

# Python Sweave Example

## Frequency response of a moving average filter

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**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
n = 11.
b = repeat(1/n, n)
#Print impulse response filter
print(b)

[ 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)')
title(r'Frequency response of an 11 point moving average filter')
savefig('ma_freq.pdf')
```

Frequency response of an 11 point moving average filter

