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CMSC 12200 Winter 2020
Project Outline
Mapping Environmental Stress Across the United States

01/28/2020

Aim: *Rank America's zip-codes by their relative level environmental welfare*

Build a webpage that allows you to put in your zip code and gives you a ranking of it's environmental health in relation to other parts of the country, showing a graphical representation of environmental concerns in your area.

Theoretical Framework: *Develop a holistic metric to rank and then assign a colour to a map to show levels of relative environmental welfare (If time permits we may want map each individual parameter as well)*

Rank America's zip-codes or geographic regions by their current environmental welfare. We will use data collected by environmental agencies by accessing their API, and by cross referencing data from each data set to develop a relative holistic metric for " eco friendliness" of a given area. This metric is developed from other holistic variables derived from data we deem as general environmental indicators; such as water/air quality. This " eco_var" would have a range of 0.0 to 1.0. A score of 1.0 would be the score of America's most eco friendly zip-code while a score of 0.0 would represent America's least eco friendly zip-code. This variable will be used to map a colour to each area corresponding to a point on a colour gradient from red to blue; 0.0 to 1.0.

Holistic and Composite Variables

0.0 < Eco_Var < 1.0

composed of data from:

EPA (API): https://www.epa.gov/enviro/envirofacts-data-service-api

Data to scrape:

- Contamination/ Waste metric
- General ecological health metric
- Water Quality metric
- Air Quality
- Water Stress / Agricultural metric

DOE (API): https://www.energy.gov/eere/buildings/application-programming-interface
and https://www.osti.gov/dataexplorer/

Data to scrape :

- Green energy score metric
- Per capita energy consumption
- Energy storage capacity

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- It should also give a basic sketch of the work required to complete the project and a timeline for completing it."
- We should begin by fetching data from both DOE (albeit less developed in this one (API is in open beta)) and EPA API's and gather data sets whether from html or csv/xlsx.
- We may want to categorize the data on a data table (json or csv table) and begin colorize them based on each category of data
    - These data require statistical analysis that may be done with pandas and numpy or other statistical libraries that work on json files.
- And look to then compare the aggregate values for overall pollution
- Lastly look to map these values onto a map of the US (or as far as our data reaches)
    - If time permits (as many of these data are time specific (relative to previous years as well, we may want to make a predictive mode)