

# Enhancing Mart Sales Forecasting with Machine Learning Techniques

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**Abstract:** *Accurate sales forecasting is essential for strategic planning, efficient inventory management, and profit maximization in the cutthroat retail sector of today. The goal of this project is to apply machine learning techniques, namely the Decision Tree Regression algorithm, to create a predictive analytics model that will estimate sales for Big Mart. The model predicts future sales by examining past sales data to find trends and connections between outlet features, product properties, and other influencing factors. In addition to increasing forecasting accuracy, Big Mart's data-driven approach helps them optimize stock levels, cut down on extra inventory, avoid stockouts, and increase overall operating efficiency. When dealing with intricate, non-linear data interactions, traditional statistical techniques like moving average models and ARIMA frequently fail. In contrast, the Decision Tree Regression model demonstrates higher precision and interpretability, making it well-suited for retail forecasting tasks. This predictive model serves as a valuable decision-support tool for Big Mart, enabling the company to refine its business strategies, better understand customer demand, and enhance profitability. The system is scalable, cost-effective, and adaptable to changing data trends, making it an essential asset in the domain of retail analytics.*

**Keywords:** *Accurate sales forecasting*

