MI1 - Project 3: Sea Monsters Checkpoint
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Narrative: Approximately 97% of scientists believe in climate change as a result of human activity [1]. Furthermore, according to Yale climate change maps from 2021, about 72% of people in the United States believe global warming is occurring [2]. Additionally, approximately 57% of people believe that humans are mostly responsible for climate change [2]. As a large portion of the US population and the majority of scientists believe in global warming, it is important to analyze global surface temperature data to understand the trends in the average surface temperature. This analysis is also important because the data can be used to forecast surface temperatures which will help scientists, and the general public, gain a better understanding of what is happening with climate change and how we may need to brace ourselves for the future.

Hypothesis: The data will predict with 75% accuracy the average global temperatures beyond 2015.

Research Question: Can we predict global average temperatures using data collected from 1850-2015?

Modeling Approach: We will be using the SARIMA model for time series forecasting. This model is an offshoot of the ARIMA (autoregressive integrated moving average) model. It is autoregressive in that it uses previous data to make predictions about the future [3]. Being integrated means that the model tries to predict the difference between today's data and tomorrow's data rather than just predicting the raw value for tomorrow. And, having a moving average indicates that the model tries to learn from its mistakes. It means that the model is essentially a function of errors that push the predictions closer to the correct prediction values [4]. Given that we are using climate data that is seasonal, we must use the SARIMA (seasonal autoregressive integrated moving average) model rather than ARIMA. Put simply, SARIMA accounts for any seasonal patterns that exist in the data by including seasonality as a predictor for future values [4]. By using this model, we will be able to make predictions from our data while still accounting for the seasonality that exists naturally within it.

References:

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