FBA | QUANTITATIVE FINANCE RESEARCH GROUP

Financial AI

Homework 5

Due at 06:00 pm (Korea Standard Time) on Saturday, October 1

Submit one file: written solutions with executable Python code

Problem 1. Udacity, Artificial Intelligence for Trading

Solve and Submit Term 1 - Lesson 16. Project 2 – Breakout Strategy.ipynb

Problem 2. Use the daily price from Homework 3, Problem 1.

(a) Assume these are daily prices on the trading days from June 12, 2012, through June 9, 2022. Calculate the percentage returns of the daily prices.

(b) Calculate the annualized return, volatility, and the maximum drawdown, as well as the starting and ending dates of said drawdown of AAPL, GOOG, and TESLA

Note: The maximum drawdown (MDD) is defined as the maximum loss from a peak to trough of a portfolio, before a new peak is attained. Maximum drawdown is an indicator of downside risk over a specified time period.

(c) Calculate the breakout strategy's long-short signal with lookback_days = 50 from Project 2 – Breakout Strategy.ipynb for each stock

Problem 3. Portfolios of 12-1 price momentum from Homework 4, Problem 3 and breakout strategy from Project 2 – Breakout Strategy.ipynb

(a) Use the momentum signal to construct a momentum portfolio that rebalances on the first business day of each month. The portfolio should be an equal-weighted long-short portfolio based on the signals

(b) Return both the daily weights and daily returns for the portfolio in (a)

(c) Repeat the analysis in (a) – (b) with breakout strategy's long-short signal

Problem 4. LeetCode

(a) Solve and Submit LeetCode : 206. Reverse Linked List (https://leetcode.com/problems/reverse-linked-list/)
(b) Solve and Submit LeetCode : 118. Pascal's Triangle (https://leetcode.com/problems/pascals-triangle/)
(c) Solve and Submit LeetCode : 328. Odd Even Linked List (https://leetcode.com/problems/odd-even-linked-list/)