

## **Digital Image Processing Assignment -3**

### **Part A**

In this assignment we would compute the fourier transformations of a two dimensional array. The transformation we calculate are Forward Fourier transform, Inverse Fourier transform, Magnitude of DFT, Discrete Cosine transformation. The calculations would be made manually.

### **Part B**

Here we would apply filters on the image and we find how the image would look like when we apply different types of filters. We would be applying ideal low pass filter, ideal high pass filter, Butterworth low pass filter, Butterworth high pass filter, Gaussian low pass filter, Gaussian filter.

We would first calculate the fft of the image then shift the fft to center the low frequencies. Then we would get the mask like ideal low pass filter. We then apply the mask to the center shifted fft. We will compute the inverse shift and compute inverse fourier transform. We will then compute the magnitude. We would then do a full contrast stretch on the magnitude to get the image. This way we would get the filtered image.

### **Observations**

1. I have observed that the ideal low pass, high pass filtered images would have a ringing effect on them.
2. The butterworth filters would have a ringing effect on high values of order otherwise i have observed no ringing effect.
3. Gaussian filtered images would not have any ringing effect.
4. All the low passed filtered images would smooth the images whereas the high pass filtered images would only give the sharp part of images.
5. As we have applied full contrast stretch we are able to see the magnitude images properly.