# Stock Price Trend Classification — Decision Tree Report

Date: August 25, 2025
Dataset file: 2) Stock Prices Data Set.csv

## 1. Overview

Binary classification of next-day stock movement (Up/Down) using open, high, low, close, and volume. Target is 1 if next day's close > today's close; else 0.

## 2. Dataset Summary (Selected Symbol)

Symbol analyzed: **AAPL** | Samples after processing: **1006** | Features used: **5**

## 3. Preprocessing & Split

• Chose a single symbol to avoid mixing companies.
• Created *next_close* and binary label *trend*.
• Train/Test split: 80/20 with stratification.

## 4. Model Configuration

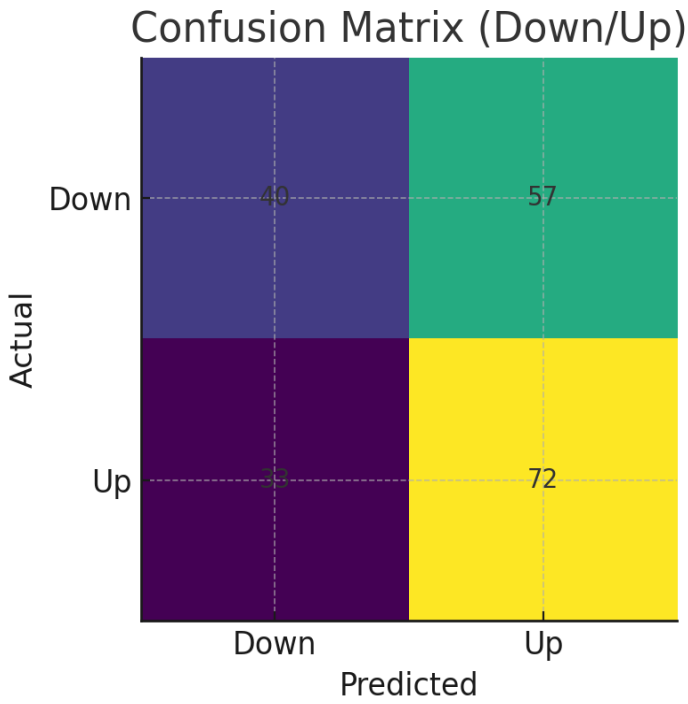
DecisionTreeClassifier with max_depth=4, random_state=42.

## 5. Evaluation Metrics

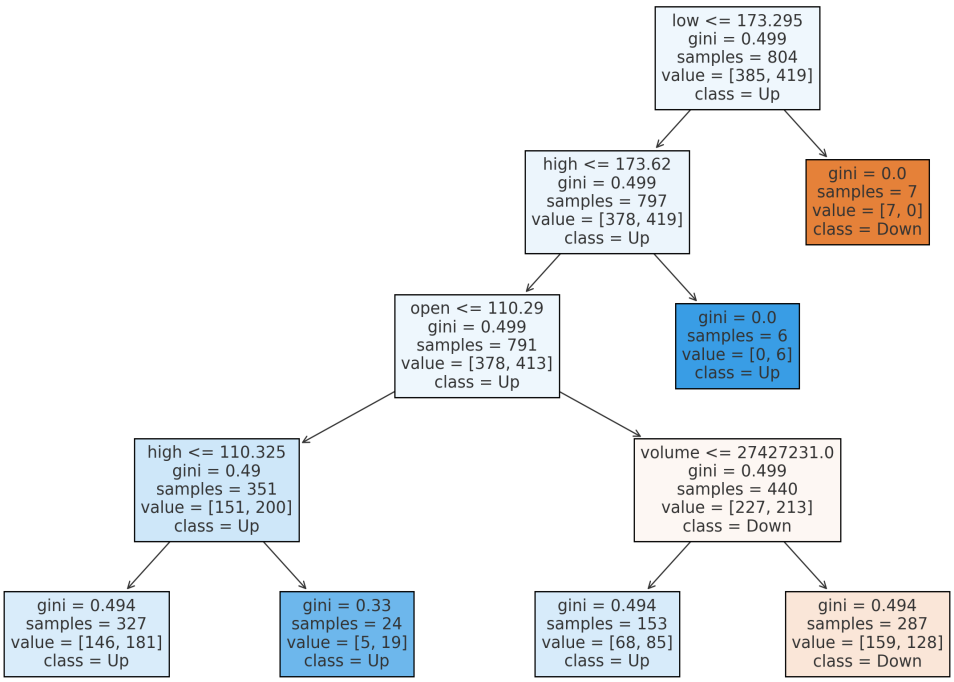
Overall Accuracy: **0.5545**

| Class | Precision | Recall | F1-Score | Support |
|---|---|---|---|---|
| Down | 0.55 | 0.41 | 0.47 | 97 |
| Up | 0.56 | 0.69 | 0.62 | 105 |
| macro avg | 0.55 | 0.55 | 0.54 | 202 |
| weighted avg | 0.55 | 0.55 | 0.55 | 202 |

## 6. Confusion Matrix




## 7. Decision Tree Visualization




## 8. Notes & Next Steps

Try hyperparameter tuning and compare with Logistic Regression, Random Forest, SVM. For time-dependence, consider window features (rolling means) or sequence models (LSTM).