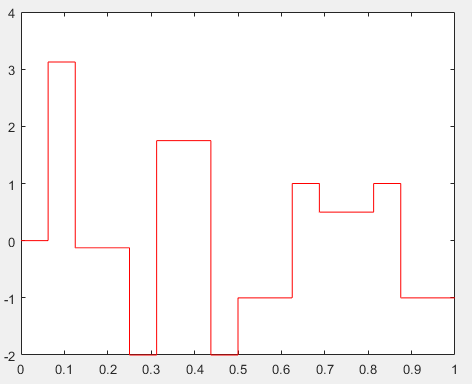
Ryan Telesca, Andrew Castle, Jake Flancer 10/27/20

Professor Gallier CIS 515

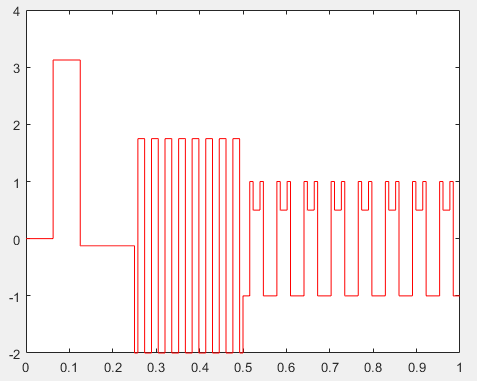
Project 3 Report

1. n/a
2. First observing both u and w through the drawplfn function, we can see that w is simply a higher frequency wave of u, that is with a frequency of 8x (1/8 the wavelength) of u. Once we use the haar transform function and plot the coefficients of u and w, we can see that before the value of 0.25, both graphs are identical. Between the values of 0.25 and 0.5, w is simply a repetition of the pattern of u within this range. That is, the values of the haar of u are repeated 8 times in the haar of w within this range. This exact phenomenon is seen respectively in the range of the haar values of w between 0.5 and 1.0 as well, where the values are simply the values of the haar of u repeated 8 times.

haar(u)



haar(w)



1. Beyond k = 4 rounds of averaging and differencing, the output values of the haar transform no longer change. That is, the haar transform is complete after only 4 rounds of averaging and differencing.
2. n/a
3. handel
   1. k = 1 – it is quite hard to tell the difference between the original handel and the handel after 1 step of the haar transform. If anything, the sound after the transform is a bit more muffled/fuzzy and not as clear.
   2. k = 2 –