IET WINTER 2016
Semester-6
Digital Signal Processing

LAB 2

Objectives:

Understand different concepts of linear and circular convolution along with its applications.

Prerequisites:

- Linear Convolution
- Cross- Correlation and Auto-correlation

Problems

1. Find the linear convolution of following **finite length sequences** using available command and also without command by developing your own function. Plot required outputs along with input sequence.

   a) $x(n) = \{1,\underset{\uparrow}{2},2,1\}$

      $h(n) = \{1,-1,\underset{\uparrow}{2}\}$

   b) $x(n) = \{-2,0,1,\underset{\uparrow}{-1},3\}$

      $h(n) = \{1,\underset{\uparrow}{2},0,-1,\}$

   c) $x(n) = \{1,2,\underset{\uparrow}{3},1\}$

      $h(n) = \{\underset{\uparrow}{1},2,1,-1\}$

   d) $x(n) = \{9,1,5,4\}$

      $h(n) = \{0,\underset{\uparrow}{2},2\}$

2. Find the linear convolution for following **infinite length sequences** and Plot required outputs.

   Note: Develop such function which can take index value from user for a given signal. You can also use previously developed functions.

   a. X(n) = u(n), h(n) = u(n)

   b. X(n) = cos (nπ) u(n) , h(n) = u(n)

   c. X(n) = n u(n), h(n) = (6+n) u(n)

3. Find cross-correlation between two sequences using available command and also without command by developing your own function. Verify your program for following sequence and Plot required outputs.

   x(n) = {1,2,2,1}
   ↑

   h(n) = {1,-1,2}
   ↑

4. Develop function for Auto-correlation and find out auto-correlation for any sequence and plot required outputs.