

Pweave Example - Frequency response of a moving average filter

Author: Matti Pastell <matti.pastell@helsinki.fi>

Website: <http://mpastell.com>

Create 11 point moving average filter and plot its frequency response and print the values.

```
from pylab import *
import scipy.signal as signal
#A function to plot frequency and phase response
def mfreqz(b,a=1):
    w,h = signal.freqz(b,a)
    h = abs(h)
    return(w/max(w), h)
```

Make the impulse response function and use terminal formatted output (=doctest block.)

```
>>> n = 11.
>>> n
11.0
>>> b = repeat(1/n, n)
>>> b
array([ 0.09090909,  0.09090909,  0.09090909,  0.09090909,  0.09090909,
        0.09090909,  0.09090909,  0.09090909,  0.09090909,  0.09090909,
        0.09090909])
```

Calculate the frequency response and plot it:

```
w, h = mfreqz(b)
#Plot the function
plot(w,h,'k')
ylabel('Amplitude')
xlabel(r'Normalized Frequency (x$\pi$rad/sample)')
show()
```

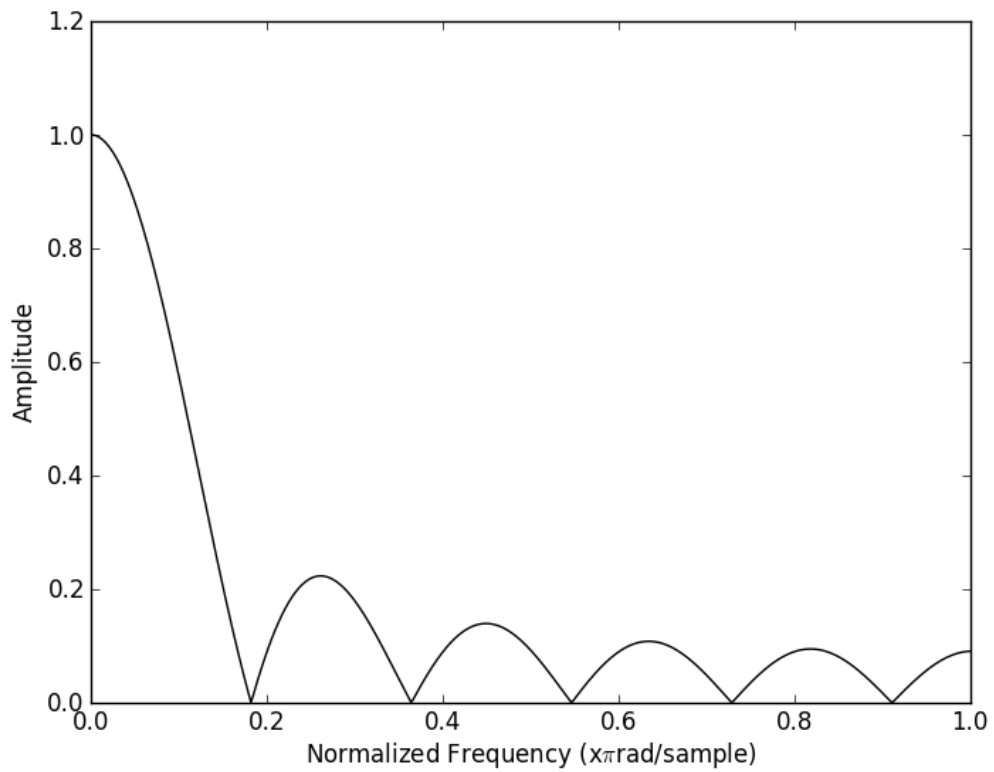


Figure 1: Frequency response of an 11 point moving average filter

The first 10 values of the frequency response (w,h) as a table, notice that the code is hidden in the output document.

Amplitude	Frequency
1.0	0.0
1.0	0.0
1.0	0.0
1.0	0.01
1.0	0.01
1.0	0.01
0.99	0.01
0.99	0.01
0.99	0.02
0.98	0.02