is

$$\begin{aligned} &\text{minimize} \quad yb \\ &\text{subject to} \quad yA \geq c \text{ and } y \leq 0. \end{aligned}$$

Problem 47.6. Use the complementary slackness conditions to confirm that

$$x_1 = 2,\ x_2 = 4,\ x_3 = 0,\ x_4 = 0,\ x_5 = 7,\ x_6 = 0$$

is an optimal solution of the following linear program (from Chavatal [40], Chapter 5):

$$\begin{aligned} &\text{maximize} \quad 18x_1 - 7x_2 + 12x_3 + 5x_4 + 8x_6 \\ &\text{subject to} \\ \\ &2x_1 - 6x_2 + 2x_3 + 7x_4 + 3x_5 + 8x_6 \leq 1 \\ &-3x_1 - x_2 + 4x_3 - 3x_4 + x_5 + 2x_6 \leq -2 \\ &8x_1 - 3x_2 + 5x_3 - 2x_4 + 2x_6 \leq 4 \\ &4x_1 + 8x_3 + 7x_4 - x_5 + 3x_6 \leq 1 \\ &5x_1 + 2x_2 - 3x_3 + 6x_4 - 2x_5 - x_6 \leq 5 \\ &x_1, x_2, x_3, x_4, x_5, x_6 \geq 0. \end{aligned}$$

Problem 47.7. Check carefully that the dual simplex method is equivalent to the simplex method applied to the dual program in maximization form.