

Trans. Laplace Inverse:

$$y(t) = b_m \frac{d^m x(t)}{dt^m} + b_{m-1} \frac{d^{m-1} x(t)}{dt^{m-1}} + \dots + b_1 \frac{dx(t)}{dt} + b_0 x(t)$$

$$= b_m x_{m+1} + b_{m-1} x_m + \dots + b_1 x_2 + b_0 x_1$$

$$y = \underbrace{\begin{bmatrix} b_0 & b_1 & \dots & b_{m-1} & b_m & 0 & 0 \end{bmatrix}}_{\substack{(m+1) \\ C[1 \times n]}} \underbrace{\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_m \\ x_{m+1} \\ \vdots \\ x_n \end{bmatrix}}_{\substack{(n) \\ X[n \times 1]}} + \underbrace{[0]}_{D[1 \times 1]} u$$