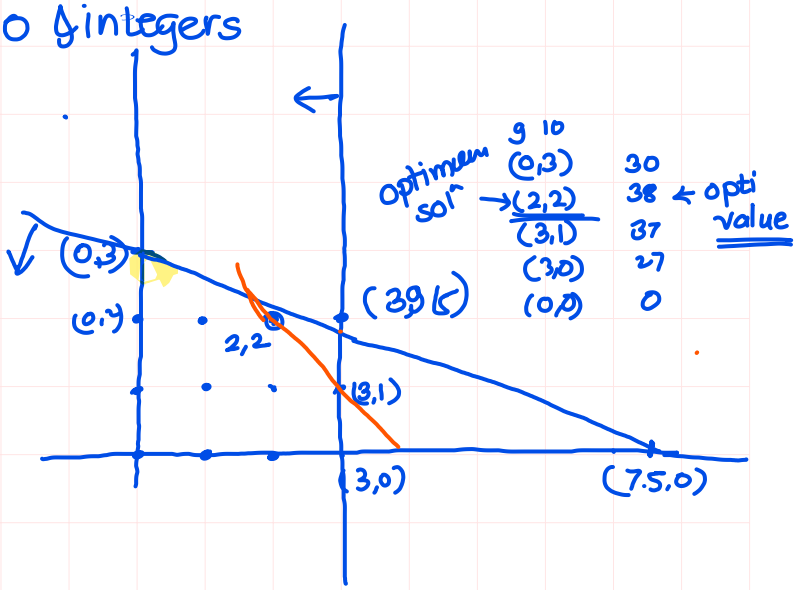
Pure Integer Programming
Gomory's Cutting Plane Method :-

Max $Z = 9x_1 + 10x_2$

S.t. $x_1 \le 3$

$2x_1 + 5x_2 \le 15$ (0,3) (7.5,0)

$x_1, x_2 \ge 0$ & integers



$\max Z = 9x_1 + 10x_2$

$x_1 + x_3 = 3$

$2x_1 + 5x_2 + x_4 \le 15$

			9	10	0	0		
		Basic	x_1	x_2	x_3	x_4	b	θ
	0	x_3	1	0	1	0	3	-
	10	x_4	2	5	0	1	15	3 →
		Z	0	0 ↑	0	0	0	
		$c_j - z_j$	9	10	0	0		
R_1	0	x_3	1	0	1	0	3	3 →
$\frac{1}{5}R_2$	10	x_2	2/5	1	0	1/5	3	15/2
		Z	4 ↑	10	0	2	30	
		$c_j - z_j$	5	0	0	-2		
			x_1	x_2	x_3	x_4		
R_1	9	x_1	1	0	1	0	3	
$R_2 - \frac{2}{5}R_1$	10	x_2	0	1	-2/5	1/5	9/5	
		Z	9	10	5	2	45	
		$c_j - z_j$	0	0	-5	-2		

$x_1 = 3, x_2 = 9/5$

$Z = 45$

$$0\cdot x_1 + 1\cdot x_2 - \frac{2}{5}x_3 + \frac{1}{5}x_4 = \frac{9}{5}$$

$$x_2 = \frac{9}{5} + \frac{2}{5}x_3 - \frac{1}{5}x_4$$

$$u_1 = \underbrace{(-1) + \frac{4}{5}} + \frac{2}{5}x_3 + \frac{4}{5}x_4 \qquad -\frac{1}{5} - (-1)$$

$$-\frac{2}{5}x_3 - \frac{4}{5}x_4 + u_1 = -\frac{1}{5}$$

			9	10	0	0	0	
			x_1	x_2	x_3	x_4	u_1	b
9	x_1		1	0	1	0	0	3
10	x_2		0	1	$-2/5$	$1/5$	0	$9/5$
0	u_1		0	0	$-2/5$	$\boxed{-4/5}$	1	$-1/5$ →
	z		9	10	5	2	0	
	$c_j - z_j$		0	0	−5	−2	0	
	θ		−	−	$25/2$	$5/2$	−	
			x_1	x_2	x_3	x_4	u_1	b
9	x_1		1	0	1	0	0	3
10	x_2	$R_2 - \frac{1}{5}R_3$	0	1	$\boxed{-1/2}$	0	$1/4$	$7/4$
0	x_4	$-5/4\,R_3$	0	0	$1/2$	1	$-5/4$	$1/4$
	z		9	10	4	0	$5/2$	$89/2$
	$c_j z_j$		0	0	−4	0	$-5/2$	

Use dual Simplex Method

$-\frac{2}{5} - \frac{1}{5} \times \frac{1}{2}$

3 → Int; $7/4$ → Non-Int; $1/4$ → Non-Int

$$x_4 = 1/4 - \frac{1}{2}x_3 + 5/4\,u_1$$

$$u_2 = -1 + \frac{1}{4} + \frac{1}{2}x_3 + \frac{1}{4}u_1$$

$$-\frac{1}{2}x_3 - \frac{1}{4}u_1 + u_2 = -\frac{3}{4}$$

		x_1	x_2	x_3	x_4	u_1	u_2	b	
9	x_1	1	0	1	0	0	0	3	
10	x_2	0	1	-1/2	0	1/4	0	7/4	
0	x_4	0	0	1/2	1	-5/4	0	1/4	leaving
0	u_2	0	0	**-1/2**	0	-1/4	1	-3/4	→
	Z	0	0	4	0	5/2	0		
	$C_j - Z_j$	0	0	-4 ↑	0	-5/2			
	θ	—	—	8	—	10			
		9	10			0	0		
9	x_1	1	0	0	0	-1/2	2	3/2	
10	x_2	0	1	0	0	1/2	-1	5/2	
$R_3 \to \frac{1}{2}R_4$ 0	x_4	0	0	0	1	**-3/2**	1	-1/2	→
$-2R_2$ 0	x_3	0	0	1	0	1/2	-2	3/2	
	Z_j	9	10	0	0	1/2	8	77/2	
	$C_j - Z_j$	0	0	0	0	-1/2	-8		
	θ	-	-	-	-	1/3 ↑	-		

Product	M1	M2	M3	Profit	Vari
1	10	6	8	200	x_1
2	5	20	15	300	x_2

$$\text{Max } Z = 200x_1 + 300x_2$$

$$10x_1 + 5x_2 \leq 600$$
$$6x_1 + 20x_2 \leq 600$$
$$8x_1 + 15x_2 \leq 600$$

$$x_1, x_2 \geq 0$$

$$\text{Min } Z = 3x_1 + 5x_2$$
$$x_1 + x_2 \geq 200$$

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$$x_1 \leq 80$$
$$x_2 \geq 60$$

2004, 16, 20, 24, 30, 36, 37, 40, 49, 53 56

~~2007~~

① 2007, 2008, 2013, 2015:

② 201~, 2019, 2028.

2032.

2035.

③ 2037.

2038.

④ 2042., 2045., 2047., 2048.

⑤ 2051., 2055.

Dear Students.

I am deeply saddene, due to your behaviour today. I think you owe me an explanation for this.

As a punishment,

I have decided to

- substract 05 marks from your ST-401 Internal Marks

R

- request you to solve all assignment questions provided in question bank

OR

- request you to prepare a pre entation in LaTex for

Group & Topics

1. BA/BE
2. PK Parameters
3. Effect Estimation in 2x2 design
4. ANOVA for 2x2 Crosover design
5. Classical Shortest CI.

Submit by tommorow 08:00PM

-Manoj

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