

**EECS 868: Mathematical Optimization with Applications**

Spring Semester 2019

Assignment #7 Due **23 April 2019**

Reading: Lecture Notes and Luenberger/Ye Sections 6.1, 6.5 - 6.9, 4.1, 4.2

1. Luenberger, Problem 12 (part a only), p. 177. Shortest Path Problem.
2. Luenberger, Problem 16, p. 178. Maximum Flow Problem.  
As part of your answer, show the minimal cut of the network.
3. Luenberger, Problem 1, p. 103. The editors "corrected" this problem by removing a "redundancy", but it was not really redundant! The problem *should* read:

Verify in detail that the dual *of the dual* of a linear program is the original problem.

Use the symmetric form of duality to show this.

4. Derive the dual LP problem corresponding to the following primal problem.

minimize  $\mathbf{c}^T \mathbf{x}$

subject to  $\mathbf{Ax} \leq \mathbf{b}$  ( $\mathbf{x}$  free)

Do *not* use the result of the previous problem for this problem.

5. Luenberger, Problem 8, p. 105. Omit part (c), but use it for parts (d) and (e). Simple Game Theory.