Lab_09_HW

Contents

- 4.1a
- 4.1b
- 4.1c
- 4.1e

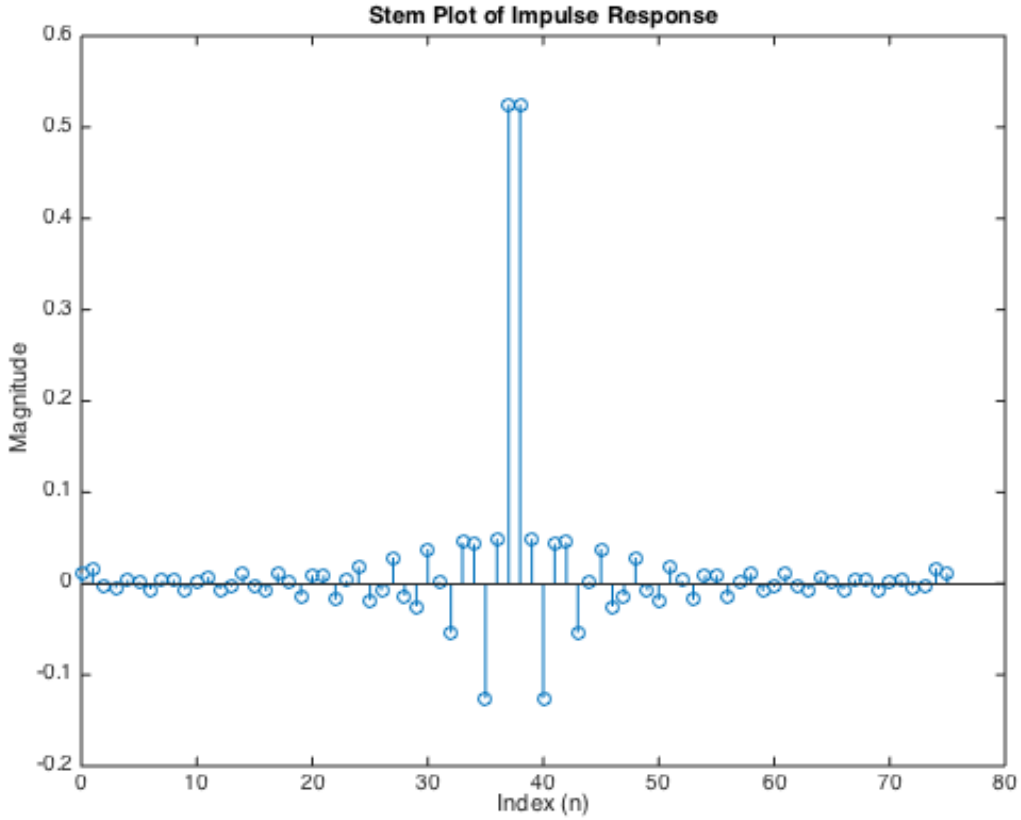
4.1a

```
wp = .6*pi;
ws = .64*pi;
dp = .05;
ds = .01;

frp = wp/(pi);
frs = ws/(pi);

[N, Fo, Ao, W] = firpmord([frp, frs], [1, 0], [.05, .01], 2);
M = N + 2;
b = firpm(M, Fo, Ao, W);
fprintf('\nOrder used was M = %d, predicted M = %d', M, N);
```

```
Order used was M = 75, predicted M = 73
```

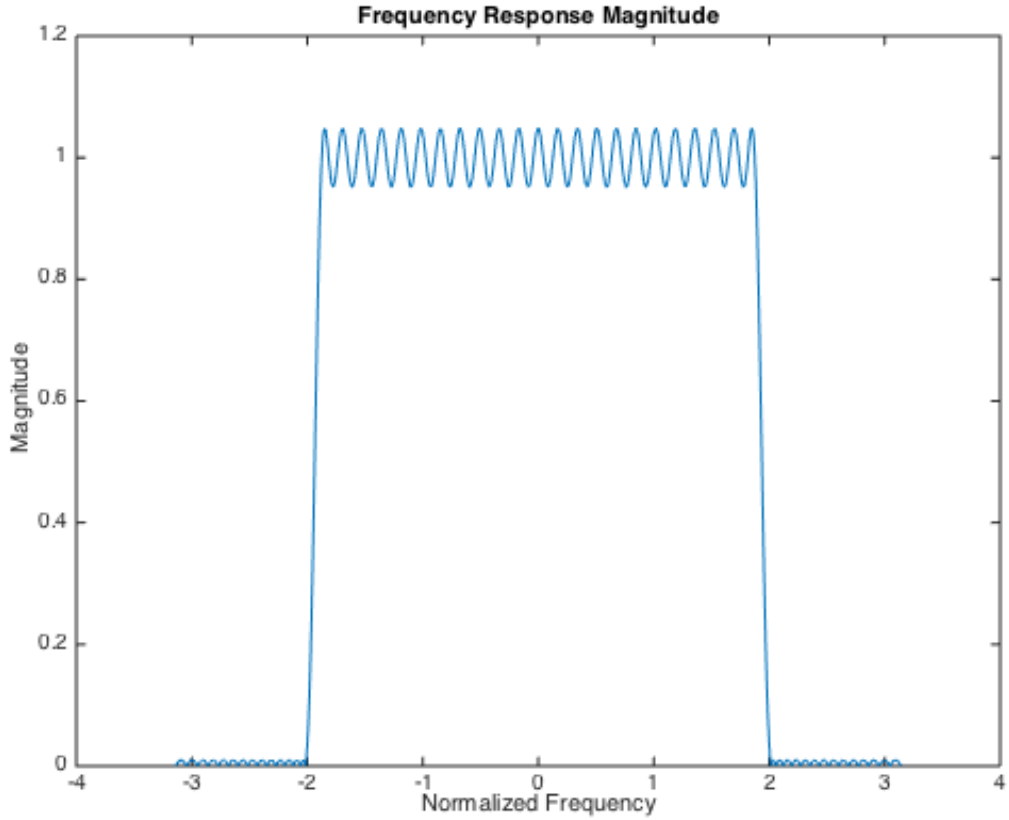
4.1b

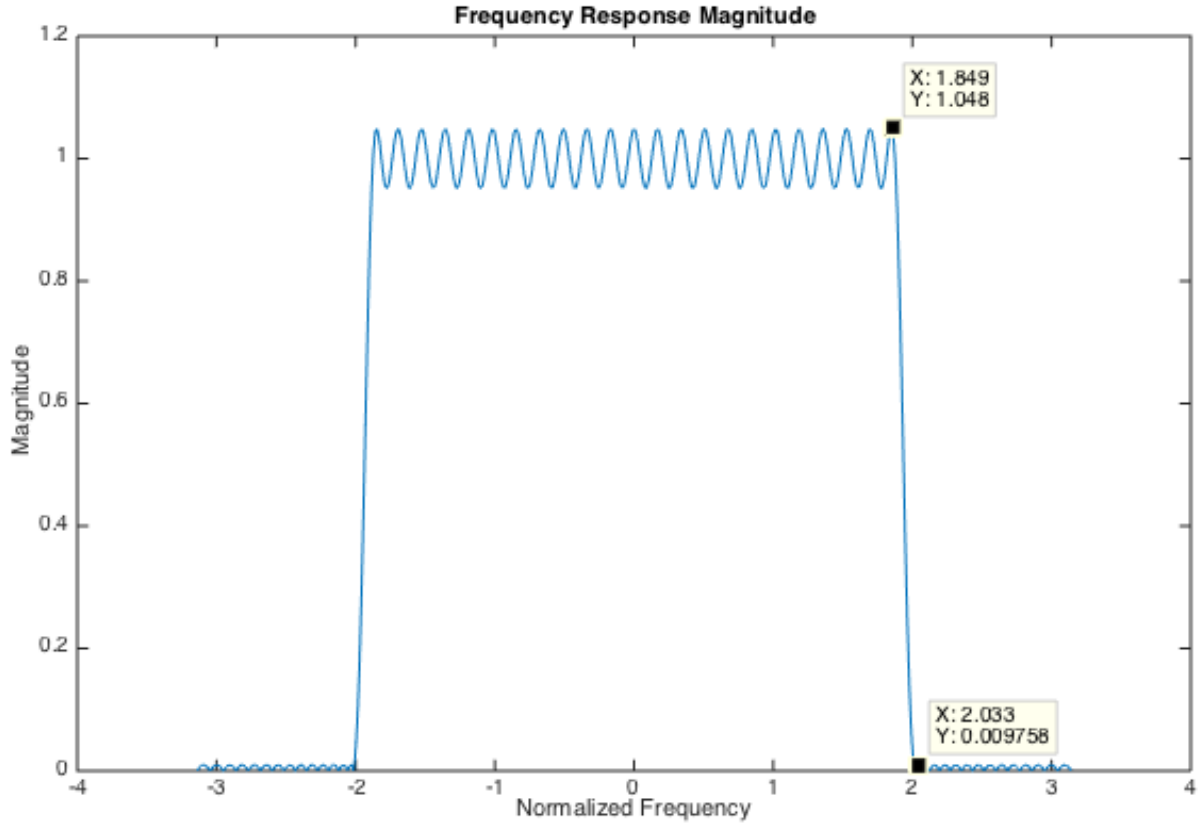
```
n = 1:length(b);
stem(n-1,b);
title('Stem Plot of Impulse Response');
xlabel('Index (n)');
ylabel('Magnitude');
```

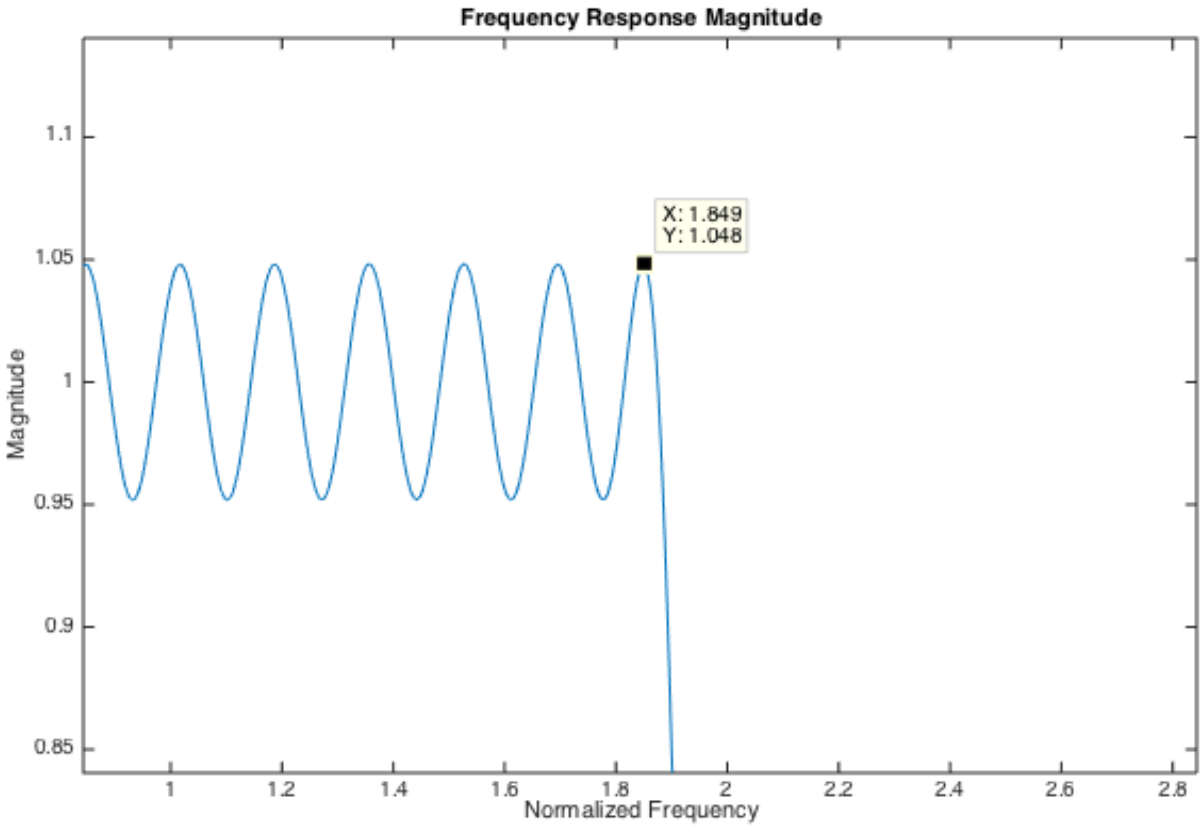


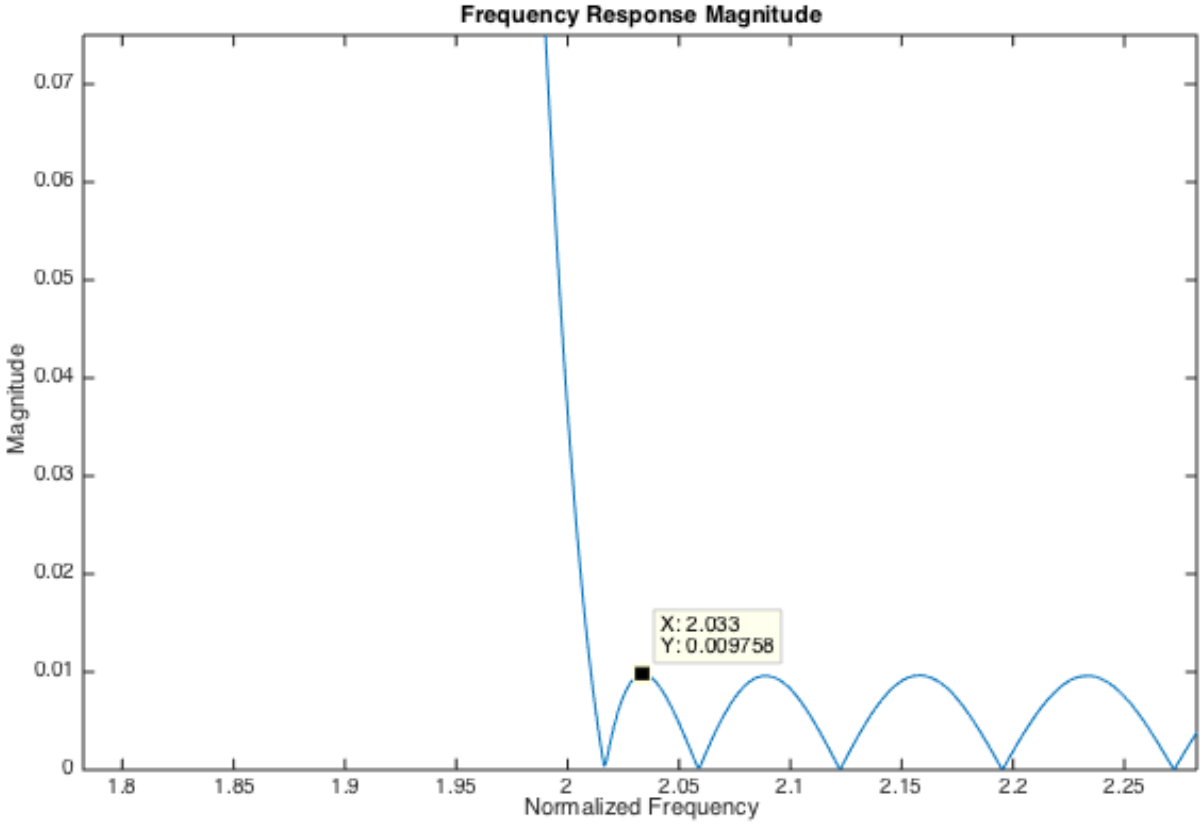
4.1c

```
figure
ww = -pi:1/1000:pi;
HH = freqz(b, 1, ww);
plot(ww, abs(HH));
title('Frequency Response Magnitude');
xlabel('Normalized Frequency');
ylabel('Magnitude');

open HW_Mag.fig
open HW_Mag1.fig
open HW_Mag2.fig
```


Frequency Response Magnitude
Magnitude
Normalized Frequency
1.2
1
0.8
0.6
0.4
0.2
0
-4
-3
-2
-1
0
1
2
3
4


Frequency Response Magnitude
X: 1.849
Y: 1.048
X: 2.033
Y: 0.009758
Magnitude
Normalized Frequency
1.2
1
0.8
0.6
0.4
0.2
0
-4
-3
-2
-1
0
1
2
3
4

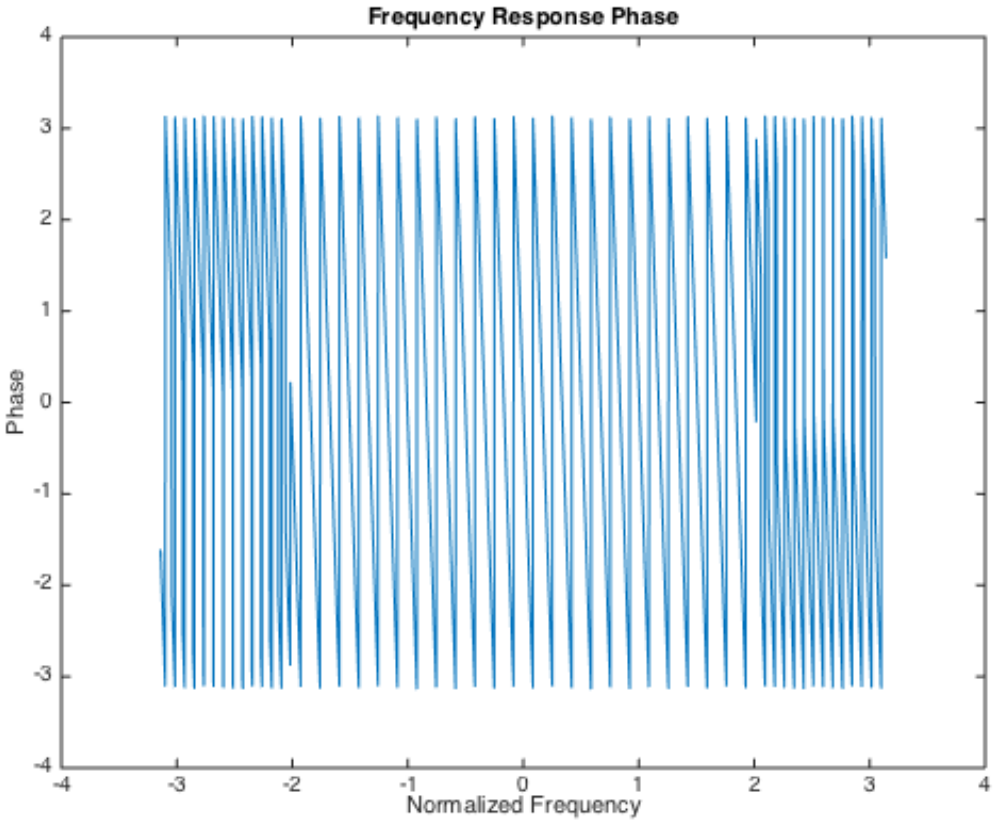

Frequency Response Magnitude
X: 1.849
Y: 1.048
Magnitude
Normalized Frequency
1.1
1.05
1
0.95
0.9
0.85
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8

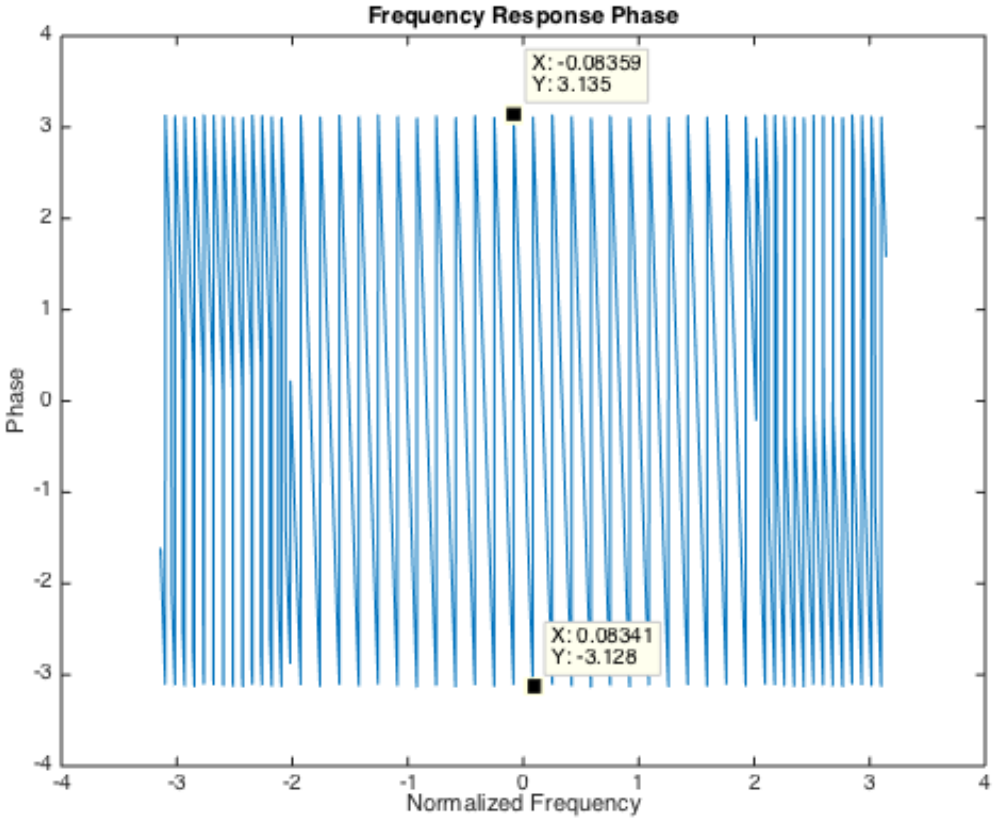

Frequency Response Magnitude
X: 2.033
Y: 0.009758
Magnitude
Normalized Frequency
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1.8
1.85
1.9
1.95
2
2.05
2.1
2.15
2.2
2.25

4.1e

```
figure
plot(ww, angle(HH));
title('Frequency Response Phase');
xlabel('Normalized Frequency');
ylabel('Phase');

open HW_phase.fig

slope = (-3.128 - 3.315)/(.08341 + .08359);
fprintf('\nSlope of FIR filter phase is %f', slope);
```

```
Slope of FIR filter phase is -38.580838
```





Published with MATLAB® R2014b