

# Exercise 7.1

$$a) \begin{pmatrix} L_{00} & 0 & 0 \\ \lambda_{0e}^T & 1 & v_{12}^T \\ 0 & 0 & U_{22} \end{pmatrix}^T \begin{pmatrix} x_0 \\ x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} L_{00}^T & \lambda_{0e} & 0 \\ 0 & 1 & 0 \\ 0 & e_{F12}^T & U_{22}^T \end{pmatrix} \begin{pmatrix} x_0 \\ x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} L_{00}^T x_0 + \lambda_{0e} x_1 \\ x_1 \\ e_{F12}^T x_1 + U_{22}^T x_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \\ 0 \end{pmatrix}$$

$$\boxed{x_1 = 1}$$

$$L_{00}^T x_0 + \lambda_{0e} = 0$$

$$\boxed{x_0 = - (L_{00}^T)^{-1} \lambda_{0e}}$$

$$e_{F12}^T x_1 + U_{22}^T x_2 = 0$$

$$\boxed{x_2 = (U_{22}^T)^{-1} e_{F12}^T}$$

$$b) O(n)$$