COVID-19 IN NEW YORK CITY

IDENTIFYING LOCATIONS FOR TEMPORARY MEDICAL FACILITIES

- New York City, the epicenter of the novel coronavirus pandemic, is looking for locations to set up temporary medical facilities to triage the enormous inflow of patients with symptoms of COVID-19.

- New York City has five boroughs: Bronx, Brooklyn, Manhattan, Queens, and Staten Island.

- I will attempt to identify which borough is in most need of a temporary facility.

DATA ACQUISITION

- Neighborhood names and coordinates from nyc.gov
- Neighborhood populations were scraped from Wikipedia and city-data.com using BeautifulSoup
    - Neighborhood names, coordinates, and populations were combined into one dataset.
- Hospital names and locations from Foursquare.

CHOICE OF BOROUGH

- According to nyc.gov, the Bronx has the highest rate of COVID-19 cases compared to the other 4 boroughs.

Rates by Borough

This chart shows the number of positive cases per 100,000 people in each borough. It indicates the spread of COVID-19 relative to each borough's population.

	Rate per 100,000 people	Count
The Bronx	2,168	31,911
Staten Island	2,110	10,582
Queens	1,748	43,824
Brooklyn	1,384	37,564
Manhattan	944	17,803
Citywide		141,754

USING BEAUTIFULSOUP TO SCRAPE WIKIPEDIA

- Used a Python script to scrape population from a New York City neighborhood list on Wikipedia. This is what the data frame looked like after merging the data with the neighborhood names and coordinates:

```
bronx_data = nyc_df[nyc_df['Borough'] == 'Bronx'].reset_index(drop=True)
#bronx_data.drop(['Population'], axis=1, inplace=True)
bronx_data.to_csv('bronx data.csv')
print(bronx_data.shape)
bronx_data.head()
```

```
(49, 5)
```

	Neighborhood	Borough	Latitude	Longitude	Population
0	Wakefield	Bronx	40.894705	-73.847201	29158.0
1	Co-op City	Bronx	40.874294	-73.829939	43752.0
2	Eastchester	Bronx	40.887556	-73.827806	NaN
3	Fieldston	Bronx	40.895437	-73.905643	3292.0
4	Riverdale	Bronx	40.890834	-73.912585	48049.0

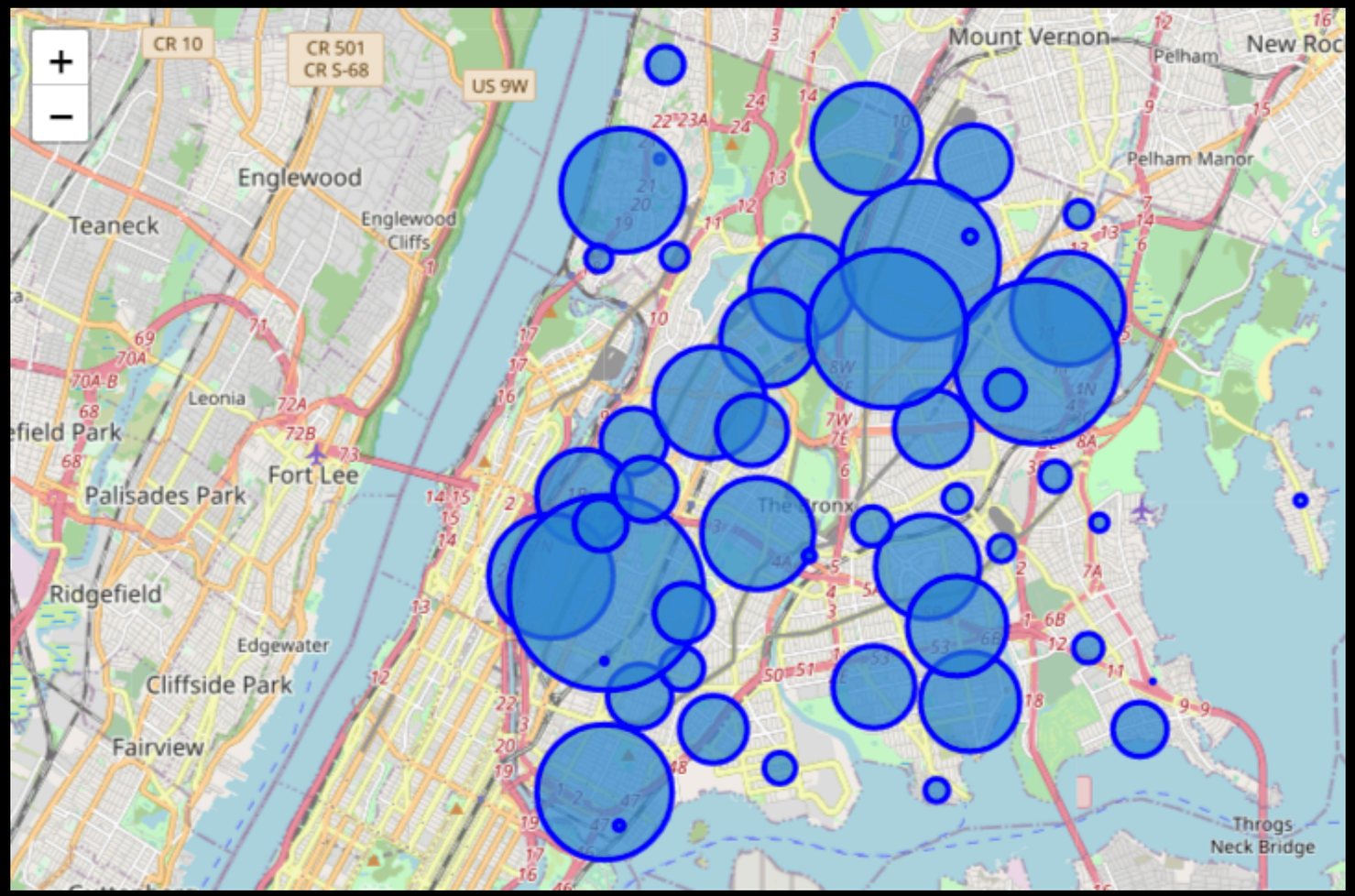
- As you can see, some data was missing. I then used city-data.com, the site Wikipedia uses for populations on its site, to fill in the missing data.

```
bronx_data = bronx_data_updated
bronx_data
```

	Neighborhood	Borough	Latitude	Longitude	Population
0	Wakefield	Bronx	40.894705	-73.847201	29158
1	Co-op City	Bronx	40.874294	-73.829939	43752
2	Eastchester	Bronx	40.887556	-73.827806	10739
3	Fieldston	Bronx	40.895437	-73.905643	3292
4	Riverdale	Bronx	40.890834	-73.912585	48049

BRONX NEIGHBORHOOD POPULATION MAP

- A map was then created to visualize the Bronx and it's population.



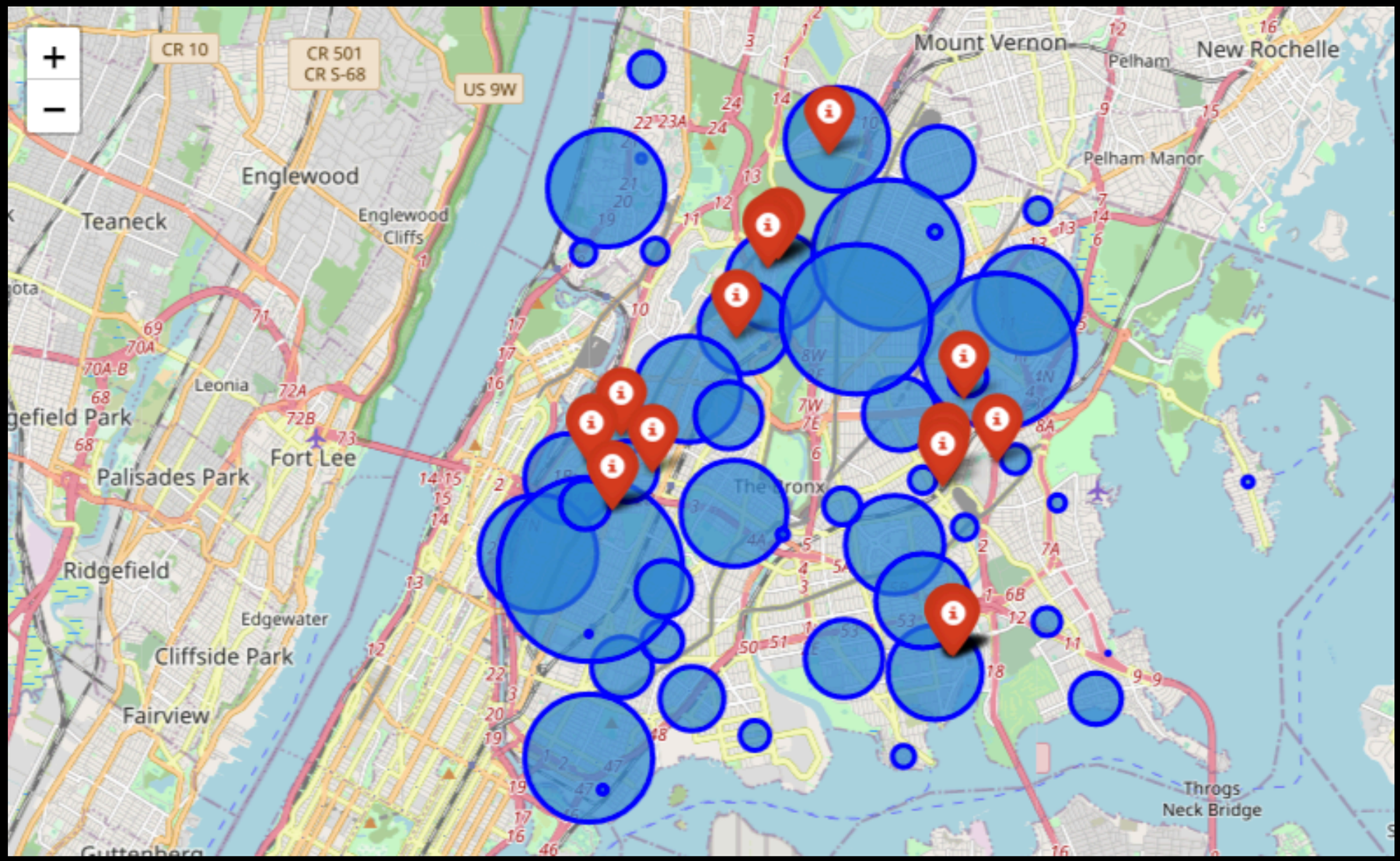
FOURSQUARE API

- Foursquare's API was used to get hospital data. Below is what the data frame looked like.

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Hospital	Hospital Latitude	Hospital Longitude	Hospital Category
0	Woodlawn	40.898273	-73.867315	Station 27	40.896225	-73.869066	Emergency Room
1	Norwood	40.877224	-73.879391	North Central Pediatric Emergency Room	40.879268	-73.881167	Emergency Room
2	Norwood	40.877224	-73.879391	Montefiore Medical Center	40.879938	-73.880868	Hospital

MAP COMBINING NEIGHBORHOOD AND FOURSQUARE DATASETS

- Red markers are hospital and emergency room locations.



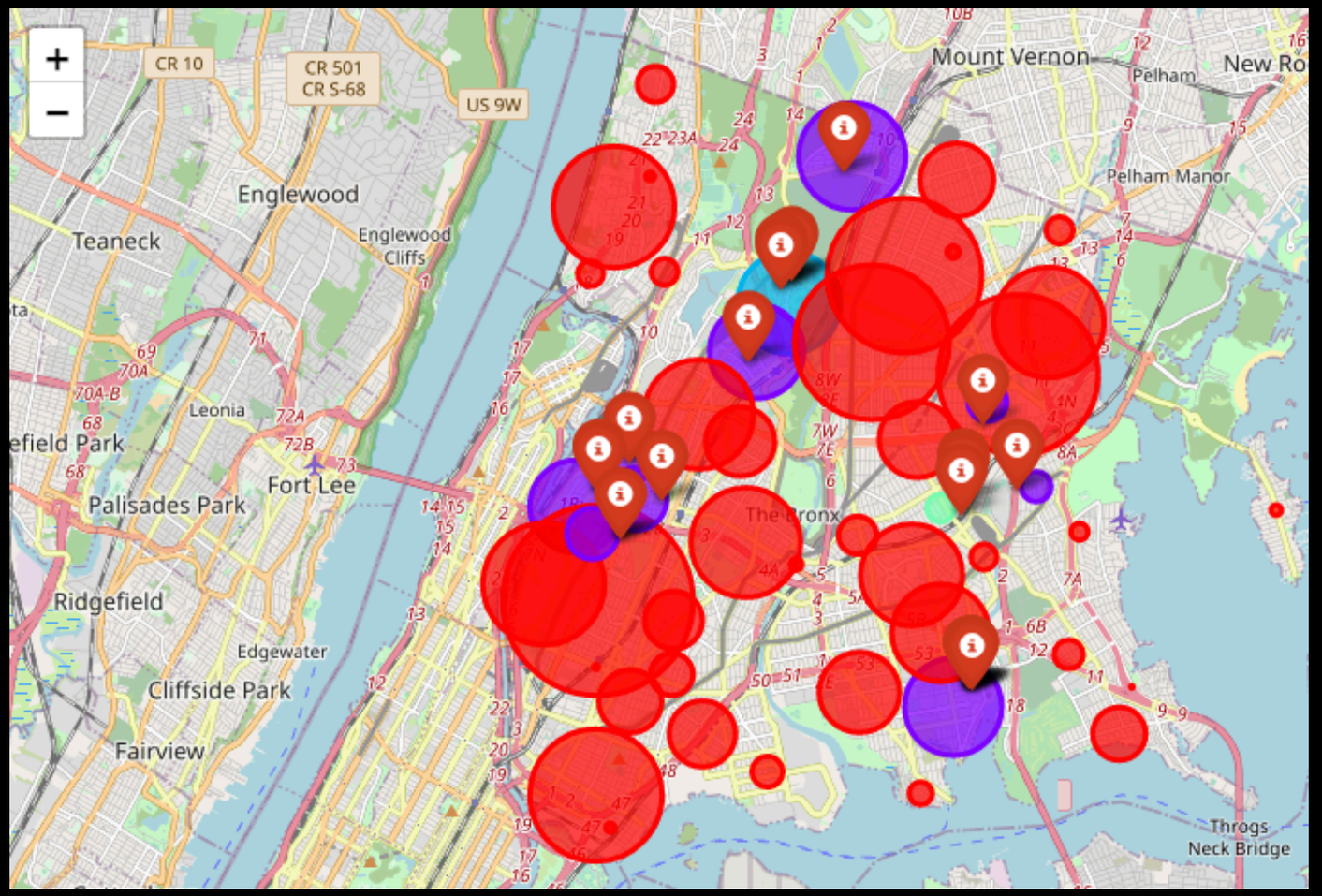
K-MEANS CLUSTERING

- Neighborhood rows that have hospitals and/or emergency rooms were grouped and a mean was calculated.

	Neighborhood	Emergency Room	Hospital
0	Bedford Park	1.000000	0.000000
1	Castle Hill	1.000000	0.000000
2	Morris Heights	1.000000	0.000000
3	Morris Park	0.666667	0.333333
4	Mount Eden	1.000000	0.000000
5	Mount Hope	1.000000	0.000000
6	Norwood	0.800000	0.200000
7	Pelham Bay	1.000000	0.000000
8	Pelham Gardens	1.000000	0.000000
9	University Heights	1.000000	0.000000
10	Woodlawn	1.000000	0.000000

K-MEANS CLUSTERING CONT'D

- Neighborhoods were grouped into 4 different clusters. The red cluster is neighborhoods without a hospital and emergency room.



K-MEANS CLUSTER MAP ANALYSIS

- As you can see, the south eastern area of the Bronx has a large population and does not have a hospital. A temporary medical facility would benefit the people of this are immensely.