood in Abuja  
Abuja\_venues.groupby('Neighborhood').count()

Out[28]:

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
Abaji	2	2	2	2	2	2
Ashara	4	4	4	4	4	4
Bwari	5	5	5	5	5	5
Dafa	1	1	1	1	1	1
Garki	3	3	3	3	3	3
Gumbo	5	5	5	5	5	5
Gwarinpa	3	3	3	3	3	3
Gwaywalada	1	1	1	1	1	1
Karu	3	3	3	3	3	3
Kwali	5	5	5	5	5	5
Nyanya	5	5	5	5	5	5
Rubbochi	4	4	4	4	4	4
Yaba	4	4	4	4	4	4

- Most common venues in Victoria Island are Pizza Place and Restaurant

In [69]: Lagos\_neighborhoods\_venues\_sorted

Out[69]:

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
0	Agboyi-Ketu	Wine Bar	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store
1	Alimosho	Bus Station	BBQ Joint	Hotel Pool	Market	Wine Shop	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant
2	Amuwo Odofin	Fried Chicken Joint	Electronics Store	Beer Garden	Mobile Phone Shop	Breakfast Spot	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant
3	Apapa	Department Store	Pizza Place	Shopping Mall	Hotel	Playground	Bus Station	Business Service	Café	Chinese Restaurant
4	Badagry	Museum	History Museum	Food Truck	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store	Department Store
5	Badagry West	Museum	History Museum	Food Truck	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store	Department Store
6	Bariga	Fast Food Restaurant	Boat or Ferry	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Electronics Store
7	Coker Aguda	Fast Food Restaurant	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Electronics Store	Department Store
8	Egbe-Idimu	Fried Chicken Joint	Movie Theater	Shopping Mall	Bus Station	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store
9	Eredo	Market	Electronics Store	Beach	Pharmacy	Wine Shop	Breakfast Spot	Flea Market	Fishing Spot	Film Studio
10	Eti-Osa East	Food Truck	Fishing Spot	Beach	College Cafeteria	Breakfast Spot	Food Court	Flea Market	Film Studio	Fast Food Restaurant
11	Iba	Bus Station	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store
12	Ifako-Ijaiye	Soccer Field	Wine Shop	Boutique	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store	Department Store
13	Ikeja	Airport Terminal	Plaza	Heliport	Electronics Store	Mobile Phone Shop	Soup Place	Film Studio	Fast Food Restaurant	Breakfast Spot
14	Ikorodu	Historic Site	Electronics Store	Bus Station	Wine Shop	Breakfast Spot	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant
15	Ikosi Ejirin	Fast Food Restaurant	Bus Station	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Electronics Store
16	Ikoyi-Obalende	Bus Station	Market	Optical Shop	Wine Shop	Breakfast Spot	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant
17	Iru Victoria Island	Pizza Place	African Restaurant	Bar	Italian Restaurant	Bistro	Department Store	Chinese Restaurant	Café	Hotel
18	Isolo	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store	Department Store
19	Itire-Ikate	Bus Station	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store
20	Lagos Island East	Beer Garden	Wine Shop	Breakfast Spot	Food Court	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store
21	Lagos Island West	Market	Fried Chicken Joint	Breakfast Spot	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant	Electronics Store	Department Store
22	Lagos Mainland	BBQ Joint	Pharmacy	Bus Station	Boutique	Wine Shop	Breakfast Spot	Flea Market	Fishing Spot	Film Studio
23	Mosan Okunola	Athletics & Sports	Hotel	Lounge	Wine Shop	Bus Station	Flea Market	Fishing Spot	Film Studio	Fast Food Restaurant

- Venues in Nyanya and Bwari are more diverse includes: Pharmacy, Building and Construction, restaurants etc.

In [68]: Abuja\_neighborhoods\_venues\_sorted

Out[68]:

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue
0	Abaji	Bookstore	Hotel Pool	Turkish Restaurant	Fast Food Restaurant	BBQ Joint	Bar	Bed & Breakfast	Beer Garden	Bus Station
1	Ashara	Hotel	Historic Site	Chinese Restaurant	Fast Food Restaurant	Turkish Restaurant	Construction & Landscaping	BBQ Joint	Bar	Bed & Breakfast
2	Bwari	Food & Drink Shop	Fast Food Restaurant	Bed & Breakfast	Beer Garden	Garden Center	BBQ Joint	Bar	Bookstore	Bus Station
3	Dafa	Park	Turkish Restaurant	Fast Food Restaurant	BBQ Joint	Bar	Bed & Breakfast	Beer Garden	Bookstore	Bus Station
4	Garki	Shopping Mall	Lounge	Hotel Pool	Turkish Restaurant	Construction & Landscaping	BBQ Joint	Bar	Bed & Breakfast	Beer Garden
5	Gumbo	Food & Drink Shop	Fast Food Restaurant	Bed & Breakfast	Beer Garden	Garden Center	BBQ Joint	Bar	Bookstore	Bus Station
6	Gwarinpa	Bar	Bed & Breakfast	Café	Turkish Restaurant	Fast Food Restaurant	BBQ Joint	Beer Garden	Bookstore	Bus Station
7	Gwaywalada	Hotel	Turkish Restaurant	Fast Food Restaurant	BBQ Joint	Bar	Bed & Breakfast	Beer Garden	Bookstore	Bus Station
8	Karu	Fast Food Restaurant	Bus Station	Construction & Landscaping	Turkish Restaurant	BBQ Joint	Bar	Bed & Breakfast	Beer Garden	Bookstore
9	Kwali	Food & Drink Shop	Fast Food Restaurant	Bed & Breakfast	Beer Garden	Garden Center	BBQ Joint	Bar	Bookstore	Bus Station
10	Nyanya	Turkish Restaurant	BBQ Joint	Pharmacy	Park	Fast Food Restaurant	Construction & Landscaping	Bar	Bed & Breakfast	Beer Garden
11	Rubbochi	Food & Drink Shop	Resort	Fast Food Restaurant	Art Gallery	Pharmacy	Chinese Restaurant	BBQ Joint	Bar	Bed & Breakfast
12	Yaba	Food & Drink Shop	Resort	Soccer Field	Fast Food Restaurant	Construction & Landscaping	BBQ Joint	Bar	Bed & Breakfast	Beer Garden

- Bars, Restaurants, Bakeries, and Diners are very common in Abuja.
- Lagos is more about commercial and also include Bars, Restaurants etc.

## Conclusion

- **For travelers (vacation trips):**  
Both states, Lagos and Abuja is more suitable to spend a good amount time of enjoy the local food
- **For business owners:**  
Lagos is good place to open small business related to food and travel industry  
Lagos is better place to involve in industry  
Abuja is better place to open a firm