## Topic Idea 1: Wind Energy Production

### Problem Statement

Renewable energy is an important source of energy as we transition from fossil fuels. Fossil fuels contribute to climate change, so increasing our renewable energy production and decreasing fossil fuel consumption would mitigate the effects. The topic of this project focuses on wind energy and weather data about wind speeds in California. The process involved will include comparing wind speeds to how much energy is being produced by wind turbines to see where more wind turbines could potentially be placed to increase the amount of energy harvested. Important words to help the search for data consist of wind, wind speed, weather data, energy production, electricity generation and similar related words.

### Significance of the Problem

This problem has enormous consequences if not dealt with properly—it might not have an impact on people now, but it will have serious repercussions in the future. It is necessary to slow down the effects of climate change to ensure the world is safe for the future. Currently, the average temperature has been rising, causing the ice caps to melt and more natural disasters to occur, so this problem must be addressed. This project could provide useful insight about where to place more wind turbines in the future so the most wind energy can be taken. There are already some resources that attempt to achieve the same results, like the maps from this website: <https://windexchange.energy.gov/maps-data>.

### Potential Datasets

Some potential datasets found were from climate.gov and from the california energy commission (California is specified in problem statement because data was found on wind energy production). The links are provided below. It might be difficult to match the locations and to choose specific locations because there is a lot of data there to go through.

<https://ww2.energy.ca.gov/almanac/renewables_data/wind/index_cms.php>

<https://cecgis-caenergy.opendata.arcgis.com/datasets/4a702cd67be24ae7ab8173423a768e1b_0/data>

<https://www.climate.gov/maps-data/dataset/worldwide-wind-roses-graphics-and-tabular-data>

## Topic Idea 2: Television Database

### Problem Statement

IMDB is the most popular site for information regarding movies, actors, and everything Hollywood. However, it falls a little short when it comes to information regarding television shows, actors, and other key aspects of the small screen that people would like to know. The ITDB (Internet Television Database) can store information such as characters of a different TV show, scripts and transcripts from favorite episodes, actors who have played in TV shows together before, a list of all the characters that an actor has played in a TV show before, etc. Similar to IMDB, but tailored to television shows. In this way, we can learn about how connected the world of popular media and culture is truly connected and provide an entertainment first-stop source for the masses. Important keywords for our dataset search is television shows, actors, character, cable, and channel / network.

### Significance of the Problem

It can be important to consolidate all of the information gathered from the dataset into one location to provide a one-stop database for television watchers. It can help viewers of Netflix, Hulu, and cable alike when they ask themselves questions like “what show has this person been in before?”, “has Person A been in a show with Person B before?”, and other such questions. It can help viewers feel like they are more of a community if they all use a similar database.

### Potential Datasets

<https://www.imdb.com/interfaces/> can provide a starting point to gain initial data on television. Must be added onto because IMDB does not contain enough detailed information about television shows and the different episodes of them.

<http://www.omdbapi.com> paid service that provides relevant data about television. Not likely to be used.

## Topic Idea 3: Asteroid Threat Classification

### Problem Statement

Thousands of small bodies are found in our solar system at any given time. Often, the orbits of these small bodies come close to planets, including the earth. This project would pull data from multiple files to determine which asteroids pose the greatest risk to orbiting satellites and launches based on size and approach distance to Earth. Asteroids would be identified across multiple data sets by their names and the combined data would include diameters pulled from spectroscopic or radiographic data sets with approach distance pulled from the near earth object database.

### Significance of the Problem

Many of the things we rely on in day to day life are based on satellites which orbit the planet. In addition, missions and satellites used to collect data are spread out in the solar system, and any of these missions being hit by asteroids would be a great loss for science and research. By classifying several of the objects in our solar system, we could note which pose greater threats than others, and which to keep an eye on in the future in case anything were to affect their path or otherwise cause them to head towards the earth of any probes in the solar system.

### Potential Datasets

Much of NASA’s data relating to asteroids and other small bodies is available online through the Planetary Science Institute’s Planetary Data System. There is also image data available from the Hubble Space Telescope that is published online.

<https://pds.nasa.gov/>

<https://sbn.psi.edu/pds/>