The University of Windsor

ELEC4570: Embedded System Design Lab

Winter 2022

Lab #1

Discrete Time Sequences, Operations, and Convolution

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Contents

OBJECTIVES

The objective for this lab is to investigate basic discrete time sequences, operations, and the convolution process. The discrete time sequences that will be studied include unit sample, step, real-valued exponential, complex-valued exponential, and sinusoidal sequences. Operations performed include time-shifting and function multiplication. Lastly, we will take the convolution of two sequences. All of the results for these tests will be plotted.

RESULTS

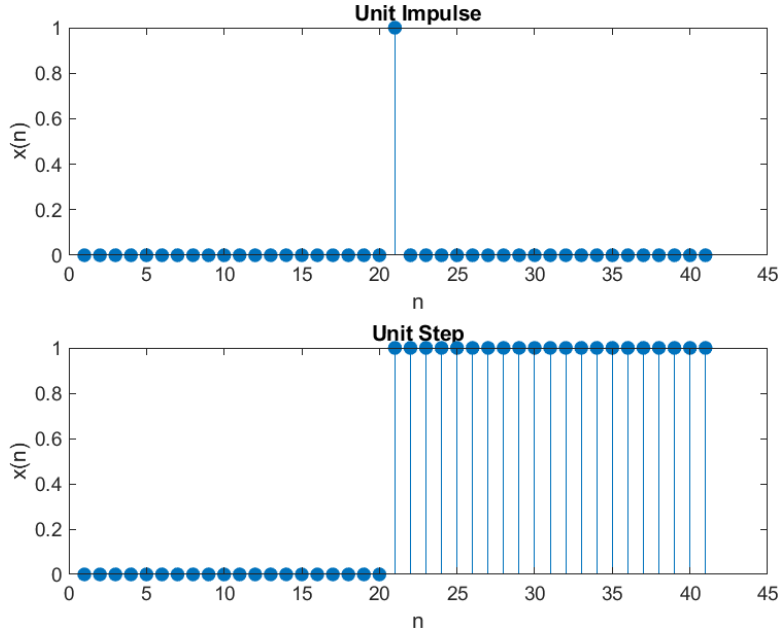

FIGURE 1 PART 1.1: UNIT SEQUENCES

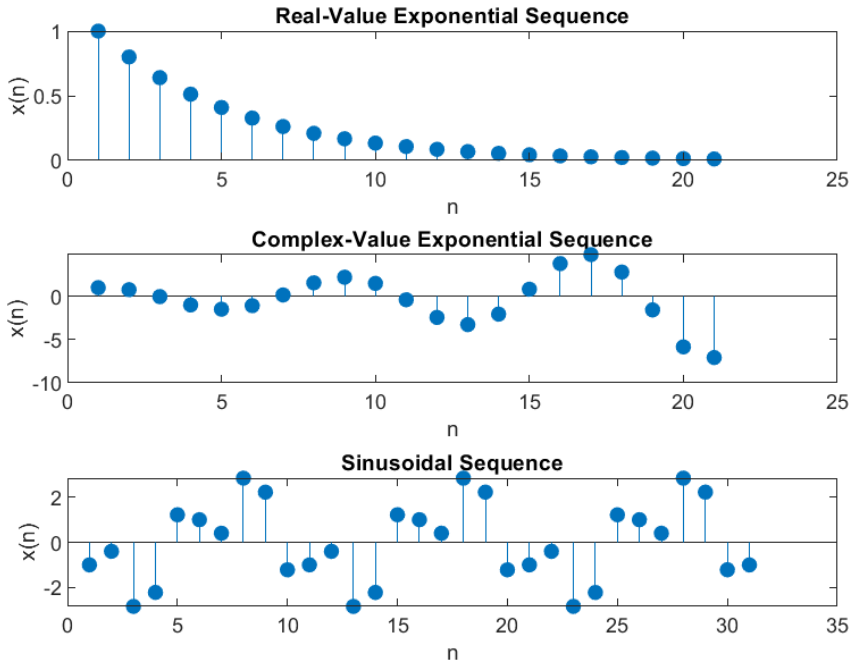

FIGURE 2 PART 1.2: REAL, COMPLEX, AND SINUSOIDAL SEQUENCES

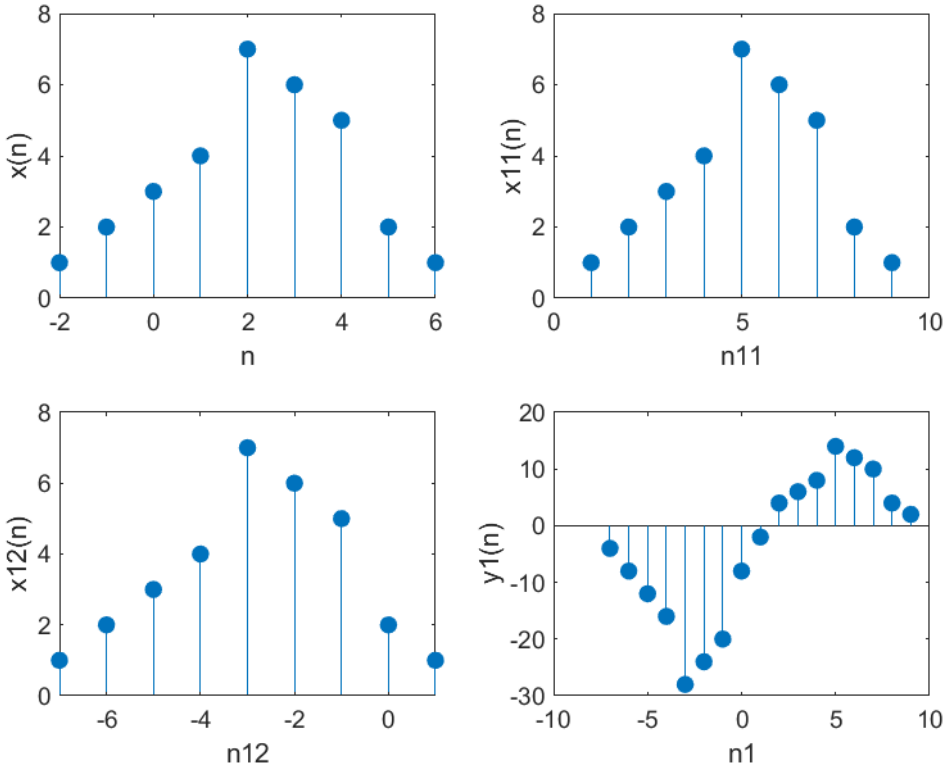

FIGURE 3 PART 2.1: OPERATIONS ON SEQUENCES

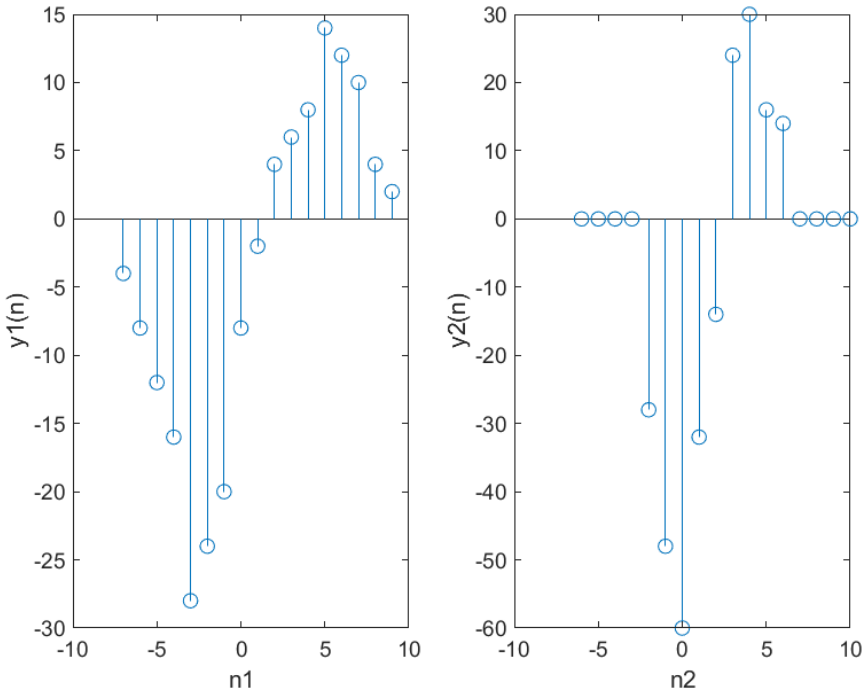

FIGURE 4 PART 2.2: OPERATIONS ON SEQUENCES

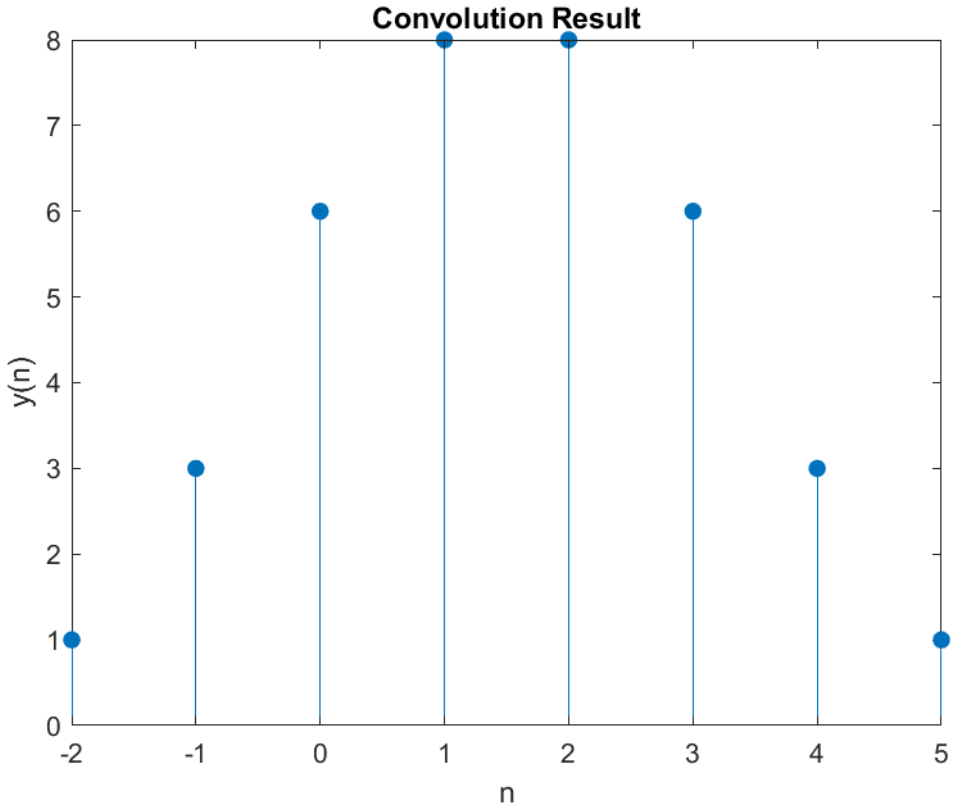

FIGURE 5 PART 3: CONVOLUTION

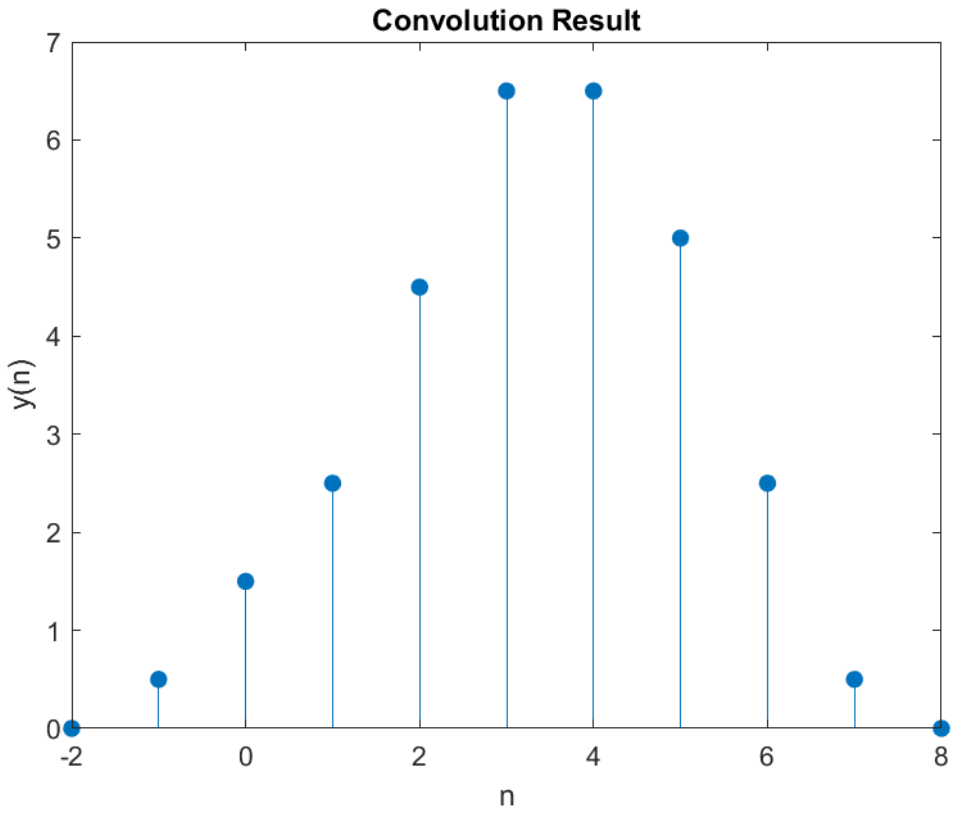

FIGURE 6 PART 4.1: CONVOLUTION OF FUNCTIONS

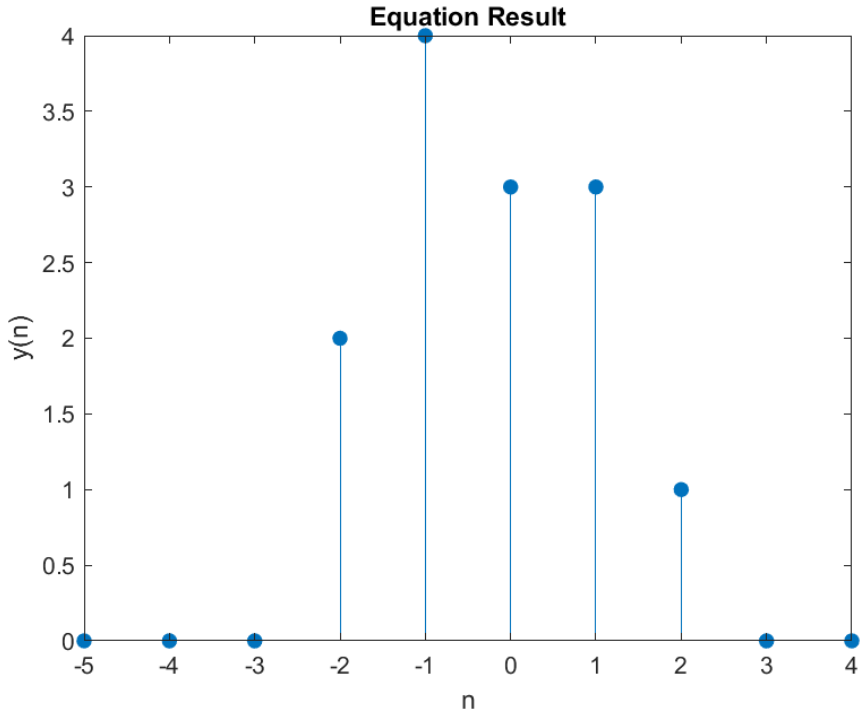

FIGURE 7 PART 4.2 SUBSTITUTION OF X(N) AND H(N)

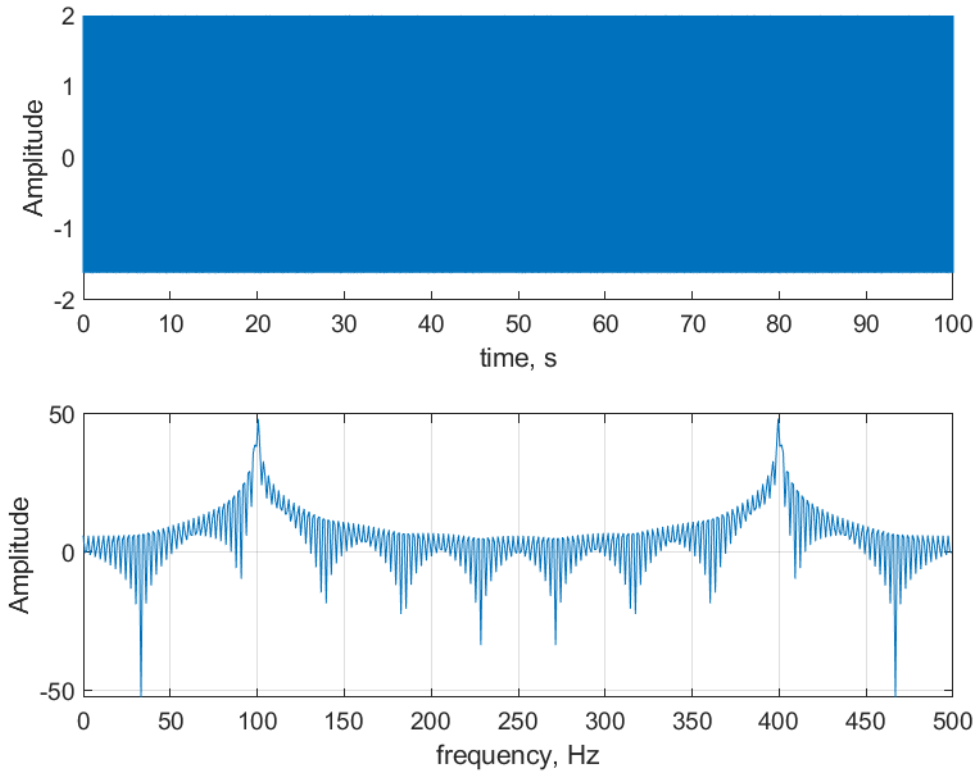

FIGURE 8 SIGNAL WITH 100HZ, AND 400HZ SINUSOIDAL WAVEFORMS

DISCLAIMER

All code used in this lab can be found attached to the submission as well as the images used.