NATIONAL INSTITUTE OF TECHNOLOGY SURATHKAL

MANGALORE, KARNATAKA-575025

LAB ASSIGNMENT :-04

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COURSE :- B.TECH (INFORMATION TECHNOLOGY)

SUBJECT :- IT204 (SIGNALS AND SYSTEMS LAB)

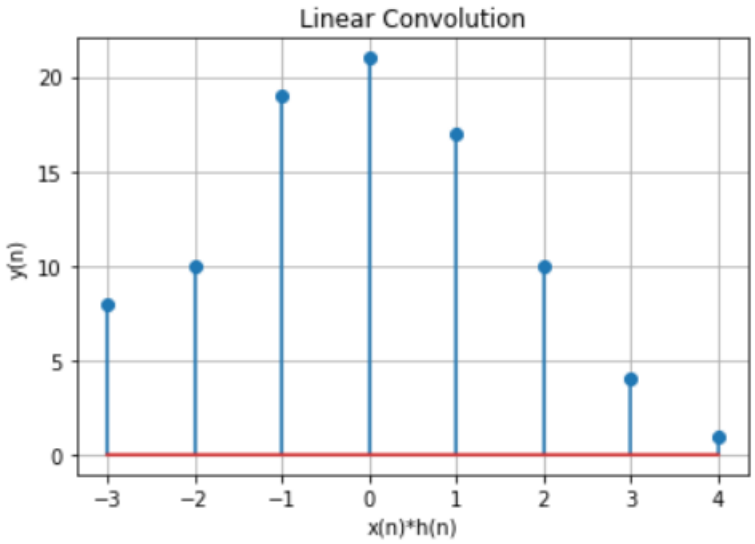
SUBMITTED TO :-

- REVANESHA M SIR

1. x(n) = [2,1,3,2,1] , h(n) = [4,3,2,1]

```
import matplotlib.pyplot as plt
import numpy as np
x = [2,1,3,2,1]
h = [4,3,2,1]
t = []
y = np.convolve(x,h) #Used to calculate convolution
s = len(y)
i = -3
while s:
    t.append(i)
    i = i+1
    s = s-1
print( " y(n) = ",end='')
print(y)
plt.title("Linear Convolution")
plt.xlabel("x(n)*h(n)")
plt.ylabel("y(n)")
plt.stem(t,y,use_line_collection=True)
plt.grid()
```

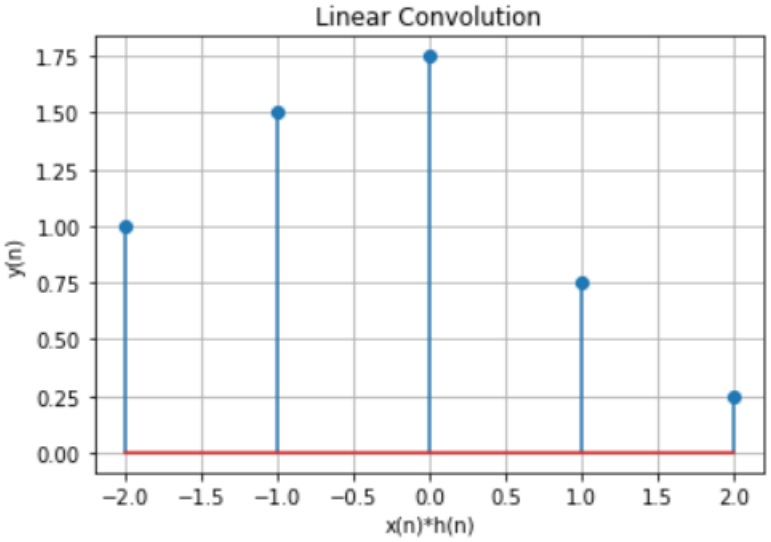
```
 y(n) = [ 8 10 19 21 17 10  4  1]
```



2. x(n) = [1,1,1] , h(n) = [1,0.5,0.25]

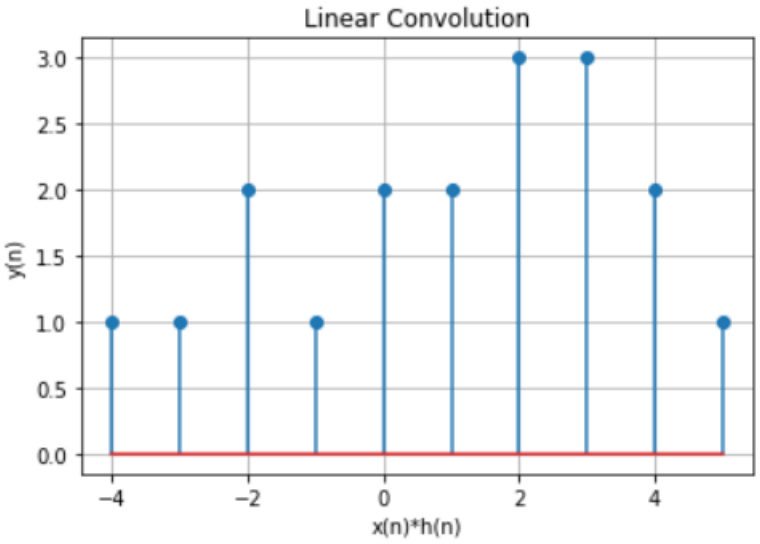
```
import matplotlib.pyplot as plt
import numpy as np
x = [1,1,1]
h = [1,0.5,0.25]
t = []
y = np.convolve(x,h) #Used to calculate convolution
s = len(y)
i = -2
while s:
    t.append(i)
    i = i+1
    s = s-1
print( " y(n) = ",end='')
print(y)
plt.title("Linear Convolution")
plt.xlabel("x(n)*h(n)")
plt.ylabel("y(n)")
plt.stem(t,y,use_line_collection=True)
plt.grid()
```

```
 y(n) = [1.   1.5  1.75 0.75 0.25]
```



3. x(n) = [1,0,1,0,1,1,1,1] , h(n) = [1,1,1]

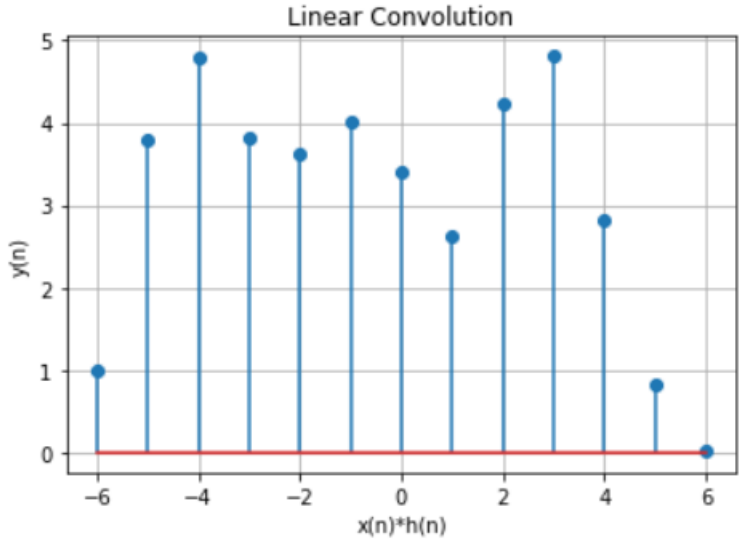
```
import matplotlib.pyplot as plt
import numpy as np
x = [1,0,1,0,1,1,1,1]
h = [1,1,1]
t = []
y = np.convolve(x,h) #Used to calculate convolution
s = len(y)
i = -4
while s:
    t.append(i)
    i = i+1
    s = s-1
print( " y(n) = ",end='')
print(y)
plt.title("Linear Convolution")
plt.xlabel("x(n)*h(n)")
plt.ylabel("y(n)")
plt.stem(t,y,use_line_collection=True)
plt.grid()
```



4. x(n)=[1,3,2,1,2,2,1,1,3,2], h(n)=[1,0,8,0,4,0,0,1]

```
[ ]  import matplotlib.pyplot as plt
     import numpy as np
     x = [1,3,2,1,2,2,1,1,3,2]
     h = [1,0.8,0.4,0.01]
     t = []
     y = np.convolve(x,h) #Used to calculate convolution
     s = len(y)
     i = -6
     while s:
         t.append(i)
         i = i+1
         s = s-1
     print( " y(n) = ",end='')
     print(y)
     plt.title("Linear Convolution")
     plt.xlabel("x(n)*h(n)")
     plt.ylabel("y(n)")
     plt.stem(t,y,use_line_collection=True)
     plt.grid()
```

```
 y(n) = [1.   3.8  4.8  3.81 3.63 4.02 3.41 2.62 4.22 4.81 2.81 0.83 0.02]
```



5. x(n) = [3,2,1,0,0,0] , h(n) = [1,1,1]

```
import matplotlib.pyplot as plt
import numpy as np
x = [3,2,1,0,0,0]
h = [1,1,1]
t = []
y = np.convolve(x,h) #Used to calculate convolution
s = len(y)
i = -3
while s:
    t.append(i)
    i = i+1
    s = s-1
print( " y(n) = ",end='')
print(y)
plt.title("Linear Convolution")
plt.xlabel("x(n)*h(n)")
plt.ylabel("y(n)")
plt.stem(t,y,use_line_collection=True)
plt.grid()
```

```
 y(n) = [3 5 6 3 1 0 0 0]
```