The Stock Market

Stocks, also known as equities or equity securities, represent ownership interests in companies who choose to have their shares available to public investors.

Stock markets facilitate the sale and purchase of these stocks between individual investors, institutional investors, and companies. There are two components of stock markets - the primary market and the secondary market.

The primary market: Stocks first become publicly traded through a process known as an initial public offering, or IPO. This involves a company selling shares, or pieces of itself, to investors in order to raise capital. This initial sale comprises the primary market.

The secondary market: After the IPO takes place, virtually all subsequent stock trades take place between investors -- that is, the company is not involved. Stock exchanges, such as the Bombay Stock Exchange (BSE) or National Stock Exchange (NSE), facilitate the buying and selling of stocks between investors.

The vast majority of stock trades take place on secondary markets between investors. That means that, for example, if you want to buy shares of Microsoft (NASDAQ:MSFT) and hit the "buy" button through your broker's website, you are buying shares that another investor has decided to sell -- *not from Microsoft itself*.

Stock prices on exchanges are governed by supply and demand -- plain and simple. At any given time, there's a maximum price someone else is willing to pay for a certain stock and a minimum price someone else is willing to sell shares of the stock for. Think of stock prices as an auction, with some investors bidding for the stocks that other investors are willing to

sell.

If there is a lot of demand for a stock, investors will buy shares quicker than sellers want to get rid of them, and the price will move higher. On the other hand, if more investors are selling a stock than buying, the market price will drop.

Problem Statement

Stock market prediction is the act of trying to determine the future value of a company stock or other financial instrument traded on an exchange. The successful prediction of a stock's future price could yield significant profit. The efficient-market hypothesis suggests that stock prices reflect all currently available information and any price changes that are not based on newly revealed information thus are inherently unpredictable. Others disagree and those with this viewpoint possess myriad methods and technologies which purportedly allow them to gain future price information.

Ever since COVID 19 strike, markets loom under fear as uncertainty prevails. It has sent markets around the world crashing to levels not witnessed since the Global Financial Crisis of 2008. Following the strong correlation with the trends and indices of the global market as BSE Sensex and Nifty 50 fell by 38 percent.

The challenge of the stock price forecast is the most crucial component for companies and equity traders to predict future revenues. A successful and accurate prediction to the future stock prices ultimately results in profit maximization.

Part -01:

The objective of the first part of the problem statement is to predict the Stock Price of a Listed Stock on 10th August 2020. The output file 01 should contain only Stock Index and the respective Stock Price for the test data. (**You can find training dataset for this part in Train_dataset_.xlsx and you can test your model using data in the first sheet of Test_dataset.xlsx**)

Part -02:

The **Put-Call ratio of a stock is a time-dependent parameter, for which you have to come up with a Time-series prediction model**. Using the Put-Call Ratio predicted by the model, **you need to calculate the Stock Price on 16th Aug 2020 for every Stock in the test data.** . The output file 02 should contain only Stock Index and the respective Stock Price on 16th August. (**You can find training dataset for this in the second sheet of Test_dataset.xlsx**)

There are 3 files provided:

1. Variable_Description.xlsx:

This file contains description of all the variables available in the dataset

2. Train_dataset_.xlsx:

This is the training dataset on which model has to be trained, which contains parameters of a Stock on 10th August 2020

3. Test_dataset.xlsx:

This is the test data on which the accuracy of the model will be computed. It also contains Time Series data of Put-Call Ratio to be used for Part – 02

Competition Rules

- Privately sharing of code is not permitted.
- There should only be **one submission per participant/team.**
- In case of plagiarism, the participant shall be disqualified
- The **solution_sheet** should also be attached along with the results.
- The accuracy of the model, approach, and quality of code will be the main areas for judging the participants.
- **All the files that need to be submitted are - ipython notebooks for both the questions containing all the code, output files for both the problems, and solution sheet.**