# UniQuant Challenge

**2022**

Date of issue: 11.04.2022

# Contents

## *Timeline*

**UniQuant Challenge**: 1,5 weeks (11.04.2022 – 20.04.2022)
**Evaluation**: 2,5 weeks (21.04.2022 – 11.05.2022)

## *Data*

Provided data export files

## *Financial instruments*[1]

The financial instruments portfolio consists of 5 US Financial Sector companies::
Bank of America Corporation (BAC);

The Goldman Sachs Group, Inc. (GS);

Citigroup Inc.(C);

Wells Fargo & Company (WFC);

JPMorgan Chase & Co. (JPM)).

## *Challenge*

### **Description**:

You are required to build a price forecasting algorithm. You will design only one algorithm as solution, however you should test it on all 5 companies in target portfolio: Bank of America Corporation (BAC); The Goldman Sachs Group, Inc. (GS);Citigroup Inc.(C);Wells Fargo & Company (WFC);JPMorgan Chase & Co. (JPM)).
The input data consists of time-series data and the output consists of price predictions for the next 5 days (which is approx. 1 trading week).

*Clarification*: It is left to student's judgement the lookback period for historical testing of the algorithm.

### **Points to follow**[2]:

1. For each of the 5 stocks in target portfolio, provide a data analysis. The analysis should address (without being limited to) the followings:
    a. Are there any outliers in the data? If yes, how do you manage them? Is there any explanation for the identified outliers (if any)?

[1] These financial instruments will be used to test the performance of the proposed algorithm.
[2] Please make sure you cover all points before submitting your solution

   b. How do you manage missing data?
   c. Do you remark any special behaviour (trend/pattern) in the data? Please support your answer with evidences.
2. Explain why the chosen algorithm/method (i.e. Regression, ARMA, ARIMA etc.) is suitable for the prediction problem above.
3. Are the assumptions of the algorithm above satisfied?
4. Explain the choice of lookback period (e.g. Why you considered 5 years of historical data instead of 10?)
5. Considering the availability of additional data, how would you improve the proposed algorithm?

## *Minimum code requirements*

The minimum requirements for accepting the Python code:

- The code should run without errors.
- The code should be properly commented.
- The code should be well idented.
- Each function should have a defined scope (*Single Responsibility Principle*)

## *Required files*

We expect to receive the following (mandatory) files:

- Python code (Jupyter notebook)
- Input data file (xls or csv extract containing the set of data used for training the algorithm)
- Output file ($5 \times 5$ table containing the forecasted price for the next 5 days for each of the 5 stocks under analysis)
- PowerPoint presentation (please use the ppt template provided by LSEG)

## *Evaluation guide*

For uniformity in evaluation, we propose the following weights:

- Prediction quality: 0.4
- Code quality: 0.2
- Reasoning/Explanation of methods used: 0.4

Good luck!