Assignment #3

Algorithmic Trading: Winning or Losing

Required materials: Python

Directions:

1. Collect returns data for test assets at whichever data frequency your algorithmic trading system will be for.
    a. These assets can be currencies, futures, stocks, bonds, etc.
2. Develop 3 different trading systems
    a. For example: an arbitrage algorithm, a technical trading algorithm, etc.
3. Backtest your 3 different trading programs on your test data.
4. For each trading program (either for historical data or with real-time data):
    a. What is the average time in seconds that it takes your program to compute a buy/sell decision?
    b. Print the time series of the data with your buy and sell indicators on the plot based on your strategy.
    c. Print the cumulative returns.
    d. Print the monthly returns.
    e. What is strategy's max drawdown?
    f. What is the average portfolio turnover?
    g. Does the trading strategy yield a return that is significantly different from 0?
    h. What is the strategy's Sharpe ratio?
    i. Does the strategy outperform a buy-and-hold strategy (holding the market portfolio), in a frictionless market?
    j. Does the strategy outperform a buy-and-hold strategy when trading expenses and management fees are taken into consideration? (approximate these per trade expenses and management fees that you would charge).