COMPUTER VISION

Assignment 3

1) Median filter,
2) Adaptive median filter,
3) Homomorphic filter

Submitted By:
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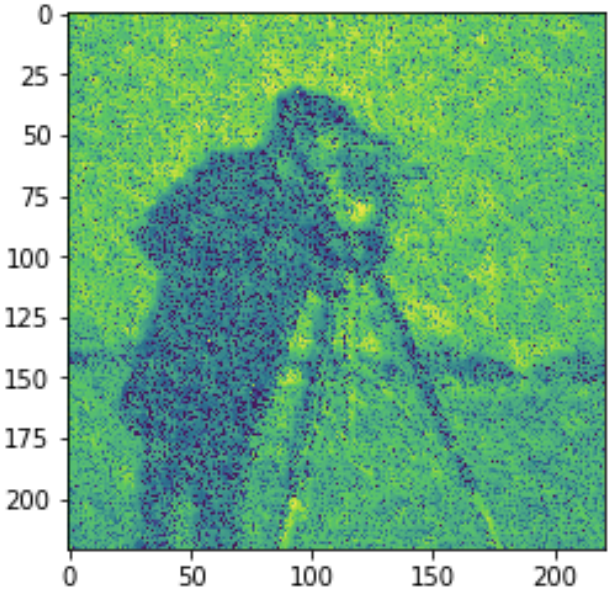
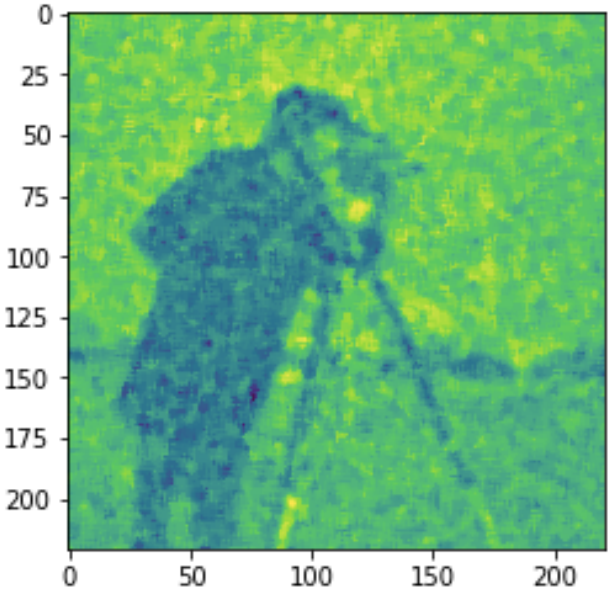
Median Filtering

I took a salt and pepper image for testing the algorithm and as I can compare the output with that of adaptive median filtering on salt and pepper images.

For this I used a filter of size 5 x 5. Output image lacks details and appeared completely blurred.



Reference Image



Output Image

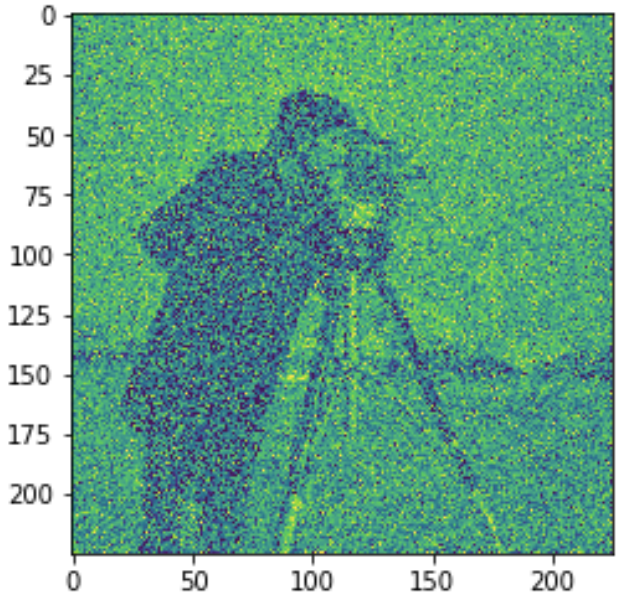
Adaptive Median Filtering

I took a salt and pepper image for testing the algorithm and as effect of adaptive median filtering can be best observed on processing salt and pepper images.

Filter size used is 5 x 5.

I used the threshold value of 0.7 for this purpose. The edge information of the image is lost and image appears really smoothened after repetitively filtering image with same filter.

After implementing I got an image which is shown below.



Reference Image

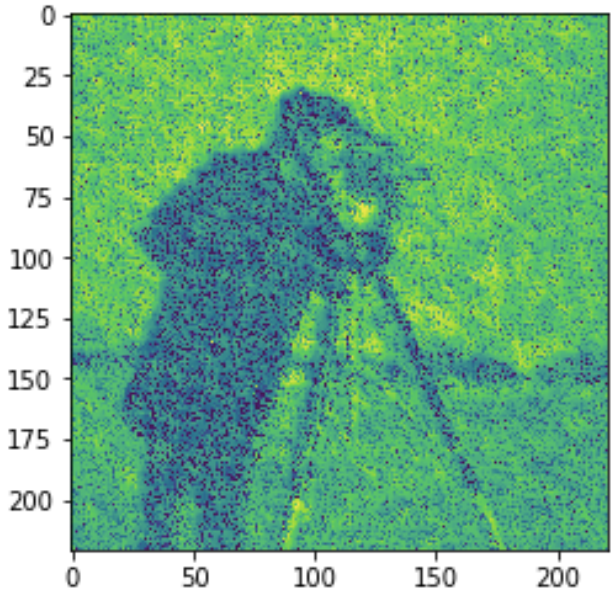


Image after 1 filtering

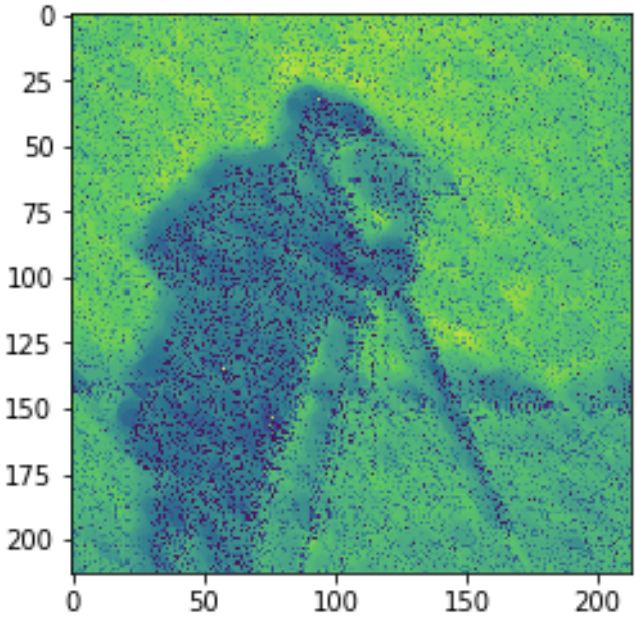


Image after 3 filtering

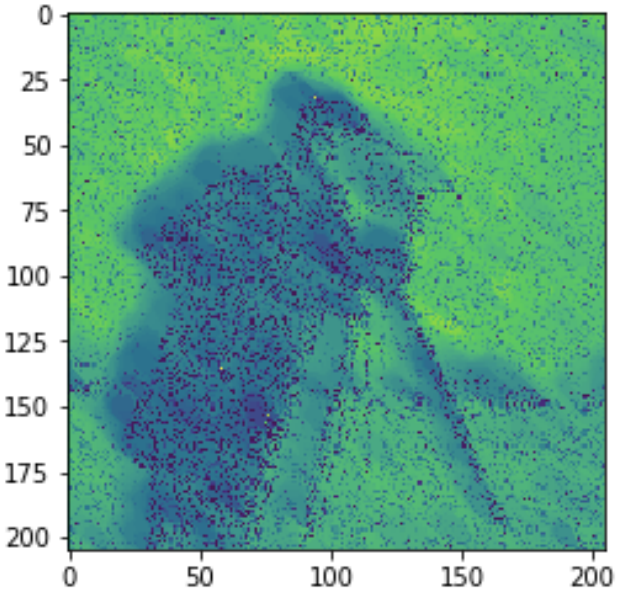


Image after 5 filtering

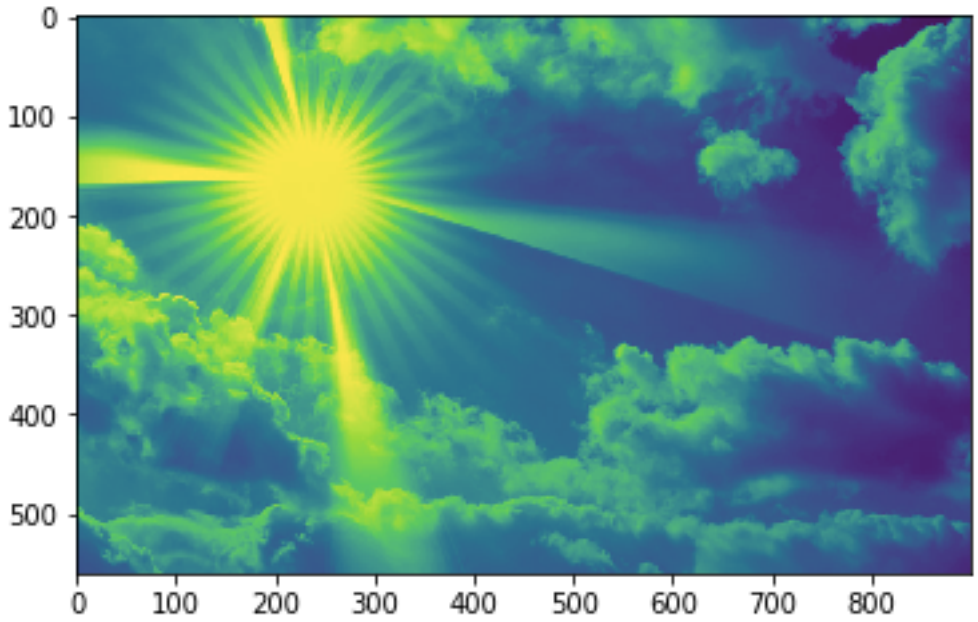
Inference

Image is smoothened and appears number of grains reduce as the image is filtered.

As we pass the image more number of times through the filter image becomes more blurred and noise clusters at different locations in the image as bigger chunks.

Homomorphic Filtering

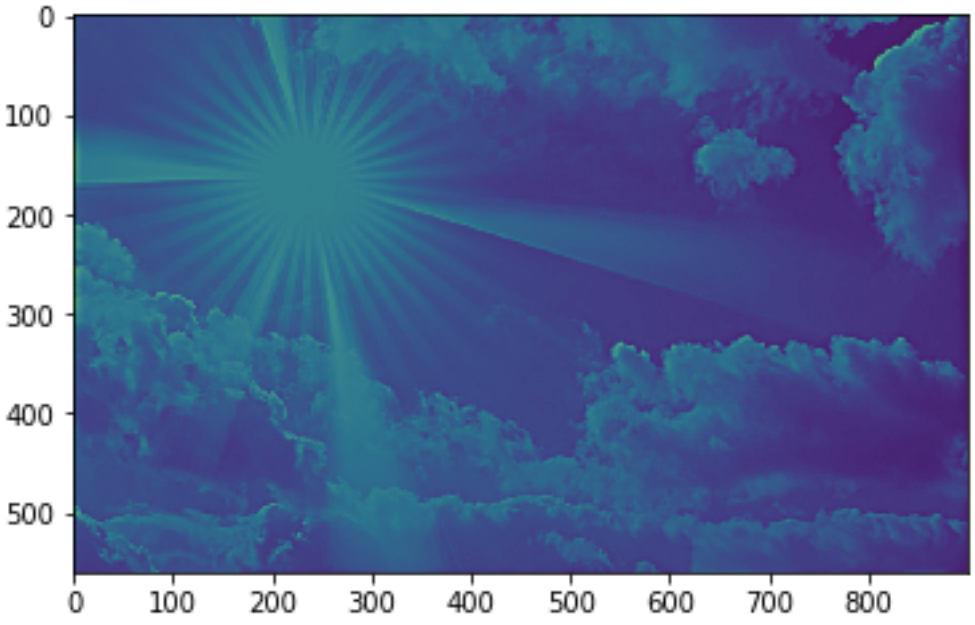
I took an image of sunlight with beams through the clouds as this filter is used to remove multiplicative noise and illumination of the image.



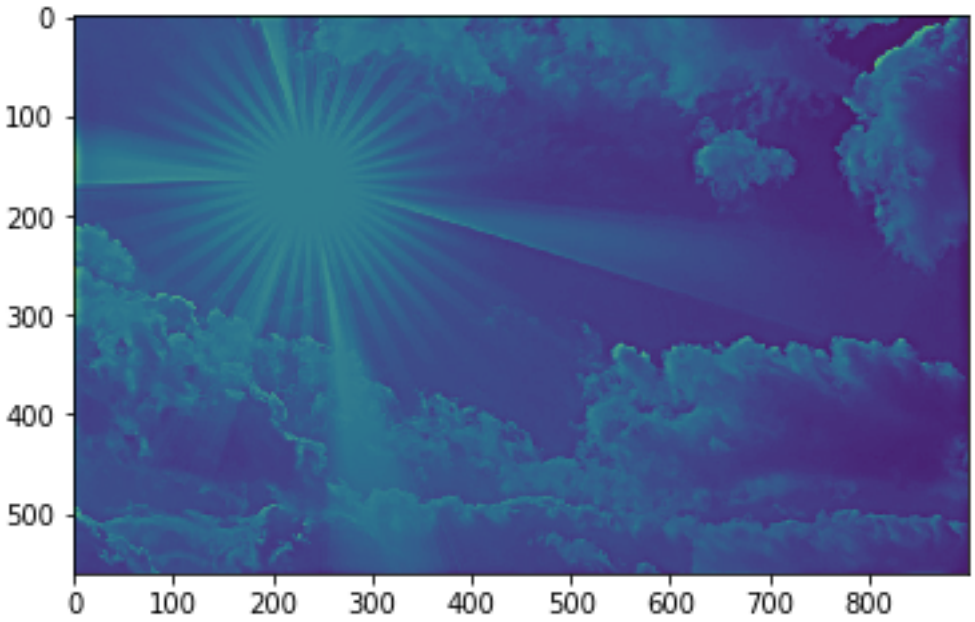
Reference Image

Output image was having less contrast than original image and appeared completely greyish.

Given below is output image with Gaussian high pass filtering and parameters a=0.75 and b=1.25



Given below is output image with Butterworth high pass filtering and parameters a=0.75 and b=1.25 which is slightly brighter than Gaussian.



Inference

Gaussian High pass filter produced slightly brighter images than butterworth high pass filter.

Output image varies with parameters a and b, and acts inversely on varying a and b ie when a is increased and b is decreased output is similar.