# Coursera Capstone Project

## Introduction

**Background:**

Ghana is a country along the Gulf of Guinea and the Atlantic Ocean, in the subregion of West Africa. Spanning a land mass of 238,535 $km^2$ (92,099 sq mi), Ghana is bordered by the Ivory Coast in the west, Burkina Faso in the north, Togo in the east, the Gulf of Guinea and the Atlantic Ocean in the south. *Ghana* means "Warrior King" in the Soninke language

Ghana, a beautiful West African country known for its tourist attraction sites which includes museums. Tourism is one of the main factors of the economy of Ghana and it is a source of foreign exchange.

Museums are a source of cultural heritage. They tell stories through their exhibitions, stories that can't be found in books and the ability to find these museums as a tourist is very beneficial especially to historical and cultural enthusiasts.

**Problem:**

However, there are some difficulties for a tourist to find a conclusive visual presentation of what they want to see with locations on the map and data regarding the various sites and its surroundings. Searches do not give a viable and comprehensive means of location which includes visual presentations and coordinates.

**Interest:**
Museums being a part of tourism, the Ghana government with particularity the ministry of tourism would be very interested in finding a way to make Ghana a more attractive destination for travelers all around the world. And also, tourists, history and cultural lover would also be interested to know that their trip will be easier to plan.

# Data

Data collection was done through scraping Wikipedia and searching through google maps. These data were the longitude and latitude of these museums and the data of the surrounding venues were found through the foursquare API.
14 museums were chosen for the purpose of this project and they are located all around the country.

**Solution:**
Using the longitude and latitude of these museums, I created a recommendation engine which is enabled through creating a visual representation of these sites which included surrounding venues like hotels, restaurants and shopping areas. This makes it easier for a tourist to plan their trips and also have recommendations on museums that might interest the tourists.

# Methodology

After data collection cleaning and organization, the longitude and latitude of the museums were plotted on a geographical map using the folium map with pop ups that provides information about the various museum choices.

After the first process, I used the FourSquare API with my unique credentials to call and find surrounding locations and venues to our museums and wrote the information to a JSON file.

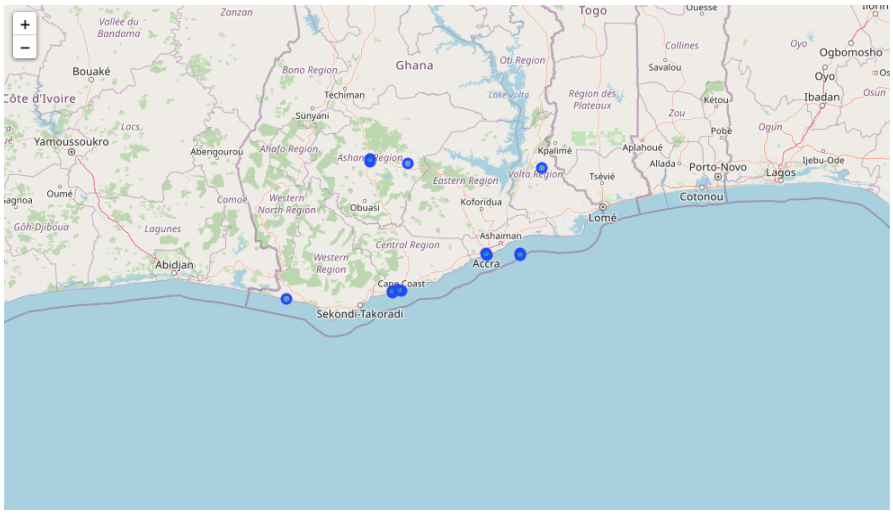
I categorized these data in the file into columns and created dataframe for them. These data of surrounding locations were organized and plotted into another geographical map.

Applying K-Means clustering algorithm wasn't effective as the dataset was really small.

Finally, a demonstration of what the recommendation engine would look like and how it will work was done using a little Python script. This script aided the user in visualizing the site of interest in their chosen category.

# Result

Below are results generated from the data which includes, maps and pictures of some of the museums.




| | name | categories | lat | lng |
|---|---|---|---|---|
| 0 | Royal Park Hotel & Chinese Restaurant | Chinese Restaurant | 6.669465 | -1.617249 |
| 1 | Piri Piri Fast Food | American Restaurant | 6.666199 | -1.617170 |
| 2 | Noble House Chinese and Indian Restaurant | Chinese Restaurant | 6.670509 | -1.616401 |
| 3 | Royal Park Rest. | Chinese Restaurant | 6.664637 | -1.617799 |
| 4 | Royal Park Hotel & Restaurant | Hotel | 6.664598 | -1.617973 |
| 5 | Ahodwo Roundabout | Intersection | 6.669084 | -1.617273 |
| 6 | Hotel Georgia | Hotel | 6.669435 | -1.615870 |
| 7 | Echoes spot | African Restaurant | 6.664010 | -1.617899 |

Out[16]:

| | Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue Longitude | Venue Category |
|---|---|---|---|---|---|---|---|
| 0 | Armed Forces Museum | 6.691367 | -1.624872 | Ababio Express | 6.690813 | -1.624448 | Grocery Store |
| 1 | Armed Forces Museum | 6.691367 | -1.624872 | Baboo Cafeteria | 6.690505 | -1.622666 | Café |
| 2 | Armed Forces Museum | 6.691367 | -1.624872 | Ultimate fashions | 6.695000 | -1.623102 | Boutique |
| 3 | Armed Forces Museum | 6.691367 | -1.624872 | Apple Store Ksi | 6.694001 | -1.621618 | Department Store |
| 4 | Armed Forces Museum | 6.691367 | -1.624872 | Paul Sagoe Lane | 6.693306 | -1.620945 | Shopping Mall |

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| 4 | Armed Forces Museum | 6.691367 | -1.624872 | Paul Sagoe Lane | 6.693306 | -1.620945 | Shopping Mall |
| 5 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Cape Coast Castle | 5.103548 | -1.240991 | Tourist Information Center |
| 6 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Oasis Beach Resort | 5.103258 | -1.243880 | Resort |
| 7 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Cape Coast Castle Restaurant | 5.103471 | -1.241924 | African Restaurant |
| 8 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Baobab Vegetarian Bar | 5.105170 | -1.241181 | Vegetarian / Vegan Restaurant |
| 9 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Emperor Ital Joint | 5.103945 | -1.243076 | Vegetarian / Vegan Restaurant |
| 10 | Cape Coast Castle Museum | 5.103600 | -1.241400 | Melcom Supermarket | 5.107586 | -1.241851 | Department Store |

```
Pick a category: Military, Ethnography, Archeology, History, Tribute, Slave Trade, Hat, MusicHistory
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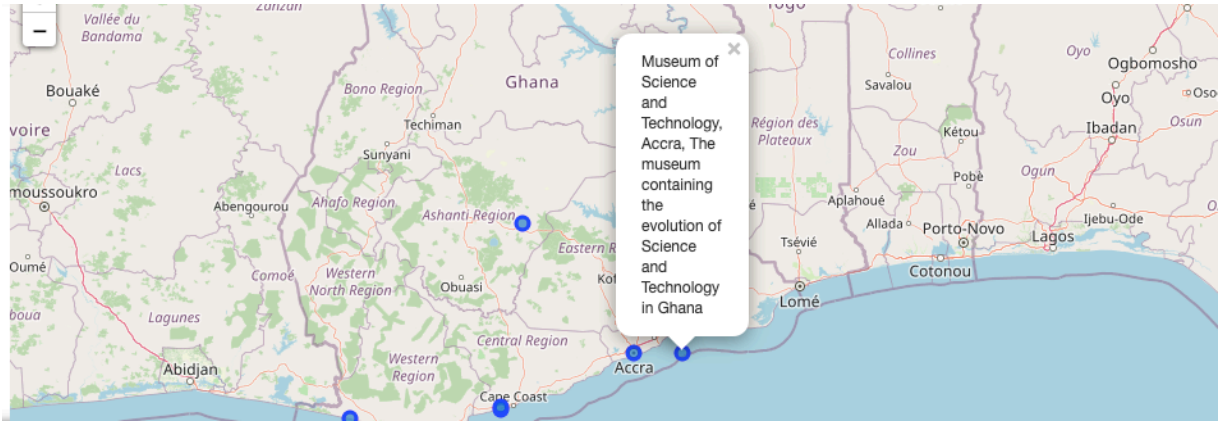

# Discussion

The main point of this discussion is the inability of the k-Means algorithm to work efficiently which is as a result of a really small dataset and being a unique project, the dataset presented wasn't conclusive as finding data related to this project was very difficult.

Notwithstanding, this project was interesting to say he least and the exploration was interesting as a foreigner to the Ghanaian history and culture and would one day love to explore some of these museums.

# Conclusion

This project was impactful though it was challenging. I also learnt a lot such as the use of folium to create a map and using python API calls.