

Q1. On the Barbara image you have to simulate salt and pepper noise. Then you have to implement the median filter to denoise it. Then you need to compute the Peak Signal to Noise Ratio (PSNR) between the clean image and denoised image.

Images need to be embedded in the following table. You will need to specify the best window size for each level of noise.

Noisy Image	Noisy Image [embed]	Best Denoised Image [embed]	PSNR	Parameter(s) of median filter for best denoising
5% corrupted pixels			14.648853800338	3X3 median filter
15% corrupted pixels			13.944563722340	5X5 median filter
20% corrupted pixels			13.870487263134	5X5 median filter
25% corrupted pixels			13.714843995999	7X7 median filter

5 marks

Q2. Take the cameraman image. Now reduce its size by 16 times, i.e. if the original image is 256x256, your reduced image should be 64x64. Your task is to super-resolve the 64x64 image by 16 times.

This question is kept intentionally open ended. Try out 5 interpolation kernels (e.g. nearest neighbour, linear, splines etc.) from the class notes to get the best results. You can compare the results based on PSNR between the original 256x256 image and the super-resolved image.

Interpolation Kernel	PSNR	Embed super-resolved Image
NN	24.9624578913201	
BiLinear	24.9712957170519	
Bell	22.4324853281213	
Bilinear Area	22.1445435318272	
Hermite	22.5247893682561	

5 marks