Title of the Project:

Sales Forecasting of Products in E-commerce Websites

Problem Statement:

E-commerce platforms frequently encounter challenges related to demand forecasting, leading to inventory mismanagement.

Overstocking causes unnecessary storage costs and resource waste, while understocking results in missed sales opportunities and customer dissatisfaction. To optimize stock levels and operational efficiency, it is crucial to accurately predict future product sales.

Objectives:

- To develop a machine learning-based system that predicts future sales of e-commerce products.
- To improve inventory management by minimizing overstocking and understocking.
- To enhance decision-making through data-driven sales forecasts.

Proposed Methodology/Approach:

The approach involves using historical sales data, customer behavior, product categories, and seasonal trends to train predictive models.

Multiple algorithms such as Random Forest, Gradient Boosting, ARIMA, and SARIMA will be implemented and compared based on accuracy and error metrics. The Brazilian E-commerce Public Dataset from Kaggle, comprising over 100,000 order records, will be used for training and validation.

Data preprocessing and transformation steps will ensure quality input, followed by model evaluation using metrics like MAE, RMSE, and R^2.

Expected Outcome:

The final system will provide accurate sales forecasts for a wide range of products. This

will support warehouse inventory planning, reduce operational inefficiencies, and help businesses maintain optimal stock levels.

The outcome is expected to enable smarter supply chain management and improve customer satisfaction through timely product availability.

Base Research Paper Reference (with link or citation):

K. Hemanth Sai et al., "E-Commerce System for Sale Prediction using Machine Learning Technique," Journal of Physics: Conference Series, ICCPET 2020, doi:10.1088/1742-6596/1712/1/012042. [Link](https://doi.org/10.1088/1742-6596/1712/1/012042)

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Domain - ecommerce