Assignment 2

MGMT 675: Generative AI for Finance

Exercise 5: Tangency Portfolio with Real Data. Download monthly return data for five ETFs of your choice (e.g., SPY, AGG, GLD, VNQ, EFA) and the one-month T-bill rate from a source such as FRED or Yahoo Finance. Upload the data to Claude and ask it to compute the tangency portfolio weights, the expected return and standard deviation of the tangency portfolio, and the Sharpe ratio. Have Claude plot the efficient frontier and the capital allocation line. Submit the data file (`Exercise5-Data.xlsx`), a screenshot of the Claude conversation (`Exercise5-Screenshot.png`), and the final plot (`Exercise5-Plot.png`).

Exercise 6: Constrained Optimization Comparison. Using the same data from Exercise 5 (or a new set of at least four assets), ask Claude to solve for the tangency portfolio under three scenarios: (a) unconstrained, (b) no short sales, and (c) maximum 40% in any single asset. Compare the portfolio weights, Sharpe ratios, and efficient frontiers across all three cases. Submit a one-page memo (`Exercise6-Memo.pdf`) discussing how constraints affect diversification and performance. Submit a screenshot of the three efficient frontiers plotted together (`Exercise6-Screenshot.png`).

Exercise 7: Stock Return Analysis in Colab. In Google Colab, use Gemini to write code that downloads daily price data for three stocks of your choice from Yahoo Finance, computes daily returns, and produces (a) a boxplot of the daily returns, (b) a summary statistics table (mean, std, min, max, skewness, kurtosis), and (c) a correlation matrix heatmap. Save the notebook and the output files to Google Drive. Submit the notebook (`Exercise7.ipynb`) and a screenshot of the outputs (`Exercise7-Screenshot.png`).

Exercise 8: Invoice Reconciliation. Download invoice-reconciliation.zip and extract the files. You will have an invoice register (PDF), a payment log (Excel), and a vendor disputes memo (Word). Open a conversation in Claude Desktop and upload all three files. Ask Claude to extract the invoice table from the PDF, match invoices to payments (note that invoice reference formats differ between files), identify fully paid, partially paid, and unpaid invoices, apply the dispute resolutions described in the memo, and produce a reconciliation summary with the total outstanding amount. Submit the reconciliation output (`Exercise8-Reconciliation.xlsx`) and a screenshot of the conversation (`Exercise8-Screenshot.png`).

Submission. Upload a zip file containing each file requested above with the filename shown in parentheses. Name the zip file Assignment2.zip.