Assignment-3

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Phase-I:

	z	a_1	x_1	x_2	s_1	s_2	s_3	
	1	1	0	0	0	0	0	0
a_1	0	1	2	1	-1	0	0	2
s_2	0	0	1	3	0	1	0	2
s_3	0	0	0	1	0	0	1	4

		z	a_1	x_1	x_2	s_1	s_2	s_3	
		1	0	-2	-1	1	0	0	-2
$*$	a_1	0	1	2	1	-1	0	0	2
	s_2	0	0	1	3	0	1	0	2
	s_3	0	0	0	1	0	0	1	4

	z	a_1	x_1	x_2	s_1	s_2	s_3	
	1	1	0	$-1+1=0$	$1+(-1)=0$	0	0	$-2+2=0$
x_1	0	1	2	1	-1	0	0	2
s_2	0	-1	0	$3\times 2-1=5$	$-(-1)=1$	$1\times 2=2$	0	$2\times 2-2=2$
s_3	0	0	0	1	0	0	1	4

Phase-II:

	z	x_1	x_2	s_1	s_2	s_3	
	1	-3	1	0	0	0	0
x_1	0	2	1	-1	0	0	2
s_2	0	0	5	1	2	0	2
s_3	0	0	1	0	0	1	4

		z	x_1	x_2	s_1	s_2	s_3	
		$1\times 2=2$	0	$1\times 2+1\times 3=5$	$(-1)\times 3=-3$	0	0	$2\times 3=6$
	x_1	0	2	1	-1	0	0	2
$*$	s_2	0	0	5	1	2	0	2
	s_3	0	0	1	0	0	1	4

	z	x_1	x_2	s_1	s_2	s_3	
	2	0	$5+5\times 3=20$	0	$2\times 3=6$	0	$6+2\times 3=12$
x_1	0	2	$1+5=6$	0	$0+2=2$	0	$2+2=4$
s_1	0	0	5	1	2	0	2
s_3	0	0	1	0	0	1	4

$$\begin{pmatrix} 2 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} x_1 \\ s_1 \\ s_3 \end{pmatrix} = \begin{pmatrix} 4 \\ 2 \\ 4 \end{pmatrix}$$

$$\begin{pmatrix} x_1 \\ s_1 \\ s_3 \end{pmatrix} = \begin{pmatrix} 2 \\ 2 \\ 4 \end{pmatrix}$$

$$\therefore \quad x_1 = 2,\ x_2 = 0,\ \max(3x_1 - x_2) = \frac{12}{2} = 6$$

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