Exercise 2A: Tangency Portfolio

MGMT 675: Generative AI for Finance

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:

(a) Estimate expected returns, standard deviations, and correlations from the historical data
(b) Compute the tangency portfolio weights, expected return, standard deviation, and Sharpe ratio
(c) Plot the efficient frontier and the capital allocation line
(d) Re-solve with a **no-short-sales** constraint (all weights ≥ 0)
(e) Re-solve with a **maximum 40% allocation** constraint (no single weight > 0.40)

Compare the portfolio weights and Sharpe ratios across all three cases. Write a one-page memo discussing how constraints affect diversification and performance.

Deliverables.

- Data file (`2A-Data.xlsx`)
- Plot showing all three efficient frontiers (`2A-Plot.png`)
- Memo (`2A-Memo.pdf`, 1 page)