DIGITAL IMAGE PROCESSING 1

UE20EC317

Unit 2: Home Assignment Questions

1. After converting to grayscale, perform discrete cosine transform on lena.png.
   (a) Display the result.
   (b) Set all values in the DCT matrix that are less than magnitude 50 to zero.
   (c) Now perform inverse discrete cosine transform on the image.
   (d) Using subplots, compare the two images and write your observations.
   (e) Also compare the quality in terms of Peak signal to noise ratio (PSNR)

2. Compute DST and IDST for Barbara image by writing a function to obtain the transformation kernel. Use subplots to compare the original image, the transformed image and the image obtained after performing IDST. (convert the image to grayscale and check if the rows and columns are equal if not resize it) (**Use :**

ψ(m,n) $= \sqrt{\dfrac{2}{N+1}} \dfrac{sin\pi(k+1)(n+1)}{N+1}; 0 \le k, n \le N-1$**, where ψ is the N x N sine transform matrix**)

3. After converting to grayscale, perform Discrete Sine Transform on lena.png.
(a) Display the result.
(b) Set all values in the DST matrix that are less than magnitude 0.5 to zero.
(c) Now perform inverse discrete sine transform on the image.
(d) Using subplots, compare the two images and write your observations.
(e) Also compare the quality in terms of Peak signal to noise ratio (PSNR)

4. Compute the Walsh Hadamard transform of Lena. Truncate values below 1. Reconstruct the image and compare the sizes.

5. Compute DFT and IDFT for the given image