



SIMATS ENGINEERING

Saveetha Institute of Medical and Technical Sciences
Chennai- 602105



Student Name: Parameswari.R

Reg. No.:192324118

Course Code: DSA0613

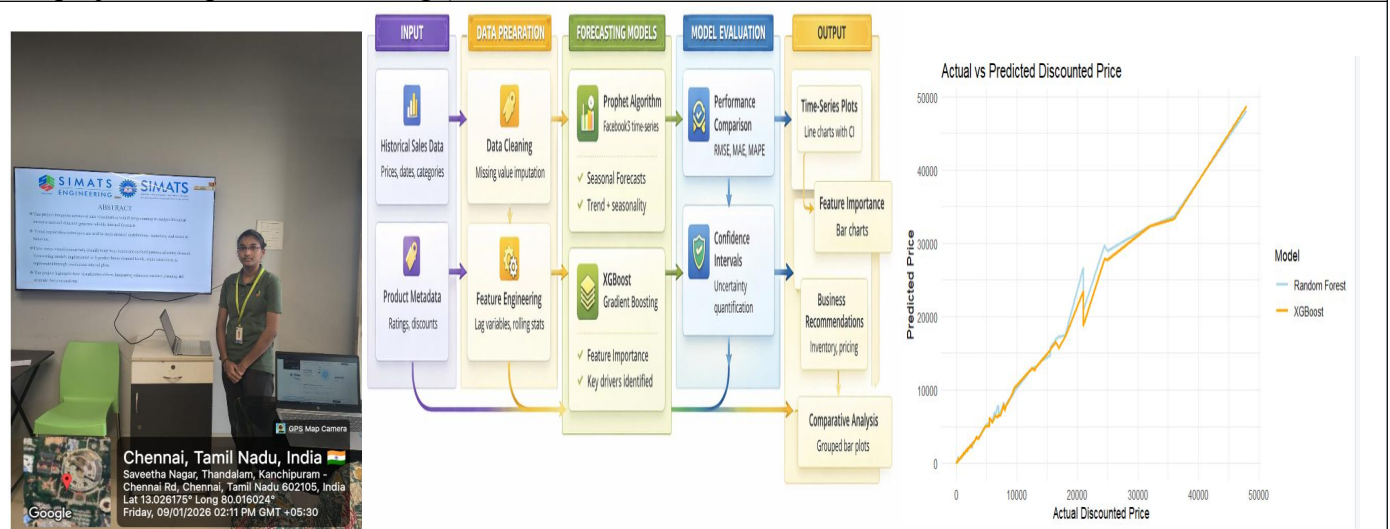
Slot: A

Course Name: Data Handling and Visualization for Data Analytics

Course Faculty: Dr. Kumaragurubaran T, Dr.Senthilvadivu S

Project Title: Integrating Advanced Data Visualization and R Programming for Business Demand Forecasting

Module Photographs: (3 photographs –Module Photo, Individual student contribution module work in the project and presentation image)



Project Description: (here you write what you did in this project (contribution) including Model Description

This module developed a price forecasting system using historical Amazon sales data to enable data-driven inventory and pricing decisions. Implemented in R, it trained and compared Random Forest and XGBoost algorithms to predict discounted product prices. Key results showed Random Forest achieved lower average error (24.5 RMSE) with consistent predictions, while XGBoost demonstrated competitive accuracy (28.3 RMSE) with slightly better trend-capturing capability. Comprehensive ggplot2 visualizations—including actual vs. predicted trends, error distribution histograms, and seasonal decomposition—effectively communicated model performance and underlying price patterns. The analysis revealed that Random Forest errors were more concentrated, whereas XGBoost showed greater variance. This scalable, reproducible framework provides actionable insights for inventory optimization, dynamic pricing, and strategic resource allocation, demonstrating the practical application of machine learning for e-commerce forecasting.

Student Signature

Guide Signature