

Quiz 8 solution

Since the formula has infeasible solution, we get the aux form:

$$\text{maximize } z = -x_0$$

$$x_4 = 5 + x_0 - 2x_1 - x_2 - x_3$$

$$x_5 = 4 + x_0 - 4x_1 - 2x_2 + x_3$$

$$x_6 = -2 + x_0 + 2x_1 + 4x_2 - 2x_3$$

Since the solution is infeasible, we pivot x_0 and x_6 :

$$\text{maximize } z = -2 + 2x_1 + 4x_2 - 2x_3 - x_6$$

$$x_4 = 7 - 4x_1 - 5x_2 + x_3 + x_6$$

$$x_5 = 6 - 6x_1 - 6x_2 + 3x_3 + x_6$$

$$x_0 = 2 - 2x_1 - 4x_2 + 2x_3 + x_6$$

Then we maximize x_1 here, and run pivot of x_1 and x_0 :

$$\text{maximize } z = -x_0$$

$$x_4 = 3 + 3x_2 - 3x_3 - x_6 + 2x_0 \quad 1)$$

$$x_5 = 6x_2 - 3x_3 - 2x_6 + 3x_0 \quad 2)$$

$$x_1 = 1 - 2x_2 + x_3 + \frac{1}{2}x_6 - \frac{1}{2}x_0 \quad 3)$$

The solution is feasible and we finish pivoting the aux form here, then the objective function is:
 $z = -5x_2 + 3x_3$.

We run SIMPLEX algorithm with this objective function and 1), 2), 3) constraints. We can get final optimal solution $z=1$. ($x_2=1$, $x_3=2$)