

Trend Change Detection

1. Objective

The objective of this assignment is to detect a change in trend for NVIDIA stock, specifically transitions between Red and Green weeks, which signal buy/sell decision points.

2. Data Preparation

We used the existing dataset containing weekly values for mean_return, volatility, and manual labels (Red/Green) from 2020 to 2024. A new column 'Trend_Change' was added to indicate if the label switched from the previous week.

3. Trend Change Labeling

- Trend_Change = 1: Label changed from previous week (Red ↔ Green)
- Trend_Change = 0: No change in trend

4. Model Training

A Logistic Regression model was trained using the following features:

- mean_return
- volatility

Training data: 2020–2022

Testing data: 2023–2024

5. Evaluation

Model tested on 2023–2024 data yielded the following results:

- Accuracy: 49.52%
- Confusion Matrix:
[[33, 19],
[34, 19]]

6. Interpretation

The model's performance is weak at detecting true trend changes. It misclassified many actual change points. This indicates that the features (mean_return and volatility) alone may not be sufficient to reliably detect transitions. Additional features such as moving averages, volume shifts, or momentum indicators might improve detection accuracy.

7. Conclusion

While the method successfully labels transitions and attempts prediction using a linear model, its limited accuracy highlights the need for more complex models or feature engineering. Detecting trend changes is a challenging yet important task for building adaptive trading strategies.

```
# [TN, FP]
# [FN, TP]  <- change correctly predic
```



Accuracy: 49.52 %
Confusion Matrix:
[[33 19]
[34 19]]

Attachments

1. Processed_Stock_Data.csv
2. Python code file (Trend Change Detection)
3. This pdf report