**Data Analysis Assignment II**

**You need to use your previous monthly return data to do Assignment II.**

1. In a new worksheet use Excel Data Analysis/Correlation function to construct a 4×4 **correlation matrix table** by the 60 monthly returns of the three stocks and the S&P 500 market index. What are the lowest and the highest individual pairs of correlation coefficients? (**name the worksheet “Correlation”**). (15%)

2. Download the monthly risk-free rate data in Moodle and copy and paste it into your monthly returns worksheet, make sure the dates for all data are properly aligned. (5%)

3. Select the stock that is most strongly correlated with the market index. Calculate (a) the **excess returns** per month for the stock and the S&P 500 index in new columns next to the monthly returns data, (b) **the average** and the **standard deviation** of the stock’s excess returns, and the market’s excess returns, and (c) the **Sharpe ratio** of the S&P 500 index. (15%)

4. Use Excel XY **scatter plot chart** with no line joining the points to plot the stock’s excess returns against the market index’s excess return in a new worksheet (**named “Scatter Chart**). Now select one of the data points, and right-click to obtain a shortcut menu allowing you to add a trendline. This is the stock’s **characteristic line**, as displayed in Figure 6.12. (15%)

5. Use Excel’s Data Analysis/Regression for the stock and select “Residuals” in the regression function box and display the results in a new worksheet (**named: Regression**).   
Answer the following question:   
A) What is the stock’s β from your regression analysis? Explain what a stock’s β means quantitatively? For instance, if the market increases by 1%, how much will the stock tend to change? (20%)

B) What is your stock’s unsystematic risk, that is, its residual variance σ2(e) from the regression results? (10%)

C) The average market risk premium in the US is 5.6% for 2011-2022. As of August 15, 2023. the annualized 3-month T-bill yield, which is commonly used as a proxy for the risk-free rate, is 5.48%. Based on the information, what should be the **required** one-year return for the US stock market and for your stock, respectively, according to the CAPM? (20%)

D) Check the average analyst price target and use it as the stock’s expected price in a year. What is the stock’s **expected** return? Comparing it with your answer C), is the stock worth buying at the current price level? (extra 20%)