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**Thực hành Convolution và Amplitude Response 1**

**BÀI TẬP 1**

import matplotlib.pyplot as plt

import numpy as np

fig, axs = plt.subplots(3)

fig.suptitle("Convolution")

# Vẽ x(n)

n = np.arange(-9,10,1)

print("n: ",n)

u = 1 \* (n>=0)

x = np.power(0.8,n)\*u

axs[0].set\_title('x(n)')

axs[0].stem(n,x)

print(x)

# Vẽ h(n)

h = u

axs[1].set\_title('h(n)')

axs[1].stem(n,h)

print(h)

# Vẽ y(n)

y = np.convolve(x,h,'same')

print(y)

axs[2].set\_title('y(n)')

axs[2].stem(n,y)

plt.show()

A picture containing chart

Description automatically generated

import numpy as np

**BÀI TẬP 2**

import matplotlib.pyplot as plt

fig, axs = plt.subplots(2)

fig.suptitle("Đáp ứng biên độ")

w = np.linspace(0,2\*np.pi,100)

# Hệ thứ nhất

z = np.cos(w) - np.sin(w)\*1j

H\_complex = 1/(1-0.87\*z)

H = np.absolute(H\_complex)

axs[0].plot(w, H)

axs[0].set\_xticks([0, np.pi, np.pi\*2])

labels = ['0', '$\pi$', '$2\pi$']

axs[0].set\_xticklabels(labels)

# Hệ thứ 2

H2\_complex = 1 - z

H2 = np.absolute(H2\_complex)

axs[1].plot(w, H2)

axs[1].set\_xticks([0, np.pi, np.pi\*2])

axs[1].set\_xticklabels(labels)

plt.show()

Chart

Description automatically generated with medium confidence