

Mukesh Patel School of Technology Management & Engineering

Department of Mechatronics Engineering

Signal Processing Lab

Subject- Digital Signal Processing

EXPERIMENT NO. 5

Aim: To generate convolution of two Signals using Scilab.

Software Used: Scilab software.

Code:

1. Method 1:

```
clear;
```

```
close;
```

```
x1 = [1,2,3,4]
```

```
x2 = [1,1,2,2]
```

```
X1 = fft(x1, -1)
```

```
X2 = fft(x2, -1)
```

```
X3 = X1 .* X2
```

```
disp(X3, "X3[k] = ");
```

```
x3 = fft(X3, 1)
```

```
disp(x3, "x3[n] = ");
```

```
//alternatively convolution
```

```
x3 = conv(x1,x2)
```

```
disp(x3, "x3 = ");
```

2. Method 2:

```
x1 = [1,2,3,4];
```

```
x2 = [1,1,2,2];
```

```
m = length(x1)
```

```
n = length(x2)
```

```

if (m > n)
    for i = n+1:m
        x2(i) = 0;
    end
elseif (n > m)
    for i = m+1:n
        x1(i) = 0;
    end
end
N = length(x1)
x3 = zeros(1,N);
a(1) = x2(1);
for j = 2:N
    a(j) = x2(N-j+2);
end
for i = 1:N
    x3(1) = x3(1)+x1(i)*a(i);
end
for k = 2:N
    for j = 2:N
        x2(j) = a(j-1);
    end
    x2(1) = a(N);
    x2
    for i = 1:N
        a(i) = x2(i);
        x3(k) = x3(k)+x1(i)*a(i);
    end
end
disp(x3,'Circular Convolution of Discrete Sequence is x3 = ')

```

Output:

```
Startup execution:
  loading initial environment

--> exec('C:\Jay\Sem7\DSP\DSP-Sem7-Lab\exp5-dsp-convolution.sce', -1)

X3[k] =

    60.   -4.i    0.    4.i

x3[n] =

    15.    17.    15.    13.

x3 =

    1.    3.    7.   13.   14.   14.    8.

--> exec('C:\Jay\Sem7\DSP\DSP-Sem7-Lab\exp5sub-dsp.sce', -1)

Circular Convolution of Discrete Sequence is x3 =

    15.    17.    15.    13.
```

Conclusion:

In this experiment we learnt to generate the convolution of two signals using 'conv' command in Scilab.