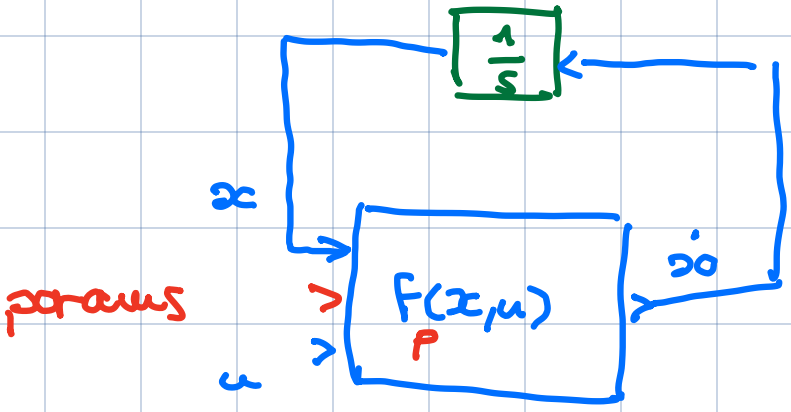
"WRITE" IN SIMULINK THE PLANT

1. MATLAB FUNCTION (EASY)
2. S-FUNCTION (MATLAB CODED) (EASY...)
3. S-FUNCTION (C-CODED) (DIFFICULT...)

$$\dot{x}(t) = f(x(t), u(t))$$




$$m l^2 \dot{\omega} + mgl \sin(q) = \tau + k l^2 \cos(q)$$

$$\dot{\omega} = -\frac{\cancel{m} g \cancel{\ell}}{\cancel{m} \ell^2} \sin(q) + \frac{k \cancel{\ell}^2}{m \cancel{\ell}^2} \cos(q) + \frac{1}{m \ell^2} \tau$$

$$\frac{g}{\ell} \qquad \frac{k}{m}$$

$$T_s \leq \frac{2\pi}{20\,\omega_{BW}}$$

$$\omega_{BW} \approx |\lambda_{dom}| = 8.37 \ \frac{rad}{sec}$$

$C_z$, $D_{zu}$

$$C_z = \left[\begin{array}{cc} 1 & 0 \\ \hline 0 & 0 \end{array}\right] \qquad D_{zu} = \left[\begin{array}{c} 0 \\ \hline \rho \end{array}\right]$$

# S-FUNCTION PARADIGM

## PROGRAMMING PARADIGM OF THE SIMULINK BLOCKS

$$\begin{cases} \dot{x}(t) = Ax(t) + Bu(t) \\ y(t) = Cx(t) \end{cases}$$

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