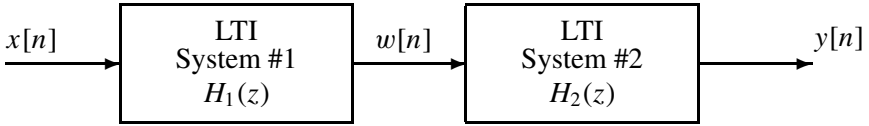
PROBLEM:

Consider the following cascade system:



where

$$H_1(z) = 2 - z^{-1} - z^{-2} \quad \text{and} \quad H_2(z) = 1 + \tfrac{1}{2}z^{-1}$$

(a) If the input $x[n]$ is a step,

$$x[n] = \begin{cases} 1 & \text{for } 0 \le n \\ 0 & \text{for } n < 0 \end{cases}$$

Find the output of the **first filter**, $w[n]$.

(b) Find and plot the impulse response $h[n]$ of the overall system.