Linear Programming Problem Procedure

Step 1: Formulate the LP Problem.

Step 2: Introduce Slack / auxiliary variables.

- If constraint type is ≤ Introduce +S
- If constraint type is ≥ Introduce - S + A
- If constraint type is = introduce A

Step 3: Find the initial basic solution.

Step 4: Establish a simplex table and enter all variable coefficients. If the objective function is maximization, enter the opposite sign co-efficient and if minimization, enter without changing the sign.

Step 5: Take the most negative coefficient in the objective function, Z_j to identify the key column (the corresponding variable is the entering variable of the next iteration table).

Step 6: Find the ratio between the solution value and the coefficient of the key key column. Enter the values in the minimum ratio column.

Step 7: Take the minimum positive value available in the minimum ratio column to identify the key row. (The corresponding variable is the leaving variable of the table).

Step 8: The intersection element of the key column and key row is the pivotal element.

Step 9: Construct the next iteration table by eliminating the leaving variable and introducing the entering variable.

Step 10: Convert the pivotal element as 1 in the next iteration table and compute the other elements in that row accordingly. This is the pivotal equation row (not key row).

Step 11: Other elements in the key column must be made zero. For simplicity, form the equations as follows: Change the sign of the key column element, multiply with pivotal equation element and addd the corresponding variable.

Step 12: Check the values of objective function. If there are negative values, the solution is not an optimal one; go to step 5. Else, if all the values are positive, optimality is reached. Non-negativity for objective function value is not considered. Write down the values of x1, x2….,xn and calculate the objective function for maximization or minimization.