EE562 - Digital Signal Processing I
Second Semester (212)

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Homework and Computer Assignment 1

Date: January 19, 2020
Due date: January 26, 2020

Objective:

To learn how to generate and plot discrete-time signals (sequences) in MATLAB.

The required task:

Generate and plot the following signals:

1. The step sequence: $u(n)$ for $n = -10,\ldots,50$. What is the length of the vectors *n* and *u*?
2. The exponential sequences:
   - $h_1(n) = 0.9^n$
   - $h_2(n) = 2^n$
   - $h_3(n) = (-\frac{1}{2})^n$
   - $h_4(n) = (-3)^n$

   for $n = 0,\ldots,50$. Obtain the maximum value of each sequence and its index value.
3. The sinusoidal sequence: $h_5(n) = \sin(2\pi n/20)$ for $n = -40,\ldots,40$. Is it a periodic signal? If yes, then what is its period?

You can use the following MATLAB functions:

The column operator ":", the exponential operator "^", the dot operator ".", ones, zeros, sin, length, stem, max, & find.

What to submit?

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

Homework: Solve problems: 2.1 and 2.2.