Substituting $y_2' - y_2'' = y_2$, where y_2 is unrestricted in sign, the dual problem becomes,

(19)

$$\text{Minimize } W = 7y_1 + 3y_2$$

Subject to the constraints given by

$$2y_1 + 3y_2 \geq 3$$
$$3y_1 - 2y_2 \geq 10$$
$$2y_1 + 4y_2 \geq 2$$

, where $y_1 \geq 0$, and y_2 is unrestricted in sign.

Assignment problem:

Construct the dual of the problem

$$\text{Minimize } Z = x_2 + 3x_3$$

Subject to

$$2x_1 + x_2 \leq 3$$
$$x_1 + 2x_2 + 6x_3 \geq 5$$
$$-x_1 + x_2 + 2x_3 = 2$$

and $x_1, x_2, x_3 \geq 0$.

Solving the LPP by using its dual:

Solve the following LPP by using its dual

$$\text{Maximize } Z = 5x_1 - 2x_2 + 3x_3$$

Subject to

$$2x_1 + 2x_2 - x_3 \geq 2$$
$$3x_1 - 4x_2 \leq 3$$
$$x_2 + 3x_3 \leq 5$$
$$x_1, x_2, x_3 \geq 0.$$

Solution: The problem can be written as

$$\text{maximize } Z = 5x_1 - 2x_2 + 3x_3$$

Subject to $2x_1 + 2x_2 - x_3 \geq 2$ ... $+3x_3 \leq 5$, $x_1, x_2, x_3 \geq 0$