**SIGNAL AND IMAGE PROCESSING**

**COURSE PROJECT 1**

**(AUDIO SIGNAL FILTERING)**

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1. **Original signal time domain plot.**



1. **FFT of original signal**



1. **Noisy signal time domain plot**



**(iv) FFT of Noisy signal**



**(v) FFT of filtered signal(1st Filter)**



**(vi) time domain plot of filtered signal(1st Filter)**

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**CONCLUSION:**

In this course project we have original audio signal and noisy signal .so we have to remove this unwanted freq from noisy signal to get back our original signal. I have plotted time domain plots for original and noisy signal , FFT of original and noisy signal and observed the variation in FFT of noisy signal over original signal.so I used 2 filters to remove this particular freq .so 1st of all I used low pass filter and I have removed some freq and filter the signal in given freq . Then I have used band stop filter and got the FFT nearly same as the original signal and from that I also able to hear my voice very much clear but not fully clear there is some variance may occur.

**LEARNING OUTCOME:**

From this course project I have learnt many things as follows:

* I get the knowledge about sci-py library.
* I am well understood about how to read and write a signal.
* I am able to plot that audio signal.
* I come to know about different window functions. like hanning , blackmanharris etc.
* I also learn how to apply a filter to noisy signal .
* I get knowledge about different types of filter.
* I have learnt how to compare the signals and their FFTs .
* The main thing we learn from this project is noise reduction concept. How the software or whatever the function use in market.

**!! THANK YOU !!**