Item Demand Forecasting

Problem Statement

Demand forecasts are fundamental to plan and deliver products and services. Accurate forecasting of demand can help the manufacturers to maintain appropriate stock which results in reduction in loss due to product not being sold and also reduces the opportunity cost (i.e. higher demand but less availability => opportunity lost). Despite such relevance, manufacturers have difficulty choosing which forecast model is the best for their use case. In this project, historical sales data corresponding to multiple(25) items sold in 10 stores are provided and participants are expected to come up with a best model to predict the future demand for products which results in maximum profit for the manufacturer. In general, the manufacturer incurs a loss of Rs. 10 for each item that is not sold (retention cost) and incurs an opportunity loss of Rs. 3 for excess demand. **Predict the demand for the next 3 months at the item level (i.e. all the stores combined).**

Data

The historical sales data is available here. The item, store and sales details are provided at the daily level for a period spanning 4 years.

Minimum Requirements

The end objective of the participant is to produce a model that gives the best **profit** to the manufacturer (i..e strikes a balance between the opportunity cost and retention cost). Such a model must include the seasonality of the items sold.