BRIEFING

GENERAL INFORMATION

- Attached you'll find the files you'll be working on during this assignment.
- The situation you are facing is described as **THE PROBLEM.**
- **THE CHALLENGE / YOUR TASKS** are outlined in 9 steps below.
- Please make sure you take your time to carefully read and understand the assignment.

ASSESSMENT CRITERIA

- Cleanliness of Code
- Correctness of Code
- Thought Process / Creativity

TIME

- Estimated time to complete assignment: 3-4 hours.
- We are aware that assessment tests can be quite stressful. At Energetech, we'd like to see our talents succeed. That's why we decided to give you a 48 hours period to complete our assignment. That's our way to ensure you find the perfect time to complete our tasks.
- Whether you complete the assignment within 4 hours or take longer won't have any impact on our assessment.

SUBMISSION

- Please submit a zipped folder with your completed assignment.
- Name your zip folder **Results_firstname_lastname_012022.zip**
- Please send your zipped file to **codingchallenge@energetech.ae**
- Make sure to submit your assignment no later than 48 hours after you received the assignment. Unfortunately, we cannot consider any assignments submitted at a later time.

NEXT STEPS

- Every challenge is an opportunity to grow! Our team will get in touch shortly after assessing your assignment to give you feedback on your Coding Challenge submission.
- Together with and depending on the feedback on your Coding Challenge, we'll inform you whether we see the potential to take the next step in our recruitment process with you.

GOOD LUCK!
Team Energetech

THE PROBLEM

A portfolio can have stocks and currency assets (Cash in a particular currency, normally acquired through Forex transactions). We want to be able to track the assets, the average purchase cost and value the portfolio using current exchange rates. The code currently handles only domestic stocks.

THE CHALLENGE / YOUR TASKS

1. Modify the design to accommodate multiple asset types:
    1. currency assets (i.e. 1000 EUR)
    2. currency denominated stocks (i.e. stock in GBP)
    3. the design should be extendable to accommodate new asset types in the future

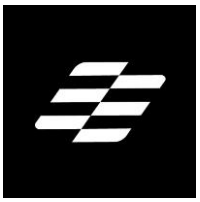
2. Write a function to load and persist historic FX rates per day in base currency EUR from a public API source. We imagine the observation time is 2:30am CET every day. Store the data in any way you see applicable. Convert and store the observation datetime in UTC with each day's data. (example API: https://exchangeratesapi.io/).

3. Web scrape data with a package of your choice. Store the data in any way you see applicable:
    a. Scrape currency code by country from https://www.countriesoftheworld.com/world-currencies.html
    b. Scrape the 'Score' column of the world happiness index from https://en.wikipedia.org/wiki/World_Happiness_Report#2019_report

4. Using the data from 2 & 3a and write a function to calculate the change of FX rate (in base currency EUR) of a given country between 2 dates. Interpolate for missing data if necessary.

   Then visualize the correlation between a countries happiness score (3b) and the change of FX between 2019-01-01 and 2019-12-31 as a scatter plot using a package of your choice. Extra points: Show examples of linear and polynomial regression (polyfit) between data points

5. Adjust the code to allow valuing the portfolio in any currency (i.e. given current exchange rates and a given date in 2019 be able to find the value of the entire portfolio, for example, in USD, GBP, EUR, etc.)



6. Complete the function to consolidate the portfolio by unique asset and average cost.

    a. For example, if the portfolio consists of the following assets: i. 100 shares of ABC stock at $2 USD ii. 200 shares of ABC stock at $3.50 USD iii. Cash of 1000 EUR iv. Cash of 200 EUR
    b. The consolidated portfolio will have two assets: i. 300 shares of ABC stock at $3 USD ii. Cash of 1200 EUR

7. Use the function from 5 to plot the change in value of our portfolio in EUR throughout 2019. Showing min and max value Extra points: Create a routine that would be detecting outliers in value change.

8. Load USD/EUR rates from 2010 to 2020 using the function from 2. Prove or disprove the theory that historically FX rates are more likely to go down between Friday and Monday due to profit taking.

9. Assuming that one of the assets is interconnector rights for 100MW from Hungary to Romania that you received for free for the period of calendar year 2019. Both markets trade in local currencies. Assuming that the markets were coupled for the entire year and it was exercised every weekend of the year, calculate the yearly PnL in EUR.

Feel free to make any changes to the initial code, use any libraries or add additional projects. Please provide a requirements.txt file with your code for all needed dependencies. Bonus points if you provide a Dockerfile.