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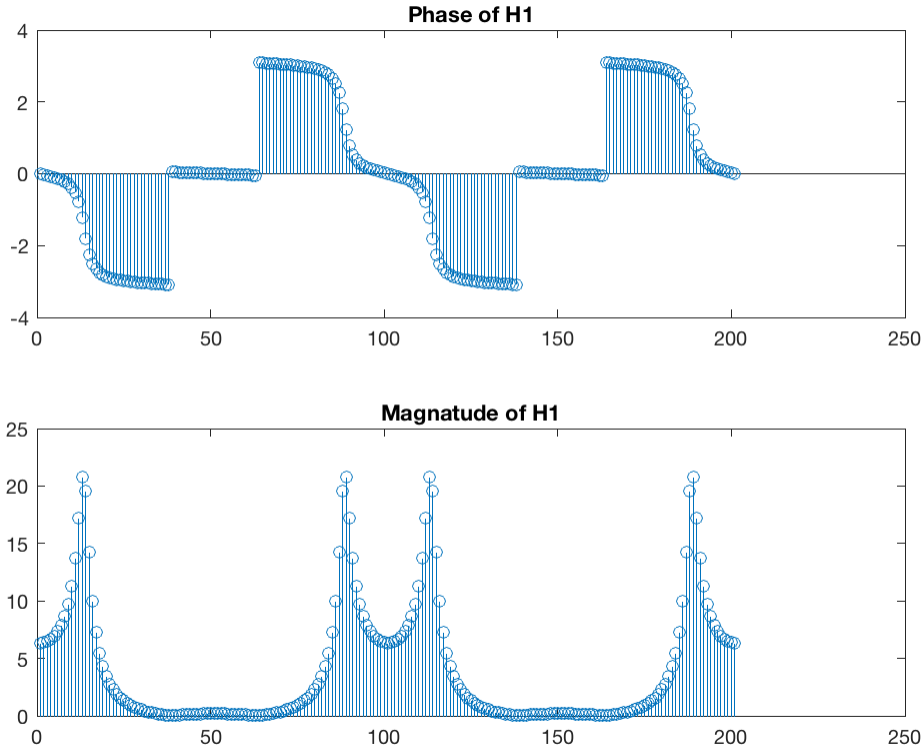
Task 1 (problem 1 & 2)

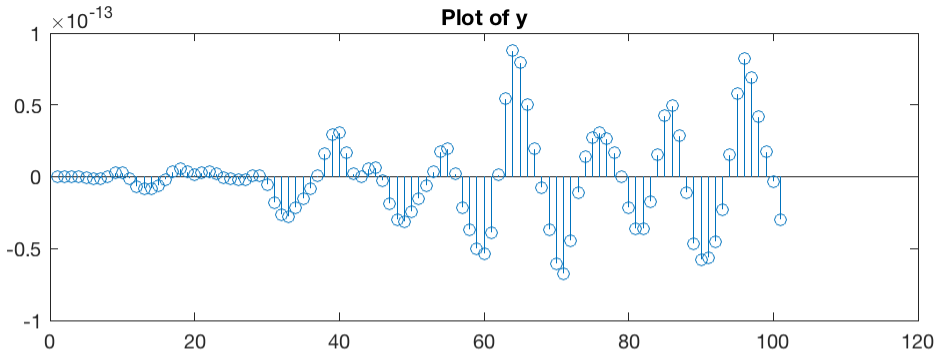
```
%
%
%
%
% <<1.png>>

% plot was used for the frequency response.
clear all
j = sqrt(-1);
f = -1:.01:1;
w = 2*pi*f;
%From hand calculations
Y1 = 1-2*cos(3*pi/4)*exp(-j*w)+exp(-2*j*w);
X1 = 1 - 1.8*cos(pi/4)*exp(-j*w)+0.81*exp(-2*j*w);
H1 = Y1./X1;
figure
subplot(2,1,1)
stem(angle(H1));
title('Phase of H1')
subplot(2,1,2)
stem(abs(H1));
title('Magnatude of H1')
%The angle of h ocilates over the x axis, the plot of the magnatude
 appears
%to be constant.
```



Problem 3

3) Assume $y[-1] = y[-2] = 0$ and $x[n] = \cos\left(\frac{3\pi}{4}n\right)u[n]$. Compute, plot and discuss $y[n]$ for $n \geq 0$.

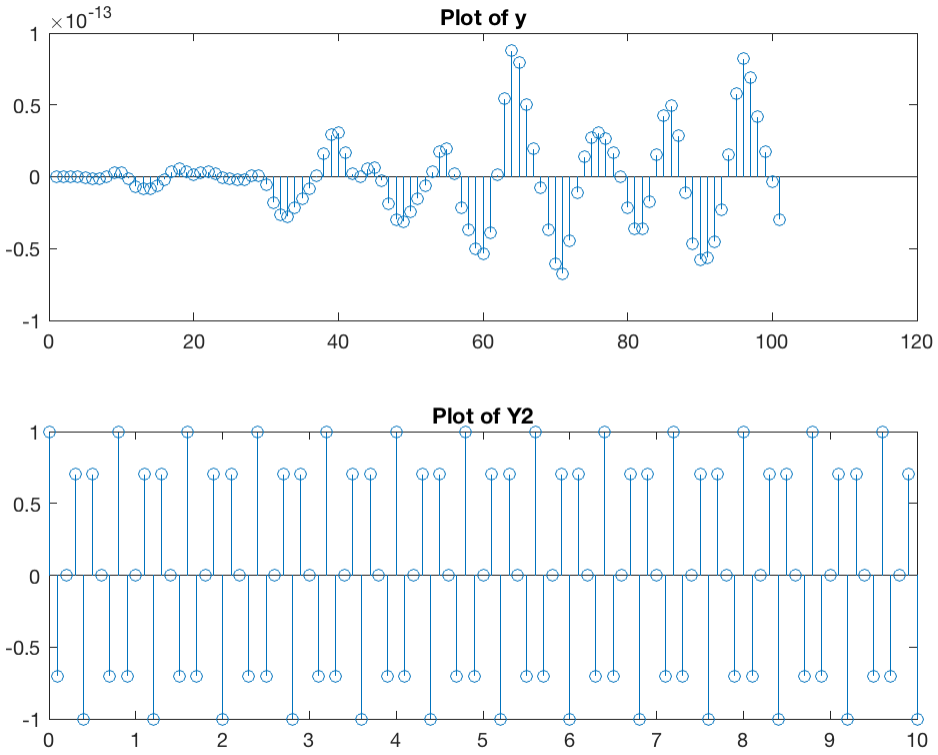
```
n = 0:100;
for l = 1:101
   y(l) = 0;
end
x = cos(3*pi/4*(n+1));
for m = 3:100;
    y(m+1) = x(m+1)-2*cos(3*pi/4)*x(m+1-1)+x(m+1-2)+ ...
        1.8*cos(pi/4)*y(m+1-1)-0.81*y(m+1-2);
end
figure
subplot(2,1,1)
stem(y)
title('Plot of y')
```



Problem 4

4) Assume $x[n] = \cos\left(\frac{3\pi}{4}n\right)$. Determine an analytical expression of $y[n]$. Plot this $y[n]$ for $n \geq 0$ and compare it with the plot from 3).

```
Y2 = 0:100;

for f = 0:100
     Y2(f+1) = cos(3*pi/4*f);
end
subplot(2,1,2)
stem(0:0.1:10,Y2)
title('Plot of Y2')
%This plot and the plot form problem 3 are identicle.
```



Problem 5

Assume $y[-1] = y[-2] = 0$ and $x[n] = \cos\left(\frac{\pi}{4}n\right)u[n]$. Compute, plot and discuss $y[n]$ for $n \geq 0$.

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