% Example7\_2.m

% Design of windowed LPF with a

% cutoff frequency of pi/2 and length 17

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%

clear

Wc = pi/2;

%N = 17;

N = 9;

M = (N-1)/2;

n = 0:N-1;

h = (Wc/pi)\* sinc((n-M)\*Wc/pi);

%

w1 = window(@bartlett,N);

w2 = window(@hann,N);

w3 = window(@hamming,N);

w4 = window(@blackman,N);

wr = ones(N,1);% rectangular window

A = zeros(size(w1));

A(1) = 1;

[H1,Wz] = freqz(h.\*w1',A,256);

H2 = freqz(h.\*w2',A,Wz);

H3 = freqz(h.\*w3',A,Wz);

H4 = freqz(h.\*w4',A,Wz);

H5 = freqz(h.\*wr',A,Wz);

%

figure,plot(Wz,20\*log10(abs(H1)/max(abs(H1))))

hold on

plot(Wz,20\*log10(abs(H2)/max(abs(H2))),'r')

plot(Wz,20\*log10(abs(H3)/max(abs(H3))),'b--')

plot(Wz,20\*log10(abs(H4)/max(abs(H4))),'k.-')

plot(Wz,20\*log10(abs(H5)/max(abs(H5))),'m-.')

hold off

title(['Length-' int2str(N) ' windowed LP FIR filter'])

ylabel('Magnitude(dB)')

xlabel('Frequency(rad)')

legend('Bartlett', 'Haan', 'Hamming', 'Blackman', 'Rect')