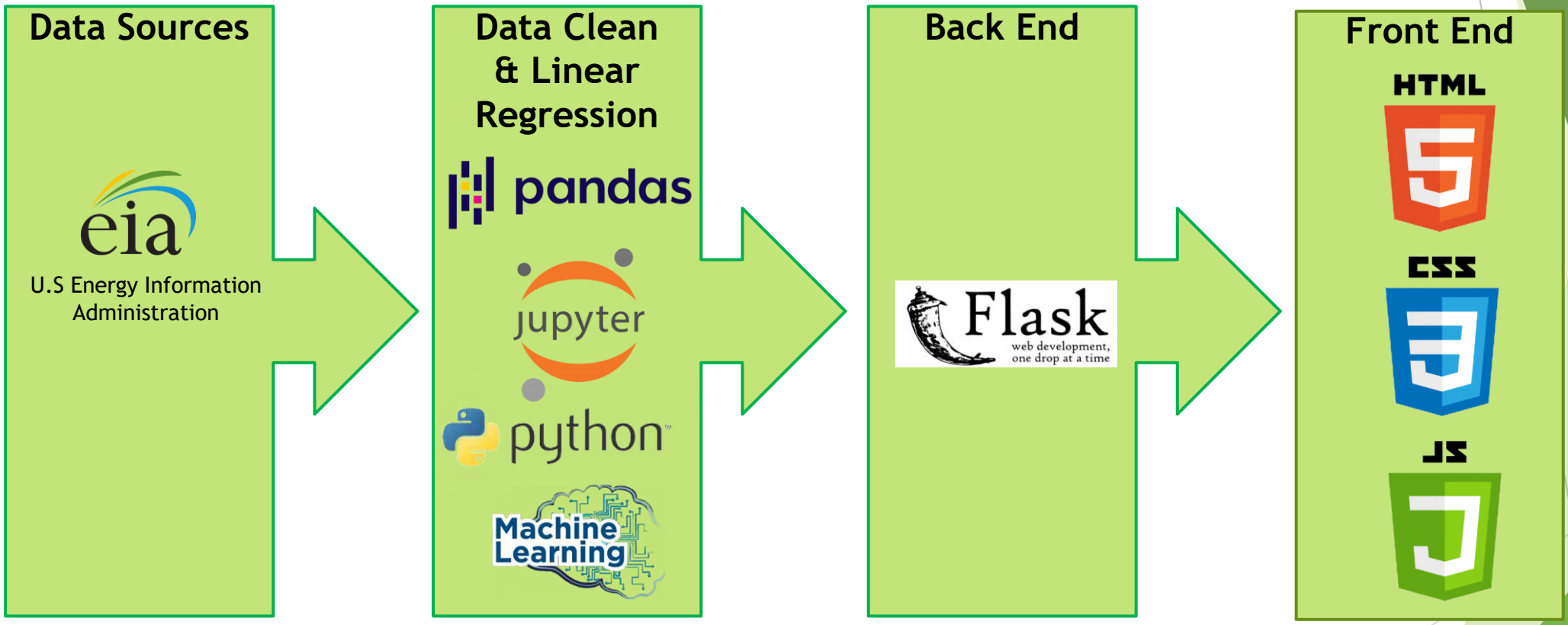
USA Renewable Energy

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

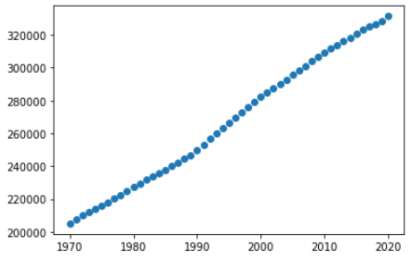
FlowChart



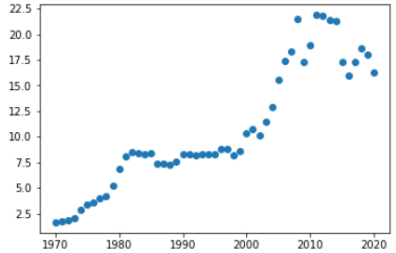
United States Renewable Energy Linear Regression

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

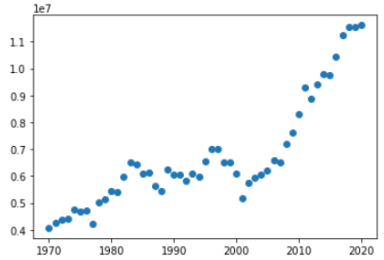
Consumption Scatter



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:

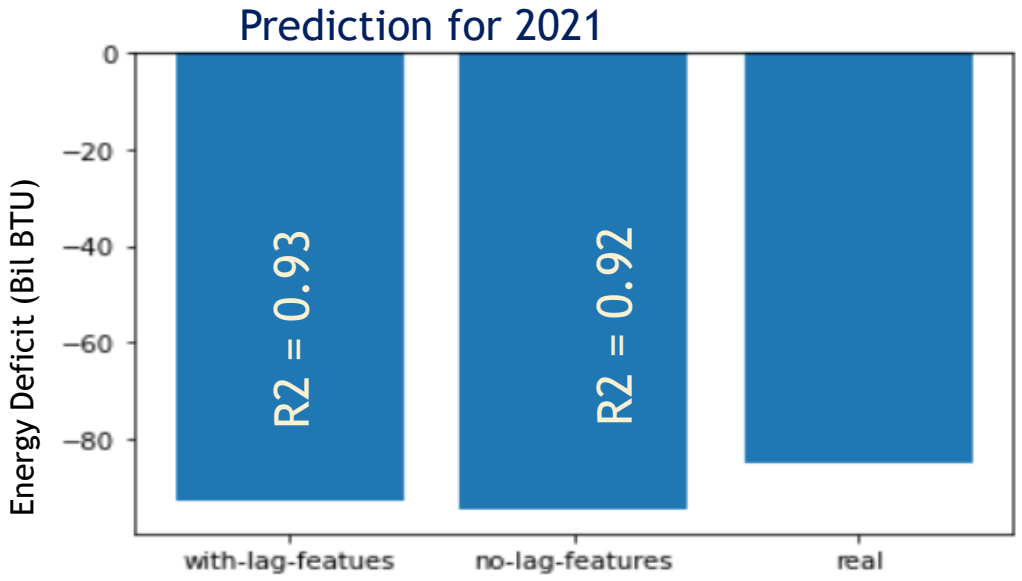
  Deficit = Renewable energy production – Total consumption

	year	production	consumption	population	price
0	1970	4070021.0	67720114.0	205052.0	1.65
1	1971	4262212.0	69163993.0	207661.0	1.76
2	1972	4382009.0	72677208.0	209896.0	1.84
3	1973	4410938.0	75723857.0	211909.0	2.02
4	1974	4741851.0	73914525.0	213854.0	2.87

	year	production	consumption	population	price	deficit
0	1970	4070021.0	67720114.0	205052.0	1.65	-63650093.0
1	1971	4262212.0	69163993.0	207661.0	1.76	-64901781.0
2	1972	4382009.0	72677208.0	209896.0	1.84	-68295199.0
3	1973	4410938.0	75723857.0	211909.0	2.02	-71312919.0
4	1974	4741851.0	73914525.0	213854.0	2.87	-69172674.0
		?		?	?	???

Time series analysis with lag features

	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