

Forma Canónica

$$\text{MAX } Z = 20x_1 + 45x_2$$

s.e

$$\begin{cases} x_1 + 2x_2 \leq 40 \\ 3x_1 + 1.5x_2 \leq 75 \\ x_2 \leq 15 \\ x_1, x_2 \geq 0 \end{cases}$$

Forma Estándar $C \xrightarrow{\text{fila}} x | \text{col}$

$$\text{MAX } Z = Cx \quad Z \text{ escalar}$$

$$\text{s.e } Ax = b$$

$$x \geq 0$$

$$\text{MAX } Z = 20x_1 + 45x_2 + 0x_3 + 0x_4 + 0x_5$$

s.e

$$1x_1 + 2x_2 + 1x_3 + 0x_4 + 0x_5 = 40$$

$$3x_1 + 1.5x_2 + 0x_3 + 1x_4 + 0x_5 = 75$$

$$0x_1 + 1x_2 + 0x_3 + 0x_4 + 1x_5 = 15$$

$$x_1, x_2, x_3, x_4, x_5 \geq 0$$

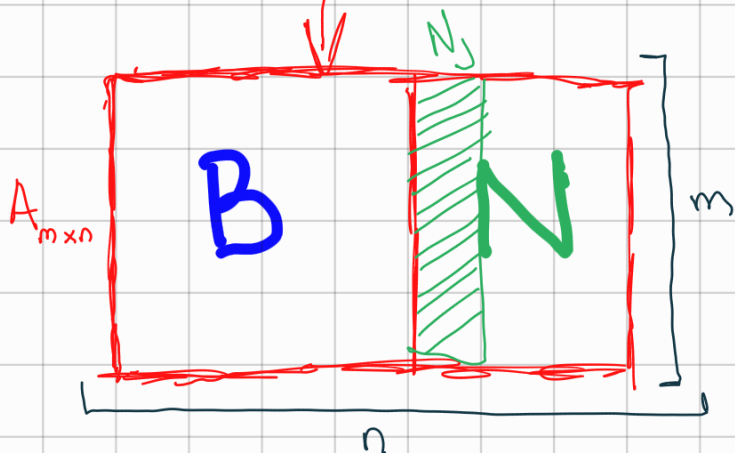
m restricciones
n variables
(m=3; n=5)
n > m

$A_{m \times n}$

A

$$C = [20, 45, 0, 0, 0]$$

$$x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \\ x_5 \end{bmatrix}$$



$$Ax = b$$

$$Bx_B + Nx_N = b$$

supongo $x_N = 0$

$$x = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_m \\ x_{m+1} \\ \vdots \\ x_n \end{bmatrix} \geq 0$$

$$Bx_B + Nx_N = b$$

$$Bx_B = b \quad (a)$$

$$A = \begin{bmatrix} A_{11} & A_{12} & \dots & A_{1n} \\ A_{21} & A_{22} & \dots & A_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ A_{m1} & A_{m2} & \dots & A_{mn} \end{bmatrix} \begin{bmatrix} b_1 \\ \vdots \\ b_m \end{bmatrix}$$

Libro: A_i col BASE
 A_j col NO BASE

$$x_B = b - N_j \theta_j$$

$$N_j = B Y_j$$

$$B^{-1} N_j = B^{-1} B Y_j$$

$$B^{-1} N_j = Y_j$$

$$B Y_j = N_j \quad (1)$$

$$B Y = N$$

$$\begin{array}{c|c} Y & Y_j \\ \hline B & N \end{array}$$

columna de Y (Y_j)

$$\begin{bmatrix} Y_{1j} \\ Y_{2j} \\ \vdots \\ Y_{mj} \end{bmatrix}$$

$$\left. \begin{array}{l} B Y_j = N_j \quad (1) \\ B x_B = b \quad (2) \end{array} \right\} (2) - (1) \theta_j \rightarrow \text{escalar} ; \theta_j \geq 0$$

$$B x_B - B Y_j \theta_j = b - N_j \theta_j$$

$$B (x_B - Y_j \theta_j) + N_j \theta_j = b$$

Matriz COL COL ESCALAR

$$B_1 (x_1 - Y_{1j} \theta_j) + B_2 (x_2 - Y_{2j} \theta_j) + \dots + B_r (x_r - Y_{rj} \theta_j) + \dots + B_m (x_m - Y_{mj} \theta_j) + N_j \theta_j = b$$

$$\theta_j = \min \left\{ \frac{x_i}{Y_{ij}} ; Y_{ij} > 0 ; i = 1 \dots m \right\} \quad \text{CONDICIÓN DE FACTIBILIDAD}$$

$$\text{Supongamos } x_i = x_r$$

$$B_1 (x_1 - Y_{1j} \theta_j) + B_2 (x_2 - Y_{2j} \theta_j) + \dots + B_r \underbrace{\left(x_r - Y_{rj} \frac{x_r}{Y_{rj}} \right)}_{=0} + \dots + B_m (x_m - Y_{mj} \theta_j) + N_j \theta_j = b$$

$\underbrace{\frac{x_r}{Y_{rj}}}_{\neq 0}$

