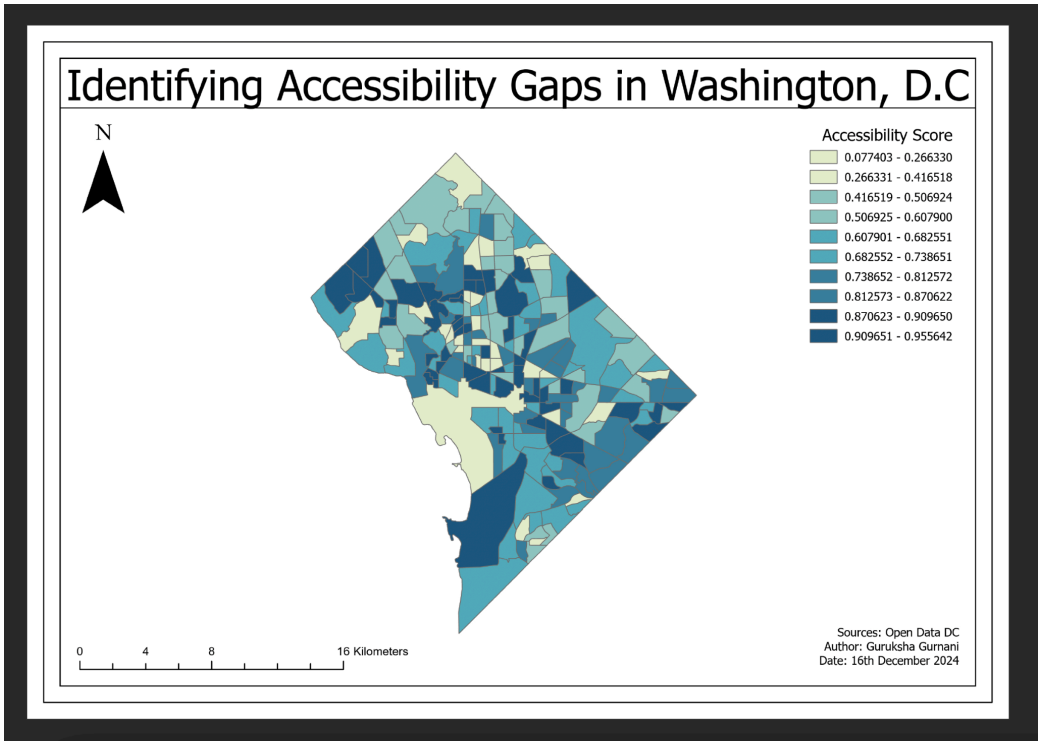
Introduction
Access to primary healthcare is a cornerstone of a well-functioning society, directly influencing population health, well-being, and socio-economic stability. However, disparities in healthcare accessibility persist, particularly in urban settings where physical proximity, transportation infrastructure, and socio-economic conditions create barriers for underserved communities. This project focuses on **Washington, D.C.**, an urban area known for its socio-economic and geographic diversity.

Data Sources :
Census Tracts: Geographic boundaries at the census tract level for Washington, DC (Open Data DC)
Environmental Data: Metrics related to transportation infrastructure and healthcare facilities(physical and mental health access)

TACKLING QUESTION 1:
Which neighborhoods have limited access to primary health care facilities based on proximity and available transport options?

Weighting Rationale:
Buses and Metro were allotted a 20% weightage each. SideWalks and Bike Lanes were allotted a 5% weightage each. Both Physical Health Facilities and Mental Health Facilities were allotted a 25% Weightage each. These weights were assigned based on the importance of contributing to accessibility. On the basis of the weighted composite accessibility score, the map was created and here is the result:



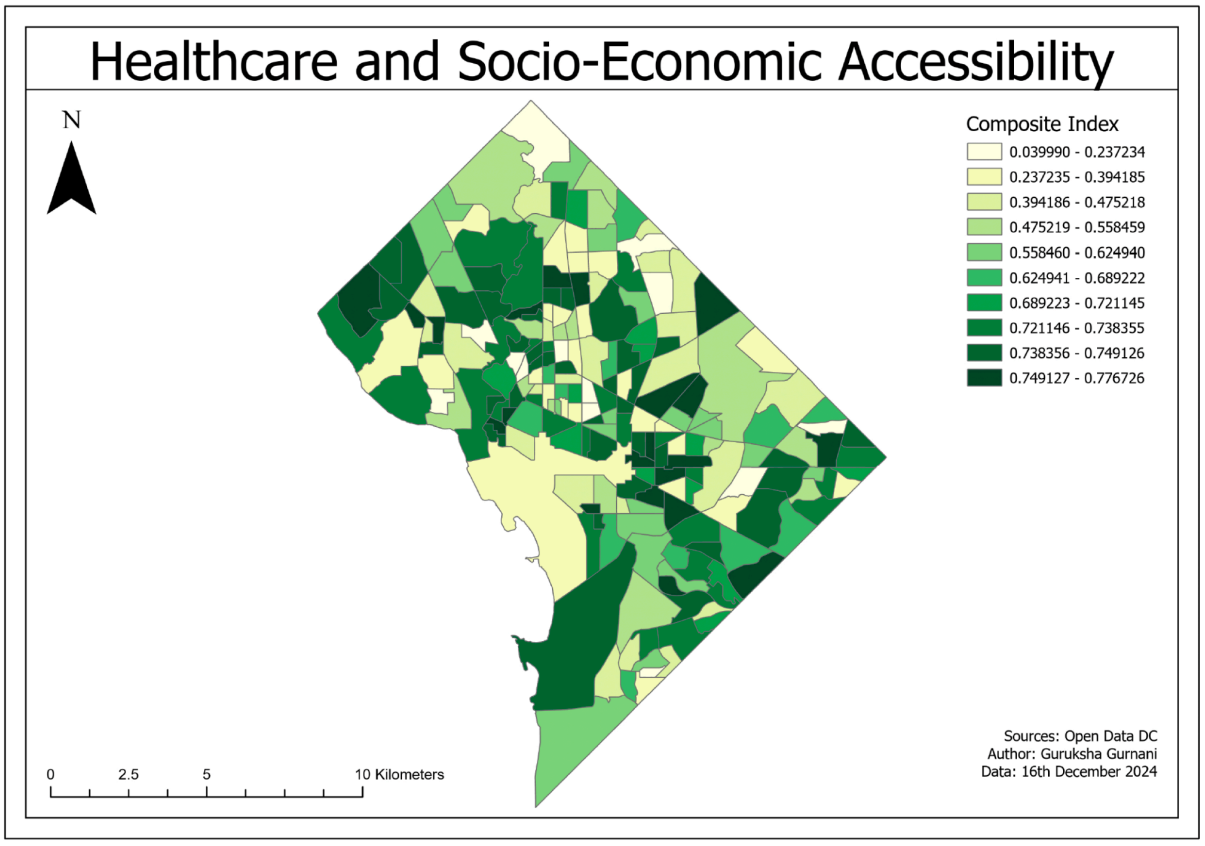
Based on the proximity score and the dataset, the least accessible regions are the one with the least accessibility score, with highest proximity percentile and vice versa

Note: The accessibility score ranges between **0.077** and **0.955**:
Lower Scores (0.077–0.4): Indicate **low accessibility** (underserved areas). These neighborhoods have greater distances to healthcare services and poor transportation infrastructure. Represented by **darker shades** on the map. (Shaded Areas: **eastern and southeastern D.C)**

Higher Scores (0.8–0.95): Indicate **high accessibility** (well-served areas). These neighborhoods are closer to healthcare facilities and benefit from robust transportation options.Represented by **lighter shades** on the map.(Shaded Areas: **northwest and central parts of D.C)**

The map highlights neighborhoods in need of improved healthcare infrastructure and transportation access, enabling more informed decision-making for urban planning and resource allocation.

TACKLING QUESTION 2
How do socio-economic factors, such as income levels and age demographics, correlate with healthcare accessibility in the area?



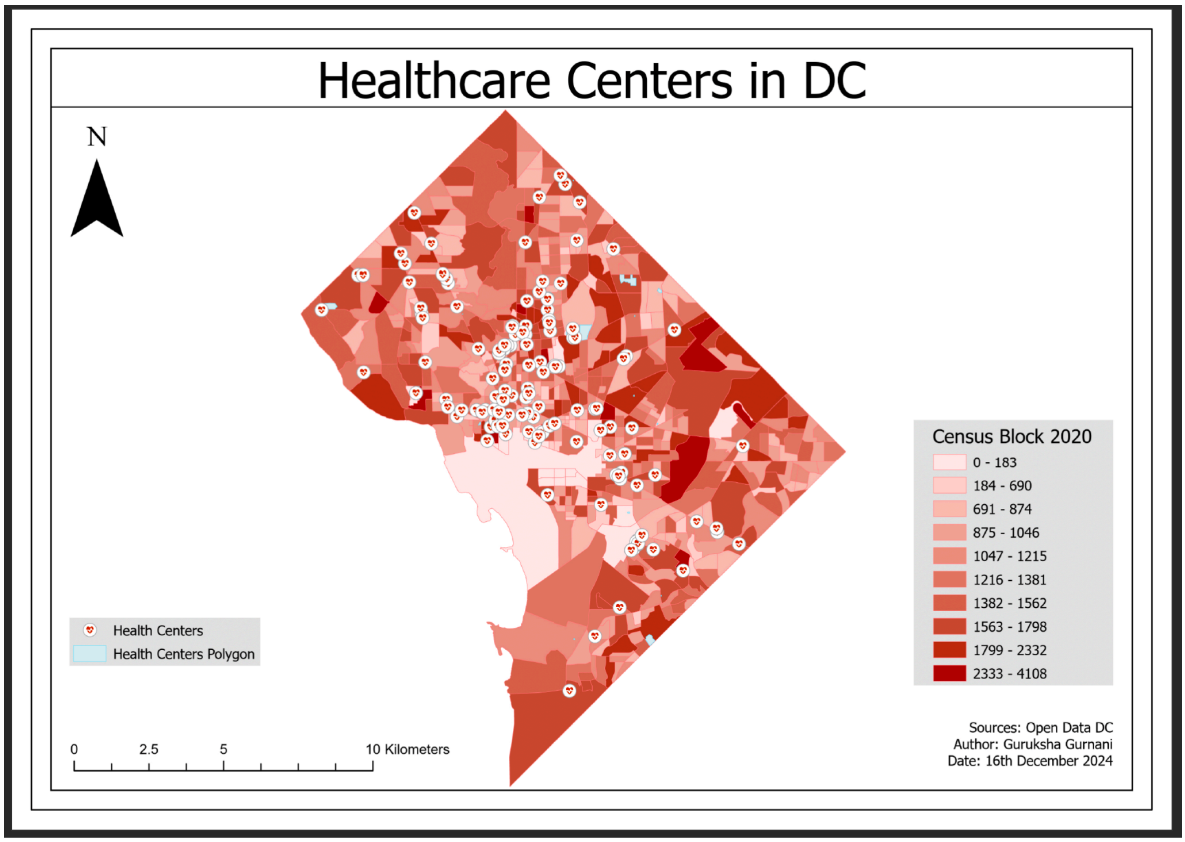
This map illustrates the composite accessibility index across Washington, D.C., incorporating healthcare proximity and socio-economic factors like income and demographics.

Low Composite Index (Lighter Shades): These areas indicate **better accessibility** to healthcare services and favorable socio-economic conditions, concentrated in **northwest and central regions** of DC.

High Composite Index (Darker Shades): These areas face worse accessibility to healthcare facilities and correlate with lower socio-economic conditions concentrated in eastern and southeastern neighborhoods of DC

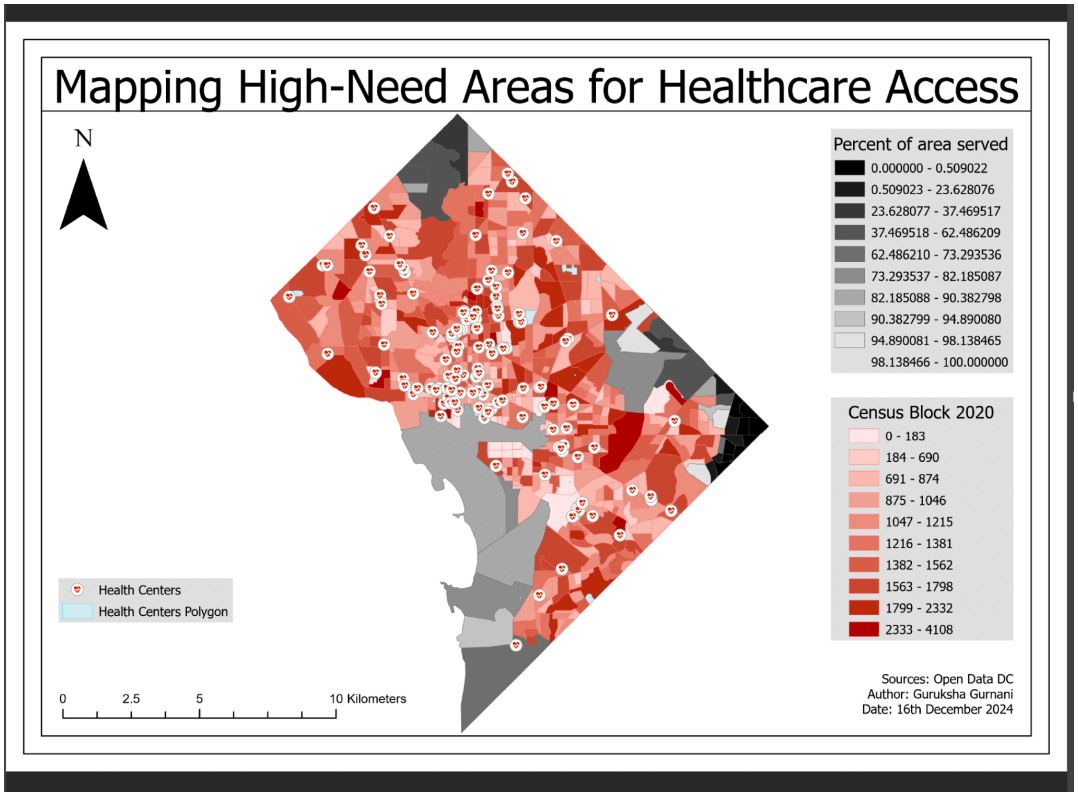
TACKLING Question 3
There are two maps aim to address the third question:
"Where would the placement of new healthcare facilities most effectively increase accessibility for high-need populations?"

The first map:



The map highlights the **population distribution** across Census Blocks (2020 data) using a red gradient, where darker shades indicate **higher population density**.
Healthcare Center Locations: Existing healthcare centers are represented as **red icons**.

Second map:



This map visualizes the **percentage of each area currently served** by healthcare facilities, with:

Darker Gray/Black Areas: Representing regions with low to no coverage (0–50%).
Lighter Red Areas: Representing regions with better healthcare coverage.
Southeastern and Eastern D.C. show the highest unmet need with low percentages of area served.

Conclusion

The findings underscore the critical need to improve healthcare access in Washington, D.C.'s underserved neighborhoods, particularly in eastern and southeastern areas. Future efforts should prioritize:

- Placing new healthcare facilities in high-need regions with high population density and limited coverage.
- Enhancing transportation infrastructure to bridge accessibility gaps.
- Integrating socio-economic support to address broader inequalities impacting healthcare access.

Citations: https://opendata.dc.gov/datasets/DCGIS::built-environment-indicators/about
https://opendata.dc.gov/datasets/c143846b7bf4438c954c5bb28e5d1a21_2/explore?location=38.890547%2C-77.031102%2C10.78