Homework Assignments (preliminary)

Homework set # 1, due Mon. Jan. 9
Problem 3.3
Problem 3.4
Problem 3.7

Homework set # 2, due Tues. Jan. 17
Problem 3.31
Problem 3.30
Problem 3.37
Problem 3.54

The following three problems are taken from the handout on contour integration, Oppenheim and Schafer 1st edition.
Problem 4.36 a), d), e), 1st ed.
Problem 4.38, 1rst ed.
Problem 4.40, 1rst ed.

Homework set # 3, due Mon. Jan. 23
Problem 3.42
Problem 3.44
Problem 3.52

Homework set # 4, due Jan. 30
From your third ed. text:
Problem 4.15
Problem 4.31
Problem 4.35
Problem 4.58
Problem 4.65

Homework set # 5, due Mon. Feb 6
Problem 8.3
Problem 8.17
Problem 8.55
(note this is the basis for developing the FFT in the next chapter)
Problem 8.10
Extension part b) Consider using each of the two sequences as the impulse response for a lowpass filter. Discuss which would perform better in this roll, and explain why. As part of your analysis, compute the DFT to approximate the DTFT (i.e. zero pad to a longer DFT size) of the two sequences (MATLAB FFT function, calculator, or other computed solution acceptable) and explain why these numerical results support your conclusion.

Problem 8.66
Problem 8.67
Homework set # 6, due Mon. Feb 13

Problem 9.1
Problem 9.17
Problem 9.18
Problem 9.39
Problem 9.37
Problem 9.27

Homework set # 7, due Tues Feb 21

Problem 9.60  (Refer to lecture notes)

Using MATLAB write a subroutine for computing an $N$ point FFT recursively. Do not use the built in FFT functions. Assume $N$ is a power of 2. Submit your source code listing and output data for an input signal of:

$x[n] = \cos \frac{n\pi}{4}, \quad 0 \leq n \leq 31.$

Problem 5.17

Homework set # 8 due Mon. Feb. 27

Problem 5.54
Problem 5.28

Given two minimum phase sequences, $h_1[n]$ and $h_2[n]$, is $h_1[n] \ast h_2[n]$ minimum phase? Prove your conclusion.

Problem 5.15

Homework set # 9 due Mon. Mar. 5

Problem 5.44. Do not actually compute the magnitude frequency responses for these sequences. Select your answers based on known properties of such systems.

Problem 5.57
Problem 7.23
Problem 7.2
Problem 7.3

Homework set # 10 due Mon. Mar. 12

Problem 7.25
Problem 7.26
Problem 7.43
Problem 7.5

Also, use MATLAB to compute the impulse response using windowed filter design techniques.

Problem 7.6
Homework set # 11 due Mon. Mar. 19

Problem 7.34
Also, use MATLAB to compute the impulse response and frequency response using firpm (the Parks - McLellan algorithm) and freqz.

Problem 7.63
Also, use MATLAB to compute the impulse response and frequency response using firpm (the Parks - McLellan algorithm) and freqz. No values are specified for $\omega_1, \cdots, \omega_4$ or $\delta_1, \delta_2$. Pick your own values and design the filter.

Problem 7.61

Problem 7.59

Homework set # 12 due Mon. Mar. 26

Problem 7.57

Problem 12.1

Problem 12.4

Homework set # 13 due Mon. Apr. 2

Problem 12.5

Problem 12.29

Problem 12.28

Problem 12.34

Homework set # 14 due Wednesday Apr. 11

Problem 10.14

Problem 10.19

Problem 10.33

Problem 10.40

Problem 10.42