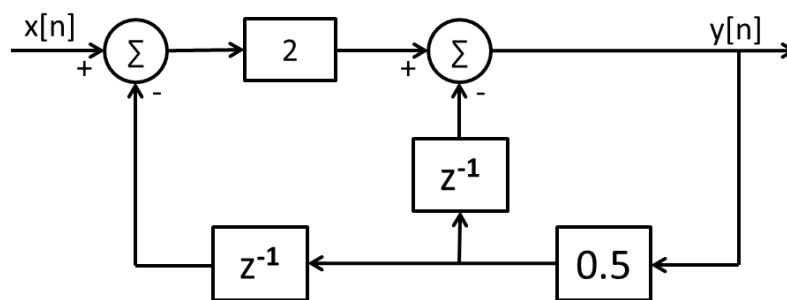


# Assignment #1

## Signals and Systems for Computer Engineering

1- Consider the discrete system shown in the figure below where  $x[n]$  is the input and  $y[n]$  is the output.

- Find the impulse response ( $h[n]$ ) of the system.
- Express the output  $y[k]$  as a function of  $x[k]$  in a difference equation.
- Find and draw the system output values for  $n=0$  to 5 while input stream  $x[n]$  is:  
 $x[n]=(n-1)(u[n-1]-u[n-4]-\delta[n])$ .
- Find the transfer function  $T(z) = \frac{Y(z)}{X(z)}$  (in terms of “ $z$ ” where  $z^{-1}$  represents the unit delay).



2- Apple Stock Price (@Nasdaq AAPL) is given in the attached .csv file. Write a Python program that performs the following tasks:

- Draws the variation of closing price in chosen date interval (default will be all data).
- Draws a 3<sup>rd</sup> order (4 taps) moving average FIR filter closing price value (as given in previous question) in chosen date interval, when a logical option is checked.
- Calculates “Average”, “Standard deviation” and “Root Means Square” values of the drawn graphics.

Note: Your next assignments will be partially dependent on this code.