

# **Rajshahi University of Engineering & Technology**



## **Department : Electrical & Computer Engineering**

**Course No: ECE 4124**

**Course Name: Digital Signal Processing Sessional**

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## Experiment No: 2

Experiment Date: 4.5.23

Experiment Name:

i. Take two signals and show the circular convolution of the signals.

ii.  $n1=\{0,0,0,2,2,2,1,1,1,0,2\}$

$n2=\{2,2,0,1,1,1,0,0,0,3\}$

Plot the figure of the two signals and also plot the summation and subtraction of the two signals.

iii. Draw two signals in one figure.

### Theory:

Circular convolution, also known as cyclic convolution, is a special case of periodic convolution, which is the convolution of two periodic functions that have the same period.

Code:

i. Circular convolution:

```
clc;
clear all;
close all;
g=input('Enter the sequence 1:');
h=input('Enter the sequence 2:');
N1=length(g);
N2=length(h);
N=max(N1,N2);
N3=N1-N2;
if(N3>0)
    h=[h,zeros(1,N3)];
else
    g=[g,zeros(1,-N3)];
end
for n=1:N
    y(n)=0;
    for i=1:N;
        j=n-i+1;
        if(j<=0)
            j=N+j;
        end
        y(n)=[y(n)+(g(i)*h(j))];
    end
end
disp('The result is');y
subplot(2,1,1);
stem(y);
xlabel('N->');
ylabel('Amplitude->');
```

Output:

```
Enter the sequence 1:  
[1 2 3 4]  
Enter the sequence 2:  
[1 1 1 1]  
The result is  
  
y =  
  
    10    10    10    10
```

Figure:

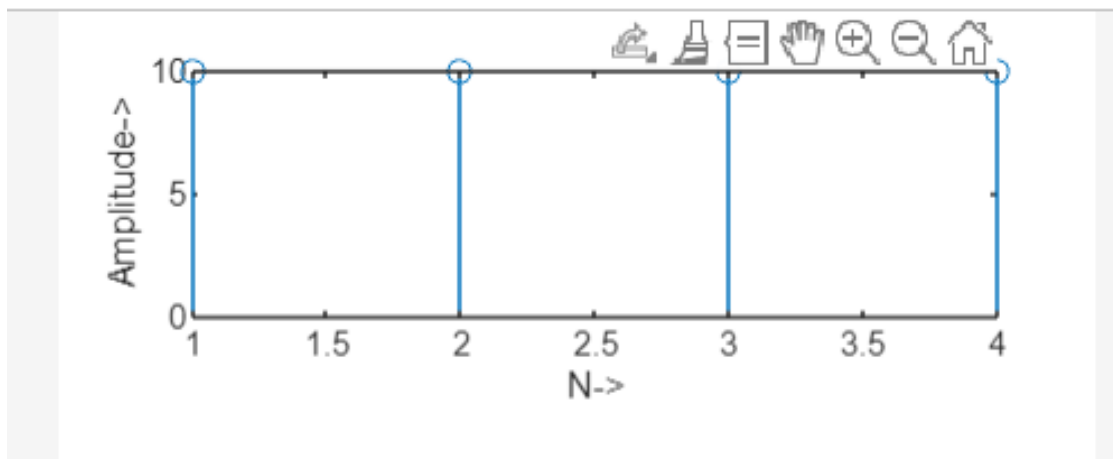


Fig:Convolution

## ii.Summation and subtraction

### Code:

```
clc;  
clear all;  
close all;  
n1=[0 0 0 2 2 2 1 1 1 0 2]  
n2=[2 2 0 1 1 1 0 0 0 0 3]  
sum=n1+n2;  
sub=n1-n2;  
subplot(4,1,1);  
stem(n1);  
subplot(4,1,2);  
stem(n2);  
  
subplot(4,1,3);  
stem(sum);  
subplot(4,1,4);  
stem(sub);
```

Output:

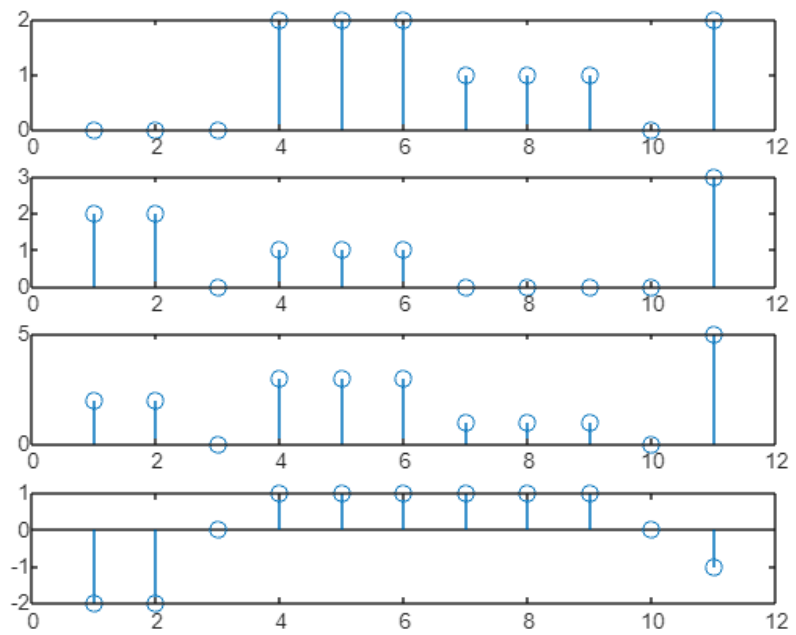


Fig: summation & subtraction

### iii. Two types of signal

Code:

```
clc;
clear all;
close all;

n=[0 4 4 0]
subplot(2,1,1);
plot(n);
n1=[0 2 2 3 3 2 2 0];
subplot(2,1,2);
plot(n1);
```

Output:

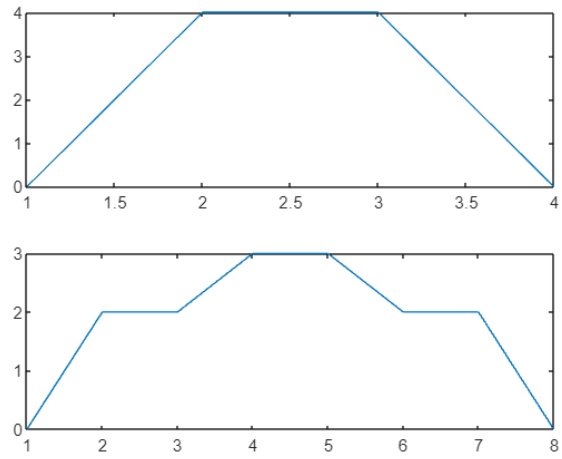


Fig: signals

**Conclusion:**

The result has achieved successfully.