

1. Plot the signal $y(t) = \sin(2\pi 10t)$ with $f_s = 1000, 100, 30, 20,$ and 15 Hz. Take the fft of the signal for each value of f_s and recreate the signal based on the fft.
2. You have an analog signal $y(t) = a \cos(2\pi ft)$ where $a = 2.0$ and $f = 1.0$ Hz. This signal is being sampled at $f_s = 10$ Hz with a 5 bit DAQ card. The card uses the first bit for the positive or negative sign (1xxxx is negative, 0xxxx is positive). What will be the time vector, binary representation, and corresponding base 10 representation if this signal is sampled for 1 period? Plot the signal at 1 kHz and 10 Hz with both the double precision representation and the 5 bit representation.

This was done with a different value for f and for a different number of bits, but your plot should look something like:

