Ex:

$$\max(z) = 3x_1 - x_2$$

s.t.,

$$2x_1 + x_2 \geq 2$$

$$x_1 + 3x_2 \leq 2$$

$$x_1 \leq 4$$

$$x_1, x_2 \geq 0$$

Sol:

$$\max(z) = 0 \cdot x_1 + 0 \cdot x_2 + 0 \cdot x_3 + 0 \cdot x_4 + 0 \cdot x_5 - x_6$$

s.t.,

$$2x_1 + x_2 - x_3 + x_6 = 2$$

$$x_1 + 3x_2 + x_4 = 2$$

$$x_1 + x_5 = 4$$

$$x_1, x_2, x_3, x_4, x_5, x_6 \geq 0$$

		C_j	0	0	0	0	0	-1	b/a_1	
C_B	B	X_B	b	a_1	a_2	a_3	a_4	a_5	a_6	min ratio	operation
-1	a_6	x_6	2	2	1	-1	0	0	1	1	
0	a_4	x_4	2	1	3	0	1	0	0	2	
0	a_5	x_5	4	1	0	0	0	1	0	4	
	$Z_j - C_j$			-2	-1	1	0	0	0		
0	a_1	x_1	1	1	$1/2$	$-1/2$	0	0			$R_1' \leftarrow R_1/2$
0	a_4	x_4	1	0	$5/2$	$1/2$	1	0			$R_2' \leftarrow R_2 / R_1'$
0	a_5	x_5	3	0	$-1/2$	$1/2$	0	1			$R_3' \leftarrow R_3 - R_1'$
	$Z_j - C_j$		0	0	0	0	0	0			

$\therefore$ all $Z_j - C_j = 0$ & $Z = 0$ optimal condition reached

		C_j	3	-1	0	0	0	b/a_3	
C_B	B	X_B	b	a_1	a_2	a_3	a_4	a_5	min ratio	operation
3	a_1	x_1	1	1	$1/2$	$-1/2$	0	0	X	
0	a_4	x_4	1	0	$5/2$	$1/2$	1	0	2	
0	a_5	x_5	3	0	$-1/2$	$1/2$	0	1	6	
	$Z_j - C_j$			0	$5/2$	$-3/2$	0	0		
3	a_1	x_1	2	1	3	0	1	0		$R_1' \leftarrow R_1 + \frac{1}{2} R_2'$
0	a_3	x_3	2	0	5	1	2	0		$R_2' \leftarrow R_2/2$
0	a_5	x_5	2	0	-3	0	-1	1		$R_3' \leftarrow R_3 - \frac{1}{2} R_2'$
	$Z_j - C_j$		6	0	10	0	3	0		

$\therefore$ all $Z_j - C_j \geq 0$ optimal solution reached.

Ans:- $Z = 6$ $x_1 = 2$ $x_2 = 0$