15/03/22.

⇒ Revised Simplex Method

Step I ~~Input Introuse~~ Introduce slag and surplus variable if needed and restate the given LPP in maximization standard form

Step II Begin with an initial basis $B = I_m$ and form the auxilary matrix we get $\hat{B}$ and write down $\hat{B}^{-1}$

Step III State the objective relation $z = Cx$ as an addition constraint and form $\hat{A}$ and $\hat{b}$ where $\hat{A} = \begin{bmatrix} A \\ -C^T \end{bmatrix}$ and $\hat{b} = \begin{bmatrix} b \\ 0 \end{bmatrix}$

Step IV Compute the net evulations $Z_j - C_j$, $j = 1, 2, \dots$ By multiply the successive problems of $\hat{A}$ with the last row of $\hat{B}^{-1}$ i.e., by using the relation $Z_j - C_j = [C_B \; B^{-1} \; 1] \hat{A}$

If all $Z_j - C_j$ are non - negative then the current basis solution is optimum.

If atleast one $Z_j - C_j$ is negative then determine the atmost-ve say $Z_k - C_k$ the corresponding vector y_k enters the basis. or Go to Step V.

If there is a di
~~dif~~ dissolve by any standard metho
Go to Step V.

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Step V Compute $\hat{y}_K = \hat{B}_{curr}^{-1} \hat{a}_K$. If form $\hat{y}_{iK} \leq 0$ there exist an unbounded optimum solution.

If atleast one $\hat{y}_{iK} > 0$, consider the current x_B and determine the departing ~~matri~~ vector or go to step VI.

Step VI Write down the result obtained in Step II in Step V in a ~~paper~~ table form known as revised simple table.

Step VII Convert the leading element to unity and all other elements of entering to 0 by suitable process.
And update the current basic feasible Solution.

Step VIII Go to Step IV and repeat the procedure until an optimum basic feasible solution is obtained all there is an indication of unbounded solution.

Ques Used revised simplex method to solve the LPP.

$$\text{Max } z = 3x_1 + 2x_2 + 5x_3$$

s.t.

$$x_1 + 2x_2 + x_3 \leq 430$$
$$3x_1 + 2x_3 \leq 460$$
$$x_1 + 4x_2 \leq 420$$
$$x_1, x_2, x_3 \geq 0$$