

## DSP – Experiment 6 – Output

### Calculation of FFT of a signal

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

- File Browser:** Shows the file structure, including 'Documents', 'Custom Office Text', 'LabVIEW Data', 'My Music', 'My Pictures', 'My Videos', and 'Zoom'.
- Console:** Contains the script and its output.
 

```

1 //Calculation of FFT of signal.--DSP Lab.--Experiment-6--Kunal.Keshan
2 clear; clf; clear all;
3 N=100; //Enter the value of N';
4 x=input('Enter input sequence');
5 y=fft(x);
6 A=real(y);
7 B=imag(y);
8 mag=abs(y);
9 x1=atan(imag(y), real(y));
10 phase=x1*(180/pi);
11 disp('the resultant FFT sequence is');
12 disp(y);
13 disp('the magnitude response is');
14 disp(mag);
15 disp('the phase response is');
16 disp(phase);
17 a=fftz(y);
18 disp('the resultant IFFT sequence is');
19 disp(a);
20 subplot(321);
21 plot2d3(x);
22 title('Input Sequence');
23 subplot(322);
24 plot2d3(A);
25 title('FFT real sequence');
26 subplot(323);
27 plot2d3(B);
28 title('FFT imaginary sequence');
29 subplot(324);
30 plot2d3(mag);
31 title('magnitude response');
32 subplot(325);
33 plot2d3(phase);
34 title('phase response');
35 subplot(326);
36 plot2d3(x);
      
```

The output of the script is as follows:

```

Enter input sequence [1 2 3 4 5 6 7 8]

"the resultant FFT sequence is"

column 1 to 3
36. + 0.1 -4. + 9.6568542i -4. + 4.1
column 4 to 5
-4. + 1.6568542i -4. + 0.1
column 6 to 7
-4. - 1.6568542i -4. - 4.1
column 8
-4. - 9.6568542i

"the magnitude response is"

column 1 to 4
36. 10.452504 5.6568542 4.3295688
column 5 to 8
4. 4.3295688 5.6568542 10.452504

"the phase response is"

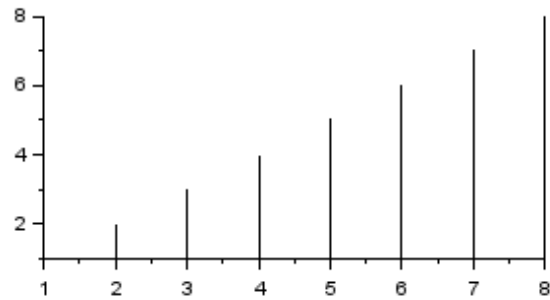
column 1 to 6
0. 112.5 135. 157.5 180. -157.5
column 7 to 8
-135. -112.5

"the resultant IFFT sequence is"

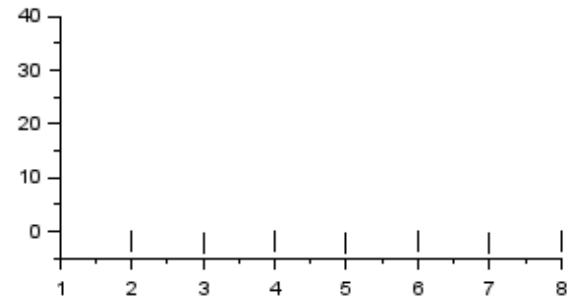
1. 2. 3. 4. 5. 6. 7. 8.
      
```
- Variable Browser:** Shows the variables defined in the script, including A, B, N, x, y, x1, and phase.
- Command History:** Lists the commands executed in the console.
- News feed:** Displays a message: "Scilab 6.1.1 has been released!!!".



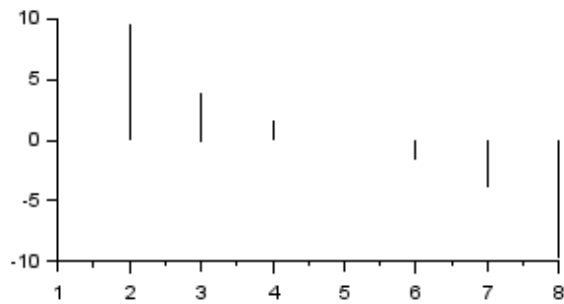
Input Sequence



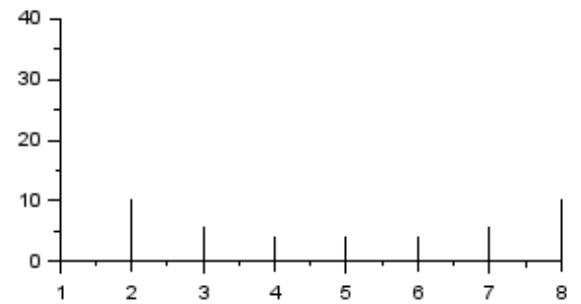
FFT real sequence



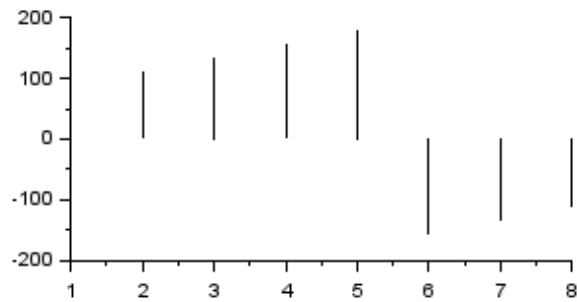
FFT imaginary sequence



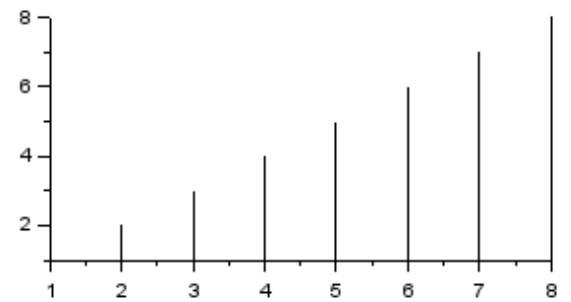
magnitude response



phase response



IFFT Sequence



## Post Lab

The screenshot shows the Scilab 6.1.1 Console window. The main area displays the following text and code:

```

Enter the value of N8

Enter input sequence[1, 2, 1, 2, 3, 4, 3, 4]

"the resultant FFT sequence is"

      column 1 to 3
20. + 0.i -2. + 4.8284271i  0. + 0.i
      column 4 to 6
-2. + 0.8284271i -4. + 0.i -2. - 0.8284271i
      column 7 to 8
0. + 0.i -2. - 4.8284271i

"the magnitude response is"

      column 1 to 7
20.  5.2262519  0.  2.1647844  4.  2.1647844  0.
      column 8
5.2262519

"the phase response is"

0.  112.5  0.  157.5  180. -157.5  0. -112.5

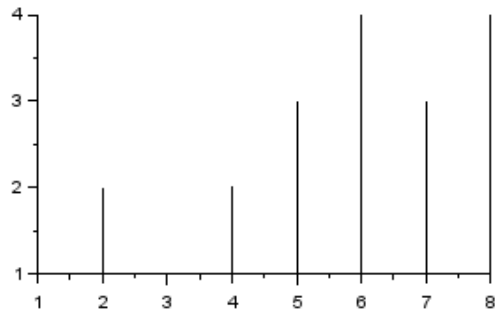
"the resultant IFFT sequence is"

1.  2.  1.  2.  3.  4.  3.  4.

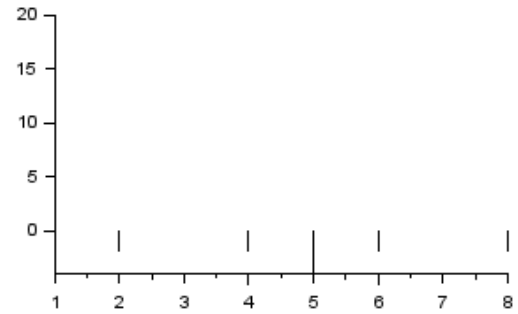
--> |
  
```

On the left, the File Browser shows a directory structure with "Experiment 6" and "Experiment 6 Output". On the right, the Variable pane shows a list of variables including A, B, N, x, x1, y, z, and a Command History pane showing the execution of the code.

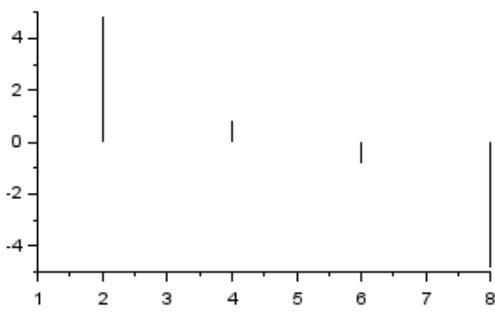
Input Sequence



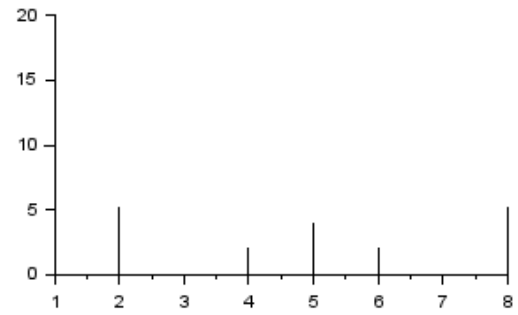
FFT real sequence



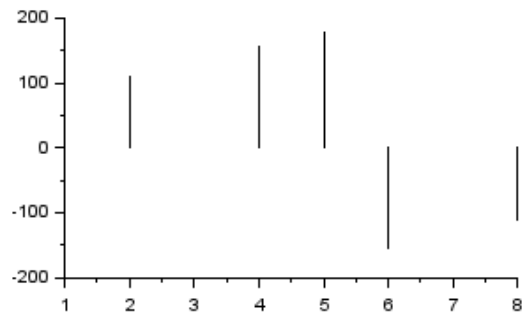
FFT imaginary sequence



magnitude response



phase response



IFFT Sequence

