Homework 4
Due Friday 02/01

1. Problem 1 on page 92 in the text book. (Hint: Let x_ij be the amount of material type j you put into final product i).

2. Solve the Farmer Jones problem USING SIMPLEX METHOD (without the government constraint).

$$\begin{aligned} \max \quad z =& (3)(10)x_1 + (4)(25)x_2 + 0x_3 + 0x_4 + 0x_5 && (1)\\ & \text{subject to} \\ & x_1 + x_2 + x_3 = 7 \qquad \text{Acres} && (2)\\ & 4x_1 + 10x_2 + x_4 = 40 \qquad \text{Labor} && (3)\\ & x_i \geq 0 \qquad \forall i = 1,2,3,4,5 && (4) \end{aligned}$$

3. Solve the Farmer Jones problem USING SIMPLEX METHOD (with the government constraint).

$$\begin{aligned} \max \quad z =& (3)(10)x_1 + (4)(25)x_2 + 0x_3 + 0x_4 + 0x_5 && (5)\\ & \text{subject to} \\ & x_1 + x_2 + x_3 = 7 \qquad \text{Acres} && (6)\\ & 4x_1 + 10x_2 + x_4 = 40 \qquad \text{Labor} && (7)\\ & 10x_1 - x_5 = 30 \qquad \text{Government} && (8)\\ & x_i \geq 0 \qquad \forall i = 1,2,3,4,5 && (9) \end{aligned}$$

4. Solve the following minimization problem USING SIMPLEX METHOD.

$$\begin{aligned} \min \quad z =& 10x_1 + 5x_2 && (10)\\ & \text{subject to} \\ & x_1 + 2x_2 \geq 8 \qquad \text{Acres} && (11)\\ & 3x_1 + 2x_2 \geq 12 \qquad \text{Labor} && (12)\\ & x_2 \geq 1 \qquad \text{Government} && (13)\\ & x_i \geq 0 \qquad \forall i = 1,2 && (14) \end{aligned}$$