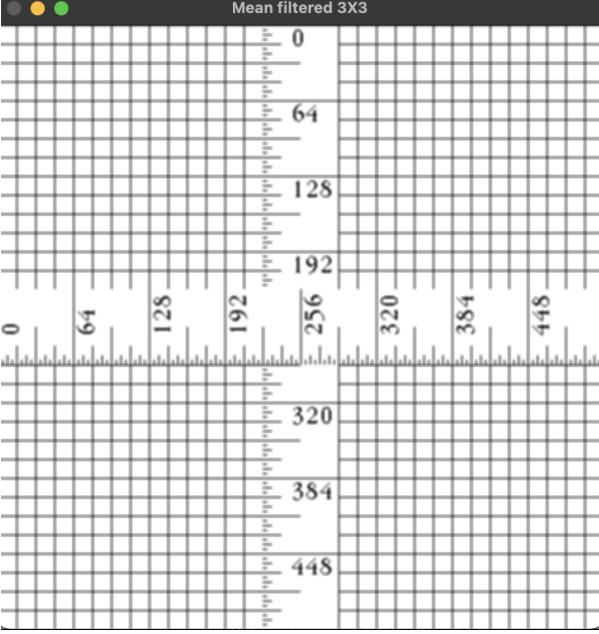
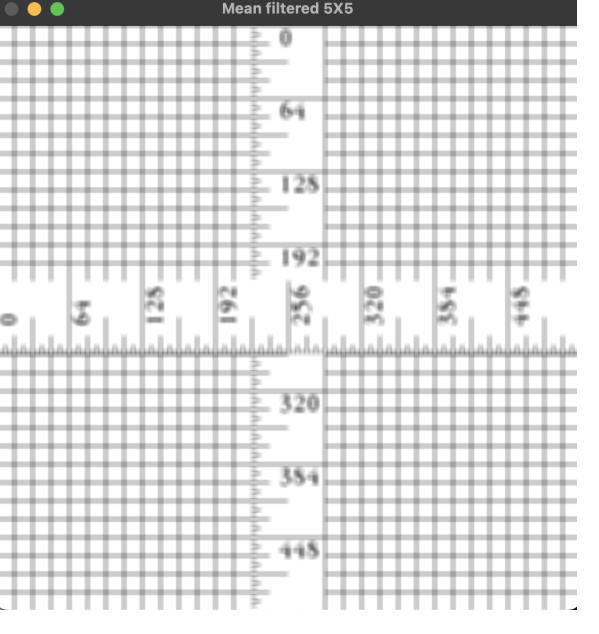
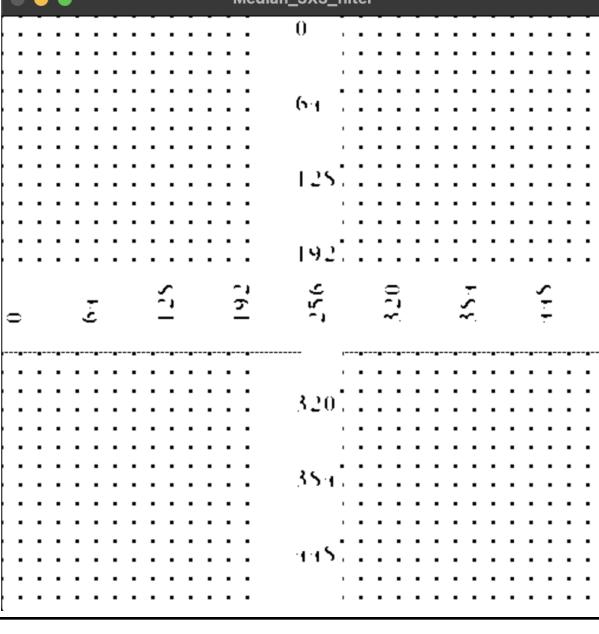
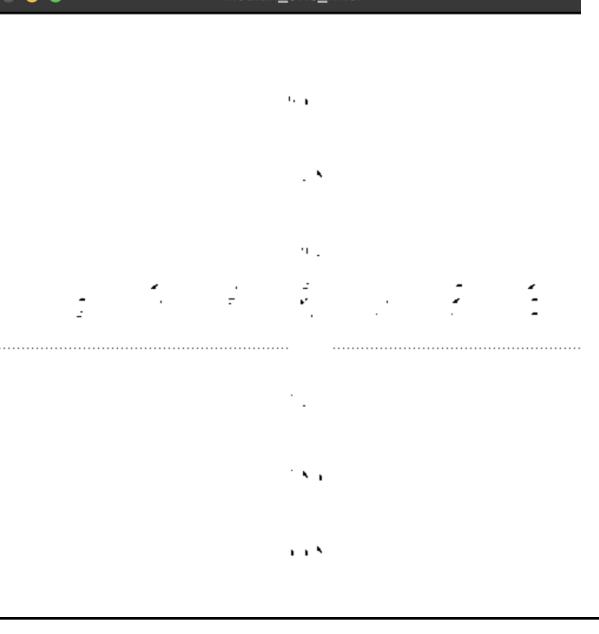


PALLAV SINGLA

2020225

Implement a simple mean filter of kernel 3x3 and 5x5. Also implement a median filter of the same size kernels. Apply it on the ‘ruler’ image sent for the assignment. 4

The images need to be embedded in the following table (remove the [...] and embed the corresponding image).

	Kernel Size 3x3	Kernel Size 5x5
Mean Filter		
Median Filter		

Which of these two filters preserves the edges better and why?

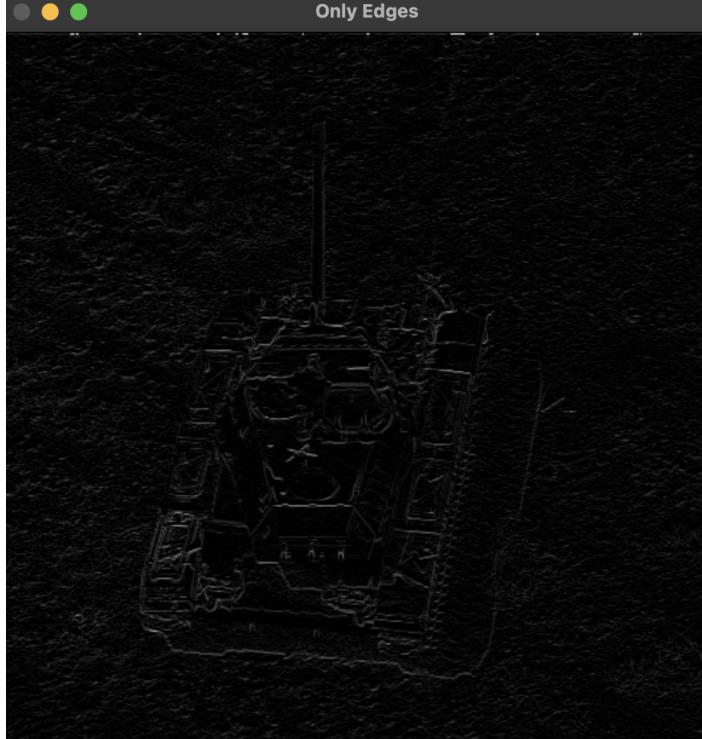
The median filter preserves the value edges better when compared with the mean filter. As one can see from the results, the mean filter is used for blurring the image well, and in the median filter as the values taken are the median of the pixel value itself. That's why the edges are preserved, as it doesn't have some value which is not present in the pixel.

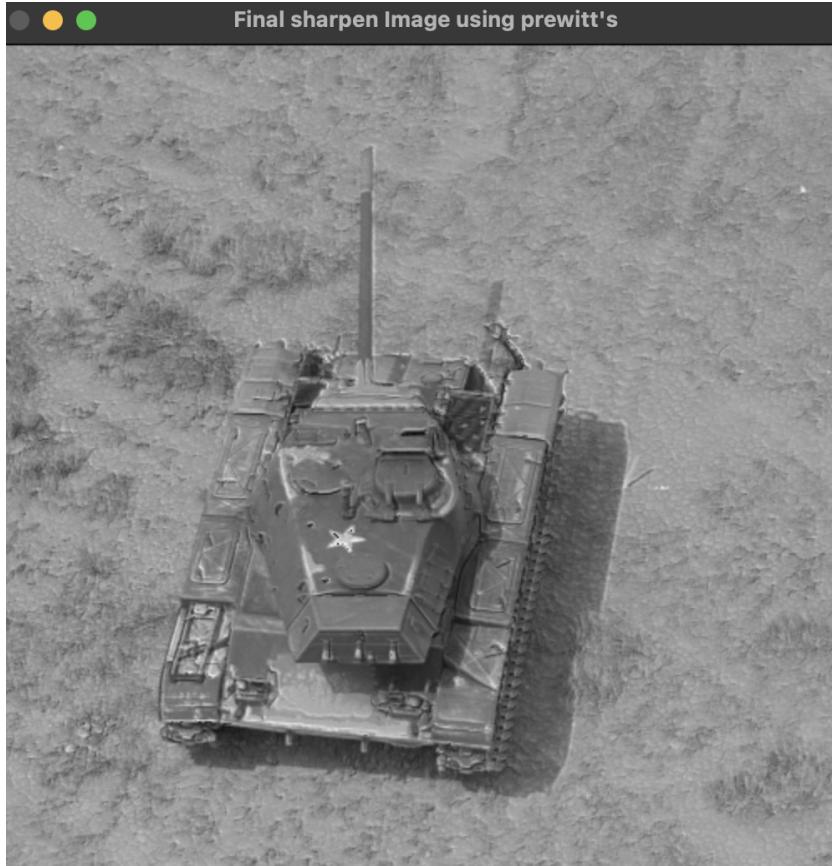
If we can see the image after applying the 5X5 median filter, only edges can be seen there, and in the 3X3 median filter, numbers started diminishing.

The mean filter gives the blur effect, which depends on the size of the filter, less blur in the 3X3 filter and more in the 5X5 filter.

Sharpen the ‘tank’ image using first and second order techniques. Embed the resulting images in the following table. 6

First Order	
Sobel Method	 A grayscale image of a tank from a top-down perspective, showing its tracks, hull, and turret. The image has been processed using the Sobel method to enhance edges, making the boundaries between the tank and the grassy background more distinct. The image is titled "Final sharpen Image using Sobel" at the top.

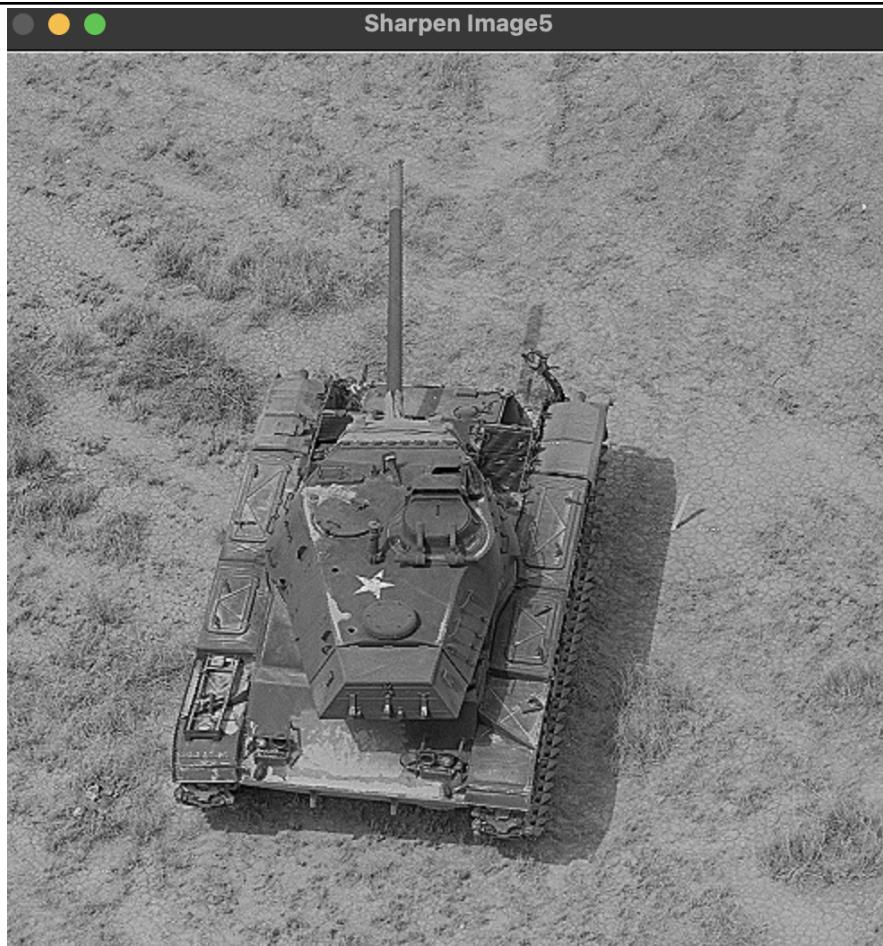
	
Robert method	 <p>Edges:</p>

	 <p>Only Edges</p> A grayscale image showing the edges of a tank against a textured background. The edges are highlighted in white, while the background is dark. The tank's hull, tracks, and various structural components are clearly outlined.
Perwitt Method	 <p>Final sharpen Image using prewitt's</p> A grayscale image of a tank, appearing slightly darker than the original input image. The tank is centered and has a visible star symbol on its side. The background is a textured ground surface.

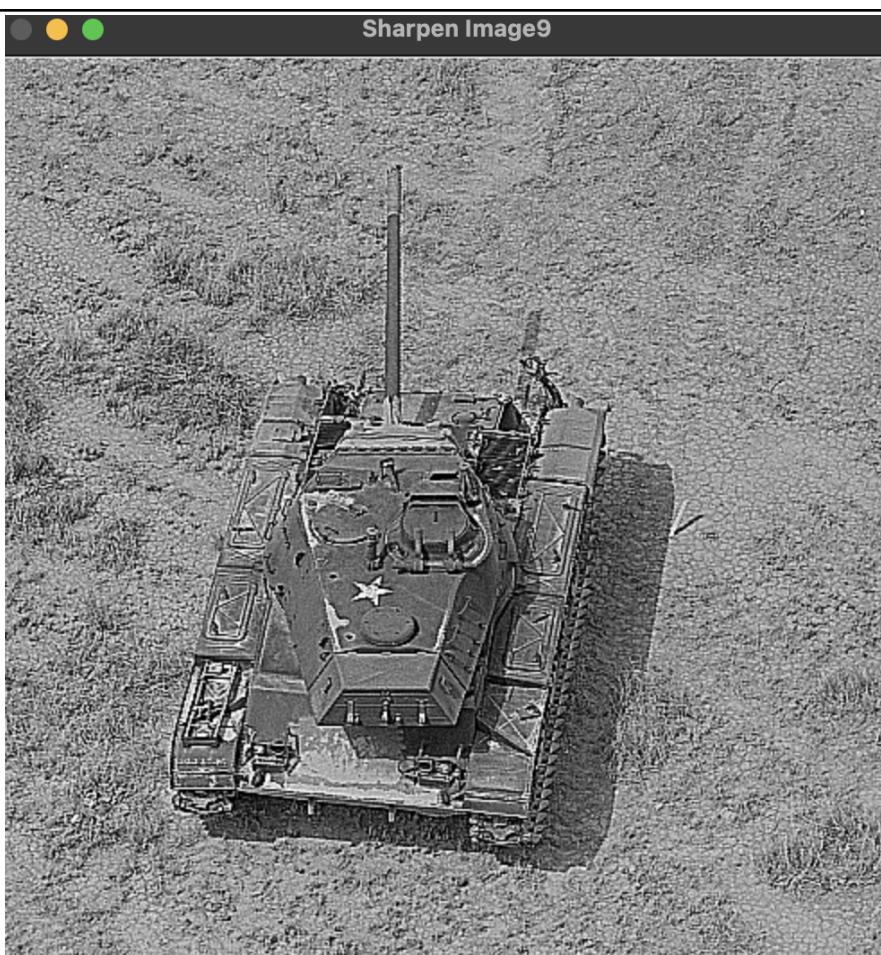


Second Order

Laplacian ->
3X3 mask



Enhanced
Laplacian
->3X3 mask



Unsharpening
g ->3X3
mask & 5X5
mask,
blur filter
used is
mean filter





Add more rows to the table if needed

This question is kept purposefully open ended. Not all the techniques have been discussed in class. Marks will be assigned based on ranking. Students with the best results will be given the highest marks (out of 2). The rest (4 marks) will be based on your effort, i.e. higher the effort higher will be the marks.

Experimental Review

If we increase the value of the mask in the laplacian filter from 5(middle value), we will see the darker part will remain, and other parts will start getting whitish; this I have found by changing the values of the mask. We can use this condition to get the required dark part from the image, more specifically, which can also look like if we want some specific thing from the image changing the value of the mask can solve that problem.

The best technique is Unsharpening as it reduces the noise in the image and one can get good quality of sharpen images. I have some screenshots in the zip folder for the same.