AIFT, Winter/2024

Homework III: Quantitative Trading Strategy Development

Objective:

Implement a basic quantitative trading strategy using historical stock price data. You will use a simple moving average (SMA) crossover strategy and backtest it on historical stock price data.

Instructions:

1. **Data Collection:**
    - Download historical stock price data for 3 stocks (e.g., from Yahoo Finance).
    - Use at least 10-year of daily stock prices.
2. **Implement SMA Crossover Strategy:**
    - Calculate two simple moving averages (SMA):
        - A short-term SMA (e.g., 10-day).
        - A long-term SMA (e.g., 50-day).
    - Generate buy and sell signals based on SMA crossovers:
        - Buy when the short-term SMA crosses above the long-term SMA.
        - Sell when the short-term SMA crosses below the long-term SMA.
3. **Backtesting:**
    - Simulate trading using historical data.
    - Track portfolio value over time, assuming an initial capital of $10,000.
    - Assume a fixed trade size (e.g., buy/sell 10 shares per trade).

- Ignore trading fees/slippage for simplicity.

4. **Performance Metrics:**
    - Compute and report:
        - Total return.
        - Maximum drawdown.
5. **Visualization:**
    - Plot stock price with buy/sell signals.
    - Plot portfolio value over time.

Finally, zip the files below and upload it to elearningv4:

a) Source codes
b) Word file containing the results, the discussions, including what you have learned