

DSP Lab – Experiment 4 – Output

Linear Convolution

The screenshot displays the Scilab 6.1.1 interface with the following components:

- Editor Window (linear_convolution.sce):** Contains the following code:

```
1 // Linear Convolution -- DSP Lab -- Experiment 4 -- Kunal Keshan
2 nt = 4; RA2011004010051;
3 clc;
4 clear all;
5 x = input("Enter the first sequence: ");
6 h = input("Enter the second sequence: ");
7 disp(conv(x, h), "Convolution = ");
8 y = conv(x, h);
9
```
- Console Window:** Shows the execution output:

```
Enter the first Sequence: [1 2 3 4 5 6 7 8]
Enter the second sequence: [5 4 5 2 1]

column 1 to 7
5. 14. 28. 44. 61. 78. 95.
column 8 to 12
112. 84. 60. 23. 8.

"Convolution = "
```
- Variable Browser:** Lists variables: f, fs, h, n, p, t, x, y, with their respective dimensions (e.g., 1x8 D., 1x5 D.).
- Command History:** Shows the sequence of commands entered, including the script execution and variable assignments.
- System Tray:** Displays system information: 31°C, 14:49, 07-09-2022, and a notification for Scilab 6.1.1 release.

Circular Convolution Using Concentric Circle Method

The screenshot displays the Scilab 6.1.1 environment with the following components:

- Script Editor (circular_convolution.sce):** Contains the following code:


```

1 // Circular Convolution -- DSP Lab -- Experiment 4 -- RA2011004010051 -- Kunal Keshan
2 clear;
3 clf;
4 clear all;
5 g=input('Enter the first sequence: ');
6 h=input('Enter the second sequence: ');
7 N1=length(g);
8 N2=length(h);
9 N=max(N1,N2);
10 N3=N1-N2;
11 if (N3>0) then
12     h=[h, zeros(1,N3)];
13 else
14     g=[g, zeros(1,-N3)];
15 end
16 for n=1:N
17     y(n)=0;
18     for i=1:N
19         j=n-i+1;
20         if (j<=0)
21             j=N+j;
22         end
23         y(n)=y(n)+g(i)*h(j);
24     end
25 end
26 disp('sequence y:');
27 disp(y);
28 plot2d3(y);
      
```
- Command Window:** Shows the input sequences and the resulting sequence:


```

Enter the first sequence: [2 1 2 1]
Enter the second sequence: [1 2 3 4]

"sequence y ="

column 1 to 7
14.    16.    14.    16.    61.    78.    95.
column 8 to 12
112.   84.   60.   23.    8.
      
```
- Graphic Window (number 0):** Displays a stem plot of the sequence y, with values ranging from 0 to 120 on the y-axis and indices from 0 to 12 on the x-axis.

Circular Convolution Using DFT Computation

The screenshot displays the Scilab 6.1.1 environment. The main window shows a script titled 'circular_convolution_using_dft' with the following code:

```

1 // Circular Convolution using DFT Computation
2 DSP.lab -- Experiment 4 -- RA2011004010051 -- Kunal
3 .Keshan
4 clc;
5 close;
6 x1=[2,1,2,1];
7 x2=[1,2,3,4];
8 // DFT Computation
9 X1=fft(x1,-1);
10 X2=fft(x2,-1);
11 X3=X1.*X2;
12 // IDFT Computation
13 x3=fft(X3,1);
14 disp(x3);

```

The Command History window on the right shows the execution of the script, including the definition of variables and the execution of the FFT and IDFT functions. The Variable Browser window shows the current state of the workspace, including variables like N, N1, N2, N3, X1, X2, X3, f, and fs.

The bottom status bar indicates the file path: 'C:\Users\Kunal\Desktop\Kunal Keshan\Experiment 4\circular_convolution_using_dft'.

Post Lab

The screenshot shows the Scilab 6.1.1 Console window. The File Browser on the left lists 'Experiment 4' with sub-items 'circular_convolution', 'circular_convolution', 'Experiment 4 Output', and 'linear_convolution'. The main console area displays the following text:

```
Enter the first Sequence: [3, -1, 0, 1, 3, 2, 0, 1, 2, 1]
Enter the second sequence: [1, 1, 1]

      column 1 to 11
3.   2.   2.   0.   4.   6.   5.   3.   3.   4.   3.
      column 12
1.

"Convolution = "
--> |
```

On the right, the Variable Editor shows variables 'h', 'x', and 'y'. The Command History at the bottom right shows the following commands:

```
[2 1 2
[1 2 3
[[ 1 2
[1 2 3
[3 4 5
08/09,
08/09,
```

The screenshot shows the Scilab 6.1.1 Console window. The File Browser on the left lists 'Experiment 4' with sub-items 'circular_convolution', 'circular_convolution', 'Experiment 4 Output', and 'linear_convolution'. The main console area displays the following text:

```
Enter the first Sequence: [3, 2, 1, 2]
Enter the second sequence: [1, 2, 1, 2]

      3.   8.   8.  12.   9.   4.   4.

"Convolution = "
--> |
```

On the right, the Variable Editor shows variables 'h', 'x', and 'y'. The Command History at the bottom right shows the following commands:

```
[1 1 2
[1 2 3
[3 4 5
08/09,
14/09,
14/09,
```

Scilab 6.1.1 Console

File Edit Control Applications ?

File Browser Scilab 6.1.1 Console

Enter the first sequence: [3, 2, 1, 2]

Enter the second sequence: [1, 2, 3, 1]

"sequence y ="

12. 15. 16. 13. 9. 4. 4.

-->

Variable

...
N
...
...
...
g
h
i
j

Confirmation

[3 4 5
08/09
14/09
14/09
3 -10
[3 -1

