%FIR Filter using Window Technique Low Pass Filter

clc

clear all;

close all

wc = input('énter the cutoff frequency')

N = input('enter the order/length of filter')

alpha = floor((N-1)/2);

for n = 1:N

if (n-1) == alpha

hd(n) = (wc/pi)

else

hd(n) = (sin((n-1-alpha)\*wc))/((n-1-alpha)\*pi);

end

end

wn = hamming(N);

hn = hd'.\*wn;

w = 0:0.01:pi;

h = freqz(hn, 1, w);

subplot(3,1,1)

plot(w/pi, abs(h));

xlabel("Normalised frequency ");

ylabel("Magnitude");

t = 0:(1/314):1;

fs = 570;

x = 2\*sin(2\*pi\*50\*t)+4\*sin(2\*pi\*120\*t)+8\*sin(2\*pi\*240\*t);

y = fft(x);

f = (0:length(x)-1)\*fs/length(x);

subplot(3,1,2);

stem(f, abs(y));

xlabel("frequency in hz");

ylabel("frequency response of input signal");

yout = y.\*h;

subplot(3,1,3);

stem(f, abs(yout));

xlabel("frequency in HZ");

ylabel("frequency response of output signal");