Quantitative Portfolio Management

Assignment #1
(based on Lectures 1 and 2)

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Instructions for each assignment

- Assignments are to be done in groups of 4 or 5 students.
  - This means that groups of 1, 2, 3, 6, etc. are not allowed and will be assigned a grade of 0.
  - Diversity in groups is strongly encouraged
    (people from different countries, different genders, different finance knowledge, and different coding abilities, etc.)
- Each assignment should be emailed as a Jupyter file
  - To Raman.Uppal@edhec.edu
  - The subject line of the email should be: "QPM-2025-2026: Assignment n," where $n = \{1, 2, 3, 4\}$.

Instructions for each assignment

- The Jupyter file should include the following (use Markdown):
  - Section "0" with information about your submission:
    - Line 1: Submission date
    - Line 2: QPM-2025-2026: Assignment n
    - Line 3: Group members: listed alphabetically by last name, where the last name is written in CAPITAL letters
    - Line 4: Explain along which dimensions your group is diverse
    - Line 5: Any other comments about the assignment (e.g., if you think your Python code is particularly beautiful, you can mention this)
    - The same instructions apply to each assignment, so you can re-use the same Section 0 for all four assignments.
  - Section "k" where $k = \{1, 2, \ldots\}$.
    - 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 for Assignment 1

Note: there are two questions in this assignment. The first question has three parts. The second question has four parts.

Q1.1 Download daily stock prices for FAANG stocks (Facebook/Meta, Amazon, Apple, Netflix, Google/Alphabet) from January 2015 until December 2020. Note that the ticker symbols for the five stocks are: META, AMZN, AAPL, NFLX, and GOOG.

Q1.2 Compute the first and second moments of stock returns for each of these stocks (i.e., their means, variances, and covariances).

Q1.3 Compute the skewness and excess kurtosis for the returns for each of these stocks. Do the daily stock returns have a Normal distribution?

. . . the second question is on the next page

Questions for Assignment 1

Q2.1 Prepare the data for this question.

- Make sure you have already imported "pandas" and "yfinance" into Python.
- Download from Wikipedia (or any other source) a table that lists the companies that comprise the S&P 500. (See "Helpful links" provided at the end of the assignment.)
- From this table, extract the list of ticker symbols (short names for all the companies).
- Set the start date and end date to be
  - start_date = "2000-01-01"
  - end_date = "2022-12-31"
- Build a dataframe that contains the stock prices for the S&P 500 companies. (If there are errors for some company names, it is fine to ignore the company names with errors.)
- Drop the columns that have only "NaN" entries.
- Drop also company names with more than 100 missing observations.

Questions for Assignment 1

Q2.2 Compute the log returns for the companies in your dataset.

Q2.3 Compute the annualized mean return, volatility, and Sharpe ratios for these companies in your dataset.

Q2.4 Would it make sense to choose portfolio weights based only on the Sharpe ratios of the stocks in your dataset? Explain the reasons for your answer.

- Helpful links for information on downloading S&P 500 ticker symbols.
  - from Danny Groves
  - from GitHub
- Please save the data you have downloaded for the second question because we will be using it again for the next assignment.

End of questions