



Quantitative Trading

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Make an impact



Assignment 1

Make an impact





Instructions for the assignments

- ◆ The assignments are to be done in groups of 4 or 5 students.
- ◆ Each assignment should be emailed as a Jupyter file
 - To: julien.kockelkoren@gmail.com
 - The subject line of the email should be: “QT: Assignment n,” where $n = \{1, 2, \dots, 5\}$.
- ◆ The Jupyter file should include the following (use Markdown):
 - Section “0” with information about your submission:
 - ◆ Line 1: QT Assignment n
 - ◆ Line 2: Group members: listed alphabetically by last name, where the last name is written in CAPITAL letters
 - ◆ Any comments/challenges about the assignment
 - Section “k” where $k = \{1, 2, \dots\}$.
 - ◆ First type Question k of Assignment n.
 - ◆ Then, below the question, provide your answer.
 - ◆ Your code should include any packages that need to be imported.



Questions

1. Read the daily time series of the S&P500 index (since 01-01-1928) with the yfinance library. (Its symbol is "^GSPC".)
2. What is the information ratio of being long this index over the entire period. And since 1950? In both cases, based on the formula presented in the lecture, what is the typical timescale below which fluctuations dominates the drift?
3. Plot the daily log returns as a function of time. What can you say about the volatility of the S&P500 index?
4. Plot the autocorrelation function of the absolute value of log returns in a log-log scale.
5. Fit that data with a power law function $f(\tau) \sim \tau^{-\nu}$ (restricting yourself to the first 100 points). What exponent do you find?
6. Bonus question: What is your expectation about the drawdown lengths for series with autocorrelated volatility?



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