Read in the following dictionary:

$$\begin{array}{c|c|l} x_4 & -7.0 & -8.00x_1 +8.00x_2 +3.00x_3 \\ x_5 & -5.0 & +5.00x_1 +3.00x_2 +10.00x_3 \\ x_6 & -2.0 & +6.00x_2 -8.00x_3 \\ x_7 & -1.0 & +7.00x_2 +6.00x_3 \\ x_8 & -2.0 & +3.00x_1 +4.00x_2 -10.00x_3 \\ \hline z & 0.0 & -4.00x_1 -4.00x_2 -2.00x_3 \end{array}$$

0.1 Initialization Phase: Dual Problem Solving

New Objective in primal was changed to :

$$\max \sum_{j=1}^{3} -x_j$$

Primal variable x_j corresponds to dual variable y_j for $j = 1, \ldots, 8$ Dual Dictionary (with objective changed is):

$$\begin{array}{c|c|l} y_1 & 1.0 & +8.00y_4 -5.00y_5 -3.00y_8 \\ y_2 & 1.0 & -8.00y_4 -3.00y_5 -6.00y_6 -7.00y_7 -4.00y_8 \\ y_3 & 1.0 & -3.00y_4 -10.00y_5 +8.00y_6 -6.00y_7 +10.00y_8 \\ \hline z & -0 & +7.00y_4 +5.00y_5 +2.00y_6 +1.00y_7 +2.00y_8 \end{array}$$

Initialization succeeded in finding final dual dictionary with 4 pivots

$$\begin{array}{c|c|l} y_8 & 0.0827250608273 & -0.08y_2 +0.05y_3 -0.88y_6 -0.23y_7 -0.06y_1 \\ y_4 & 0.0170316301703 & -0.06y_2 -0.01y_3 -0.32y_6 -0.51y_7 +0.06y_1 \\ y_5 & 0.177615571776 & -0.06y_2 -0.05y_3 +0.02y_6 -0.68y_7 -0.07y_1 \\ \hline z & 1.17274939173 & -0.90y_2 -0.19y_3 -1.89y_6 -6.39y_7 -0.09y_1 \end{array}$$

Primal Dictionary is:

$$\begin{array}{c|c|l} x_2 & 0.896188158962 & +0.08x_8 +0.06x_4 +0.06x_5 \\ x_3 & 0.185725871857 & -0.05x_8 +0.01x_4 +0.05x_5 \\ x_6 & 1.89132197891 & +0.88x_8 +0.32x_4 -0.02x_5 \\ x_7 & 6.38767234388 & +0.23x_8 +0.51x_4 +0.68x_5 \\ x_1 & 0.0908353609084 & +0.06x_8 -0.06x_4 +0.07x_5 \\ \hline z & -1.17274939173 & -0.08x_8 -0.02x_4 -0.18x_5 \end{array}$$

Primal Dictionary with original objective is:

$$\begin{array}{c|c|l} x_2 & 0.896188158962 & +0.08x_8 +0.06x_4 +0.06x_5 \\ x_3 & 0.185725871857 & -0.05x_8 +0.01x_4 +0.05x_5 \\ x_6 & 1.89132197891 & +0.88x_8 +0.32x_4 -0.02x_5 \\ x_7 & 6.38767234388 & +0.23x_8 +0.51x_4 +0.68x_5 \\ x_1 & 0.0908353609084 & +0.06x_8 -0.06x_4 +0.07x_5 \\ \hline z & -4.3195458232 & -0.43x_8 -0.05x_4 -0.62x_5 \end{array}$$

1 Optimization Phase Simplex

Starting Dictionary is:

x_2	0.896188158962	$+0.08x_8 +0.06x_4 +0.06x_5$
x_3	0.185725871857	$-0.05x_8 +0.01x_4 +0.05x_5$
x_6	1.89132197891	$+0.88x_8 +0.32x_4 -0.02x_5$
x_7	6.38767234388	$+0.23x_8 +0.51x_4 +0.68x_5$
x_1	0.0908353609084	$+0.06x_8 -0.06x_4 +0.07x_5$
z	-4.3195458232	$-0.43x_8 -0.05x_4 -0.62x_5$

Final Dictionary Solution: -4.3195458232 Num Pivots: 1