Learning Objectives For Midterm #1

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Students should be able to demonstrate the following skills:

1. Characterize signals and systems via their properties: continuous/discrete time, symmetric, linearity, causality, etc.
2. Evaluate whether a proposed signal suffers from aliasing when sampled at a prescribed rate.
3. Compute the Nyquist rate required to sample an analog signal.
4. Stability: determine whether a system is BIBO stable - using "inspection," absolute summability of the impulse response, properties of its z-transform, etc.
5. Convert between direct form 1 and direct form 2 implementations of difference systems.
6. Compute the correlation between sequences - directly or using convolution.
7. Demonstrate how the region of convergence relates to properties of a signal and/or a system.
8. Utilize properties of z-transforms to simplify the computation of the z-transform of a signal.
9. Sketch a pole-zero plot, and infer properties of a signal from its pole zero plot.
10. Difference systems: solve them via z-transforms and solve for their initial conditions using the one-sided z-transform.