DIGITAL IMAGE PROCESSING REPORT

1. Image Resize
   A. Using bilinear interpolation
      (Height is scaled 2 times and width .5 times of original)

INPUT IMAGE

OUTPUT IMAGE

ERROR WITH RESPECT TO INBUILT FUNCTION: RMSE=6.62876 PSNR=39.9165

```
resize(input, inbuiltOutput, size, 1, 1, INTER_NEAREST)
```

B. Using nearest neighbour interpolation
      (Height is scaled 3 times and width 2 times of original iamge)

INPUT IMAGE

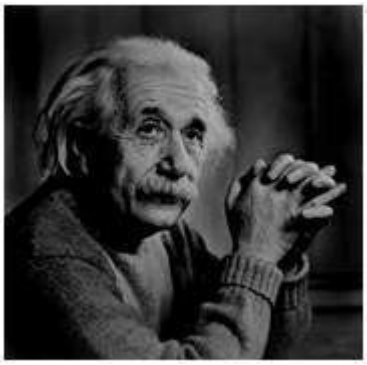
OUTPUT IMAGE

ERROR WITH RESPECT TO INBUILT FUNCTION: RMSE=0

```
resize(input, inbuiltOutput, size, 1, 1, INTER_LINEAR)
```

2.IMAGE ROTATION

(65 degree clockwise)



ORIGINAL IMAGE

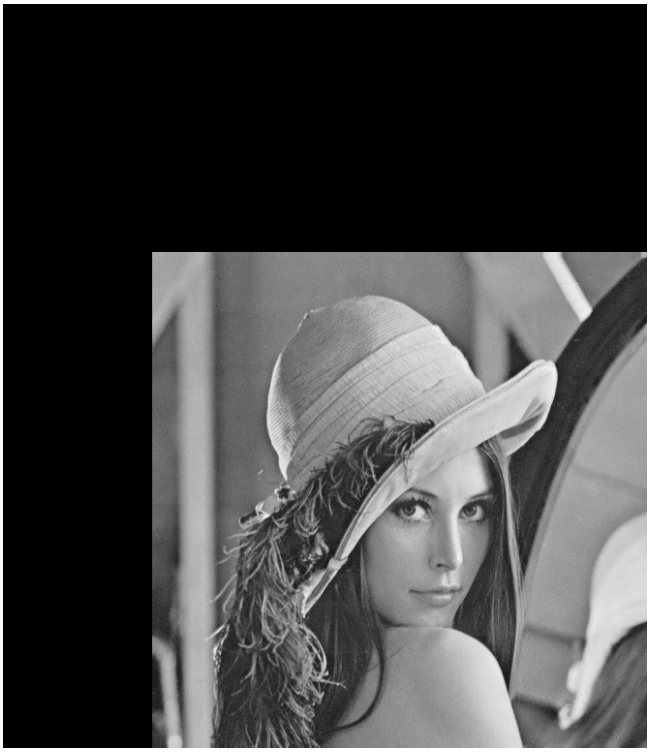
Nearest neighbour interpolation

Bilinear interpolation

OUTPUT IMAGES

3. IMAGE TRANSLATION

INPUT IMAGE



OUTPUT IMAGE

4. IMAGE SHEARING

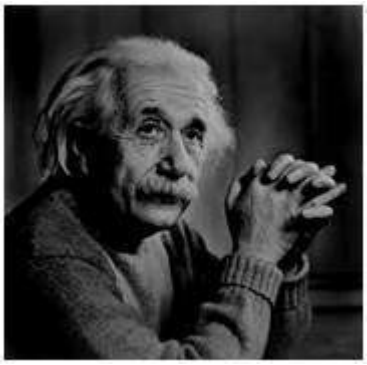
ORIGINAL IMAGE

Nearest neighbour interpolation

Bilinear interpolation

OUTPUT IMAGES

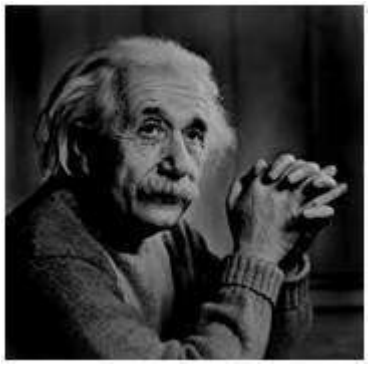
5. IMAGE NEGATIVES



INPUT IMAGE

OUTPUT IMAGE

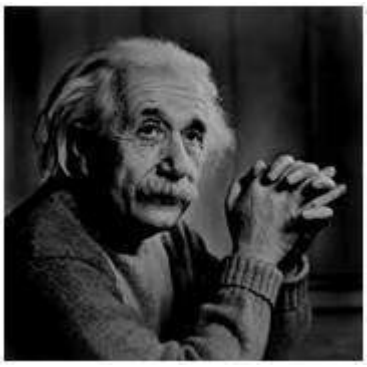
6. LOG TRANSFORMATION



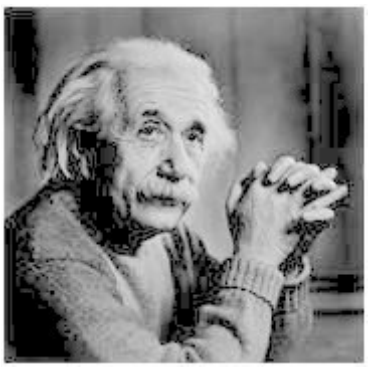
INPUT IMAGE

OUTPUT IMAGE

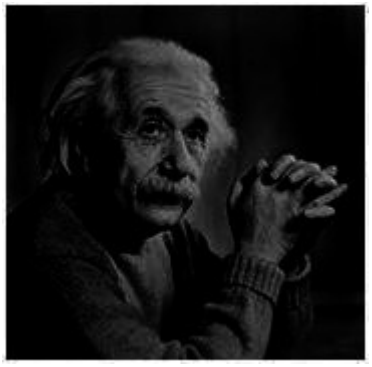
7. POWER LAW



INPUT IMAGE



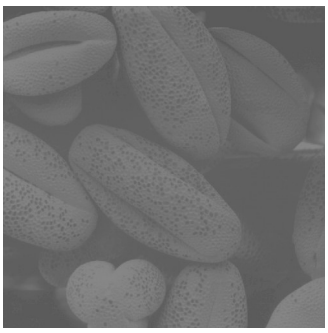
(gamma=3)



(gamma=.5)

OUTPUT IMAGES

8. CONTRAST STREACHING



INPUT IMAGE

OUTPUT IMAGE

9. THRESHOLDING

INPUT IMAGE

OUTPUT IMAGE
(Intensities above 130 are shown,
where max intensity=255)

10. INTENSITY SLICING

INPUT IMAGE

OUTPUT IMAGE
(Intensities between 100 and 130
are shown, where max intensity=255)

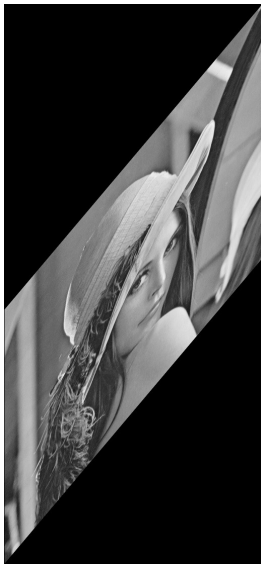
11. BIT-PLANE SLICING

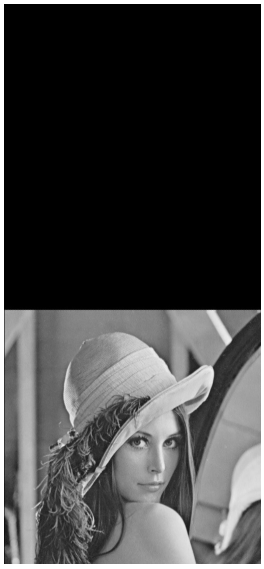
INPUT IMAGE

OUTPUT IMAGE
(7^{th} bit plane)

12. IMAGE RECONSTRUCTION FROM TIE POINTS

A. SHEAR CORRECTION





Nearest neighbour Biliner interpolation

SHEARED INPUT IMAGE CORRECTED OUTPUT IMAGES

Using original image points **(216.8,64) (588.2,256)** and **(140,64)(281,256)**
as coressponding points in the input image

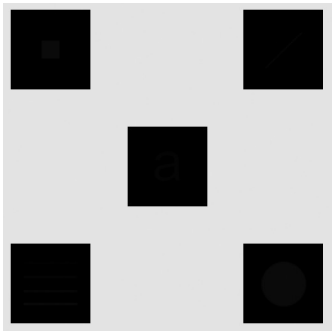
B. ROTATION CORRECTION

Nearest neighbour Biliner interpolation

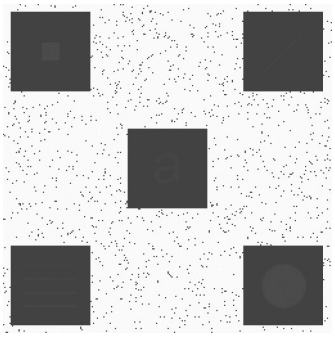
ROTATED INPUT IMAGE CORRECTED OUTPUT IMAGES

Using original image points (**561.577,-29.8092) (348.804,317.127)**
(710.873,348.804) and **(128,128)(57,514)(514,257)**
as coressponding points in the input image

13. HISTOGRAM EQUALIZATION



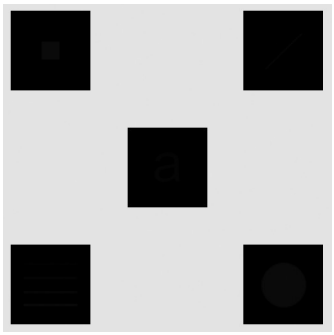
INPUT IMAGE



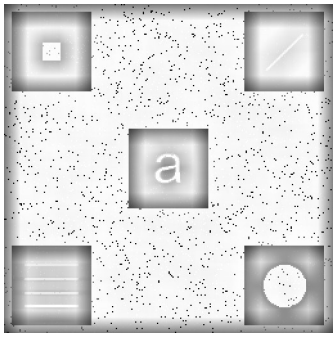
OUTPUT IMAGE

RROR WITH RESPECT TO INBUILT FUNCTION: RMSE=33.0306 PSNR=32.9416
equalizeHist(input, inbuiltOutput)

14. ADAPTIVE HISTOGRAM EQUALIZATION

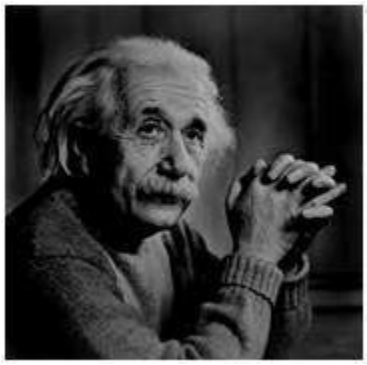


INPUT IMAGE



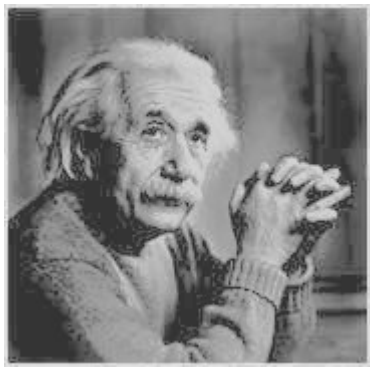
OUTPUT IMAGE

15. HISTOGRAM MATCHING



ORIGINAL IMAGE

IMAGE WHOSE HISTOGRAM IS USED



MATCHED OUTPUT

ERROR WITH RESPECT TO INBUILT FUNCTION: RMSE=0
equalizeHist(inbuiltOutput, input2)