**EXPERIMENT 2**

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To write a MATLAB script to study the basic operations on the Discrete–time signals.

1) Amplitude manipulation

i) Addition of two sequences

ii) Multiplication of two sequences

iii) Amplitude scaling

2) Time manipulation

i) Time scaling

ii) Time shifting

iii) Time reversal

**Code:**

clc; %clearing the screen

clear; %clearing the variables

close all; %closing all the previous windows

x1 = randi([0,9],1,randi(10));%generating the 1st sequence randomly

x2 = randi([0,9],1,randi(10));%generating the 2nd sequence randomly

n1 = length(x1); %length of the sequence

n2 = length(x2); %length of the sequence

n = max(n1,n2); % to have same length

if n1~=n2

x1 = [x1, zeros(1,n-n1)]; %add zeros if needed

x2 = [x2, zeros(1,n-n2)]; %add zeros if needed

end

subplot(5,2,1); %1st subplot

stem(0:n-1,x1); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('1st sequence'); %raw input sequence 1

subplot(5,2,2); %2nd subplot

stem(0:n-1,x2); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('2nd sequence'); %raw input sequence 2

% Amplitude Modulation

add = x1+ x2; %addition of two arrays

subplot(5,2,3); %3rd subplot

stem(0:n-1,add); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('addition of two sequence'); %addition of arrays

mul = x1 .\* x2; %multiplication of two arrays

subplot(5,2,4); %3rd subplot

stem(0:n-1,mul); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('multiplication of two sequence'); %multiplication of arrays

atten = x1 .\* .25; %attenuation of 1st array

subplot(5,2,5); %5th subplot

stem(0:n-1,atten); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('attenuation of 1st sequence'); %attenuation of 1st array

ampl = x1 .\* 5; %amplification of 1st array

subplot(5,2,6); %5th subplot

stem(0:n-1,ampl); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('amplification of 1st sequence'); %amplification of 1st array

subplot(5,2,7); %7th subplot

stem(0:n-1,-x1); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('amplitude inversion of sequence 1'); %amplitude inversion of sequence 1

% Time Modulation

subplot(5,2,8); %8th subplot

stem((0:n-1)/10,x2); %discrete values of n/10 length

xlabel('time');

ylabel('amplitude');

title('time scaling of 2nd sequence'); %time scaling of 2nd sequence

subplot(5,2,9); %9th subplot

stem(-n+1:0,x2); %discrete values of n length

xlabel('time');

ylabel('amplitude');

title('time shifting of 2nd sequence'); %time shifting of 2nd sequence

subplot(5,2,10); %10th subplot

stem(-n+1:0,x2); %time reversed discrete values of n length

xlabel('time');

ylabel('amplitude');

title('time reversal of 2nd sequence'); %time reversal of 2nd sequence

**Output:**



