

PR 3  
OR 1 Teknik Industri ITS  
Budi Santosa

1. Convert the following LP to standard form:

$$\begin{aligned} \min z &= -3x_1 + x_2 \\ \text{s.t. } x_1 &\geq 3 \\ x_1 + x_2 &\leq 4 \\ 2x_1 - x_2 &= 3 \\ x_1, x_2 &\geq 0 \end{aligned}$$

2. From the following problem

$$\begin{aligned} \max z &= 2x_1 + 2.5x_2 \\ \text{s.t. } x_1 + 2x_2 &\leq 350 \\ 2x_1 + x_2 &\leq 400 \\ x_1, x_2 &\geq 0 \end{aligned}$$

Demonstrate the correspondence between corner points and basic feasible solutions.

3. Gunakan simplex algorithm untuk menyelesaikan problem berikut:

$$\begin{aligned} \max z &= 2x_1 + x_2 + x_3 \leq 60 \\ \text{s.t. } 3x_1 + x_2 + x_3 &\leq 60 \\ \text{s.t. } x_1 - x_2 + 2x_3 &\leq 10 \\ \text{s.t. } x_1 + x_2 - x_3 &\leq 20 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

4. Use the simplex algorithm to find the optimal solution to the following LP:

$$\begin{aligned} \min z &= 2x_1 - 5x_2 \\ \text{s.t. } 3x_1 + 8x_2 &\leq 12 \\ 2x_1 + 3x_2 &\leq 6 \\ x_1, x_2 &\geq 0 \end{aligned}$$

5. Tunjukkan bahwa problem berikut unbounded:

$$\begin{aligned} \max z &= 2x_2 \\ \text{s.t. } x_1 - x_2 &\leq 4 \\ \text{s.t. } -x_1 + x_2 &\leq 1 \\ x_1, x_2 &\geq 0 \end{aligned}$$