LAB 04: CONVOLUTION AND CORRELATION

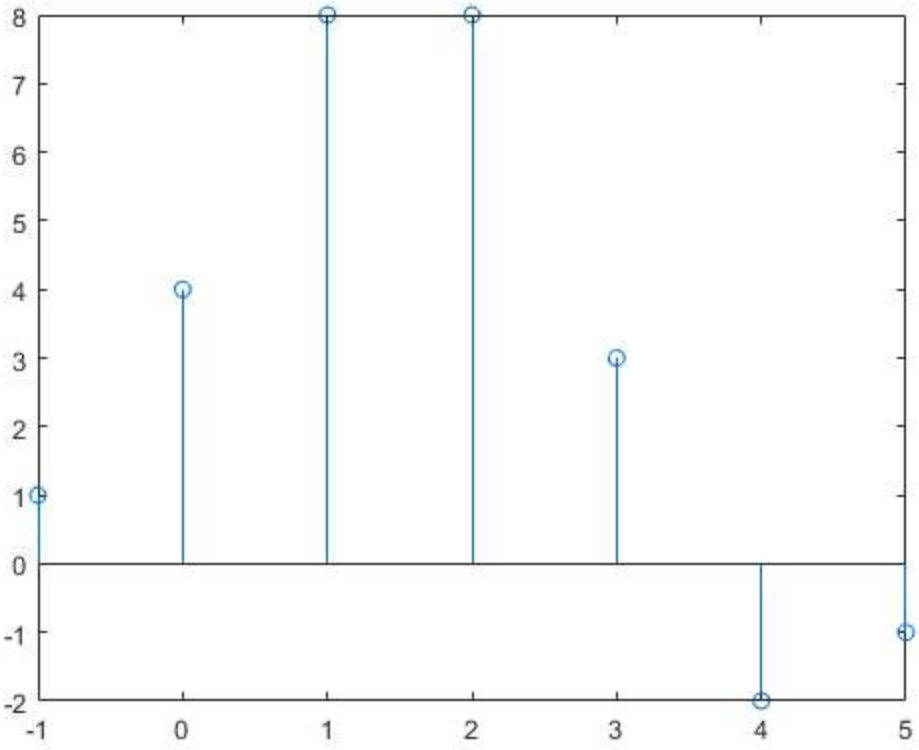
Contents

Convolution

Formula to compute Convolution $$y[n] = \sum_{k=-\infty}^{\infty} x[k]h[n-k]$$ $

```
xh = [1,2,3,1], nx = [0:3]
%stem(nx,xh);
hh = [1,2,1,-1]; nh = [-1:2];
%stem(nh,hh);
nyb = nx(1)+nh(1);
nye= nx(length(xh))+nh(length(hh));
ny = [nyb:nye];
y = conv(xh,hh)
%calc_conv(xh,hh,nyb,nye)
stem(ny,y)
```

```
xh =

     1     2     3     1


nx =

     0     1     2     3


y =

     1     4     8     8     3    -2    -1
```

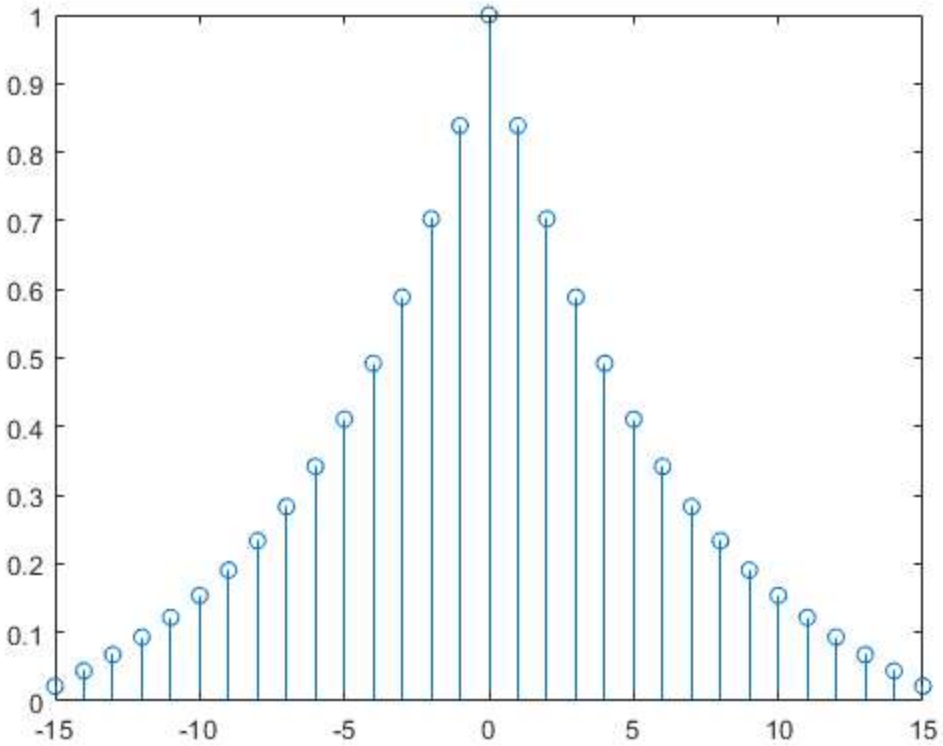


Correlation

```
% Formula to compute Correlation is
```

$$y[l] = \sum_{k=-\infty}^{\infty} x[k]h[k-l]$$

```
n = 0:15;
x = 0.84.^n;
%y = circshift(x,5);
[c,lags] = xcorr(x,x,'normalized');
stem(lags,c)
```



Published with MATLAB® R2020a