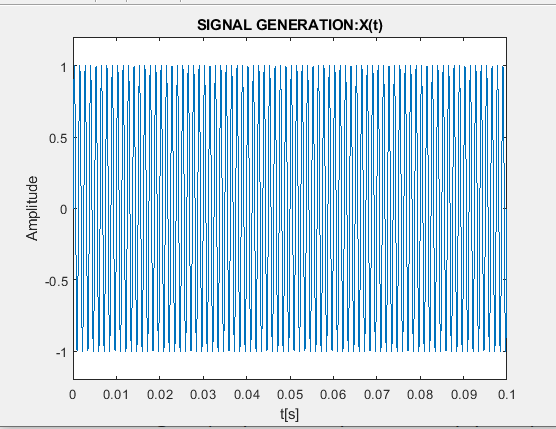
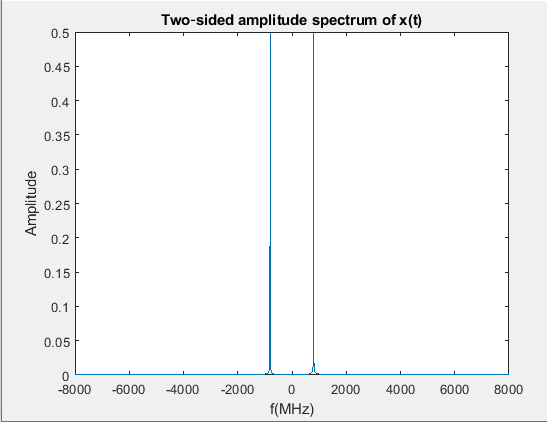
# 3. Spectral Illustration

## 3.1 Signal Generation

Generate the signal x

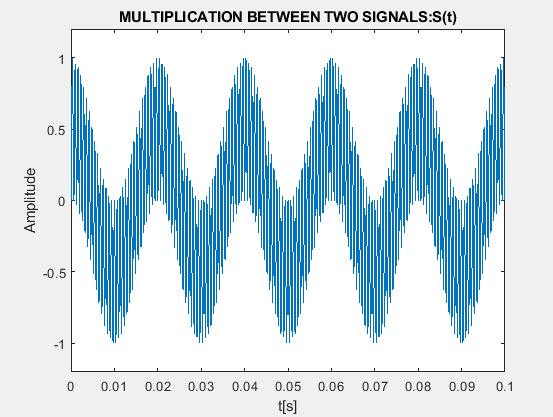


Two‐sided amplitude spectrum of x:

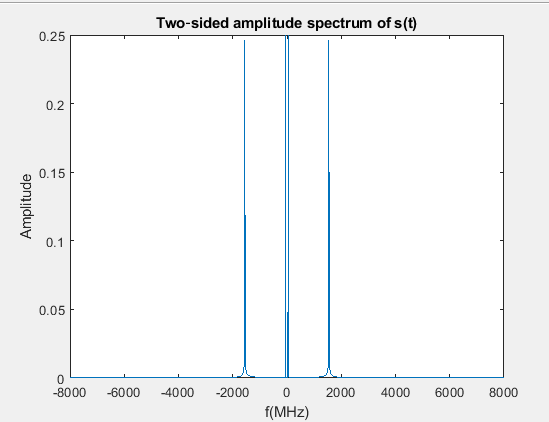


## 3.2 Multiplication between two signals

Multiply the x and m signals s

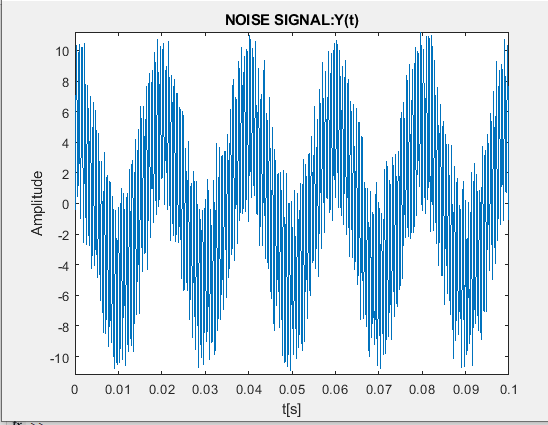


Two‐sided amplitude spectrum of s(t)

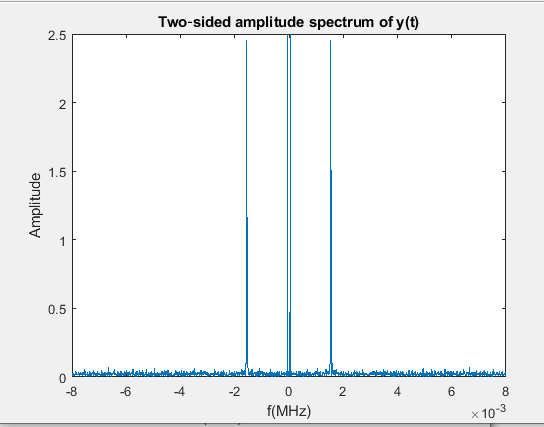


## 3.3 Adding a Noise Signal

Noisy Signal :



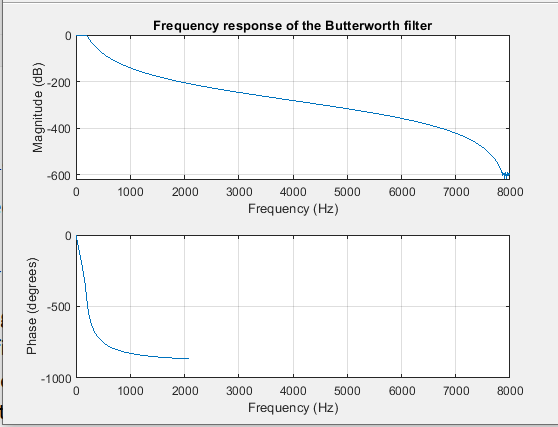
Two‐sided amplitude spectrum of y(t)



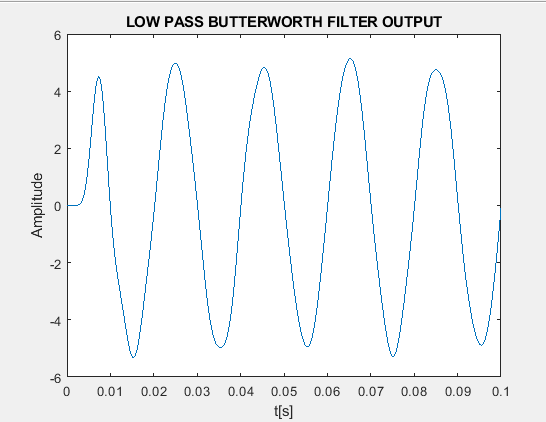
# 4. LINEAR FILTERING

## 4.1 Low Pass Butterworth Filter

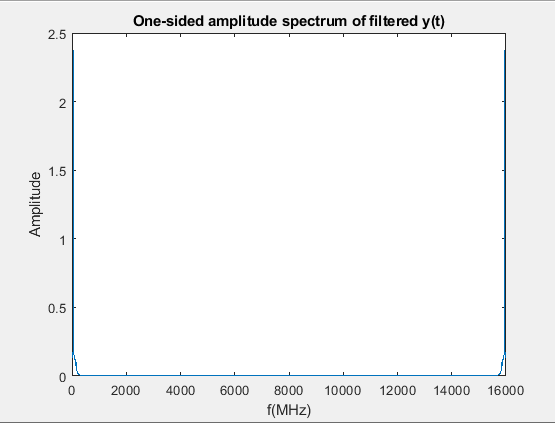
Frequency response of the filter

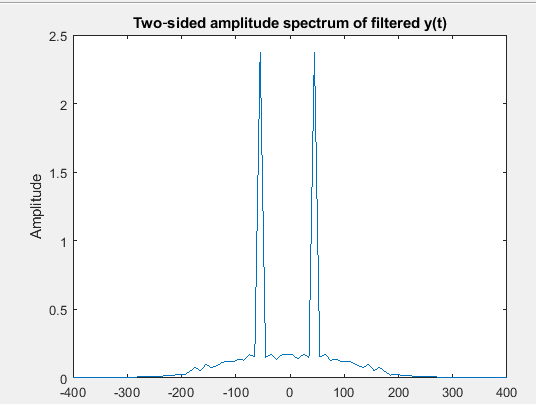


Filtered signal in time domain



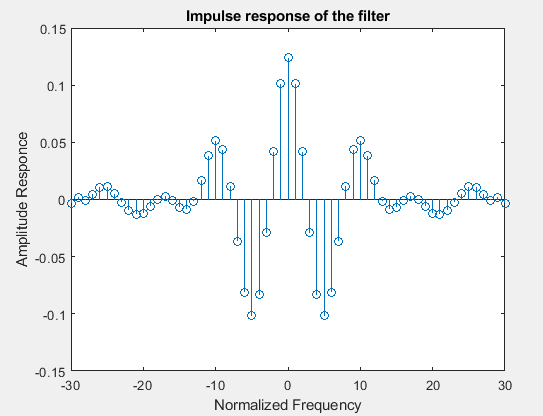
Filtered signal in frequency domain



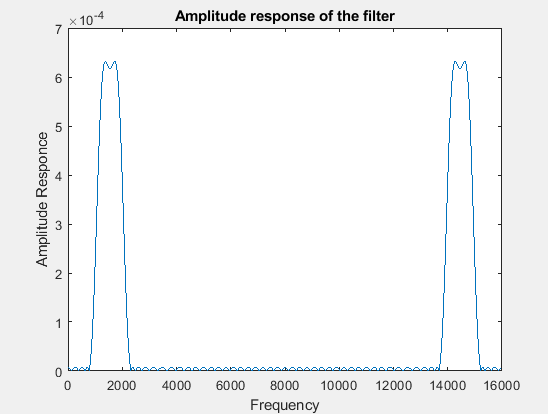


## 4.2 Band Pass FIR Filter

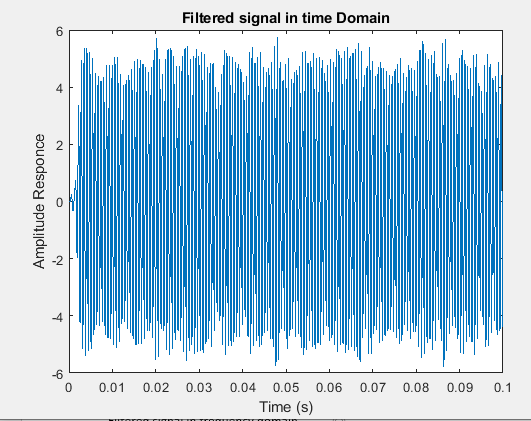
Impulse response of the filter



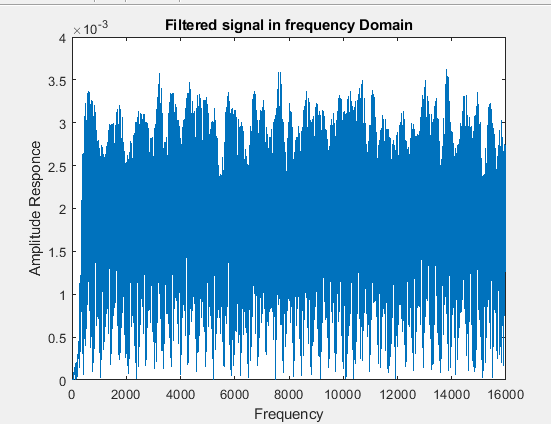
Amplitude response of the filter



Filtered signal in time domain



Filtered signal in frequency domain



# Matlab Codes

## Class room exercise



## Homework Assignment

