Consider the data in databases "bsedata1" and "nsedata1" that you have already obtained. Now for each of the stocks and for each of the market indices do the following:

1. Estimate the historical volatility from last one month's data.
2. Using the final value of the stock price in your data set as S_0 and taking $r = 5\%, K = S_0$ compute the BSM price of six month European call and put options. Repeat this for $K = A \times S_0$ (for $A = 0.5 : 0.1 : 1.5$) also.
3. Now estimating the historical volatility by extending the data period backwards by one month at a time, repeat part (b) above. Plot the volatility and the option prices against the corresponding length of the period considered.

   Put all your observations in the report, with appropriate tables and figures for problems 1, 2 and 3.
4. Collect the data of option prices on NIFTY index for a time interval depending on the availability of data (going backwards from March 29, 2019). The data at each time point should comprise of prices of calls and puts of various maturities and strike prices. Put all these data in an Excel file and name it as "NIFTYoptiondata".

Note on computing the historical volatility: Assume that you have daily data of stock prices and that there are 252 trading days, by convention, in a year. If the daily returns of a stock have a standard deviation σ_d then the annualized volatility is given by $\sigma_a = \sigma_d\sqrt{252}$. In our labs, the volatility should always be expressed in annualized terms, just like any other rates (e.g. r).