

Battle of the DC Neighborhoods- Hospital and EMS (Emergency Medical Services) Availability

Final Capstone Presentation for Chris Odekirk

Introduction and Business Problem

- The purpose of this report is to address a need for anyone that requires near immediate access to hospitals and EMS services (fire stations and police stations).
- Anyone with a medical condition living in or moving to Washington, DC will want to know what neighborhoods have the best access to hospitals and EMS services.
- Washington, DC has 132 neighborhoods. Each neighborhood will be analyzed to determine which one has the best access to medical services.
- Medical services for this report will be limited to hospitals, urgent care clinics, fire stations, and police stations.

The Data

- In order to determine the neighborhood with the best access to medical services we will need to get a list of neighborhoods in Washington, DC and latitude and longitude of each of those neighborhoods.
- The neighborhood data was downloaded from www.opendata.dc.gov.
- There are 132 neighborhoods in Washington DC.
 - The grid coordinate for each neighborhood represents the center of that neighborhood.
- Each neighborhood is analyzed using the Foursquare API.
 - I used a call to the Foursquare API using category ID's for hospitals, urgent care clinics, fire stations, and police stations. Fire stations and police stations were added to the analysis due to their propensity to have ambulances and EMS services at their locations.
 - The call to the FOURSQUARE API returned results of all hospitals, urgent care clinics, fire stations, and police stations within 1000 meters of the neighborhoods center.
- Using the data we then determine which neighborhood in Washington, DC has the best access to medical services.

Methodology

- For every neighborhood in Washington, DC we use the Foursquare API to collect all medical service facilities and EMS services.
- A data frame containing the total number of medical and EMS venues for each neighborhood was created.
- We then applied a weight to each of the four categories:

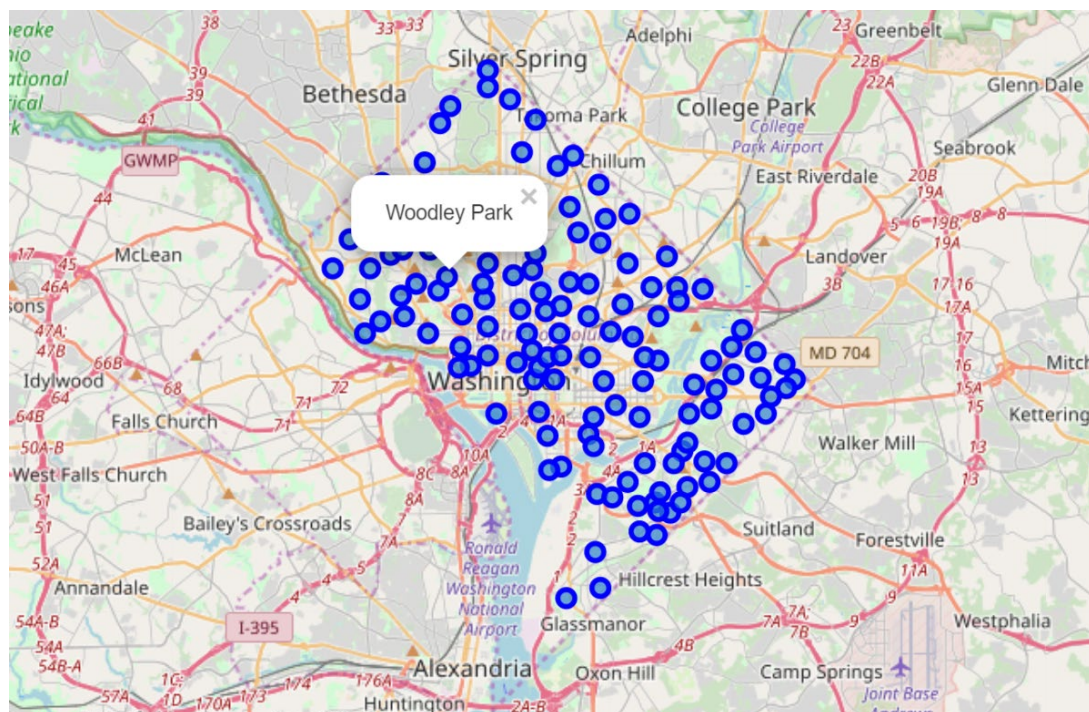
- Hospitals were assigned a weighted value of 2 due to their versatility and the quality of care they are able to provide.
- Urgent care clinics were assigned a weighted value of 2 due to their convenience and ease of access.
- Fire stations were assigned a weighted value of 1.5 due to their general colocations with ambulances/paramedics/EMT services.
- Police stations were assigned a weighted value of 1 due to having fewer medical services on hand.
- The weighted values data frame then ranks the top neighborhoods in Washington DC with the most immediate access to medical and EMS services.

Getting Washington, DC neighborhoods

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[6]: df_dc.head()
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[6]:
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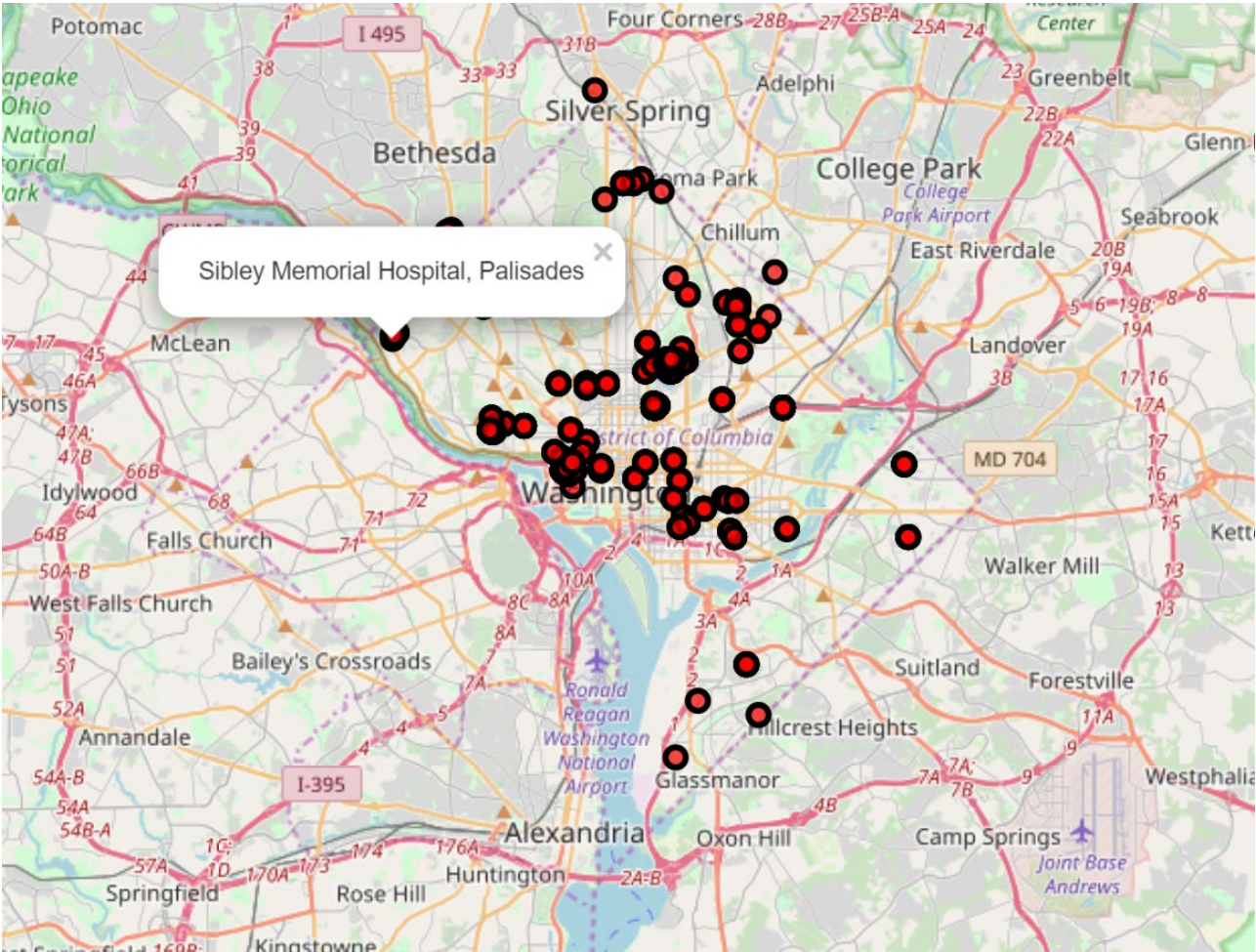
	LATITUDE	LONGITUDE	NEIGHBORHOOD
0	38.855658	-76.980348	Fort Stanton
1	38.841077	-76.997950	Congress Heights
2	38.830237	-76.995636	Washington Highlands
3	38.826952	-77.009271	Bellevue
4	38.853688	-76.967660	Knox Hill/Buena Vista



All hospitals in Washington, DC by neighborhood

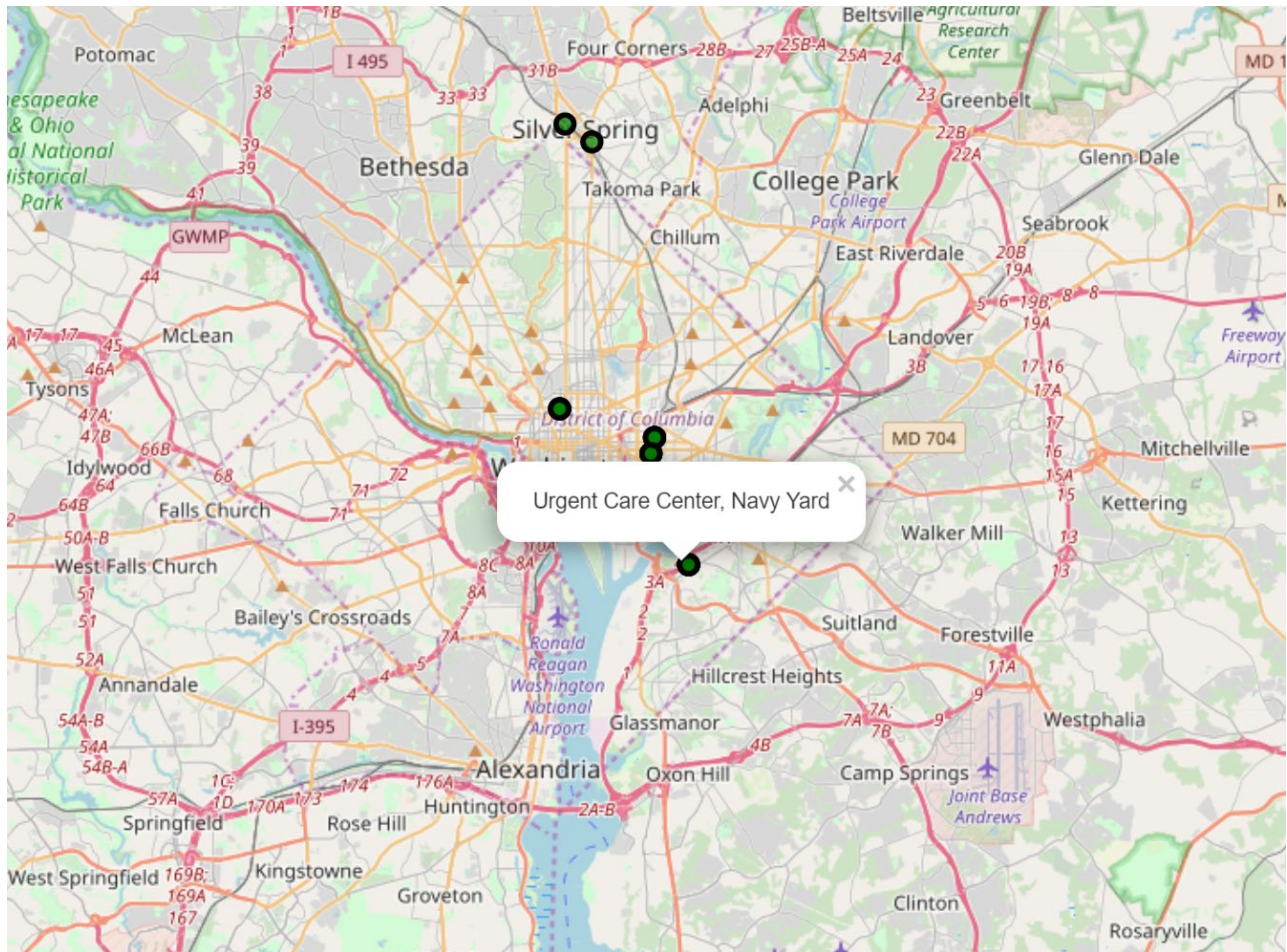
[25]:

	NEIGHBORHOOD	NEIGHBORHOOD LATITUDE	NEIGHBORHOOD LONGITUDE	VENUE	VENUE LATITUDE	VENUE LONGITUDE	VENUE CATEGORY
0	Fort Stanton	38.855658	-76.980348	St Elizabeths Hospital	38.849297	-76.988809	Hospital
1	Congress Heights	38.841077	-76.997950	Congress Heights Senior Wellness Center	38.839839	-77.005264	Hospital
2	Congress Heights	38.841077	-76.997950	St Elizabeths Hospital	38.849297	-76.988809	Hospital
3	Washington Highlands	38.830237	-76.995636	United Medical Center	38.835728	-76.984487	Hospital
4	Bellevue	38.826952	-77.009271	SHW- Hadley	38.824655	-77.012575	Hospital



All urgent care clinics in Washington, DC by neighborhood

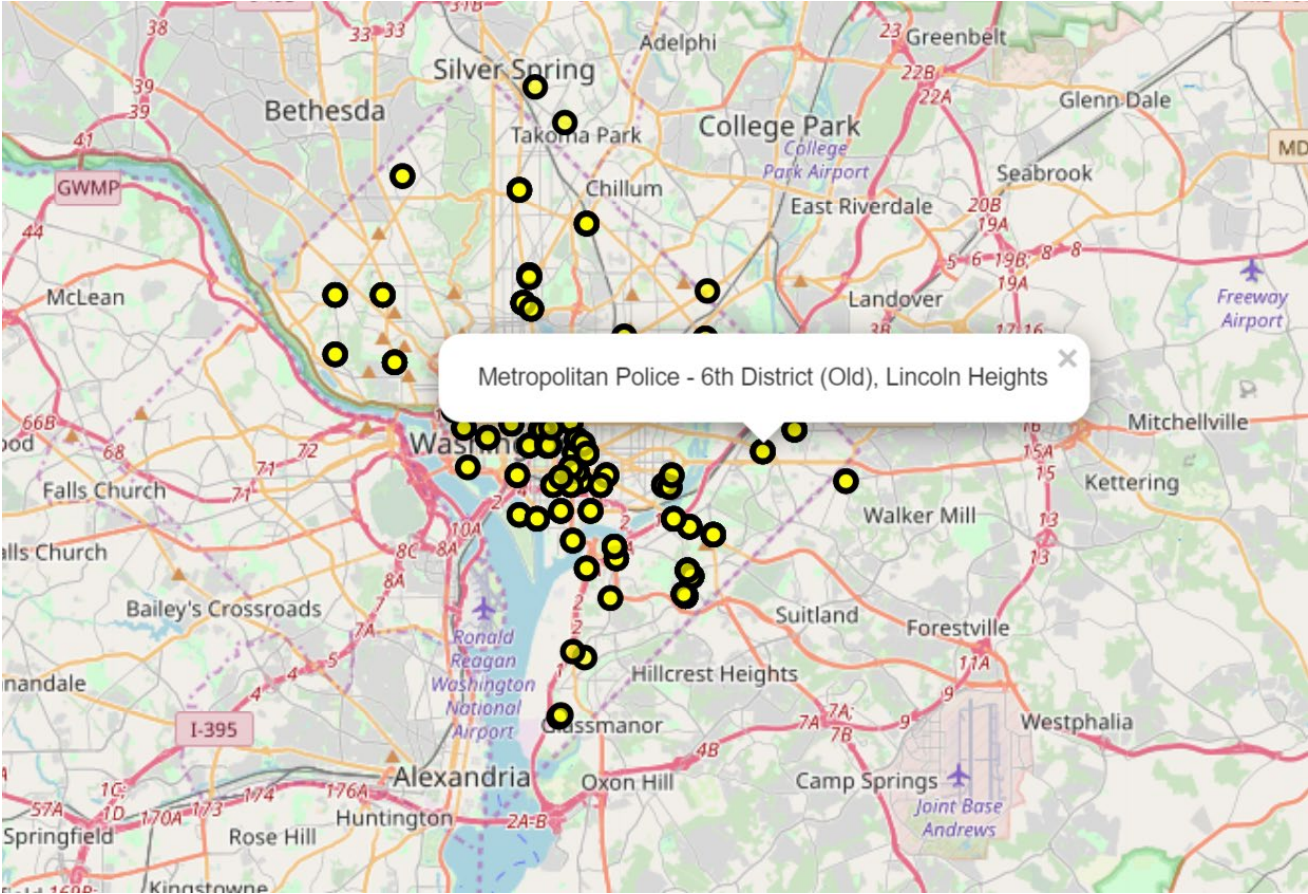
[42]:	NEIGHBORHOOD	NEIGHBORHOOD LATITUDE	NEIGHBORHOOD LONGITUDE	VENUE	VENUE LATITUDE	VENUE LONGITUDE	VENUE CATEGORY
0	Fairlawn	38.869159	-76.977452	Urgent Care Center	38.866032	-76.989372	Urgent Care Center
1	Barry Farm	38.859255	-76.997281	Urgent Care Center	38.866032	-76.989372	Urgent Care Center
2	Historic Anacostia	38.863186	-76.984678	Urgent Care Center	38.866032	-76.989372	Urgent Care Center
3	Cardozo/Shaw	38.917168	-77.027550	Medics USA	38.912613	-77.038839	Doctor's Office
4	Hillsdale	38.858423	-76.990561	Urgent Care Center	38.866032	-76.989372	Urgent Care Center



All police departments in Washington, DC by neighborhood

[40]:

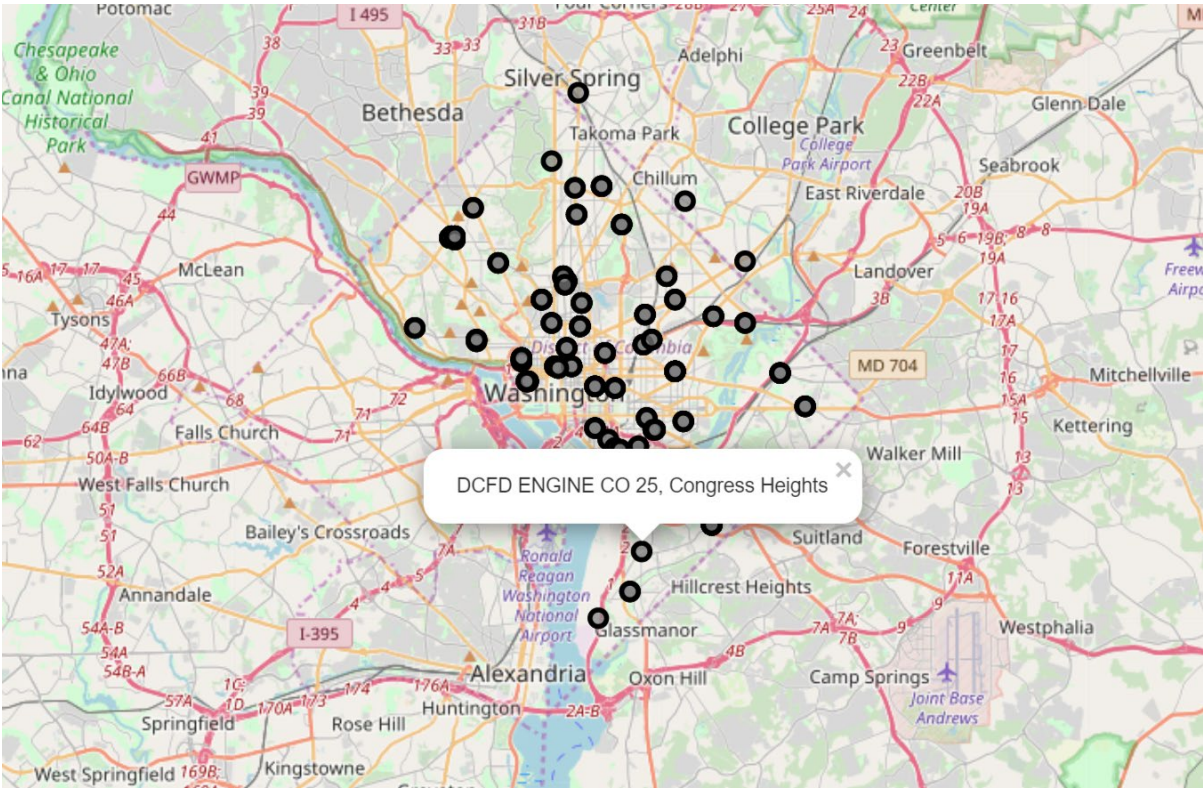
	NEIGHBORHOOD	NEIGHBORHOOD LATITUDE	NEIGHBORHOOD LONGITUDE	VENUE	VENUE LATITUDE	VENUE LONGITUDE	VENUE CATEGORY
0	Fort Stanton	38.855658	-76.980348	Metropolitan Police Department - 7th District	38.853651	-76.969364	Police Station
1	Fort Stanton	38.855658	-76.980348	Sixth District Satellite Station	38.859010	-76.967216	Police Station
2	Fort Stanton	38.855658	-76.980348	MPD 7D Gym	38.854384	-76.970002	Police Station
3	Congress Heights	38.841077	-76.997950	7d Police Department	38.837091	-77.004633	Police Station
4	Congress Heights	38.841077	-76.997950	US Capitol Police Off-Site Screening	38.838776	-77.008734	Police Station



All fire departments in Washington, DC by neighborhood

[44]:

	NEIGHBORHOOD	NEIGHBORHOOD LATITUDE	NEIGHBORHOOD LONGITUDE	VENUE	VENUE LATITUDE	VENUE LONGITUDE	VENUE CATEGORY
0	Fort Stanton	38.855658	-76.980348	DCFD Engine 32 Truck 16	38.852665	-76.971353	Fire Station
1	Fort Stanton	38.855658	-76.980348	Firehouse Flop House (bunkroom)	38.852697	-76.971519	Fire Station
2	Congress Heights	38.841077	-76.997950	DCFD ENGINE CO 25	38.844005	-77.000435	Fire Station
3	Washington Highlands	38.830237	-76.995636	DCFD Engine 33 / Truck 8	38.831036	-77.005139	Fire Station
4	Bellevue	38.826952	-77.009271	DCFD Engine 33 / Truck 8	38.831036	-77.005139	Fire Station



Total count of medical and EMS venues in each Washington, DC neighborhood

[48]:

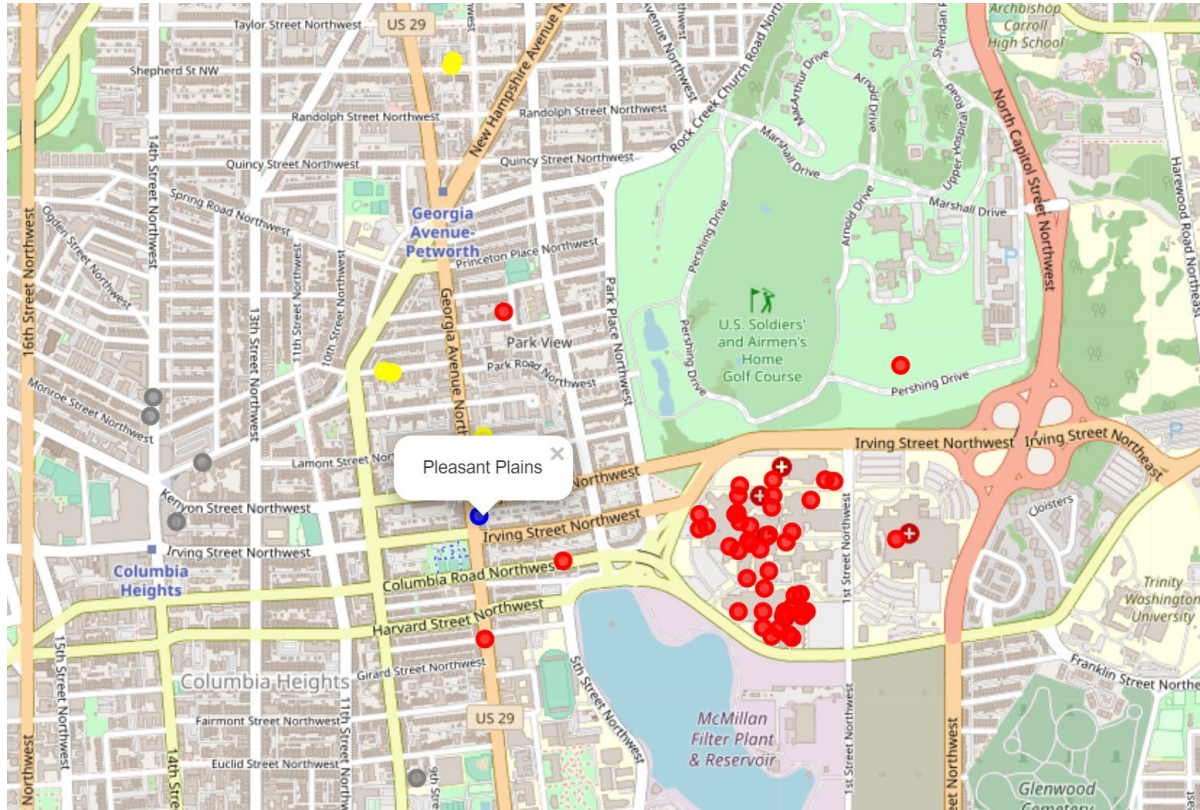
	LATITUDE	LONGITUDE	NEIGHBORHOOD	HOSPITAL	URGENT CARE	POLICE STATION	FIRE STATION
0	38.855658	-76.980348	Fort Stanton	1.0	0.0	3.0	2.0
1	38.841077	-76.997950	Congress Heights	2.0	0.0	2.0	1.0
2	38.830237	-76.995636	Washington Highlands	1.0	0.0	0.0	1.0
3	38.826952	-77.009271	Bellevue	1.0	0.0	2.0	2.0
4	38.853688	-76.967660	Knox Hill/Buena Vista	0.0	0.0	4.0	2.0

Weighted score of each Washington, DC neighborhood

[22]:

	NEIGHBORHOOD	Score
35	Pleasant Plains	107.5
109	Park View	106.0
82	West End	105.5
81	Foggy Bottom	101.5
79	Connecticut Avenue/K Street	99.5
111	Howard University	97.5
80	George Washington University	93.0
40	Stronghold	91.5
63	Bloomingdale	49.5
43	Downtown East	39.0
84	Georgetown	36.0
85	Burleith/Hillandale	34.0
18	Columbia Heights	32.5
106	Dupont Circle	32.0
24	Foxhall Village	30.5
10	Capitol Hill	30.0
100	Glover Park	30.0
110	Le Droit Park	30.0
9	Near Southeast	29.0
39	Chinatown	28.0

Pleasant Plains scores the highest of all Washington, DC neighborhoods



- Red dots indicate hospitals within 1000 meters of the center of Pleasant Plains
- Yellow dots indicate police stations within 1000 meters of the center of Pleasant Plains
- Grey dots indicate firestations within 1000 meters of the center of Pleasant Plains

Results

- After evaluating each neighborhood, it is clear to see that Pleasant Plains has the highest weighted score due to its close proximity to MedStar hospital, the largest private hospital in Washington, DC. There are also five fire stations and five police stations within 1000m of the center of the Pleasant Plains neighborhood.
- Using the Foursquare category ID call, other categories can easily be added to this dataset. Foursquare makes it easy to add venues such as; chiropractors, alternative medicine clinics, pharmacies, etc.

Discussion

- For more accurate analysis, I would recommend filtering through the hospital venues, as major hospitals tend to be listed numerous times when making the Foursquare API call.

- Washington, DC is a large city with many hospitals and medical clinics. Due to the ease of access to health services, I would recommend adding a filter for cost of living for each neighborhood, as that may be a larger discriminator when choosing a place to live.

Conclusion

- After close analysis of all the neighborhoods in Washington, DC, it is clear to see that Pleasant Plains is the most ideal location to live. Pleasant Plains offers the largest hospital in the Nations capital and is also home to five police and fire stations. Further analysis could be done to include home values and rents in the neighborhoods with the best access to healthcare. While this is not a definitive report, it will provide the family with a good place to start when looking for a place to live in Washington, DC.