City of Boulder EV Charging Station Health Assessment

*Abstract:* The goal of this project was to prioritize electric vehicle charging stations for continued investment and maintenance by the City of Boulder. Charging stations were evaluated based on their use rate, as well as the failure rate of their plugs.

*Design:* The City of Boulder operates 25 electric vehicle charging stations and they are interested in whether they are adequately meeting demand at each station. They are wondering if it would be worth adding plugs to any of the existing station locations and are additionally trying to prioritize the maintenance of the various stations.

*Data:* The [City of Boulder’s data](https://open-data.bouldercolorado.gov/datasets/183adc24880b41c4be9fd6a14eb6165f_0/explore) on electric vehicle charging station energy consumption contains information on the start time, end time, charge time, and energy delivered for 32,635 reported transactions across the City’s 25 charging stations. This dataset was combined with [additional information](https://bouldercolorado.gov/services/electric-vehicle-charging-stations#section-8319) on whether the stations cost money to use and how many plugs are available at each station. Plug and rate info could not be found for three stations (1275 Alpine Ave, 5050 Pearl St, & 900 Baseline Rd). As such, those stations were excluded from this analysis, leaving 26,696 relevant transactions.   
*Algorithms:* The combined data were used to derive information about failure rates per charging event at each station, which was used to better understand which stations are most in need of maintenance. The data were also used to derive the percent of the day that a plug at a given station was in use, which was used to better understand which stations get the most use.   
Tools

* Python (Pandas, Requests, and Beautiful Soup) to scrape info on number of plugs and fee for each station
* Excel to join info on number of plugs and presence of a fee to the main dataset, manipulate data, and generate variables of interest
* Tableau to create an interactive dashboard of results

*Communication:* The data, code, slides, and a link to the Tableau dashboard can be found on my personal GitHub.