Development of an Application Programming Interface (API) for Real Time Financial Data in the Julia Programming Language

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Data driven stock and currency trading approaches require access to high quality financial data streams. Unfortunately, there are only a limited number of free or low cost vendors for this type of data. One such vendor is Alpha Vantage (https://www.alphavantage.co); Alpha Vantage is a leading provider of free APIs for realtime and historical data on stocks, forex (FX), and digital/crypto currencies that provides intraday, daily streams along with a large number of technical indicators. However, while Alpha Vantage is free it does require fairly detailed knowledge of web-based programming approaches. Toward this challenge, in this project, we will develop a wrapper around the Alpha Vantage API that allows users to access the data stream without having to directly make the web-based API calls. In addition, this wrapper should transform the raw data produced by the Alpha Vantage into a common format that is easier to work with. This wrapper will be written in the Julia Programming Language (https://julialang.org), a modern high performance computing language developed at MIT [1] that is gaining popularity in the financial community, including the Federal Reserve Bank of New York [2]. The Julia framework developed on this project will be published as a Julia package under an MIT software license, and released to the financial technology community via GitHub and released on arXiv.org.

Taken together, this project offers students training in the development of application programming interfaces (APIs), the Julia programming language, realtime financial data streams and financial modeling approaches.

1. Julia: A Fresh Approach to Numerical Computing. Jeff Bezanson, Alan Edelman, Stefan Karpinski and Viral B. Shah (2017) SIAM Review, 59: 65–98.
   doi: 10.1137/141000671. url: https://julialang.org/research/julia-fresh-approach-BEKS.pdf.
2. Michael Cai, (2108). Estimating Non-Linear Macroeconomic Models at the New York Fed. https://juliacon.org/2018/talks_workshops/51/