• Exercise 7.1:

System of equations:

$L_{00} \cdot x_0 \cdot \lambda_{10} e_L^T \cdot x_1 = 0$

$x_1 = 1$

$v_{12} e_F^T \cdot x_1 + u_{22} x_2 = 0$

Since ~~Using~~ $x_1 = 1$, plugging in equation 1

$L_{00} \cdot x_0 \cdot \lambda_{10} e_L^T = 0$

Solving for x_0 we get

$x_0 = -\lambda_{10} \cdot L_{00}^{-1} \cdot e_L^T$

Substituting in 3rd equation:

$v_{12} e_F^T + u_{22} \cdot x_2 = 0$

$x_2 = -v_{12} e_F^T \cdot 1/u_{22}$

Therefore:

$x_0 = -\lambda_{10} e_L^T \cdot 1/L_{00}$

$x_1 = 1$

$x_2 = 1/u_{22} \cdot -v_{12} e_F^T$

• What is cost? : We can use ~~Thomas~~ alg. We can compute inverse of L_{00} and U_{22} in $O(n)$ time each, & then compute the values of x_0 & x_2 in $O(n)$ time using formulas above.

Therefore total cost is $\boxed{O(n)}$, which is much faster than general algorithm cost of $O(n^3)$