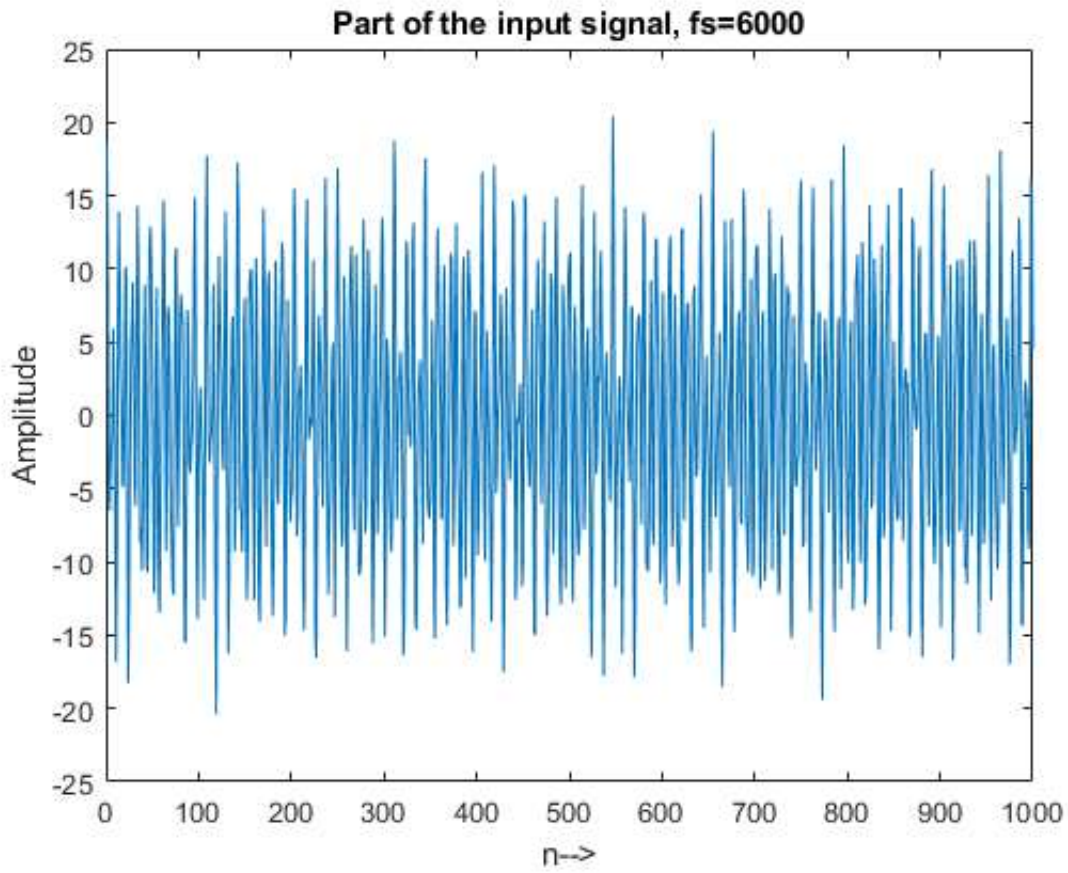
Contents


```
clc;
```

Sampling the input signal

The input signal is sampled with the initial sampling frequency of 6000Hz and a part of the input signal which is interfered with noise is plotted.

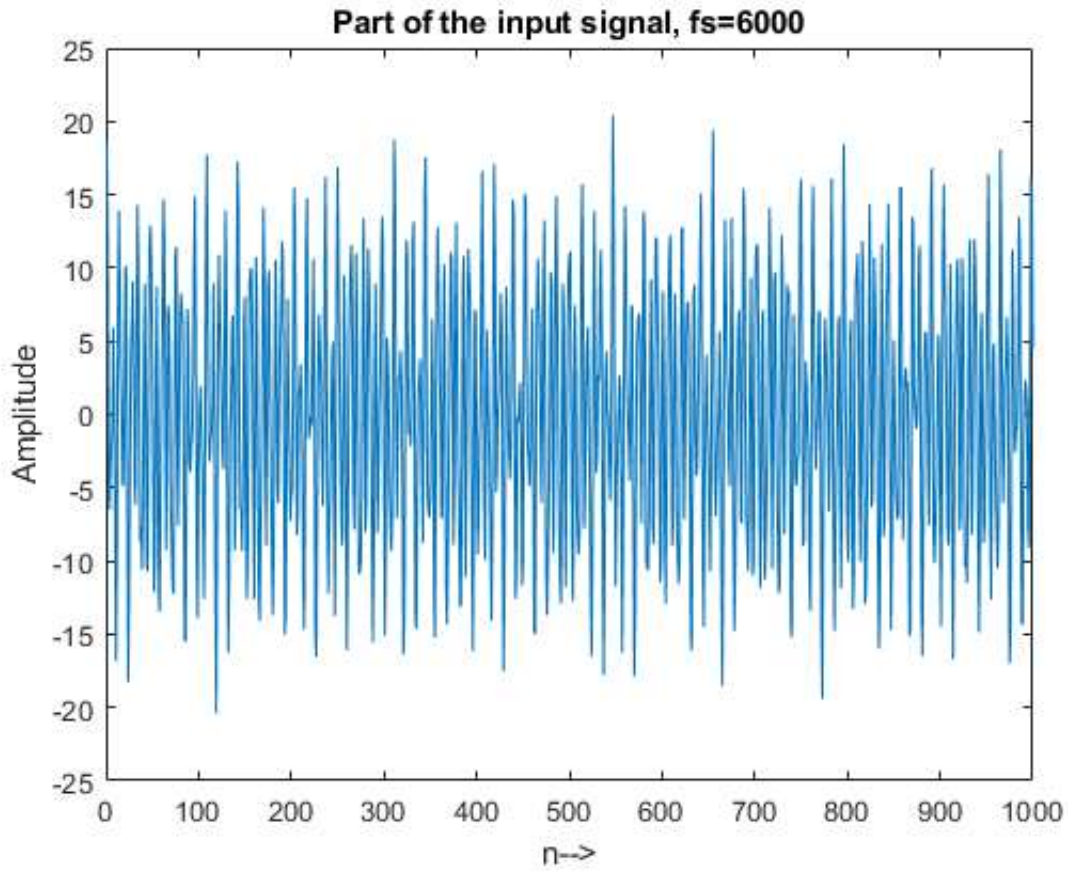
```
I=6; D=2; %Example I and D values
fs=6000; %Initial sampling frequency
t=0:1/fs:3; %Since the resulting number of samples is 3*sampling frequency
Noise = 1*randn(size(t)) + 0; %random noise with zero mean and standard deviation equal to 1
sampled_inp=10*cos((2*pi*890).*t)+5*cos((2*pi*385).*t)+4*cos((2*pi*1450).*t)+Noise; %Example
signal
figure(1);
plot(sampled_inp(1:1000)); %Plotting 1000 samples of the input signal
title("Part of the input signal, fs="+fs);
xlabel("n-->");ylabel("Amplitude");
```

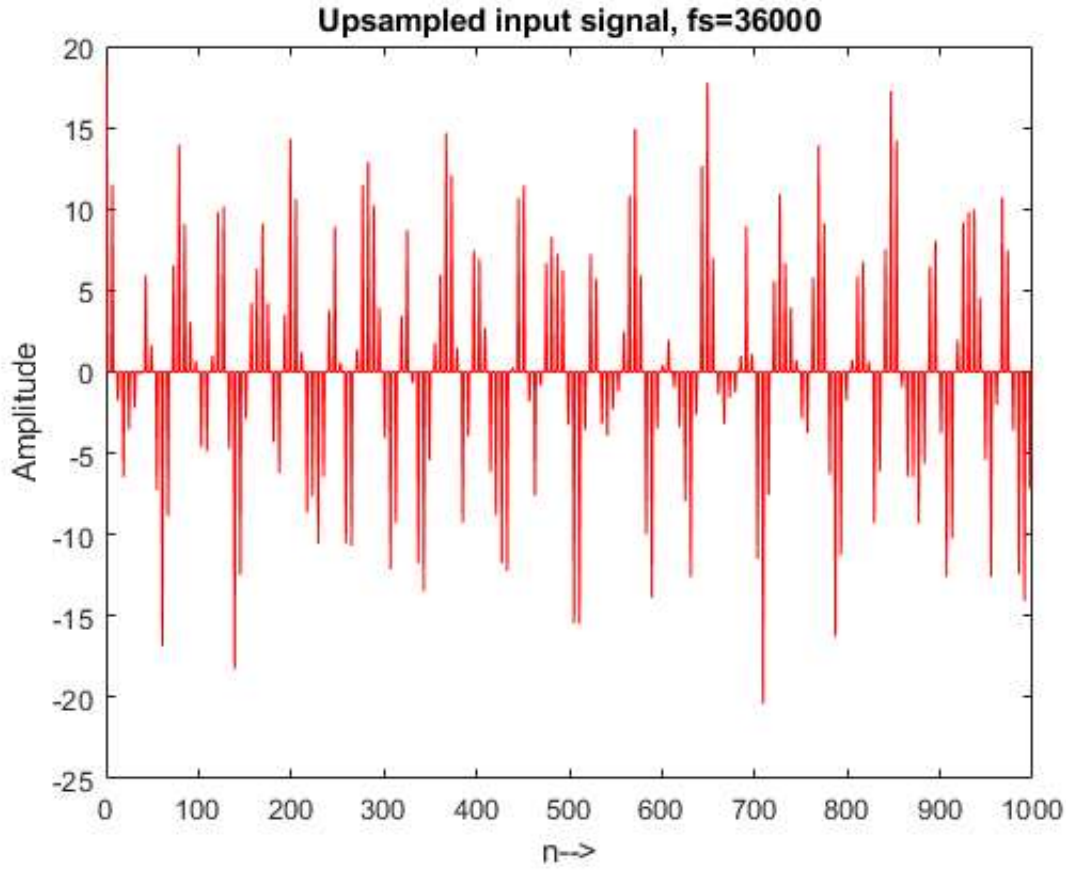


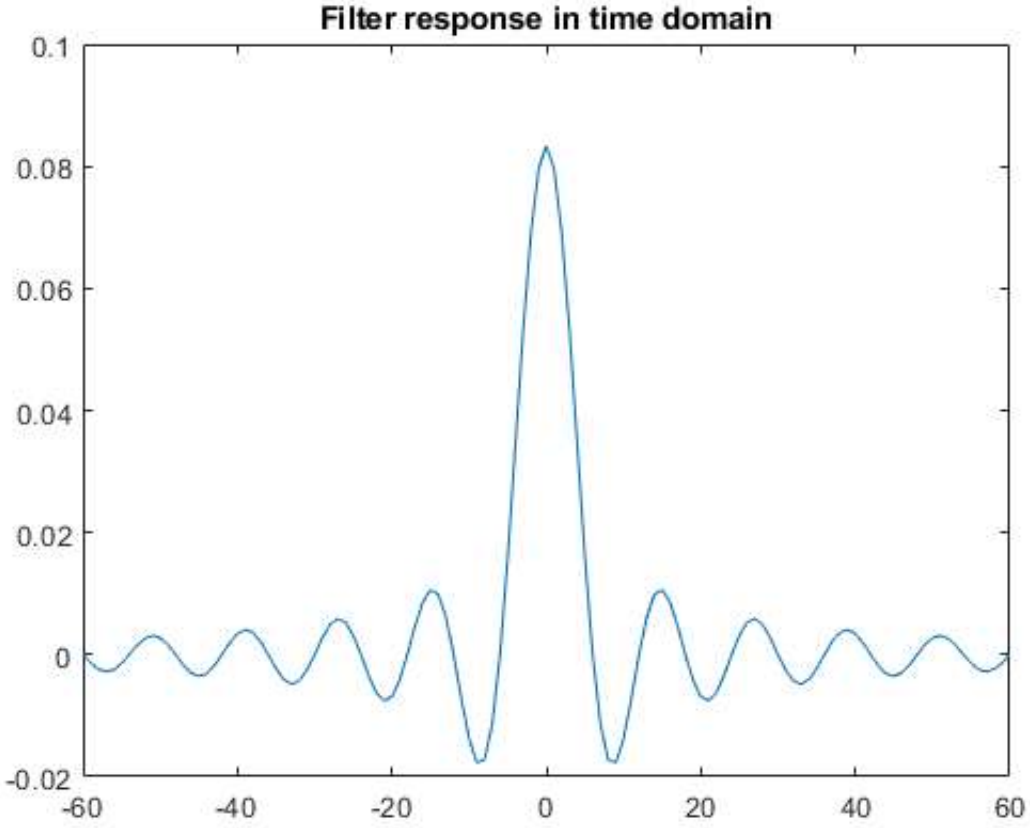
Sampling rate conversion

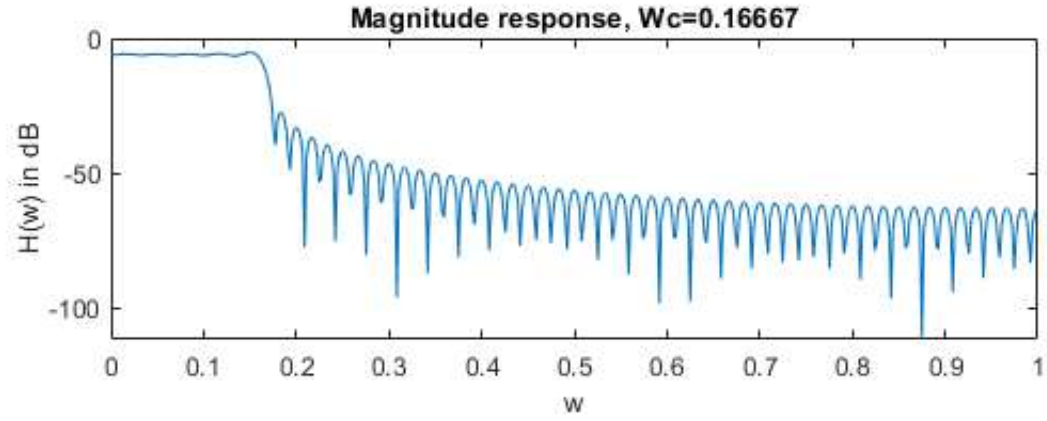
The sampling rate of the input signal is converted by a factor of I/D. Part of the output signal with sampling frequency fs* (I/D) is plotted.

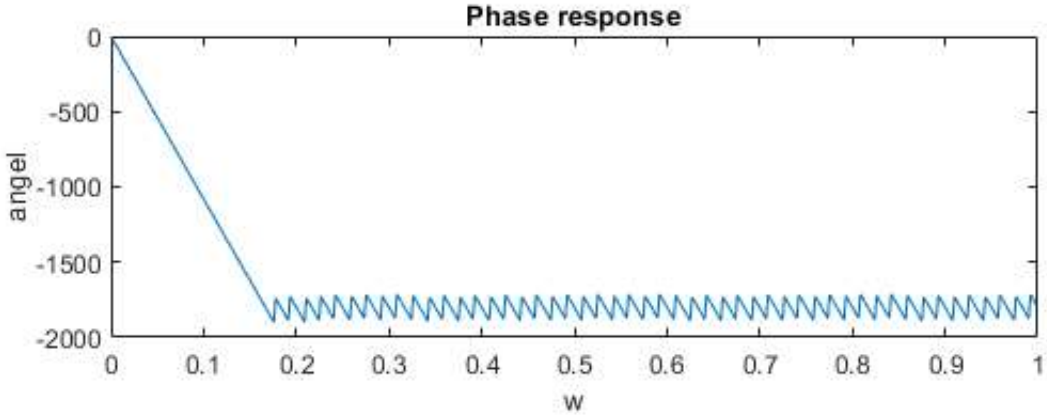
```
[output_sg,fs_out]=SamplingRateConverter(sampled_inp,I,D,fs); %Calling the function sampling
rate converter
figure(7);
plot(output_sg(1:1000)); %Plotting 1000 samples of output signal
title("Part of the output signal, fs="+fs_out);
xlabel("n-->");ylabel("Amplitude");
```

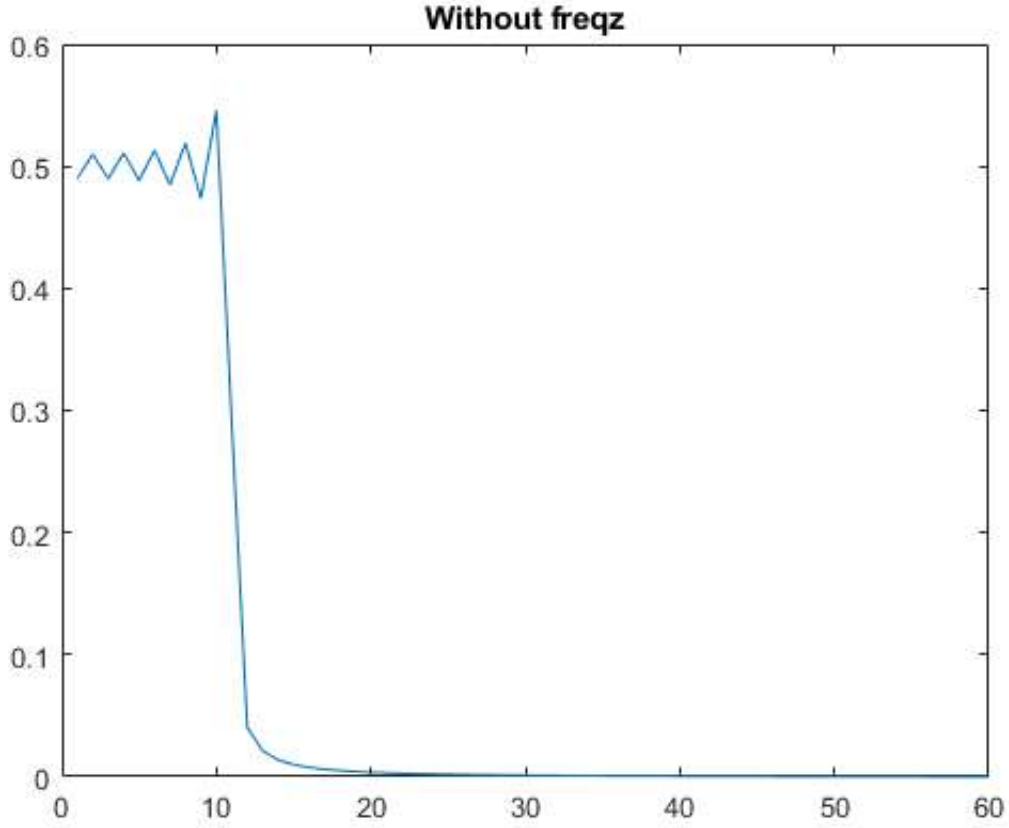


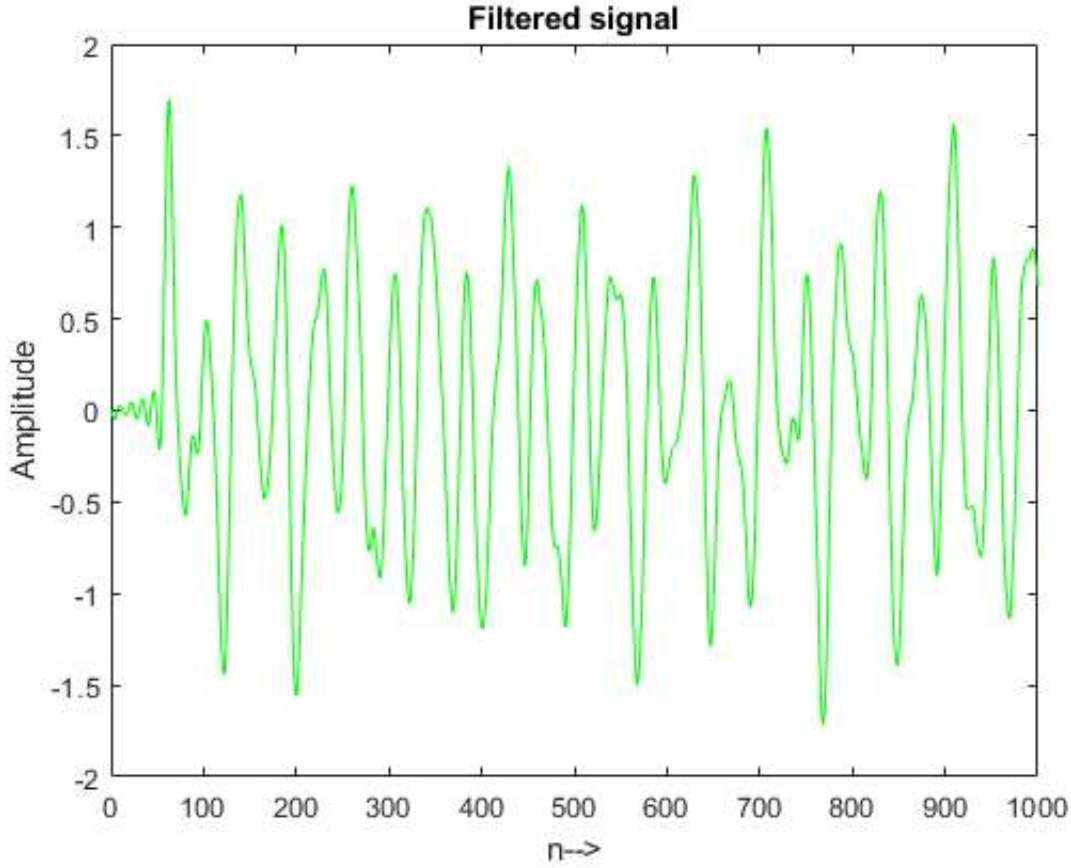

Upsampled input signal, fs=36000
Amplitude
n-->
20
15
10
5
0
-5
-10
-15
-20
-25
0
100
200
300
400
500
600
700
800
900
1000

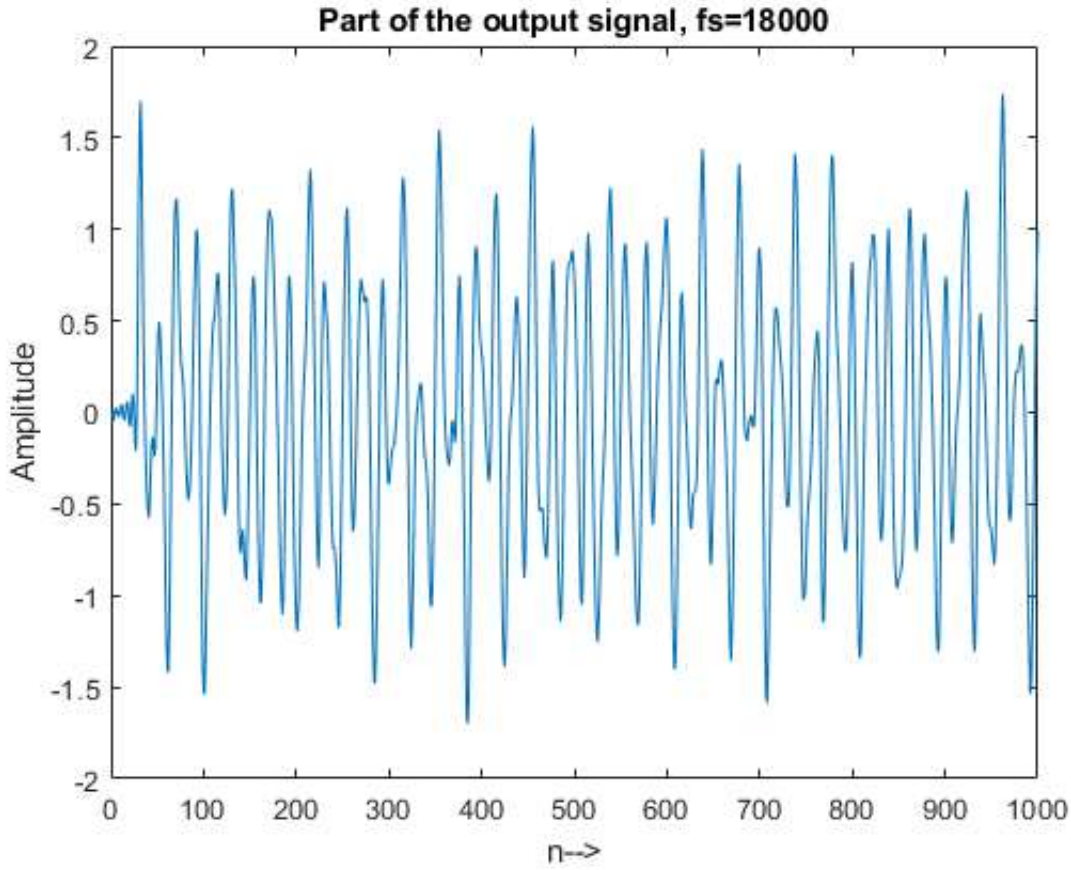

Filter response in time domain
0.1
0.08
0.06
0.04
0.02
0
-0.02
-60
-40
-20
0
20
40
60


Magnitude response, Wc=0.16667
H(w) in dB
0
-50
-100
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
w


Phase response
angel
0
-500
-1000
-1500
-2000
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
w


Without freqz
0.6
0.5
0.4
0.3
0.2
0.1
0
0
10
20
30
40
50
60


Filtered signal
Amplitude
n-->
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
100
200
300
400
500
600
700
800
900
1000


Part of the output signal, fs=18000
Amplitude
n-->
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
0
100
200
300
400
500
600
700
800
900
1000

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