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$$1- \text{Max } Z = 3X_1 + 4X_2$$

Subject to

$$15X_1 + 10X_2 \leq 300$$

$$2.5X_1 + 5X_2 \leq 110$$

$$X_1 \geq 0, X_2 \geq 0$$

Solution:

The standard form of LPP

$$\text{Max } Z - 3X_1 - 4X_2$$

Subject to

$$15X_1 + 10X_2 + S_1 = 300$$

$$2.5X_1 + 5X_2 + S_2 = 110$$

$$X_1 \geq 0, X_2 \geq 0, S_1 \geq 0, S_2 \geq 0$$

Basic Variables	x_1	x_2	S_1	S_2	Solution	Ratio
Z	-3	-4	0	0	0	
S_1	15	10	1	0	300	300/10=30
S_2	2.5	5	0	1	110	110/5=22

Basic Variables	x_1	x_2	S_1	S_2	Solution	Ratio
Z	-1	0	0	4/5	88	
S_1	10	0	1	-2	80	80/10=8
x_2	0.5	1	0	0.2	22	22/0.5=44

Basic Variables	x_1	x_2	S_1	S_2	Solution	Ratio
Z	0	0	0.1	0.6	96	
x_1	1	0	0.1	-0.2	8	
x_2	0	1	-0.05	0.3	18	

$$x_1 = 8, x_2 = 18, Z = 96$$

$$2- \text{Max } Z = 200X_1 + 140X_2$$

Subject to

$$3X_1 \leq 6000$$

$$2.9X_2 \leq 8000$$

$$2.5X_1 + 2X_2 \leq 7500$$

$$1.3X_1 + 1.5X_2 \leq 5000$$

$$X_1 \geq 0, X_2 \geq 0$$

Solution:

The standard form of LPP

$$\text{Max } Z - 200X_1 - 140X_2 = 0$$

Subject to

$$3X_1 + S_1 = 6000$$

$$2.9X_2 + S_2 = 8000$$

$$2.5X_1 + 2X_2 + S_3 = 7500$$

$$1.3X_1 + 1.5X_2 + S_4 = 5000$$

$$X_1 \geq 0, X_2 \geq 0, S_1 \geq 0, S_2 \geq 0$$

Basic Variables	x_1	x_2	S_1	S_2	S_3	S_4	Solution	Ratio
Z	-200	-140	0	0	0	0	0	
S_1	3	0	1	0	0	0	6000	6000/3=2000
S_2	0	2.9	0	1	0	0	8000	-----
S_3	2.5	2	0	0	1	0	7500	7500/2.5=3000
S_4	1.3	1.5	0	0	0	1	5000	5000/1.3=3846

Basic Variables	x_1	x_2	S_1	S_2	S_3	S_4	Solution	Ratio
Z	0	-140	200/3	0	0	0	400000	
x_1	1	0	1/3	0	0	0	2000	-----
S_2	0	2.9	0	1	0	0	8000	8000/2.9=2758.62
S_3	0	2	-2.5/3	0	1	0	2500	2500/2=1250
S_4	0	1.5	-1.3/3	0	0	1	2400	2400/1.5=1600

Basic Variables	x_1	x_2	S_1	S_2	S_3	S_4	Solution	Ratio
Z	0	0	25/3	0	70	0	575000	
x_1	1	0	1/3	0	0	0	2000	
S_2	0	0	7.25/6	0	-2.9/2	0	4375	
x_2	0	1	-2.5/6	0	1/2	0	1250	
S_4	0	0	1.15/6	0	-1.5/2	1	525	

$$x_1 = 2000$$

$$S_2 = 4375$$

$$x_2 = 1250$$

$$S_4 = 525$$

$$Z = 575000$$