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Assignment 2
30th March 2019

Question A

A1a) Box Filter

Original Image

The above image shows the original image and after applying the filter the image is smoothened out and we see that as the size of the box filter increases the image is more blurred.
We have applied 2 box filters i.e. a 3x3 filter and a 5x5 filter and we see that the image after filtering with the 5x5 filter is more blurred when compared with the image generated by the 3x3 filter.

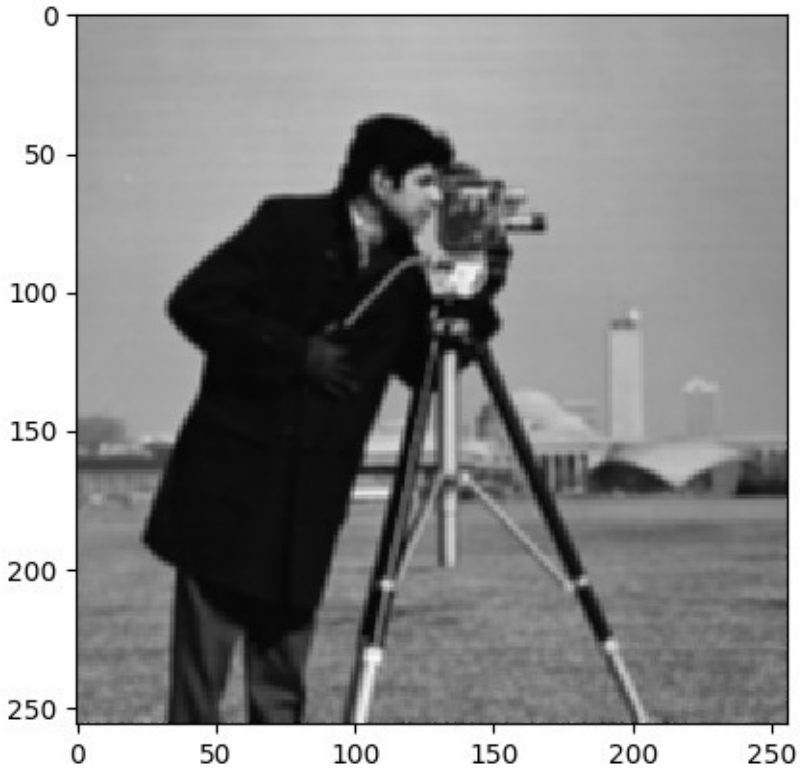


Image generated with 3x3 filter

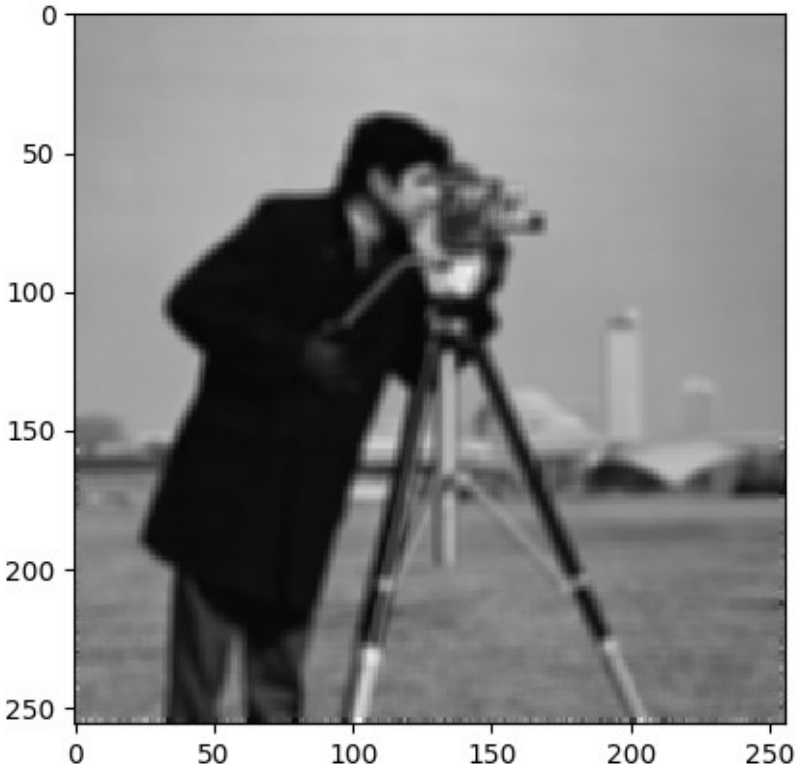


Image generated with 5x5 filter

A1b)

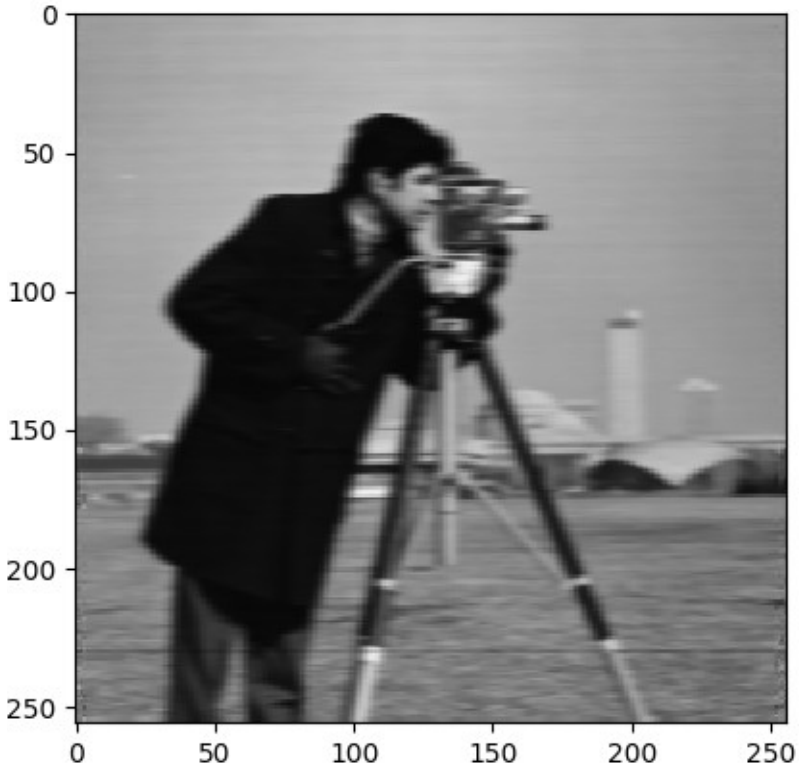


Image generated after applying the horizontal filter

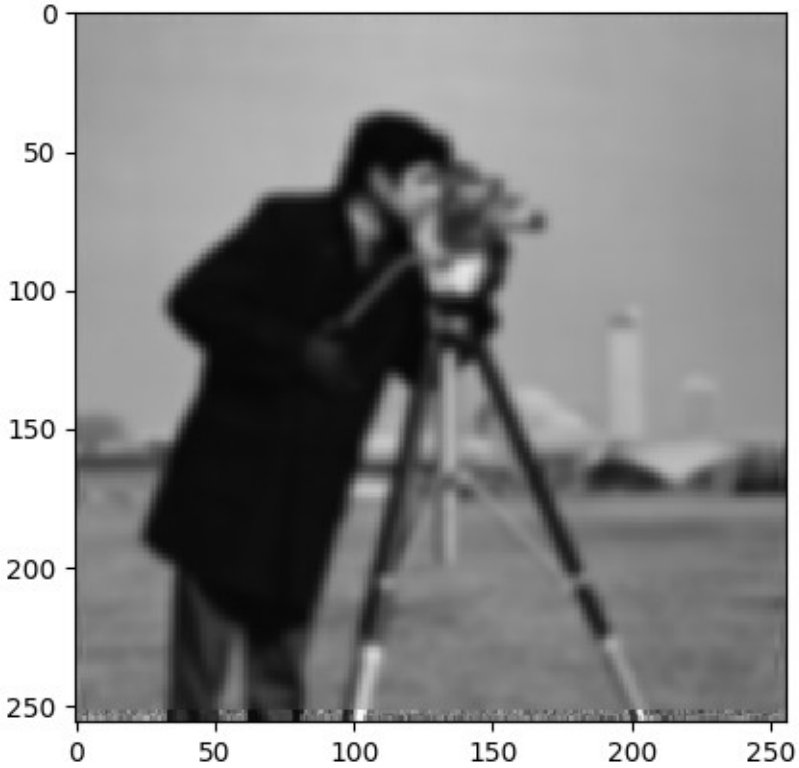


Image generated after applying the vertical filter

From the above 2 images we can see that the image generated after applying both the horizontal and the vertical filter is more smooth than the one with only the horizontal filter, especially in the horiontal direction.
The horizontal edges are smoothed out after applying the vertical filter.

We can see from the images that the image formed from the Guassian filter is more smooth when compared with the image formed from the 5x5 filter.

A1c)

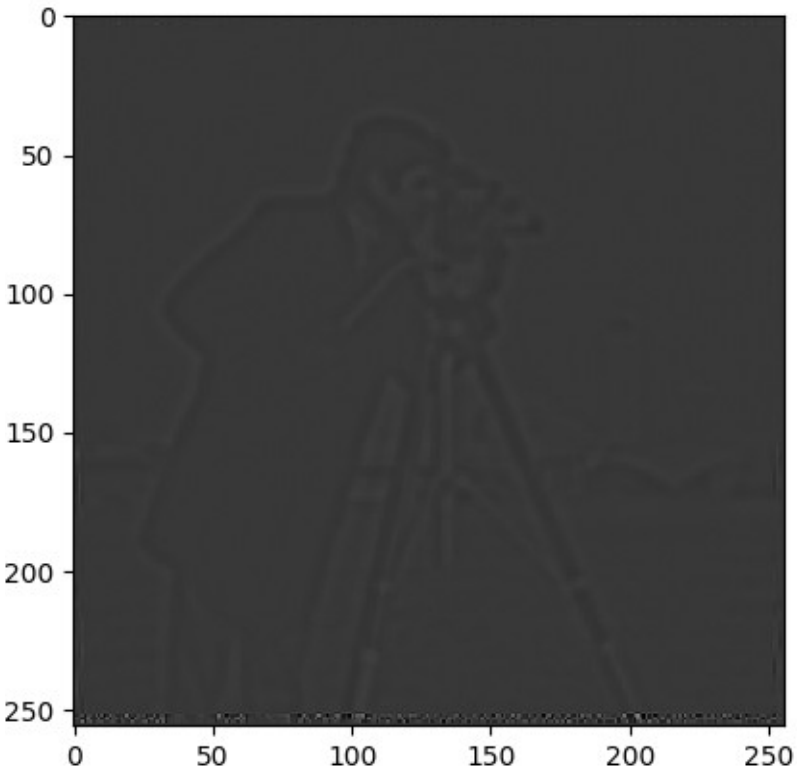


Image after applying the LoG filter

The above image is formed after applying the LoG filter. We can see that when the pixel values are scaled between 0-128 we get this image which is quite dark for most parts but we can still make out the features in the image as the edges are clearly defined.

After binarizing the image we can clearly see the edges as only the edges will have value of 0 and the other regions will have a value of 255 and because of this we can easily differentiate the edges from the other parts.

We can generate the edge map with the zero crossing reference and it is displayed below.

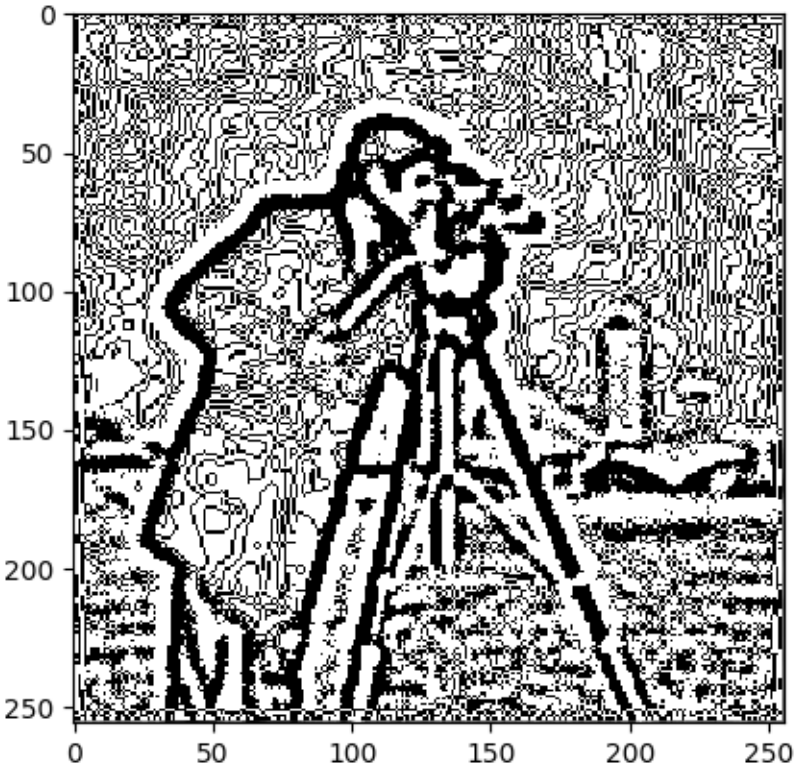
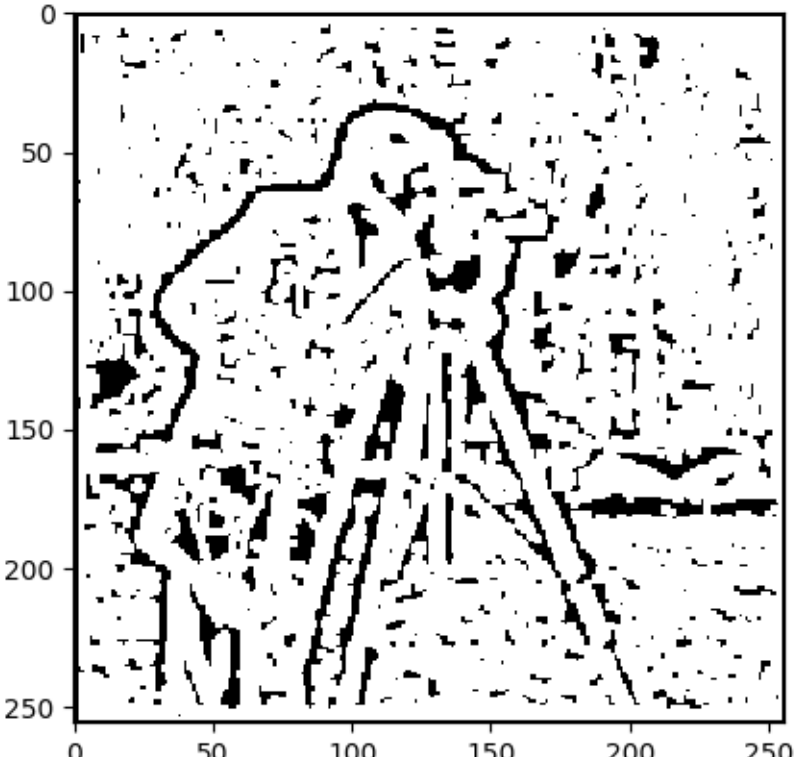


Image formed after binrizing the LoG generated image



Edge Map

Question A2

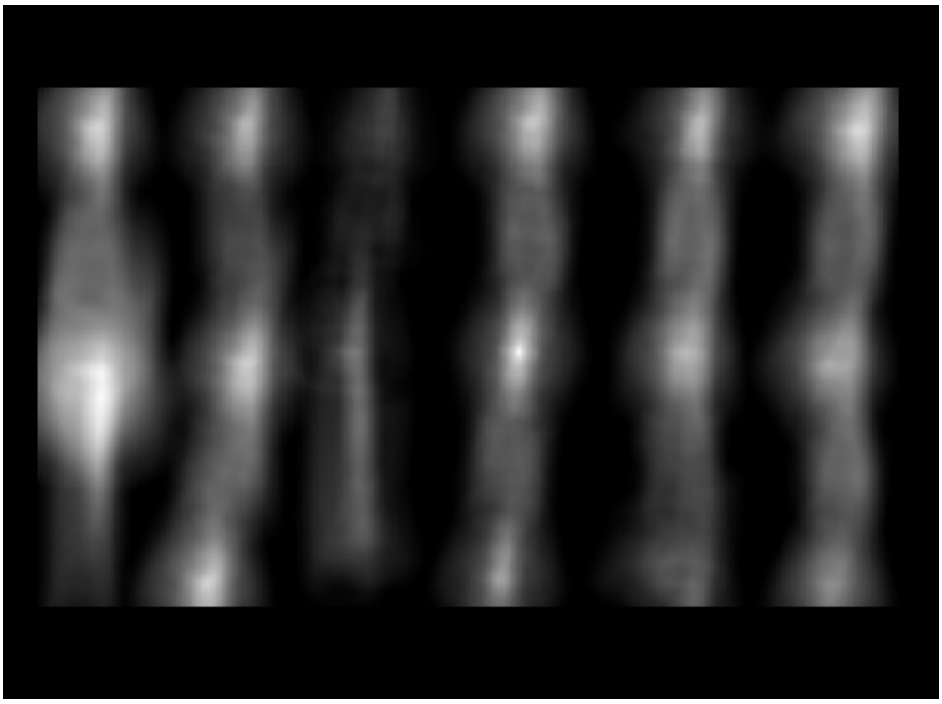
Grayscale Image

Binary image

Original Key Image

Greyscale Key Image

Binary Key Image



Peak image

The image above is the image after applying the template key as the kernel to filter the image.each pixel intensity represents how close it was to the actual image; only one pixel value will have n intensity of 255, this is the position of the templete center in the image.

For our image and template the pixel with the highest intensity Is at the position **(258, 375)** and it is marked in the image below.