ISOM 2600 - Assignment 1

In this assignment, a dataset with stock prices of Berkshire and Hathaway (BH), and index level of S&P 500(SP) is provided. The goal is to perform exploratory data analysis with python basic data structure and pandas and data pre-processing skill.

The stock dataset includes price of BH and level of SP from Jan 2009 to Dec 2022. The attributes are:

- Date: The current date
- SP: The level of S&P 500 index.
- BH: The stock price of Berkshire and Hathaway's A share.

Complete the following tasks and answer the questions:

Part I: Understand the example code.

Example 1: Import the data by pandas, set index_col = 0 so that the data column could be the index column.

Example 2: Create a numpy array that contains the level of SP.

Example 3: Generate a histogram and a line plot of the level of SP.

Example 4: Calculate the returns of SP500 using the above array, i.e. $(price_t - price_{t-1})/price_{t-1}$, name this array of returns as RSP.

Example 5: Generate a histogram and a line plot of the return of RSP.

Example 6: Calculate the sample mean and sample standard deviation of the RSP, and number of positive returns.

Part II: Complete the tasks.

Task 1: Generate a line plot, and a histogram of BH.

Task 2: Calculate the returns of BH with method in Example 4 and name the array as RBH.

Task 3: Generate a line plot, and a histogram of RBH.

Task 4: Calculate the sample mean and sample standard deviation of the RBH, and number of negative returns.

Task 5: Generate a scatter plot with RSP as x-axis and RBH as y-axis, calculate their level of correlation. Interpret the level of correlation.

After completion of all task and questions,

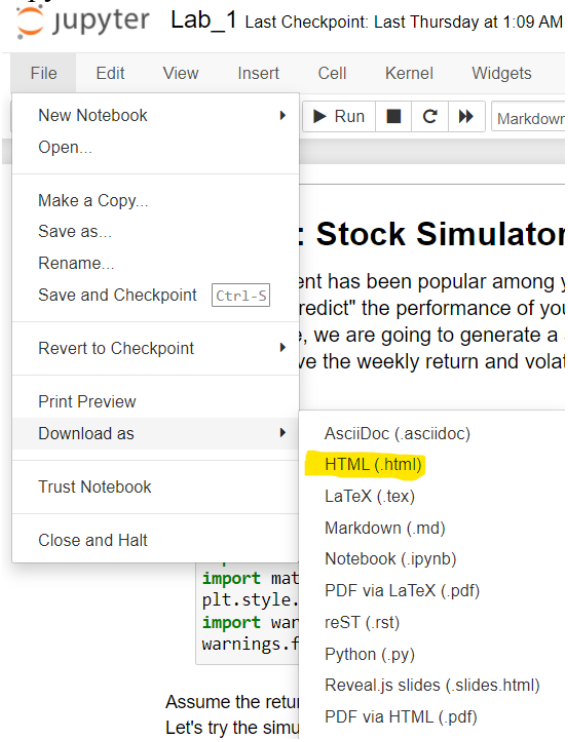
- For Jupyter Notebook/Jupyter lab user: Once you finish implementing all the codes, please export the notebook as HTML (see instruction below) and submit both your notebook and HTML to Canvas.

- For Google Colab user: Once you finish implementing all the codes, please download your .ipynb file (see instruction below). Please submit your .ipynb file with the outputs (Please DO NOT clear the outputs) to Canvas.

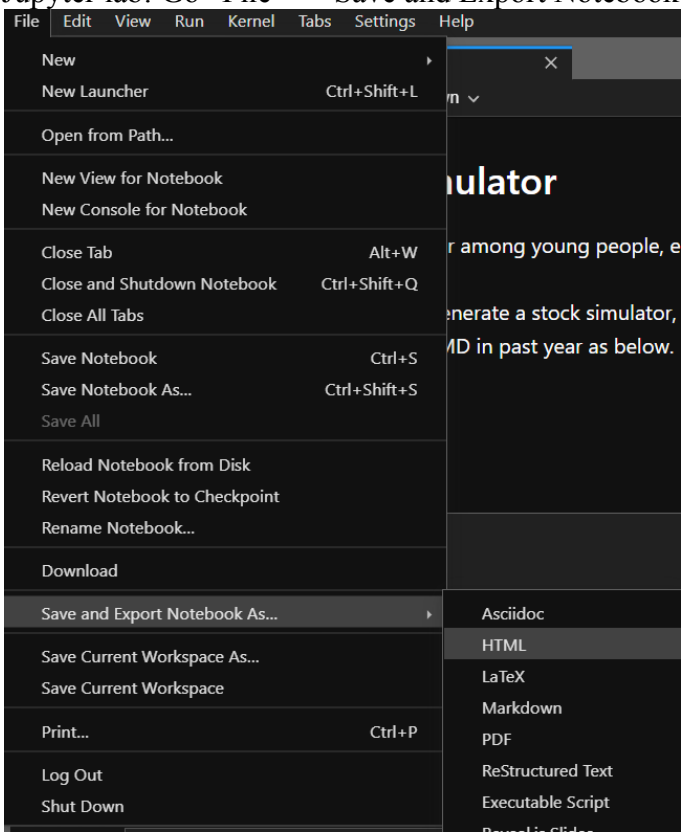
For Jupyter Notebook/Jupyter lab user

Export the code and output as HTML:

Jupyter Notebook: Go "File" > "Download as" > Choose "HTML"



Jupyter lab: Go "File" > "Save and Export Notebook As" > Choose "HTML"



For Google Colab user:

Export the code and output as ipynb: