ex 10.

$l_{11} = 1 \quad d_1 = a_{11} = 2$

$t_{21} = a_{21} = -1$

$l_{ij} = l_{21} = t_{21} / d_1 = -\frac{1}{2}$

$t_{22} = a_{22} - \sum_{k=1}^{1} t_{2k} l_{2k} = -2 - \frac{1}{2} = -\frac{5}{2}$

$d_2 = a_{22} - \sum_{k=1}^{1} t_{2k} l_{2k} = -2 - \frac{1}{2} = -\frac{5}{2}$

$l_{22} = 1$

$t_{31} = a_{31} - 0 = 1$

$l_{31} = t_{31} / d_1 = \frac{1}{2}$

$t_{32} = a_{32} - \sum_{k=1}^{1} t_{3k} l_{2k} = -3 - 1 \times (-\frac{1}{2}) = -\frac{5}{2}$

$l_{32} = t_{32} / d_2 = 1$

$\Rightarrow d_3 = a_{33} - \sum_{k=1}^{2} t_{3k} l_{3k} = 1 - (1 \times \frac{1}{2} + (-\frac{5}{2}) \times 1)$

$= 3.$

$$\Rightarrow L = \begin{pmatrix} 1 & & \\ -0.5 & 1 & \\ 0.5 & 1 & 1 \end{pmatrix}, \quad D = \begin{pmatrix} 2 & & \\ & -2.5 & \\ & & 3 \end{pmatrix}$$

$$X = \begin{pmatrix} 1.45 \\ -3.2 \\ -1 \end{pmatrix}$$

Chapter 5.

ex7. 作变换, s.t. 第一列最优

$$\Rightarrow \begin{pmatrix} 18 & -3 & -1 \\ 12 & -3 & 3 \\ 1 & 1 & 1 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 15 \\ 15 \\ 6 \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} 18 & -3 & -1 \\ 0 & -1 & \frac{11}{3} \\ 0 & \frac{7}{6} & \frac{19}{18} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 15 \\ 5 \\ \frac{41}{6} \end{pmatrix}$$

$$\Rightarrow \begin{pmatrix} 18 & -3 & -1 \\ 0 & \frac{7}{6} & \frac{19}{18} \\ 0 & 0 & \frac{32}{7} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} 15 \\ \frac{41}{6} \\ \frac{76}{7} \end{pmatrix}$$

$\Rightarrow \vec{X} = (0.9898, 1.9570, 3.0530)$

ex9. $\beta_1 = c_1 / b_1 = \frac{-1}{2} = -\frac{1}{2}$

$\beta_2 = c_2 / (b_2 - a_2 \cdot \beta_1) = -1 / (2 - (-1) \cdot (-\frac{1}{2}))$

$= -\frac{2}{3}$

$\beta_4 = -\frac{4}{5}$

$\beta_5 = -\frac{6}{7}$

$\vec{X} = (0.833, 0.667, 0.5, 0.33, 0.1667)$