

$$G_1(s) = \frac{\text{num1}}{\text{den1}} = \frac{10}{s^2 + 2s + 10}, \quad G_2(s) = \frac{\text{num2}}{\text{den2}} = \frac{5}{s + 5}$$

To obtain for every systems?

$$[num, den] = \text{series}(num1, den1, num2, den2)$$

" " = parallel " "

$$[num, den] = \text{feedback} "$$

printsys(num, den)

$$\rightarrow \text{Series} \quad \frac{10}{s^2 + 2s + 10} \cdot \left(\frac{5}{s + 5} \right) = \frac{50}{s^3 + 7s^2 + 20s + 50}$$

$$\rightarrow \text{Parallel} \quad \frac{10}{s^2 + 2s + 10} + \frac{5}{s + 5} = \frac{5s^2 + 20s + 100}{s^3 + s^2 + 20s + 50}$$

$$\rightarrow \text{Feedback} \quad \frac{\frac{10}{s^2 + 2s + 10}}{1 + \left(\frac{10}{s^2 + 2s + 10} \right) \cdot \left(\frac{5}{s + 5} \right)} = \frac{10s + 50}{s^3 + 7s^2 + 20s + 100}$$