

2024 November 13

$$y[n] = x[n] - 1.45y[n-1]$$

Impulse Response

$$x[n] = \delta[n]$$

$$y[n] = h[n]$$

$$h[n] = \delta[n] - 1.45h[n-1]$$

$$h[0] = 1$$

$$h[1] = -1.45$$

$$h[2] = (1.45)^2$$

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$$h[n] = (-1.45)^n u[n]$$

If this had a freq response, it would be

$$Y(\omega) = X(\omega) - 1.45e^{-j\omega} Y(\omega)$$

$$H(\omega) = \frac{Y(\omega)}{X(\omega)} = \frac{1}{1 + 1.45e^{-j\omega}}$$

But it doesn't b/c it's unstable!