EE562 - Digital Signal Processing I
Second Semester (212)

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**Homework and Computer Assignment 2**

**Date:** January 26, 2022
**Due date:** February 2, 2022

**Objective:**

To learn how to perform convolution of discrete-time signals (sequences) using MATLAB.

**The required task:**

1. Using the convolution sum, obtain the discrete-time signal $y(n) = x(n) * h(n)$ where

$$x(n) = \begin{cases} 1 \ , 0 \le n \le 19 \\ 0 \ , Otherwise \end{cases},$$

for $n$=-10,…,40 and $h(n) = 0.9^n$ for $n$=0,…,50. Plot all three signals. What is the length of the output signal?

2. Repeat 1 but with $h(n) = x(n)$.
3. Repeat 1 but with $x(n) = h(n)$.

You can use the MATLAB function "conv" to perform convolution. Do not forget to put labels for the x-axis and y-axis along with a title for each figure by, respectively, using the functions "xlabel", "ylabel", and "title".

**What to submit?**

1. A print of the written MATLAB code or M-file.
2. The results.
3. Your observations.

**Homework:** Solve problems: 2.6, 2.10, 2.11, 2.18, 2.33(a), 2.35, 2.46(b)