
# Rajshahi University of Engineering and Technology

## DEPT. of Electrical and Computer Engineering

**Course No.: ECE 4124**

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**Experiment No.: 02**
**Experiment Name:** MATLAB implementation of-
Convoluting two signals with and without using conv() function.

**Theory:**
A continuous signal or a continuous-time signal is a varying quantity whose domain, which is often time, is a continuum. That is, the function's domain is an uncountable set. The function itself need not to be continuous.

A discrete signal or discrete-time signal is a time series consisting of a sequence of quantities. Unlike a continuous-time signal, a discrete-time signal is not a function of a continuous argument; however, it may have been obtained by sampling from a continuous-time signal.

The convolution of two signals in the time domain is equivalent to the multiplication of their representation in frequency domain.

$y(n)=x(n)*h(n)$

Mathematically, we can write the convolution of two signals as-

$$y(n) = \sum_{k=-\infty}^{\infty} \mathrm{x(k)} * \mathrm{h(n-k)}$$

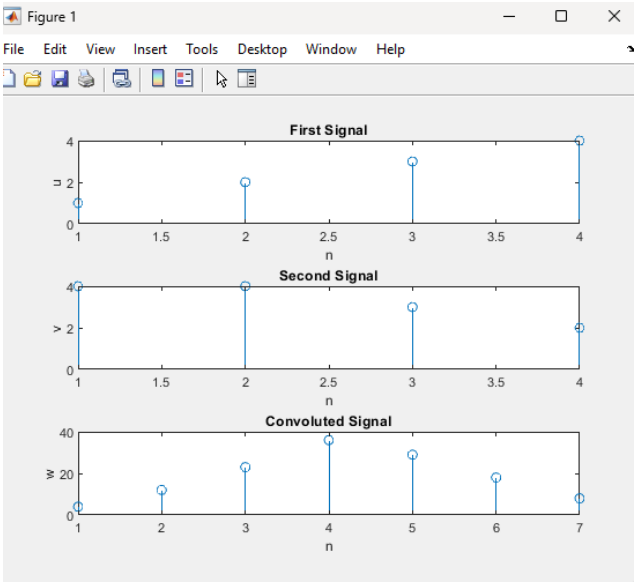
**Convoluting two signals with and without using conv() function:**

**<u>With conv() Function:</u>**

**Code:**

```
u=[1 2 3 4];
v=[4 4 3 2];
w= conv(u,v);

subplot(3,1,1);
stem(u);
xlabel('n');
ylabel('u');
title('First Signal');

subplot(3,1,2);
stem(h);
xlabel('n');
ylabel('v');
title('Second Signal');

subplot(3,1,3);
stem(w);
ylabel('w');
xlabel('n');

title('Convoluted Signal');
```

## Output:

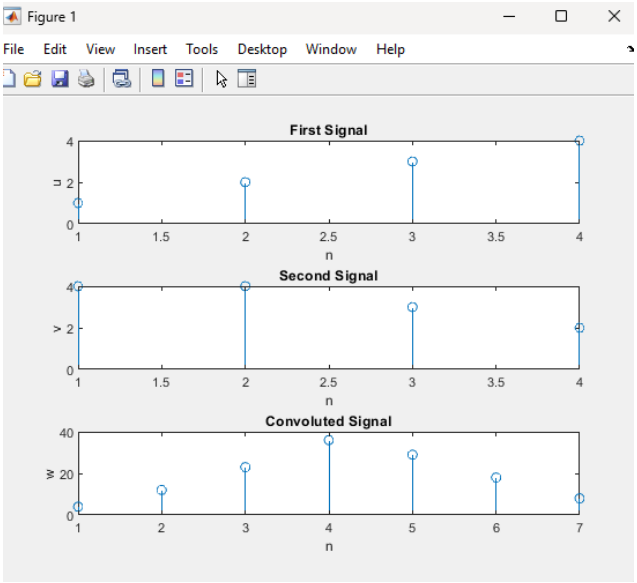



## Without conv() Function:

## Code:

```
x=[1 2 3 4];
h=[4 4 3 2];
m=length(x);
n=length(h);
X=[x,zeros(1,n)];
H=[h,zeros(1,m)];
for i=1:n+m-1
    Y(i)=0;
    for j=1:m
        if(i-j+1>0)
            Y(i)=Y(i)+X(j)*H(i-j+1);
        else
        end
    end

end


subplot(3,1,1);
stem(x);
xlabel('n');
ylabel('x[n]');
title('First Signal');

subplot(3,1,2);
stem(h);
xlabel('n');
ylabel('h[n]');
title('Second Signal');

subplot(3,1,3);
stem(Y);
ylabel('Y[n]');
xlabel('n');

title('Convoluted Signal');
```

**Output:**




**Conclusion:** Thus we have successfully implemented the signals in MATLAB. The output was found as expected.