EECS 868 Mathematical Optimization with Applications
Spring Semester 2019
Assignment **#5** Due **2 April 2019**

Reading: Lecture Notes and Luenberger/Ye Chapter 2, Appendix B

1. Luenberger, Problem 1, p. 28. Slack and surplus variables.
2. Luenberger, Problem 2, p. 28. LP problem formulation. Also, add another part to this problem, as follows. What is wrong with this problem as stated? How would you correct it?
3. Consider the LP problem as stated in Luenberger, Problem 5, p. 29.
    a. Convert the problem to standard form.
    b. Identify *all* basic solutions to the equality constraints and indicate the feasibility of each (that is, are the non-negativity constraints met?).
    c. This problem also has a "flaw"; identify it. Hint: what is the solution to this problem?
4. Luenberger, Problem 9, p. 30. Converting objective function to standard form.
5. Luenberger, Problem 14, p. 30. Basic solutions. Also identify which of the basic solutions are also feasible (satisfy non-negativity constraints).
6. Prove item ii) of Proposition 1 in Appendix B, p. 515. Convexity.
7. Luenberger, Problem 15, p. 30. Extreme points.

