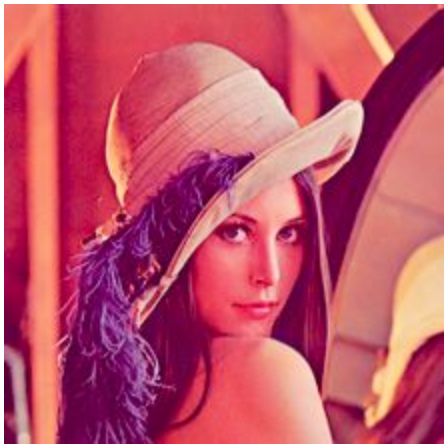

Assignment-1
Zaid Khan (B16CS038)

Answer 1

Original image



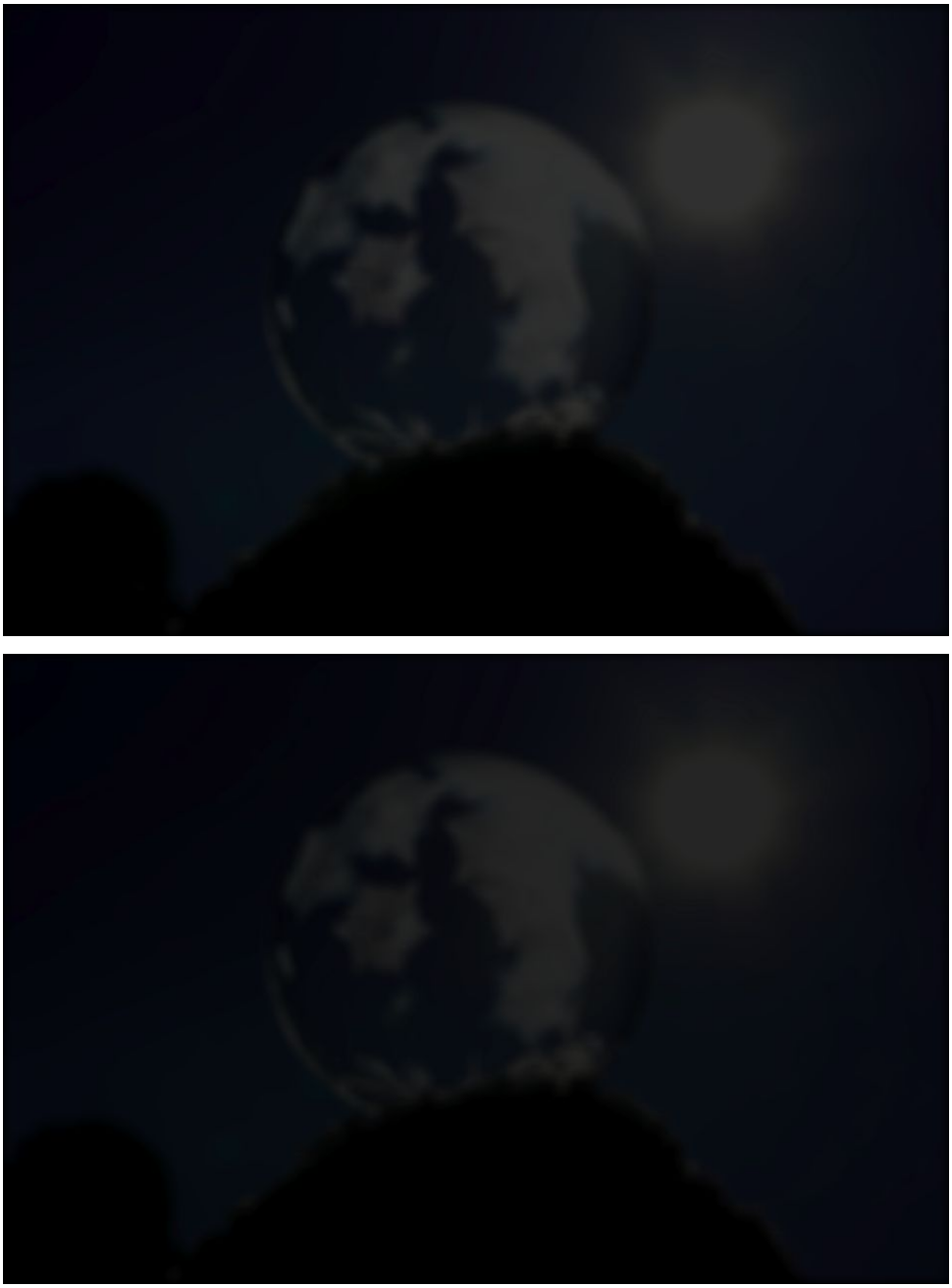
I0 (grayscale image)

h matrix

-1	0	1
-2	0	2
-1	0	1

I1 (result after convolution)

Answer 2 (i) sigma is directly proportional to smoothing. Smaller sigma: limited smoothing Larger sigma: Strong smoothing. Larger the size of the filter more is the blurring.



Figures in the order they appear above : (i) Output with a 3 x 3 kernel with sigma = 3 (ii) Output with a 5 x 5 kernel with sigma = 3 (iii) Output with a 11 x 11 kernel with sigma = 3 (iv) Output with a 15 x 15 kernel with sigma = 3 (v) Output with a 15 x 15 kernel with sigma = 5 (vi) Output with a 15 x 15 kernel with sigma = 7 (vii) Output with a 15 x 15 kernel with sigma = 9 (viii) Output with a 15 x 15 kernel with sigma = 11 (ix) Output with a 15 x 15 kernel with sigma = 13 (x) Output with a 15 x 15 kernel with sigma = 15

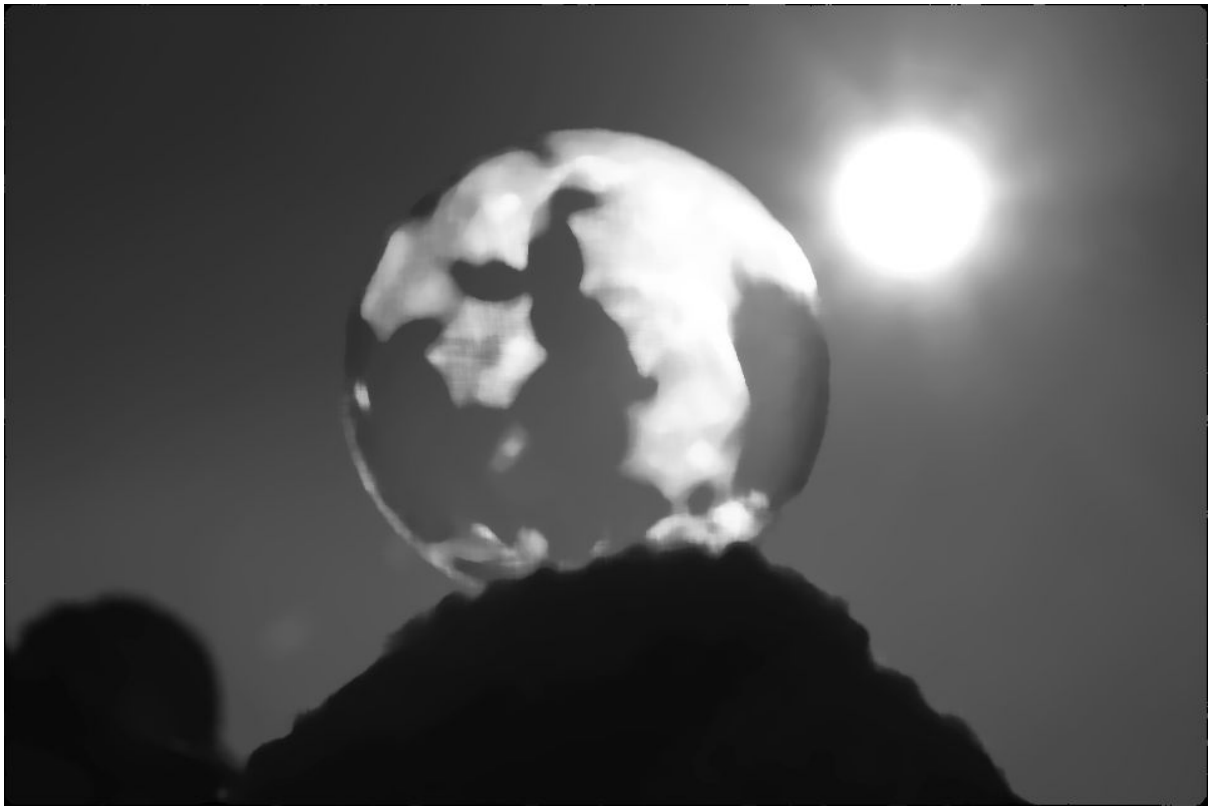
(ii) Image is getting more and more blurred as we increase the kernel size

Salt and paper noised image

Output with kernel size 3

Output with kernel size 5

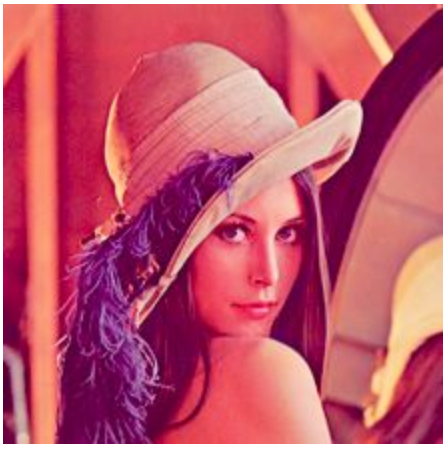
Output with kernel size 11



Output with kernel size 15

Question 3

Original image



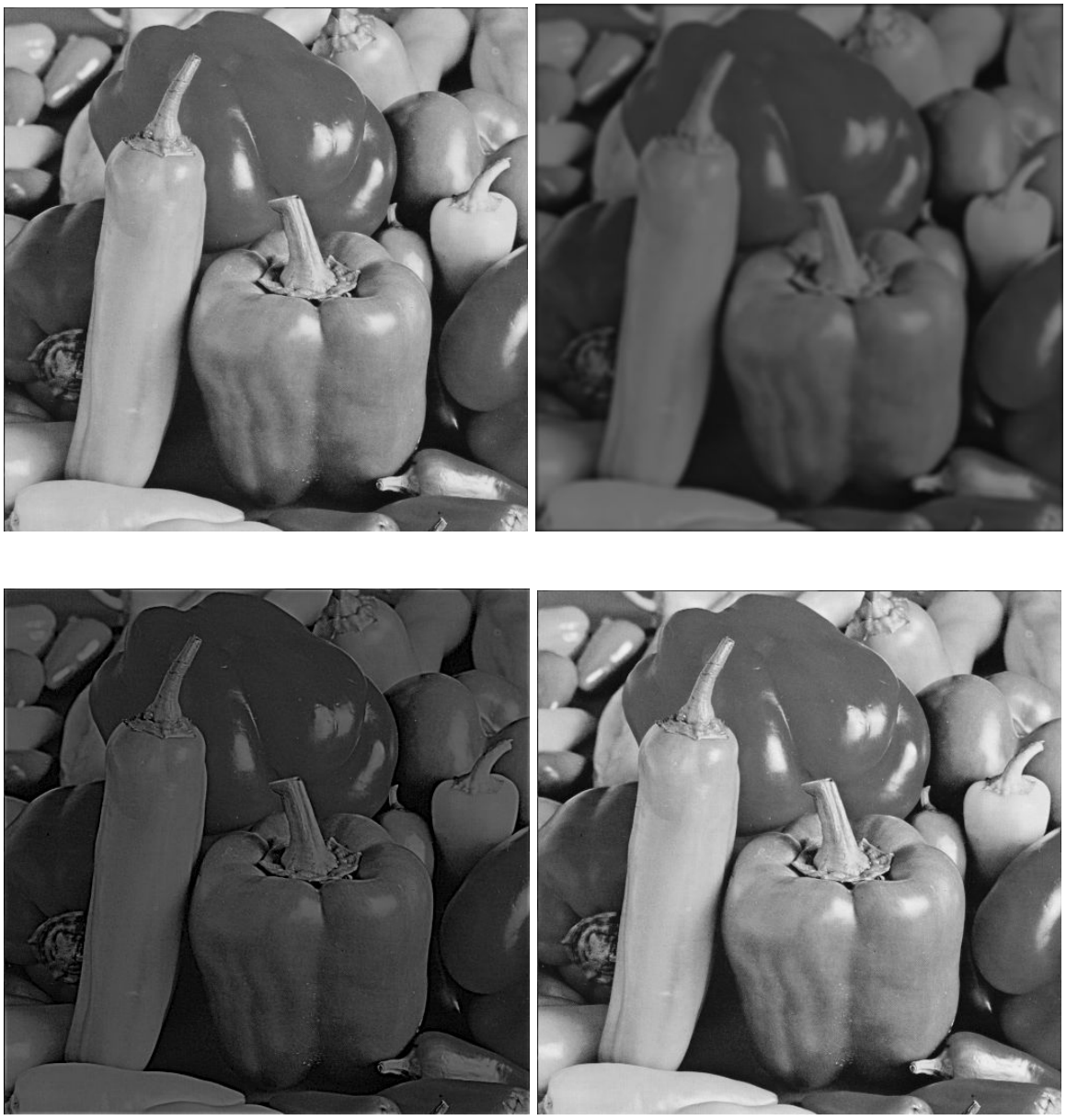
Output after sharpening

Output after edge detection

Output after sharpening + edge detection

Edge detection using canny edge detection

Question 4



Figures in the order they appear above : (i) Grayscale image (ii) Output after blurring with a 7x7 gaussian filter with sigma = 3 (iii) Grayscale image - blurred image (iv) Grayscale image + 0.1 * (Grayscale image - blurred image)

Question 5

(i)

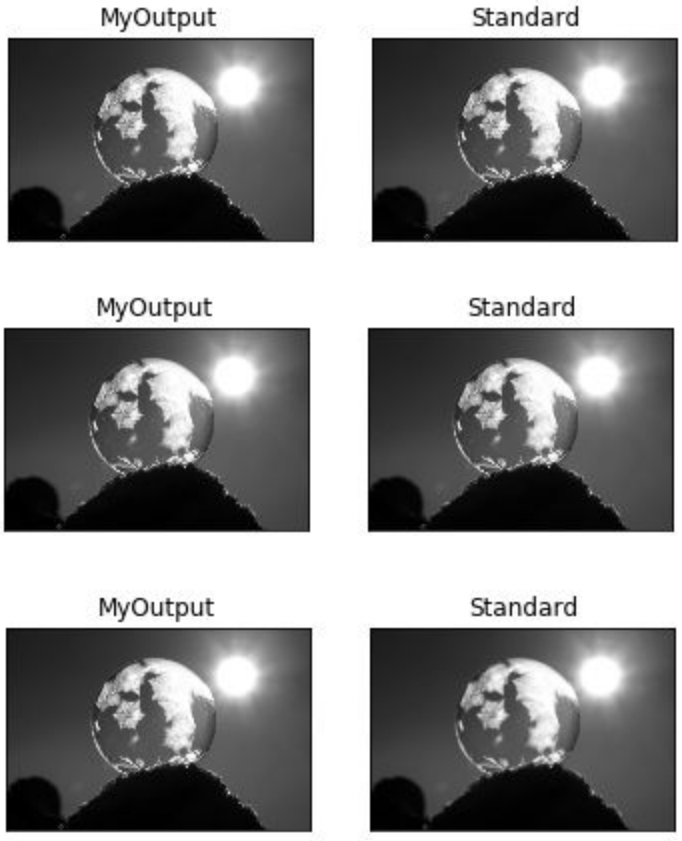
Gray Image

Standard O/P

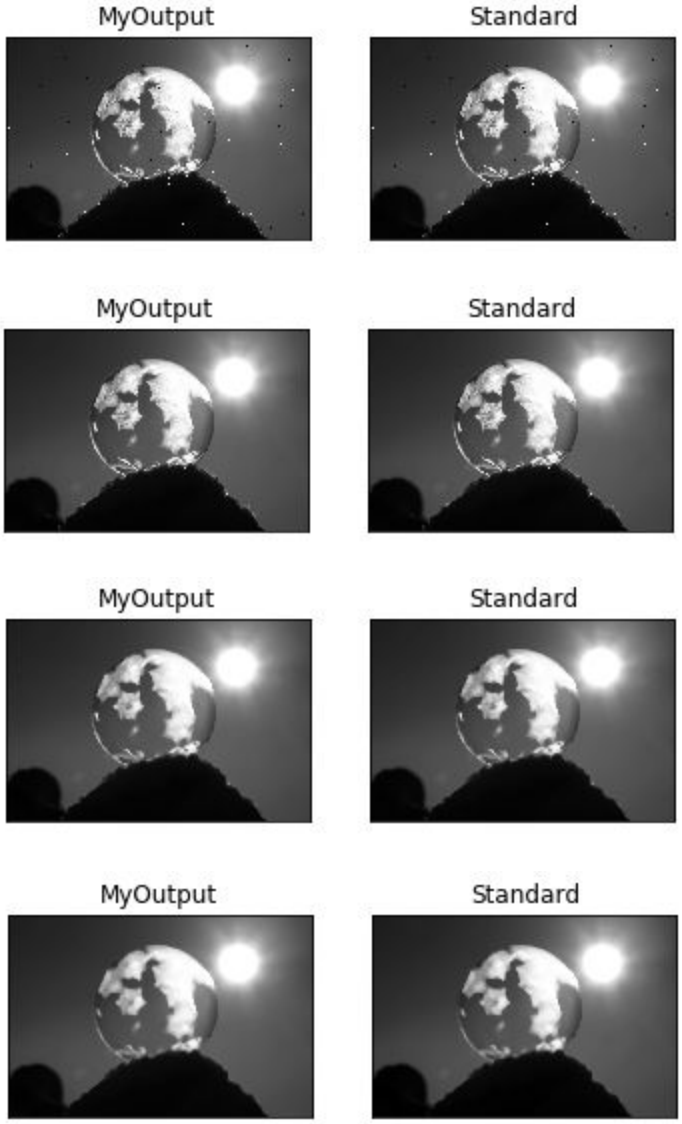
My Output

(ii)

(a) Results with kernel size 3, 5, 11, 15. No significant visual difference between my output and output obtained using standard function.



(b) Median filtering results with filter sizes 3, 5, 11, 15



Output for this section is also the same

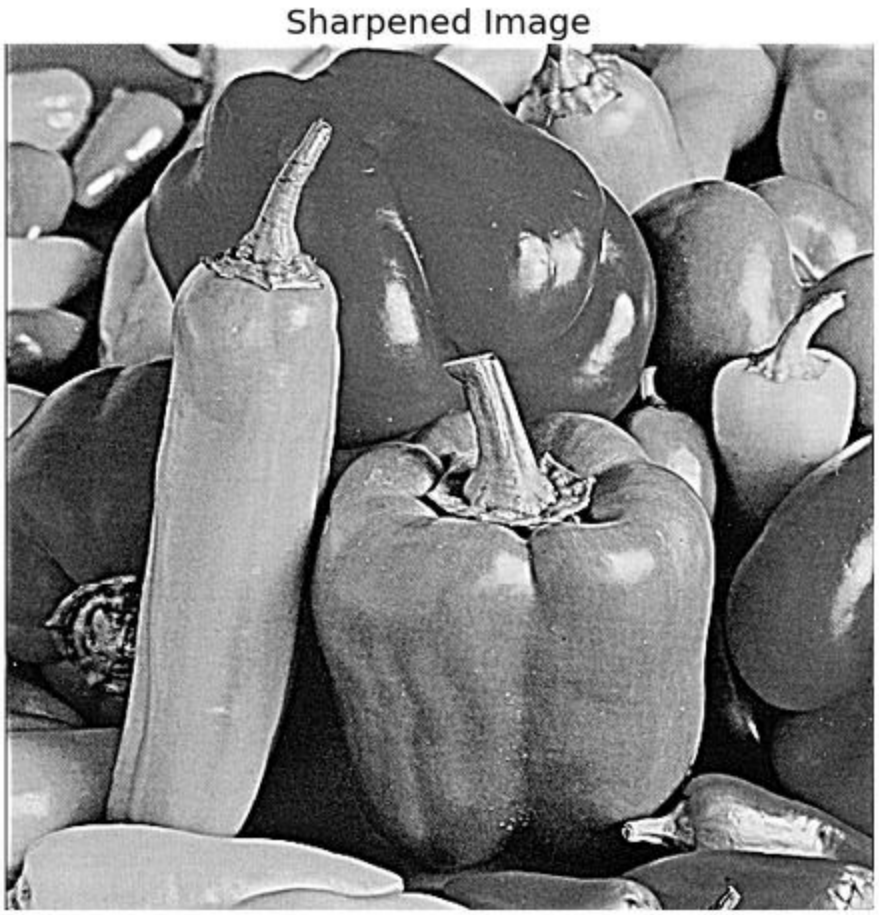
(iii)

My results are better because I have guaranteed connection between the broken edges

Sharpen image using the library function

(iv)

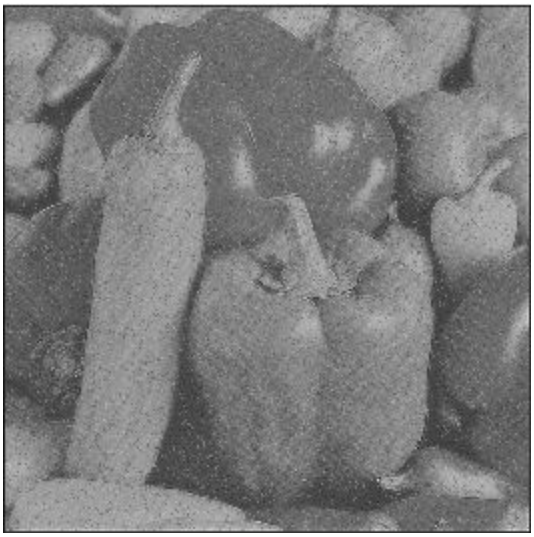
My result are better than the results obtained using standard library function.



Question 6

Original image

Output Image



Pre processed Image