Computer Vision

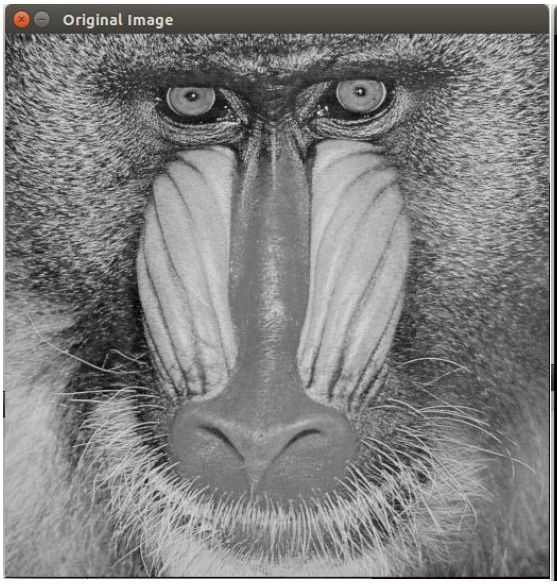
Assignment One Report

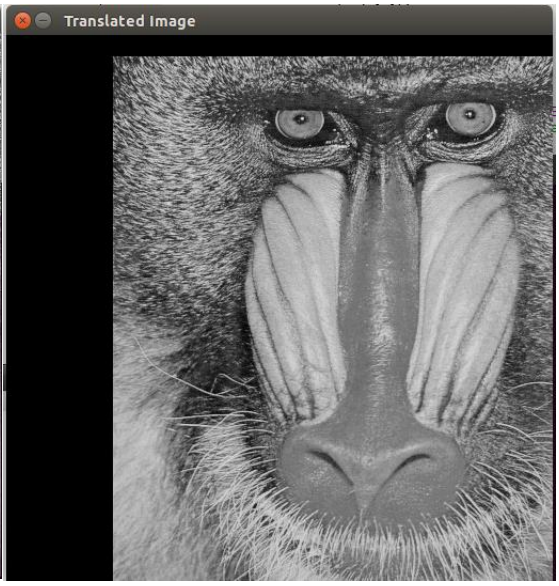
Hagar Radi Mahmoud

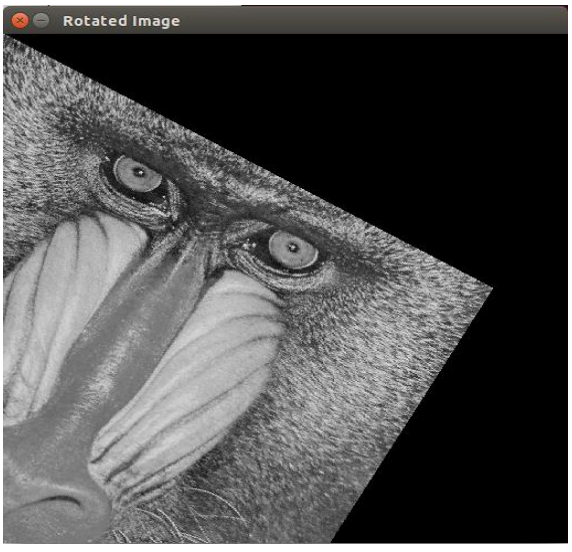
900123209

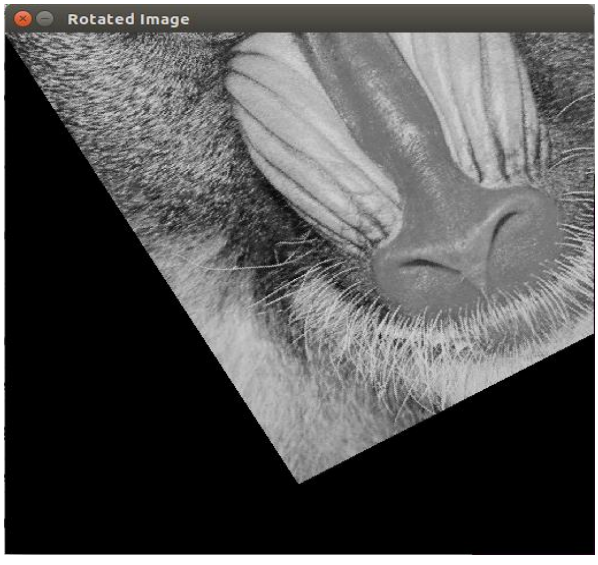
There is a function for each single transformation with specific arguments.

1. Translate, Scale and Rotate Translated (100,20)

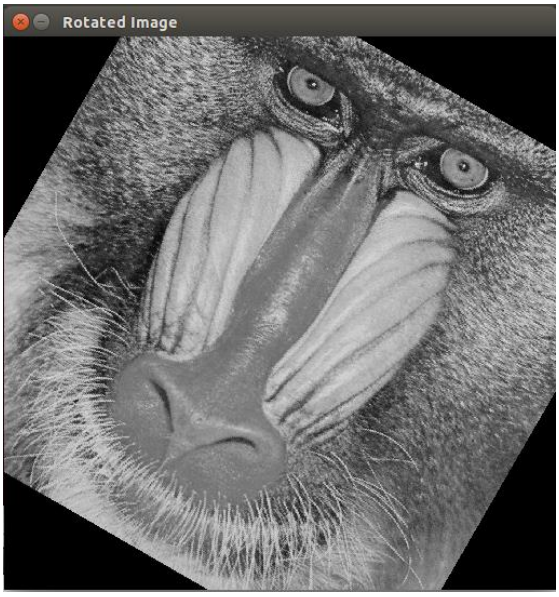




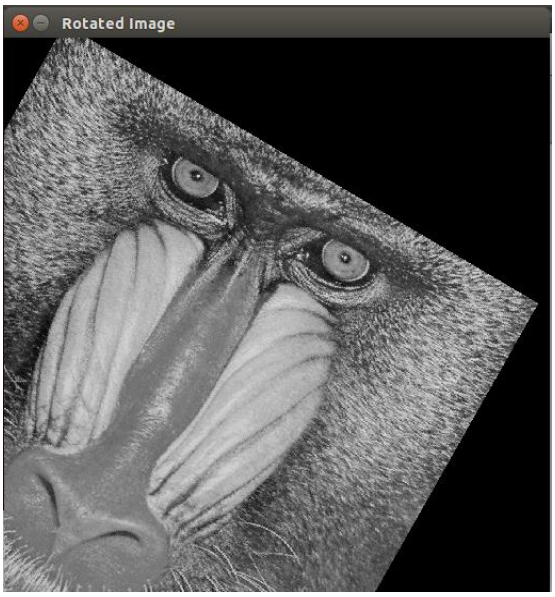




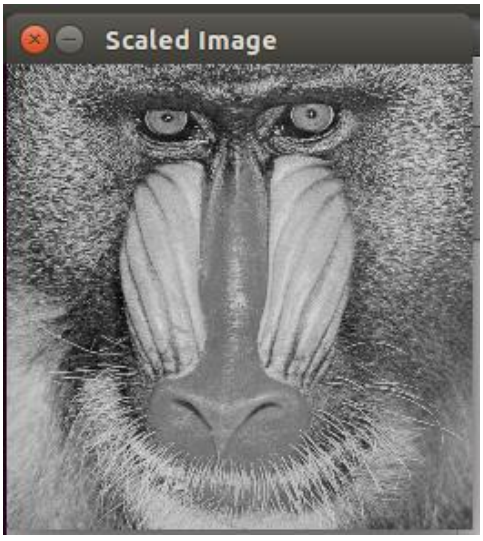
Rotation -30 degrees around the origin Rotation +30 degrees around the origin



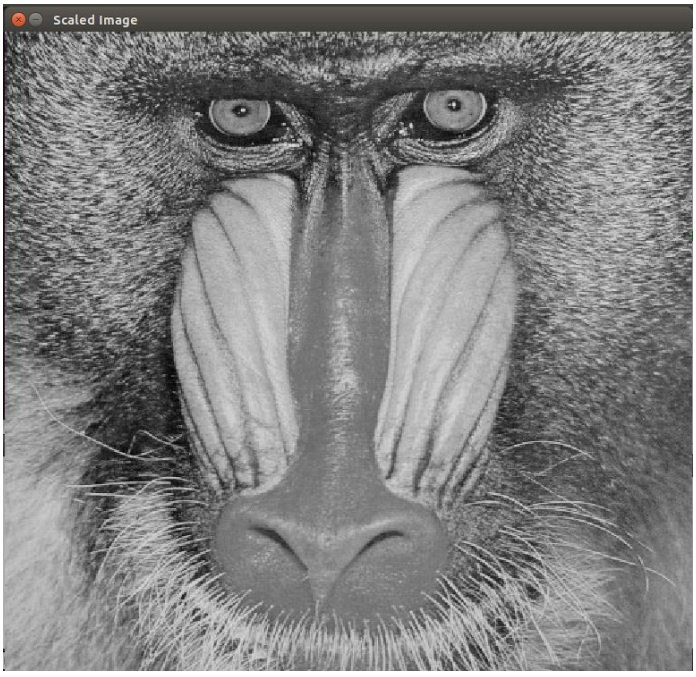
Rotation -30 degrees around the center



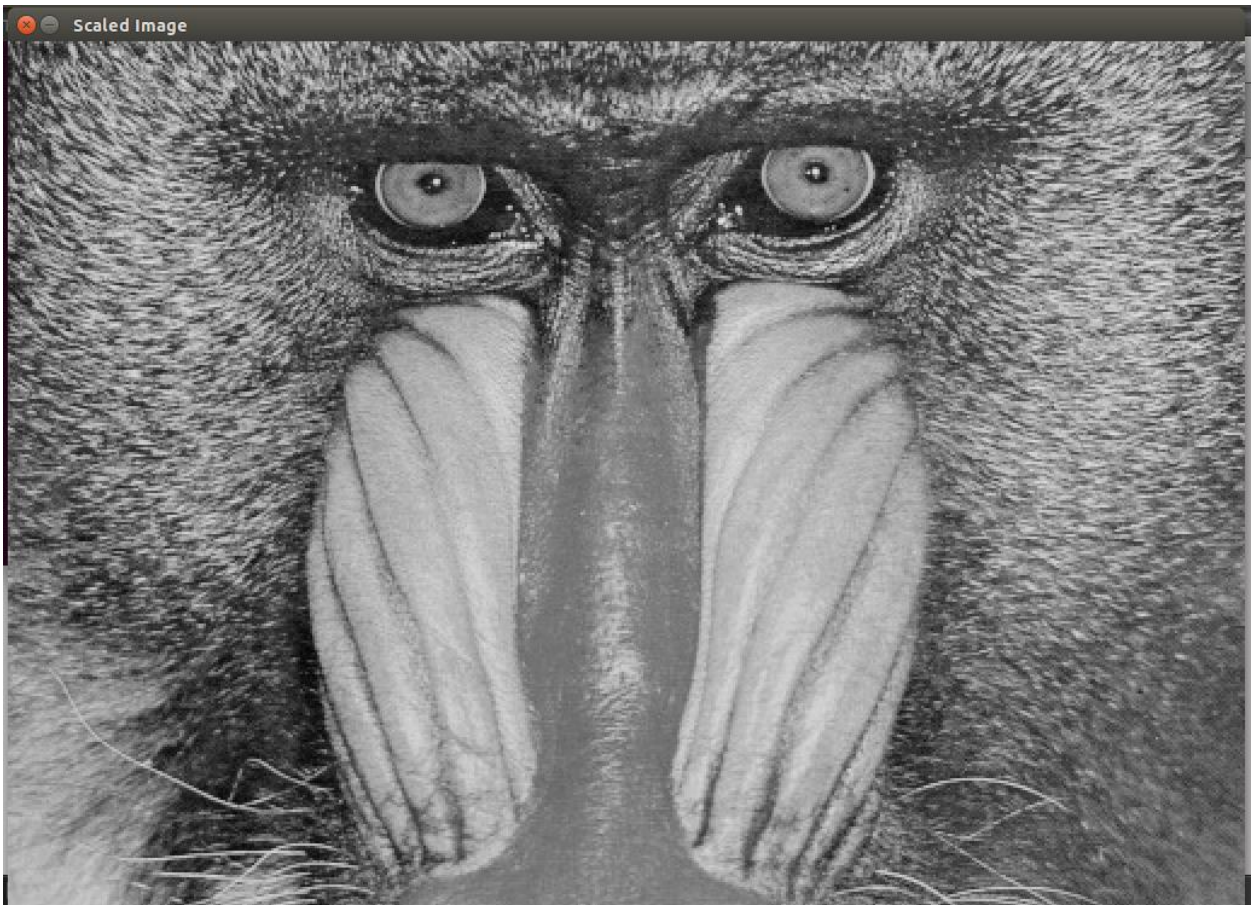
Rotation -30 degrees around (50,100)



Scale Factor = 0.5



Scale Factor= 1.5

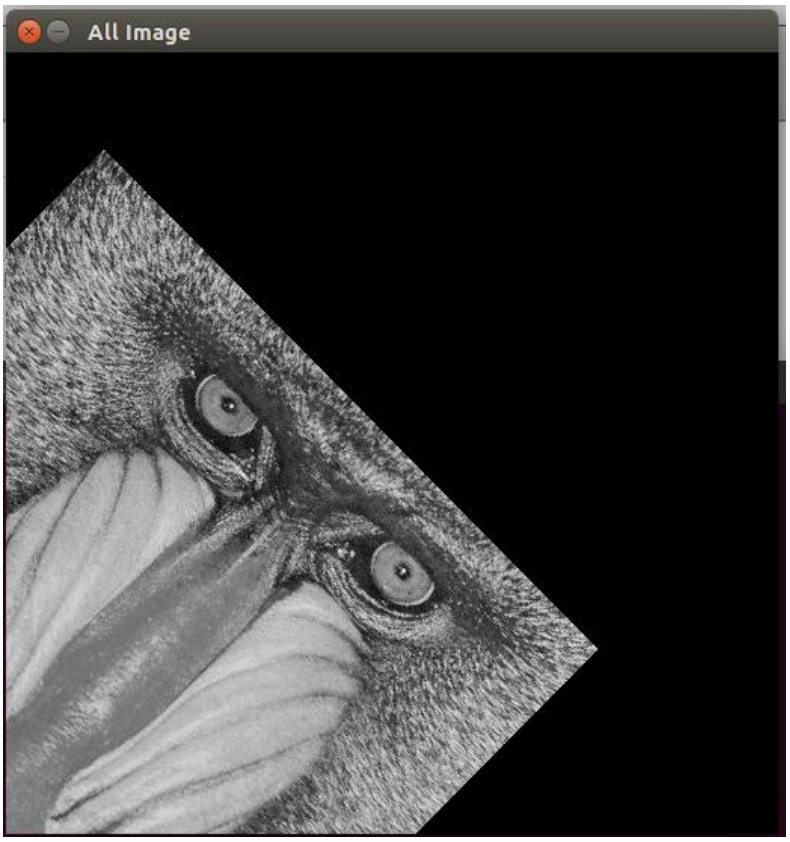


Scale Factor = 2

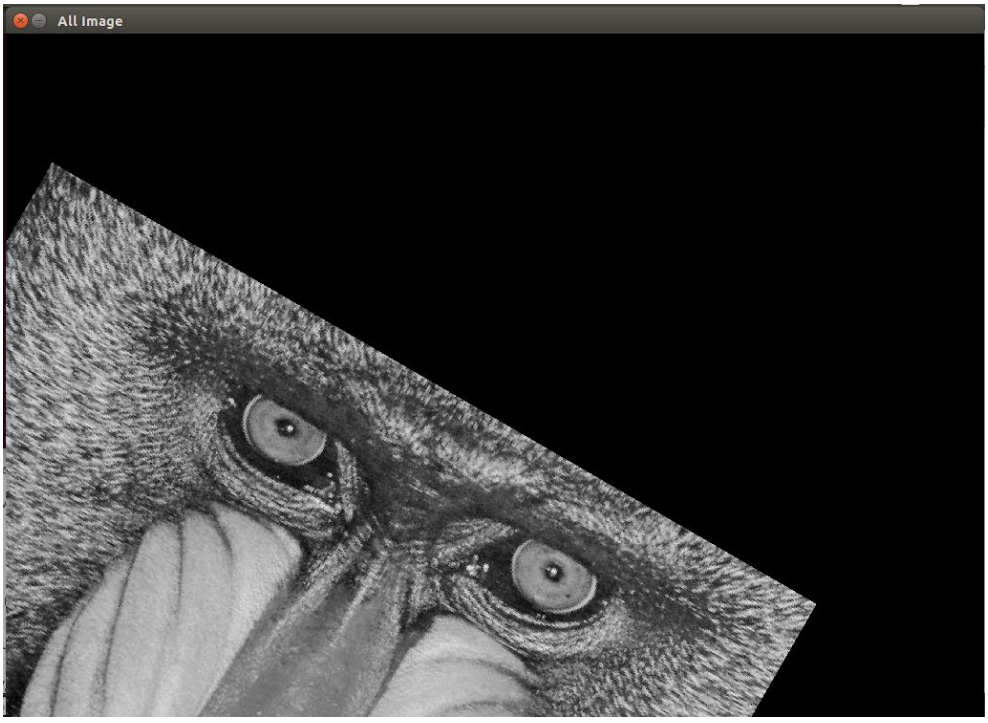
For combined transformations, there is a function “Combined” that called the three functions “Translate”, then “Scale”, then “Rotate”. Arguments are taken from the command line with the following order

Image - translation point(dx ,dy) – scale factor – rotation point(px,py) – rotation angle – bit number for slicing.

For the combined transformation, you have to set the values correctly and set zeros if you don’t need a certain transformation. For example, for no scaling, the scale factor has to be 1.

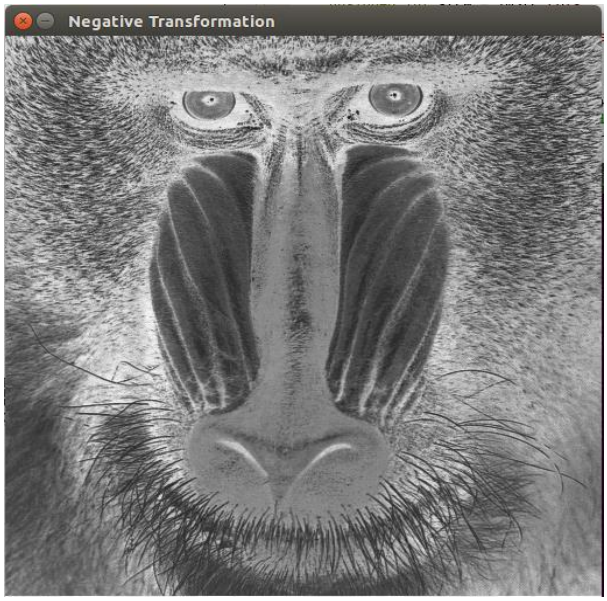


Combined Transformation: Translate (50,50) , Scale(1) , Rotation around (100,100) with -45 degrees.

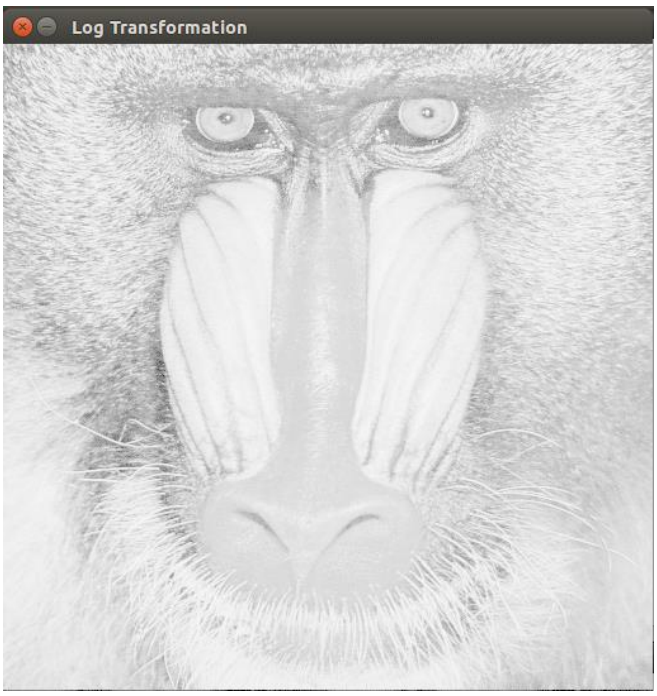


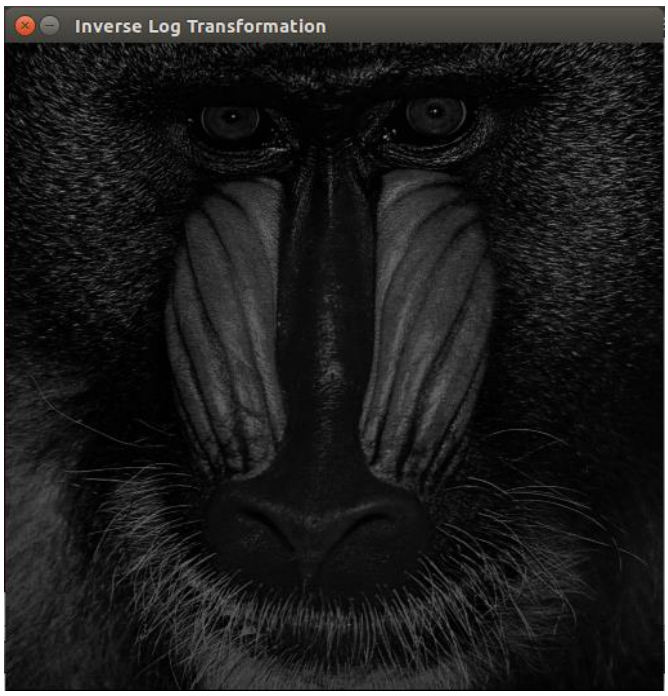
Combined Transformation: Translate (50,20) , Scale(2) , Rotation around (10,20) with -30 degrees.

2. Grey level Transformation



In negative transformation, the pixel value is inverted following this rule (S = L-1-r) so the image is the opposite to the original.

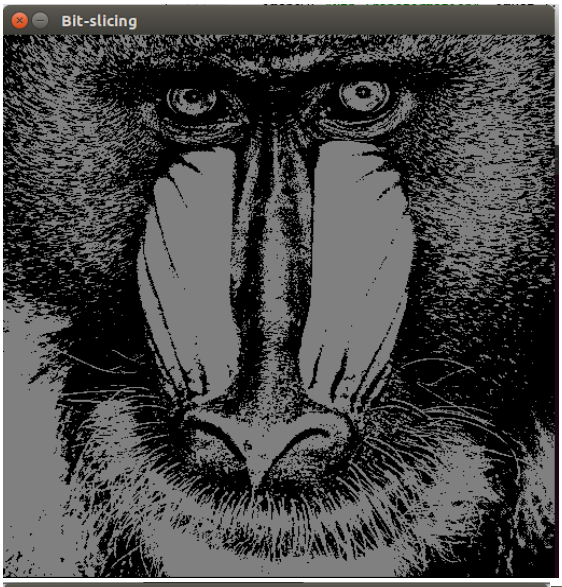


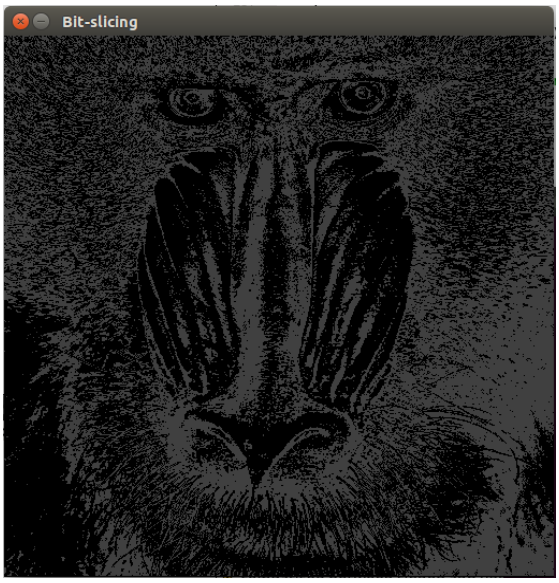


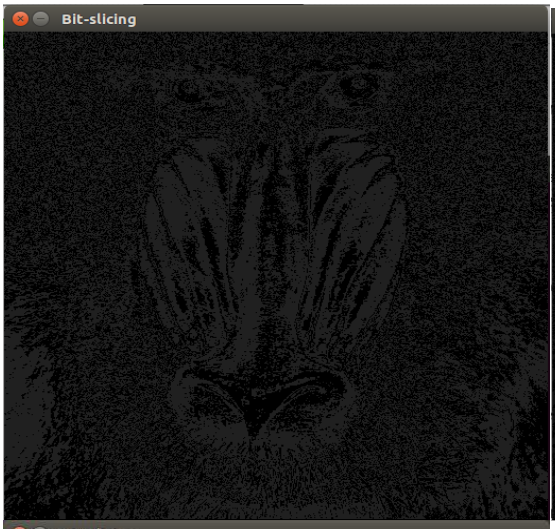
For the log transformation, the high-value pixels are compressed so the image gets very bright.

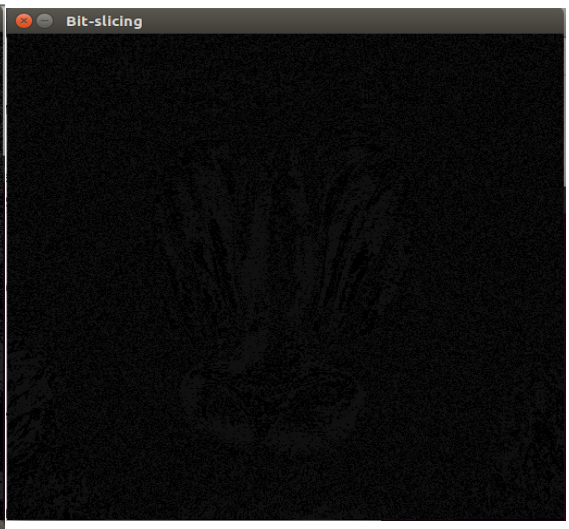
The inverse log transformation is the opposite to the log transformation so the image looks much darker.

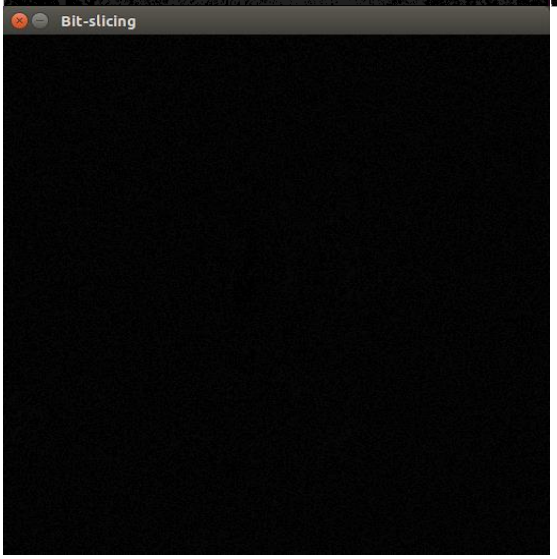
Bit Slicing:


Bit-slicing

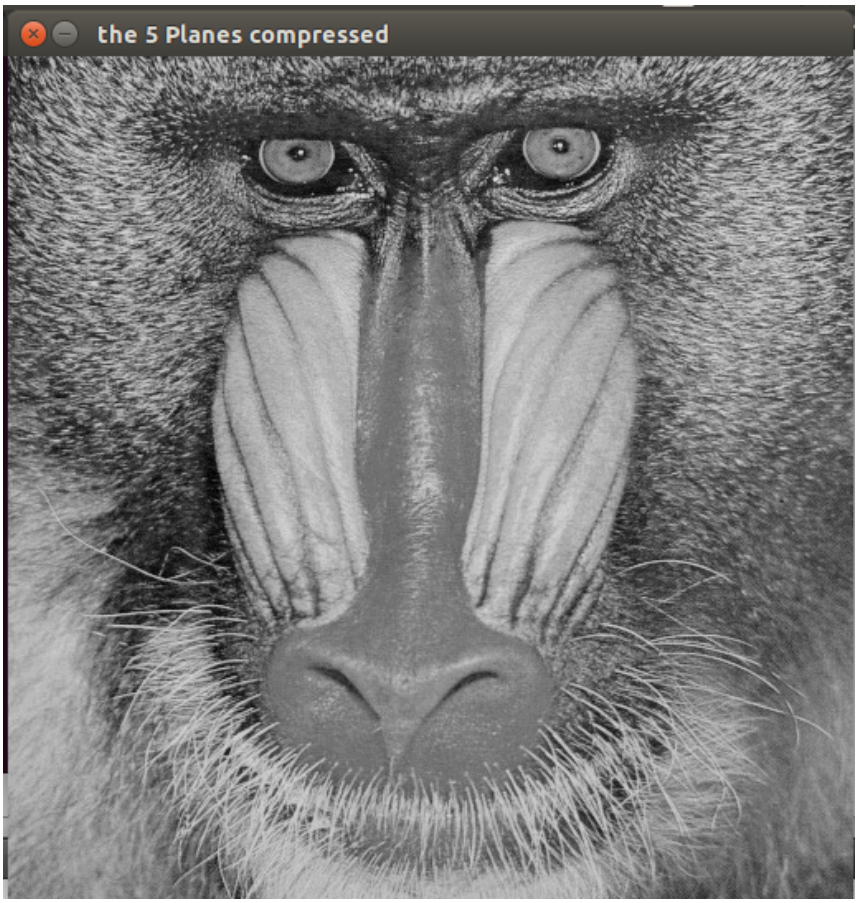

Bit-slicing


Bit-slicing


Bit-slicing

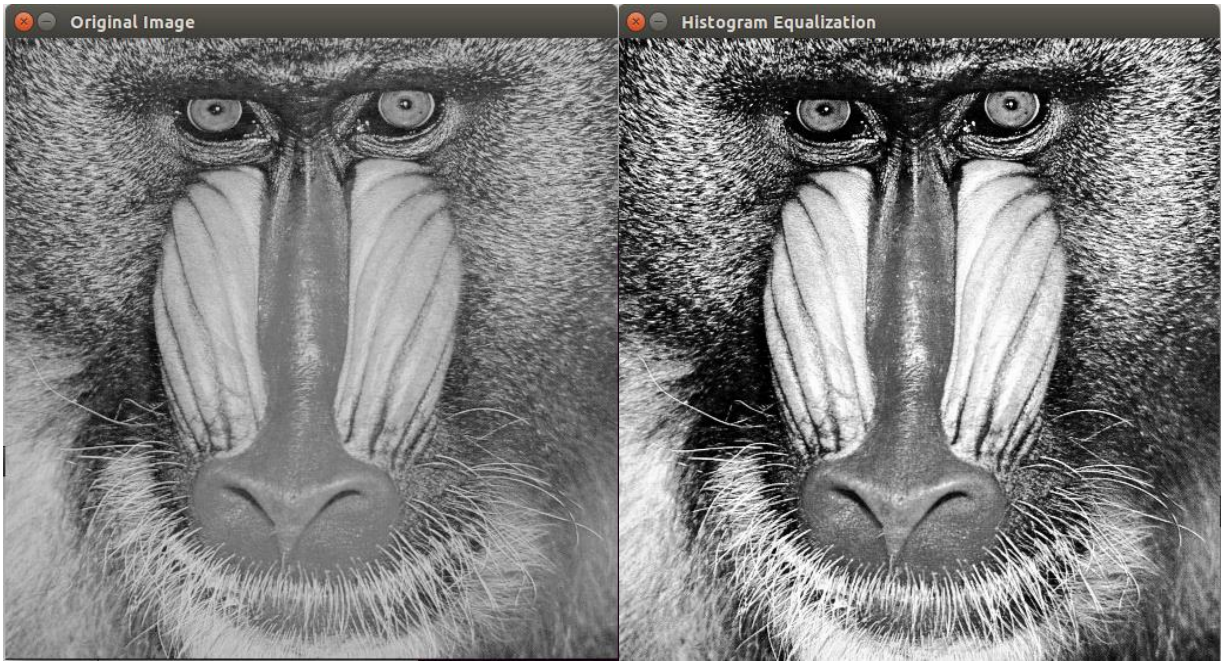

Bit-slicing

For bit-slicing, the 7th plane (bit-7) is the closest to the original image. Getting away from the highest order bit takes the image away from the original one. It turns to black starting from bit 3.



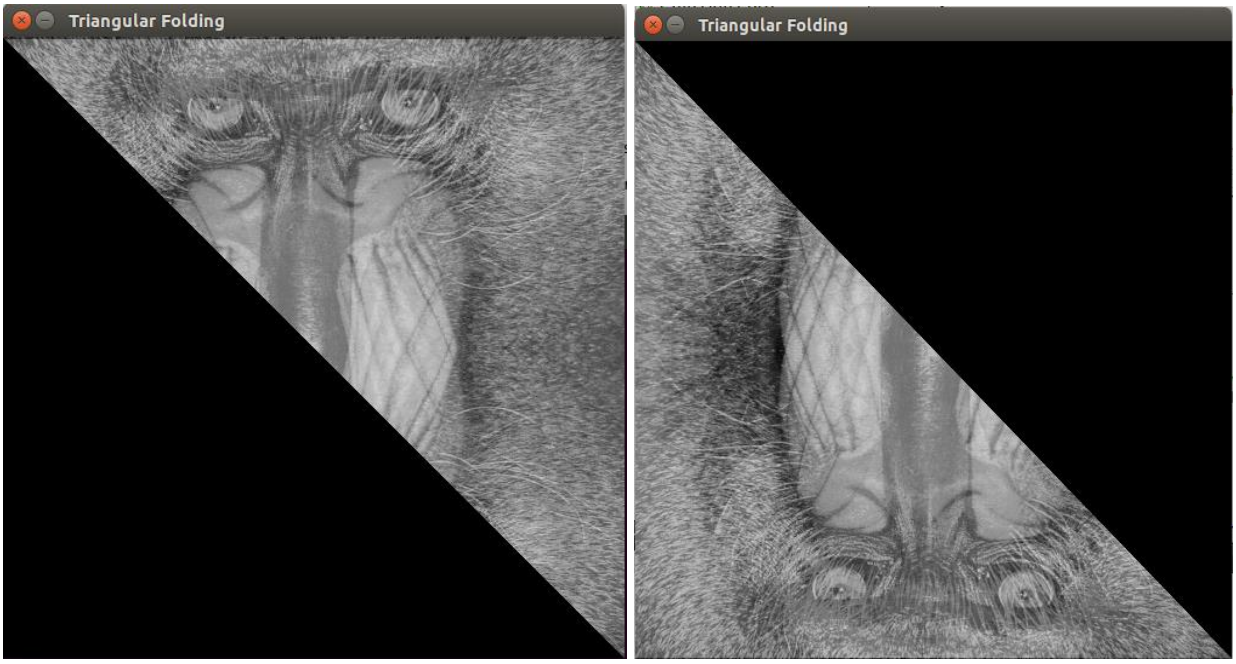
For the first 5 planes compressed together, the output is almost the same as the original image as the most significant bits are the ones that contribute to the image's content.

Histogram Equalization:



With Histogram Equalization, the output image has become of a high contrast because the pixel intensities have been better distributed.

Triangular Folding:



We average each pixel with the one opposite to it along the diagonal so it appears as if the features have been added together.