Quiz 1

Sujal - AI20BTECH11020

Download all latex codes from

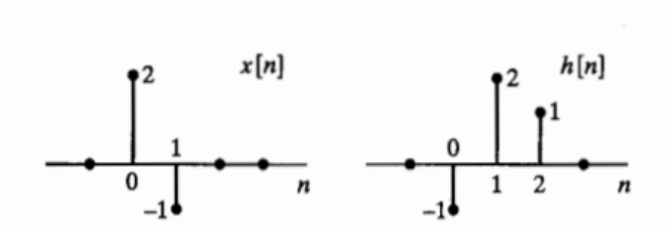
https://github.com/https://github.com/sujal100/EE3900/blob/main/quiz1/quiz1.tex

Download all python codes from

https://github.com/https://github.com/sujal100/EE3900/blob/main/quiz1/codes/code.py

1 Problem

[2.22(b)] Use discrete convolution to find the response to the input $x[n]$ of the linear-time invariant system with impulse response $h[n]$



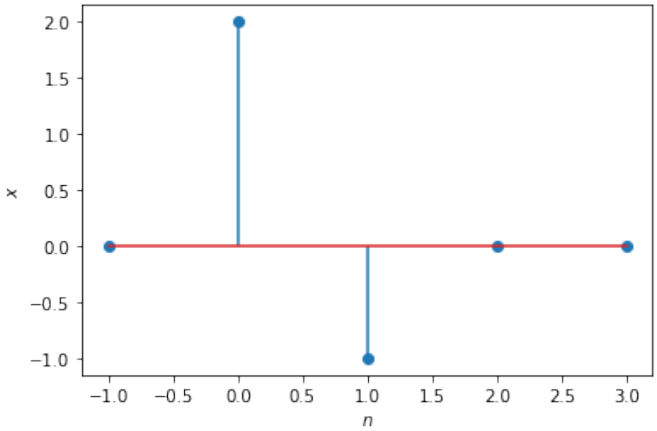


Fig. 0: plot of x

2 Solution

$$y[n] = x[n] * h[n] \tag{2.0.1}$$

$$= \sum_{k=-\infty}^{\infty} x[k]h[n-k] \tag{2.0.2}$$

From the input signal figure

$$x[n] = \delta[n-1] \tag{2.0.3}$$

The plot of $x[n]$ is given below The plot of $h[n]$ is given below from (2.0.1) and (2.0.3), we get

$$y[n] = \delta[n-1] * h[n] \tag{2.0.4}$$

$$= h[n-1] \tag{2.0.5}$$

The above expression has been computed using python.

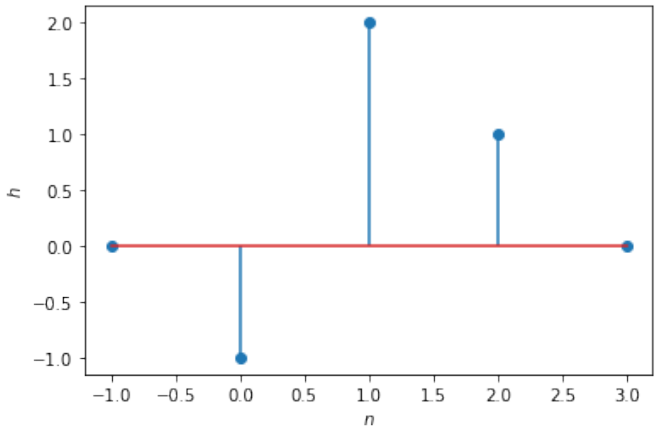


Fig. 0: plot of h

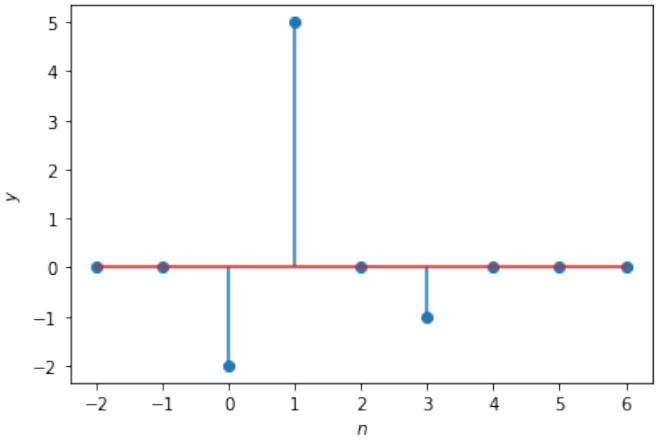


Fig. 0: plot of y