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| **Experiment 2(b)** |
| **Title:** Develop codes to simulate, and plot the results for an exponential signal:  k e –at u(t)  for the cases:   1. k = 1 and a = 0.35 2. k = 1.2 and a = -0.45 |
| **Learning Objectives** |
| 1. To understand basic standard signals 2. To have hands on simulation using python language |
| **Prerequisites** |
| 1. Basic understanding of mathematics 2. Basic understanding of Python language |
| **Theory** |
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| **Simulation Code** |
| **import numpy as np**  **import matplotlib.pyplot as plt**  **UL = 5**  **LL = -5**  **t = np.arange(LL, UL, 0.1)**  **# Function to generate exponential signals e\*\*(at)**  **def exponential(a, t):**  **expo =[]**  **for sample in t:**  **expo.append(np.exp( a\*sample))**  **return (expo)**    **def unit\_step(t):**  **unit =[]**  **for sample in t:**  **if sample<0:**  **unit.append(0)**    **else:**  **unit.append(1)**  **return(unit)**  **k = 1.2**  **a = -0.45**  **exp\_O = exponential(a, t)**  **unit\_O = unit\_step(t)**  **y = []**  **len\_t = len(t)**  **for i in range(len\_t):**  **x = k \* exp\_O[i] \* unit\_O[i]**  **y.append(x)**  **plt.subplot(3,1,1)**  **plt.plot(t, exp\_O)**  **plt.title('exponential function')**  **plt.xlabel('time t')**  **plt.ylabel('magnitude')**  **plt.subplot(3,1,2)**  **plt.plot(t, unit\_O)**  **plt.title('Unit Step Function')**  **plt.xlabel('time t')**  **plt.ylabel('magnitude')**  **plt.subplot(3,1,3)**  **plt.plot(t, y)**  **plt.title('k e –at u(t)')**  **plt.xlabel('time t')**  **plt.ylabel('magnitude')**  **plt.show()** |
| **Assignment** |
| **Task1: Write description for code**  **Task2: Vary the parameters of the signals and observe the output** |