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 - Forecasting Proportion of Weekday using LGBM model Part 4 - Clubbing models in Part 1 and Part 3 to forecast daily sales Part 5 - Final Model Evaluation

Final Model:

1. Approach:

We implemented a two-step approach for forecasting daily units using tree-based models.

The first step of this approach involves using a tree-based regressor model like 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 another tree-based regressor model to predict the proportion of sales for each day of the week. This model is trained on historical data of the proportion of daily sales within a week.

Finally, the daily units are forecasted by multiplying the predicted weekly sales from the first model with the predicted proportion of sales for each day of the week from the second model. This approach allows for more accurate forecasting of daily units by considering both the overall trend of weekly sales and specific sales patterns within each week.

2. Features Used:

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