

## Coding Exercise

This exercise is meant to: gauge how you translate business needs into software, your understanding of the financial markets, your assumptions and approach, and how you structure your code.

### **Problem Statement:**

Create a command line Python based backtester that can measure the performance of a series of modeled trades and integrate the results with pyfolio. For simplicity, it only needs to test the performance of trades on 10 stocks (listed below) during calendar year 2022. It should be able to accept the name of a simple .csv file which contains trades in the following format:

Ticker, StartDate, EndDate, Trade(1 for long and -1 for short). The StartDate means that the trade is executed at on that date. Conversely, the EndDate means that the exit trade happens on that date. Hence a valid sample trade.csv file would look like the following:

```
Ticker, StartDate, EndDate, Trade
'AAPL', '2022-05-11', '2022-07-13', 1
'META', '2022-05-11', '2022-07-13', -1
'AAPL', '2022-08-06', '2022-09-10', -1
```

### **Instructions:**

#### Part I: Backtester

- The application should be able to calculate and display:
  - At the **MINIMUM**, the cumulative and annualized returns based on average gross market value
  - The additional metrics that you think are relevant for a portfolio manager
- Stocks to use. For simplicity, you only need to use data for the following 10 stocks in 2022  
AAPL, AMZN, CAT, GOOG, JPM, META, MRK, MSFT, NVDA, TSLA
- Please use the historical pricing & volume data from yahoo/finance.
  - Your code should not use pre-cached(saved) data, i.e. the data download should be part of your app
  - Note: This API contains ALL the data that you need to successfully complete this exercise.
- Assume that each trade is sized at \$10m and only .15% of the day's volume or ADV can be traded each day.
- Try to add configurations or approaches to make it realistic as possible.
- Please document your code and add comments as appropriate.

#### Part II: Pyfolio integration

- Additionally, your backtester should be able to integrate with pyfolio , an opensource backtest analysis tool.
- Your code should have a create\_pyfolio\_analysis() method that should be able to convert the data from your backtester and pass it to pyfolio's create\_full\_tear\_sheet() method.