

Mode of this problem

$$\begin{aligned}
 &\text{Maximize } Z = x_1 + 4x_2 \quad (\text{objective function}) \\
 &\text{Subject to } \left. \begin{aligned} 6x_1 + 4x_2 &\leq 24 \\ x_1 + 2x_2 &\leq 6 \\ -x_1 + x_2 &\leq 1 \\ x_2 &\leq 2 \end{aligned} \right\} \text{Constraints (or, Restriction)} \\
 &x_1, x_2 \geq 0 \quad \text{Non-negativity restriction on decision variable}
 \end{aligned}$$

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Tab	C_B	$c_j \rightarrow$ basis	3 x_1	2 x_2	0 S_1	0 S_2	0 S_3	Constant/ Solution
I	0	S_1	-1	2	1	0	0	4
	0	S_2	3	2	0	1	0	14
	0	S_3	1	-1	0	0	1	3
	c_j row		3	2	0	0	0	Z=0
II	0	S_1	0	1	1	0	1	7
	0	S_2	0	5	0	1	-3	5
	3	x_1	1	-1	0	0	1	3
	c_j row		0	5	0	0	-3	Z=9
III	0	S_1	0	0	1	-1/5	8/5	6
	2	x_2	0	1	0	1/5	-3/5	1
	3	x_1	1	0	0	1/5	2/5	4
	c_j row		0	0	0	-1	0	Z=14
IV	0	S_1	0	0	5/8	-1/8	1	15/4
	2	x_2	0	1	3/8	1/8	0	13/4
	3	x_1	1	0	-1/4	1/4	0	5/2
	c_j row		0	0	0	-1	0	Z=14

$$\begin{aligned}
 &\max / \min Z = c_1x_1 + c_2x_2 + \dots + c_nx_n \\
 &\text{subject to } a_{11}x_1 + a_{12}x_2 + \dots + a_{1n}x_n (\leq \text{or} = \text{or} \geq) b_1 \\
 &\quad a_{21}x_1 + a_{22}x_2 + \dots + a_{2n}x_n (\leq \text{or} = \text{or} \geq) b_2 \\
 &\quad \dots \quad \dots \quad \dots \quad \dots \\
 &\quad a_{m1}x_1 + a_{m2}x_2 + \dots + a_{mn}x_n (\leq \text{or} = \text{or} \geq) b_m \\
 &\quad x_j \geq 0 (j = 1, 2, \dots, n)
 \end{aligned}$$

$$\begin{aligned}
 &\max / \min Z = \sum_{j=1}^n c_j x_j \\
 &\text{subject to } \sum a_{ij} x_j (\leq \text{or} = \text{or} \geq) b_i (i = 1, 2, m) \\
 &\quad x_j \geq 0 (j = 1, 2, \dots, n)
 \end{aligned}$$

Tab	c_B	basis	$c_j \rightarrow$					Constant/ Solution
			3 x_1	2 x_2	0 S_1	0 S_2	0 S_3	
I	0	S_1	-1	2	1	0	0	4
	0	S_2	3	2	0	1	0	14
	0	S_3	1	-1	0	0	1	3
	\bar{c}_j row		3	2	0	0	0	Z=0
II	0	S_1	0	1	1	0	1	7
	0	S_2	0	5	0	1	-3	5
	3	x_1	1	-1	0	0	1	3
	\bar{c}_j row		0	5	0	0	-3	Z=9
III	0	S_1	0	0	1	-1/5	8/5	6
	2	x_2	0	1	0	1/5	-3/5	1
	3	x_1	1	0	0	1/5	2/5	4
	\bar{c}_j row		0	0	0	-1	0	Z=14
IV	0	S_1	0	0	5/8	-1/8	1	15/4
	2	x_2	0	1	3/8	1/8	0	13/4
	3	x_1	1	0	-1/4	1/4	0	5/2
	\bar{c}_j row		0	0	0	-1	0	Z=14

Tab	c_B	basis	$c_j \rightarrow$						Constant/ Solution
			5 x_1	4 x_2	0 S_1	0 S_2	0 S_3	0 S_4	
I	0	S_1	6	4	1	0	0	0	24
	0	S_2	1	2	0	1	0	0	6
	0	S_3	-1	1	0	0	1	0	1
	0	S_4	0	1	0	0	0	1	2
	\bar{c}_j row		5	4	0	0	0	0	Z=0
II	5	x_1	1	2/3	1/6	0	0	0	4
	0	S_2	0	4/3	-1/6	1	0	0	2
	0	S_3	0	5/3	1/6	0	1	0	5
	0	S_4	0	1	0	0	0	1	2
	\bar{c}_j row		0	2/3	-5/6	0	0	0	Z=20
III	5	x_1	1	0	1/4	1/2	0	0	3
	4	x_2	0	1	-1/8	3/4	0	0	3/2
	0	S_3	0	0	3/8	-5/4	1	0	5/2
	0	S_4	0	0	1/8	-3/4	0	1	1/2
	\bar{c}_j row		0	0	-3/4	-11/2	0	0	Z=21

PRimal	Dual
Minimize $Z = 12x_1 + 20x_2$	Maximize $W = 100y_1 + 120y_2$
subject to	subject to
$6x_1 + 8x_2 \geq 100$	$6x_1 + 8x_2 \geq 100$
$7x_1 + 12x_2 \geq 120$	$7x_1 + 12x_2 \geq 120$
$x_1, x_2 \geq 0$	$x_1, x_2 \geq 0$

	M1	M2	M3	M4	
W1	3	0	0	0	3
	2	2	2	1	
W2	1	3	3		7
	10	8	5	4	
W3			1	4	5
	7	6	6	8	

	M_1		M_2		M_3		Supply				
1	x_{11}		x_{12}		\dots		\dots		x_{1n}		a_1
	c_{11}		c_{12}		\dots		\dots		c_{1n}		
2	x_{21}		x_{22}		\dots		\dots		x_{2n}		a_2
	c_{21}		c_{22}		\dots		\dots		c_{2n}		
3	\dots		\dots		\dots		\dots		\dots		a_3
	\dots		\dots		\dots		\dots		\dots		
.	\dots		\dots		\dots		\dots		\dots		.
.	\dots		\dots		\dots		\dots		\dots		.
.	x_{m1}		x_{m2}		\dots		\dots		x_{mn}		.
m	c_{m1}		x_{m2}		\dots		\dots		c_{mn}		a_m
Demand	b_1		b_2		\dots		\dots		b_n		

	M_1	M_2	M_3	M_4	Supply
W1	<div>3<div>2</div></div>	<div><div>2</div></div>	<div><div>2</div></div>	<div><div>1</div></div>	\mathfrak{Z}
W2	<div>1<div>10</div></div>	<div>3<div>8</div></div>	<div>3<div>5</div></div>	<div><div>4</div></div>	$7 \notin \mathfrak{Z}$
W3	<div><div>7</div></div>	<div><div>6</div></div>	<div>1<div>6</div></div>	<div>4<div>8</div></div>	5
Demand	4	3	4	4	

		Markets				
Warehouse		M_1	M_2	M_3	M_4	Supply
	W_1	2	2	2	1	3
	W_2	10	8	5	4	7
	W_3	7	6	6	8	5
	Demand	4	3	4	4	15

→ Supply=Demand
∴ Standard TP