IBM Applied Data Science Capstone

Optimal Locations for Hospitals in Chennai city

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Introduction:

Chennai is the capital of the Indian state of Tamil Nadu. Located on the Coromandel Coast of the Bay of Bengal, it is one of the largest cultural, economic and educational center of south India. It is the sixth-most populous city and fourth-most populous urban agglomeration in India. The city together with the adjoining regions constitutes the Chennai Metropolitan Area, which is the 36th-largest urban area by population in the world.

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment.

The rising number of cases has resulted in a deepening healthcare crisis that has gripped several states. India is reeling under a severe second wave of Covid-19 and many states are struggling to cope with the rising numbers. The second wave has hit a country which was unprepared. This has led to increased no. of cases where the hospitals are overcrowded and there is also shortage of oxygen supply in some areas.

Business Problem:

This project aims to analyze and solve the following problems

1. List and visualize all the hospitals in and around the Chennai city
2. Identify the neighborhoods around the hospitals
3. What are all the best locations to open new public health centers
4. Identify areas that lack hospital centers compared to other areas
5. To alleviate over-crowding in hospitals and enhance the medical facilities to the citizens

Target Audience:

The purpose of this project is to help people through identification of optimal placement of new health centers by exploring the facilities around their neighborhood. It will help people navigate to the nearest neighborhoods with medical facilities out of numbers of other postal areas in Chennai, India.

Data Description:

Chennai city's demographics show that it is a large and ethnically diverse metropolis. With its diverse society, comes diverse infrastructure. There are many different kinds of infrastructure in Chennai city, each

belonging to different categories like hospitals, schools, colleges and apartments.

1. Chennai Postal codes
    a. Data source:
    https://www.mapsofindia.com/pincode/india/tamil-nadu/chennai/
    b. Description:
    This data contains list of major boroughs and their postal codes
2. Geocoding API
    a. Data source:
    https://developers.google.com/maps/documentation/geocoding/overview
    b. Description:
    The Geocoding API provides a direct way to access these services via an HTTP request. We leverage this API to obtain latitude and longitudes of hospitals
3. Hospital Location information
    a. Data source:
    https://nationalinsurance.nic.co.in/sites/default/files/Chennai%20PPN%20List%20of%20Hospitals.pdf

b. Description:

   The data source contains list of hospitals and their addresses which are located in and around the Chennai city

4. Foursquare API

   a. Data source:

      https://developer.foursquare.com/

   b. Description:

      Foursquare helps us identify the various venues near our neighborhood through we'll able to identify the facilities around the hospitals

Work flow:

Our plan is to leverage the aforementioned data sources to explore and examine the medical centers throughout the city. This project would use various data science skills including web scraping, Geocoding API, Foursquare API, data cleaning, data wrangling, map visualization (Folium) and a clustering based machine learning approach (K-means clustering).