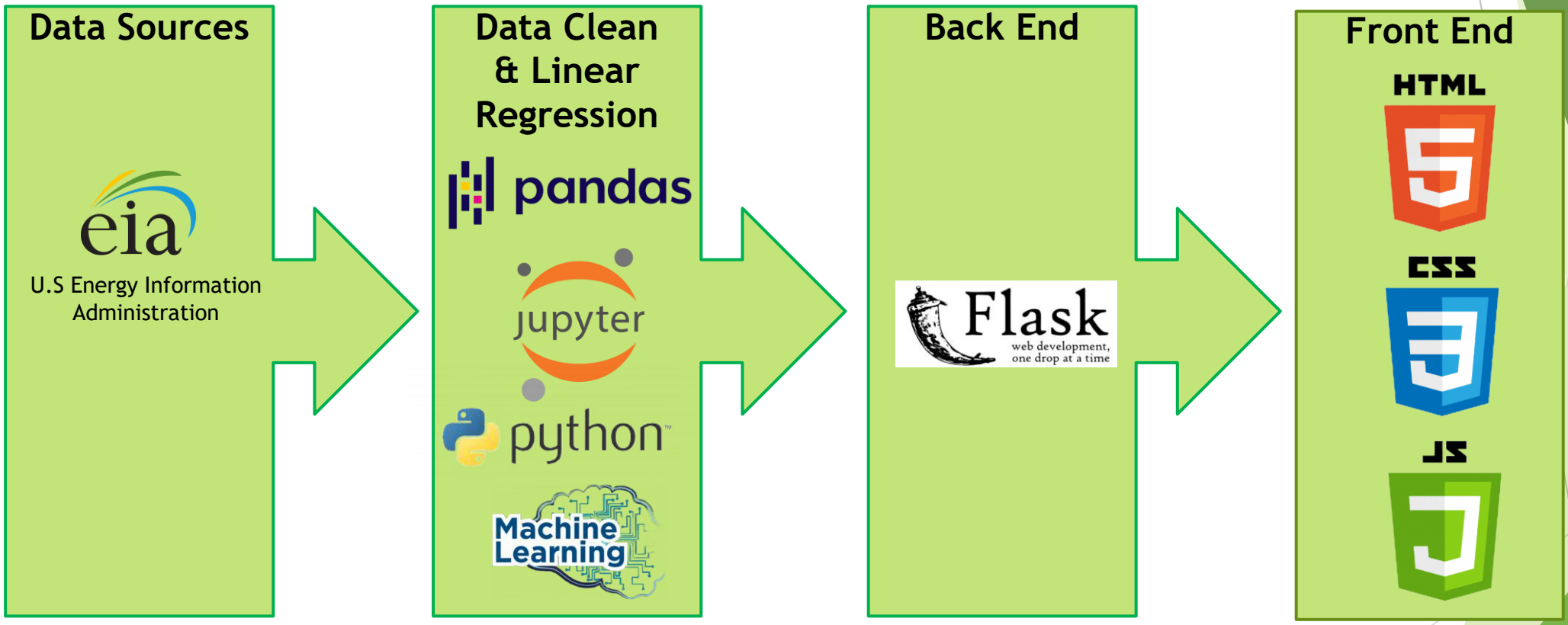
# USA Renewable Energy

Group 5: Artem Iliushin, Bhumi Bhusal, Rafael Tem Pahs, Ryan Callaghan, Ryan Cheng

# Project Description

- Our goal is to use past and current renewable and consumption data to predict which states, by 2035, will be running entirely on sustainable
- Predict which states would not be producing the same amount of renewable energy compared to energy consumption by 2035

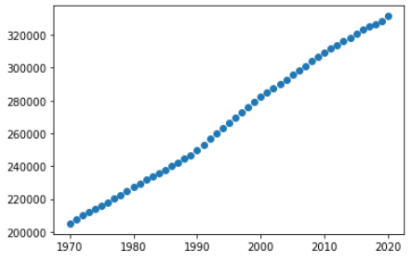
# FlowChart



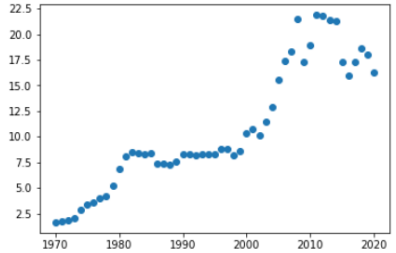
# United States Renewable Energy Linear Regression

- Data was mostly linear for the years 1970 to 2020 and the key features were increasing each year.

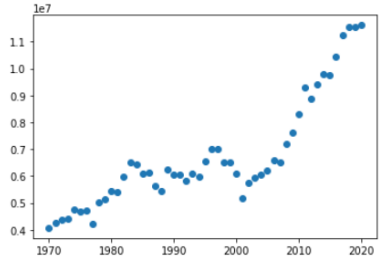

Consumption Scatter




Population Scatter




Price Scatter




Production Scatter

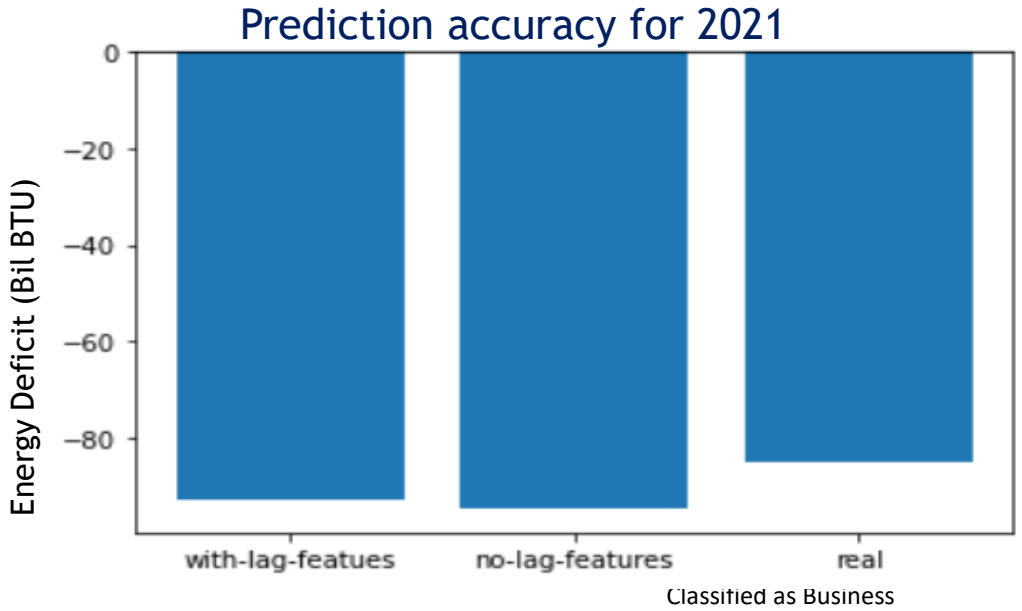
- The features used were population, energy price and renewable production.
- We calculated the renewable energy deficit by taking renewable energy production less the total energy consumption each year.
- We used linear regression model to predict the above features future values for the next 15 years.
- Then we used multiple-linear regression model to predict the renewable energy deficit for the next 15 years.

# Time series analysis with lag features

- Target Variable:

  Deficit = Renewable energy production – Total consumption

| | deficit_t-3 | deficit_t-2 | deficit_t-1 | deficit_t | production | population | price |
|---|---|---|---|---|---|---|---|
| **0** | 0.0 | 0.0 | 0.0 | -63650093.0 | 4070021.0 | 205052.0 | 1.65 |
| **1** | 0.0 | 0.0 | -63650093.0 | -64901781.0 | 4262212.0 | 207661.0 | 1.76 |
| **2** | 0.0 | -63650093.0 | -64901781.0 | -68295199.0 | 4382009.0 | 209896.0 | 1.84 |
| **3** | -63650093.0 | -64901781.0 | -68295199.0 | -71312919.0 | 4410938.0 | 211909.0 | 2.02 |
| **4** | -64901781.0 | -68295199.0 | -71312919.0 | -69172674.0 | 4741851.0 | 213854.0 | 2.87 |



# Web Visualizations