

### **Ideas for Predicted Actual Shipments By Week Aggregated (Current Model)**

- Remove outliers from the training set but not from testing to remove influence from noise during the prediction process.
  - Pros: Reduce Data ie. computation time, remove noise
  - Cons: Could be removing relevant data to help the model generalize
- Use previous Actuals and Latest Estimates (4-6 weeks previous for each test point) to predict Actl Ship Usd instead of Omitting them completely from inputs of Neural Network.
  - Pros: If incorporated correctly will greatly improve the prediction accuracy because of the high correlation between Actl Ship Usd and other Actuals/Latest Estimates. Three methods of doing: add a column to the test set outside the network, add a column to the initial dataframe, or make the network. Seems easiest to add the column to the initial dataframe
  - Cons: Greatly Increase computation, hard to implement with range of values will need to be done incrementally, There may be ranges where values are not present. If we make the network do this process it can be difficult.
- Use external economic data as indicators for the Actl Ship Usd
  - Pros: More Features, It is more important in the current time period to consider economic metrics like inflation and their impact on product sales, as demonstrated by periods like COVID. Not that much more computationally expensive.
  - Cons: More Data, have to spend a lot of time modifying the economic data to merge with the internal dataset.
- Use correlation coefficient as a form of weights in the Neural Network
  - Cons: May throw off the network, Network may already be doing this could just ruin computation time
- Find a Sales Prediction Model on the internet and try to mimic its style
- Remove Categorical Features that did not convert properly when changing the data frame to a completely numeric data frame
- Try to find instances of multicollinearity and remove them. Will be difficult to do as there are a lot of features to choose from

### **Future Priorities**

1. Analyze the Research Question: Is economic indicator a good indicator for Actual Shipments By Week USD? Do this by comparing the created models to models with the same architecture but removing the economic data as inputs to the Neural Network. Use metrics like rmse and average to determine the respective impact.
2. Try a model with external bought dataset that compares and contrasts the success and failures of Kel versus their competitor brands
3. Create a Dashboard with economic models' results