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```
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clc;
clear all;
close all;
```

Input

```
xdata= [1  2  0  1 ];
hData =[2  2  1  1 ] ;
```

1st Question : Computing the 4-point circular convolution between the given two sequences g[n] and h[n], using matrix method. Let g[n]={1 2 0 1 } and h[n]={2 2 1 1}.

```
[m,n]=size(xdata);
[a,b]=size(hData);
H(:,1)=hData';
for i=2:n
    H(:,i)=[(hData(n+2-i:n)');(hData(1:n+1-i))'];
end
H
Y=H*xdata'
```

```
H =

     2     1     1     2
     2     2     1     1
     1     2     2     1
     1     1     2     2
```

```
Y =

     6
     7
     6
     5
```

2nd Question : Verifying the above result using DFT based method

```
for i=0:1:n-1
    for j=0:1:n-1
        D(i+1,j+1)=exp((2*pi*1j*j*i)/n);
    end
end
DH=D';
DTFTx=DH*xdata.';
DTFTh=DH*hData.';
DTFTY=DTFTx.*DTFTh;

iDTFT1 =(D*DTFTY)/n


iDTFT1 =

   6.0000 + 0.0000i
   7.0000 - 0.0000i
   6.0000 + 0.0000i
   5.0000 + 0.0000i
```

3rd Question : Computing the linear convolution between above two sequences using circular convolution

```
xdata = [xdata zeros(1,b-1)];
hData =[hData zeros(1,b-1)];
[m,n]=size(xdata);
[a,b]=size(hData);
HLin(:,1)=hData';
for i=2:n
    HLin(:,i)=[(hData(n+2-i:n)');(hData(1:n+1-i))'];
end
HLin
Y=HLin*xdata'


HLin =
```

```
     2     0     0     0     1     1     2
     2     2     0     0     0     1     1
     1     2     2     0     0     0     1
     1     1     2     2     0     0     0
     0     1     1     2     2     0     0
     0     0     1     1     2     2     0
     0     0     0     1     1     2     2
```

```
Y =

     2
     6
     5
     5
     4
     1
     1
```

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