Simply RC Circuit:

$$
\begin{aligned}
H(s) &= \frac{1}{1+\frac{\omega}{\omega_p}} \\
\mathscr{L}^{-1}\{H(s)\} &= -\omega_p^2 e^{-\omega_p t} \\
v_{\text{in}}(t) - v_{\text{out}}(t) &= \omega_p \frac{dv_{\text{out}}}{dt} \\
\Rightarrow ret[x] &= (y[x+1]/(\omega_p)) - (y[x]/(\omega_p));
\end{aligned} \tag{1}
$$

Butterworth Filter:

$$
\begin{aligned}
H(s) &= \frac{1}{(s^2 - 2\cos(\frac{7\pi}{12})s+1)(s^2 - 2\cos(\frac{3\pi}{4})s+1)(s^2 - 2\cos(\frac{11\pi}{12})s+1)} \\
v_{\text{in}}(t) - v_{\text{out}}(t) &= \omega_p \frac{dv_{\text{out}}}{dt} \\
\Rightarrow ret[x] &= (y[x+1]/(\omega_p)) - (y[x]/(\omega_p));
\end{aligned} \tag{2}
$$

$$
\frac{(-2\sin(\frac{3\pi}{4})\sin(\frac{7\pi}{12})(\cos(\frac{3\pi}{4}) - \cos(\frac{7\pi}{12}))((-\cos(\frac{11\pi}{12})^2 + \frac{1}{2})\sin(t\sin(\frac{11\pi}{12})) + \cos(t\sin(\frac{11\pi}{12}))\cos(\frac{11\pi}{12})\sin(\frac{11\pi}{12}))e^{(t\cos(\frac{11\pi}{12}))} + 2\sin(\frac{11\pi}{12})(((-\cos(\frac{7\pi}{12})^2 + \frac{1}{2})\sin(t\sin(\frac{7\pi}{12})) + \cos(t\sin(\frac{7\pi}{12}))}{(4\sin(\frac{11\pi}{12})\sin(\frac{7\pi}{12})\sin(\frac{3\pi}{4})(\cos(\frac{3\pi}{4}) - \cos(\frac{7\pi}{12}))(-\cos(}
$$