

Running automated testing:

WFF\_FHT Test: Pure sine wave with frequency = 2500 Hz and amplitude of +-16383  
FHT\_LEN = 64, N\_DB = 64

Test 1 - Rectangular window, linear output

Output from generateSample():

0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11584,	0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,

Output from fhtDitInt():

-1,	-1,	-1,	-1,	0,	-1,	-1,	-1,	8184,	-1,	0,	-1,	0,	0,	-1,	-1,
0,	-1,	-1,	-1,	0,	-1,	-1,	-1,	-35,	-1,	-1,	-1,	0,	-1,	-1,	-1,
0,	1,	1,	1,	0,	1,	1,	1,	6,	1,	0,	1,	0,	0,	1,	1,
0,	1,	1,	1,	0,	1,	1,	1,	-8157,	1,	1,	1,	0,	1,	1,	1

Output from complexToReal():

0,	0,	0,	0,	0,	0,	0,	0,	63,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |*****
9 |
10|
11|
12|
13|
14|
15|
16|
17|
18|
19|
20|
21|
22|
23|
24|
25|
26|
27|
28|
29|
30|
31|
```

Test 2 - Rectangular window, decibel output

Output from generateSample():

0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11584,	0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,

Output from fhtDitInt():

-1,	-1,	-1,	-1,	0,	-1,	-1,	-1,	8184,	-1,	0,	-1,	0,	0,	-1,	-1,
0,	-1,	-1,	-1,	0,	-1,	-1,	-1,	-35,	-1,	-1,	-1,	0,	-1,	-1,	-1,
0,	1,	1,	1,	0,	1,	1,	1,	6,	1,	0,	1,	0,	0,	1,	1,
0,	1,	1,	1,	0,	1,	1,	1,	-8157,	1,	1,	1,	0,	1,	1,	1

Output from complexToDecibel():

0,	0,	0,	0,	0,	0,	0,	0,	63,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |*****
9 |
10|
11|
12|
13|
14|
15|
16|
17|
18|
19|
20|
21|
22|
23|
24|
25|
```

26 |  
27 |  
28 |  
29 |  
30 |  
31 |

Test 3 - Hamming window, linear output  
Output from generateSample():

0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11584,	0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585

Output from applyHammingWindow():

0,	953,	1459,	1163,	0,	-1576,	-2620,	-2173,	0,	2933,	4757,	3824,	0,	-4813,	-7538,	-5858,
0,	6917,	10523,	7952,	0,	-8920,	-13246,	-9782,	0,	10503,	15277,	11056,	0,	-11420,	-16299,	-11578,
0,	11524,	16149,	11262,	0,	-10803,	-14855,	-10162,	0,	9366,	12614,	8446,	0,	-7442,	-9784,	-6389,
0,	5329,	6805,	4308,	0,	-3365,	-4148,	-2535,	0,	1852,	2227,	1344,	0,	-1033,	-1348,	-927

Output from fhtDitInt():

-3,	-4,	-2,	-1,	1,	4,	17,	-1800,	4360,	-1975,	20,	6,	4,	2,	1,	1,
1,	1,	0,	1,	0,	-1,	-1,	11,	-18,	3,	-1,	-1,	0,	-1,	-1,	-1,
0,	0,	2,	1,	1,	0,	1,	6,	4,	5,	0,	0,	0,	0,	-1,	-1,
0,	1,	0,	-1,	-2,	-5,	-17,	1783,	-4346,	1967,	-21,	-7,	-4,	-1,	-1,	1

Output from complexToReal():

0,	0,	0,	0,	0,	0,	0,	14,	34,	14,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

Test 4 - Hamming window, decibel output with gain  
Output from generateSample():

0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11585,	16383,	11585,	0,	-11585,	-16383,	-11585,
0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11584,	0,	11585,	16383,	11584,	0,	-11585,	-16383,	-11585,
0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585,	0,	11584,	16383,	11585,	0,	-11584,	-16383,	-11585

Output from applyHammingWindow():

0,	953,	1459,	1163,	0,	-1576,	-2620,	-2173,	0,	2933,	4757,	3824,	0,	-4813,	-7538,	-5858,
0,	6917,	10523,	7952,	0,	-8920,	-13246,	-9782,	0,	10503,	15277,	11056,	0,	-11420,	-16299,	-11578,
0,	11524,	16149,	11262,	0,	-10803,	-14855,	-10162,	0,	9366,	12614,	8446,	0,	-7442,	-9784,	-6389,
0,	5329,	6805,	4308,	0,	-3365,	-4148,	-2535,	0,	1852,	2227,	1344,	0,	-1033,	-1348,	-927

Output from fhtDitInt():

-3,	-4,	-2,	-1,	1,	4,	17,	-1800,	4360,	-1975,	20,	6,	4,	2,	1,	1,
1,	1,	0,	1,	0,	-1,	-1,	11,	-18,	3,	-1,	-1,	0,	-1,	-1,	-1,
0,	0,	2,	1,	1,	0,	1,	6,	4,	5,	0,	0,	0,	0,	-1,	-1,
0,	1,	0,	-1,	-2,	-5,	-17,	1783,	-4346,	1967,	-21,	-7,	-4,	-1,	-1,	1

Output from complexToDecibelWithGain():

0,	0,	0,	0,	0,	0,	0,	63,	63,	63,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*



```

0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 | *****
8 | *****
9 | *****
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |

```

Tests completed...

WFF\_FHT Test: Pure sine wave with frequency = 5000 Hz and amplitude of +/-16383  
FHT\_LEN = 64, N\_DB = 64

Test 1 - Rectangular window, linear output

Output from generateSample():

```

0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, -1, 16383, 1, -16383, -1, 16383, 1, -16383

```

Output from fhtDitInt():

```

-1, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1,
8191, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
-1, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1,
-8192, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

```

Output from complexToReal():

```

0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
63, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

```

```

0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 | *****
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |

```

Test 2 - Rectangular window, decibel output

Output from generateSample():

```

0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, -1, 16383, 1, -16383, -1, 16383, 1, -16383

```

Output from fhtDitInt():

```

-1, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1,
8191, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
-1, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1, 0, -1,
-8192, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

```

Output from complexToDecibel():

0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,  
63, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*

Test 3 - Hamming window, linear output  
Output from generateSample():

0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, -1, 16383, 1, -16383, -1, 16383, 1, -16383

Output from applyHammingWindow():

0, 1347, 0, -1645, 0, 2227, 0, -3073, 0, 4147, 0, -5409, 0, 6805, 0, -8284,  
0, 9783, 0, -11247, 0, 12614, 0, -13834, 0, 14854, 0, -15637, 0, 16149, 0, -16374,  
0, 16298, 0, -15929, 0, 15277, 0, -14372, 0, 13245, 0, -11947, 0, 10523, 0, -9035,  
0, 7537, 0, -6093, 0, 4757, 0, -3585, -1, 2619, 0, -1902, -1, 1459, 0, -1310

Output from fhtDitInt():

-2, -2, -1, -1, -1, -1, 0, 0, 0, -1, 1, 2, 3, 6, 18, -1789,  
4364, -1962, 21, 8, 3, 2, 1, 1, 1, 1, 0, 0, -1, -1, -1, -1,  
0, 2, 1, 1, 1, 1, 0, 0, 0, 1, -1, -2, -3, -6, -18, 1789,  
-4365, 1962, -21, -8, -3, -2, -1, -1, -1, -1, 0, 0, 1, 1, 1, 1

Output from complexToReal():

0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 14,  
34, 14, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

Test 4 - Hamming window, decibel output with gain  
Output from generateSample():

0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,  
0, 16383, 0, -16383, 0, 16383, 0, -16383, -1, 16383, 1, -16383, -1, 16383, 1, -16383

Output from applyHammingWindow():

```
0, 1347, 0, -1645, 0, 2227, 0, -3073, 0, 4147, 0, -5409, 0, 6805, 0, -8284,
0, 9783, 0, -11247, 0, 12614, 0, -13834, 0, 14854, 0, -15637, 0, 16149, 0, -16374,
0, 16298, 0, -15929, 0, 15277, 0, -14372, 0, 13245, 0, -11947, 0, 10523, 0, -9035,
0, 7537, 0, -6093, 0, 4757, 0, -3585, -1, 2619, 0, -1902, -1, 1459, 0, -1310
```

Output from fhtDitInt():

```
-2, -2, -1, -1, -1, -1, 0, 0, 0, -1, 1, 2, 3, 6, 18, -1789,
4364, -1962, 21, 8, 3, 2, 1, 1, 1, 1, 0, 0, -1, -1, -1, -1,
0, 2, 1, 1, 1, 1, 0, 0, 0, 1, -1, -2, -3, -6, -18, 1789,
-4365, 1962, -21, -8, -3, -2, -1, -1, -1, -1, 0, 0, 1, 1, 1, 1, 1
```

Output from complexToDecibelWithGain():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 63,
63, 63, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |
```

```
*****
*****
*****
```

Test 5 - Hann window, linear output

Output from generateSample():

```
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383, 0, 16383, 0, -16383,
0, 16383, 0, -16383, 0, 16383, -1, 16383, 1, -16383, -1, 16383, 1, -16383
```

Output from applyHannWindow():

```
0, 39, 0, -363, 0, 996, 0, -1916, 0, 3083, 0, -4454, 0, 5972, 0, -7579,
0, 9209, 0, -10801, 0, 12287, 0, -13612, 0, 14721, 0, -15572, 0, 16129, 0, -16373,
0, 16291, 0, -15889, 0, 15181, 0, -14197, 0, 12973, 0, -11561, 0, 10013, 0, -8396,
0, 6768, 0, -5199, 0, 3746, 0, -2472, -1, 1422, 0, -643, -1, 161, 0, 0
```

Output from fhtDitInt():

```
-2, -3, -1, -1, -1, 0, -1, 0, 0, -1, 0, 1, 3, 6, 19, -1945,
4031, -2133, 23, 8, 4, 2, 1, 1, 1, 1, -1, 0, 0, -1, -1, -1,
0, 3, 1, 1, 1, 0, 1, 0, 0, 1, 0, -1, -3, -6, -19, 1945,
-4032, 2133, -23, -8, -4, -2, -1, -1, -1, -1, 1, 0, 0, 1, 1, 1, 1
```

Output from complexToReal():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 15,
31, 15, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
```

```
*****
*****
*****
```

30 |  
31 |

Test 6 - Hann window, decibel output with gain  
Output from generateSample():

0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,
0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,
0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	0,	16383,	0,	-16383,
0,	16383,	0,	-16383,	0,	16383,	0,	-16383,	-1,	16383,	1,	-16383,	-1,	16383,	1,	-16383,

Output from applyHannWindow():

0,	39,	0,	-363,	0,	996,	0,	-1916,	0,	3083,	0,	-4454,	0,	5972,	0,	-7579,
0,	9209,	0,	-10801,	0,	12287,	0,	-13612,	0,	14721,	0,	-15572,	0,	16129,	0,	-16373,
0,	16291,	0,	-15889,	0,	15181,	0,	-14197,	0,	12973,	0,	-11561,	0,	10013,	0,	-8396,
0,	6768,	0,	-5199,	0,	3746,	0,	-2472,	-1,	1422,	0,	-643,	-1,	161,	0,	0

Output from fhtDitInt():

-2,	-3,	-1,	-1,	-1,	0,	-1,	0,	0,	-1,	0,	1,	3,	6,	19,	-1945,
4031,	-2133,	23,	8,	4,	2,	1,	1,	1,	1,	-1,	4,	0,	-1,	-1,	-1,
0,	3,	1,	1,	1,	0,	1,	0,	0,	1,	0,	-1,	-3,	-6,	-19,	1945,
-4032,	2133,	-23,	-8,	-4,	-2,	-1,	-1,	-1,	-1,	1,	0,	0,	1,	1,	1

Output from complexToDecibelWithGain():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	63,
63,	63,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

Tests completed...

WFF\_FHT Test: Pure sine wave with frequency = 7500 Hz and amplitude of +-16383  
FHT\_LEN = 64, N\_DB = 64

Test 1 - Rectangular window, linear output  
Output from generateSample():

0,	11585,	-16383,	11585,	0,	-11585,	16383,	-11585,	0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,	0,	11585,	-16383,	11584,	0,	-11584,	16383,	-11585,
0,	11584,	-16383,	11585,	0,	-11584,	16383,	-11585,	0,	11584,	-16383,	11585,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584,	-1,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584

Output from fhtDitInt():

-1,	-2,	-1,	-2,	0,	-2,	0,	-2,	-7,	0,	-1,	-1,	0,	-1,	-1,	-1,
-1,	-2,	-1,	-2,	0,	-2,	-1,	-2,	8156,	-1,	0,	-1,	0,	-1,	-1,	-1,
0,	0,	1,	0,	0,	0,	0,	0,	-8185,	0,	1,	1,	0,	1,	1,	1,
-1,	0,	1,	0,	0,	0,	1,	0,	34,	1,	0,	1,	0,	1,	1,	1

Output from complexToReal():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	63,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |

19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*

Test 2 - Rectangular window, decibel output  
Output from generateSample():

0,	11585,	-16383,	11585,	0,	-11585,	16383,	-11585,	0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,	0,	11585,	-16383,	11584,	0,	-11584,	16383,	-11585,
0,	11584,	-16383,	11585,	0,	-11584,	16383,	-11585,	0,	11584,	-16383,	11585,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584,	-1,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584

Output from fhtDitInt():

-1,	-2,	-1,	-2,	0,	-2,	0,	-2,	-7,	0,	-1,	-1,	0,	-1,	-1,	-1,
-1,	-2,	-1,	-2,	0,	-2,	-1,	-2,	8156,	-1,	0,	-1,	0,	-1,	-1,	-1,
0,	0,	1,	0,	0,	0,	0,	0,	-8185,	0,	1,	1,	0,	1,	1,	1,
-1,	0,	1,	0,	0,	0,	1,	0,	34,	1,	0,	1,	0,	1,	1,	1

Output from complexToDecibel():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	63,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*

Test 3 - Hamming window, linear output  
Output from generateSample():

0,	11585,	-16383,	11585,	0,	-11585,	16383,	-11585,	0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,	0,	11585,	-16383,	11584,	0,	-11584,	16383,	-11585,
0,	11584,	-16383,	11585,	0,	-11584,	16383,	-11585,	0,	11584,	-16383,	11585,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584,	-1,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584

Output from applyHammingWindow():

0,	953,	-1460,	1163,	0,	-1576,	2619,	-2173,	0,	2933,	-4758,	3824,	0,	-4813,	7537,	-5858,
0,	6918,	-10524,	7951,	0,	-8920,	13245,	-9782,	0,	10503,	-15278,	11055,	0,	-11419,	16298,	-11578,
0,	11523,	-16150,	11263,	0,	-10803,	14854,	-10163,	0,	9365,	-12615,	8447,	0,	-7442,	9783,	-6389,
0,	5330,	-6806,	4307,	0,	-3365,	4147,	-2535,	-1,	1852,	-2228,	1344,	0,	-1033,	1347,	-927

Output from fhtDitInt():

-2,	-2,	-3,	-2,	-2,	-2,	-1,	-7,	-5,	-6,	-2,	-2,	-1,	-1,	-1,	0,
0,	0,	1,	1,	3,	5,	17,	-1783,	4345,	-1966,	21,	8,	3,	2,	1,	0,
0,	2,	1,	0,	-2,	-6,	-17,	1799,	-4361,	1974,	-22,	-8,	-5,	-3,	-3,	-2,
-2,	0,	1,	1,	1,	1,	1,	-11,	17,	-2,	1,	2,	1,	2,	1,	2

Output from complexToReal():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	14,	34,	14,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |



13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

Test 4 - Hamming window, decibel output with gain  
Output from generateSample():

0,	11585,	-16383,	11585,	0,	-11585,	16383,	-11585,	0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,	0,	11585,	-16383,	11584,	0,	-11584,	16383,	-11585,
0,	11584,	-16383,	11585,	0,	-11584,	16383,	-11585,	0,	11584,	-16383,	11585,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584,	-1,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584

Output from applyHammingWindow():

0,	953,	-1460,	1163,	0,	-1576,	2619,	-2173,	0,	2933,	-4758,	3824,	0,	-4813,	7537,	-5858,
0,	6918,	-10524,	7951,	0,	-8920,	13245,	-9782,	0,	10503,	-15278,	11055,	0,	-11419,	16298,	-11578,
0,	11523,	-16150,	11263,	0,	-10803,	14854,	-10163,	0,	9365,	-12615,	8447,	0,	-7442,	9783,	-6389,
0,	5330,	-6806,	4307,	0,	-3365,	4147,	-2535,	-1,	1852,	-2228,	1344,	0,	-1033,	1347,	-927

Output from fhtDitInt():

-2,	-2,	-3,	-2,	-2,	-2,	-1,	-7,	-5,	-6,	-2,	-2,	-1,	-1,	-1,	0,
0,	0,	1,	1,	3,	5,	17,	-1783,	4345,	-1966,	21,	8,	3,	2,	1,	0,
0,	2,	1,	0,	-2,	-6,	-17,	1799,	-4361,	1974,	-22,	-8,	-5,	-3,	-3,	-2,
-2,	0,	1,	1,	1,	1,	1,	-11,	17,	-2,	1,	2,	1,	2,	1,	2

Output from complexToDecibelWithGain():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	63,	63,	63,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

Test 5 - Hann window, linear output

Output from generateSample():

0,	11585,	-16383,	11585,	0,	-11585,	16383,	-11585,	0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	0,	-11585,	16383,	-11584,	0,	11585,	-16383,	11584,	0,	-11584,	16383,	-11585,
0,	11584,	-16383,	11585,	0,	-11584,	16383,	-11585,	0,	11584,	-16383,	11585,	0,	-11585,	16383,	-11584,
0,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584,	-1,	11585,	-16383,	11584,	1,	-11585,	16383,	-11584

Output from applyHannWindow():

0,	28,	-162,	256,	0,	-705,	1422,	-1355,	0,	2180,	-3747,	3149,	0,	-4224,	6768,	-5359,
0,	6512,	-10014,	7636,	0,	-8689,	12973,	-9625,	0,	10409,	-15182,	11009,	0,	-11405,	16291,	-11578,
0,	11518,	-16130,	11234,	0,	-10735,	14721,	-10039,	0,	9173,	-12288,	8174,	0,	-7081,	9209,	-5937,
0,	4786,	-5973,	3675,	0,	-2650,	3083,	-1748,	-1,	1006,	-997,	454,	0,	-115,	39,	0

Output from fhtDitInt():

-2,	-2,	-2,	-2,	-1,	-2,	-1,	-8,	-4,	-7,	-2,	-1,	-1,	-1,	-1,	0,
0,	0,	0,	2,	2,	6,	19,	-1938,	4014,	-2138,	23,	9,	4,	2,	1,	0,
0,	2,	0,	0,	-3,	-6,	-19,	1956,	-4028,	2145,	-24,	-9,	-5,	-3,	-3,	-2,
-2,	0,	0,	0,	0,	2,	1,	-12,	16,	-2,	1,	1,	0,	2,	1,	2

Output from complexToReal():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	15,	31,	16,	0,	0,	0,	0,	0,	0

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |
```

Test 6 - Hann window, decibel output with gain  
Output from generateSample():

```
0, 11585, -16383, 11585, 0, -11585, 16383, -11585, 0, 11585, -16383, 11584, 0, -11585, 16383, -11584,
0, 11585, -16383, 11584, 0, -11585, 16383, -11584, 0, 11585, -16383, 11584, 0, -11584, 16383, -11585,
0, 11584, -16383, 11585, 0, -11584, 16383, -11585, 0, 11584, -16383, 11585, 0, -11585, 16383, -11584,
0, 11585, -16383, 11584, 1, -11585, 16383, -11584, -1, 11585, -16383, 11584, 1, -11585, 16383, -11584
```

Output from applyHannWindow():

```
0, 28, -162, 256, 0, -705, 1422, -1355, 0, 2180, -3747, 3149, 0, -4224, 6768, -5359,
0, 6512, -10014, 7636, 0, -8689, 12973, -9625, 0, 10409, -15182, 11009, 0, -11405, 16291, -11578,
0, 11518, -16130, 11234, 0, -10735, 14721, -10039, 0, 9173, -12288, 8174, 0, -7081, 9209, -5937,
0, 4786, -5973, 3675, 0, -2650, 3083, -1748, -1, 1006, -997, 454, 0, -115, 39, 0
```

Output from fhtDitInt():

```
-2, -2, -2, -2, -1, -2, -1, -8, -4, -7, -2, -1, -1, -1, 0,
0, 0, 0, 2, 2, 6, 19, -1938, 4014, -2138, 23, 9, 4, 2, 1, 0,
0, 2, 0, 0, -3, -6, -19, 1956, -4028, 2145, -24, -9, -5, -3, -3, -2,
-2, 0, 0, 0, 0, 2, 1, -12, 16, -2, 1, 1, 0, 2, 1, 2
```

Output from complexToDecibelWithGain():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 63, 63, 63, 0, 0, 0, 0, 0, 0
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |
```

Tests completed...

WFF\_FHT Test: Pure sine wave with frequency = 1990 Hz and amplitude of +-16383  
FHT\_LEN = 64, N\_DB = 64

Test 1 - Rectangular window, linear output

Output from generateSample():

```
0, 9588, 15549, 15628, 9795, 257, -9378, -15466, -15703, -10001, -515, 9166, 15379, 15775, 10203, 772,
-8952, -15289, -15842, -10403, -1029, 8735, 15194, 15906, 10601, 1285, -8516, -15096, -15966, -10796, -1542, 8295,
14994, 16021, 10988, 1798, -8072, -14889, -16073, -11177, -2053, 7847, 14780, 16121, 11364, 2308, -7621, -14667,
-16165, -11548, -2563, 7392, 14550, 16205, 11729, 2817, -7161, -14430, -16241, -11908, -3070, 6929, 14307, 16272
```

Output from fhtDitInt():

```
567, 631, 752, 946, 1328, 2283, 8481, -4963, -1944, -1224, -875, -703, -588, -504, -441, -403,
-366, -336, -307, -287, -270, -253, -227, -241, -220, -212, -209, -197, -189, -181, -173, -170,
-164, -159, -152, -148, -144, -139, -121, -147, -138, -124, -147, -133, -130, -128, -129, -131,
-133, -140, -147, -161, -182, -217, -263, -403, -662, -1828, 3447, 1043, 697, 577, 533, 538
```

Output from complexToReal():

```
3, 4, 5, 6, 8, 13, 50, 29, 11, 7, 5, 4, 3, 2, 2, 2,
2, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1
```

```
0 | ***
1 | ****
2 | *****
3 | *****
4 | *****
5 | *****
6 | *****
7 | *****
8 | *****
9 | *****
10 | *****
11 | *****
12 | *****
13 | *****
14 | *****
15 | *****
16 | *****
17 | *****
18 | *****
19 | *****
20 | *****
21 | *****
22 | *****
23 | *****
24 | *****
25 | *****
26 | *****
27 | *****
28 | *****
29 | *****
30 | *****
31 | *****
```

Test 2 - Rectangular window, decibel output

Output from generateSample():

```
0, 9588, 15549, 15628, 9795, 257, -9378, -15466, -15703, -10001, -515, 9166, 15379, 15775, 10203, 772,
-8952, -15289, -15842, -10403, -1029, 8735, 15194, 15906, 10601, 1285, -8516, -15096, -15966, -10796, -1542, 8295,
14994, 16021, 10988, 1798, -8072, -14889, -16073, -11177, -2053, 7847, 14780, 16121, 11364, 2308, -7621, -14667,
-16165, -11548, -2563, 7392, 14550, 16205, 11729, 2817, -7161, -14430, -16241, -11908, -3070, 6929, 14307, 16272
```

Output from fhtDitInt():

```
567, 631, 752, 946, 1328, 2283, 8481, -4963, -1944, -1224, -875, -703, -588, -504, -441, -403,
-366, -336, -307, -287, -270, -253, -227, -241, -220, -212, -209, -197, -189, -181, -173, -170,
-164, -159, -152, -148, -144, -139, -121, -147, -138, -124, -147, -133, -130, -128, -129, -131,
-133, -140, -147, -161, -182, -217, -263, -403, -662, -1828, 3447, 1043, 697, 577, 533, 538
```

Output from complexToDecibel():

```
20, 26, 27, 30, 34, 42, 60, 52, 39, 32, 27, 24, 22, 19, 18, 16,
15, 13, 12, 12, 11, 9, 9, 9, 9, 9, 7, 7, 7, 7, 7, 7
```

```
0 | *****
1 | *****
2 | *****
3 | *****
4 | *****
5 | *****
6 | *****
7 | *****
8 | *****
9 | *****
10 | *****
11 | *****
12 | *****
13 | *****
14 | *****
15 | *****
16 | *****
17 | *****
18 | *****
19 | *****
20 | *****
21 | *****
22 | *****
23 | *****
24 | *****
25 | *****
26 | *****
27 | *****
28 | *****
29 | *****
30 | *****
31 | *****
```

Test 3 - Hamming window, linear output

Output from generateSample():

```
0, 9588, 15549, 15628, 9795, 257, -9378, -15466, -15703, -10001, -515, 9166, 15379, 15775, 10203, 772,
-8952, -15289, -15842, -10403, -1029, 8735, 15194, 15906, 10601, 1285, -8516, -15096, -15966, -10796, -1542, 8295,
14994, 16021, 10988, 1798, -8072, -14889, -16073, -11177, -2053, 7847, 14780, 16121, 11364, 2308, -7621, -14667,
-16165, -11548, -2563, 7392, 14550, 16205, 11729, 2817, -7161, -14430, -16241, -11908, -3070, 6929, 14307, 16272
```

Output from applyHammingWindow():

```
0, 788, 1385, 1569, 1137, 34, -1500, -2901, -3436, -2532, -150, 3026, 5719, 6553, 4694, 390,
-4937, -9131, -10176, -7142, -751, 6725, 12283, 13430, 9299, 1165, -7942, -14408, -15523, -10642, -1535, 8289,
14984, 15937, 10831, 1748, -7704, -13884, -14574, -9805, -1734, 6344, 11379, 11755, 7800, 1482, -4552, -8089,
-8174, -5314, -1065, 2748, 4803, 4706, 2969, 616, -1344, -2308, -2209, -1383, -309, 617, 1177, 1301
```

Output from fhtDitInt():

```
38, 38, 42, 32, -29, -1101, 5168, -4109, 401, -13, -32, -44, -40, -38, -31, -32,
-28, -27, -24, -24, -22, -22, -12, -28, -18, -15, -19, -15, -16, -16, -14, -14,
-13, -12, -10, -12, -11, -13, 0, -21, -9, -1, -20, -8, -10, -10, -9, -10,
-9, -9, -8, -8, -8, -8, 8, 12, 218, -1731, 1939, -319, 20, 38, 36, 42
```

Output from complexToReal():

```
0, 0, 0, 0, 0, 6, 30, 24, 2, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
30 |
31 |
```

```
*****
*****
*****
**
```

Test 4 - Hamming window, decibel output with gain

Output from generateSample():

```
0, 9588, 15549, 15628, 9795, 257, -9378, -15466, -15703, -10001, -515, 9166, 15379, 15775, 10203, 772,
-8952, -15289, -15842, -10403, -1029, 8735, 15194, 15906, 10601, 1285, -8516, -15096, -15966, -10796, -1542, 8295,
14994, 16021, 10988, 1798, -8072, -14889, -16073, -11177, -2053, 7847, 14780, 16121, 11364, 2308, -7621, -14667,
-16165, -11548, -2563, 7392, 14550, 16205, 11729, 2817, -7161, -14430, -16241, -11908, -3070, 6929, 14307, 16272
```

Output from applyHammingWindow():

```
0, 788, 1385, 1569, 1137, 34, -1500, -2901, -3436, -2532, -150, 3026, 5719, 6553, 4694, 390,
-4937, -9131, -10176, -7142, -751, 6725, 12283, 13430, 9299, 1165, -7942, -14408, -15523, -10642, -1535, 8289,
14984, 15937, 10831, 1748, -7704, -13884, -14574, -9805, -1734, 6344, 11379, 11755, 7800, 1482, -4552, -8089,
-8174, -5314, -1065, 2748, 4803, 4706, 2969, 616, -1344, -2308, -2209, -1383, -309, 617, 1177, 1301
```

Output from fhtDitInt():

```
38, 38, 42, 32, -29, -1101, 5168, -4109, 401, -13, -32, -44, -40, -38, -31, -32,
-28, -27, -24, -24, -22, -22, -12, -28, -18, -15, -19, -15, -16, -16, -14, -14,
-13, -12, -10, -12, -11, -13, 0, -21, -9, -1, -20, -8, -10, -10, -9, -10,
-9, -9, -8, -8, -8, -8, 8, 12, 218, -1731, 1939, -319, 20, 38, 36, 42
```

Output from complexToDecibelWithGain():

```
0, 0, 0, 0, 0, 55, 63, 63, 42, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 |
```

```
*****
*****
*****
*****
```

30 |  
31 |

Test 5 - Hann window, linear output  
Output from generateSample():

0,	9588,	15549,	15628,	9795,	257,	-9378,	-15466,	-15703,	-10001,	-515,	9166,	15379,	15775,	10203,	772,
-8952,	-15289,	-15842,	-10403,	-1029,	8735,	15194,	15906,	10601,	1285,	-8516,	-15096,	-15966,	-10796,	-1542,	8295,
14994,	16021,	10988,	1798,	-8072,	-14889,	-16073,	-11177,	-2053,	7847,	14780,	16121,	11364,	2308,	-7621,	-14667,
-16165,	-11548,	-2563,	7392,	14550,	16205,	11729,	2817,	-7161,	-14430,	-16241,	-11908,	-3070,	6929,	14307,	16272

Output from applyHannWindow():

0,	23,	153,	346,	384,	15,	-815,	-1809,	-2370,	-1883,	-118,	2491,	4880,	5750,	4215,	357,
-4588,	-8595,	-9683,	-6859,	-727,	6551,	12031,	13214,	9185,	1154,	-7892,	-14348,	-15484,	-10629,	-1534,	8289,
14983,	15931,	10817,	1743,	-7672,	-13797,	-14443,	-9686,	-1706,	6213,	11085,	11375,	7491,	1410,	-4285,	-7517,
-7478,	-4772,	-935,	2345,	3955,	3706,	2207,	425,	-838,	-1254,	-989,	-468,	-69,	68,	34,	0

Output from fhtDitInt():

-8,	-14,	-19,	-48,	-148,	-1396,	4881,	-4034,	605,	91,	41,	13,	7,	2,	5,	-1,
1,	0,	0,	-2,	-1,	-4,	8,	-11,	-1,	1,	-4,	0,	-1,	-2,	0,	-2,
0,	0,	1,	0,	0,	-2,	11,	-10,	3,	9,	-9,	3,	1,	0,	1,	1,
1,	2,	4,	6,	7,	10,	32,	49,	295,	-1723,	1808,	-438,	-39,	-8,	-6,	-2

Output from complexToReal():

0,	0,	0,	0,	0,	8,	28,	24,	3,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*

Test 6 - Hann window, decibel output with gain  
Output from generateSample():

0,	9588,	15549,	15628,	9795,	257,	-9378,	-15466,	-15703,	-10001,	-515,	9166,	15379,	15775,	10203,	772,
-8952,	-15289,	-15842,	-10403,	-1029,	8735,	15194,	15906,	10601,	1285,	-8516,	-15096,	-15966,	-10796,	-1542,	8295,
14994,	16021,	10988,	1798,	-8072,	-14889,	-16073,	-11177,	-2053,	7847,	14780,	16121,	11364,	2308,	-7621,	-14667,
-16165,	-11548,	-2563,	7392,	14550,	16205,	11729,	2817,	-7161,	-14430,	-16241,	-11908,	-3070,	6929,	14307,	16272

Output from applyHannWindow():

0,	23,	153,	346,	384,	15,	-815,	-1809,	-2370,	-1883,	-118,	2491,	4880,	5750,	4215,	357,
-4588,	-8595,	-9683,	-6859,	-727,	6551,	12031,	13214,	9185,	1154,	-7892,	-14348,	-15484,	-10629,	-1534,	8289,
14983,	15931,	10817,	1743,	-7672,	-13797,	-14443,	-9686,	-1706,	6213,	11085,	11375,	7491,	1410,	-4285,	-7517,
-7478,	-4772,	-935,	2345,	3955,	3706,	2207,	425,	-838,	-1254,	-989,	-468,	-69,	68,	34,	0

Output from fhtDitInt():

-8,	-14,	-19,	-48,	-148,	-1396,	4881,	-4034,	605,	91,	41,	13,	7,	2,	5,	-1,
1,	0,	0,	-2,	-1,	-4,	8,	-11,	-1,	1,	-4,	0,	-1,	-2,	0,	-2,
0,	0,	1,	0,	0,	-2,	11,	-10,	3,	9,	-9,	3,	1,	0,	1,	1,
1,	2,	4,	6,	7,	10,	32,	49,	295,	-1723,	1808,	-438,	-39,	-8,	-6,	-2

Output from complexToDecibelWithGain():

0,	0,	0,	0,	24,	59,	63,	63,	47,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

17 |  
18 |  
19 |  
20 |  
21 |  
22 |  
23 |  
24 |  
25 |  
26 |  
27 |  
28 |  
29 |  
30 |  
31 |

Tests completed...

WFF\_FHT Test: Pure sine wave with frequency = 9490 Hz and amplitude of +-16383  
FHT\_LEN = 64, N\_DB = 64

Test 1 - Rectangular window, linear output  
Output from generateSample():

0	2614	-5160	7575	-9795	11765	-13433	14757	-15703	16247	-16375	16083	-15379	14281	-12818	11026
-8951	6648	-4174	1593	1029	-3624	6127	-8472	10601	-12458	13996	-15175	15966	-16347	16310	-15855
14994	-13749	12152	-10244	8073	-5695	3171	-566	-2053	4620	-7068	9336	-11364	13101	-14503	15533
-16165	16383	-16181	15565	-14550	13162	-11437	9420	-7160	4718	-2154	-464	3071	-5599	7984	-10164

Output from fhtDitInt():

-78	-77	-67	-63	-58	-53	-48	-41	-36	-30	-21	-15	-7	2	10	23
35	45	65	82	103	129	159	206	264	339	455	647	1012	1935	8108	-5532
-2765	-3211	2353	125	-126	-191	-206	-217	-210	-204	-191	-187	-181	-172	-162	-163
-156	-149	-135	-134	-129	-123	-119	-116	-112	-107	-99	-97	-94	-87	-84	-80

Output from complexToReal():

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	1	1	1	1	2	2	3	5	10	46	35

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |  
13 |  
14 |  
15 |  
16 |  
17 |  
18 |  
19 | \*  
20 | \*  
21 | \*  
22 | \*  
23 | \*  
24 | \*  
25 | \*\*  
26 | \*\*  
27 | \*\*\*  
28 | \*\*\*\*\*  
29 | \*\*\*\*\*  
30 | \*\*\*\*\*  
31 | \*\*\*\*\*

Test 2 - Rectangular window, decibel output  
Output from generateSample():

0	2614	-5160	7575	-9795	11765	-13433	14757	-15703	16247	-16375	16083	-15379	14281	-12818	11026
-8951	6648	-4174	1593	1029	-3624	6127	-8472	10601	-12458	13996	-15175	15966	-16347	16310	-15855
14994	-13749	12152	-10244	8073	-5695	3171	-566	-2053	4620	-7068	9336	-11364	13101	-14503	15533
-16165	16383	-16181	15565	-14550	13162	-11437	9420	-7160	4718	-2154	-464	3071	-5599	7984	-10164

Output from fhtDitInt():

-78	-77	-67	-63	-58	-53	-48	-41	-36	-30	-21	-15	-7	2	10	23
35	45	65	82	103	129	159	206	264	339	455	647	1012	1935	8108	-5532
-2765	-3211	2353	125	-126	-191	-206	-217	-210	-204	-191	-187	-181	-172	-162	-163
-156	-149	-135	-134	-129	-123	-119	-116	-112	-107	-99	-97	-94	-87	-84	-80

Output from complexToDecibel():

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	4	4	7	7	11	12	15	19	23	29	38	59	55

0 |  
1 |  
2 |  
3 |  
4 |  
5 |  
6 |  
7 |  
8 |  
9 |  
10 |  
11 |  
12 |

```
13 |
14 |
15 |
16 |
17 |
18 |
19 | ****
20 | ****
21 | *****
22 | *****
23 | *****
24 | *****
25 | *****
26 | *****
27 | *****
28 | *****
29 | *****
30 | *****
31 | *****
```

Test 3 - Hamming window, linear output  
Output from generateSample():

```
0, 2614, -5160, 7575, -9795, 11765, -13433, 14757, -15703, 16247, -16375, 16083, -15379, 14281, -12818, 11026,
-8951, 6648, -4174, 1593, 1029, -3624, 6127, -8472, 10601, -12458, 13996, -15175, 15966, -16347, 16310, -15855,
14994, -13749, 12152, -10244, 8073, -5695, 3171, -566, -2053, 4620, -7068, 9336, -11364, 13101, -14503, 15533,
-16165, 16383, -16181, 15565, -14550, 13162, -11437, 9420, -7160, 4718, -2154, -464, 3071, -5599, 7984, -10164
```

Output from applyHammingWindow():

```
0, 215, -460, 760, -1138, 1599, -2149, 2767, -3436, 4113, -4756, 5309, -5720, 5932, -5898, 5574,
-4937, 3969, -2682, 1093, 750, -2791, 4953, -7154, 9299, -11296, 13051, -14484, 15522, -16114, 16225, -15846,
14984, -13678, 11978, -9960, 7704, -5311, 2875, -497, -1734, 3735, -5443, 6807, -7801, 8415, -8661, 8565,
-8174, 7537, -6722, 5788, -4804, 3822, -2896, 2061, -1343, 754, -293, -54, 308, -499, 656, -813
```

Output from fhtDitInt():

```
-8, -10, -6, -7, -7, -6, -5, -4, -4, -5, -2, -3, -2, -1, -1, 0,
3, 2, 5, 4, 7, 10, 9, 15, 17, 20, 20, 13, -49, -1122, 5183, -4128,
608, -1746, 1874, -375, -37, -20, -13, -18, -16, -15, -12, -15, -14, -15, -9, -14,
-12, -12, -7, -12, -9, -10, -7, -9, -9, -8, -6, -7, -7, -6, -5, -6
```

Output from complexToReal():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 6, 30, 24
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 | *****
30 | *****
31 | *****
```

Test 4 - Hamming window, decibel output with gain  
Output from generateSample():

```
0, 2614, -5160, 7575, -9795, 11765, -13433, 14757, -15703, 16247, -16375, 16083, -15379, 14281, -12818, 11026,
-8951, 6648, -4174, 1593, 1029, -3624, 6127, -8472, 10601, -12458, 13996, -15175, 15966, -16347, 16310, -15855,
14994, -13749, 12152, -10244, 8073, -5695, 3171, -566, -2053, 4620, -7068, 9336, -11364, 13101, -14503, 15533,
-16165, 16383, -16181, 15565, -14550, 13162, -11437, 9420, -7160, 4718, -2154, -464, 3071, -5599, 7984, -10164
```

Output from applyHammingWindow():

```
0, 215, -460, 760, -1138, 1599, -2149, 2767, -3436, 4113, -4756, 5309, -5720, 5932, -5898, 5574,
-4937, 3969, -2682, 1093, 750, -2791, 4953, -7154, 9299, -11296, 13051, -14484, 15522, -16114, 16225, -15846,
14984, -13678, 11978, -9960, 7704, -5311, 2875, -497, -1734, 3735, -5443, 6807, -7801, 8415, -8661, 8565,
-8174, 7537, -6722, 5788, -4804, 3822, -2896, 2061, -1343, 754, -293, -54, 308, -499, 656, -813
```

Output from fhtDitInt():

```
-8, -10, -6, -7, -7, -6, -5, -4, -4, -5, -2, -3, -2, -1, -1, 0,
3, 2, 5, 4, 7, 10, 9, 15, 17, 20, 20, 13, -49, -1122, 5183, -4128,
608, -1746, 1874, -375, -37, -20, -13, -18, -16, -15, -12, -15, -14, -15, -9, -14,
-12, -12, -7, -12, -9, -10, -7, -9, -9, -8, -6, -7, -7, -6, -5, -6
```

Output from complexToDecibelWithGain():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 56, 63, 63
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 | *****
30 | *****
31 | *****
```

Test 5 - Hann window, linear output

Output from generateSample():

```
0, 2614, -5160, 7575, -9795, 11765, -13433, 14757, -15703, 16247, -16375, 16083, -15379, 14281, -12818, 11026,
-8951, 6648, -4174, 1593, 1029, -3624, 6127, -8472, 10601, -12458, 13996, -15175, 15966, -16347, 16310, -15855,
14994, -13749, 12152, -10244, 8073, -5695, 3171, -566, -2053, 4620, -7068, 9336, -11364, 13101, -14503, 15533,
-16165, 16383, -16181, 15565, -14550, 13162, -11437, 9420, -7160, 4718, -2154, -464, 3071, -5599, 7984, -10164
```

Output from applyHannWindow():

```
0, 6, -52, 167, -385, 715, -1167, 1725, -2370, 3058, -3745, 4372, -4881, 5206, -5296, 5100,
-4587, 3737, -2552, 1050, 726, -2718, 4851, -7039, 9185, -11195, 12969, -14423, 15483, -16094, 16218, -15845,
14983, -13672, 11963, -9935, 7672, -5278, 2849, -491, -1706, 3658, -5301, 6587, -7492, 8007, -8153, 7959,
-7478, 6768, -5899, 4939, -3956, 3010, -2153, 1421, -838, 409, -132, -19, 68, -56, 19, 0
```

Output from fhtDitInt():

```
-2, -4, 0, -2, -3, -2, -1, -2, -1, -3, 0, -2, -1, -1, -1, -1,
-1, -2, 0, -2, -1, 0, -4, -2, -5, -8, -17, -41, -141, -1387, 4928, -4006,
902, -1618, 1832, -418, -29, -6, 3, 0, 1, 1, 4, 0, 1, -1, 3, -1,
0, 0, 4, 0, 1, 0, 2, 0, 1, 0, 3, 1, 1, 1, 2, 2
```

Output from complexToReal():

```
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 7, 29, 23
```

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |
29 | *****
30 | *****
31 | *****
```

Test 6 - Hann window, decibel output with gain

Output from generateSample():

```
0, 2614, -5160, 7575, -9795, 11765, -13433, 14757, -15703, 16247, -16375, 16083, -15379, 14281, -12818, 11026,
-8951, 6648, -4174, 1593, 1029, -3624, 6127, -8472, 10601, -12458, 13996, -15175, 15966, -16347, 16310, -15855,
14994, -13749, 12152, -10244, 8073, -5695, 3171, -566, -2053, 4620, -7068, 9336, -11364, 13101, -14503, 15533,
-16165, 16383, -16181, 15565, -14550, 13162, -11437, 9420, -7160, 4718, -2154, -464, 3071, -5599, 7984, -10164
```

Output from applyHannWindow():

```
0, 6, -52, 167, -385, 715, -1167, 1725, -2370, 3058, -3745, 4372, -4881, 5206, -5296, 5100,
-4587, 3737, -2552, 1050, 726, -2718, 4851, -7039, 9185, -11195, 12969, -14423, 15483, -16094, 16218, -15845,
14983, -13672, 11963, -9935, 7672, -5278, 2849, -491, -1706, 3658, -5301, 6587, -7492, 8007, -8153, 7959,
-7478, 6768, -5899, 4939, -3956, 3010, -2153, 1421, -838, 409, -132, -19, 68, -56, 19, 0
```



Output from fhtDitInt():

-2,	-4,	0,	-2,	-3,	-2,	-1,	-2,	-1,	-3,	0,	-2,	-1,	-1,	-1,	-1,
-1,	-2,	0,	-2,	-1,	0,	-4,	-2,	-5,	-8,	-17,	-41,	-141,	-1387,	4928,	-4006,
902,	-1618,	1832,	-418,	-29,	-6,	3,	0,	1,	1,	4,	0,	1,	-1,	3,	-1,
0,	0,	4,	0,	1,	0,	2,	0,	1,	0,	3,	1,	1,	1,	2,	2

Output from complexToDecibelWithGain():

0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,
0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	0,	24,	58,	63,	63

```
0 |
1 |
2 |
3 |
4 |
5 |
6 |
7 |
8 |
9 |
10 |
11 |
12 |
13 |
14 |
15 |
16 |
17 |
18 |
19 |
20 |
21 |
22 |
23 |
24 |
25 |
26 |
27 |
28 |*****
29 |*****
30 |*****
31 |*****
```

Tests completed...