Homework 6

Problems to turn in individually

1. Consider the Markowitz problem where $L = V_\pi$ as opposed to the case from class where $L = \frac{1}{2}V_\pi$. Do you expect to get different results for your optimal portfolio? Work through the Lagrange multiplier method shown in class to establish if your guess is right.

Problems to turn in as a group

1. Solve the following portfolio optimization problem:

$$\min_{\underline{w}} \quad \frac{1}{2}\,\underline{w}^T \underline{\underline{\Sigma}}\,\underline{w}$$

such that

$$\underline{w}^T \underline{\mu} + (1 - \underline{w}^T \underline{1})r_f = E_\pi$$

where E_π is a constant representing the expected return desired for the portfolio. The expected return vector on risky assets is $\underline{\mu}$ and the covariance matrix of returns is $\underline{\underline{\Sigma}}$. The risk-free rate of return is r_f. Present the expression for the optimal portfolio weights, i.e., the optimal components of $\underline{w}$. Note that these do not need to add up to 1.