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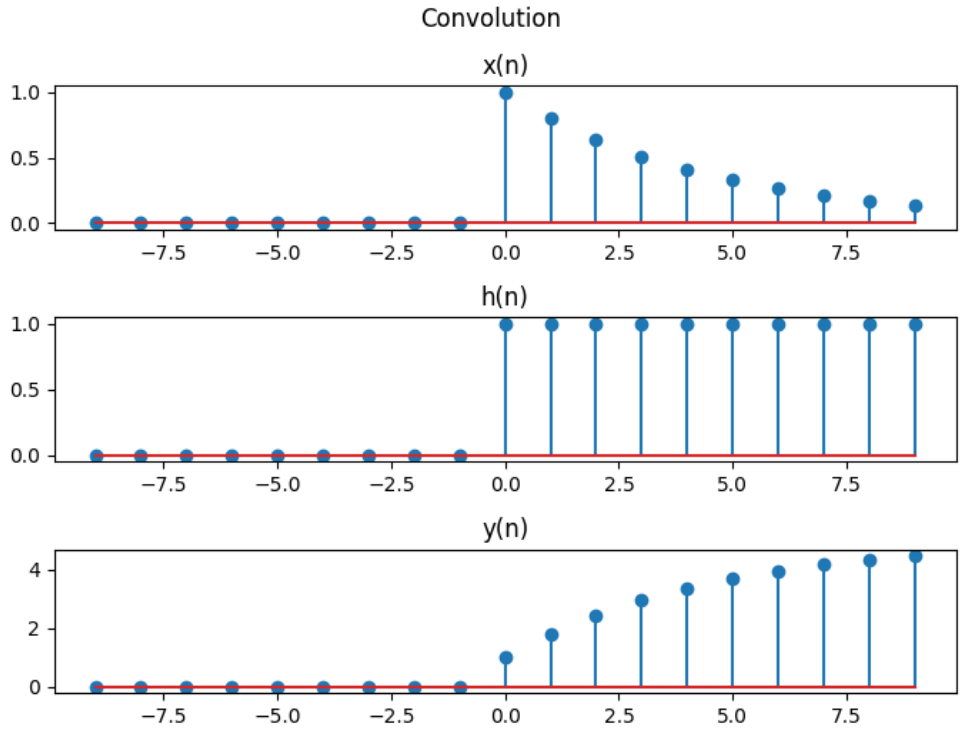
Thực hành Convolution và Amplitude Response 1

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()
```



BÀI TẬP 2

```
import numpy as np
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()
```