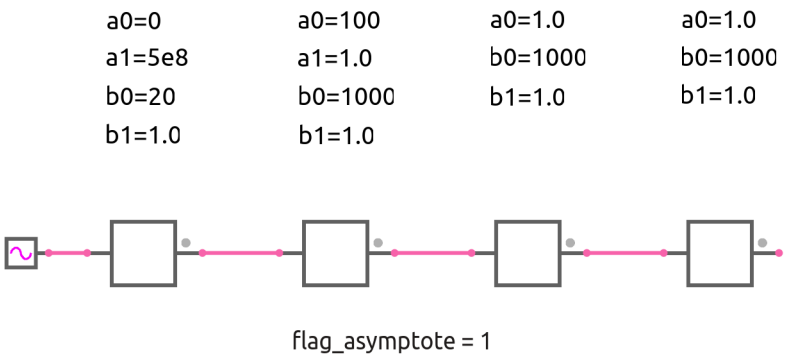
test_filter_8.sqproj



Shown in the figure is a filter given by

$$H(s) = \frac{a_0^{(1)} + a_1^{(1)} s}{b_0^{(1)} + b_1^{(1)} s} \times \frac{a_0^{(2)} + a_1^{(2)} s}{b_0^{(2)} + b_1^{(2)} s} \times \frac{a_0^{(3)} s}{b_0^{(3)} + b_1^{(3)} s} \times \frac{a_0^{(4)} s}{b_0^{(4)} + b_1^{(4)} s} \,. \tag{1}$$

Exercise Set

1. With the coefficient values as specified in the figure, draw the asymptotic gain and phase plots (Bode plots) for the filter for $0.01\,\text{Hz} < f < 100\,\text{kHz}$. The frequency and gain axes should be logarithmic, and the phase axis should be linear.

2. Compare your plots with simulation results obtained by setting the global parameter `flag_asymptote` to 1.

   (Note that the output is equal to the transfer function since the filter input $\mathbf{V}_i$ is set to $1\angle 0$.)

3. Compare the asymptotic plots with the actual gain and phase plots obtained by setting `flag_asymptote` to 0.