Lab on Dual Simplex Method:

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

   Step I– Initial table and least negative for outgoing vector and print the variable name.
   Step II – Value of Max $(delta_j/X_r)$ for incoming variable, objective value at every iteration.
   Step III – Final solution, Optimal value of the problem.

$$(P\ 1):\quad Maximize \quad 2x + 3y + z$$

$$subject\ to\ \ x + y + z \le 40,\ 2x + y - z \ge 10,\ \ -y + z \ge 10, x, y, z \ge 0$$

2. After completing Q1, write a C program for Dual Simplex Method

$$Maximize\ \ c^T x\ \ subject\ to\ \ Ax\ (\le\ or\ \ge\ or =)b,$$

$$A = (a_{ij})_{m \times n}, b \in R^m, x \ge 0,\ \ c, x \in R^n,$$

   and verify your manual answer.

   Out put of the program should be:

   Step II– Initial table and least negative for outgoing vector and print the variable name –
   Step II – Value of Max $(delta_j/X_r)$ for incoming variable, objective value at every iteration.
   Step III – Final solution, Optimal value of the problem.

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

$$(P\ 2):\quad Maximize \quad 2x + 3y + z$$

$$subject\ to\ \ x + y + z \le 40,\ 2x + y - z \ge 10,\ \ -y + z \ge 10, x \ge 0, y, z \in R$$