

Stock Price Movement Analysis Using AI

Title Page

Problem Statement: Predicting stock price movement using AI techniques.

Name: [Your Name]

Roll No.: [Your Roll Number]

Date: [Exam Date]

1. Introduction

Stock price prediction is a crucial area of financial analysis that helps investors make informed decisions.

This project analyzes stock price movement using machine learning techniques based on historical stock data.

The goal is to classify whether a stock's price will increase or decrease using key features such as opening price, closing price, high, low, volume, and adjusted closing price.

2. Dataset Description

The dataset used for this analysis contains historical stock data, including:

- Date: The trading date
- Open: Opening price of the stock
- High: Highest price during the trading session
- Low: Lowest price during the trading session
- Close: Closing price of the stock
- Adj Close: Adjusted closing price considering stock splits/dividends
- Volume: Total number of shares traded

3. Methodology

1. Data Preprocessing:

- The dataset is loaded from a CSV file.
- Missing values are identified and removed.
- Date columns are converted to proper formats.

2. Feature Engineering:

- Daily Return Calculation: The percentage change in stock price from the previous day.
- Price Direction: A new feature that assigns 1 if the stock price increased and 0 if it decreased.

3. Model Selection and Training:

- A Random Forest Classifier is used for classification.
- The dataset is split into training (80%) and testing (20%) sets.
- The model is trained with 100 decision trees.

4. Code Implementation

(Include code here in the actual report)

5. Output/Results

The model's performance was evaluated using accuracy, classification reports, and a confusion matrix.

- Accuracy Score: The model achieved an accuracy of approximately X% (Replace with actual accuracy).
- Classification Report: Displays precision, recall, and F1-score.
- Confusion Matrix: A heatmap visualization of classification performance.

(Screenshot of the output from Google Colab should be added here.)

6. References/Credits

- Stock data obtained from Yahoo Finance
- Random Forest Algorithm: Scikit-Learn Documentation
- Data visualization: Seaborn & Matplotlib

7. Conclusion and Future Work

This project successfully implemented AI techniques to predict stock price movements with reasonable accuracy.

However, to improve predictions, future enhancements can include:

- Deep Learning Models (LSTM): To capture long-term dependencies in stock price movements.
- Technical Indicators (RSI, MACD, Bollinger Bands): To improve feature engineering.
- Sentiment Analysis: Incorporating news sentiment to analyze external market influences.

This study demonstrates the power of AI in financial analysis and provides a foundation for further research.

8. GitHub Repository

- Upload the following to GitHub:
 - The .ipynb file containing the code.
 - This report in PDF format.
 - A README file.
- Share the repository link in the Google Form provided during the exam.

Prepared by: [Your Name]

Date: [Exam Date]

Institution: [Your University/College Name]