SS-Computer Assignment - 05 - Spring 2019

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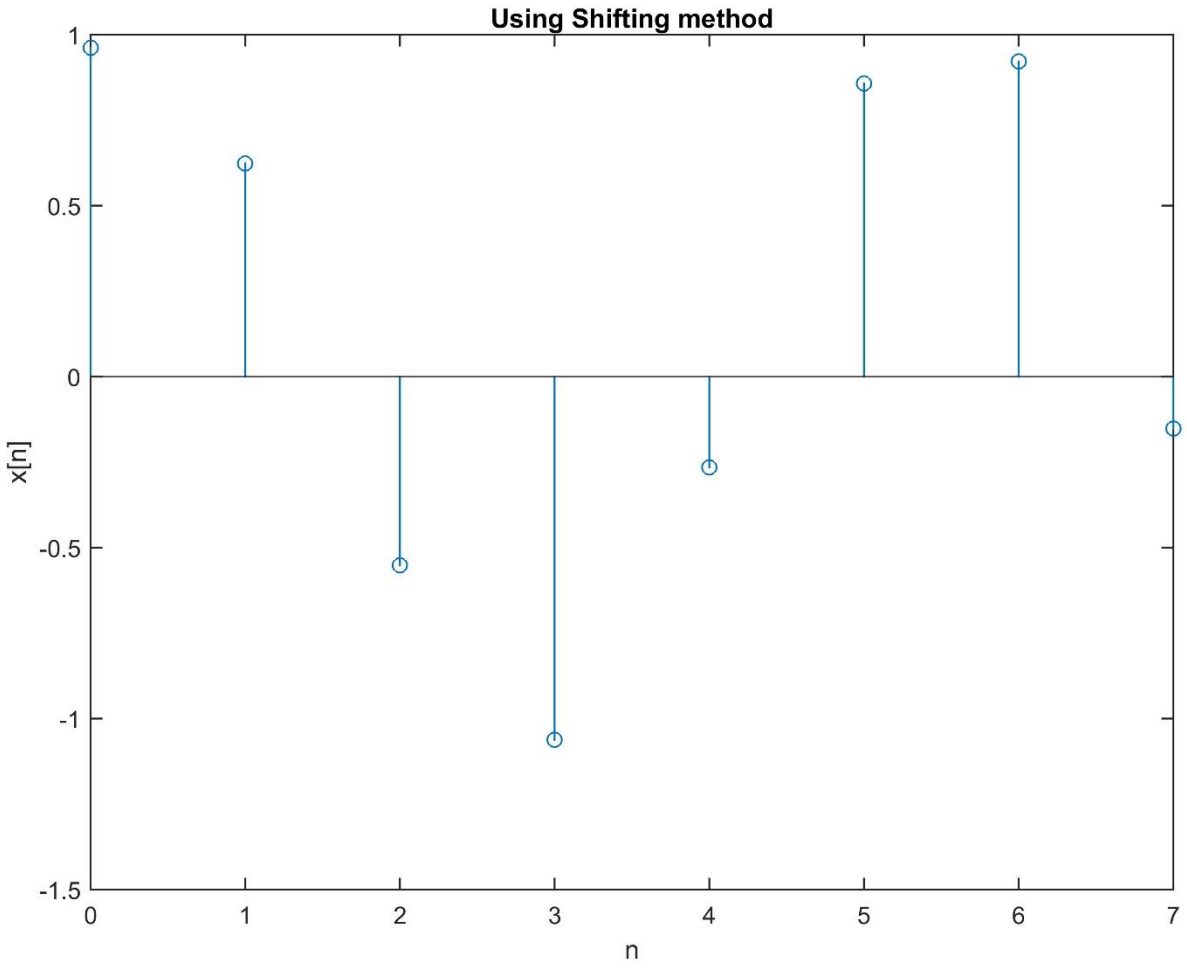
Code :

```
clear;
%%
%Initialzing the signals
n = 0:7;
L = length(n);
x1_n = (1/4).^n;
x2_n = cos((3*pi*n)/8);

%%
%Circular Convolution
cir_conv = zeros(1,L);
for i = 1:L
    for j = 1:L
        cir_conv(i) = cir_conv(i) + x1_n(j).*x2_n(mod(i-j,L)+1);
    end
end

%Plotting
figure();
stem(n,cir_conv);
title('Using Shifting method');
xlabel('n');
ylabel('x[n]');

fprintf('Using Shifting method : \n\n');
disp(cir_conv);

%%
%DFT and IDFT Method
lx1=length(x1_n);
lx2=length(x2_n);
N=max(lx1,lx2);

%DFT
x1=[x1_n zeros(N-lx1)];
x2=[x2_n zeros(N-lx2)];
W=zeros(N,N);

for m=0:N-1
    for k=0:N-1
        W(m+1,k+1)=exp(-1i*2*pi*m*k/N);
    end;
end;

X1=W*x1.';
X2=W*x2.';

%IDFT
Y1=X1.*X2;
w=zeros(N,N);
for m=0:N-1
    for k=0:N-1
        w(m+1,k+1)=exp(1i*2*pi*m*k/N);
    end;
end;
B=w*Y1;
Y=B/N;
```

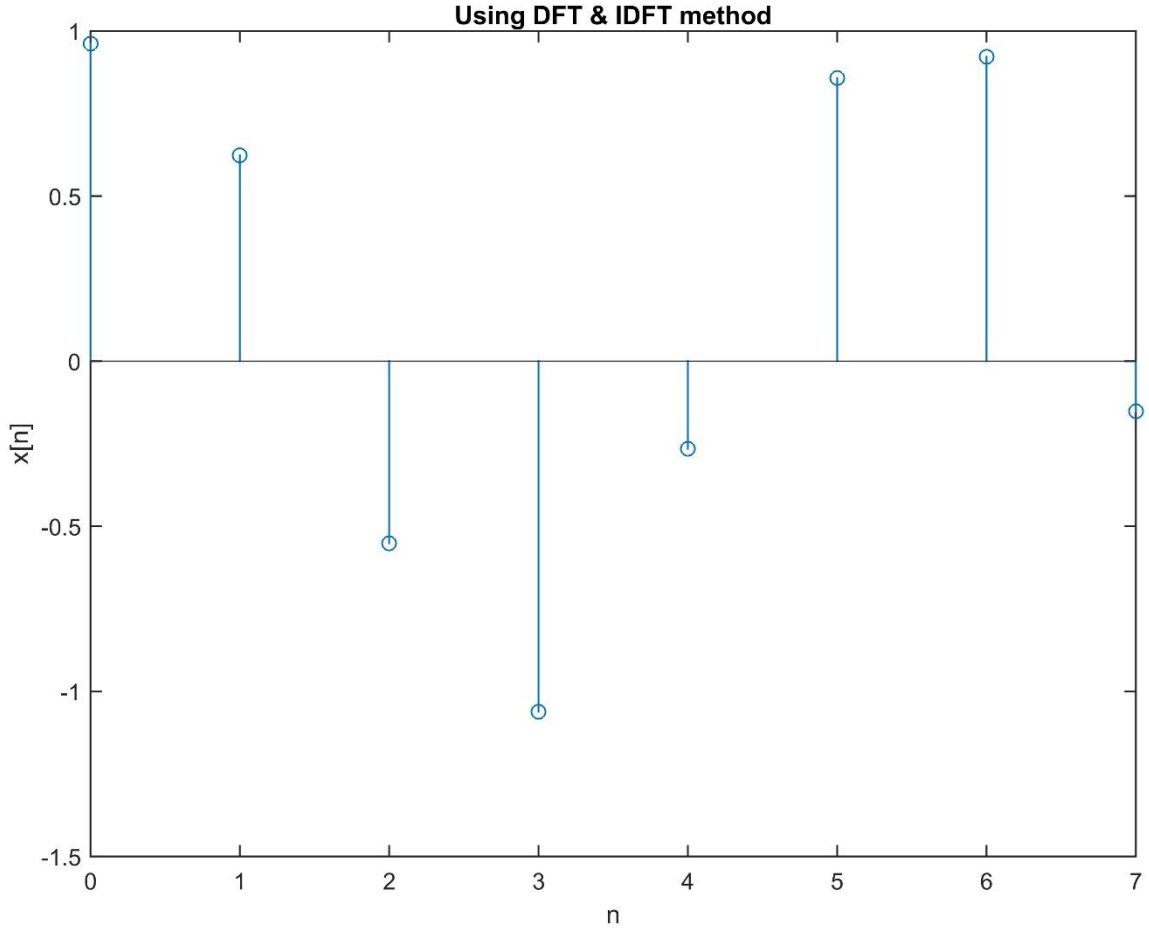
```
%Plotting
figure();
stem(0:N-1,Y);
title('Using DFT & IDFT method');
xlabel('n');
ylabel('x[n]');

fprintf('Using DFT and IDFT :\n\n');
disp(real(Y.'));

%%
%Comparision
figure();
plot(n,cir_conv,'+','MarkerSize',10);
hold on;
plot(0:N-1,real(Y.'),'s','MarkerSize',10);
title('Comparing the both methods');
xlabel('n');
ylabel('x[n]');
legend('Using Shifting method','Using DFT & IDFT method');
```

PLOTS :

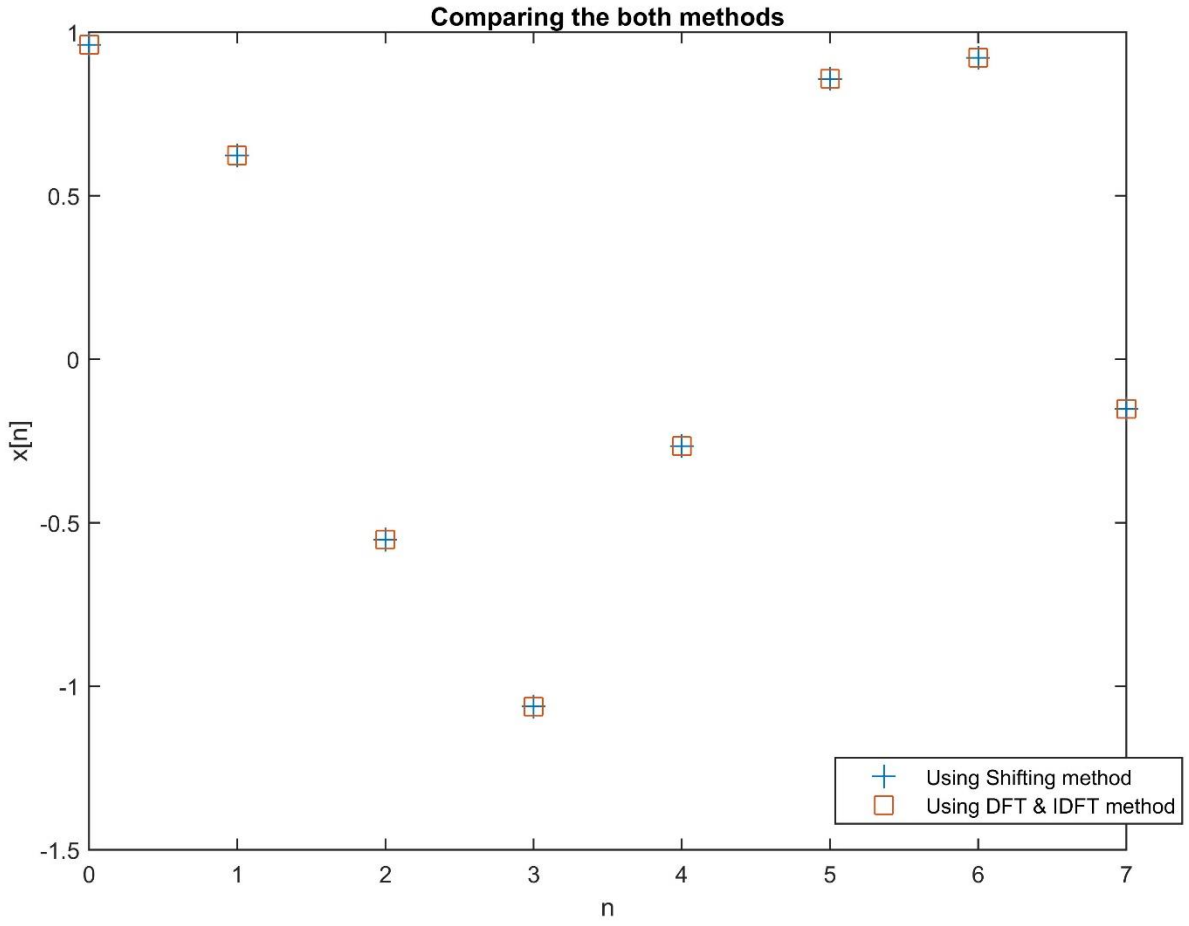
Using shifting method:



Using DFT & IDFT method:



Comparing both:


Comparing the both methods
x[n]
n
1
0.5
0
-0.5
-1
-1.5
0
1
2
3
4
5
6
7
Using Shifting method
Using DFT & IDFT method