James Bird – 2212304
Communication systems lab 2

Question 1.

For this question I chose to use a gaussian pulse to calculate and plot the FFT over the
negative to positive range. First, I created a time vector and plotted the pulse, I then created
the frequency axis and calculated the FFT and FFT shift as seen plotted bellow.

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Communication systems lab 2
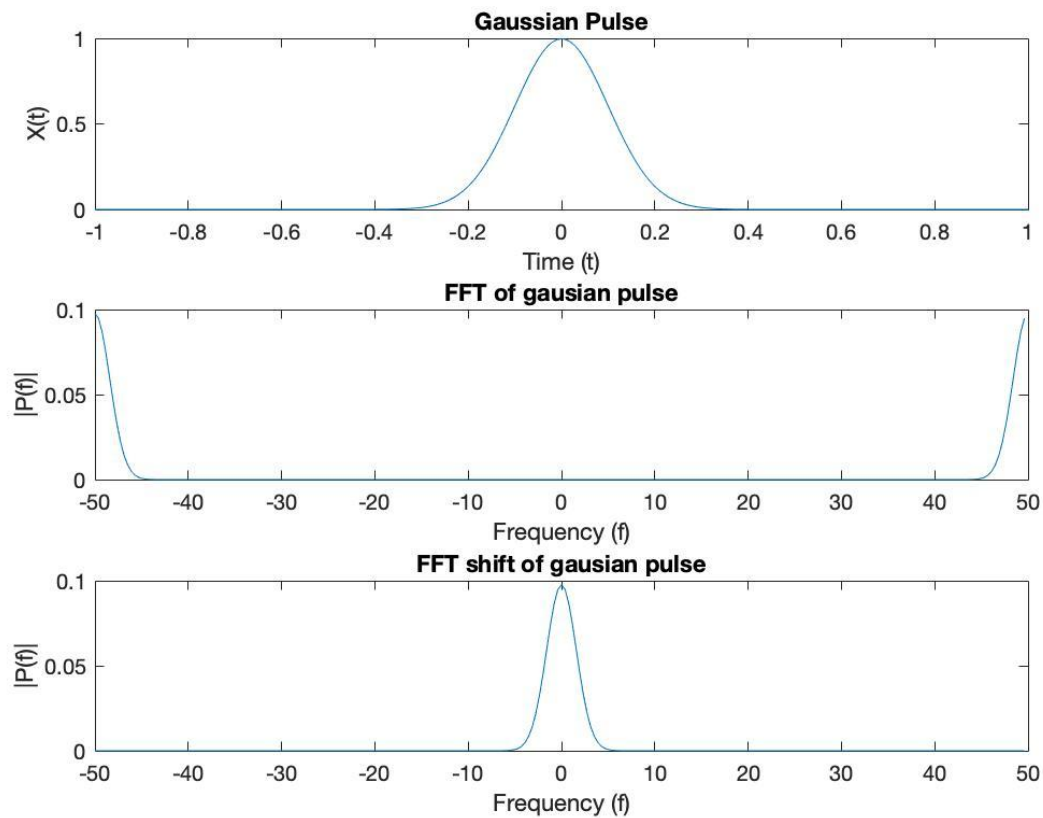
Question 2.

For this question to prove the linear relationship between the Fourier transform of two signals I plotted two gaussian signals then calculated to get w(t) and plotted the sum of these onto the same graph, I then calculated the Fourier transforms of both pulses and calculated the sum to give W(f). as seen in the given graphs the relationship is linear, but I have also calculated the Fourier transform of w(t) which gives the same as we calculated through the sum of the Fourier transformed pulses, W(f).

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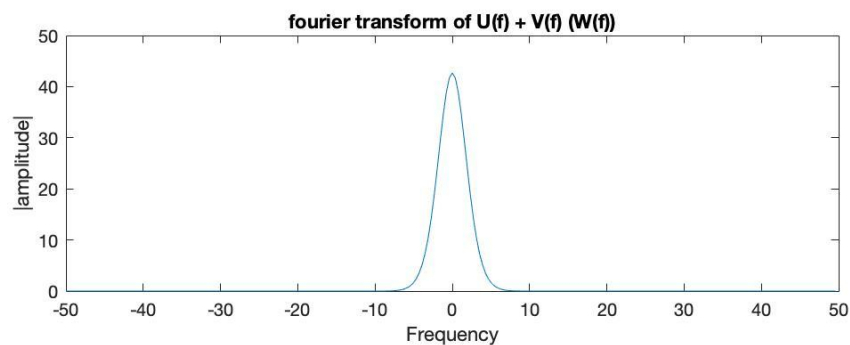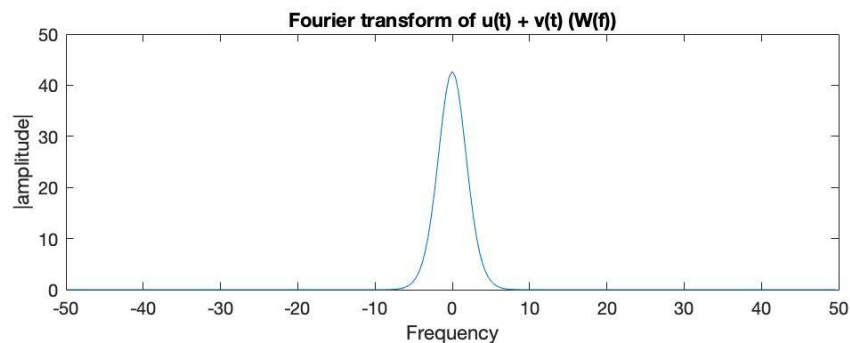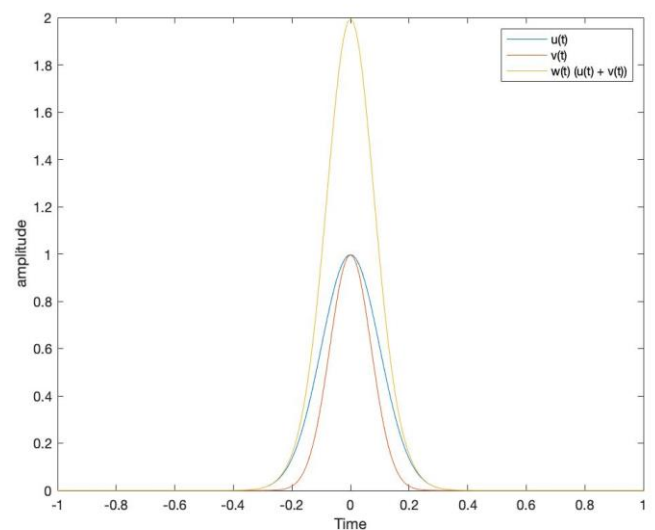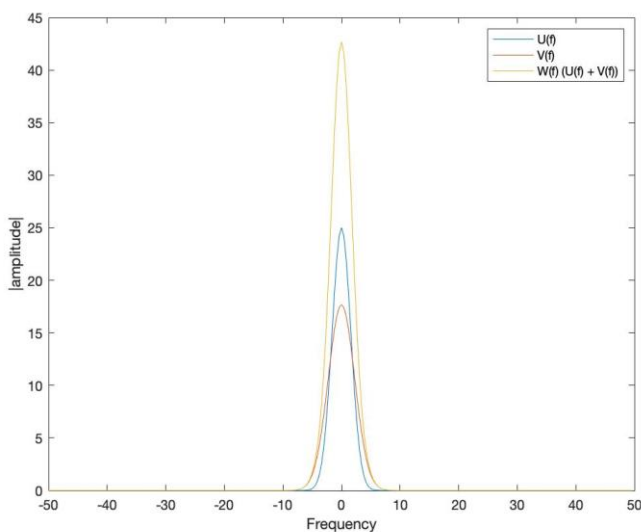
Question 3.

For this question I initially created the time vectors to use for the sine wave and digital binary signal, then using built in MATLAB functions I modulated the carrier wave with my signal, added the white gaussian noise, and finally decoded the modulated signal by multiplying it by a copy of the carrier signal and applying the moving median filter.
https://www.dropbox.com/s/gjjaft4v8e4n9qr/q3lab2attempt2.m?dl=0 (.m file)