Homework for Module 5

1. Using the Parks-McClellan algorithm, design a highpass filter with the following specifications: $\omega_p=0.6\pi$, $\omega_s=0.5\pi$, Rp=1dB and R_s=40dB. Plot the impulse response and the frequency response magnitude. Show clearly that your design meets all specifications by plotting the specification template on the frequency response graph. You will find the MATLAB functions *firpm and firpmord* helpful for this problem.

2. Create a MATLAB script that implements the eigenfilter design procedure. Design a lowpass eigenfilter with the following specifications: $\omega_p=0.3\pi$, $\omega_s=0.5\pi$, N=30 and α=0.2. Plot the impulse response and the frequency response magnitude. Repeat for α=0.5 and compare your filter with the result of using the MATLAB function *firls* (least-squares FIR design).