Design and Evaluation of an RSI Mean-Reversion Trading Strategy

Introduction:

- The aim of this project is to implement a trading strategy over the past ten years of stock data (2015 – 2025)
- It uses a momentum oscillator called RSI (Relative Strength Index) to detect if a stock is being overbought or oversold:
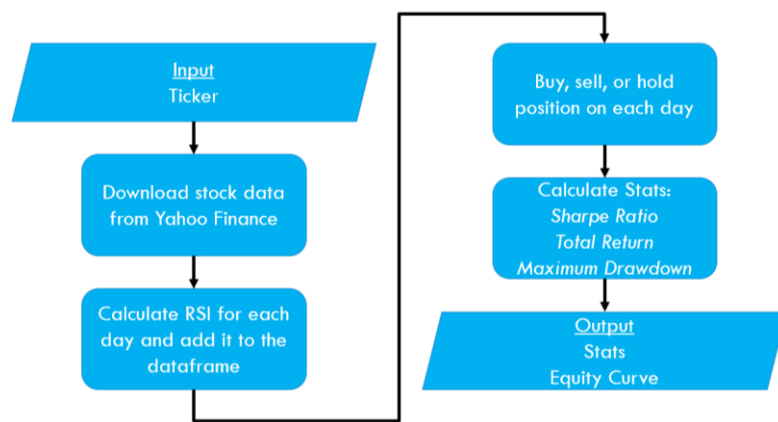
$$RSI = 100 - \left(\frac{100}{1 + RS}\right)$$

Where:

$$RS = \frac{Average\ Gain}{Average\ Loss}$$

Methodology:

- Historical stock data was collected from Yahoo Finance
- The code uses python packages: Yfinance, Pandas, NumPy, Matplotlib
- RS was calculated each day over a moving two-week window
- If RSI > 70 → Stock is overbought → Sell
- If RSI < 30 → Stock is oversold → Buy
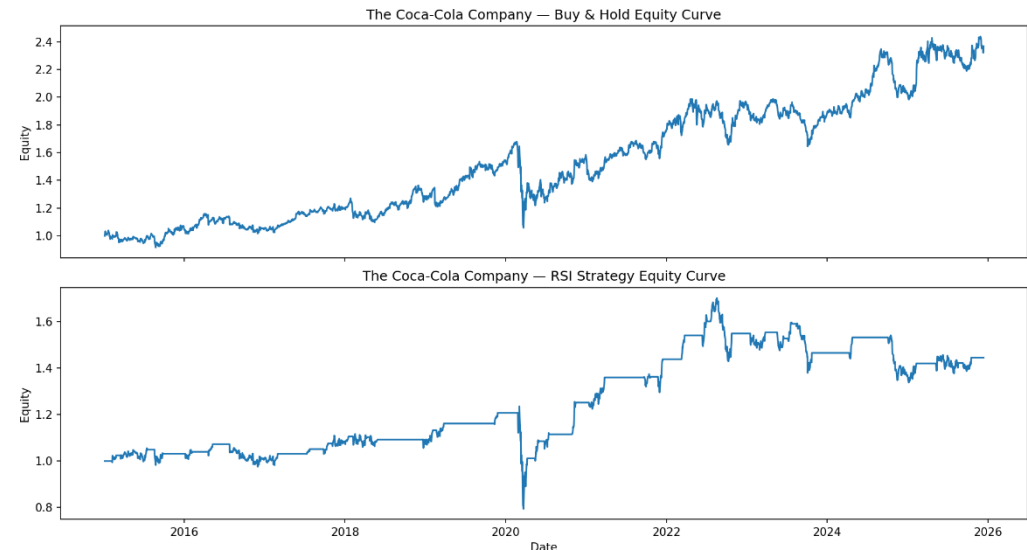

See GitHub for full implementation

Example Results: The Coca-Cola Company (KO)

Sharpe Ratio = 0.33   Total Return = 0.45   Maximum Drawdown = -0.36

Limitations:

- Evidently, the trading strategy provides less returns than an alternative strategy of simply never selling the stock
- Using RSI alone relies on the assumption that any sudden increase in a stock's value reflects it being overbought, and will be followed by a decrease of similar magnitude.
- This is not always true – A stock may increase in value for many reasons, e.g. organic company growth
- This strategy would work best for a stock that has little long-term growth, but high short-term volatility – This is rare for real-world cases
- To make a more sophisticated trading strategy, many metrics must be considered simultaneously.
- See README.md on GitHub for a full explanation