

COMPARATIVE ANALYSIS OF REGRESSION MODELS FOR STOCK PRICE PREDICTION: LINEAR, SUPPORT VECTOR, POLYNOMIAL, AND LASSO

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Abstract

This paper investigates the performance of various regression-based machine learning techniques for short-term stock price prediction. Four regression algorithms – linear regression, support vector regression (SVR), polynomial regression and LASSO regression – were applied to Apple Inc’s historical price data for two-years ending on October 1st, 2024, to predict the next day’s closing stock price. Technical indicators such as moving average, relative strength index (RSI) and lag features were included in the regressions to improve prediction performance. Evaluation metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and R-squared (R^2) were employed to assess the models’ performance. Results show that linear regression and LASSO regression were the most performant models, reaching R^2 values of more than 0.95, with minimal error values. While SVR yielded the poorest results when accounting for all metrics. Overall, the study highlights the predictive power of simpler regression models over more complex ones in stock price predictions and offers recommendations for model selection.

Keywords

Stock market, machine learning, predictions, regressions, linear regression, LASSO regression, polynomial regression, support vector regression

JEL Classification

C32; C52; C53; G10

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