Joint Tech Internship Community Program

Generative AI Consortium (MSME)

SystimaNX IT Solutions Pvt Ltd.

AI/ML Internship - Deep Learning

Assignment 2

Demand Prediction

Designing Phase Document

Submitted by:

S.K.Surya Prasath

B.Suriya Balaji

Pagalavan.K.S

BE Computer Science

Kongu Engineering College

Design Document for Demand Prediction

1. Introduction

This design document outlines the key decisions made during the design phase of the demand prediction project. It serves as a reference for implementing the project efficiently.

2. Training/Test Data Split

- **Split Ratio:** The dataset will be split into an 80%-20% ratio for training and testing, respectively.
- **Rationale:** This ensures a sufficient amount of data is available for training while providing a robust evaluation of model performance on unseen data.

3. Acceptable Error Rates

- **Mean Absolute Error (MAE):** The target MAE for the prediction model is set at less than 50. This threshold is chosen based on domain knowledge and stakeholder expectations.

4. Machine Learning Algorithms Used

- **Algorithms Chosen:**
  - LightGBM: Known for its efficiency and performance with large datasets.
  - XGBoost: Provides robust performance and accuracy through gradient boosting.
  - Random Forest: Offers resilience against overfitting and can handle high-dimensional data.

5. Outlier Removal

- **Outlier Handling Strategy:**
  - Implement capping to remove extreme values in the target variable ('Demand') by replacing them with the 95th percentile value. This helps maintain model performance by reducing the influence of outliers.

6. Dimensionality Reduction Decisions

- **Feature Selection:**
  - Use a combination of feature engineering and selection methods to ensure the model is trained on relevant features, reducing noise and enhancing interpretability.

7. Conclusion

This design document captures the critical design decisions and strategies for the demand prediction project. It serves as a comprehensive guide for implementation and ensures that all team members are aligned on the project goals.