Any L.P.P can put in the canonical form by use of sum elementary transformation

1) The minimization of function f(x) is equivalent to the minimization of the negative expression of this function –f(x) .

The linear objective function

Min $Z = C_1 X_1 + C_2 X_2 + \dots\dots\dots + C_n X_n$

Is equivent to

Maximize $G = - Z = - C_1 X_1 - C_2 X_2 - \dots\dots\dots - C_n X_n$

With $Z = - G$

There fore all L.P.P the objective function can be expressed in the maximization form .

2) Any inequality constraints of ($\geq$) type can be change to the inequality of ($\leq$) by multipling both sides by (-1) .

For example:

eq. $X_1 + 2X_2 \geq 2$

$-X_1 - 2X_2 \leq -2$

3) Any equation may be replaced by tow weak inequalities in opposite direction

For example:

$a_1 x_1 + a_2 x_2 = b$ is equaralent to the tow simul tanons constraints

Solu:

$a_1 x_1 + a_2 x_2 \leq b$ and $a_1 x_1 + a_2 x_2 \geq b$

$a_1 x_1 + a_2 x_2 \leq b$ and $- a_1 x_1 - a_2 x_2 \leq -b$

4) A inequality constrain with absolute from on the left hand side can be expressed as a com bination of tow requalr inequalities

For example:

$|a_1 x_1 + a_2 x_2| \leq b$ $\qquad$ $-b \leq a_1 x_1 + a_2 x_2 \leq b$

Is equaralent to :

$a_1 x_1 + a_2 x_2 \leq b$ and $a_1 x_1 + a_2 x_2 \geq -b$

$a_1 x_1 + a_2 x_2 \leq b$ and $-a_1 x_1 - a_2 x_2 \leq b$

5) We have assumed the decision variables x_1 , x_2,…., x_n to be all non-negative , its possible in actual practice that a variable may be un constrained (un restrieted) is sign it may be positive , zero , or negative

(theoretically its value may vary form $-\infty$ to ∞)

If a variable is unconstrained it is expressed as the difference between two non-negative .

For example:

If x is unconstrained variable , then it can by expressed as

$X = X^{-} - X^{=}$, where $X^{-} - X^{=} \geq 0$

Value of x is positive zero or negative depending up an wether x^{-} is large equal to or smaller than $x^{=}$.