Data resource:

API\_EG.USE.ELEC.KH.PC\_DS2\_en\_csv\_v2\_4251643.csv, API\_NY.GDP.DEFL.KD.ZG\_DS2\_en\_csv\_v2\_4250766.csv, API\_NY.GDP.MKTP.CD\_DS2\_en\_csv\_v2\_4251000.csv,

API\_NY.GDP.PCAP.CD\_DS2\_en\_csv\_v2\_4251004.csv,

API\_NY.GDP.PCAP.KD.ZG\_DS2\_en\_csv\_v2\_4250851.csv

And API\_SP.POP.GROW\_DS2\_en\_csv\_v2\_4251293.csv are public data from World Bank(https://data.worldbank.org/indicator) For example, the GDP growth data(API\_NY.GDP.MKTP.CD\_DS2\_en\_csv\_v2\_4251000.csv) is downloaded by <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart.>

The F-F\_Research\_Data\_5\_Factors\_2x3\_dail.csv and F-F\_Research\_Data\_Factors\_daily.csv are downloaded from the official website of Fama/French: <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html>

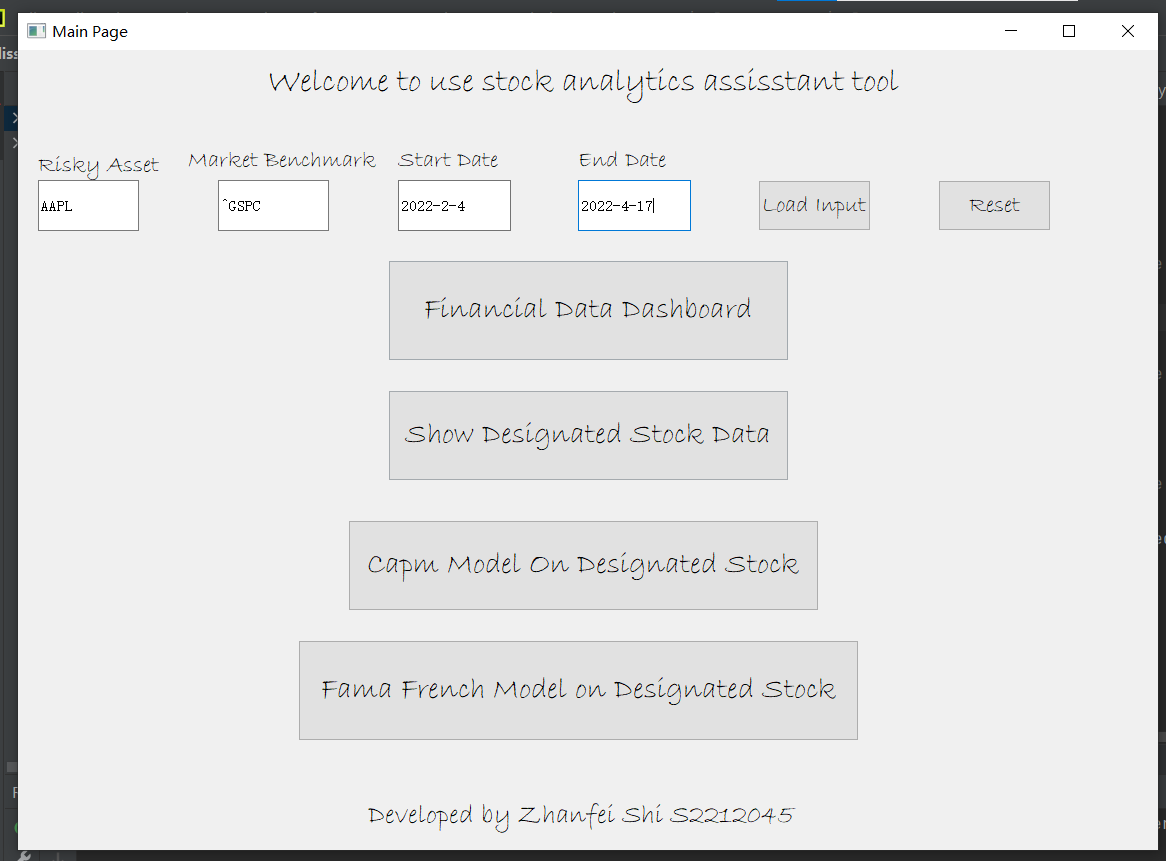
The q5\_factors\_daily\_2021\_2.csv is originally downloaded from the official website of Hou-Xue-Zhang:

<http://global-q.org/factors.html>

and I modify the format of Date from “yyyymmdd” like “19670111” to “yyyy-mm-dd” like “1967-01-11” in convenience of data processing.

These nine .csv files should be put in the same directory of PyQt5\_GUI.py and plotly&dash\_webpage.py as these .csv file will be input by API “pd.read\_csv”.

The GUI generated by GUI.py has for parameters to input:



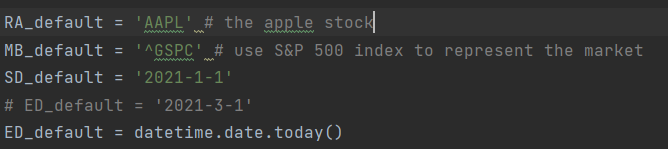
1: For Risky Asset please input stock code of the insteresting stock, like 'AAPL', 'MSFT' and 'AMZN',

2: For Market Benchmark please input the stock code of a popular market index, like '^GSPC'

3: For Start Date please input the specified start date in the format of yyyy-m-d

4: For End Date please input the specified end date in the format of yyyy-m-d

And the default value of the four parameters are shown below:



All the figures present in the GUI will be downloaded and saved in the same directory of GUI.py. The dissertation.ico can be input as the icon parameter when using command like “pyinstaller.exe -F -w -i C:\Users\szf1998\Documents\UniversityOfEdinburghCS\dissertation\dissertation.ico C:\Users\szf1998\Documents\UniversityOfEdinburghCS\dissertation\test3.py” to adjust the icon of the output .exe file.

Environment and the requirements of Python Packages:

Please use: pip install dash, pip install plotly, pip install yfinance, pip install numpy, pip install pandas, pip install pyQt5, pip install pyQt5-tools, pip install mplfinance and other required Python packages I may forget to mention, or directly using the command “conda env create -f dissertation.yaml” to replicate the project runtime environment I exported in dissertation.yaml file.