

Read in the following dictionary:

x_{10}	-3.0	-8.00 x_1	-1.00 x_2	-3.00 x_3	+5.00 x_4	+8.00 x_5	-9.00 x_6	+1.00 x_7	-3.00 x_8	-9.00 x_9
x_{11}	-3.0	-1.00 x_1	+2.00 x_2	-8.00 x_3	-5.00 x_4	-9.00 x_5	+1.00 x_6	+6.00 x_7	+6.00 x_8	-7.00 x_9
x_{12}	0.0	+5.00 x_1	+7.00 x_2	+7.00 x_3	-4.00 x_4	-8.00 x_5	+7.00 x_6	+8.00 x_7	+9.00 x_8	-4.00 x_9
x_{13}	1.0	+3.00 x_1	-5.00 x_2	+2.00 x_3	-2.00 x_4	+7.00 x_5	-9.00 x_6	+3.00 x_7	+8.00 x_8	-4.00 x_9
x_{14}	-2.0	+5.00 x_1	-3.00 x_2	+1.00 x_3	-10.00 x_4	+5.00 x_5	+10.00 x_6	-6.00 x_7	-5.00 x_8	-9.00 x_9
x_{15}	-1.0	+4.00 x_1	-1.00 x_2	-3.00 x_3	+5.00 x_4	-8.00 x_5	-1.00 x_6	-2.00 x_7	+7.00 x_8	+5.00 x_9
x_{16}	0.0	-9.00 x_1	+2.00 x_2	+1.00 x_3	+8.00 x_4	-7.00 x_5	+3.00 x_6	+2.00 x_7	+4.00 x_8	-8.00 x_9
x_{17}	0.0	+5.00 x_1	+4.00 x_2	-4.00 x_3	-7.00 x_4	+8.00 x_5	+6.00 x_6	+9.00 x_7	+6.00 x_8	
x_{18}	-3.0	-8.00 x_1	+9.00 x_2	-6.00 x_3	+4.00 x_4	+2.00 x_5	+7.00 x_6	+3.00 x_7	+5.00 x_8	+10.00 x_9
z	0.0	-4.00 x_1		-3.00 x_3	+3.00 x_4	+3.00 x_5	+5.00 x_6	+1.00 x_7	+2.00 x_8	+5.00 x_9

0.1 Initialization Phase: Dual Problem Solving

New Objective in primal was changed to :

$$\max \sum_{j=1}^9 -x_j$$

Primal variable x_j corresponds to dual variable y_j for $j = 1, \dots, 18$ Dual Dictionary (with objective changed is):

y_1	1.0	+8.00 y_{10}	+1.00 y_{11}	-5.00 y_{12}	-3.00 y_{13}	-5.00 y_{14}	-4.00 y_{15}	+9.00 y_{16}	-5.00 y_{17}	+8.00 y_{18}
y_2	1.0	+1.00 y_{10}	-2.00 y_{11}	-7.00 y_{12}	+5.00 y_{13}	+3.00 y_{14}	+1.00 y_{15}	-2.00 y_{16}	-4.00 y_{17}	-9.00 y_{18}
y_3	1.0	+3.00 y_{10}	+8.00 y_{11}	-7.00 y_{12}	-2.00 y_{13}	-1.00 y_{14}	+3.00 y_{15}	-1.00 y_{16}	+4.00 y_{17}	+6.00 y_{18}
y_4	1.0	-5.00 y_{10}	+5.00 y_{11}	+4.00 y_{12}	+2.00 y_{13}	+10.00 y_{14}	-5.00 y_{15}	-8.00 y_{16}	+7.00 y_{17}	-4.00 y_{18}
y_5	1.0	-8.00 y_{10}	+9.00 y_{11}	+8.00 y_{12}	-7.00 y_{13}	-5.00 y_{14}	+8.00 y_{15}	+7.00 y_{16}	-8.00 y_{17}	-2.00 y_{18}
y_6	1.0	+9.00 y_{10}	-1.00 y_{11}	-7.00 y_{12}	+9.00 y_{13}	-10.00 y_{14}	+1.00 y_{15}	-3.00 y_{16}	-6.00 y_{17}	-7.00 y_{18}
y_7	1.0	-1.00 y_{10}	-6.00 y_{11}	-8.00 y_{12}	-3.00 y_{13}	+6.00 y_{14}	+2.00 y_{15}	-2.00 y_{16}	-9.00 y_{17}	-3.00 y_{18}
y_8	1.0	+3.00 y_{10}	-6.00 y_{11}	-9.00 y_{12}	-8.00 y_{13}	+5.00 y_{14}	-7.00 y_{15}	-4.00 y_{16}	-6.00 y_{17}	-5.00 y_{18}
y_9	1.0	+9.00 y_{10}	+7.00 y_{11}	+4.00 y_{12}	+4.00 y_{13}	+9.00 y_{14}	-5.00 y_{15}	+8.00 y_{16}		-10.00 y_{18}
z	-0	+3.00 y_{10}	+3.00 y_{11}		-1.00 y_{13}	+2.00 y_{14}	+1.00 y_{15}			+3.00 y_{18}

Initialization succeeded in finding final dual dictionary with 6 pivots

y_1	15.6344449135	-4.24 y_5	-2.52 y_7	-43.48 y_{12}	-54.05 y_{13}	-2.25 y_6	-4.53 y_8	-1.09 y_4	-94.67 y_{17}	-
y_2	2.79485014774	-0.84 y_5	+0.27 y_7	-9.71 y_{12}	-7.28 y_{13}	-0.20 y_6	-1.10 y_8	+0.07 y_4	-16.58 y_{17}	-
y_3	11.74124103	-3.60 y_5	-1.11 y_7	-42.76 y_{12}	-62.81 y_{13}	-1.10 y_6	-5.21 y_8	+0.27 y_4	-74.51 y_{17}	-
y_{16}	0.944702406079	-0.24 y_5	-0.14 y_7	-2.60 y_{12}	-2.43 y_{13}	-0.19 y_6	-0.28 y_8	-0.09 y_4	-5.34 y_{17}	-
y_{10}	1.56943858168	-0.54 y_5	-0.15 y_7	-3.96 y_{12}	-7.77 y_{13}	-0.19 y_6	-0.66 y_8	-0.04 y_4	-10.48 y_{17}	-
y_{14}	1.17623469818	-0.40 y_5	-0.07 y_7	-3.25 y_{12}	-5.20 y_{13}	-0.20 y_6	-0.50 y_8	-0.01 y_4	-7.98 y_{17}	-
y_{11}	0.8853946813	-0.27 y_5	-0.14 y_7	-3.36 y_{12}	-4.56 y_{13}	-0.11 y_6	-0.39 y_8	+0.03 y_4	-6.71 y_{17}	-
y_{15}	0.356901646264	-0.14 y_5	+0.08 y_7	-0.93 y_{12}	-2.89 y_{13}	-0.02 y_6	-0.29 y_8	+0.01 y_4	-2.25 y_{17}	-
y_9	37.6819333052	-11.63 y_5	-4.45 y_7	-100.53 y_{12}	-149.60 y_{13}	-5.68 y_6	-13.99 y_8	-0.93 y_4	-244.54 y_{17}	-
z	10.0738708316	-3.38 y_5	-0.92 y_7	-29.41 y_{12}	-51.27 y_{13}	-1.30 y_6	-4.45 y_8	-0.02 y_4	-69.76 y_{17}	-

Primal Dictionary is:

x_5	3.38286196707	$+4.24x_1$	$+0.84x_2$	$+3.60x_3$	$+0.24x_{16}$	$+0.54x_{10}$	$+0.40x_{14}$	$+0.27x_{11}$	$+0.14x_{15}$	$+$
x_7	0.923877866892	$+2.52x_1$	$-0.27x_2$	$+1.11x_3$	$+0.14x_{16}$	$+0.15x_{10}$	$+0.07x_{14}$	$+0.14x_{11}$	$-0.08x_{15}$	$+$
x_{12}	29.4081891093	$+43.48x_1$	$+9.71x_2$	$+42.76x_3$	$+2.60x_{16}$	$+3.96x_{10}$	$+3.25x_{14}$	$+3.36x_{11}$	$+0.93x_{15}$	$+$
x_{13}	51.2664978191	$+54.05x_1$	$+7.28x_2$	$+62.81x_3$	$+2.43x_{16}$	$+7.77x_{10}$	$+5.20x_{14}$	$+4.56x_{11}$	$+2.89x_{15}$	$+$
x_6	1.30322217532	$+2.25x_1$	$+0.20x_2$	$+1.10x_3$	$+0.19x_{16}$	$+0.19x_{10}$	$+0.20x_{14}$	$+0.11x_{11}$	$+0.02x_{15}$	$+$
x_8	4.44716476713	$+4.53x_1$	$+1.10x_2$	$+5.21x_3$	$+0.28x_{16}$	$+0.66x_{10}$	$+0.50x_{14}$	$+0.39x_{11}$	$+0.29x_{15}$	$+$
x_4	0.0167440551569	$+1.09x_1$	$-0.07x_2$	$-0.27x_3$	$+0.09x_{16}$	$+0.04x_{10}$	$+0.01x_{14}$	$-0.03x_{11}$	$-0.01x_{15}$	$+$
x_{17}	69.7629098072	$+94.67x_1$	$+16.58x_2$	$+74.51x_3$	$+5.34x_{16}$	$+10.48x_{10}$	$+7.98x_{14}$	$+6.71x_{11}$	$+2.25x_{15}$	$+$
x_{18}	37.9627128183	$+50.83x_1$	$+16.47x_2$	$+37.17x_3$	$+4.01x_{16}$	$+6.26x_{10}$	$+4.93x_{14}$	$+3.58x_{11}$	$+1.57x_{15}$	$+$
z	-10.0738708316	$-15.63x_1$	$-2.79x_2$	$-11.74x_3$	$-0.94x_{16}$	$-1.57x_{10}$	$-1.18x_{14}$	$-0.89x_{11}$	$-0.36x_{15}$	$-$

Primal Dictionary with original objective is:

x_5	3.38286196707	$+4.24x_1$	$+0.84x_2$	$+3.60x_3$	$+0.24x_{16}$	$+0.54x_{10}$	$+0.40x_{14}$	$+0.27x_{11}$	$+0.14x_{15}$	$+$
x_7	0.923877866892	$+2.52x_1$	$-0.27x_2$	$+1.11x_3$	$+0.14x_{16}$	$+0.15x_{10}$	$+0.07x_{14}$	$+0.14x_{11}$	$-0.08x_{15}$	$+$
x_{12}	29.4081891093	$+43.48x_1$	$+9.71x_2$	$+42.76x_3$	$+2.60x_{16}$	$+3.96x_{10}$	$+3.25x_{14}$	$+3.36x_{11}$	$+0.93x_{15}$	$+$
x_{13}	51.2664978191	$+54.05x_1$	$+7.28x_2$	$+62.81x_3$	$+2.43x_{16}$	$+7.77x_{10}$	$+5.20x_{14}$	$+4.56x_{11}$	$+2.89x_{15}$	$+$
x_6	1.30322217532	$+2.25x_1$	$+0.20x_2$	$+1.10x_3$	$+0.19x_{16}$	$+0.19x_{10}$	$+0.20x_{14}$	$+0.11x_{11}$	$+0.02x_{15}$	$+$
x_8	4.44716476713	$+4.53x_1$	$+1.10x_2$	$+5.21x_3$	$+0.28x_{16}$	$+0.66x_{10}$	$+0.50x_{14}$	$+0.39x_{11}$	$+0.29x_{15}$	$+$
x_4	0.0167440551569	$+1.09x_1$	$-0.07x_2$	$-0.27x_3$	$+0.09x_{16}$	$+0.04x_{10}$	$+0.01x_{14}$	$-0.03x_{11}$	$-0.01x_{15}$	$+$
x_{17}	69.7629098072	$+94.67x_1$	$+16.58x_2$	$+74.51x_3$	$+5.34x_{16}$	$+10.48x_{10}$	$+7.98x_{14}$	$+6.71x_{11}$	$+2.25x_{15}$	$+$
x_{18}	37.9627128183	$+50.83x_1$	$+16.47x_2$	$+37.17x_3$	$+4.01x_{16}$	$+6.26x_{10}$	$+4.93x_{14}$	$+3.58x_{11}$	$+1.57x_{15}$	$+$
z	26.5331363444	$+34.83x_1$	$+5.22x_2$	$+24.00x_3$	$+2.67x_{16}$	$+4.12x_{10}$	$+3.29x_{14}$	$+2.20x_{11}$	$+0.98x_{15}$	$+$

1 Optimization Phase Simplex

Starting Dictionary is:

x_5	3.38286196707	$+4.24x_1$	$+0.84x_2$	$+3.60x_3$	$+0.24x_{16}$	$+0.54x_{10}$	$+0.40x_{14}$	$+0.27x_{11}$	$+0.14x_{15}$	$+$
x_7	0.923877866892	$+2.52x_1$	$-0.27x_2$	$+1.11x_3$	$+0.14x_{16}$	$+0.15x_{10}$	$+0.07x_{14}$	$+0.14x_{11}$	$-0.08x_{15}$	$+$
x_{12}	29.4081891093	$+43.48x_1$	$+9.71x_2$	$+42.76x_3$	$+2.60x_{16}$	$+3.96x_{10}$	$+3.25x_{14}$	$+3.36x_{11}$	$+0.93x_{15}$	$+$
x_{13}	51.2664978191	$+54.05x_1$	$+7.28x_2$	$+62.81x_3$	$+2.43x_{16}$	$+7.77x_{10}$	$+5.20x_{14}$	$+4.56x_{11}$	$+2.89x_{15}$	$+$
x_6	1.30322217532	$+2.25x_1$	$+0.20x_2$	$+1.10x_3$	$+0.19x_{16}$	$+0.19x_{10}$	$+0.20x_{14}$	$+0.11x_{11}$	$+0.02x_{15}$	$+$
x_8	4.44716476713	$+4.53x_1$	$+1.10x_2$	$+5.21x_3$	$+0.28x_{16}$	$+0.66x_{10}$	$+0.50x_{14}$	$+0.39x_{11}$	$+0.29x_{15}$	$+$
x_4	0.0167440551569	$+1.09x_1$	$-0.07x_2$	$-0.27x_3$	$+0.09x_{16}$	$+0.04x_{10}$	$+0.01x_{14}$	$-0.03x_{11}$	$-0.01x_{15}$	$+$
x_{17}	69.7629098072	$+94.67x_1$	$+16.58x_2$	$+74.51x_3$	$+5.34x_{16}$	$+10.48x_{10}$	$+7.98x_{14}$	$+6.71x_{11}$	$+2.25x_{15}$	$+$
x_{18}	37.9627128183	$+50.83x_1$	$+16.47x_2$	$+37.17x_3$	$+4.01x_{16}$	$+6.26x_{10}$	$+4.93x_{14}$	$+3.58x_{11}$	$+1.57x_{15}$	$+$
z	26.5331363444	$+34.83x_1$	$+5.22x_2$	$+24.00x_3$	$+2.67x_{16}$	$+4.12x_{10}$	$+3.29x_{14}$	$+2.20x_{11}$	$+0.98x_{15}$	$+$

x_1 enters and Unbounded Dictionary!

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