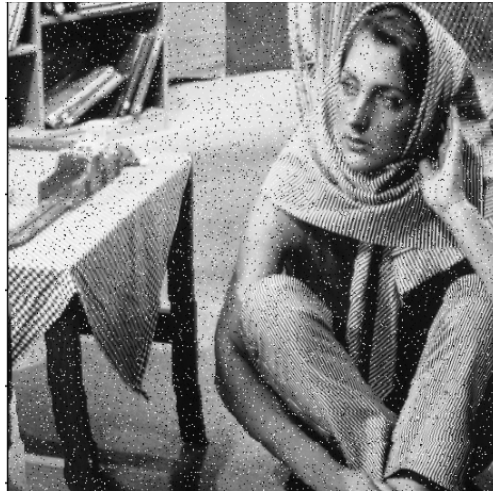


- 1) In this question, we corrupt the images and try to restore them  
a) 5% corrupted



i)



ii)

iii) PSNR = 32.84663762661696

iv) The filter used is 3x3 Median

- b) 15% corrupted



i)



ii)

iii) PSNR = 32.48222973886923

iv) The filter used is 3x3 Median

c) 20% corrupted



i)



ii)

iii) PSNR = 32.31021629807359

iv) The filter used is 3x3 Median

d) 25% corrupted



i)



ii)

iii) PSNR = 32.126698871420075

iv) 3x3 Median filter

Question 2

1) Bi-cubic



PNSR = 31.210447462381886

2) Bi-linear



PNSR = 33.36153259788275

3) Nearest Neighbour



PSNR = 33.96835572943057

4) Hermite



PSNR = 33.503042853868976

5) B-spline (Bell)



PSNR = 31.83930871851144

Now, in this part, I made a kernel for each filter using the definitions given in the lecture notes. Unfortunately, in the notes, the kernel given was 1-D. Now that kernel definition was used to make a kernel 1-D. With that 1-D kernel, I took an outer product with itself to make it a 2-D matrix. Now, this matrix shows the effect of a particular pixel on its neighbouring pixels.

Ex

$[\frac{1}{4}, \frac{1}{2}, \frac{1}{4}]$

$[\frac{1}{2}, 1, \frac{1}{2}]$

$[\frac{1}{4}, \frac{1}{2}, \frac{1}{4}]$

This matrix shows that in the small image pixel at  $i, j$  has  $w = 1$  effect on  $\text{multiplication\_size} * i, \text{multiplication\_size} * j$ , and  $\frac{1}{2}$  weight on  $\text{multiplication\_size} * i + 1, \text{multiplication\_size} * j$ .