

University of California, Los Angeles  
Department of Statistics

Statistics C183/C283

Instructor: Nicolas Christou

Project 6

Please answer the following questions:

- a. Assume the multigroup model holds with short sales allowed. Find the composition of the optimal portfolio and its expected return and standard deviation and place it on the plot you constructed in previous projects with all the other portfolios and stocks. Note: Please see the numerical example of handout #35 here for more details: [http://www.stat.ucla.edu/~nchristo/statistics\\_c183\\_c283/statc183c283\\_multigroup\\_model.pdf](http://www.stat.ucla.edu/~nchristo/statistics_c183_c283/statc183c283_multigroup_model.pdf) .
- b. Evaluate your portfolios that you constructed in the previous projects. In your analysis you should include the following:
  1. Time plots of the performance of all portfolios compared to the *S&P500* (see the graph constructed using handout #17) under “Labs”.
  2. Average growth of each portfolio (use geometric mean).
  3. Calculate the Sharpe ratio, differential excess return, Treynor measure, and Jensen differential performance index.
  4. Decompose the overall performance using Fama’s decomposition (net selectivity and diversification) for the single index model when short sales are not allowed. Please show this decomposition on the plot expected return against beta.