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15/ENG02/087
Computer Engineering.
500L.

1) Linear programming is an optimization technique for a System of linear constraints and a linear objective function. An objective function defines the quantity to be optimised, and the goal of linear programming is to find the values of the variables that maximize or minimize the objective function.

B)

2)

2	0	0	1	4	51
2	0	1	0	3	-99
2	1	1	1	2	351
0	-20	0	0	30	10500

$R_4 \to 20R_3 + R_4$

x_1	x_2	S_1	S_2	S_3	Constant
2	0	0	1	4	51
2	0	1	0	3	-99
2	1	1	1	2	351
40	0	20	20	70	17520

Since we have no

$$\left[\begin{array}{cccc|c} 1 & 1/2 & 1/2 & 0 & 500 \\ 0 & 1/2 & -1/2 & 1 & 300 \\ 0 & -5 & 15 & 0 & 15000 \end{array}\right]$$

$R_2 - 2R_2$

$$\left[\begin{array}{cccc|c} 1 & 1/2 & 1/2 & 0 & 500 \\ 0 & 1 & -1 & 2 & 600 \\ 0 & -5 & 15 & 0 & 15000 \end{array}\right]$$

$R_1 = -\frac{1}{2}R_2 + R_1$

$R_3 = 5R_2 + R_3$

$$\left[\begin{array}{cccc|c} 1 & 0 & 1 & -1 & 200 \\ 0 & 1 & -1 & 2 & 600 \\ 0 & -5 & 15 & 0 & 15,000 \end{array}\right]$$

$$\left[\begin{array}{cccc|c} 1 & 0 & 1 & -1 & 200 \\ 0 & 1 & -1 & 2 & 600 \\ 0 & 0 & 10 & 10 & 18,000 \end{array}\right]$$

$x_1 = 200$, $x_2 = 600$, ~~x_3~~ $z = 18,000$

Observative function

Max $z = 30x_1 + 20x_2$

Subtract -10

$2x_1 + x_2 \leq 1000$

$x_1 + x_2 = 500$

$x_1, x_2 \geq 0$

$z - 30x_1 - 20x_2 = 0$

X_1	X_2	S_1	S_2	z
2	1	1	0	1000
1	1	0	1	500
-30	-20	0	0	0

$R_1 = \text{Row}1/2$, $R_3 \rightarrow 30R_1 + R3$
$R_2 = -R_1 + R_2$

X_1	X_2	S_1	S_2	z
1	1/2	1/2	0	500
1	1	0	1	800
-30	-30	0	0	0

1	1/2	1/2	0	500
0	1/2	-1/2	1	300
0	-5	15	0	15000

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