

EXAMPLE:

$$y(k+r) = G_r(k+r) u_r(k+r) + T(k+r)$$

$$\begin{matrix} \swarrow & \swarrow \\ G_r(k) + g_1 r + g_2 r^2 & T(k) + t_1 r + t_2 r^2 \end{matrix}$$

$$\underline{\Theta} = [G_r(k) \ g_1 \ g_2 \ T(k) \ t_1 \ t_2]$$

~~MINIMUM ORDER~~

$$n = 2$$

$$y(k-2) = G_r(k) u_r(k-2) + g_1(-2) u(k-2) + g_2(-2)^2 u(k-2) + T(k-2) + t_1(-2) + t_2(-2)^2 \quad \dots \text{ETC.}$$

$$= [G_r \ g_1 \ g_2 \ T \ t_1 \ t_2] \begin{bmatrix} u(k-2) \\ (-2)u(k-2) \\ (-2)^2 u(k-2) \\ 1 \\ (-2) \\ (-2)^2 \end{bmatrix} \left\{ \begin{bmatrix} 1 \\ (-2) \\ (-2)^2 \end{bmatrix} u(k-2) \right. \\ \left. \begin{bmatrix} 1 \\ (-2) \\ (-2)^2 \end{bmatrix} \right\}$$

$$y(k-1) = \underline{\Theta} \begin{bmatrix} 1 \\ (-1) \\ (-1)^2 \\ 1 \\ (-1) \\ (-1)^2 \end{bmatrix} u(k-1)$$

$$y_n = \underline{\Theta} \cdot \underline{K}_n + \underline{V}_n$$

$$[y(k-2) \ y(k-1) \ y(k) \ y(k+1) \ y(k+2)] = \underline{\Theta} \times$$

$$\begin{bmatrix} \begin{bmatrix} 1 \\ (-2) \\ (-2)^2 \end{bmatrix} u(k-2) & \begin{bmatrix} 1 \\ (-1) \\ (-1)^2 \end{bmatrix} u(k-1) & \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} u(k) & \begin{bmatrix} 1 \\ 1 \\ 1^2 \end{bmatrix} u(k+1) & \begin{bmatrix} 1 \\ 2 \\ 2^2 \end{bmatrix} u(k+2) \\ \begin{bmatrix} 1 \\ (-2) \\ (-2)^2 \end{bmatrix} & \begin{bmatrix} 1 \\ (-1) \\ (-1)^2 \end{bmatrix} & \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} & \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} & \begin{bmatrix} 1 \\ 2 \\ 2^2 \end{bmatrix} \end{bmatrix}$$

$$\underline{K}_n \quad \{ 2R+2 = (R+1)(n+1) \quad (\text{par}) \}$$

$$\# \text{EQU} \geq \# \text{PAR}$$

$$2n+1 \quad (\text{eqn})$$

$$2n \geq 2R+1 \quad n \geq R+1$$