**FIN6307**

**Project 1: Industry sector selection using ChatGPT and Data Exploratory Analysis**

The project has two parts.

Part 1: First, Select two industry sectors using ChatGPT prompts based on some statements. For example, list two sectors which are mostly affected by inflation/tariff/financial crisis. Secondly, After you choose the sectors, select five stocks in each sector using ChatGPT upon some criteria such as market cap/earning stability/gross margin. At last, write prompts in ChatGPT to provide analysis framework about stock performance and fundamental analysis . Decide the financial measures in the analysis.

Part 2: Data collection and exploratory analysis. Choose a timeframe of 5 years. Download stock price data from Nasdaq.com and financial metrics from Captal IQ for selected companies. Also download S&P 500 data (ticker: "^GSPC") and 13-week treasury bill (ticker: "^IRX" ) over the same time period.

Instruction on how to retrieve historical prices from Nasdaq.com:

Go to http://nasdaq.com and enter a ticker symbol, such as APPL in the Enter Symbol box and click on “Historical Quotes” on the left menu panel. Click the time line, then click on Download to Spreadsheet, enter a name for the csv file, and click on save.

1. Nasdaq stock prices: For each stock, calculate the returns using the adj. close price. Describe the distribution of the returns using descriptive statistics including central tendency of returns, dispersion, and shape of the distribution. Use graphs (histogram or over-laid charts) to contrast the distributions of stock returns within each industry. Fit the histogram with a normal curve and evaluate the normality of stock returns.
2. Nasdaq stock prices and S&P 500 index: Calculate correlations, and variance/covariance between each pair of risky assets, i.e. you need to create a variance/covariance matrix and a correlation matrix for all stocks. Compare the relative risk among all stocks within each industry and cross industries. Compare the performance of stocks with the S&P 500 index.
3. Capital IQ fundamentals and Nasdaq stock prices: Use scatter plots to examine the relationship between stock returns and financial fundamentals.
4. 13-Week T-Bill risk-free rate, Capital IQ fundamentals and Nasdaq stock prices: If you create a portfolio with equal weights among the ten stocks, find the portfolio return, portfolio volatility and the sharpe ratio of the portfolio. Use the treasury yield data to calculate the risk-free rate of return.
5. 13-Week T-Bill risk-free rate, Capital IQ fundamentals and Nasdaq stock prices: If you invest differently on each asset in the portfolio (design your own portfolio to find an optimal portfolio), find the optimal portfolio return, portfolio volatility and the sharpe ratio. Compare this portfolio with the one in question (d).

After you finish the analysis and save the tables by excel format. In the first tab of the excel file, **list all group members’ name and percentage of each member’s contribution** to the project and how much percentage of the work is done by each group member. Use a separate table for each stock and name the tables correspondingly. You need to use a word file to summarize your analysis results (about 10-15 pages). It should include all prompts and response in ChatGPT, introduction of each company, the performance and risk level of each stock over time, the relative risk among all stocks in your portfolio. Name the file by your group name such as “**group1\_project1**”. Each group only needs to submit one copy.