

```

Linearity Verification:
DFT of linear combination:
26.0000 + 0.0000i -0.8284 -18.7279i -4.0000 + 4.0000i 4.8284 + 6.7279i -10.0000 + 0.0000i 4.8284 + 6.7279i -4.0000 - 4.0000i -0.8284 +18.7279i
Linear combination of DFTs:
26.0000 + 0.0000i -0.8284 -18.7279i -4.0000 + 4.0000i 4.8284 + 6.7279i -10.0000 + 0.0000i 4.8284 + 6.7279i -4.0000 - 4.0000i -0.8284 +18.7279i
Circular Time Shift Verification:
DFT of shifted sequence:
10.0000 + 0.0000i -7.2426 + 0.4142i 2.0000 - 2.0000i 1.2426 + 2.4142i -2.0000 + 0.0000i 1.2426 - 2.4142i 2.0000 + 2.0000i -7.2426 - 0.4142i
Expected result:
10.0000 + 0.0000i -7.2426 + 0.4142i 2.0000 - 2.0000i 1.2426 + 2.4142i -2.0000 - 0.0000i 1.2426 - 2.4142i 2.0000 + 2.0000i -7.2426 - 0.4142i

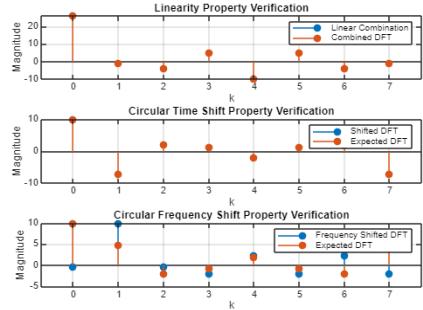
```

```

Circular Frequency Shift Verification:
DFT of frequency shifted sequence:
-0.4142 + 7.2426i 10.0000 + 0.0000i -0.4142 - 7.2426i -2.0000 + 2.0000i 2.4142 - 1.2426i -2.0000 + 0.0000i 2.4142 + 1.2426i -2.0000 - 2.0000i
Expected result:
10.0000 + 0.0000i 4.8284 + 5.4142i -2.0000 - 2.0000i -0.8284 + 2.5858i 2.0000 - 0.0000i -0.8284 - 2.5858i -2.0000 + 2.0000i 4.8284 + 5.4142i

```

Verification of DFT Properties



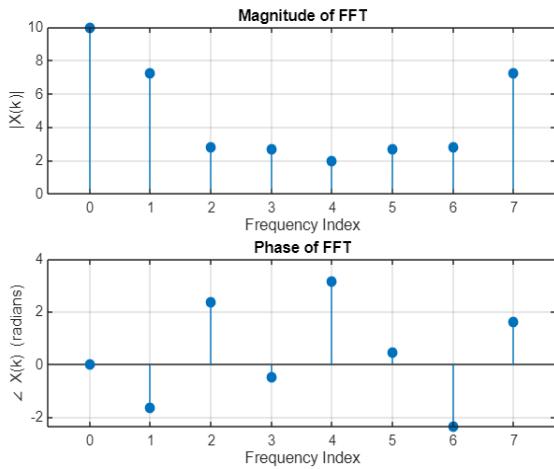
Expt 7

```

FFT Result:
10.0000 + 0.0000i -0.4142 - 7.2426i -2.0000 + 2.0000i 2.4142 - 1.2426i -2.0000 + 0.0000i 2.4142 + 1.2426i -2.0000 - 2.0000i -0.4142 + 7.2426i

```

Radix-2 FFT Result



Expt 8

N = 3

```

Circular Convolution Result:
3.5000    2.0000    3.5000

```

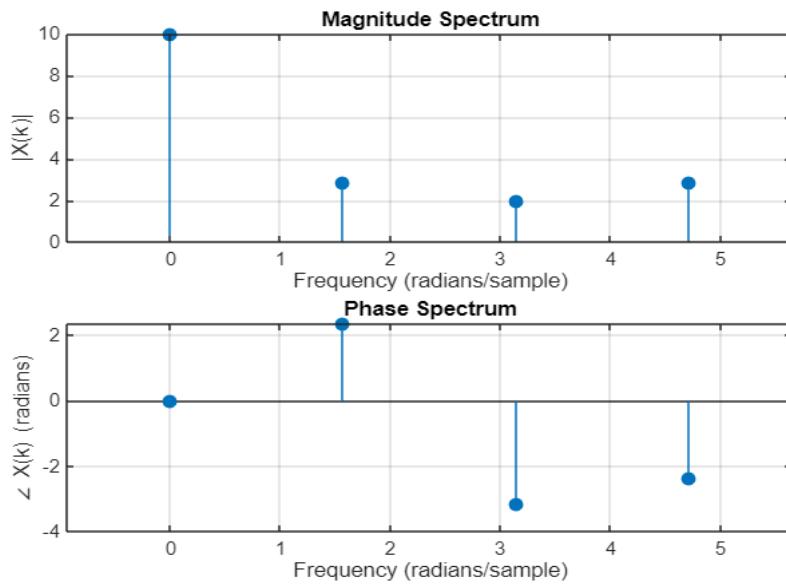
```

Linear Convolution Result:
0.5000    2.0000    3.5000    3.0000

```

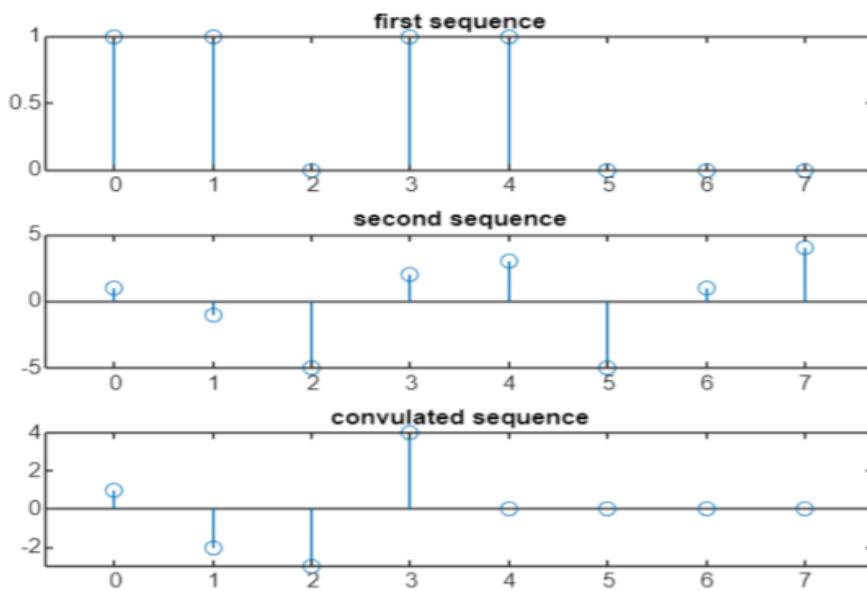
Expt 6

N-point DFT of the Sequence



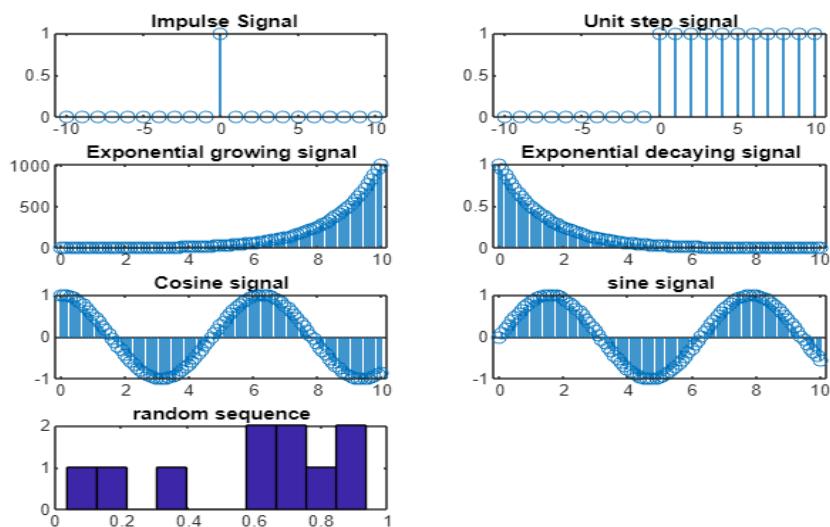
Expt 5

1 -1 -5 2 3 -5 1 4

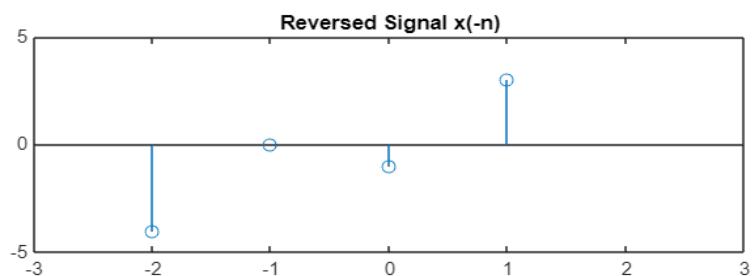
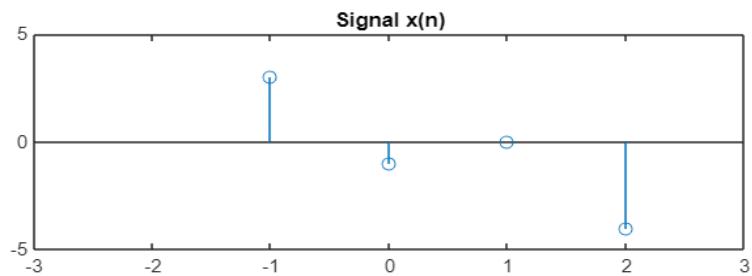


Expt 3

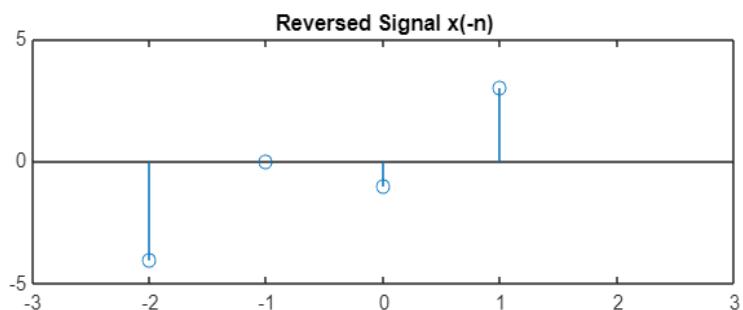
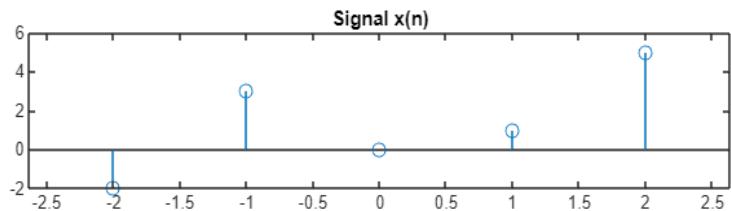
$x_8 = 1 \times 10$
 0.6557 0.0357 0.8491 0.9340 0.6787 0.7577 0.7431 ...



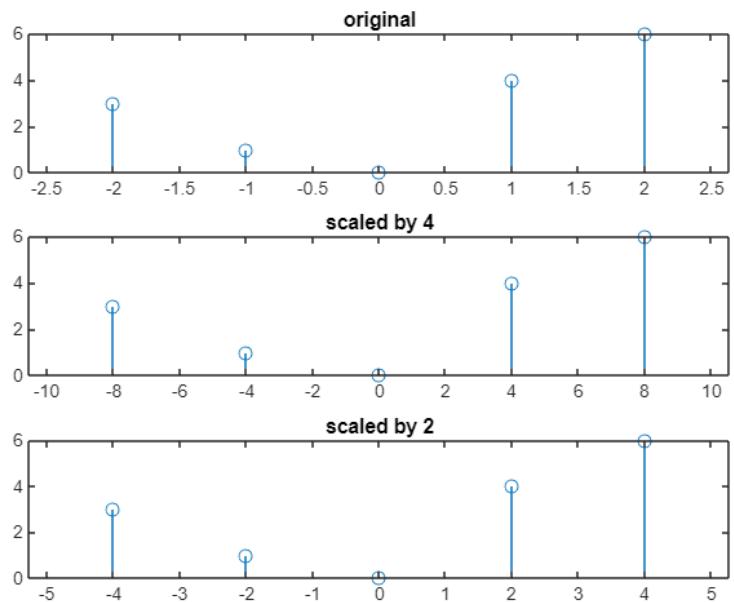
Expt 1



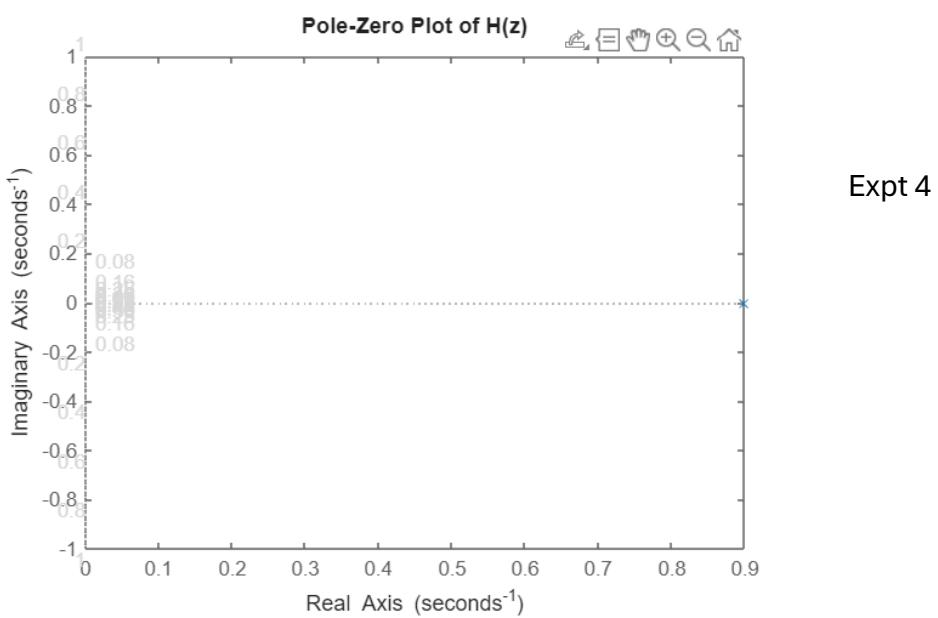
expt 2

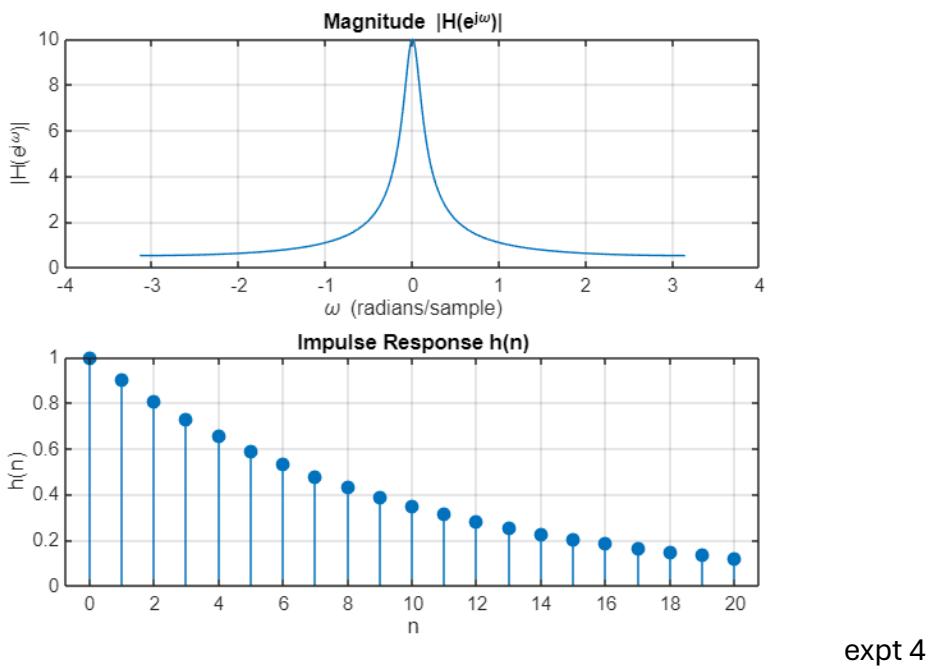


expt 2

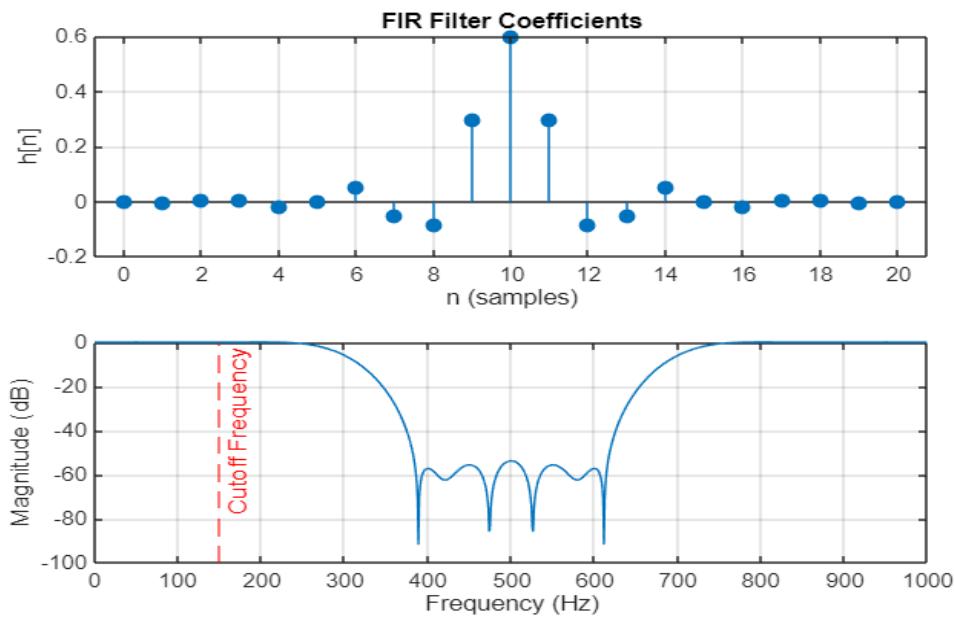


expt 2

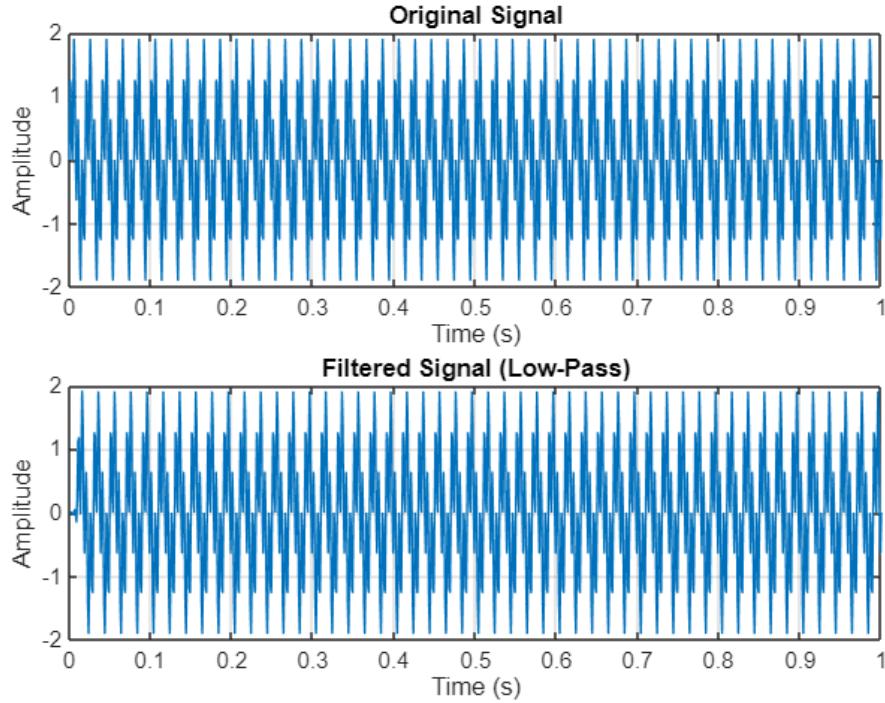




Low-Pass FIR Filter Design Using Window Method

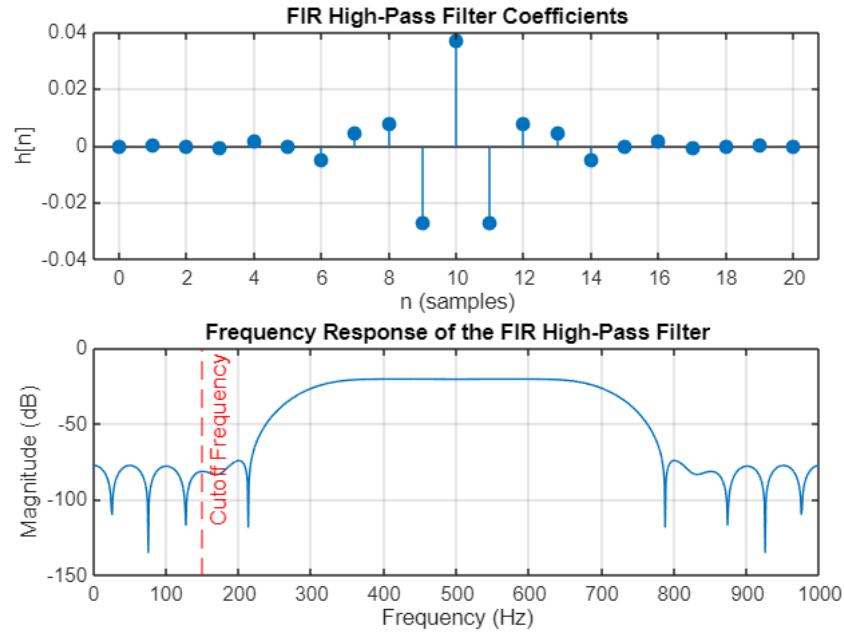


Signal Filtering using FIR Low-Pass Filter



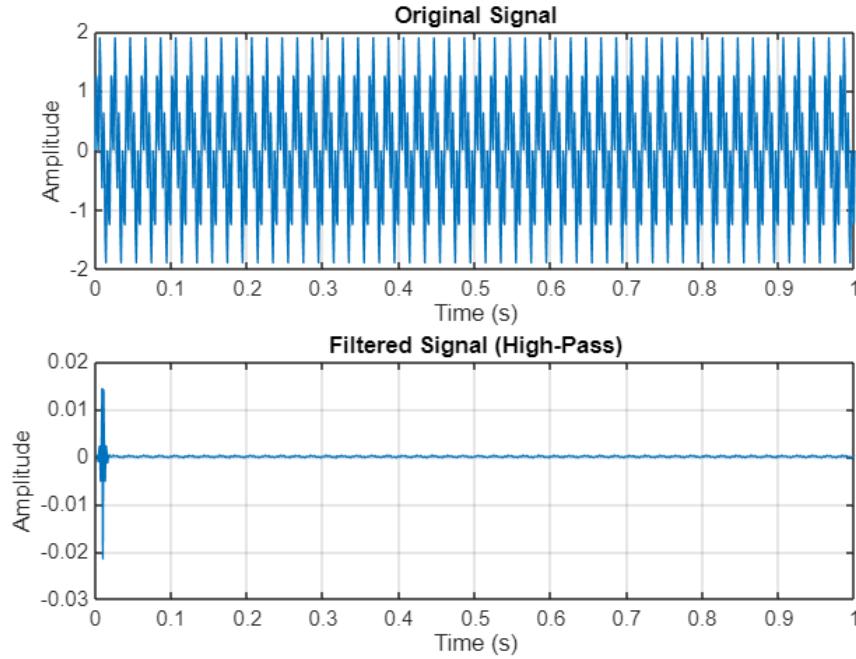
expt 9

High-Pass FIR Filter Design Using Window Method



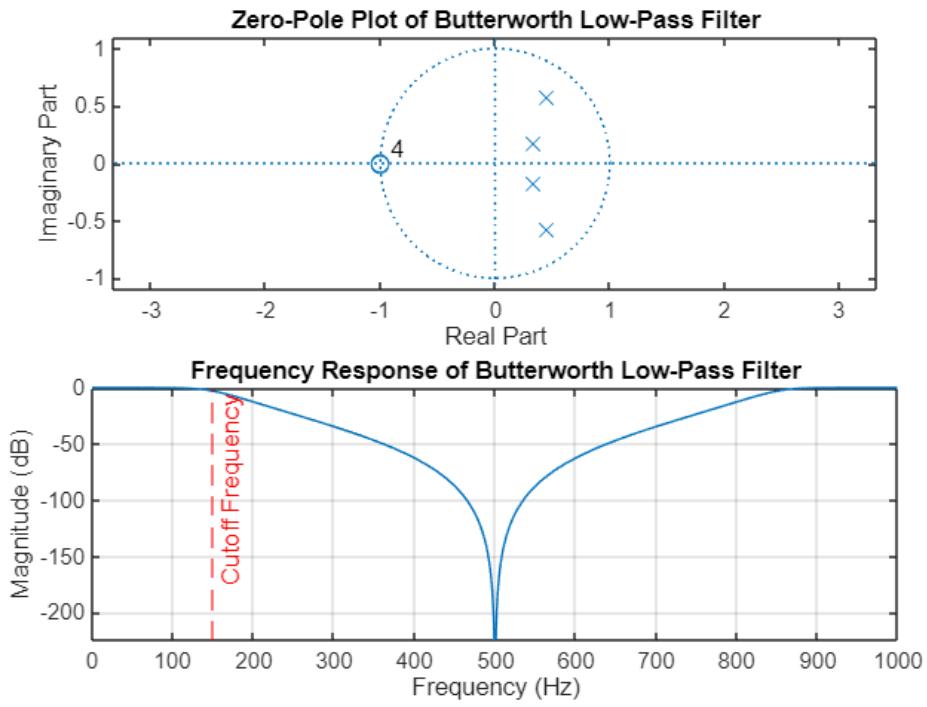
expt 10

Signal Filtering using FIR High-Pass Filter



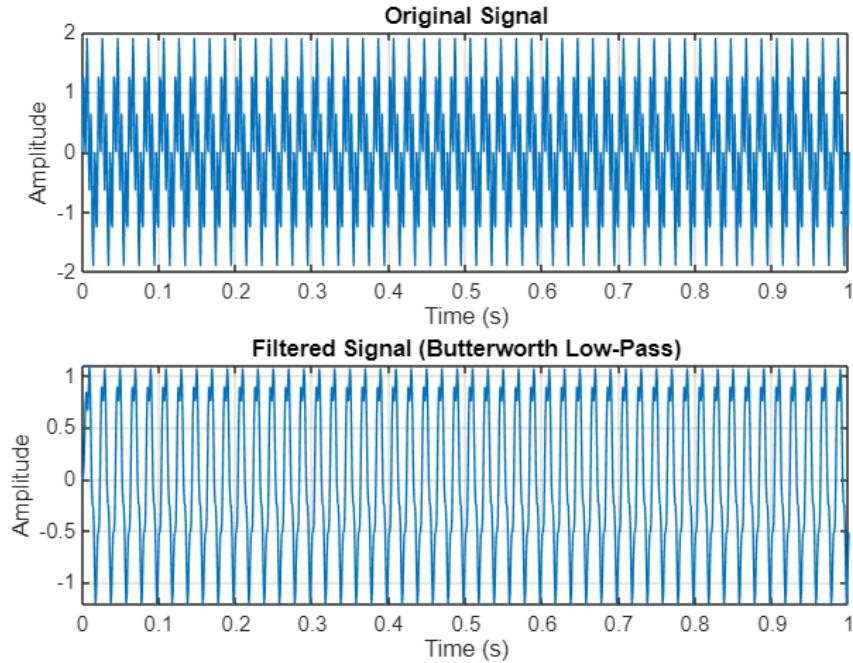
expt 10

Butterworth Low-Pass Filter Design



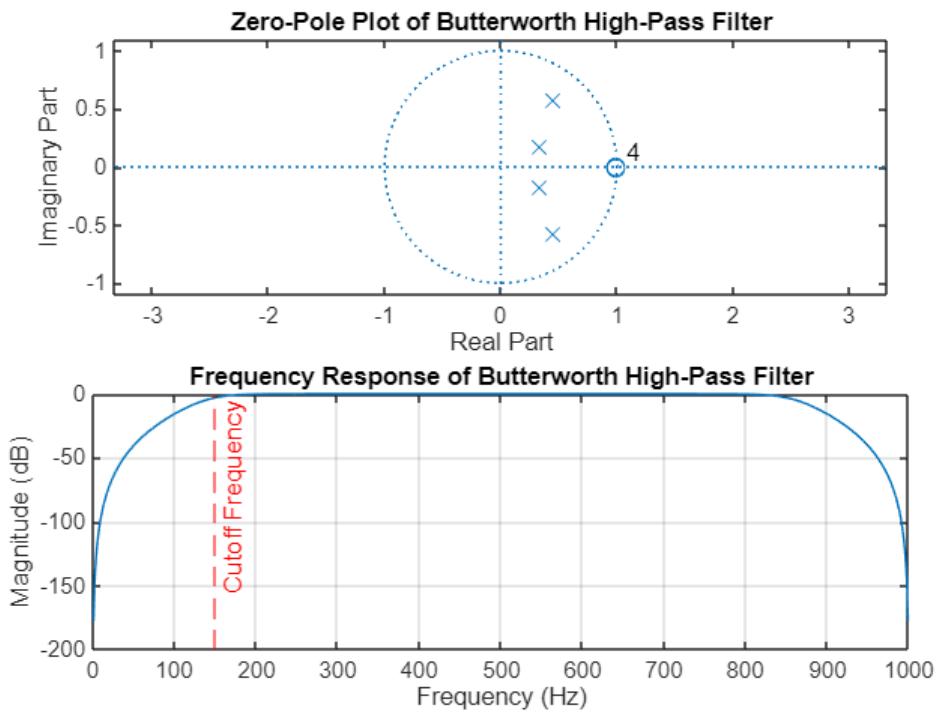
expt 11

Signal Filtering using Butterworth Low-Pass Filter



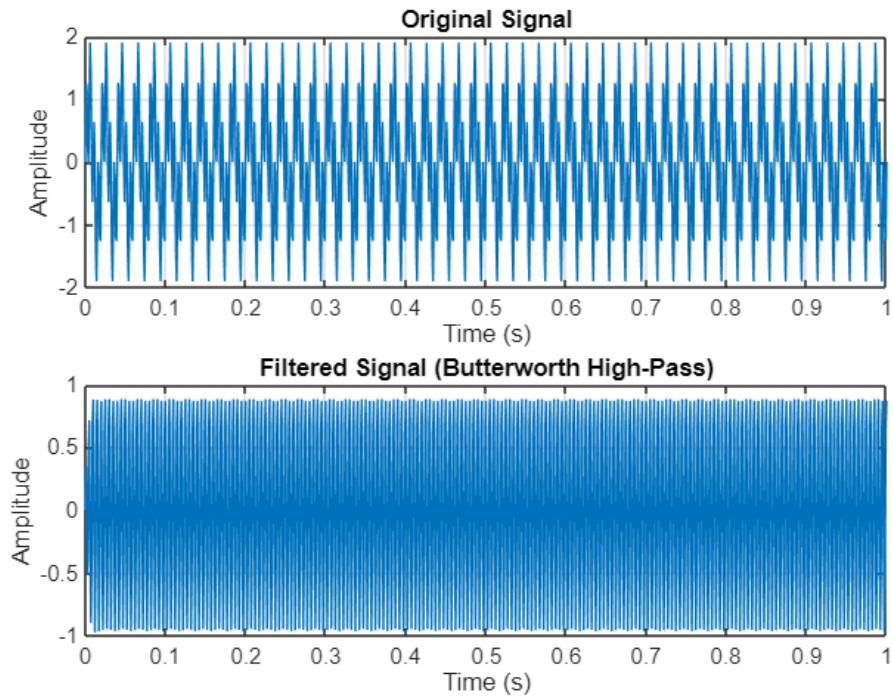
expt 11

Butterworth High-Pass Filter Design



expt 12

Signal Filtering using Butterworth High-Pass Filter



expt 12