Purpose: We plan to scrape NOAA Sea-Level Rise (SLR) data from NOAA CO-OPs API and combine with data scraped from California housing datasets in order to identify areas of high risk. Risk is conceptualized in this project as normalized sea-level trend × normalized house value. We will calculate risk scores by applying this formula to the data we scrape from the SLR and Housing API's. We will then construct a simple interactive HTML map of risk that end-users can click on to view regional risks and analyze the distribution of this risk along the California coast.

Program:
1. Downloads all CA stations from NOAA CO-OPS API
2. Retrieves raw water-level time series for each station for the last 30 days
3. Computes linear regression trends (m/year)
4. Saves everything in a single CSV
5. Creates an interactive map using folium and cartopy (ca_stations_map.html) showing:
   a. Station location
   b. Latest water level
   c. General trend calculated in step 3
6. Downloads Housing Cost Burden Data from California Open Data API
   a. Proxy for affordability analysis/vulnerability
7. Downloads California Housing Dataset from 1990s census
   a. Outdated, but useful for setting spatial baselines for housing cost
8. Combines housing data with sea-level trend and coastal proximity to establish general risk scores for comparison
9. Visualizes risk score to identify areas with both high housing costs and high SLR exposure through interactive html map.

Data We Will Scrape
- From NOAA CO-OPS API For Data Retrieval
  - Long-Term Trends
    - Using hourly water-level tide gauge data to create time series for OLS regression
  - Mapping
    - Lon. and Lat. data will be used to visualize the locations of these stations on a map of California's coast
- Downloads California Housing Dataset from 1990s census using sklearn
  - Set spatial baselines for cost
    - Identify relative cost differences between regions
    - Use as proxy for cost in calculation of risk
  - Lon. and Lat. data will be used to map these differences in cost in order to construct risk map using SLR data
- Downloads Housing Cost Burden Data from California Open Data API using sklearn
  - Identifies communities with high vulnerability to the loss of housing
    - Housing cost burden as a proxy for affordability

Packages we will use:
- Pandas
- Requests
- Numpy
- Seaborn
- Matplotlib.pyplot
- Sklearn.neighbors.KDTree
- Fetch_california_housing() method from sklearn.datasets
- Folium
- Geopandas
- cartopy.crs as ccrs
- cartopy.feature as cfeature
- Shapely.geometry
- Datetime
- Scipy.stats
- OS