# INFOIBV P1 Report

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**Differences between image A,B,C**



(From left to right images A,B and C)
If we look at these images we can see that images B and C are only in black and white and only show the edges. This is because of the threshold filter and the edge detection filter. The threshold filter maps each pixel to 0 or 255 based on a condition. And the edge detection filter highlights edges. The difference that we can see between B and C is that in image C the smaller edges are also highlighted. While in image B we can see that the edges are thicker but there is less detail. Image B has these thicker edges because the gaussian filter was used on the image. The gaussian filter essentially just blurs the image taking  (kind of) an average of the surrounding pixels. This causes the edges that are notably present to become even more present and the edges that are thin to disappear. Image C did not have a gaussian filter but the median filter. The median filter is also a blurring filter. But it takes the pixel with the median value in an area. This makes it so that the smaller edges don't disappear as seen in image C.

**choice of kernel and parameters for image B and C**
For kernels we used the Sobel kernels, as we did not have much success implementing any other kernel. The threshold is set at 10, as that gives a good balance between making the edges visible, and completely whitening out the image. The initial value of 127 only showed the very hard edges, and therefore made the difference between the gaussian and the median filter very small. With this threshold value, you can very clearly see the blur caused by the gaussian filter, as the median filter picks up less clear edges much better.
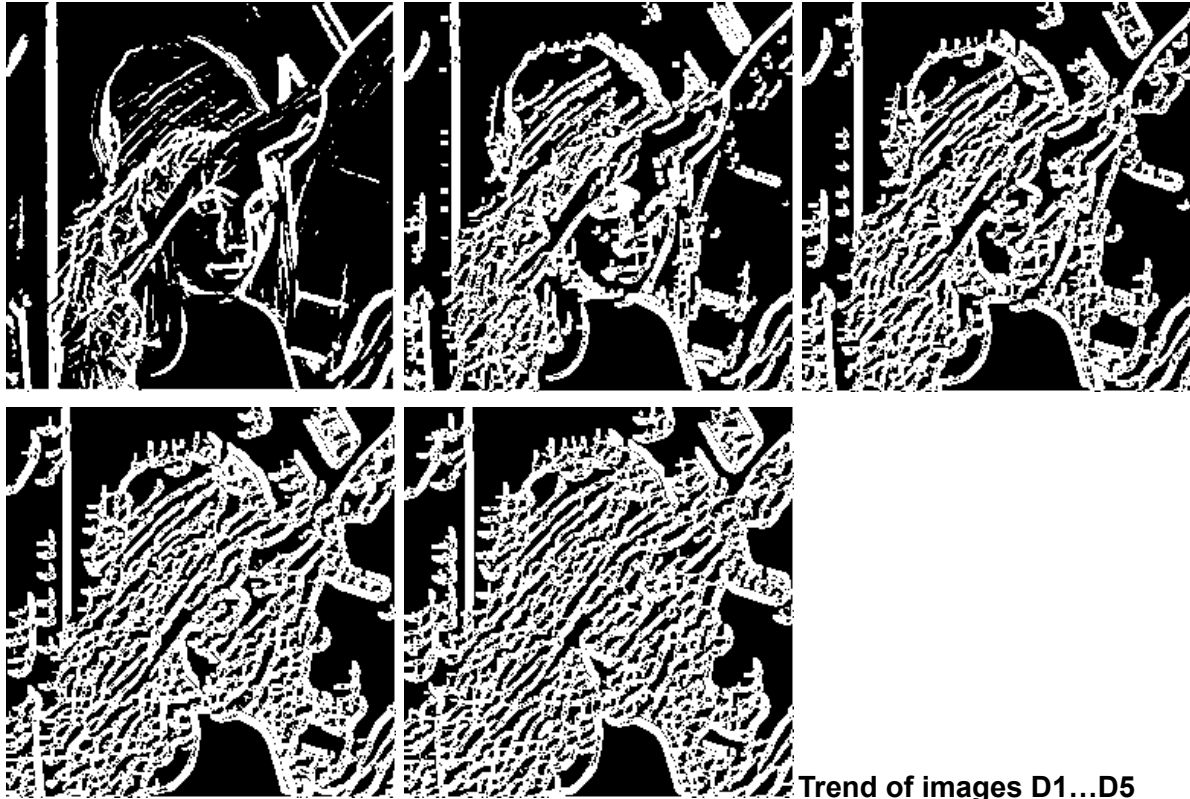
**Trend of images D1…D5**

As the image is filtered by an increasingly large kernel for the gaussian, it tends to blur out lines more, and this is very visible in these images, as the edges are made thicker and thicker. The first image is still rather recognizable, you can very clearly still see the features of the face, and the hat that the woman is wearing. By the second image, you can still make out certain features, but without the first image present, it's rather difficult to recognise. By the third iteration, it's nearly unrecognizable. Many lines have blurred together, and there is no real difference between the lines, and they have become too convoluted. Iteration 4 and 5 just compound these things, especially as the kernel becomes larger, it blurs more and more things together. The standard deviation for all of these is 1.