The following system is given
\[ \dot{x}(t) = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} x(t) + \begin{bmatrix} 1 \\ 1 \end{bmatrix} u(t). \]

Can you find a state feedback gain \( u(t) = -Kx(t) = -[k_1 \ k_2] x(t) \) such that the closed loop system eigenvalues are \( \lambda_{cl} = \{-1, -1\} \)? Find \( K \) if that is possible.

What if the desired closed loop system eigenvalues are \( \lambda_{cl} = \{-1, 1\} \)? Is that doable? If yes, find \( K \).

Your Solution:
Your Solution: