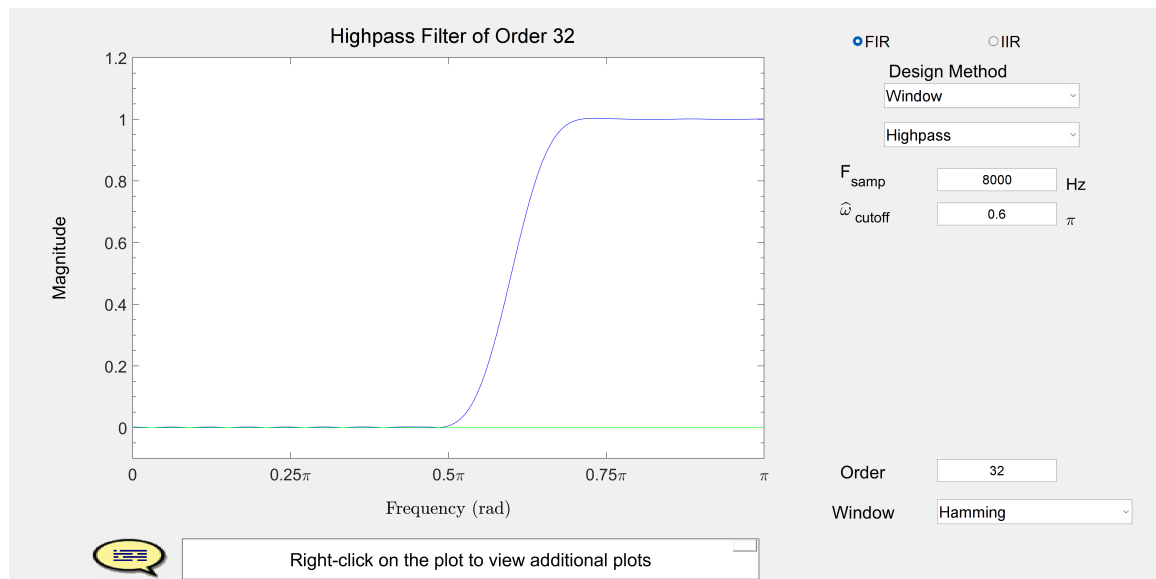


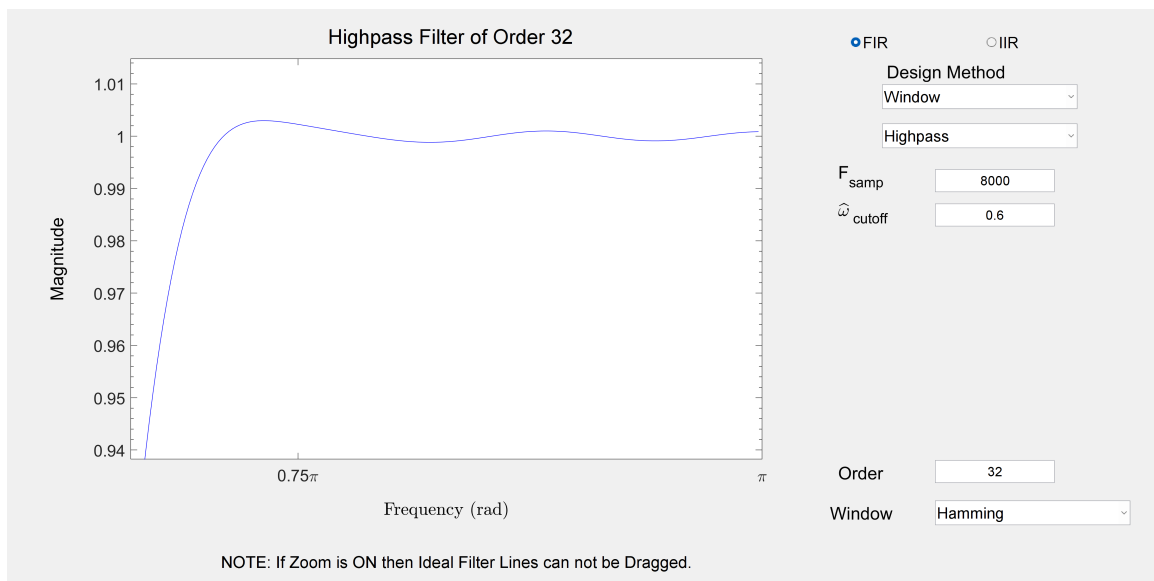
Problem 7.17

Given: To use filterdesign GUI to create impulse response of FIR HPF with : $M = 32$, $\hat{\omega}_{co} = 0.6\pi$ with hamming window method.

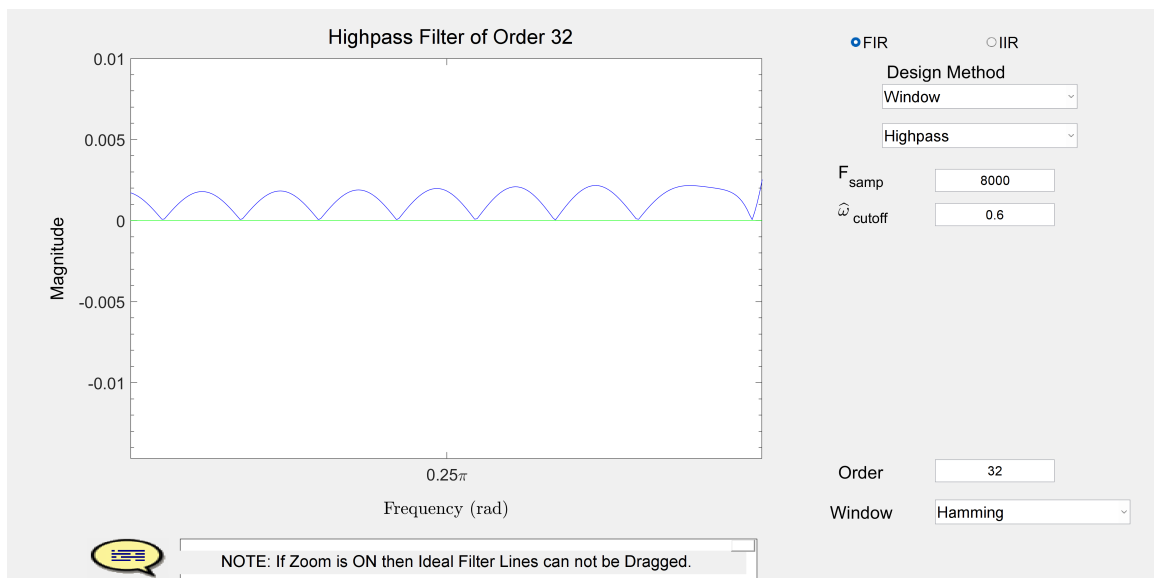
(a) Plot of frequency response magnitude:



Zoomed in plot of passband:



Zoomed in plot of stopband:



(b) Passband edge($\hat{\omega}_p$) is approximately 0.71π radians.

Stopband edge($\hat{\omega}_s$) is approximately 0.48π radians.

Passband ripple(δ_p) is approximately 0.0019.

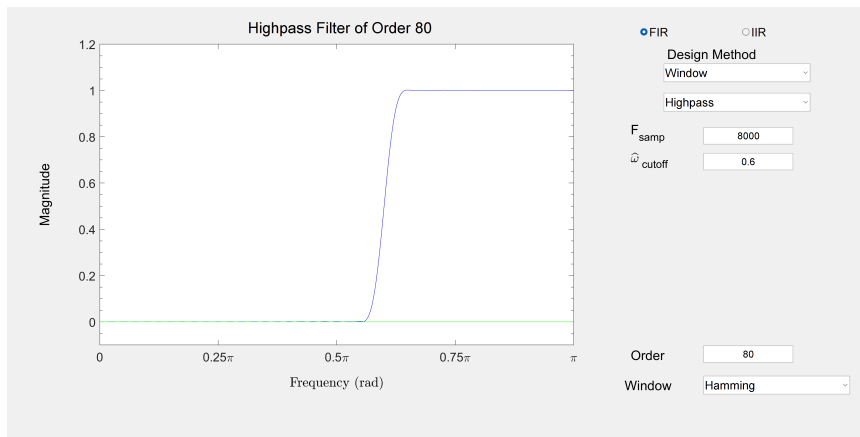
Passband ripple(δ_s) is approximately 0.00214.

(c) Filter order is now $M=80$. Then, change in passband and stopband edges is given by the mainlobe width using hamming window is $8\pi/M = 8\pi/80 = 0.1\pi$.

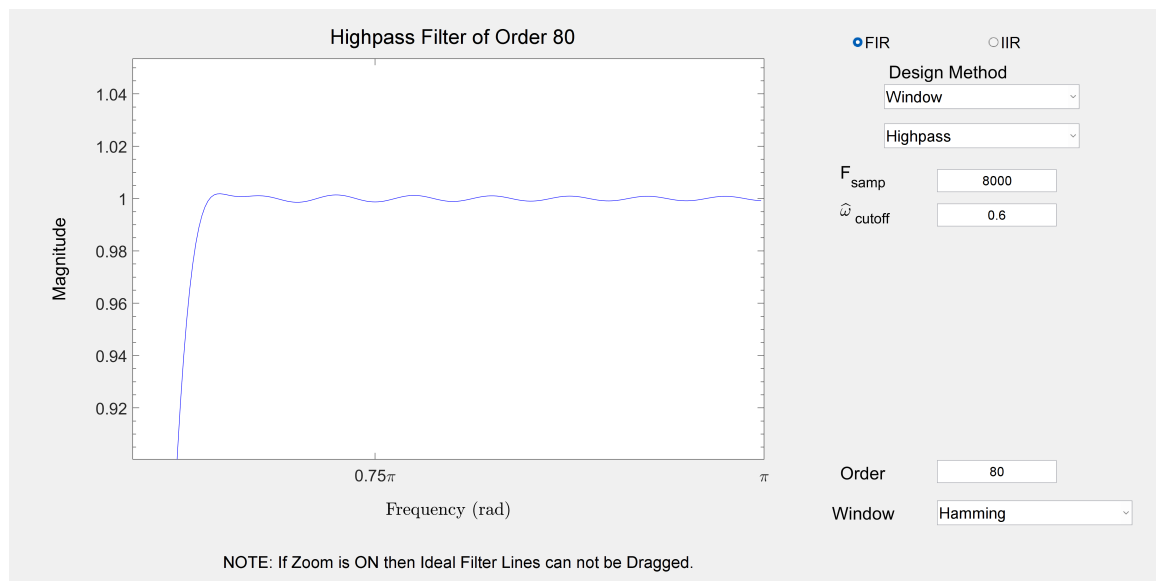
(d) For $M=80$, the new Passband edge($\hat{\omega}_p$) is approximately 0.64π radians and Stopband edge($\hat{\omega}_s$) is approximately 0.56π radians. Hence, the change in both is 0.08π , which is close to what is determined in (c).

For $M=80$:

Frequency Response Magnitude:



Zoomed in plot of passband:



Zoomed in plot of stopband:

