**MN 125 Engineering Computation**

**Progress Report #1**

This progress report should be completed by the team.

The team leader should submit the report to Blackboard by at least two days before the next recitation section so that your professor can review your team plan.

**Description of Team:**

1. List team members (indicate team leader)
2. For each team member list:
   1. Your major
   2. Whether or not they have had programming experience prior to taking MN125 (if so, list the languages and extent of experience).

Eli Briskin

**Major:** Electrical Engineering

**Programming Experience:**

* Python
* R
* SQL
* Web Development
  + HTML
  + CSS
  + JavaScript
* Basic C++
* Basic Go

Nick McCevoy

We have decided to evaluate the feasibility of solar energy. This is often a popular proposed alternative form of renewable energy but logistical and financial considerations are not often considered in the public conversation. We want to develop tools to analyze the feasibility of solar power – how much can actually be generated, and to what extent can it actually meet current energy needs in the United States?

Fortunately to investigate this topic there are many sources of data available. These include American Census Data, solar data via the National Renewable Energy Laboratory, and Energy consumption data. Below is a table that lists data sources and the specific uses provided for this project:

|  |  |
| --- | --- |
| Data Source |  |
| National Solar Radiation Database  <https://nsrdb.nrel.gov/> | Models solar irradiance data as well as modelling PV power generation estimates |
| American Census Survey  https://www.census.gov/programs-surveys/acs | Provides current energy consumption data by household – will be used to determine current county needs |
| Energy Information Agency  https://www.eia.gov/ | Provides total energy consumption (MMBTU) by US county |

Our project will involve creating an interactive web based application. The user will select a US county, and the app will provide a variety of information pertaining to current energy trends and solar energy potential.

The back end of this project will utilize Python. Python is more suitable for creating web based interactive web applications, and it also contains a variety of libraries that can query the previously mentioned data sources.

The app will specifically be used to provide information about two categories: current energy needs and solar data potential.

*Current energy needs:*

The app currently queries both the ACS data and EIA data to provide household data on the percentage of households relying on certain types of energy (gas, electricitry, fuel etc.) and estimates for annual energy usage (MMBTU – will be converted to kW). This data will be displayed via dashboard design so a user can currently see an overview of energy reliance for a specific county.

*Solar potential:*

The app currently queries the NREL database. This database has solar models which determine annual solar characteristics such as GHI and DNI, which will be displayed. In addition, there is a PV (Photovoltaic) model that estimates the amount of solar power generated by panel placement. A major feature of the app will be to calculate the percentage that solar power can provide in relation to total energy consumption.

**Progress:**

All data has been collected and queried via Python script. In addition, web page is currently in progress (screenshot below). Adding interactivity and programming the backend is the next step.

End goal: An online application that can be accessed remotely.

All current programming files/data are attached.

Graphical user interface, text, application

Description automatically generated