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Connecting Life with Learning

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Project Topic : Stock Price Prediction

Stock Price Prediction

introduction

Predicting stock prices is a significant challenge in the field of financial analytics due to the volatile and non-linear nature of the stock market. This project aims to develop a **regression-based model** to predict the next-day closing price of a stock using historical price data.

The model will be trained on historical stock data, which includes features like **prev close, open, last traded price etc.**

By the end of this project, we aim to not only predict next-day prices with reasonable accuracy but also provide meaningful insights into how regression techniques can be used in financial forecasting.

problem statement

Stock Price Prediction

Project Question: **Create a regression-based model to predict next-day stock prices from historical data. Visualize trends and evaluate the model's accuracy.**

problem statement

PITCH DECK PRESENTATION

our solutions

We developed a stock price prediction system using machine learning to forecast next-day closing prices.

Utilized Random Forest Regression for accurate predictions.

Designed a pipeline that handles data preprocessing, training, and evaluation.

Focused on key performance indicators: RMSE, MAE, R^2 Score, Directional Accuracy, and ±2% Tolerance Accuracy.

Delivered clear visual insights through performance plots and metric comparisons.

Enables data-driven decision making and helps assess stock movement trends effectively.

Methodology

Data Extraction: Unzipped and selected 7 stock CSV files.

Preprocessing: Parsed dates, selected key features, and created next-day Close as target.

Modeling: Trained Random Forest Regressor (80% train / 20% test split).

Evaluation Metrics:

RMSE, MAE, R^2 Score

Directional Accuracy (Up/Down)

±2% Tolerance Accuracy

Visualization:

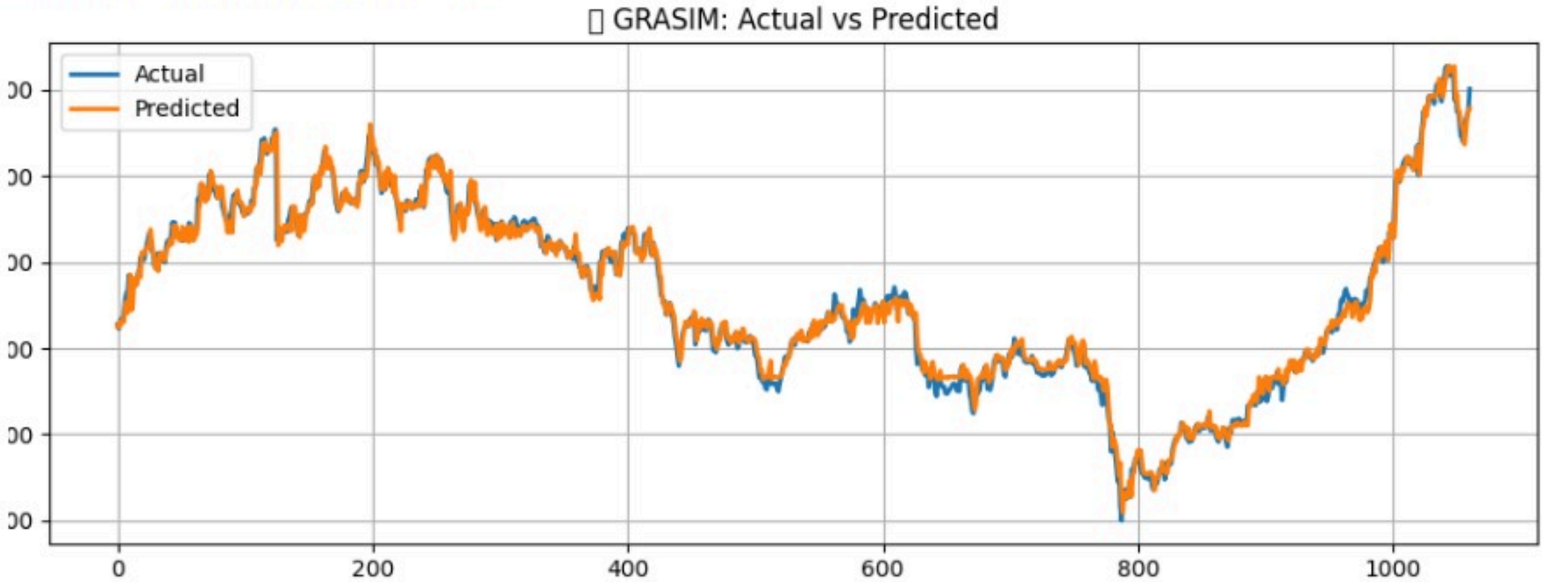
Line plots (Actual vs Predicted)

Bar charts for metric comparison

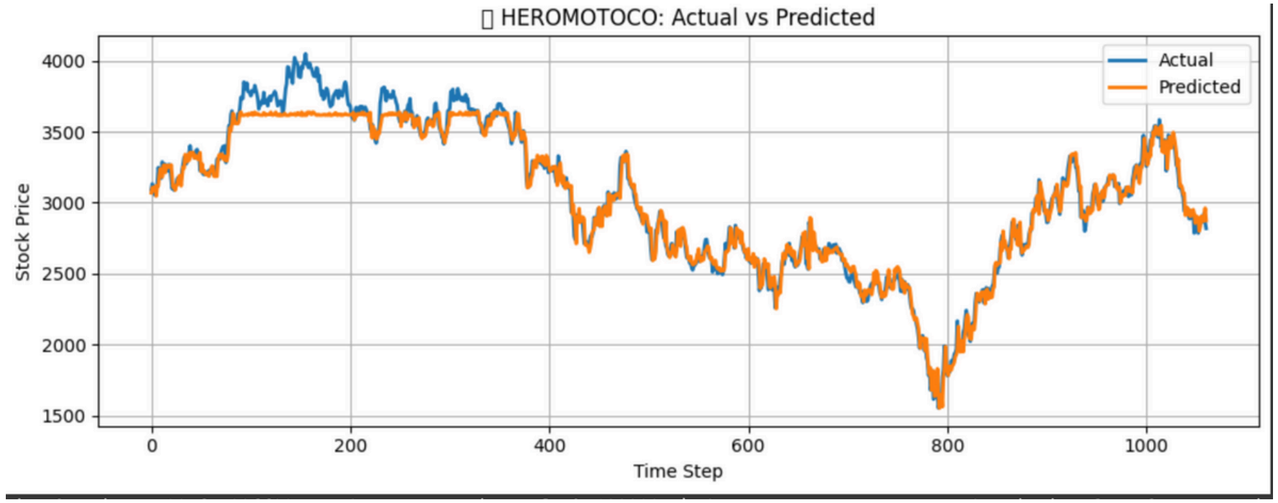
Results

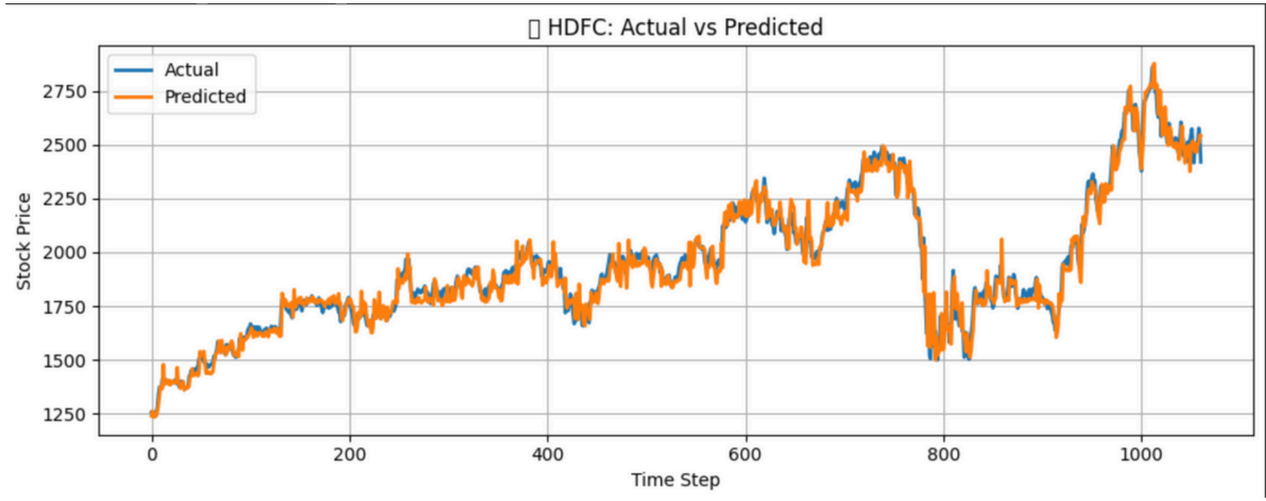
📊 Model Evaluation Summary:

	Stock	RMSE	MAE	R2 Score	Directional Acc. (%)	Within ±2% Acc. (%)
0	GRASIM	23.58	17.31	0.9882	49.43	64.47
1	HCLTECH	25.53	14.00	0.9781	46.93	73.77
2	BHARTIARTL	12.70	9.23	0.9779	46.54	59.37
3	HDFC	50.46	37.24	0.9738	52.08	62.58
4	HEROMOTOCO	91.42	63.13	0.9703	49.53	61.26
5	NESTLEIND	4367.26	3688.14	-2.0868	46.96	13.37



Results


HEROMOTOCO: Actual vs Predicted
Actual
Predicted
Stock Price
Time Step
4000
3500
3000
2500
2000
1500
0
200
400
600
800
1000


HDFC: Actual vs Predicted
Actual
Predicted
Stock Price
Time Step
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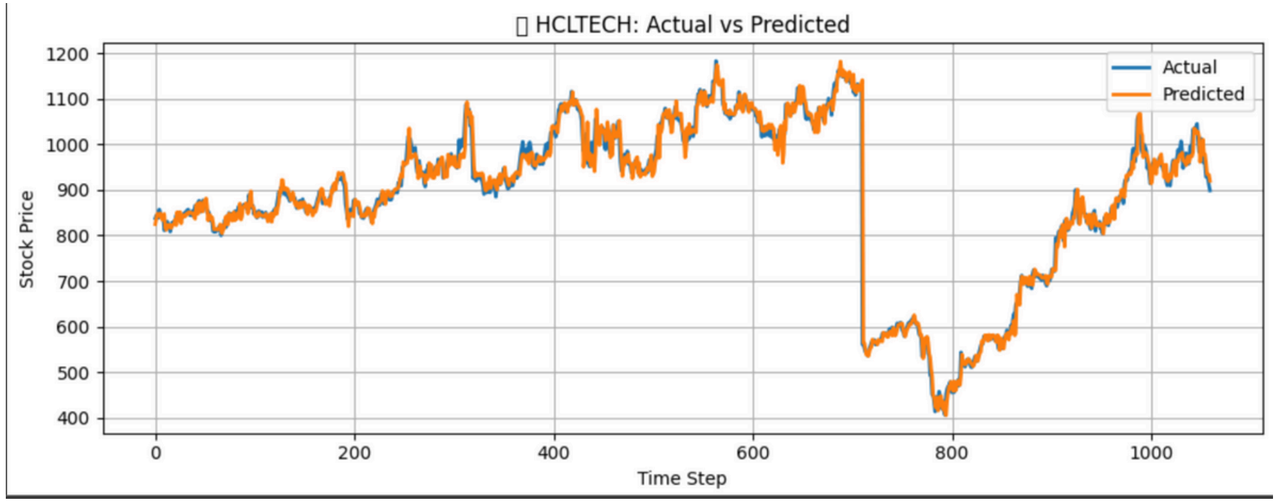
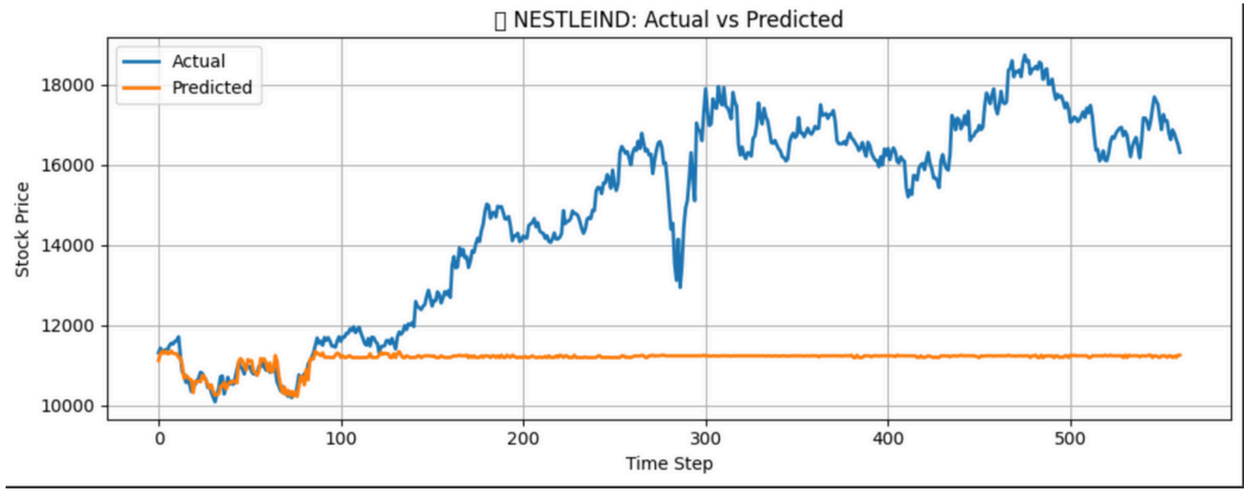
2250
2000
1750
1500
1250
0
200
400
600
800
1000


HCLTECH: Actual vs Predicted
Actual
Predicted
Stock Price
Time Step
1200
1100
1000
900
800
700
600
500
400
0
200
400
600
800
1000


NESTLEIND: Actual vs Predicted
Actual
Predicted
Stock Price
Time Step
18000
16000
14000
12000
10000
0
100
200
300
400
500

References

- www.kaggle.com

Developer

Refrences

Thank You

Thank You