Quantitative Portfolio Management

Assignment #3

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Instructions for each assignment . . . I

- Assignment #1 should be done individually.
- The other 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.
  - Diversity in groups is strongly encouraged
    (people from different countries, different genders, different finance knowledge, and different coding ability, etc.)

Instructions for each assignment . . . II

- Each assignment should be emailed as a Jupyter file
  - To Raman.Uppal@edhec.edu
  - The subject line of the email should be: "QPM: Assignment n," where $n = \{1, 2, \ldots, 8\}$.
  - Assignment n is due before Lecture n, where $n = \{1, 2, \ldots, 8\}$.
  - Assignments submitted late will not be accepted (grade $= 0$), so please do not email me assignments after the deadline.

Instructions for each assignment . . . III

- The Jupyter file should include the following (use Markdown):
  - Section "0" with information about your submission:
    - Line 1: QPM: Assignment *n*
    - Line 2: Group members: listed alphabetically by last name, where the last name is written in CAPITAL letters
    - Line 3: Any comments/challenges about the assignment
  - 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 3 . . . I

Q3.1 Prepare the data for this assignment.

- 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 the company names that have more than 100 missing observations.

Questions for Assignment 3 . . . II

Q3.2 Compute the log returns for the companies in your dataset.

Q3.3 Compute the annual mean return, volatility, and Sharpe ratios for these companies in your dataset.

Q3.4 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
- Finally, please save the data you have downloaded because we will be using it again.

End of questions