

Step-1

The complementary slackness conditions are given by the following;

$$(Ax^*)_i > b_i \text{ implies that } y_i^* = 0.$$

$$(y^*A)_j < c_j \text{ implies that } x_j^* = 0.$$

Step-2

Consider

$$Ax = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \\ 0 \end{bmatrix} \\ = \begin{bmatrix} 1 \\ 1 \\ 3 \\ 0 \end{bmatrix}$$

Comparing Ax^* and b , we note that $\boxed{(Ax^*)_3 > b_3}$. Similarly, note that $\boxed{y_3^* = 0}$.

Step-3

Consider

$$y^*A = (1, 1, 0, 1) \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \end{bmatrix} \\ = (1, 1, 1, 1)$$

Comparing y^*A and c , we note that $\boxed{(y^*A)_4 < c_4}$. Also note that $\boxed{x_4^* = 0}$.