Homework 1
Lilly Parham US
MSA 8600: Deep Learning & Gen AI
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Currently, the United States of America continues to push the adoption of electric vehicles, mainly in support of the environmental benefits the nation will reap from switching from fossil fuels to electric. However, many Americans are continuing to purchase gas powered vehicles opposed to electric, despite the many rewards for switching, like tax incentives offered by the government. Personally, I have considered purchasing an electric vehicle, but due to the lack of charging infrastructure near me, an electric vehicle would impose a large inconvenience to my daily life. The only charging station locally to me that I know is across town in a Target parking lot where you can pay to charge your vehicle. I don't have a garage, so even if I were to consider purchasing and getting a home hookup, I have no idea of where this would be even possible to install. I have a friend that lives in the city opposed to the suburbs like me, and although he has way more options and availability to charge his vehicle, in certain parts of town it still appears to be a hassle to do such. This made me think of the everyday problem that potentially affects other consumers like me in the decision to not buy an electric vehicle, which is the lack of electric vehicle charging infrastructure. This is important to study because if charging infrastructure was increased, it is highly likely that more consumers would be open to the switch of gas to electric vehicles.

Overall, this problem can be developed into the clear task: Identify optimal locations for new EV charging stations based on population density, existing charging infrastructure, and current EV ownership rates to improve accessibility and increase EV adoption. This task would specifically aim to address the issue of inadequate charging infrastructure that discourages consumers from adopting electric vehicles, with a focus on understanding where new charging stations would have the greatest impact. This predictive model could be used by potential charging station companies, or development companies to determine where to place new charging stations would be the most beneficial to emerging EV consumers.

To address this task, the ideal dataset would include data regarding location, population, and electric vehicles. Location data would provide geographic coordinates of currently established charging stations available for use. Population data would provide the population density and distribution in the cities, income levels and socioeconomic factors of the cities population, and vehicle ownership data (gas or electric). Electric vehicle data would give the current EV adoption rates by city and trends in their sales.

To evaluate the problem, the performance measure would include the EV adoption impact, which would be the calculated change in EV registrations where the new charging stations were added measure over a specific time period, in comparison to the previous EV registration records in the

area. A utilization rate would also be beneficial to analyze to ensure the new charging stations are being actively used.