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1st Reflection - NYU Langone Health Evaluation & Analytics Lab

In assisting with research at the Health Evaluation & Analytics Lab (HEAL), my first crucial task focused on understanding the health of homeless populations in New York City. This began by conducting thorough literature reviews on healthcare accessibility and homelessness. I gathered and synthesized findings and developments from academic sources, think tanks, and policy documents, assessing the effectiveness of current intervention programs designed to address the healthcare needs of disenfranchised populations. Additionally, I examined the difference in quality and accessibility of healthcare services between rural and urban areas. This process provided a greater scope of understanding of the socio-economic factors contributing to homelessness and healthcare disparities.

Additionally, I examined the difference in quality and accessibility of healthcare services between rural and urban areas. One significant insight was that metropolitan areas, like NYC, generally have more proximity to emergency facilities due to high population density; however, this proximity does not directly correlate with the efficiency of traditional intervention models in effectively addressing the necessities of homeless populations. Moreover, this finding highlighted the complexity of structural healthcare issues and the necessity for comprehensive care models that account for different individuals and settings. Navigating complex policy frameworks and peer-reviewed papers, in and of itself, was time-consuming, and extracting essential information required significant effort. This first experience has taught me the

importance of organization and critical analysis when dealing with vast and diverse sources of information.

My next task was somewhat open-ended, as I had to find the average distance between any residential address and the nearest emergency care facility. With this question, I developed a Python script using the Google Maps API to calculate the nearest travel distances from user-inputted residential addresses to emergency rooms. I used the Google Maps API *rather than any other external database/source*, as it allows for keyword searches within its parameters and returns real-time, reliable geospatial data about the closest locations, proving crucial for accurate travel distance calculations (*it is also free-of-charge up to a thousand calls/requests*). Using the connected Geocoding API, I converted the residential addresses into geographic values (longitude and latitude). I then utilized the Places API to search for emergency rooms within a specific radius around the given location coordinates. Finally, I used the Distance Matrix API embedded within Google Maps to calculate the travel distance and duration between both identified locations. While developing this program, I encountered many challenges in extrapolating valuable and accurate data for rural areas and needed more access to real-time traffic data. While the former impacted the comprehensiveness of any derived insights, the latter affected the precision of travel-time estimates. However, this process enhanced my proficiency in data/software development and real-time data retrieval and processing. Even learning how to implement APIs with different endpoints and protocols was a critical learning experience as I developed my skills in processing large datasets while maintaining data integrity, which were essential aspects of this task. I ensured that all the data I handled and saved was within the API's terms and conditions, adhering to ethical guidelines.

Moreover, I improved my ability to conduct in-depth, scholarly research through thorough literature reviews, gaining greater insight into the systemic causes of homelessness. Going into this task, I wanted to obtain a nuanced understanding of the issues I would explore extensively. As I proceed with my work, I am confident I can counter any future challenges, having acquired valuable research skills alongside technical expertise. Despite these successes, I still need help with data quality and integration; consequently, I want to work with various data sources and analysis techniques.

Regarding my current research and academic goals, I plan to apply the technical and analytical skills I have gained to advanced projects that integrate live data feeds that provide up-to-date information. In addition, I will continue to assist my research mentor in her work on homeless service systems; I would love to work with third-party healthcare providers and policymakers to implement reformed legislation and drive systemic change that solves the issue. I am also beginning to write my first research paper on this topic with the help of my mentor, intending to submit it to academic journals for publication. Regarding long-term ambitions, I want to develop data migration/management software that can overcome current limitations, provide more feasible insights, and be used in a civic/policy-oriented manner. Furthermore, I am committed to staying updated with the latest technologies and research methodologies to amplify future projects' effectiveness.