Example: Converting a Controllable System to CCF

Step 3: Compute T.

Recall: $T = \mathcal{C}(\bar{A}, \bar{B}) \cdot [\mathcal{C}(A, B)]^{-1}$

$$\mathcal{C}(A, B) = \begin{pmatrix} 1 & -7 \\ 1 & -8 \end{pmatrix}$$

$$[\mathcal{C}(A, B)]^{-1} = \begin{pmatrix} 1 & -7 \\ 1 & -8 \end{pmatrix}^{-1}$$

$$= \frac{1}{-1} \begin{pmatrix} -8 & 7 \\ -1 & 1 \end{pmatrix} = \begin{pmatrix} 8 & -7 \\ 1 & -1 \end{pmatrix}$$

$$\mathcal{C}(\bar{A}, \bar{B}) = \begin{pmatrix} 0 & 1 \\ 1 & -8 \end{pmatrix}$$

$$T = \begin{pmatrix} 0 & 1 \\ 1 & -8 \end{pmatrix} \begin{pmatrix} 8 & -7 \\ 1 & -1 \end{pmatrix}$$

$$= \begin{pmatrix} 1 & -1 \\ 0 & 1 \end{pmatrix}$$