Class 5 (07.02.2017)

Make a **menu driven program** with the following options (a) List of all BFS (b) Number of Iterations to solve the problem (c) List of all Non-basic variables along with net evaluations in i^{th} iteration (d) List of Basic variables along with min ratios in i^{th} iteration (e) simplex table of i^{th} iteration (f) optimal solution (if exists otherwise generate report for infeasibility, unboundedness, alternative optimum etc.)

1. Maximize $Z = 7x_1 + 3x_2$, Subject to $x_1 + 2x_2 \geq 3$, $3x_1 + x_2 \leq 4, x_1 \leq \frac{5}{2}, x_2 \leq \frac{3}{2}, x_1, x_2 \geq 0$.

   (Ans. $x_1 = 2.5, x_2 = 1.5, Z = 22$)

2. Minimize $Z = 4x_1 + 8x_2 + 3x_3$, Subject to $x_1 + x_2 \geq 2$, $2x_1 + x_3 \leq 5, , x_1, x_2, x_3 \geq 0$.

   (Ans. $x_1 = 2, x_2 = 0, x_3 = 0, Z = 8$)

3. Maximize $Z = -x_1 - x_2 - x_3$, Subject to $x_1 - x_2 + 2x_3 = 2$, $-x_1 + 2x_2 - x_3 = 1, x_1, x_2, x_3 \geq 0$.

   (Ans. $x_1 = 0, x_2 = \frac{4}{3}, x_3 = \frac{5}{3}, Z = -3$)

4. Minimize $Z = -x_1 - x_2 - x_3$, Subject to $x_1 - x_2 + 2x_3 = 2$, $-x_1 + 2x_2 - x_3 = 1, x_1, x_2, x_3 \geq 0$.

   (Ans. $x_1 = 5, x_2 = 3, x_3 = 0, Z = -8$)

5. Maximize $Z = 5x_1 - 2x_2 + 3x_3$, Subject to $2x_1 + 2x_2 - x_3 \geq 2$, $3x_1 - 4x_2 \leq 3$, $x_2 + 3x_3 \leq 3, x_1, x_2, x_3 \geq 0$.

   (Ans. $x_1 = \frac{23}{3}, x_2 = 5, x_3 = 0, Z = \frac{85}{3}$)

6. Minimize $Z = x_1 - 2x_2 - 3x_3$, Subject to $-2x_1 + x_2 + 3x_3 = 2$, $2x_1 + 3x_2 + 4x_3 = 1, x_1, x_2, x_3 \geq 0$.

   (Ans. ?)