MS&E 315 and CME 304
Class Project: Part 1

The purpose of the project is to gain some experience in the difficulties and options when defining a problem, implementing an optimization algorithm, and interpreting output. Also to gain some appreciation that good optimization algorithms are necessary. The complete project will be to solve a specific problem and will be given later. This problem can be cast as that of minimizing a nonlinear function subject to linear constraints. The first part is to write a module to perform a line search to be used within your algorithm for linearly constrained problems. The input of this line search module will be the search direction p and $\alpha_{\max}$, the maximum step allowed along p. Assume you know both of these. You can test this routine both on one-dimensional functions and n-dimensional functions in which you define p. You can assume that p is a sufficient descent direction. I am not interested in your code and it should not be part of your submission. Likewise neither is your detailed output required although a summary of it will be needed. It is important to organize the output that you put in the report in such a manner that it is not overwhelming. You may use any programming language you wish. You can seek advice on pure coding issues either from fellow students or others you may know. The code does not need to be efficient in terms of the linear algebra operations. You need to include in your report how you confirmed you have the correct solution and how you checked the correctness of your code. The report is due in the final week of the quarter. If you put extra effort in your project it will count as a bigger proportion of the marks for you grade.