**Brain Storming Document**

**Project Overview:**

The scope of the project includes the following:  
• Analyze historical sales data to identify patterns and trends in customer buying behavior.

• Develop a machine learning model to forecast future sales for different product categories and time periods

• Evaluate the accuracy of the model and identify opportunities for improvement

• Provide a sales forecasting report with insights and recommendations for the grocery store

Brainstorming Session:

During a brainstorming session, the following ideas and considerations were discussed:

**Historical Sales Data**: Historical sales data will be used to develop the forecasting model. The data will be analyzed to identify patterns and trends, as well as to determine any seasonality or cyclical patterns that may influence sales.

**Market Trends**: Market trends will be analyzed to identify external factors that may influence sales, such as changes in consumer preferences, economic conditions, and competitor activity.

**Data Cleaning and Preprocessing**: The historical sales data will need to be cleaned and preprocessed to ensure that it is accurate and reliable. This may involve removing outliers, filling in missing data, and normalizing the data.

**Model Selection**: A variety of time series forecasting models will be considered, such as ARIMA, Exponential Smoothing, and Prophet. The selected model will be based on the accuracy and reliability of the forecasts, as well as the complexity and ease of implementation of the model.

**Hyperparameter Tuning**: The parameters of the selected model will need to be tuned to optimize the accuracy and reliability of the forecasts. This may involve adjusting the smoothing factors, the seasonality periods, or other parameters of the model.

**Validation and Testing**: The forecasting model will need to be validated and tested to ensure that it is accurate and reliable. This may involve comparing the forecasted sales data to actual sales data, as well as conducting sensitivity analysis to determine the impact of changes in the input variables on the forecast.

**Visualization and Reporting**: The forecasted sales data will be visualized and reported to stakeholders, such as sales and marketing teams, supply chain managers, and senior management. This may involve the use of dashboards, charts, and other visualizations to communicate the forecasted sales data in an easily understandable way.

**Maintenance and Updates**: The forecasting model will need to be maintained and updated on an ongoing basis to ensure that it continues to produce accurate and reliable forecasts. This may involve retraining the model with new data, adjusting the model parameters, or adding new variables to the model.

By brainstorming these ideas and considerations, the team can develop a comprehensive and effective Time Series Sales Forecasting Model that meets the needs of the consumer goods company and supports its business decision-making processes.