DSAA Computer Assignment 05

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1 Analysis and Synthesis

For the given periodic signals with the period $T = 2$, compute the Fourier coefficients and then reconstruct the original signal.

For each signal plot the following

- The original and reconstructed signal on the same plot

- The Fourier coefficients; both the real and imaginary components

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$$x(t) = t^2 \qquad -\frac{1}{2} < t < \frac{1}{2} \tag{1}$$

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$$\begin{aligned} x(t) &= -t & -\frac{1}{2} < t < 0 \\ &= t & 0 < t < \frac{1}{2} \end{aligned} \tag{2}$$

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$$x(t) = \exp(-|t|) \qquad -\frac{1}{2} < t < \frac{1}{2} \tag{3}$$

2 Convergence

For the signal (3), demonstrate the convergence of the reconstructed signal with respect to the original signal.