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Nomor 2

Ruang keadaan ke nisbah alih (Hasil Transformasi)

$$G(s) = \hat{C} [sI - \hat{A}]^{-1} \hat{B} + \hat{D}$$

$$G(s) = [0 \quad 0.5] \left(\begin{bmatrix} s & 0 \\ 0 & s \end{bmatrix} - \begin{bmatrix} 1 & 0 \\ 6 & -1 \end{bmatrix} \right)^{-1} \begin{bmatrix} 1 \\ 4 \end{bmatrix} + [1]$$

$$G(s) = [0 \quad 0.5] \begin{bmatrix} s-1 & 0 \\ -6 & s+1 \end{bmatrix}^{-1} \begin{bmatrix} 1 \\ 4 \end{bmatrix} + [1]$$

$$G(s) = [0 \quad 0.5] \frac{1}{(s-1)(s+1)} \begin{bmatrix} s+1 & 0 \\ 6 & s-1 \end{bmatrix} \begin{bmatrix} 1 \\ 4 \end{bmatrix} + [1]$$

$$G(s) = [0 \quad 0.5] \begin{bmatrix} 1/s-1 & 0 \\ 6/s^2-1 & 1/s+1 \end{bmatrix} \begin{bmatrix} 1 \\ 4 \end{bmatrix} + [1]$$

$$G(s) = \begin{bmatrix} \frac{3}{s^2-1} & \frac{0.5}{s+1} \end{bmatrix} \begin{bmatrix} 1 \\ 4 \end{bmatrix} + [1]$$

$$G(s) = \left[\left(\frac{3}{s^2-1} + \frac{2}{s+1} \right) \right] + [1]$$

$$G(s) = \frac{3+2(s-1)}{(s+1)(s-1)} + \frac{(s+1)(s-1)}{(s+1)(s-1)}$$

$$G(s) = \frac{3+2s-2+s^2-1}{s^2-1} = \frac{s^2+2s}{s^2-1}$$

TIDAK DIAMANKAN

harus my
sama den
sebelum transformasi

$n=2$ dan $m=2$

maka, dari hasil matriks A, B, C, D

$$g) \cdot [P] = \begin{bmatrix} B & AB \end{bmatrix} \quad A[2 \times 2]$$

$$[\hat{P}] = \begin{bmatrix} \hat{B} & \hat{A}\hat{B} \end{bmatrix}$$

$$[P] = \begin{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} & \begin{bmatrix} 1 & 0 \\ 1 & -1 \end{bmatrix} \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$= \begin{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} & \begin{bmatrix} 1 \\ 0 \end{bmatrix} \end{bmatrix}$$

→ Matriks Square $[2 \times 2]$

Maka, sistem completely controllable ✓

$$\det [P] = 1$$

$$\cdot [Q] = \begin{bmatrix} C^T & A^T C^T \end{bmatrix}$$

$$[Q] = \begin{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} & \begin{bmatrix} 1 & 1 \\ 0 & -1 \end{bmatrix} \end{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$[Q] = \begin{bmatrix} \begin{bmatrix} 1 \\ 1 \end{bmatrix} & \begin{bmatrix} 2 \\ -1 \end{bmatrix} \end{bmatrix}$$

→ Matriks Square $[2 \times 2]$

Maka, sistem completely observable ✓

$$\det [Q] = 3$$

→ di kertas sebelah

yang hasil transformasi ✓