$$\begin{bmatrix} x_1'(t) \\ x_2'(t) \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ 3 & 0 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix} + \begin{bmatrix} -1 \\ 0 \end{bmatrix} u(t)$$

$$y(t) = \begin{bmatrix} 0 & 1 \end{bmatrix} \begin{bmatrix} x_1(t) \\ x_2(t) \end{bmatrix}$$

p.p.:

$x_1(0) = 1$

$x_2(0) = -1$

$x_1'(t) = x_2(t) - u(t)$

$x_2'(t) = 3x_1(t)$

$y(t) = x_2(t)$

$y(t) = x_2(t)$

$y'(t) = x_2'(t) = 3x_1(t)$

$y''(t) = 3 \cdot x_1'(t) = 3 \cdot (x_2(t) - u(t))$

$y''(t) = 3y(t) - 3 \cdot u(t)$

$y''(t) - 3 \cdot y(t) = 3u(t)$

$y(0) = -1$

$y'(0) = -3$

$y(t) \rightarrow x_2(t)$

$x_2(0) = -1 \rightarrow y(0)$

$y'(t) = 3 \cdot x_1(t)$

$x_1(0) = -1$

$$\begin{bmatrix} x_1[n+1] \\ x_2[n+1] \\ x_3[n+1] \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & 0 & 3 \end{bmatrix} \begin{bmatrix} x_1[n] \\ x_2[n] \\ x_3[n] \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 1 & -2 \end{bmatrix} \begin{bmatrix} u_1[n] \\ u_2[n] \end{bmatrix}$$

$$y[n] = \begin{bmatrix} 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} x_1[n] \\ x_2[n] \\ x_3[n] \end{bmatrix}$$

$$x_1[n+1] = x_2[n]$$
$$x_2[n+1] = x_3[n]$$
$$x_3[n+1] = -6x_1[n] + 3x_3[n] + u_1[n] - 2u_2[n]$$
$$y[n] = x_1[n]$$

$$y[n] = x_1[n] \qquad y[n+1] = x_1[n+1]$$
$$y[n+1] = x_2[n] \qquad y[n+2] = x_2[n+1]$$
$$y[n+2] = x_3[n] \qquad y[n+3] = x_3[n+1]$$

$$y[n+3] = -6y[n] + 3y[n+2] + u_1[n] - 2u_2[n]$$

$$y[n+3] - 3y[n+2] + 6y[n] = u_1[n] - 2u_2[n]$$