# Segmentation and Clustering of Medical Facilities

By Edward Lampoh

# Segmentation and Clustering of Medical Facilities in the Greater Accra Region of Ghana

- The Greater Accra region of Ghana is smallest region in this West African country.
- It is the 2nd most densely populated region in the country.
- It is the largest commercial region of the country and home to the capital city, Accra.
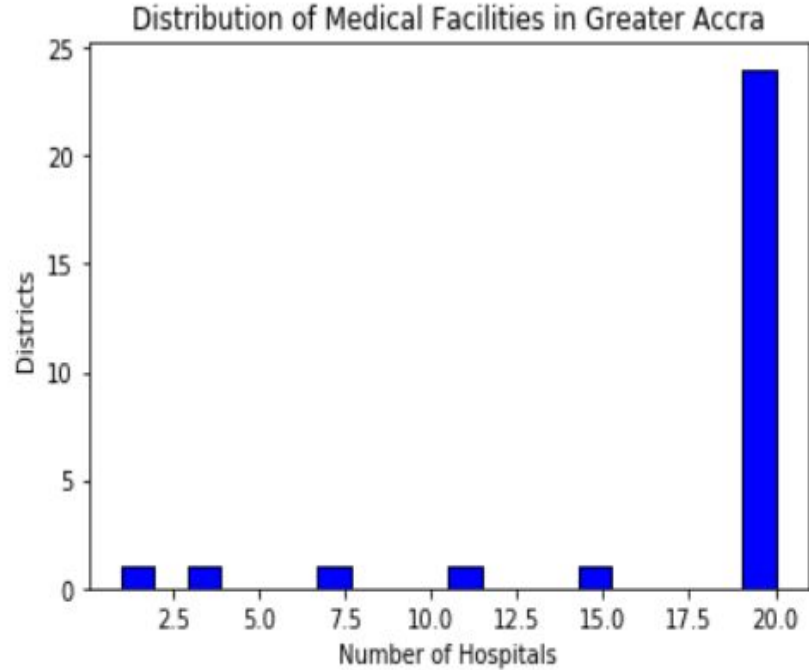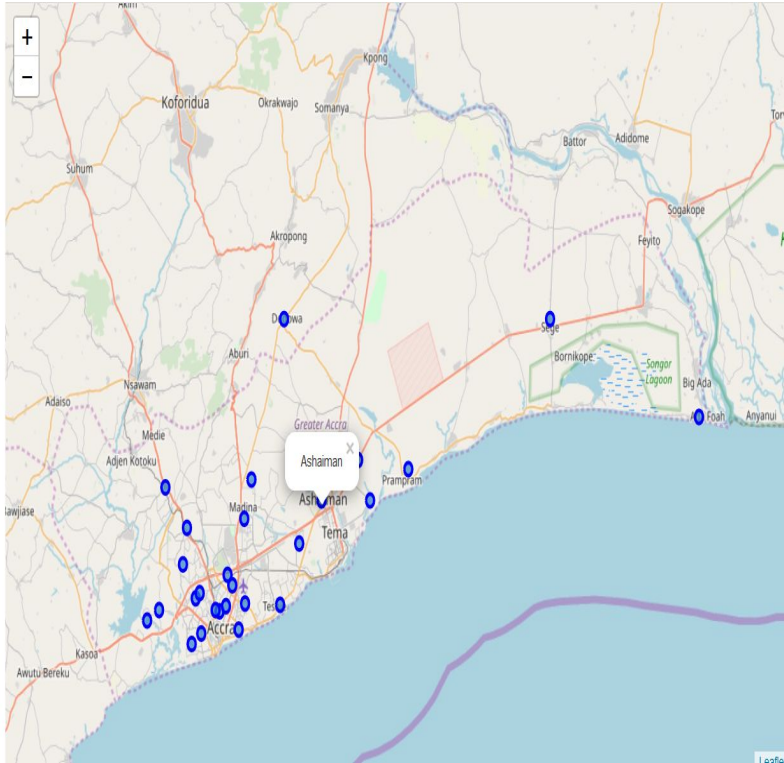
## Key Problem:

- Densely populated region with traffic congestion
- Quick access to **MEDICAL FACILITIES** in case of emergencies is threatened by traffic congestion
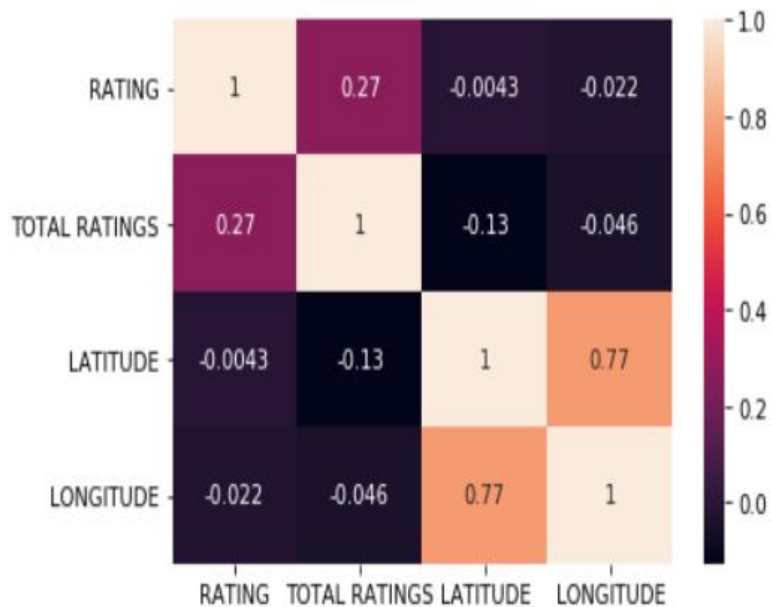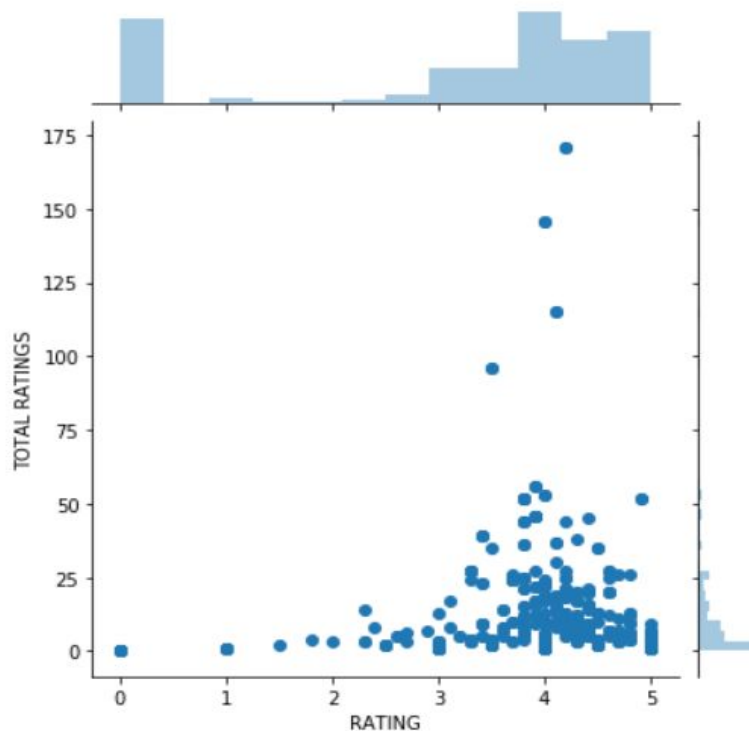
# DATA ACQUISITION AND CLEANING

- The list of the various districts and their capitals within the Greater Accra Region were obtained from [here.](here.)

- The list of hospitals and medical facilities that can be found within a 500 meter radius along with their location data and user rating stats were obtained using Foursquare and Google Maps API.

- A total of 419 medical facilities can be found within the 500 m radius of these district capitals.
- Duplicate, and non medical facility features were dropped.
- Cleaned data contains 4 features.

# Distribution of district capitals and hospitals

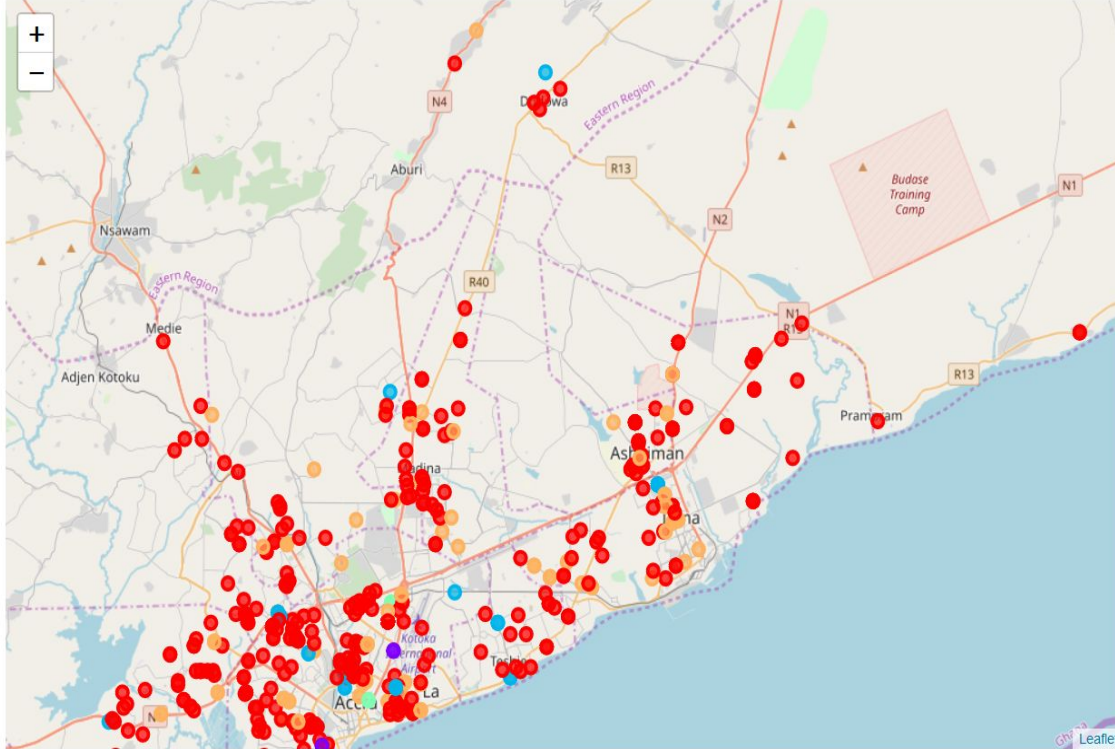# Correlation between total ratings and average rating

# Cluster Analysis

| | NAME OF HOSPITAL | RATING | TOTAL RATINGS | LATITUDE | LONGITUDE | Cluster Labels |
|---|---|---|---|---|---|---|
| 0 | Barnor Hospital | 3.8 | 21 | 5.549374 | -0.240991 | 4 |
| 1 | Holy Care Specialist Hospital | 4.4 | 9 | 5.549925 | -0.244662 | 0 |
| 2 | Loving Life Chinese Clinic | 4.2 | 6 | 5.548236 | -0.232870 | 0 |
| 3 | Beth's Clinic | 4 | 1 | 5.550399 | -0.233826 | 0 |
| 4 | Robert Medical Centre | 4.7 | 6 | 5.547638 | -0.233553 | 0 |

- **A total of 5 clusters were defined for the algorithm to map out the clusters in the data.**

- **All features including location coordinates were selected.**

# Map of Clustered Medical Facilities



KEY

| COLOR | LABEL |
|-------|-------|
| RED | 0 |
| ORANGE | 1 |
| GREEN | 2 |
| LIGHT-BLUE | 3 |
| DEEP BLUE | 4 |

# Conclusion and future directions

- There are areas in the region that appear neglected with respect to the siting of medical facilities. Whereas citing new facilities in these areas may not be the only solution, the challenges provides an opportunity to be explored by entrepreneurs and other stakeholders in the health industry.

- Future work could benefit greatly with more data on the unique features of the various medical facilities. This would help drive more insight into the clusters uncovered by the K-means algorithm