Exercício 01/10

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$$\begin{cases} \ddot{X} = (M_1 x_1 + M_2 x_2)/M \\ \ddot{X} = (u_1 + u_2)/M \end{cases}$$

$$\delta = x_1 - x_2 \qquad \ddot{\delta} = -\frac{KM}{M_1 M_2}\delta + \frac{u_1}{M_1} - \frac{u_2}{M_2}$$

$$X = [x \;\; \delta \;\; \dot{x} \;\; \dot{\delta}]^t$$

$$\begin{bmatrix} \dot{x} \\ \dot{\delta} \\ \ddot{x} \\ \ddot{\delta} \end{bmatrix} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & -KM/M_1M_2 & 0 & 0 \end{bmatrix} \begin{bmatrix} x \\ \delta \\ \dot{x} \\ \dot{\delta} \end{bmatrix} + \begin{bmatrix} 0 & 0 \\ 0 & 0 \\ 1/M & 1/M \\ 1/M_1 & -1/M_2 \end{bmatrix} \begin{bmatrix} u_1 \\ u_2 \end{bmatrix}$$