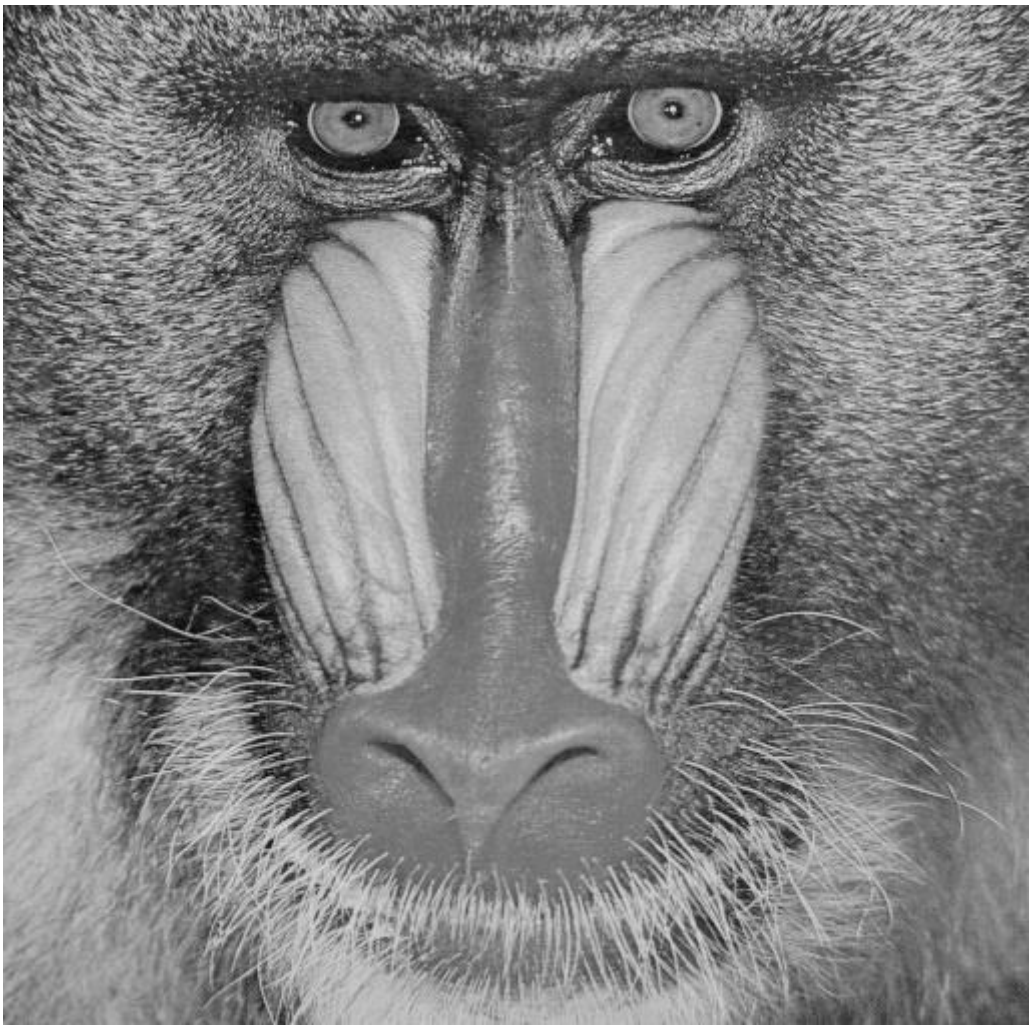
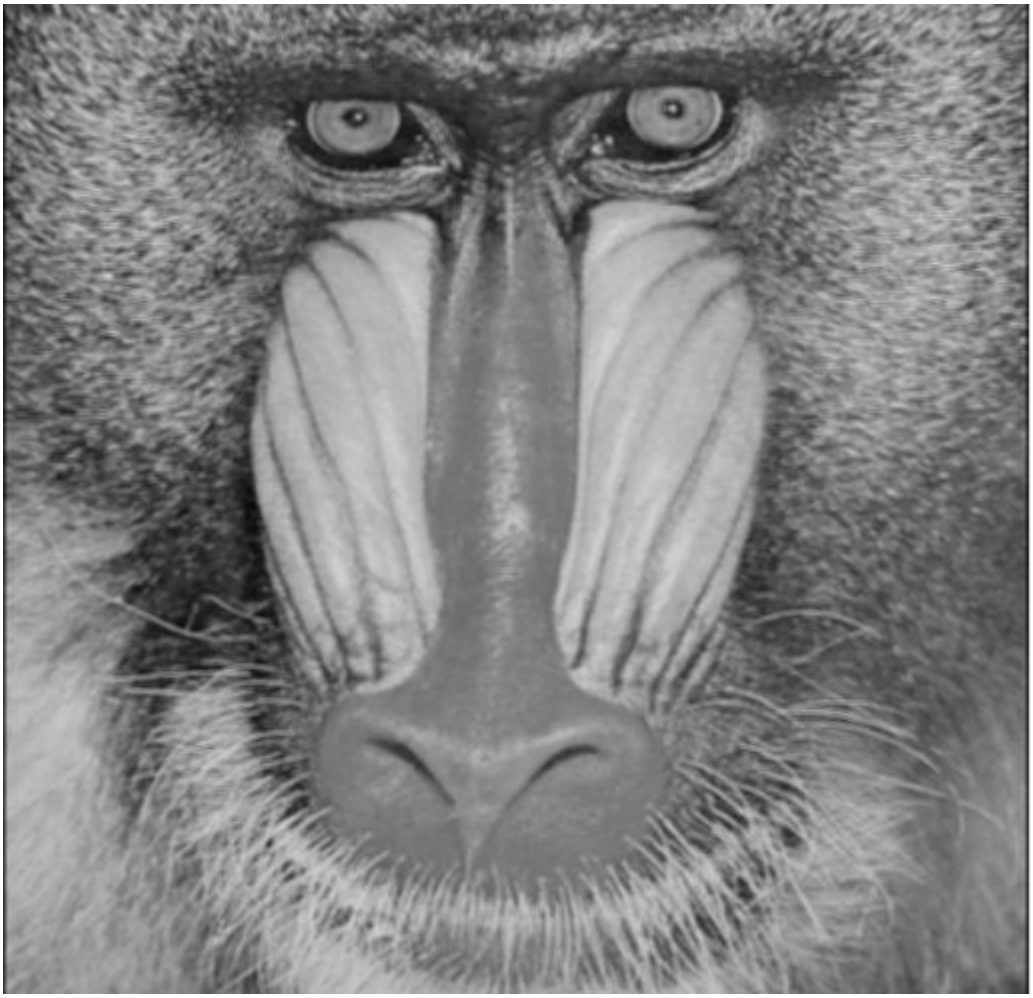
I wrote a function for convolution function which is myconv in myconv.m file. myconv function uses the convolution formula to filter the image by given image file and filter array. I used this function to filter my images. I wrote all the necessary comments for the reader to understand this function. I also created different scripts for each question which is named like first, second etc. so it would be easier to look each question separately and grade. I also did not use all example images for each question because it would just made the report and the code unnecessarily longer but if you want to test other images you can just change imread function's input and see the results.

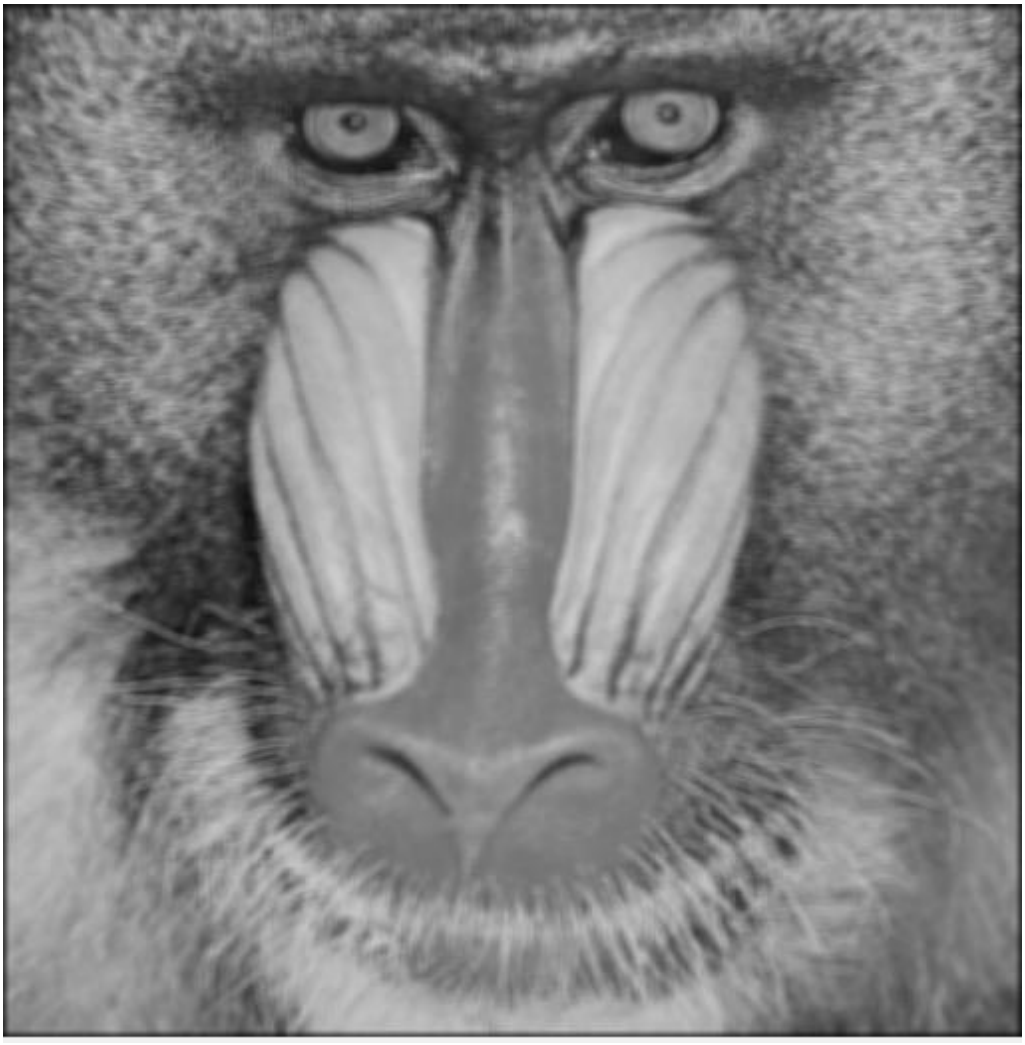
1. In the first I used mean filter to blur the images. Each time the matrix got bigger the blur of the image increased. When I wrote my convolution method, I made sure that I used 0 padding.



Şekil 1-Original Image

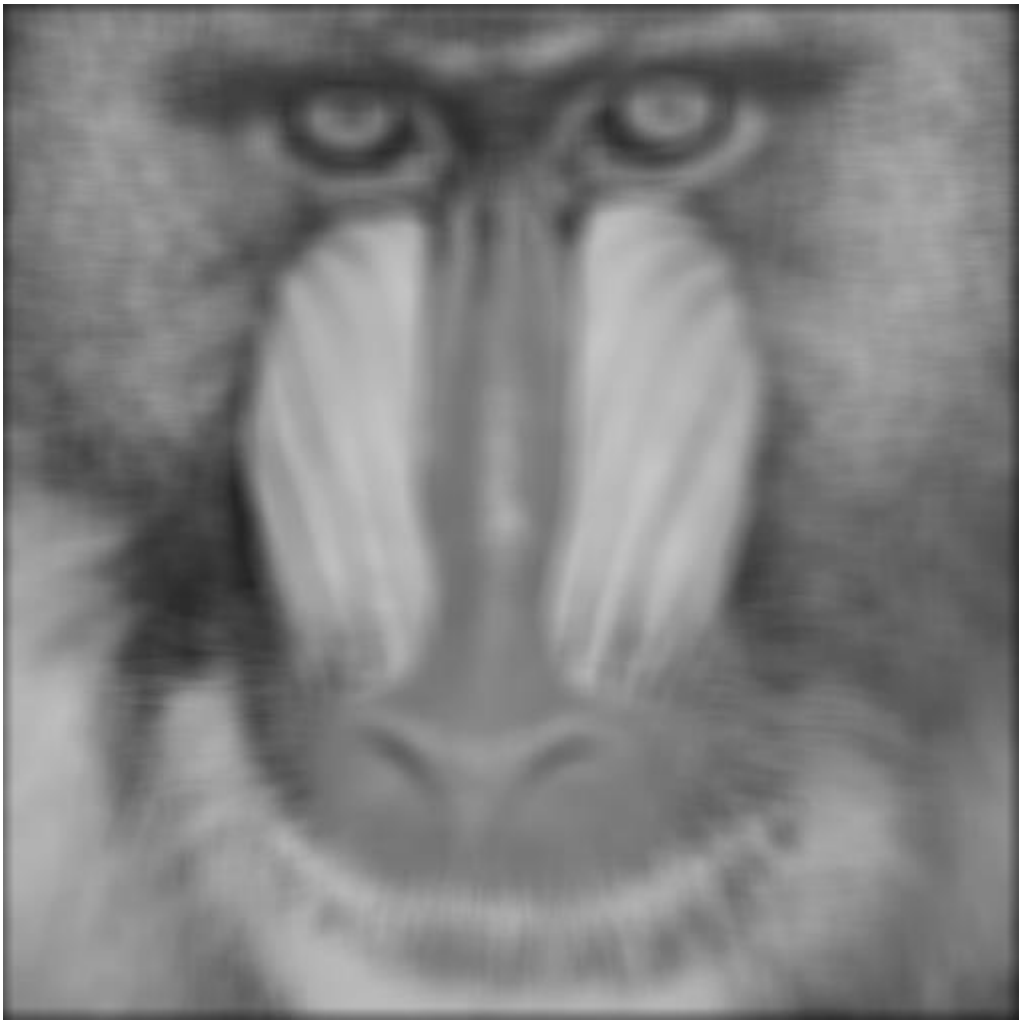


Şekil 2- 3x3 Mean Filtered Image



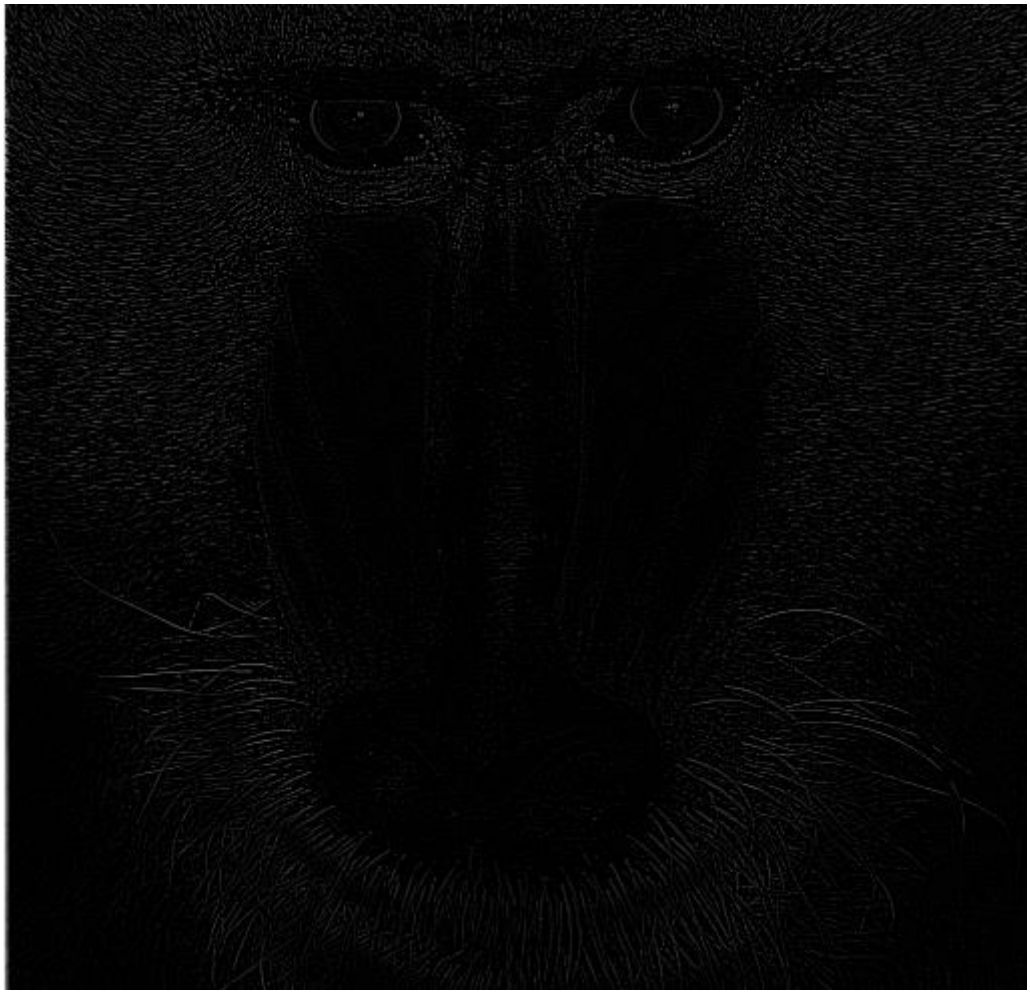
Şekil 3- 5x5 Mean Filtered Image

Şekil 4- 9x9 Mean Filtered Image

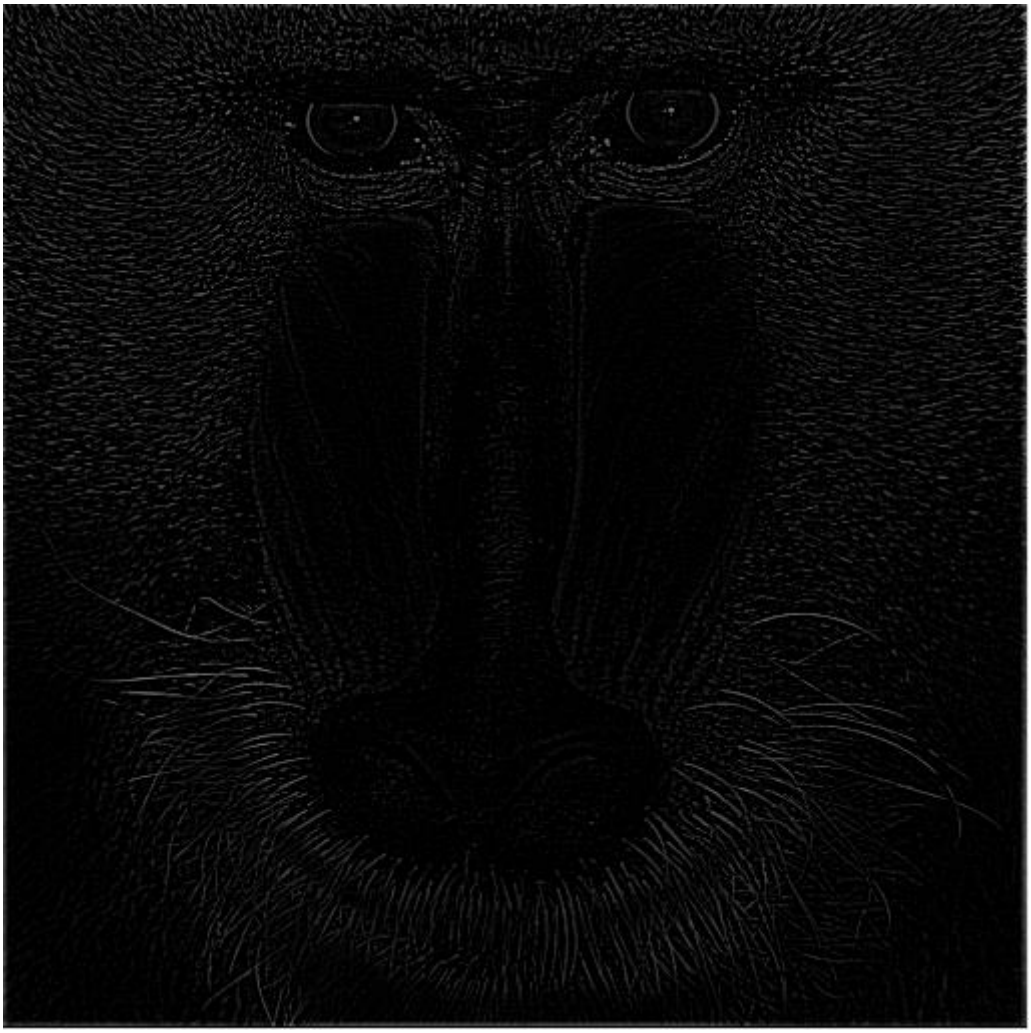


Şekil 5- 15x15 Mean Filtered Image

2. For this question I subtracted filtered images from original image and printed them on the screen.

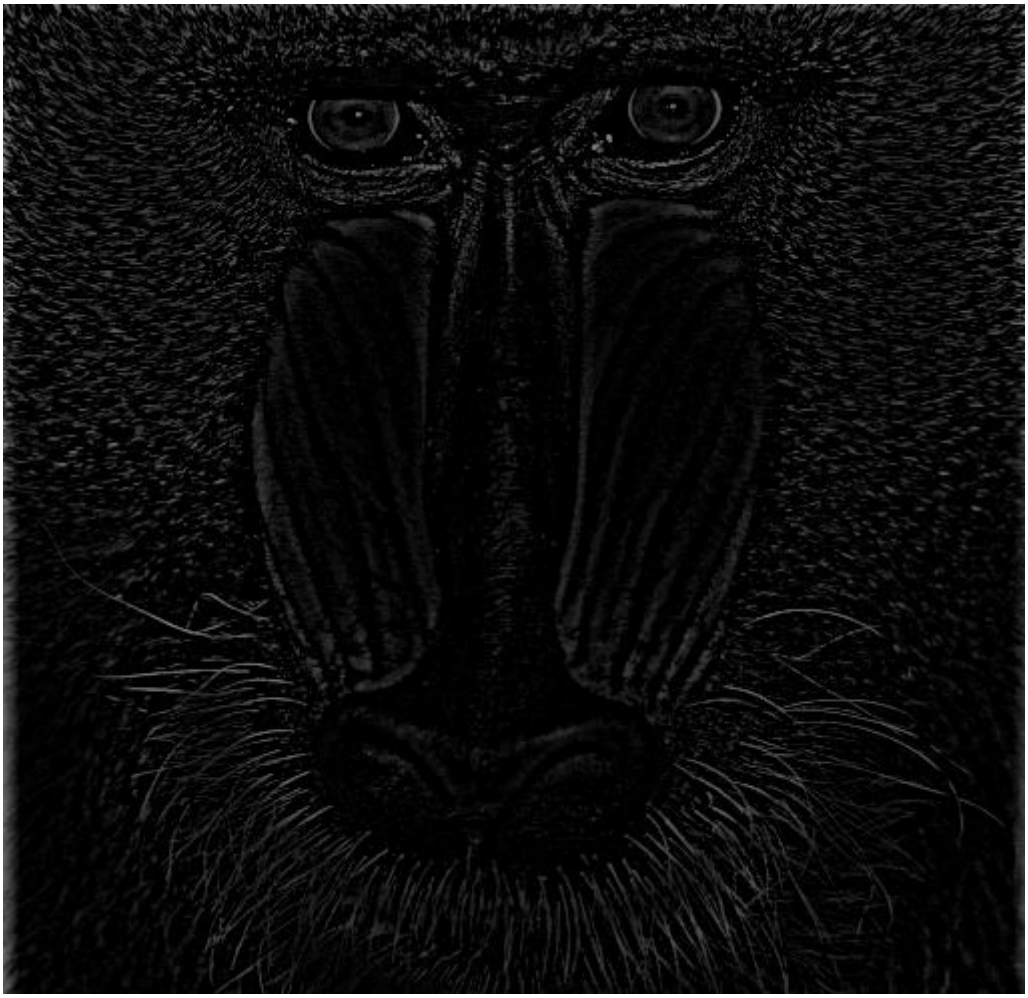


Şekil 6- 3x3 Subtracted Image



Şekil 7- 5x5 Subtracted Image

Şekil 8- 9x9 Subtacted Image



Şekil 9- 15x15 Subtracted Image

3. I shifted the image 1 and 5 times and printed them on the screen. I used different filters to shift the images as requested in the question. We can clearly see black lines in the bottom when we shift the image 5 times to the up.

Şekil 10- Original Image

Şekil 11- 1 Time Upshifted Image

Şekil 12- 5 Times Upshifted Image

4. I used the filter which was on the slides to sharpen the picture.

Şekil 13-Original Image

Şekil 14-Sharpened Image