

PROBLEM:

The following MATLAB code will compute a time response and the frequency response of a digital filter:

```
bb = [ 1  0  -1 ];  
xn = [ 1, -1, -1, -1, 1, zeros(1,3) ];  
yn = firfilt( bb, xn );  
subplot(2,1,1), stem( [0:9], yn(1:10) );    %--- TIME RESPONSE  
w = -pi : (pi/100) : pi;  
H = freqz( bb, 1, w );  
subplot(2,1,2), plot( w, abs(H) )          %--- FREQUENCY RESPONSE
```

- (a) Make the plot of y_n that will be done by the MATLAB `stem` function (in line #4).
- (b) Again referring to the MATLAB code above, make the plot of the magnitude response vs. $\hat{\omega}$ over the range $-\pi \leq \hat{\omega} \leq \pi$. Justify by giving a simple formula for the frequency response $H(e^{j\hat{\omega}})$. Remember that the magnitude should never be negative.