

The following document outlines the high-level functions and approaches used in the code files for the Best Buy Case competition.

Code File Name	Overview
Data Preprocessing	Preprocessing the data like treating missing values, data imputation, etc.
CROSTON_ARIMA_MA_Implementation	Implementation of Time series methods such as Croston, ARIMA, and Moving average for forecasting daily units
Daily_Units_LGBM_Forecast_Model	Implementation of LightGBM for forecasting daily units
LGBM_Forecast_Final_Model	Part 0 - Aggregation and Feature Engineering Part 1 - Weekly Sales Unit Prediction Part 2 - Proportion of Weekday on Historical Data Part 3 - Final Model Evaluation

Final Model:

1. Approach:

We implemented a approach for forecasting weekly sales units using tree-based models, followed by desegregation using proportions for each weekday using historical data.

This approach involves using a tree-based regressor model such as LGBM to forecast weekly sales. This model is trained on historical weekly sales data and makes predictions for future weeks.

The second step of this approach involves using a subset of historical data to calculate a suitable proportion of weekly sales for each weekday.

Finally, the daily units are forecasted by multiplying the predicted weekly sales from the first model with the calculated proportion of sales for each weekday. This approach allows for a quite accurate forecasting of daily units by considering the overall trend of weekly sales and the sales distribution patterns over weekdays.

2. Features Used:

- Date and Seasonality
- Lag indicators (1, 7, 14, 30 days)
- Price availability variables
- Weekly stats of price variables
- Weekly cumulative stats on categorical variables

3. Exogenous Data Sources

- Monthly Consumer Sentiment Index – UMich (<http://www.sca.isr.umich.edu/files/tbmics.csv>)
- Monthly Inflation Rate – CPI (<https://www.usinflationcalculator.com/inflation/current-inflation-rates/>)
- Monthly Housing Prices – DQYDJ (<https://dqydj.com/historical-home-prices/>)