

CS571 Lab 8

October 12, 2021

1. Plot the basic signals in separate plots: $\delta(n)$, $u(n)$, ramp signal for the interval $n = -10 : 100$.
2. Plot $n(u[n] - u[n - 10]) + 10e^{-0.3(n-10)}(u[n - 10] - u[n - 20])$
3. Plot the “continuous-time” sinusoid $x(t) = \sin(2\pi t)$ for two cycles.
4. Sampling the above sinusoid at 20 Hz gives $x(n)$. Plot $x(n)$ for two cycles.
5. A **rect** signal can be obtained as the difference of two step signals. Use the **rect** signal to restrict the above discrete-time sinusoid to samples between $n = 15$ and $n = 25$. Plot the resulting signal.
6. Determine the output $y(n)$ of the relaxed LTI system with the impulse response $h(n) = a^n u(n)$, given $a = 0.5$ and $x(n) = u(n)$.
7. Given the LTI system $y(n) = 0.8y(n - 1) + x(n)$, plot its frequency response. What is the output when the input is a low frequency sinusoid, and when it is a high frequency sinusoid?