

$$u = a_n x_n + a_{n-1} x_{n-1} + a_{n-2} x_{n-2} + \dots + a_2 x_2 + a_1 x_1 + a_0 x_0$$

$$\dot{x}_n = -\frac{a_0}{a_n} x_1 - \frac{a_1}{a_n} x_2 - \frac{a_2}{a_n} x_3 - \dots - \frac{a_{n-2}}{a_n} x_{n-1} - \frac{a_{n-1}}{a_n} x_n +$$

Pers. Keadaan

$$\dot{X} = \begin{bmatrix} \dot{x}_1 \\ \dot{x}_2 \\ \dot{x}_3 \\ \vdots \\ \dot{x}_{n-2} \\ \dot{x}_{n-1} \\ \dot{x}_n \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 & \dots & 0 & 0 \\ 0 & 0 & 1 & \dots & 0 & 0 \\ 0 & 0 & 0 & \ddots & 0 & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots & \vdots \\ 0 & 0 & 0 & \dots & 1 & 0 \\ 0 & 0 & 0 & \dots & 0 & 1 \\ -\frac{a_0}{a_n} & -\frac{a_1}{a_n} & \dots & \dots & -\frac{a_{n-1}}{a_n} & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ \vdots \\ x_{n-2} \\ x_{n-1} \\ x_n \end{bmatrix} + \frac{1}{a_n} \begin{bmatrix} u \\ 0 \\ 0 \\ \vdots \\ 0 \\ 0 \\ u \end{bmatrix}$$

$A[n \times n]$   $B[n \times 1]$