Predicting Future Sales using Machine Learning

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Abstract

In today's competitive retail landscape, accurate sales forecasting is crucial for effective inventory management, pricing strategies, and overall business planning. This project focuses on future sales prediction using Machine learning and Flask-based deployment. We employ an XGBoost Regressor model, a powerful gradient-boosting algorithm, to predict sales based on key features such as product details, pricing, store characteristics, and location-specific factors. The dataset undergoes extensive data preprocessing and feature engineering, including handling missing values, encoding categorical variables, and normalizing numerical features to enhance model accuracy. The trained model is integrated into a Flask-based web application, providing an interactive interface where users can input product attributes and receive real-time sales predictions. The system ensures a seamless experience, allowing businesses to make data-driven decisions without requiring technical expertise. By implementing this predictive analytics solution, businesses can optimize their inventory management, reduce overstocking and understocking issues, enhance demand planning, and improve revenue generation.

Keywords

Sales Forecasting, Machine Learning, Time Series Forecasting, XGBoost Regressor model, Inventory Management, Demand Planning, Data-Driven Decisions.