

Assignment 4

BUSI 721

Data Driven Finance I

Jones Graduate School of Business

Rice University

Submit a Jupyter notebook. Copy each question into a Markdown cell and provide your answer in the cell or cells below it.

1. Two stocks have standard deviations of 30%.
 - a. Plot the standard deviation of a 50-50 portfolio of the two stocks as a function of the correlation between them, for correlations between -1 and +1.
 - b. Plot the Sharpe ratio of the 50-50 portfolio as a function of the correlation. Assume both assets have expected returns of 10% and the risk-free rate (saving rate) is 2%. Exclude the correlation of -1.
2. Three assets have standard deviations of 20%, 30%, and 40%. Their expected returns are 10%, 15%, and 12%. Their correlations are $\text{corr}_{12}=0.1$, $\text{corr}_{13}=0.3$, $\text{corr}_{23}=0.5$. Compute the mean and standard deviation of a portfolio that is 25% in stock 1, 50% in stock 2, and 25% in stock 3. Plot the assets and the portfolio in mean – standard deviation space.