Triangular WIndow

```
%Given Signal
x = [4 -1 2 1];
% Here N = 4

%Using triangular window
w = window(4,'tri')
```

```
w =
         0    0.6667    0.6667         0
```

y(n) = x(n) * w(n)

```
y = x.*w
```

```
y =
         0   -0.6667    1.3333         0
```

Taking FFT of y(n)

```
Yk = fft(y)
```

```
Yk =
   0.6667 + 0.0000i  -1.3333 + 0.6667i   2.0000 + 0.0000i  -1.3333 - 0.6667i
```

Now for Amplitude, Phase and Power Spectrum:

```
%Amplitude
Amplitude = abs(Yk)/4
```

```
Amplitude =
    0.1667    0.3727    0.5000    0.3727
```

```
%Phase
Phase = rad2deg(angle(Yk))
```

```
Phase =
         0  153.4349         0 -153.4349
```

```
%Power
Power = Amplitude.*Amplitude
```

```
Power =
    0.0278    0.1389    0.2500    0.1389
```

Hamming WIndow

```
%Using hamming window
w = window(4,'ham')
```

```
w =
    0.0800    0.7700    0.7700    0.0800
```

y(n) = x(n) * w(n)

```
y = x.*w
```

```
y =
    0.3200   -0.7700    1.5400    0.0800
```

Taking FFT of y(n)

```
Yk = fft(y)
```

```
Yk =
   1.1700 + 0.0000i  -1.2200 + 0.8500i   2.5500 + 0.0000i  -1.2200 - 0.8500i
```

Now for Amplitude, Phase and Power Spectrum:

```
%Amplitude
Amplitude = abs(Yk)/4
```

```
Amplitude =
    0.2925    0.3717    0.6375    0.3717
```

```
%Phase
Phase = rad2deg(angle(Yk))
```

```
Phase =
         0  145.1343         0 -145.1343
```

•

```
%Power
Power = Amplitude.*Amplitude
```

```
Power =
    0.0856    0.1382    0.4064    0.1382
```

Hanning WIndow

```
%Using hanning window
w = window(4,'han')
```

```
w =
         0    0.7500    0.7500         0
```

y(n) = x(n) * w(n)

```
y = x.*w
```

```
y =
         0   -0.7500    1.5000         0
```

Taking FFT of y(n)

```
Yk = fft(y)
```

```
Yk =
   0.7500 + 0.0000i  -1.5000 + 0.7500i   2.2500 + 0.0000i  -1.5000 - 0.7500i
```

Now for Amplitude, Phase and Power Spectrum:

```
%Amplitude
Amplitude = abs(Yk)/4
```

```
Amplitude =
    0.1875    0.4193    0.5625    0.4193
```

```
%Phase
Phase = rad2deg(angle(Yk))
```

```
Phase =
         0  153.4349         0 -153.4349
```

```
%Power
Power = Amplitude.*Amplitude
```

```
Power =
    0.0352    0.1758    0.3164    0.1758
```