Rafael Filipe Martins Alves 2014013189

Minimizar $Z = 1200x_1 + 850x_2$

Sa

$$x_1 + 2x_2 \geq 5000$$
$$5x_1 + 3x_2 \geq 12000$$
$$x_1 \geq 0, \; x_2 \geq 0$$

→ Vou Aplicar técnica duas Fases!!

Min $Z = 1200x_1 + 850x_2$ (=)

Max $Z' = -1200x_1 - 850x_2$

Sa

$$x_1 + 2x_2 - x_3 + x_4 = 5000$$
$$5x_1 + 3x_2 - x_5 + x_6 = 12000$$

1ª Fase

Max $Z_1 = -x_4 - x_6$

Sa

$$x_1 + 2x_2 - x_3 + x_4 = 5000$$
$$5x_1 + 3x_2 - x_5 + x_6 = 12000$$

$x_1 \geq 0, \; x_2 \geq 0$ $\qquad x_j \geq 0, \; j = 1, \dots, 6$

		0 x_1	0 x_2	0 x_3	-1 x_4	0 x_5	-1 x_6	b	
x_4	-1	1	2	-1	1	0	0	5000	$5000/1 = 5000$ (1)
← x_6	-1	5	3	0	0	-1	1	12000	$12000/5 = 2400$ (2)
$z_j - c_j$		-6	-5	1	0	1	0	-17000	

↑

$x_1 = 0$
$x_2 = 0$
$x_3 = 0$
$x_4 = 5000$
$x_5 = 0$
$x_6 = 12000$

$Z' = -17000$

		0 x_1	0 x_2	0 x_3	-1 x_4	0 x_5	-1 x_6	b	
← x_4	-1	0	7/5	-3/5	3/5	0	0	7000	$\frac{1000}{7/5}$ $(1)' = (1) - (2)'$
x_1	0	1	3/5	0	0	-1/5	1/5	2400	$\frac{2400}{3/5}$ $(2)' = 1/5\,(2)$
$z_j - c_j$		0	-7/5	3/5	2/5	0	1	-1000	

↑

$x_1 = 2400$
$x_2 = 0$
$x_3 = 0$
$x_4 = 1000$
$x_5 = 0$
$x_6 = 0$

$Z' = -1000$

		0 x_1	0 x_2	0 x_3	−1 x_4	0 x_5	−1 x_6	b
x_2	0	0	1	$-3/7$	$3/7$	0	0	$5000/7$
x_1	0	1	0	$9/35$	$-9/35$	$-1/5$	$1/5$	$13800/7$
$z_j - c_j$		0	0	0	1	0	1	0

(2) $(1)'' = 5/7\,(1)'$

$(2)'' = (2)' - 3/5\,(1)''$

Quadro ótimo

$x_1 = 5000/7$
$x_2 = 13800/7$
$x_3 = 0$
$x_4 = 0$
$x_5 = 0$
$x_6 = 0$

$z'^* = 0$

$z^* = 0$

2ª Fase

$$\text{Max } z' = -1200x_1 - 850x_2$$

S.a.

$$x_1 + 2x_2 - x_3 = 5000$$
$$5x_1 + 3x_2 - x_5 = 12000$$

		-1200 x_1	-850 x_2	0 x_3	0 x_5	b
x_2	-850	0	1	$-3/7$	0	$5000/7$
x_1	-1200	1	0	$9/35$	$-1/5$	$13800/7$
$z_j - c_j$		0	0	$390/7$	240	$-2972857,143$

Quadro Ótimo

$x_1 = \frac{13800}{7}$

$x_2 = \frac{5000}{7}$

$x_3 = 0$

$x_4 = 0$

$x_5 = 0$

$x_6 = 0$

$z^* = -2972857,143$