Project2: Optimizing Portfolio

Yicun Deng  
ydeng335@gatech.edu

***Abstract—***The MC1-P2 project optimizes a portfolio by finding the allocation of assets that maximizes the Sharpe ratio. It uses historical stock price data and the SciPy library for optimization. The code calculates portfolio statistics and offers an option to generate a plot. The project meets technical requirements and provides a practical approach to portfolio optimization.

# Introduction

For this project, I wrote software in an ML4T environment. The code implements a portfolio optimization algorithm using the Sharpe ratio as the objective function. It fills missing values, calculates daily returns, performs optimization with constraints, and generates a plot of the portfolio value.

# report and analysis

## Sample portfolio versus. SPY chart

**Figure 1**: The chart represents the daily portfolio value for the symbols ['GOOG', 'AAPL', 'GLD', 'XOM', 'IBM'] as well as the S&P 500 index (SPY) from January 1, 2009, to January 1, 2010. It visualizes the performance of the optimized allocation strategy compared to the broader market represented by the S&P 500 index during that period. A picture containing text, screenshot, diagram, line

Description automatically generated