Digital Image Processing
ASSN. 2

Basic Denoising:
Mean Filter, SP noise
PSNR - 29.53325790858461 db, Filter Size - 3
Mean Filter, Gaussian noise
PSNR - 13.415237824832912 db, Filter Size - 3
Median Filter, SP noise
PSNR - 32.83349170610384, Filter Size - 3
Median Filter, Gaussian noise
PSNR - 30.44411576438719 Filter Size -3

Edge Preserve Smoothing:
Implemented anisotropic distribution

Weiner Filtering:
(Mag(noise), Mag(Noise_fouriertransform),ratio):

(6550669.1117141405, 1717218603621.1401, 3.814697265625114e-06)
(9469509.551896876, 2482375111972.4434, 3.814697265625017e-06)
(12865269.044730226, 3372553088461.8306, 3.8146972656249204e-06)
(16742541.241024716, 4388956731087.1772, 3.814697265625005e-06)
(21264225.536767393, 5574289139110.256, 3.814697265625065e-06)

As we can see above ratio of the magnitudes of all these come out to be same

Real World Image Restoration:
Shan - Used stepwise horizontal PSF as a point source of light is visible and refined the PSF to get the best results. Assumed the noise to be gaussian and tried with different variances.

Bharti - Assumed circulsr_psf and Gaussian noise and then tried to refine image by changing value of the radius of PSF gradually to get better results by means of Weiner filtering.

Note: Images are provided in image folder attached with the assignment