

Maximize $3x_1 + 4x_2$ s.t. $x_1, x_2 \geq 0$ and

$$\begin{cases} x_1 + 2x_2 \leq 6 \\ 2x_1 + 2x_2 \leq 10 \\ x_2 \leq 2 \end{cases}$$

Place in standard form

Maximize $3x_1 + 4x_2 + 0s_1 + 0s_2 + 0s_3$ s.t. $x_1, x_2, s_1, s_2, s_3 \geq 0$ and

$$\begin{cases} x_1 + 2x_2 + s_1 = 6 \\ 2x_1 + 2x_2 + s_2 = 10 \\ x_2 + s_3 = 2 \end{cases}$$

Form Initial Simplex Tableau

Basis	c_j	x_1	x_2	s_1	s_2	s_3	Ratios
		3	4	0	0	0	
s_1	0	1	2	1	0	0	$6/2 = 3$
s_2	0	2	2	0	1	0	$10/2 = 5$
s_3	0	0	①	0	0	1	$2/1 = 2$
z_j		0	0	0	0	0	0
$c_j - z_j$		3	4	0	0	0	

Compare to MS output.

Perform 1st Iteration

Basis	c_j	x_1	x_2	s_1	s_2	s_3	Ratios
		3	4	0	0	0	
s_1	0	①	0	1	0	-2	$2/1 = 2$
s_2	0	2	0	0	1	-2	$4/2 = 3$
x_2	4	0	1	0	0	1	$2/0 = +\infty$
z_j		0	4	0	0	4	8
$c_j - z_j$		3	0	0	0	-4	

Perform 2nd Iteration; Then 3rd Iteration

Basis	c_j	x_1	x_2	s_1	s_2	s_3	Ratios
		3	4	0	0	0	
x_1	3	1	0	1	0	-2	2
s_2	0	0	0	-2	1	②	$2/2 = 1$
x_2	4	0	1	0	0	1	$2/1 = 2$
z_j		3	4	3	0	-2	14
$c_j - z_j$		0	0	-3	0	2	

Basis	c_j	x_1	x_2	s_1	s_2	s_3	Ratios
		3	4	0	0	0	
x_1	3	1	0	-1	1	0	4
s_3	0	0	0	-1	$\frac{1}{2}$	1	1
x_2	4	0	1	1	$-\frac{1}{2}$	0	1
z_j		3	4	1	1	0	16
$c_j - z_j$		0	0	-1	-1	0	

Optimal solution is $x_1 = 4, x_2 = 1$
Optimal Value is 16