CSE 4632 | Digital Signal Processing Lab | Lab 2

[show your outputs both as numbers and figures]

1. Write a code that will take a sinusoid and quantize it using b bits. Use the sinusoid **x(t) =sin(t)** in the interval t=0:0.1:4*pi. Quantize x(t) using b = 4, 8, 12 and 16 bits. For each case of b, plot the original signal and the quantized signal.

2. Write functions **delta(n), unity(n) and unitramp(n)** which will depict the elementary signals we read about in the class. Each of this functions, for a given value of n (n>0), plots the corresponding signals in the range of –n to n.

3. Write a function that will take as input an arbitrary signal x(n) and divide it into Symmetric (**even**) and Antisymmetric (**odd**) parts and plots the three signals (original signal, even part and odd part) in the same plot.

4. Write a function **sigshift** that takes a signal x(n) and a shift value k as inputs and returns the resulting signal y(n) = x(n-k).

5. Write a function **sigfold** that takes a signal x(n) and returns the resulting signal y(n) = x(-n). Verify the correctness of your function by taking suitable signals as input/output and plotting them.

6. Write a function **downsample** that takes a signal x(n) and a value d (d is an integer, d>1) and returns the down-sampled signal y(n) = x(dn). Verify the correctness by plotting suitable input/output signals.

7. Write a function **sigadd** that takes two signals x1(n) and x2(n) as inputs and returns the resulting signal y(n) = x1(n)+x2(n).

8. Write a function **sigmult** that takes two signals x1(n) and x2(n) as inputs and returns the resulting signal y(n) = x1(n)*x2(n).