Synengco Challenge

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Thank you for giving me the opportunity to work on this challenge. I spent about 2:30 hours on it, and I believe my answers met the goals of the challenge (including the bonus points).

At first, I imported tabular Data from CSV files into Pandas Dataframes. I downloaded the electricity demand for April 2020 from AEMO and loaded it to Dataframes as well. Then I reshaped the prediction and actual data to make them suitable for the information that I wanted to extract.

I averaged data from 5 years to construct the baseline of seasonally adjusted 2020 Queensland electricity. My approach was not that accurate, since I didn't consider leap days (the extra added day at the end of February). But my second approach was accurate; I constructed a function that can give a prediction for the selected day. I created a similar function for the actual data as well. These functions can be used to find electricity demand for different time intervals. I used those functions for plotting; I provided visualization for each selected day in April (the plot allows users to select the day). Also, I provided visualization for an entire week (I selected the first week of April as an example).

By comparing the prediction and the actual graphs, I can observe that the morning peaks slightly shifted to a later time. This makes sense since people didn't commute to work during the lockdown period and could wake up later. On the weekly scale, the prediction and actual demands followed a very similar trend (decreasing on weekends, and increasing on weekdays). But the increase in overall demand is very strange! I didn't expect that huge difference, I even expected a reduction in demand because of the lockdown.

If I had more time, I would check the trends for other months in 2020 to validate my findings, and I would double-check my code to find any possible mistakes. Also, I would use a convolution network to create a more accurate predictive model. The model would be stronger if we could have more data (more years) or if we could add more features such as historical weather data (raining and temperature).