**Signals And Systems**

**Assignment 3**

I operated the signal using optimised Discrete time Fourier transform.

I have effectively implemented the Fast Fourier Transform algorithm.

I operated using 1/30th time the highest frequency component magnitude, as other components will be negligible compared to this signal.

The Fourier transform gives a symmetrical frequency response as is expected.

The inverse Fourier Transform recreates the original signal.

Optimization was done following the fast fourier transform which is an nlog(n) algorithm

By taking 0.8\*bandwidth, some of the noise was reduced and the overall pitch of the sound seemed to shift towards higher side. This might be due to presence of a large amount of low frequency noise.

Phase response is also plotted.

At phase 0, we obtain a spike in the time domain.

