Javier Mayes

Ejercicio 5

Problema: Minimizar: $Z = 6x_1 + 7x_2$

Sa:

$$11x_1 + 13x_2 \geq 22$$
$$9x_1 - 16x_2 \geq 48$$
$$x_1, x_2 \geq 0$$

Maximizar: $Z = 22y_1 + 48y_2$

Sa:

$$11y_1 + 9y_2 \leq 6$$
$$13y - 16y_2 \leq 7$$
$$y_1, y_2 \geq 0$$

Inicial

Base	Z	y_1	Y_2	s_1	s_2	R
Z	1	-22	-48	0	0	0
s_1	0	11	9	1	0	6
s_2	0	13	-16	0	1	7

$y_1 = -22$
$y_2 = -48$

→ $\frac{6}{9} = \frac{2}{3}$ (para s_1)

($\frac{7}{-16}$ → descartado, es negativo)

1er Iteración

Base	Z	y_1	y_2	s_1	s_2	R
Z	1	-130/9	0	48/9	0	0
s_1	0	11/9	1	1/9	0	6
s_2	0	173/144	0	-16/9	1	7

$$\frac{\frac{2}{3}}{\frac{11}{9}} = \frac{2}{3} \times \frac{9}{11} = \frac{18}{33} = \frac{6}{11} \text{ para } y_2$$

$$\frac{\frac{79}{48}}{\frac{173}{144}} = \frac{79}{48} \times \frac{144}{173} = \frac{11376}{8304} \approx 1.37 \text{ para } s_2$$

Base	Z	y_1	y_2	s_1	s_2	R
Z	0	286/11	176/11	0	154/11	1
s_1	1	4/11	1/11	0	6/4	0
s_2	0	-173/4	-16/11	1	48/4	0

Solución Optima

$$y_1 = \frac{6}{11} \mid y_2 = 0$$

$$x_1 = 11y_1 + 9y_2 = 11\left(\frac{6}{11}\right) + 9(0) = 6$$

$$x_2 = 13y_1 - 16y_2 = 13\left(\frac{6}{11}\right) + 16(0) = \frac{78}{11} = 7.09$$

Valor Optimo:

$$Z = 6x_1 + 7x_2 = 6(6) + 7\left(\frac{78}{11}\right) = 36 + \frac{546}{11} = 85.64$$

Resultado final -> x_1 6

x_2 $\frac{78}{11} \approx 7.09$

Valor optimo $\Rightarrow Z = 85.64$