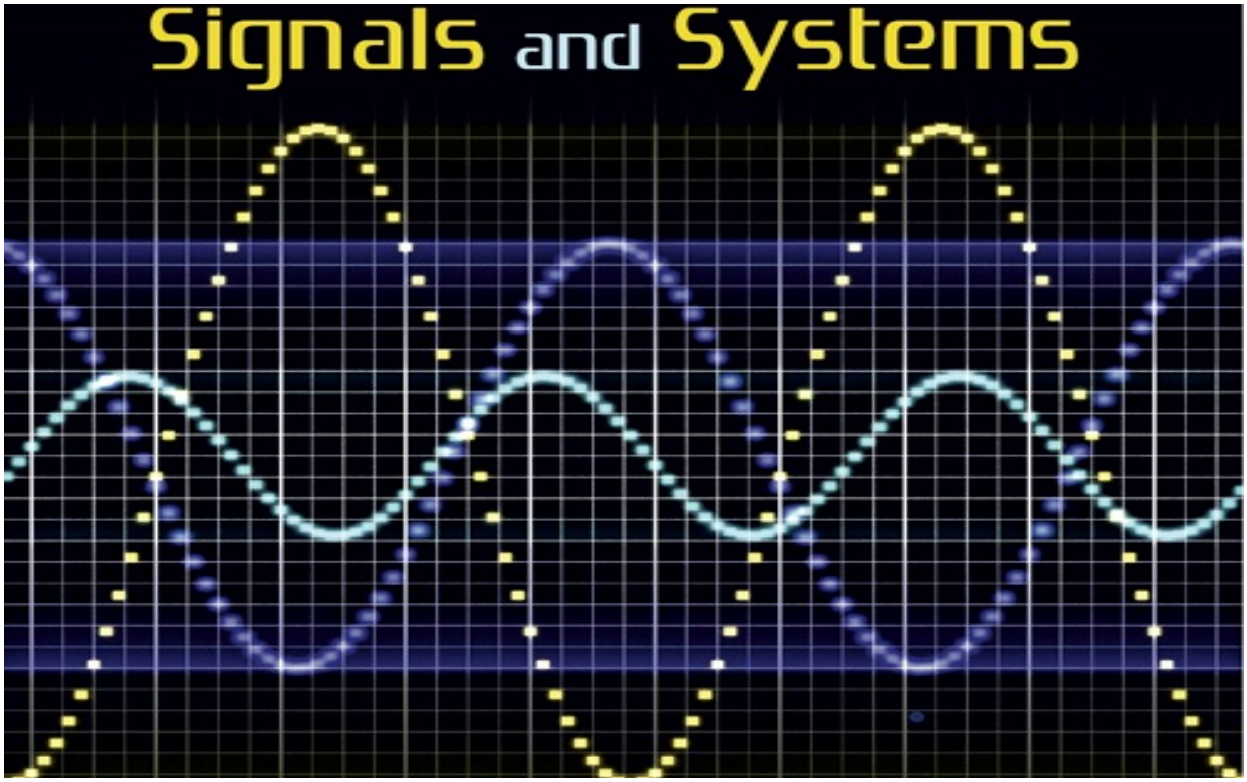
# Project Report
# For
# PROGRAMMING ASSIGNMENT
## Signals and Systems
## (EEL2010)
## IIT JODHPUR




By:-

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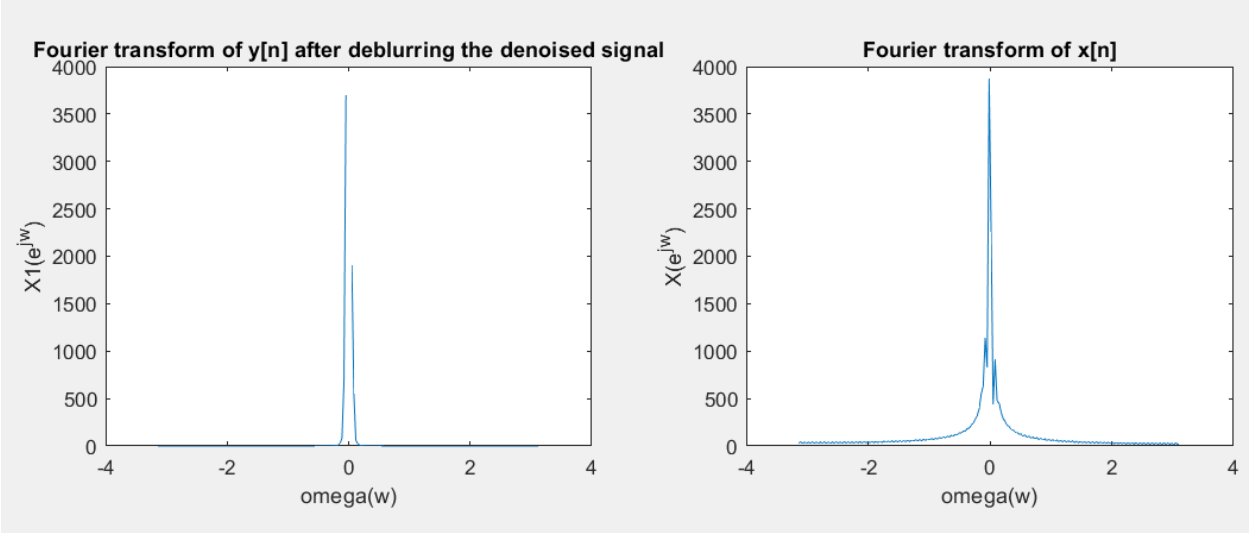
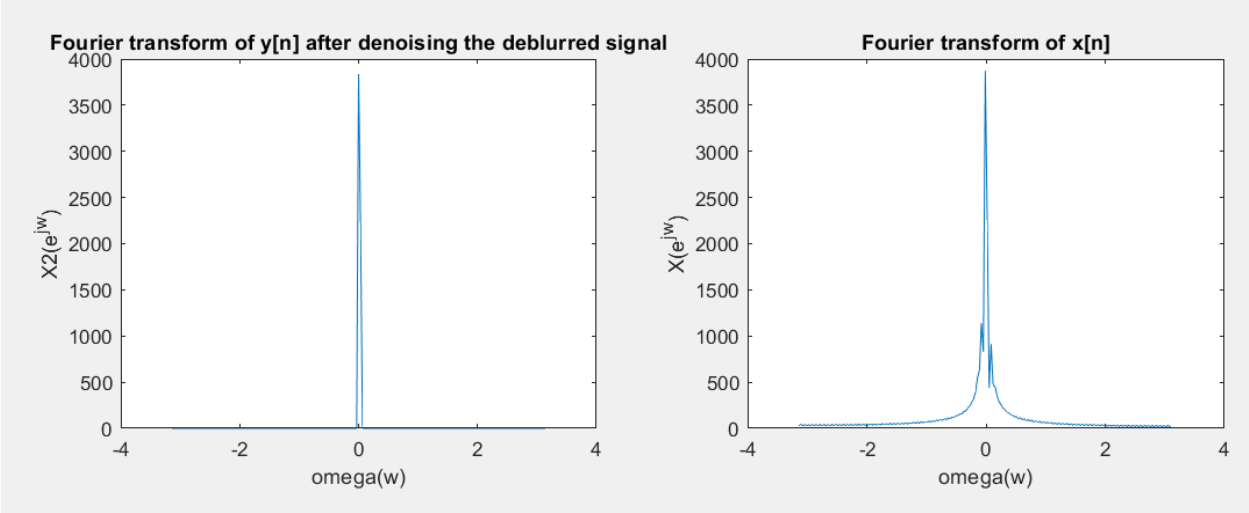
# RESULT:

- First approach:  That is, first denoising and then deblurring the signal .In the result, we have shown the two figures showing the fourier transform of x1[n] and fourier transform of x[n]




- Second approach:  That is first sharpen(deblur) and then denoise the signal. As a result we get $x_2[n]$. Below given are the two figures showing the fourier transform of x2[n] and fourier transform of x[n].




# OBSERVATIONS AND CONCLUSION:

- While denoising ,we noticed that neighboring terms generally have the same values by using low pass filter.
- So, Fourier transform and Inverse Fourier transform can be used to denoise and deblur a signal to enhance its quality.
- After comparing the output of both approaches with the original pure signal ,we came to the conclusion that both methods give almost the same output and both are appropriate ways.

# THEORETICAL EXPLANATIONS:

We have been given x[n] (true temperatures) .then some noise and blur distortions have been added to the signal and we get an impure signal y[n].So, the signal y[n] needs to be processed so that we can recover x[n] from it.

- For the first way of approach, let's say first denoising will have h1[n] as impulse response and deblurring has h2[n] as impulse response.
- Then after denoising the input(y[n]) the output (let's say v[n]) is the convolution sum of y[n] and h1[n].
- And after deblurring the denoised signal, the output will be the convolution sum of v[n] and h2[n].
- Final output (x1[n]) will be the convolution of h2[n] with the convolution of h1[n] and y[n].
- For the second way of approach, let's say first deblurring will have h1[n] as impulse response and denoising has h2[n] as impulse response.
- Then after deblurring the input(y[n]) the output (let's say u[n]) is the convolution sum of y[n] and h1[n].And after denoising the deblurred signal, the output will be the convolution sum of u[n] and h2[n].

- Final output (x2[n]) will be the convolution of h2[n] with the convolution of h1[n] and y[n].

➢ From both ways, we get the same output.
➢ Thus both approaches are appropriate.