System Identification :-

$$y = \frac{Ku}{s+a}$$

$$\Rightarrow \dot{y} + ay = Ku$$

$$\Rightarrow \underbrace{\frac{y(t+1) - y(t)}{\Delta t}}_{\text{Euler's approximation}} = -ay + Ku$$

$$\Rightarrow y(t+1) = \underbrace{(1 - a\Delta t)}_{\tilde{a}} y + \underbrace{K\Delta t}_{\tilde{b}} u$$

$$\underbrace{\begin{bmatrix} y & u \end{bmatrix}}_{Z} \begin{bmatrix} \tilde{a} \\ \tilde{b} \end{bmatrix} = \underbrace{\text{shifted } y}_{y(t+1)}$$

Use least square: $\begin{bmatrix} \tilde{a} \\ \tilde{b} \end{bmatrix} = Z \backslash y(t+1)$