

Stock Price Prediction

- Using Machine Learning & Data Analysis
- Kartikraj Nalage
- Vaishnavi farate
- Vaishnavi Jawale
- Sneha Giramkar

Introduction

- Stock markets are highly dynamic and unpredictable.
- Prediction models aim to reduce uncertainty.
- Helps investors and businesses make better decisions.

Problem Statement

- Stock price movements are nonlinear and influenced by many factors.
- Traditional methods have limitations.
- Challenge: Developing accurate, data-driven models.

Objectives

- • Collect and process stock data
- • Build predictive models
- • Compare ML/DL approaches
- • Provide insights for investors

Data Sources

- • Yahoo Finance, Google Finance APIs
- • Kaggle datasets
- • Company financial reports
- • News & social media sentiment

Data Preprocessing

- • Handle missing values
- • Feature engineering (Moving Average, RSI, etc.)
- • Normalization/scaling
- • Train-test split

Exploratory Data Analysis

- • Trend line visualization
- • Study volatility
- • Correlation between indicators
- • Market pattern understanding

Prediction Approaches

- • Statistical Models: ARIMA
- • Machine Learning: Regression, Random Forest
- • Deep Learning: RNN, LSTM

Machine Learning Workflow

- 1. Collect data
- 2. Clean & preprocess
- 3. Feature engineering
- 4. Train-test split
- 5. Train model
- 6. Predict
- 7. Evaluate

Model Example – Linear Regression

- • Simple baseline model
- • Predicts price using linear relationship
- • Easy to implement
- • Weakness: Cannot capture nonlinear patterns

Model Example – LSTM

- • Recurrent Neural Network
- • Captures sequential dependencies
- • Uses past data to predict future
- • Performs better for time-series

Evaluation Metrics

- • RMSE – Root Mean Square Error
- • MAPE – Mean Absolute Percentage Error
- • R^2 Score – Fit quality of model

Challenges

- • Market uncertainty (events, crises)
- • Overfitting problem
- • Data quality issues
- • High-frequency fluctuations

Applications

- • Algorithmic trading
- • Risk management
- • Portfolio optimization
- • Market insights & trends

Conclusion

- • Prediction is not 100% accurate
- • ML/DL models give better results
- • Combine AI + human expertise
- • Future: Integrating AI with macroeconomic & sentiment data