$$\underbrace{[sI-A]}_{[n\times n]}\underbrace{X(s)}_{[n\times 1]} = \underbrace{B}_{[n\times 1]}\underbrace{U(s)}_{[1\times 1]}$$

$$\underbrace{[sI-A]^{-1}[sI-A]}_{I}X(s) = [sI-A]^{-1}BU(s)$$

$$X(s) = [sI-A]^{-1}BU(s)$$

$$\mathcal{L}\,y(t) = \mathcal{L}\,Cx(t) + \mathcal{L}\,Du(t)$$

$$\underbrace{Y(s)}_{[1\times 1]} = CX(s) + DU(s) = C[sI-A]^{-1}BU(s) + DU(s)$$

$$Y(s) = [C[sI-A]^{-1}B + D]U(s)$$

$$[1\times 1] \quad [1\times n]\ n\times n\ [n\times 1] \quad [1\times 1] \quad [1\times 1]$$

$$G(s) = \frac{Y(s)}{U(s)} = C[sI-A]^{-1}B + D \quad [1\times 1]$$