

Lab 3 Post-lab Submission

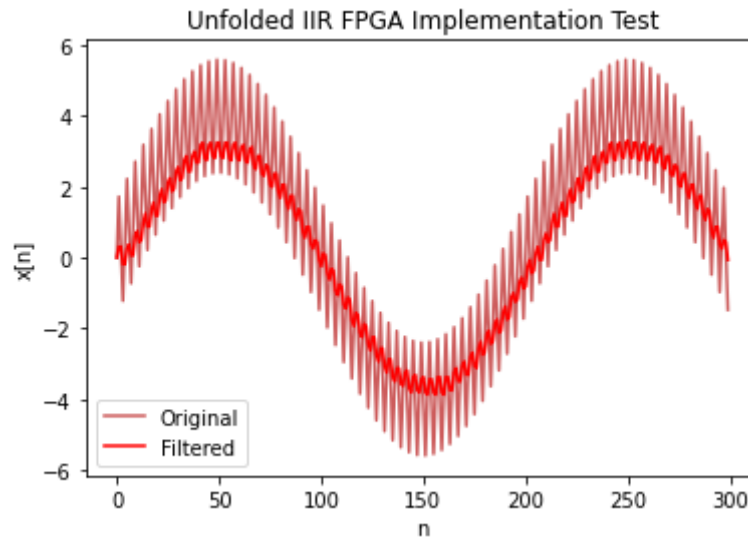


Figure 1 - IIR Filter Output Data Plot

Figure 1 shown above, plots both the original and filtered discrete signals outputted by running `lab3_IIR_unfold_test`. It is shown that the filtered signal is an attenuated version of the original signal passed through the filter.

After running the test, an output file containing the data for both the original and filtered signals, `lab3_IIR_unfold_results`, was generated. The following figure displays the terminal's output after running the test on MobaXterm.

```
2. ZYBO Z7 (COM5)
zynq> ./lab3_IIR_unfold_test
send data to FPGA
trigger FPGA
wait for FPGA
read back the results
cost 154 FPGA clock cycles
zynq> █
```

Figure 2 - Terminal Output After Running the Test

Appendix - A

Contents of Generated Output File

-----original data-----	2.472573	-1.472498
0.000000	0.749525	0.245048
1.725643	-0.974262	-1.236068
0.251162	0.501333	-2.715964
-1.223567	1.976433	-0.994760
0.501333	0.251162	0.727427
2.225738	-1.474357	-0.749525
0.749525	0.000000	-2.225738
-0.727427	1.474357	-0.501333
0.994760	-0.251162	1.223567
2.715964	-1.976433	-0.251162
1.236068	-0.501333	-1.725643
-0.245048	0.974262	0.000000
1.472498	-0.749525	1.725643
3.188592	-2.472573	0.251162
1.703117	-0.994760	-1.223567
0.215962	0.484036	0.501333
1.927015	-1.236068	2.225738
3.636166	-2.954952	0.749525
2.143307	-1.472498	-0.727427
0.648334	0.011408	0.994760
2.351141	-1.703117	2.715964
4.051628	-3.415962	1.236068
2.549696	-1.927015	-0.245048
1.045247	-0.436166	1.472498
2.738188	-2.143307	3.188592
4.428427	-3.848334	1.703117
2.915875	-2.351141	0.215962
1.400444	-0.851628	1.927015
3.082053	-2.549696	3.636166
4.760620	-4.245247	2.143307
3.236068	-2.738188	0.648334
1.708322	-1.228427	3.082053
3.377312	-2.915875	2.351141
5.042968	-4.600444	4.051628
3.505227	-3.082053	2.549696
1.964026	-1.560620	1.045247
3.619308	-3.236068	2.738188
5.271019	-4.908322	4.428427
3.719106	-3.377312	2.915875
2.163523	-1.842968	1.400444
3.804226	-3.505227	3.082053
5.441175	-5.164026	4.760620
3.874333	-3.619308	3.236068
2.303667	-2.071019	1.708322
3.929149	-3.719106	3.377312
5.550753	-5.363523	5.042968
3.968459	-3.804226	3.505227
2.382248	-2.241175	1.964026
3.992107	-3.874333	3.619308
5.598026	-5.503667	5.271019
4.000000	-3.929149	3.719106
2.398026	-2.350753	2.163523
3.992107	-3.968459	3.804226
5.582248	-5.582248	5.441175
3.968459	-3.992107	3.874333
2.350753	-2.398026	2.303667
3.929149	-4.000000	3.929149
5.503667	-5.598026	5.550753
3.874333	-3.992107	3.968459
2.241175	-2.382248	2.382248
3.804226	-3.968459	3.992107
5.363523	-5.550753	5.598026
3.719106	-3.929149	4.000000
2.071019	-2.303667	2.398026
3.619308	-3.874333	3.992107
5.164026	-5.441175	5.582248
3.505227	-3.804226	3.968459
1.842968	-2.163523	2.350753
3.377312	-3.719106	3.929149
4.908322	-5.271019	5.503667
3.236068	-3.619308	3.874333
1.560620	-1.964026	2.241175
3.082053	-3.505227	3.804226
4.600444	-5.042968	5.363523
2.915875	-3.377312	3.719106
1.228427	-1.708322	2.071019
2.738188	-3.236068	3.619308
4.245247	-4.760620	5.164026
2.549696	-3.082053	3.505227
0.851628	-2.915875	1.842968
2.351141	-4.428427	3.377312
3.848334	-2.738188	4.908322
2.143307	-1.045247	3.236068
0.436166	-2.549696	1.560620
1.927015	-4.051628	3.082053
3.415962	-2.351141	4.600444
1.703117	-0.648334	2.915875
-0.011408	-2.143307	1.228427
1.472498	-3.636166	2.738188
2.954952	-1.927015	4.245247
1.236068	-0.215962	2.549696
-0.484036	-1.703117	0.851628
0.994760	-3.188592	2.351141
		3.848334
		2.143307

0.436166	-0.437500	2.125000
1.927015	-0.625000	2.250000
3.415962	-0.312500	1.875000
1.703117	-0.375000	1.937500
-0.011408	-0.937500	2.437500
1.472498	-1.062500	2.562500
2.954952	-0.750000	2.187500
1.236068	-0.812500	2.250000
-0.484036	-1.312500	2.750000
0.994760	-1.437500	2.875000
2.472573	-1.125000	2.437500
0.749525	-1.187500	2.437500
-0.974262	-1.750000	2.875000
0.501333	-1.937500	3.000000
1.976433	-1.562500	2.687500
0.251162	-1.625000	2.687500
-1.474357	-2.125000	3.187500
	-2.250000	3.250000
-----filtered data-----	-1.875000	2.812500
0.000000	-1.937500	2.750000
0.312500	-2.437500	3.187500
0.312500	-2.625000	3.250000
-0.187500	-2.250000	2.875000
-0.187500	-2.250000	2.812500
0.250000	-2.750000	3.250000
0.375000	-2.937500	3.312500
0.062500	-2.562500	2.937500
0.062500	-2.562500	2.812500
0.625000	-3.062500	3.250000
0.750000	-3.250000	3.250000
0.437500	-2.875000	2.812500
0.500000	-2.875000	2.750000
1.000000	-3.375000	3.187500
1.250000	-3.500000	3.250000
0.875000	-3.125000	2.812500
0.875000	-3.125000	2.750000
1.375000	-3.562500	3.125000
1.562500	-3.625000	3.187500
1.187500	-3.250000	2.750000
1.187500	-3.187500	2.687500
1.750000	-3.687500	3.062500
1.937500	-3.812500	3.125000
1.562500	-3.375000	2.625000
1.625000	-3.312500	2.500000
2.125000	-3.750000	2.875000
2.250000	-3.812500	2.875000
1.875000	-3.437500	2.375000
1.937500	-3.375000	2.312500
2.437500	-3.812500	2.625000
2.562500	-3.875000	2.562500
2.187500	-3.437500	2.062500
2.250000	-3.437500	2.000000
2.750000	-3.812500	2.375000
2.875000	-3.875000	2.375000
2.437500	-3.375000	1.875000
2.437500	-3.375000	1.687500
2.875000	-3.812500	2.062500
3.000000	-3.875000	2.062500
2.687500	-3.375000	1.562500
2.687500	-3.375000	1.375000
3.187500	-3.750000	1.750000
3.250000	-3.750000	1.750000
2.812500	-3.250000	1.250000
2.750000	-3.125000	1.062500
3.187500	-3.500000	1.375000
3.250000	-3.500000	1.312500
2.875000	-3.062500	0.750000
2.812500	-2.937500	0.562500
3.250000	-3.312500	0.875000
3.250000	-3.312500	0.875000
2.875000	-2.812500	0.375000
2.812500	-2.687500	0.250000
3.250000	-3.062500	0.500000
3.250000	-3.125000	0.437500
2.812500	-2.562500	-0.062500
2.750000	-2.375000	
3.187500	-2.750000	
3.250000	-2.687500	
2.812500	-2.187500	
2.750000	-2.062500	
3.125000	-2.437500	
3.187500	-2.375000	
2.750000	-1.875000	
2.687500	-1.750000	
3.062500	-2.125000	
3.125000	-2.062500	
2.625000	-1.562500	
2.500000	-1.375000	
2.875000	-1.750000	
2.875000	-1.687500	
2.375000	-1.125000	
2.312500	-1.000000	
2.625000	-1.250000	
2.562500	-1.187500	
2.062500	-0.687500	
2.000000	-0.562500	
2.375000	-0.875000	
2.375000	-0.812500	
1.875000	-0.250000	
1.687500	-0.062500	
2.062500	-0.437500	
2.062500	-0.375000	
1.562500	0.125000	
1.375000	0.312500	
1.750000	-0.062500	
1.750000	-0.062500	
1.250000	0.500000	
1.062500	0.687500	
1.375000	0.437500	
1.312500	0.500000	
0.750000	1.000000	
0.562500	1.250000	
0.875000	0.875000	
0.875000	0.875000	
0.375000	1.375000	
0.250000	1.562500	
0.500000	1.187500	
0.437500	1.187500	
-0.062500	1.750000	
-0.250000	1.937500	
0.125000	1.562500	
0.062500	1.625000	