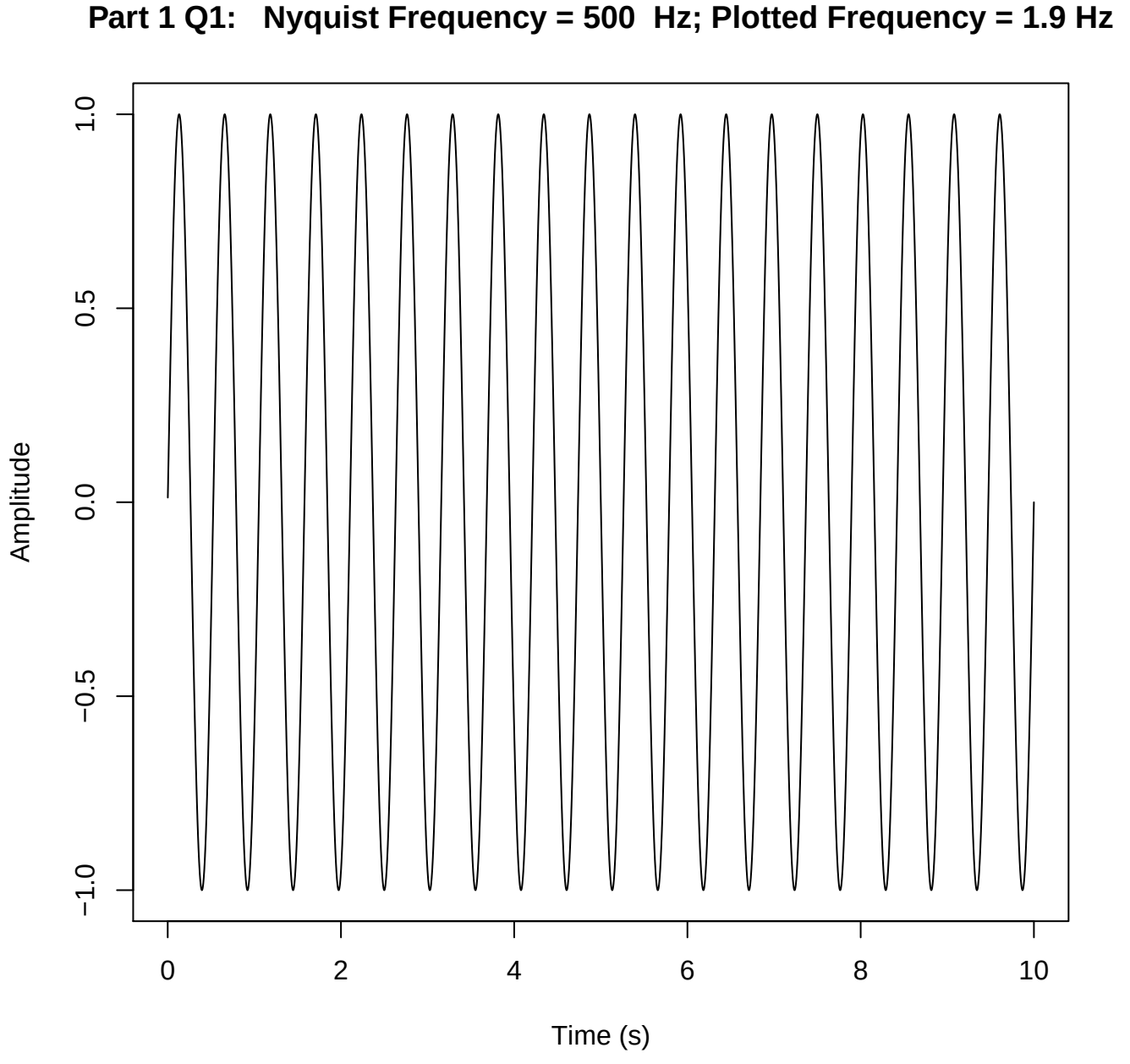
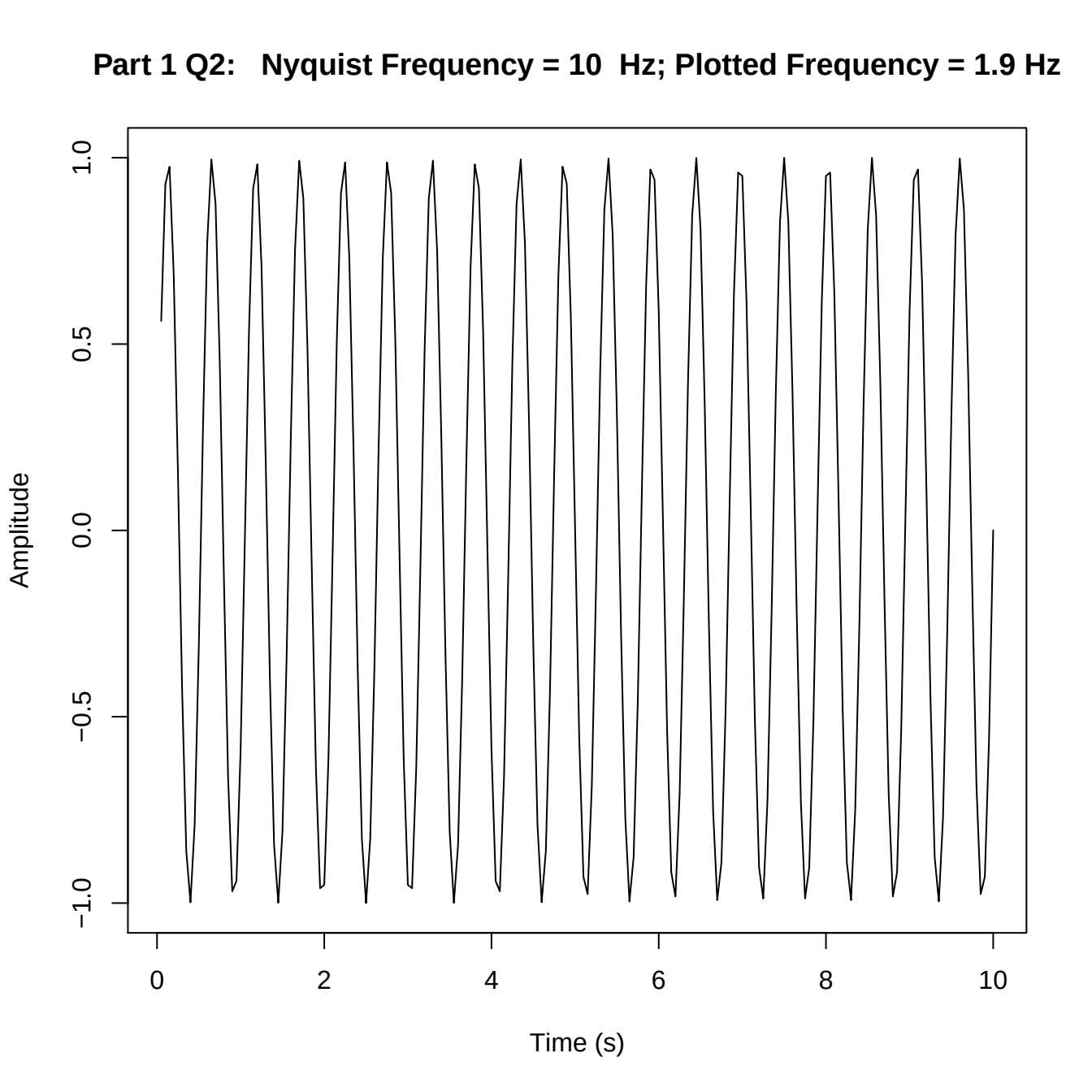
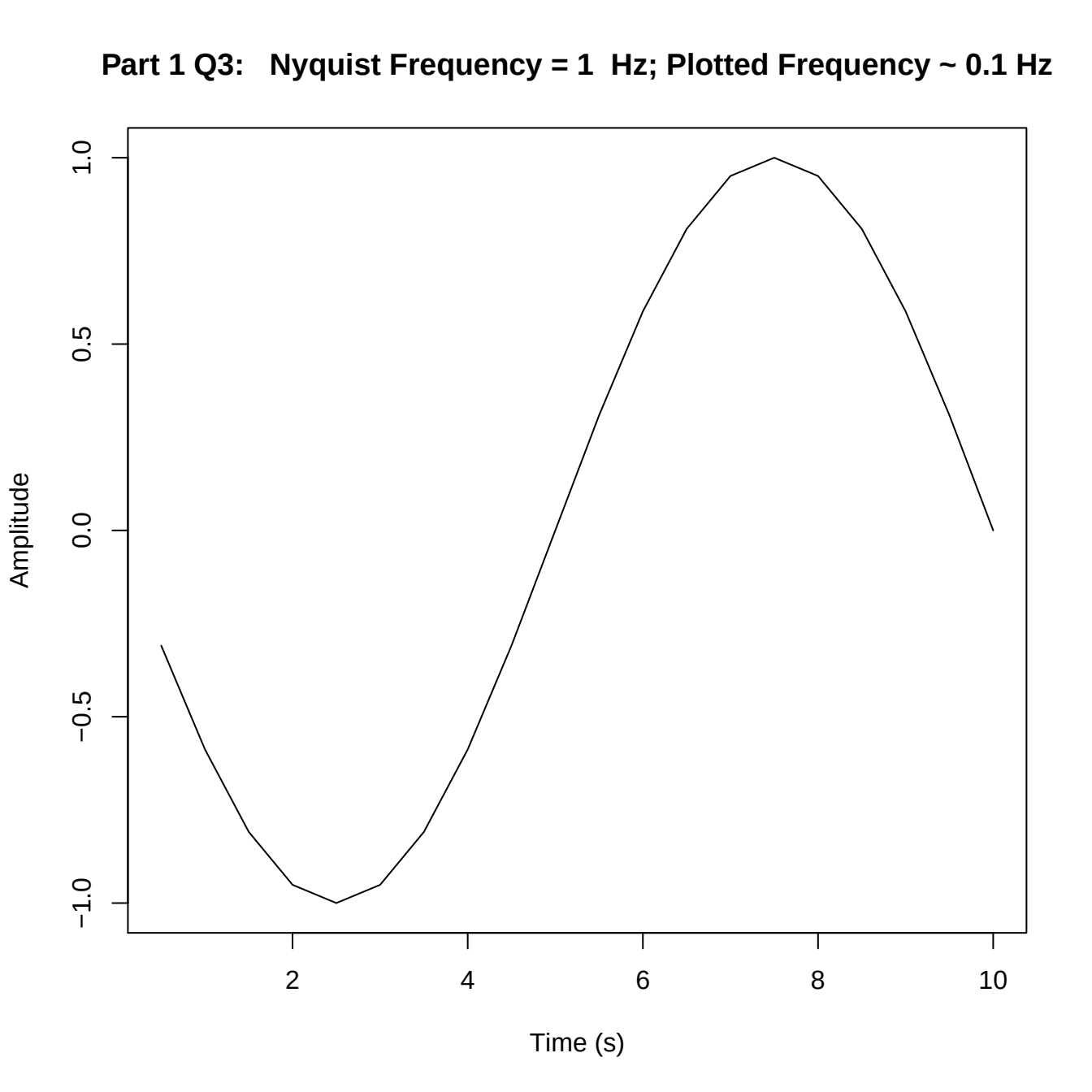
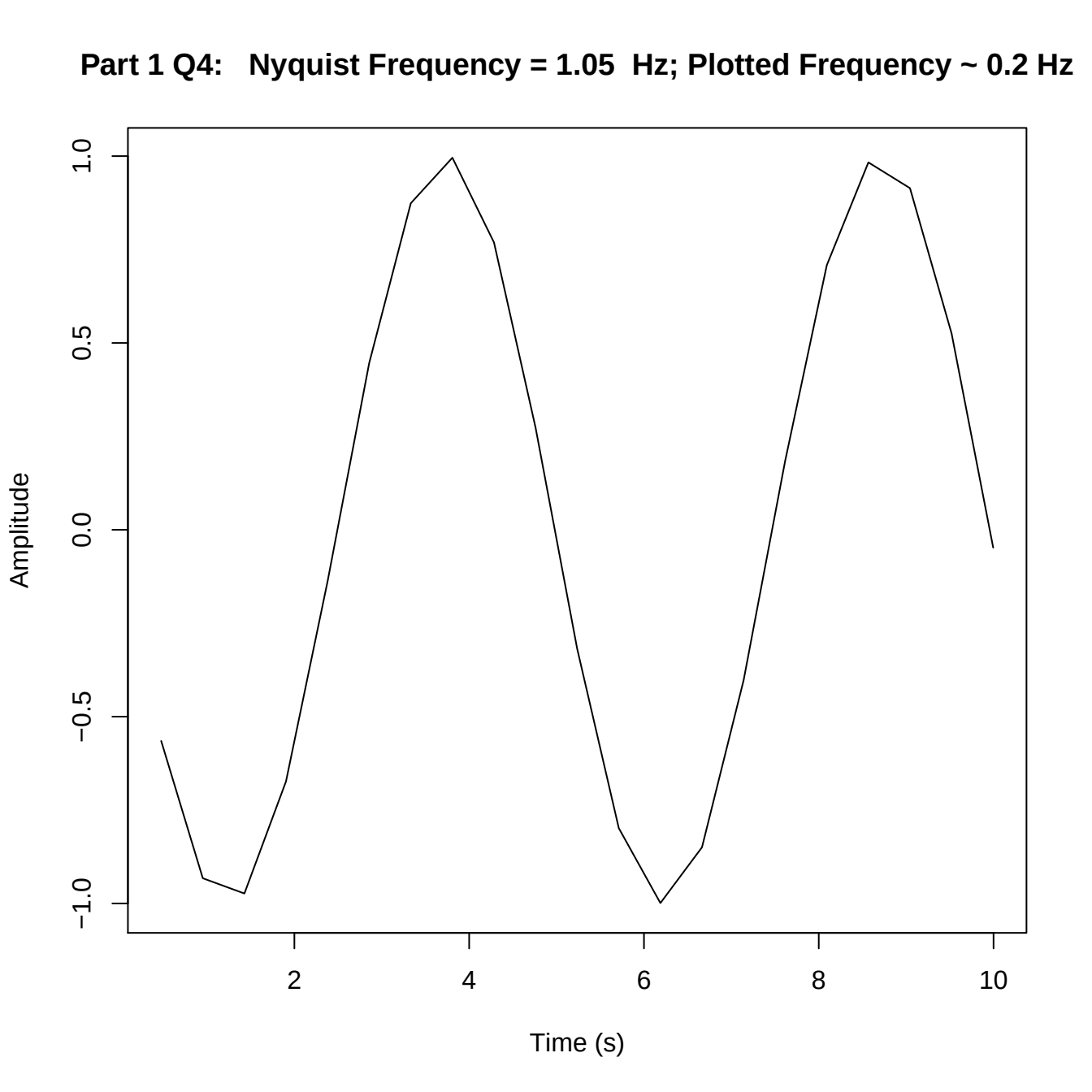
Jake Graham
DSP Lab 2


Part 1 Q1: Nyquist Frequency = 500 Hz; Plotted Frequency = 1.9 Hz
Amplitude
1.0
0.5
0.0
−0.5
−1.0
0
2
4
6
8
10
Time (s)

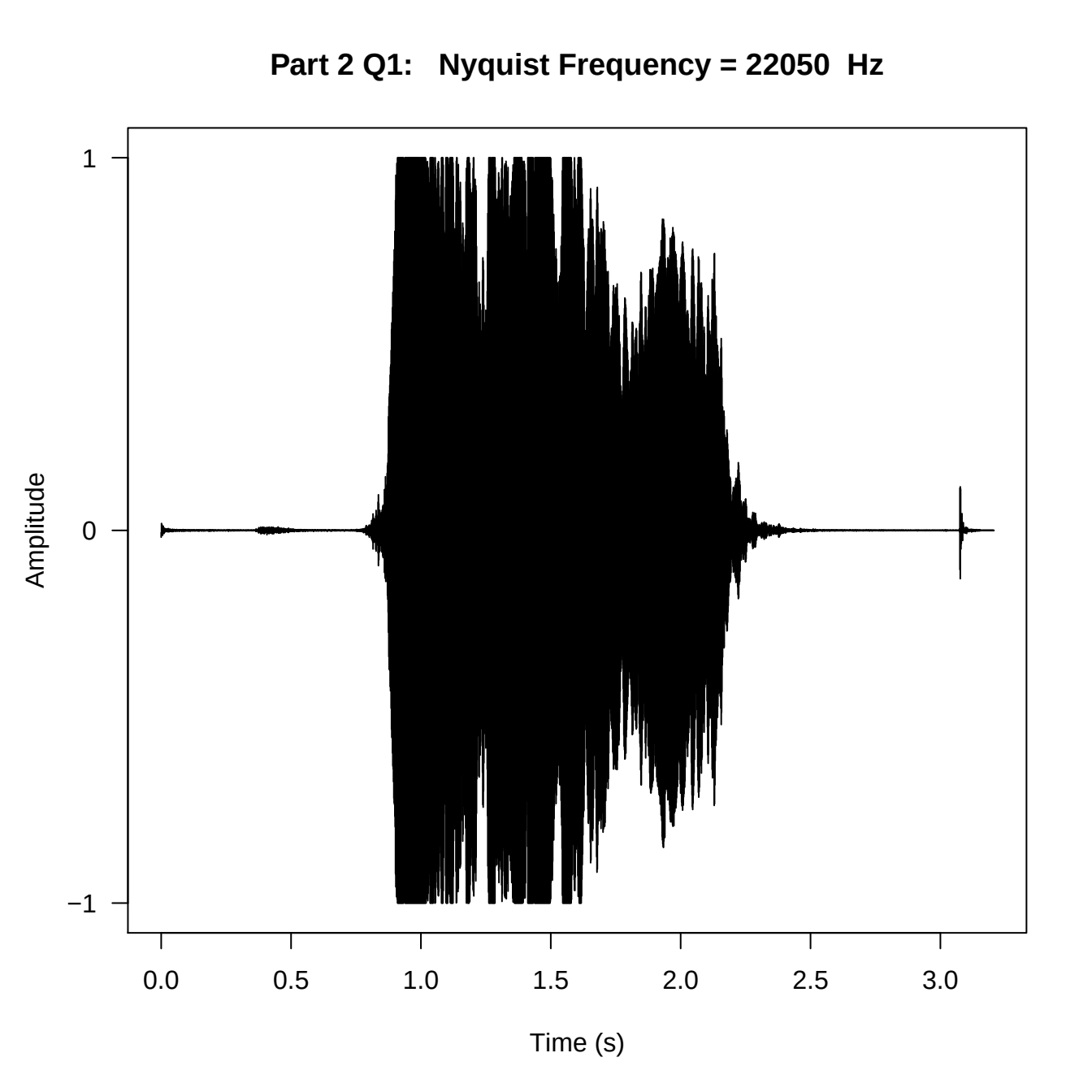

Part 1 Q2: Nyquist Frequency = 10 Hz; Plotted Frequency = 1.9 Hz
Amplitude
1.0
0.5
0.0
−0.5
−1.0
0
2
4
6
8
10
Time (s)

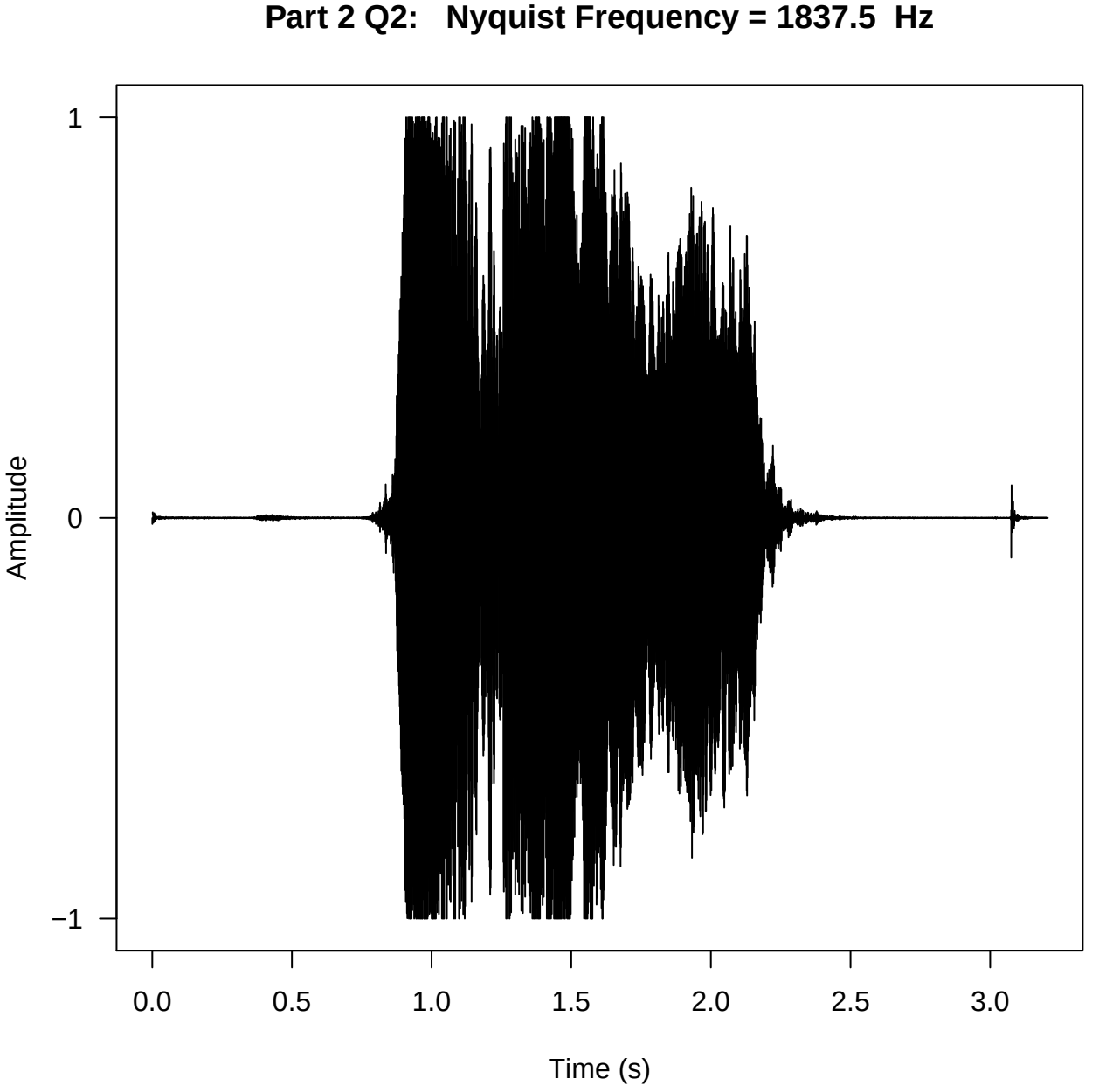

Part 1 Q3: Nyquist Frequency = 1 Hz; Plotted Frequency ~ 0.1 Hz
Amplitude
1.0
0.5
0.0
−0.5
−1.0
2
4
6
8
10
Time (s)

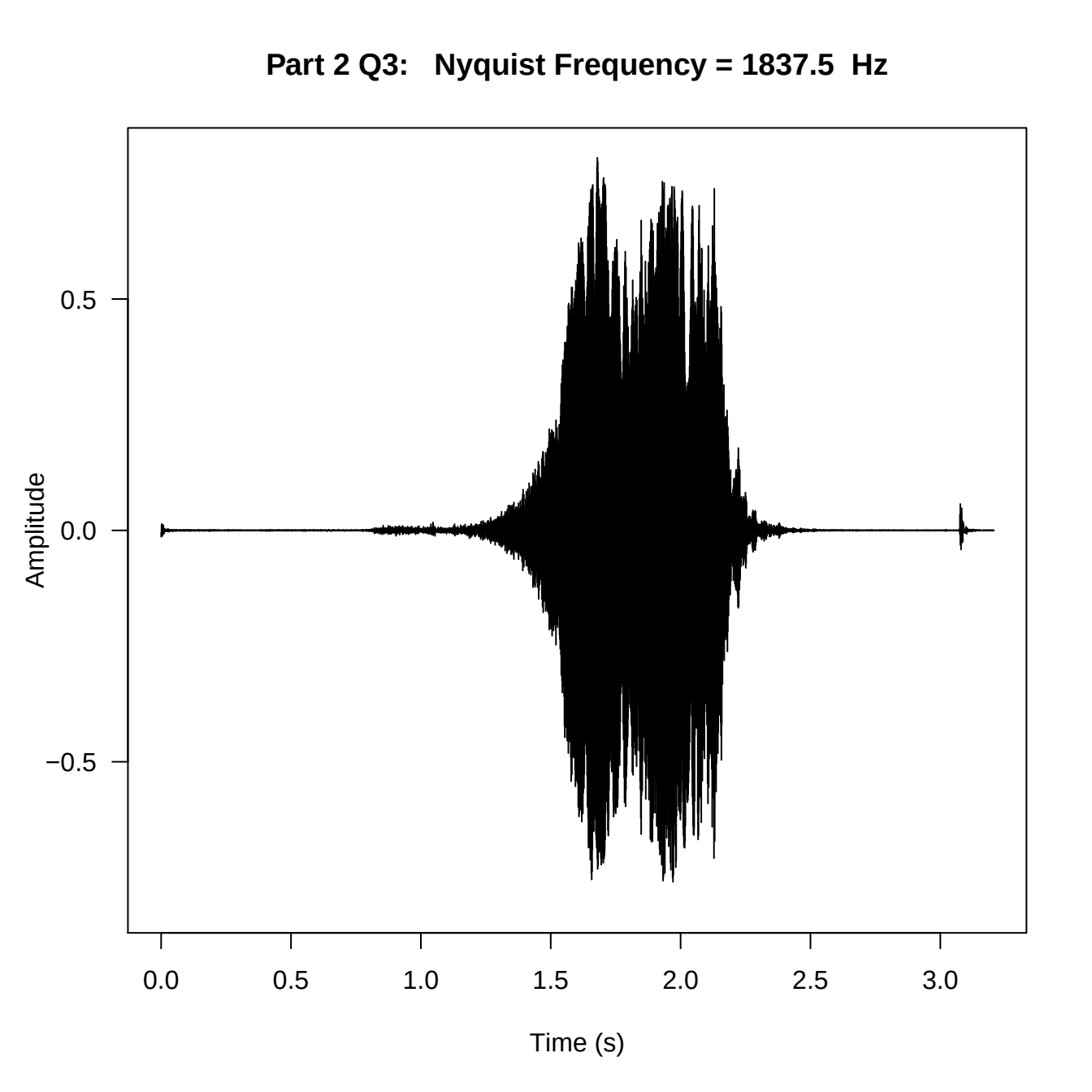

Part 1 Q4: Nyquist Frequency = 1.05 Hz; Plotted Frequency ~ 0.2 Hz
Amplitude
1.0
0.5
0.0
−0.5
−1.0
2
4
6
8
10
Time (s)

Part 1 Q5:

Alias Frequency = |FreqSig − floor((FreqNyq*2) / FreqSig) * FreqSig|


Part 2 Q1: Nyquist Frequency = 22050 Hz
1
0
−1
Amplitude
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Time (s)


Part 2 Q2: Nyquist Frequency = 1837.5 Hz
1
0
−1
Amplitude
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Time (s)


Part 2 Q3: Nyquist Frequency = 1837.5 Hz
Amplitude
0.5
0.0
−0.5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Time (s)

Part 2 Q4:

Whistles in 2 & 3 are distorted because they have been down−sampled

and some of the original signal has been lost.

The distortions are different because they were down−sampled in different manners.

The plot/sound in question 2 is aliased.

The decimate used a low pass filter to prevent aliasing.