**Assignment:** SFM-03-Assignment

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**INSTRUCTIONS**:

1. Use the MS Excel File “XL\_FILE\_SFM-03\_AssignmentData” to complete this assignment. Refer to relevant sheets within this Excel file to answer the respective questions given here.

2. Upload the updated MS Excel File and this word file to submit your work.

**HINT:** Please refer to “After\_Class--SFM-03- Latest In Class Solution” and lecture recording to do this assignment.

**Question 1:**

1. Compute the Standard deviation step-by-step using the raw formula as well as the built-in excel formula for SBI and SPY in the Assignment.xlsx. (refer sheet “SBI and SPY”)

**Answer 1:**

Please refer D23, E23 for values calculated using built-in formula and columns L & M for values calculated step by step.

Please note that the data has been sorted from oldest to newest dates.

**Question 2:**

2. Compute the Covariance step-by-step using the raw formula as well as the built-in excel formula (same two stocks as in Q1).

**Answer 2:**

Please refer D24 for value calculated using built-in formula and column O for value calculated step by step.

Please note that the data has been sorted from oldest to newest dates.

**Question 3:**

3.  Calculate the best possible portfolio weight distribution for same two stocks as in Q1, with a maximum standard deviation of 1%. The maximum standard deviation can be changed by the user and the output must highlight the best portfolio given the max. SD.

**Answer 3:**

Please refer columns R, S for the portfolio weight distributions and T, U for the corresponding returns and standard deviations.

Please enter the desired maximum standard deviation of returns in Y3.

The portfolio with the highest return but within the maximum allowed standard deviation gets highlighted in **green** color. For instance, portfolio #65 gives the best return for 1.00% maximum standard deviation and has been highlighted in green. The same portfolio can be seen in X6 to AB8 cells.

Please feel free to change the max allowed standard deviation to see how the best portfolio gets highlighted and also showcased in X6 to AB8.

**Question 4:**

4.  Bollinger band chart for S&P500 data (using 15 day moving average and 15 day moving standard deviation). (refer sheet “SPY Bollinger Bands”)

Hint:    Lower Bollinger Band = Mean – 2\*Standard Deviation

             Upper Bollinger Band = Mean + 2\*Standard Deviation

**Answer 4:**

Please refer columns D to G for the calculations for the 15-day Bollinger bands. Refer SPY-Bollinger-Bands-Chart tab for the Bollinger bands chart.

Please note that the data has been sorted from oldest to newest dates.

**Question 5:**

5. Calculate 90% Confidence VaR value for Bank of America stock, for a period of 20 days, using the Monte Carlo Simulation. (refer sheet “Bank of America Monte Carlo”

**Answer 5:**

* Please refer the Simulations table starting from column J for the 20 day Monte Carlo simulated prices for Bank of America.
* Probable price range of the stock at 90% confidence can be found in cells F9 & G9.
* Minimum stock price in the 20 day period at 90% confidence can be found in G12 and VaR at 90% confidence in G15.

Please note that the data has been sorted from oldest to newest dates.