Prediction and Analysis of Seasonal Dynamic Steel Consumption

1 Data Analysis and Pre-processing

Understanding the data distribution and structuring it based on the observations

2 Feature Engineering and Algorithm Selection

Introducing lag features including rolling mean, consumption trends etc, to integrate temporal features.

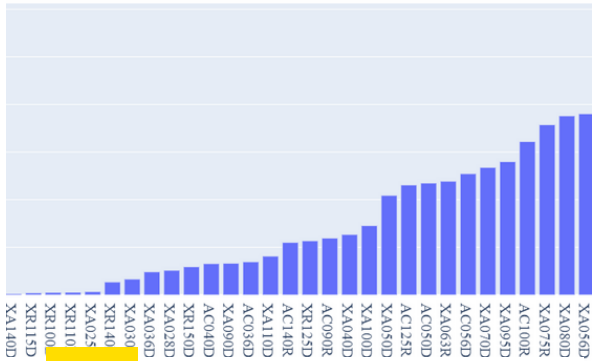
3 Results

Finding results and outputs of our trained machine learning model

Objective

To predict the amount of steel consumption required in the next 1 month interval.

•Reduce lead time by allowing pre-ordering
•Reduce material wastage
•Allows room for storage space



Inputs

- Data consists of daily consumption 35 steel types from April 2014 to March 2019
- Each metal represented by a material code can be divided into material type, section and material number
- Converting date into month part, month and year, along with continuous time series

Procedure

•Model trained on daily data
•Model draws out the hidden trends and cycles
•Extends the Dataset
•Results are aggregated on a monthly basis

Algorithms used:

- Random Forest
- Light Gradient Boosting Machine
- eXtreme Gradient Boosting
- Categorical Boosting

Output

- We have forecasted specific steel requirements for the coming month so that they can be added to the inventory before orders come in.
- This will significantly reduce the lead time by removing the time taken due to the material acquirement period.
- Inventory space is also saved by allocation to the relevant material type, thus reducing wastage of space.
- Furthermore, integrating additional methods such as safety stock reduces any backlog of material