**ECE 4522/5514: DIgital Signal Processing**

# Computer Assignment (CA) No. 5: INTERPOLATION

This assignment will teach you the basics of signal interpolation. Generate a sum of three sinewaves at frequencies of 250 Hz, 500 Hz and 750 Hz respectively. Use a duration of 0.1 secs (see below). Call this signal x(t).

(1) Sample x(t) at 8000 Hz. Call this signal x[n].

(2) Interpolate this signal using the ideal reconstruction formula:



Evaluate xc(t) at t = k(1/44100 Hz) and compute the mean square error between the original signal, x(t), and the resampled, or estimate, of the original signal.

Plot the mean-squared error as a function of L for L = 1, 128. Justify what you observe.

Explain how you would use this approach to generate a signal sampled at 4000 Hz. (Hint: think about aliasing.)