EXPERIMENT 3
LINEAR AND CIRCULAR CONVOLUTION

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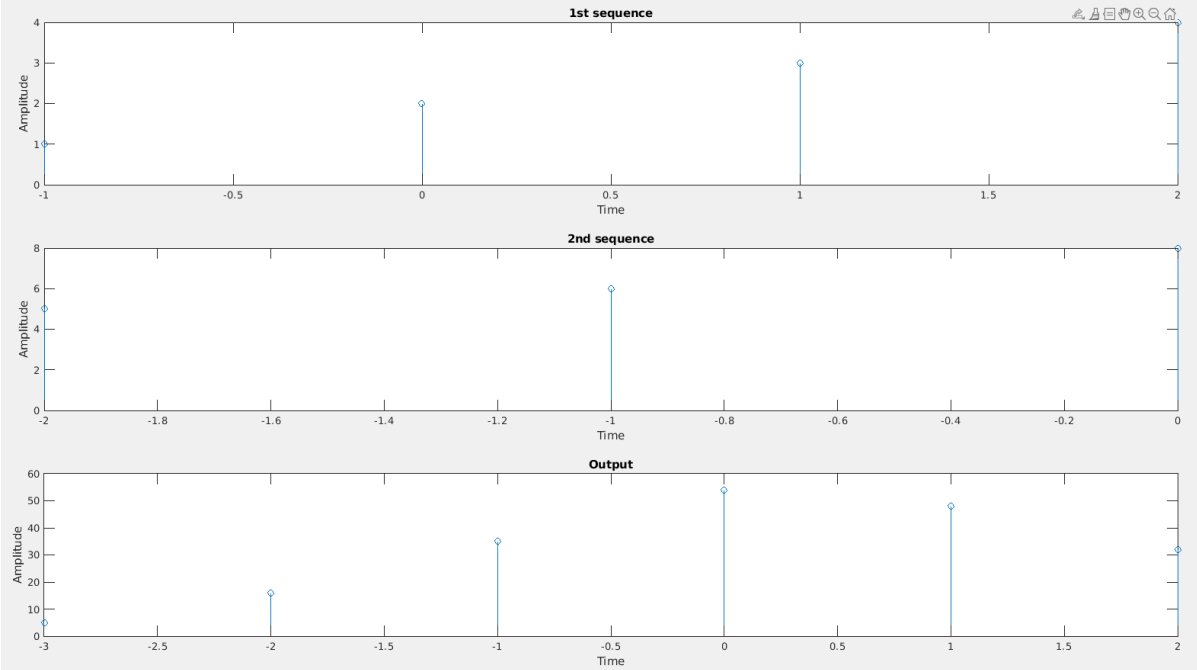
LINEAR CONVOLUTION

Code:

```
clc;
x = input('Enter the 1st sequence: ');
nx = input('Enter the time index sequence: ');
h = input('Enter the 2nd sequence: ');
nh = input('Enter the time index sequence: ');
[y, ny] = findcov(x, nx, h, nh);
figure;
subplot(3, 1, 1);
stem(nx, x);
xlabel('Time');
ylabel('Amplitude');
title('1st sequence');
subplot(3, 1, 2);
stem(nh, h);
xlabel('Time');
ylabel('Amplitude');
title('2nd sequence');
subplot(3, 1, 3);
stem(ny, y)
xlabel('Time');
ylabel('Amplitude');
title('Output');
disp(y);
disp(ny);
function [y, ny] = findcov(x, nx, h, nh)
nybegin = nx(1) + nh(1);
nyend = nx(length(nx)) + nh(length(nh));
ny = nybegin:nyend;
% y = conv(x, h);
y = calcconv(x, h);
end
function [y] = calcconv(x, h)
l1 = length(x);
l2 = length(h);
N = l1 + l2 - 1;
```

```
for n = 1: 1: N
   y(n) = 0;
   for k = 1:1:l1
       if((n - k +1 >= 1) && (n - k +1 <= l2))
           y(n) = y(n) + x(k)*(h(n - k + 1));
       end
   end
end
end
```



CIRCULAR CONVOLUTION

Code:

```
clc;
clear ;
close all;
x=input('enter x[n]');
h=input('enter h[n]');
N=input('enter N:');
l1=length(x);
l2=length(h);
x=[x zeros(1,(N-l1))];
h=[h zeros(1,(N-l2))];
%inbuilt function
%y=cconv(x,h,N);
%-----------------------------------------------------
```

```
for n=1:1:N
    y(n)=0;
    for k=1:1:N
        y(n)=y(n)+x(k)*h(mod((n-k),N)+1);
    end
end
%end%
%-----------------------------------------------------
disp('the circular convolution of the two given sequence')
n=0:N-1;
figure;
subplot(3,1,1);
stem(n,x);
xlabel('Time');
ylabel('Amplitude');
title('1st sequence');
subplot(3,1,2);
stem(n,h);
xlabel('Time');
ylabel('Amplitude');
title('2nd sequence');
subplot(3,1,3);
stem(n,y);
xlabel('Time');
ylabel('Amplitude');
title('circular Convolution');
disp(y)
disp(n)
```