Assignment 6: Lab on Dual Simplex Method

1. Solve the following problem manually by Dual Simplex Method and summarize your answer in the following form:

$$(P\ 1): \quad Maximize \quad 2x + 3y + z$$
$$subject\ \ to\ \ x + y + z \leq 40,\ 2x + y - z \geq 10,\ \ -y + z \geq 10, x, y, z \geq 0$$

   I– Initial table .
   II –Decision for incoming variable, outgoing variable, and objective value at every iteration.
   III – Final solution, Optimal value of the problem.

2. After completing Q1, write a program for Dual Simplex Method and print
   I– Initial table .
   II –Decision for incoming variable, outgoing variable, and objective value at every iteration.
   III – Final solution, Optimal value of the problem.

$$Maximize\ \ c^T x\ \ subject\ \ to\ \ Ax\ (\leq\ \ or\ \ \geq\ \ or =)b,$$
$$A = (a_{ij})_{m\times n}, b \in R^m, x \geq 0,\ \ c, x \in R^n,$$

   Verify your manual answer from this output.

3. Write a Program for Q2 in the absence of the condition $x \geq 0$. Find the solution of the following problem using your program. Write the iteration number and objective function value in each iteration.

$$(P\ 2): \quad Maximize \quad 2x + 3y + z$$
$$subject\ \ to\ \ x + y + z \leq 40,\ 2x + y - z \geq 10,\ \ -y + z \geq 10, x \geq 0, y, z \in R$$